



- (51) International Patent Classification:  
B65D 43/16 (2006.01) A47J 36/10 (2006.01)
- (21) International Application Number:  
PCT/CN2016/103811
- (22) International Filing Date:  
28 October 2016 (28.10.2016)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
62/248,774 30 October 2015 (30.10.2015) US
- (71) Applicant: KING'S FLAIR MARKETING LIMITED  
[GB/GB]; 3rd Floor, Omar Hodge Building, Wickhams  
Cay 1, P.O. Box 362, Road Town, Tortola (VG).
- (72) Inventor; and
- (71) Applicant (for SC only): WONG, Siu Wah [CN/CN];  
12/F, Yardley Commercial Building, 3 Connaught Road  
West, Hong Kong (CN).
- (74) Agent: XU & PARTNERS, LLC.; Room No.106, Build-  
ing No.1, Universal High-Tech Plaza, 958 Zhen Bei Road,  
Putuo District, Shanghai 200333 (CN).

- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: AUTO-OPENING LID AND CONTAINER COMPRISING THE SAME

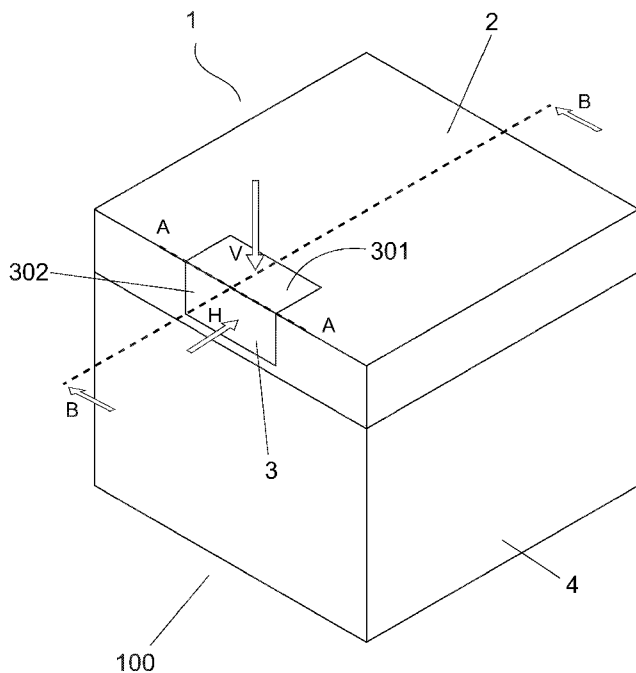


Fig. 1

(57) Abstract: The present invention relates to a lid intended for a container, the lid comprising a lid body pivotal between a closed position to cover an opening of the container, and an open position to expose the opening of the container; and an actuator movably mounted on the lid body. The actuator is configured to move the lid to the open position in two or more modes when an external force is exerted on the actuator. The present invention also provides a container assembly comprising such a lid.

WO 2017/071654 A1

**Declarations under Rule 4.17:**

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

**Published:**

— *with international search report (Art. 21(3))*

## Auto-opening Lid and Container Comprising the Same

### **Technical Field of the Invention**

This invention relates generally to an auto-opening lid, and particularly, to an auto-opening lid that can be opened by actuating in either a vertical direction or a horizontal direction, as well as a container comprising such a lid.

### **Background of the Invention**

Auto-opening lids are commonly found in containers, in particular food containers, water bottles, electric rice cookers, etc. A frequently seen mechanism for the automatic opening of the lid comprises an actuator, which when pressed triggers the lid to be opened, usually with the help of a spring member biasing the lid towards the open position. In some of these button-triggered auto-opening lids, the button is adapted for being pressed vertically. In other words, when the button is pressed downwardly, the lid is automatically opened. Such a configuration is often seen in electric rice cookers. In other button-triggered auto-opening lids, the button is adapted for being pressed horizontally. Namely, in order to open the lid, the button needs to be pressed inwardly along a direction perpendicular to the longitudinal axis of the container. This configuration is more frequently seen in water bottles.

However, there has not been an auto-opening lid with a button that can operate in both the above mentioned modes, that is, a button that triggers the automatic opening of the lid when actuated either vertically or horizontally. Such a dual-mode button-triggered auto-opening lid can provide higher flexibility and ease in the use of the container comprising said lid.

### **Summary of the Invention**

A principle object of the invention is to provide a container lid that can be triggered to open by applying a force either in the vertical direction or in the horizontal direction on an actuator of the lid. In addition, the present invention also aims to provide a container assembly comprising such a lid.

These and other objects are satisfied by the present invention, which provides a lid intended for a container, comprising:

a lid body pivotally mounted on the container, the lid body being pivotal between a

closed position to cover an opening of the container, and an open position to expose the opening of the container, and

an actuator movably, preferably pivotally, mounted on the lid body, wherein the actuator is configured to move the lid to the open position in two or more modes when an external force is exerted on the actuator.

In one embodiment of the present invention, the actuator comprises a first portion and a second portion extending vertically from the first portion, wherein the exertion of the external force on the first portion downwardly or on the second portion laterally causes movement of the first portion or movement of the second portion, thereby pivoting the lid to the open position.

In one embodiment of the present invention, the actuator comprises a lid opening and closing mechanism, the lid opening and closing mechanism comprising a hook member engageable with a locking device formed on the container to lock the lid body in the closed position, and disengageable from the locking device to allow the pivoting of the lid body to the open position when the external force is exerted on the actuator.

In one embodiment of the present invention, a first resilient member is provided to constantly bias the hook member to engage with the locking device.

In one embodiment of the present invention, the first resilient member is a compression spring arranged between the first portion of the actuator and a top wall of the lid body to constantly apply an upward force to the first portion of the actuator.

In one embodiment of the present invention, the lid body is pivotally mounted on top of the container at a rear edge of the lid body, and a second resilient member mounted at the rear edge of the lid body is provided to constantly bias the lid body toward the open position. Preferably, the second resilient member is a torsion spring.

In one embodiment of the present invention, the lid opening and closing mechanism further comprises a first linkage coupled with the first portion of the actuator for driving the hook member to disengage from the locking device of the container by the movement of the first portion of the actuator, a second linkage coupled with the second portion of the actuator for driving the hook member to disengage from the locking device of the container by the movement of the second portion of the actuator, and a frame comprising a rear plate, opposite side plates extending from two edge

portions of the rear plate, and a bottom plate connecting the opposite side plates, the frame being adapted for accommodating at least a part of the hook member, the first linkage and the second linkage.

In one embodiment of the present invention, the hook member comprises a shank and a hook portion engageable with the locking device and extending from a bottom of the shank, wherein a pair of upper pins extend from two opposite sides of an upper portion of the shank and are slidably received in a pair of upper slots positioned in the frame to correspond to the upper pins, and a pair of lower pins extend from the two opposite sides of a lower portion of the shank and are slidably received in a pair of lower slots positioned in the frame to correspond to the lower pins, such that the movement of the first portion causes the lower pins to slide in the lower slots, thereby allowing for the hook member to disengage from the locking device, and the movement of the second portion causes the upper pins to slide in the upper slots, thereby allowing for the hook member to disengage from the locking device.

In one embodiment of the present invention, the shank comprises a first bar and a second bar; and the first linkage comprises a first linkage plate terminated by a first curved element, the first curved element being pivotally engageable with the first bar, and the second linkage comprises a second T-shaped linkage plate consisting of a vertical segment and a horizontal segment terminated by a second curved element, the second curved element being pivotally engageable with the second bar.

In one embodiment of the present invention, the lid opening and closing mechanism comprises a hook member fixedly attached to or integrally formed with an inner surface of the second portion of the actuator, and the hook member is engageable with a locking device formed on the container to lock the lid body in the closed position, wherein the actuator is configured such that the movement of the first portion in a downward direction or the movement of the second portion in a direction away from the container causes to disengage the hook member from the locking device so as to allow the pivoting of the lid body to the open position.

In one embodiment of the present invention, the actuator further comprises a slidable portion mounted on the second portion in such a manner that the slidable portion is slidable in a vertical direction relative to the second portion, and downward movement of the slidable portion relative to the second portion causes the hook member to disengage from the locking device so as to allow the pivoting of the lid body to the open position.

In one embodiment of the present invention, the slidable portion comprises a cam face in cooperation with an inclined face of the locking device, in such a manner that during the downward movement of the slidable portion relative to the second portion, the cooperation between the cam face and the inclined face of the locking device causes the movement of the second portion in the direction away from the container.

In one embodiment of the present invention, at least a part of the slidable portion is slidably received in an undercut formed on an outer surface of the second portion in a manner that horizontal movement of the slidable portion relative to the second portion is prevented.

In one embodiment of the present invention, the slidable portion has two opposite latching members extending horizontally from an inner surface thereof, and the second portion has opposite longitudinal latching slots for slidably receiving the latching members, respectively.

In one embodiment of the present invention, each of the latching members has a widened end for horizontal engagement with the respective latching slot to prevent the horizontal movement of the slidable portion relative to the second portion.

In one embodiment of the present invention, a third resilient member is provided for applying an upward force on the slidable portion when the slidable portion is moved downwardly.

In one embodiment of the present invention, the third resilient member is a retainer made of a resilient material fixedly attached to the second portion, and the slidable portion comprises a protruding segment snugly received in the retainer.

In one embodiment of the present invention, a recess is formed on a top surface of the lid body for receiving the first portion of the actuator.

A second aspect of the present invention provides a container assembly comprising:  
a container having an opening and a locking device, and  
a lid constructed according to the present invention, wherein the lid is pivotally mounted on the container to cover the opening of the container and expose the opening of the container in two or more modes.

In one embodiment of the present invention, the locking device is a raised segment formed on a wall of the container and engageable with the lid to cover the opening of the container.

### **Brief Description of the Drawings**

Fig. 1 is a perspective view of a container assembly according to a first embodiment of the present invention with a lid thereof in a closed position.

Fig. 2 is a perspective view of the container assembly shown in Fig. 1 with the lid in an open position.

Fig. 3 is a perspective view of the lid body of the container assembly shown in Fig. 1.

Fig. 4 is a perspective view of the lid of the container assembly shown in Fig. 1 with the actuator removed.

Fig. 5 is a perspective view of the lid opening and closing mechanism of the container assembly shown in Fig. 1.

Fig. 6A is a perspective view of the frame of the lid opening and closing mechanism shown in Fig. 5.

Fig. 6B is a perspective view of the hook member of the lid opening and closing mechanism shown in Fig. 5.

Fig. 6C is a perspective view of the second linkage of the lid opening and closing mechanism shown in Fig. 5.

Fig. 6D is a perspective view of the first linkage of the lid opening and closing mechanism shown in Fig. 5.

Fig. 7 is a perspective view of the lid opening and closing mechanism shown in Fig. 5 with the frame removed.

Fig. 8A is a perspective view of the lid opening and closing mechanism shown in Fig. 5 when the lid is in the closed position.

Fig. 8B is a perspective view of the lid opening and closing mechanism shown in Fig. 5 when the first portion of the actuator is pressed downwardly.

Fig. 8C is a perspective view of the lid opening and closing mechanism shown in Fig. 5 when the second portion of the actuator is pressed inwardly.

Fig. 9 is a cross-sectional view of the container assembly shown in Fig. 1 cut along the line B-B.

Fig. 10 is a cross-sectional view of a container assembly according to a second embodiment of the present invention.

Fig. 11 is a perspective view of a container assembly according to a second embodiment of the present invention.

Fig. 12 is a perspective view of the container assembly shown in Fig. 11 with the lid detached from the container.

Fig. 13 is a perspective view of the second portion and the slidable portion of the actuator of the container assembly shown in Fig. 11.

Fig. 14 is a perspective view of the second portion and the slidable portion of the actuator of the container assembly shown in Fig. 11.

Fig. 15 is a perspective view of the second portion and the slidable portion of the actuator of the container assembly shown in Fig. 11.

Fig. 16 is a partial perspective view of the container assembly shown in Fig. 11 showing the cooperation between the cam face and the locking device.

Fig. 17 is a partial perspective view of the container assembly shown in Fig. 11 when the slidable portion is forced to slide downwardly.

Fig. 18 is a partial perspective view of the container assembly shown in Fig. 11 with the actuator detached from the lid body.

### **Detailed Description of the Invention**



While this invention is illustrated and described in preferred embodiments, the drinking container of the present invention may be produced in many different configurations, sizes, forms and materials.

Referring now to the drawings, Fig. 1 shows a lid 1 intended for a container assembly 100 constructed according to a first embodiment of the present invention, which may be opened in two modes. The dual-mode button-triggered auto-opening lid 1 of the container assembly 100 comprises a lid body 2 and an actuator 3. The actuator 3 is mounted to the lid body 2 in such a manner that at least part of the actuator 3 is movable or pivotable relative to the lid body 2. The lid 1 is pivotally mounted on top of a container 4 having a top opening 401 and is able to move from a closed position as shown in Fig. 1 to an open position as shown in Fig. 2, or vice versa. In the closed position, the lid body 2 closes the opening 401 of the container 4, preferably in a sealing manner. In the open position, the lid body 2 is pivoted to form an angle with the opening 401 and expose the opening, such that an inside of the container 4 is accessible through the opening 401. The angle between the lid body 2 and the opening 401 of the container 4 can be of any degrees in the range of 0-270 degrees, preferably in the range of 30-90 degrees. A spring member (not shown) may be provided to constantly bias the lid 1 toward the open position.

As can be seen in Fig. 1, the actuator 3 comprises a first portion 301 extending horizontally and a second portion 302 extending vertically. Preferably, the actuator 3 is pivotal around the axis A-A, which is an intersection line of the first portion 301 and the second portion 302. In this embodiment, the intersection line coincides with an outer edge of a top surface of the lid body. When the lid 1 is in the closed position and the first portion 301 of the actuator 3 is pressed in the direction V, that is, vertically or downwardly, the lid 1 is triggered to pivot into the open position. In addition, when the lid 1 is in the closed position and the second portion 302 of the actuator 3 is pressed along the direction H, that is, horizontally or inwardly, the lid 1 is also triggered to pivot into the open position.

As shown in Fig. 3, an opening 200 is formed in the lid body 2. The opening 200 comprises a first opening 201 formed in a top wall 21 of the lid body 2, and a second opening 202 formed in a front wall 22 of the lid body 2. The first opening 201 and the second opening 202 are shaped and sized to be substantially covered by the first portion 301 and the second portion 302, respectively, of the actuator 3, while allowing the first portion 301 and the second portion 302, respectively, to pass through.

Referring now to Fig. 4, a lid opening and closing mechanism 5 is arranged below the first opening 201 and inside the second opening 202. As shown in Figs. 5 and 6A-6D, the lid opening and closing mechanism 5 comprises a frame 6, a hook member 7, a first linkage 8 and a second linkage 9. The frame 6 comprises a rear plate 601, a pair of side plates 603, a bottom plate 602 connecting the opposite side plates 603, and a pair of top plates 604. The pair of top plates 604 is attached to a bottom surface of the top wall 21 of the lid body 2 by pasting or welding, or any other common manner known in the art, such that the frame 6 is secured to the lid body 2. On each of the side plates 603, an upper slot 605 and a lower slot 606 are formed in such a manner that they are curved toward each other, and that the front end of the upper slot 605 is substantially aligned with the rear end of the lower slot 606 in the vertical direction (as indicated by the line C-C in Fig. 6A). Besides, the slots 605 and 606 are formed to have substantially the same length.

The hook member 7 comprises a shank 701, and a hook portion 702 extending from a bottom of the shank 701. The hook portion 702 is able to engage with a locking device 402 (see Fig. 9) provided on the container body 4 to lock the lid 1 in the closed position. When the hook portion 702 is forced to move outwardly (as indicated by the arrow F in Figs. 5 and 6B), it disengages from the locking device 402, allowing the lid 1 to be opened. A pair of upper pins 705 extend from both sides of an upper portion of the shank 701, and are slidably received in the upper slots 605 of the side plates 603, respectively. In addition, a pair of lower pins 706 extend from both sides of a lower portion of the shank 701, and are slidably received in the lower slots 606 of the side plates 603, respectively. A first window 703 and a second window 707 are formed in the shank 701 at upper and lower portions thereof, and a first bar 704 and a second bar 708 are formed within the first window 703 and the second window 707, respectively. A spring member may be provided to constantly bias the hook member 7 into engagement with the locking device 402, such that when the lid 1 is closed, the lid 1 is automatically locked in the closed position.

The first linkage 8 comprises a first linkage body 801 and a first curved element 802 formed at a bottom end of the first linkage body 801. As shown, the first curved element 802 is of a C-shaped construction. As suggested by the name, the first curved element 802 has a cross section that is substantially C-shaped. As shown in Fig. 7, the first curved element 802 pivotally engages with the first bar 704.

The second linkage 9 comprises a second T-shaped linkage plate consisting of a vertical segment 903 and a horizontal segment 901. The horizontal segment 901 is

terminated by a second curved element 902. Like the first curved element 802, the second curved element 902 has a cross section that is substantially C-shaped and pivotally engages with the second bar 708.

Referring to Figs. 8A-8C, the operation of the lid opening and closing mechanism 5 to open the lid 1 in dual modes will now be explained. When the lid is in the closed position as shown in Fig. 8A, the upper pins 705 are located at the front ends of the upper slots 605, while the lower pins 706 are located at the rear ends of the lower slots 606, and the hook portion 702 is engaged with the locking device on the container body 4, such that the lid is locked in the closed position. Fig. 8B shows a first mode to open the lid. As shown in Fig. 8B, when the first portion 301 of the actuator 3 is pressed downwardly, the actuator 3 pivots around axis A-A (see Fig. 1), with the first portion 301 pivoting downwardly and pressing on the top of the first linkage 8 (as indicated by arrow V in Fig. 8B). The first linkage 8 in turn applies an outward force onto the hook member 7, which causes the pair of lower pins 706 to move outwardly along the lower slots 606, that is, towards the front ends of the lower slots 606. As the pair of upper pins 705 are already at the front ends of the upper slots 605, the upper pins 705 cannot move any further outwardly. Therefore, the hook member 7 is forced to pivot outwardly (as indicated by the arrow F in Fig. 8B) around the upper pins 705, causing the hook portion 702 to disengage from the locking device on the container body 4, thus allowing the lid 1 to be opened. This is the vertical pressing mode of the dual-mode button-triggered auto-opening lid of the present invention.

Fig. 8C shows a second mode to open the lid. In this horizontal mode of the dual-mode button-triggered auto-opening lid, the second portion 302 of the actuator 3 is pressed horizontally and inwardly, causing the actuator 3 to pivot around axis A-A (see Fig. 1), with the second portion 302 pivoting inwardly and pressing on the linkage plate 903 of the second linkage 9 (as indicated by arrow H in Fig. 8C). The second linkage 9 in turn applies an inward force onto the hook member 7, which causes the pair of upper pins 705 to move inwardly along the upper slots 605, that is, towards the rear ends of the upper slots 605. As the pair of lower pins 706 are already at the rear ends of the lower slots 606, the lower pins 706 cannot move any further inwardly. Therefore, the hook member 7 is forced to pivot in a direction as indicated by the arrow F in Fig. 8B around the lower pins 706, with the hook portion 702 pivoting outwardly to disengage from the locking device on the container body 4, thus allowing the lid 1 to be opened.

A second embodiment of the present invention is shown in Fig. 10. This embodiment

is different from the first embodiment in the lid opening and closing mechanism 5. The lid opening and closing mechanism 5 according to this embodiment is simplified, and comprises a hook member 7 integrally formed with an inner surface of the second portion 302. The hook member 7 is engageable with the locking device 402 formed on the container 4 to lock the lid body 2 in the closed position. The movement of the first portion 301 in a downward direction or the movement of the second portion 302 in a direction away from the container causes to disengage the hook member 7 from the locking device 402 so as to allow the pivoting of the lid body 2 to the open position.

Specifically and as shown, the lid 1 can be opened either by pressing the first portion 301 of the actuator 3 downwardly (as indicated by the arrow V in Fig. 10), or by pulling the second portion 302 of the actuator 3 outwardly (as indicated by the arrow H in Fig. 10). As can be seen in Fig. 10, the hook member 7 is integrally formed with the actuator 3 on an inner surface of the second portion 302 of the actuator 3, and is able to engage with the locking device 402 formed on the container body 4 to lock the lid 1 in the closed position. When either the first portion 301 of the actuator 3 is pressed downwardly or the second portion 302 of the actuator 3 is pulled outwardly, the actuator 3 pivots around the axis A-A in such a direction that disengages the hook member 7 from the locking device 402, thus allowing the lid 1 to be opened. A spring member may be provided to constantly bias the actuator 3 into engagement with the locking device 402, such that when the lid 1 is closed, the lid 1 is automatically locked in the closed position. Those skilled in the art will understand that, alternative to forming the hook member 7 integrally with the actuator 3, the hook member 7 can also be formed separately and then fixed attached to the inner surface of the second portion 302 of the actuator 3.

Figs. 11-17 show a third embodiment of the present invention, which is different from the second embodiment described above in providing a third mode to open the lid 1, in addition to pressing the first portion 301 of the actuator 3 downwardly and pulling the second portion 302 of the actuator 3 outwardly as the second embodiment. The third mode will be explained in details below.

As shown in Figs. 11-12, the lid body 2 is pivotally mounted on top of the container 4 at a rear edge of the lid body 2. A second resilient member is provided to constantly bias the lid body 2 toward the open position. In this embodiment, the second resilient member is a torsion spring 10 mounted at the rear edge of the lid body 2 where the lid body 2 is pivotally attached to the container 4. However, those skilled in the art will

understand that any other resilient device can be used in order to bias the lid body toward the open position.

As shown in Fig. 12, the actuator 3 further comprises a slidable portion 303 slidably mounted on the second portion 302. An undercut 11 is formed on an outer surface of the second portion 302 for partially receiving the slidable portion 303. The slidable portion 303 is mounted in the undercut 11 on the second portion 302 in such a manner that the slidable portion 303 is able to slide vertically relative to the second portion 302, but is prevented from moving horizontally relative to the second portion 302. In particular, as shown in Fig. 13, a pair of latching members 12 extend horizontally from an inner surface of the slidable portion 303, and are slidably received in a pair of corresponding latching slots 13 formed on the second portion 302. The widened inner ends of the latching members 12 prevent the slidable portion 303 from moving horizontally relative to the second portion 302, while the vertical lengths of the latching slots 13 allow the latching members 12 to slide vertically within the latching slots, that is, allowing the slidable portion 303 to slide vertically relative to the second portion 302. As can be seen in Fig. 14, a window 14 is formed in the second portion 302 of the actuator 3. The slidable portion 303 comprises a cam portion 15 extending from the inner surface of the slidable portion 303. The cam portion 15 comprises a cam face 16, and when the slidable portion 303 is mounted on the second portion 302, the cam portion 15 extends through the window 14. In addition, the slidable portion 303 further comprises a protruding segment 17 extending from the inner surface of the slidable portion 303. When the slidable portion 303 is mounted on the second portion 302, the protruding segment 17 extends through the window 14, and is snugly received in a retainer 18 made of a resilient material fixedly attached to the second portion. The retainer 18 serves as a third resilient member for applying an upward force on the slidable portion when the slidable portion is moved downwardly.

The third mode of opening the lid 1 will now be explained with reference to Figs. 15-16. When the slidable portion 303 is forced to slide downwardly relative to the second portion 302 (for example, by a hand of a user of the container), the cam face 16 presses against an inclined face of the locking device 402, such that the slidable portion 303 is forced to move outwardly in the horizontal direction, causing the second portion to pivot outwardly (see Fig. 16). Thus, the hook member 7 is caused to disengage from the locking device 402, allowing the lid body 2 to be pivoted into the open position.

As shown in Fig. 17, a recess 19 is formed on a top surface of the lid body 2 for

receiving the first portion 301 of the actuator 3. A compression spring 20 is provided between a bottom of the recess 19 and a bottom surface of the first portion 301 to constantly apply an upward force to the first portion 301 of the actuator 3. In other words, the compression spring 20 serves as a first resilient member to constantly bias the hook member 7 to engage with the locking device 402 to lock the lid body 2 in the closed position.

While the present invention is described in connection with what is presently considered to be the most practical and preferred embodiment, it should be appreciated that the invention is not limited to the disclosed embodiment, and is intended to closure member various modifications and equivalent arrangements included within the spirit and scope of the claims. Modifications and variations in the present invention may be made without departing from the novel aspects of the invention as defined in the claims, and this application is limited only by the scope of the claims.

**Numerical references**

- 1 lid
- 2 lid body
- 3 actuator
- 4 container
- 5 lid opening and closing mechanism
- 6 frame
- 7 hook member
- 8 first linkage
- 9 second linkage
- 10 torsion spring
- 11 undercut
- 12 latching member
- 13 latching slot
- 14 window
- 15 cam portion
- 16 cam face
- 17 protruding segment
- 18 retainer
- 19 recess
- 20 compression spring
- 21 top wall
- 22 front wall
- 200 opening
- 201 first opening
- 202 second opening
- 301 first portion
- 302 second portion
- 303 slidable portion
- 401 top opening
- 402 locking device
- 601 rear plate
- 602 bottom plate
- 603 side plate
- 604 top plate
- 605 upper slot
- 606 lower slot

701 shank  
702 hook portion  
703 first window  
704 first bar  
705 upper pin  
706 lower pin  
707 second window  
708 second bar  
801 first linkage body  
802 first curved element  
901 second linkage body  
902 second curved element  
903 linkage plate



**What is claimed is:**

1. A lid (1) intended for a container (4), comprising:  
a lid body (2) pivotally mounted on the container (4), the lid body (2) being pivotal between a closed position to cover an opening (401) of the container (4), and an open position to expose the opening (401) of the container, and  
an actuator (3) movably mounted on the lid body (2), wherein the actuator (3) is configured to move the lid to the open position in two or more modes when an external force is exerted on the actuator.
2. The lid (1) of claim 1, wherein the actuator (3) comprises a first portion (301) and a second portion (302) extending vertically from the first portion (301), wherein the exertion of the external force on the first portion (301) downwardly or on the second portion (302) laterally causes movement of the first portion (301) or movement of the second portion (302), thereby pivoting the lid (1) to the open position.
3. The lid (1) of claim 2, wherein the actuator (3) comprises a lid opening and closing mechanism (5), the lid opening and closing mechanism (5) comprising a hook member (7) engageable with a locking device (402) formed on the container (4) to lock the lid body (2) in the closed position, and disengageable from the locking device (402) to allow the pivoting of the lid body (2) to the open position when the external force is exerted on the first portion (301) or the second portion (302).
4. The lid (1) of claim 2 or 3, wherein a first resilient member is provided to constantly bias the hook member (7) to engage with the locking device (402).
5. The lid (1) of claim 4, wherein the first resilient member is a compression spring (20) arranged between the first portion (301) of the actuator (3) and a top wall of the lid body (2) to constantly apply an upward force to the first portion (301) of the actuator (3).
6. The lid (1) of any one of claims 1-5, wherein the lid body (2) is pivotally mounted on top of the container (4) at a rear edge of the lid body (2), and a second resilient member mounted at the rear edge of the lid body (2) is provided to constantly bias the lid body (2) toward the open position.

7. The lid (1) of claim 6, wherein the second resilient member is a torsion spring (10).
8. The lid (1) of claim 3, wherein the lid opening and closing mechanism (5) further comprises a first linkage (8) coupled with the first portion (301) of the actuator (3) for driving the hook member (7) to disengage from the locking device (402) of the container by the movement of the first portion (301) of the actuator (3), a second linkage (9) coupled with the second portion (302) of the actuator (3) for driving the hook member (7) to disengage from the locking device (402) of the container by the movement of the second portion (302) of the actuator (3), and a frame (6) comprising a rear plate (601), opposite side plates (603) extending from two edge portions of the rear plate (601), and a bottom plate (602) connecting the opposite side plates (603), the frame being adapted for accommodating at least a part of the hook member (7), the first linkage (8) and the second linkage (9).
9. The lid (1) of claim 8, wherein the hook member (7) comprises a shank (701) and a hook portion (702) engageable with the locking device (402) and extending from a bottom of the shank (701), wherein a pair of upper pins (705) extend from two opposite sides of an upper portion of the shank (701) and are slidably received in a pair of upper slots (605) positioned in the frame (6) to correspond to the upper pins (705), and a pair of lower pins (706) extend from the two opposite sides of a lower portion of the shank (701) and are slidably received in a pair of lower slots (606) positioned in the frame (6) to correspond to the lower pins (706), such that the movement of the first portion (301) causes the lower pins (706) to slide in the lower slots (606), thereby allowing for the hook member (7) to disengage from the locking device (402), and the movement of the second portion (302) causes the upper pins (705) to slide in the upper slots (605), thereby allowing for the hook member (7) to disengage from the locking device (402).
10. The lid of claim 9, wherein the shank (701) comprises a first bar (704) and a second bar (708); and the first linkage (8) comprises a first linkage plate (801) terminated by a first curved element (802), the first curved element (802) being pivotally engageable with the first bar (704), and the second linkage (9) comprises a second T-shaped linkage plate consisting of a vertical segment (903) and a horizontal segment (901) terminated by a second curved element (902), the second curved element (902) being pivotally engageable with the second bar (708).

11. The lid (1) of claim 3, wherein the lid opening and closing mechanism (5) comprises a hook member (7) fixedly attached to or integrally formed with an inner surface of the second portion (302) of the actuator (3), and the hook member (7) is engageable with a locking device (402) formed on the container (4) to lock the lid body (2) in the closed position, wherein the actuator (3) is configured such that the movement of the first portion (301) in a downward direction or the movement of the second portion (302) in a direction away from the container causes to disengage the hook member (7) from the locking device (402) so as to allow the pivoting of the lid body (2) to the open position.
12. The lid (1) of claim 11, wherein the actuator (3) further comprises a slidable portion (303) mounted on the second portion (302) in such a manner that the slidable portion (303) is slidable in a vertical direction relative to the second portion (302), and downward movement of the slidable portion (303) relative to the second portion (302) causes the hook member (7) to disengage from the locking device (402) so as to allow the pivoting of the lid body (2) to the open position.
13. The lid (1) of claim 12, wherein the slidable portion (303) comprises a cam face (16) in cooperation with an inclined face of the locking device (402), in such a manner that during the downward movement of the slidable portion (303) relative to the second portion (302), the cooperation between the cam face (16) and the inclined face of the locking device (402) causes the movement of the second portion (302) in the direction away from the container.
14. The lid of claim 12, wherein at least a part of the slidable portion (303) is slidably received in an undercut (11) formed on an outer surface of the second portion (302) in a manner that horizontal movement of the slidable portion (303) relative to the second portion (302) is prevented.
15. The lid of claim 14, wherein the slidable portion (303) has two opposite latching members (12) extending horizontally from an inner surface thereof, and the second portion (302) has opposite longitudinal latching slots (13) for slidably receiving the latching members (12), respectively.
16. The lid of claim 15, wherein each of the latching members (12) has a widened end for horizontal engagement with the respective latching slot (13) to prevent the horizontal movement of the slidable portion (303) relative to the second portion

(302).

17. The lid (1) of claim 12, wherein a third resilient member is provided for applying an upward force on the slidable portion (303) when the slidable portion (303) is moved downwardly.
18. The lid (1) of claim 17, wherein the third resilient member is a retainer (18) made of a resilient material fixedly attached to the second portion (302), and the slidable portion (303) comprises a protruding segment (17) snugly received in the retainer (18).
19. The lid (1) of any one of claims 2-18, wherein a recess (19) is formed on a top surface of the lid body (2) for receiving the first portion (301) of the actuator (3).
20. The lid (1) of any one of claims 1-19, wherein the actuator (3) is pivotally mounted on the lid body (2) to pivot the lid to the open position in two or more modes.
21. A container assembly comprising:
  - a container (4) having an opening and a locking device (402), and
  - a lid (1) according to any one of claims 1-20, wherein the lid (1) is pivotally mounted on the container (4) to cover the opening of the container and expose the opening of the container in two or more modes.
22. The container assembly of claim 21, wherein the locking device (402) is a raised segment formed on a wall of the container (4) and engageable with the lid (1) to cover the opening of the container.

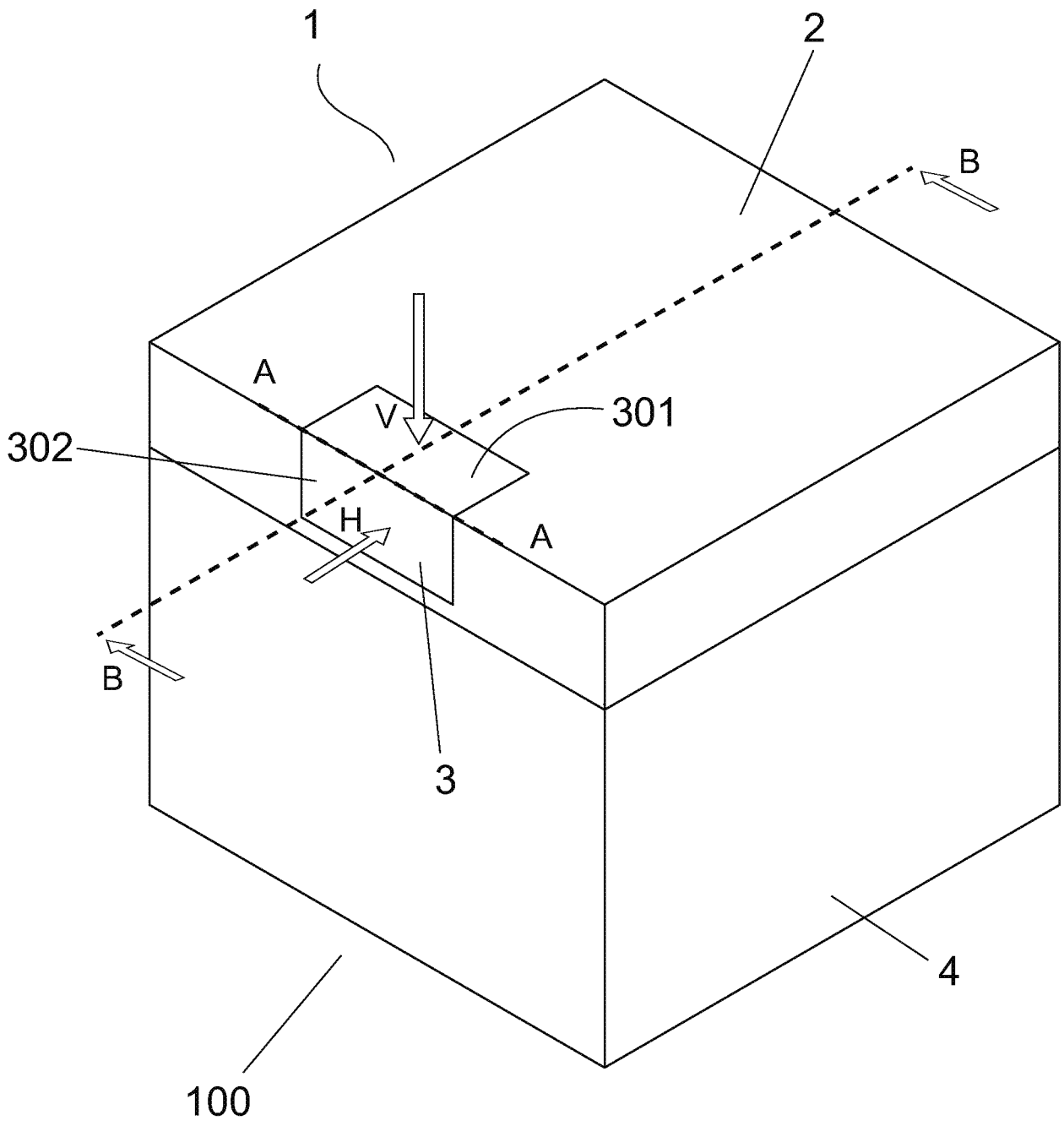


Fig. 1

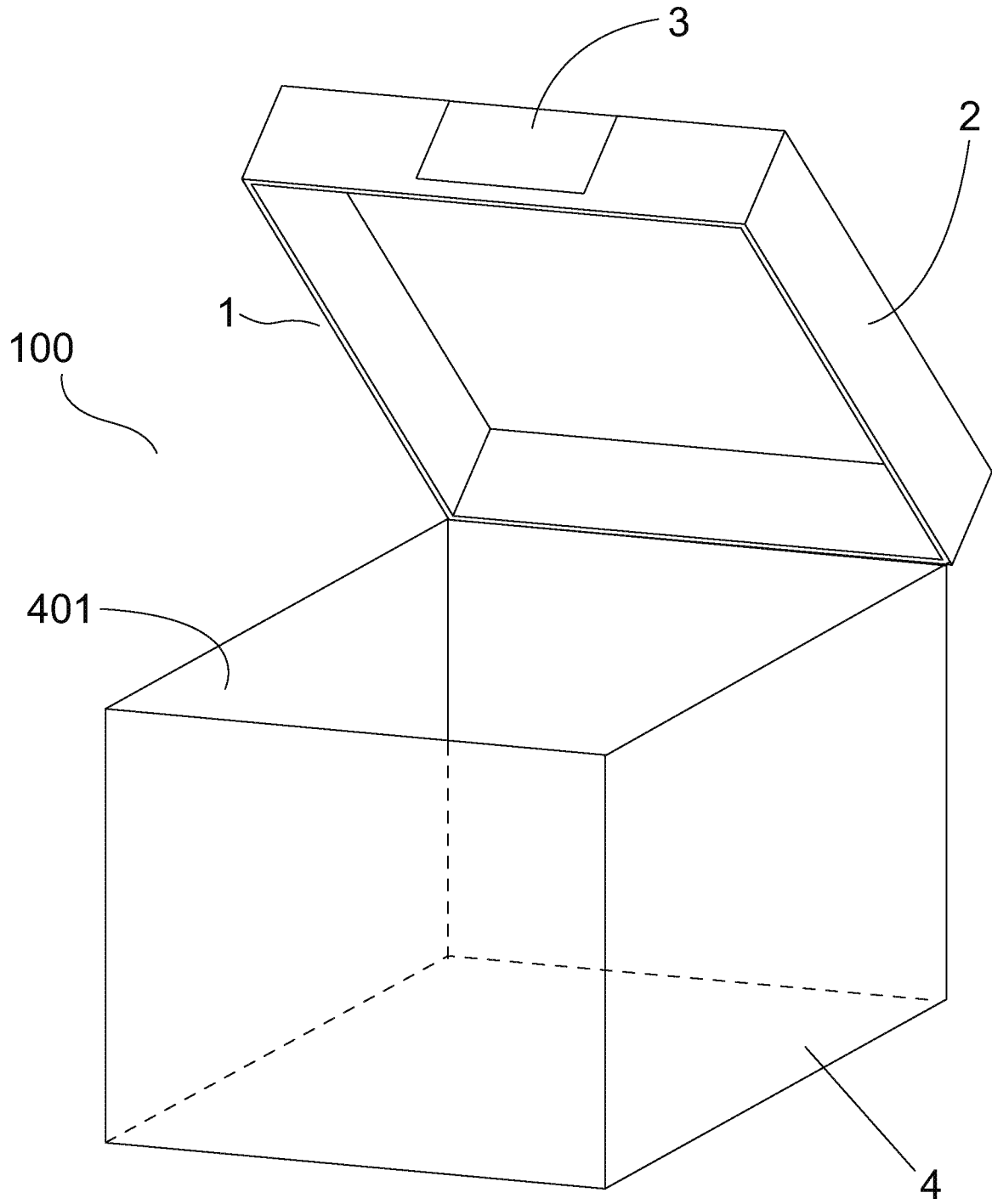


Fig. 2

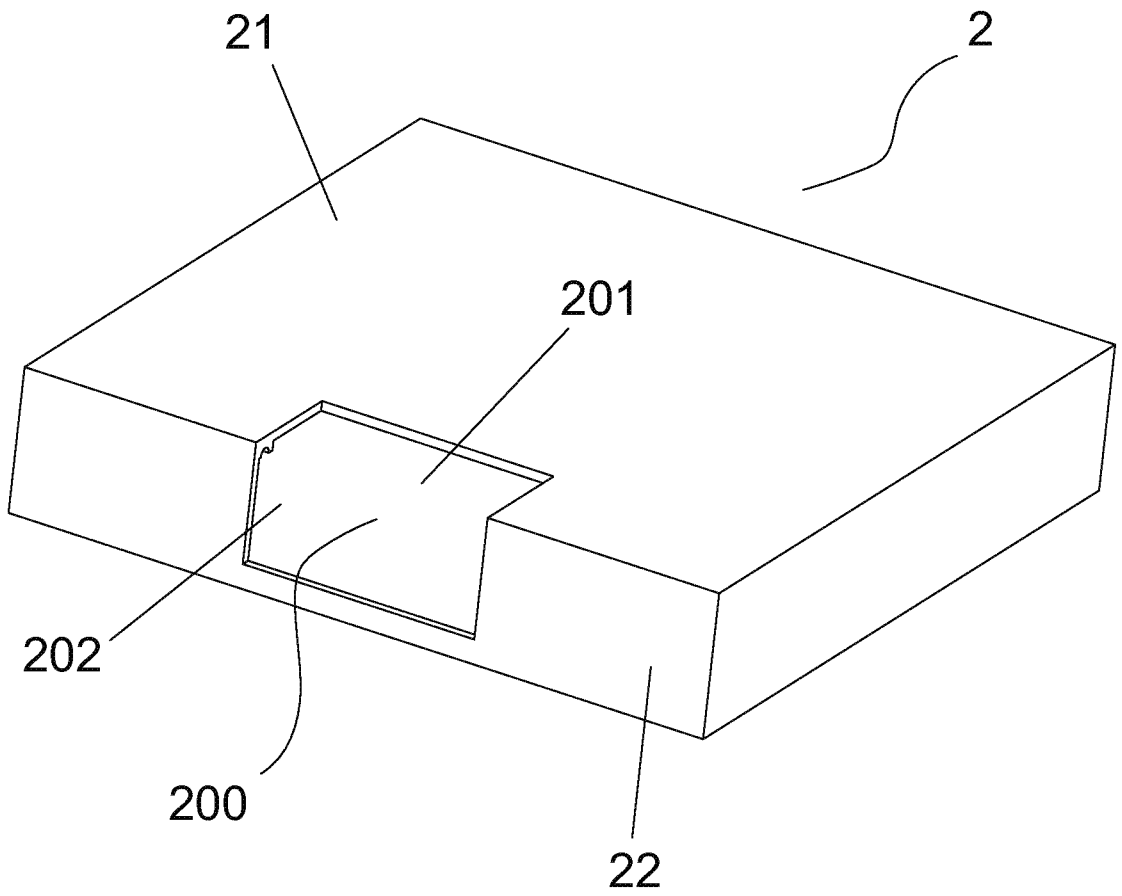


Fig. 3

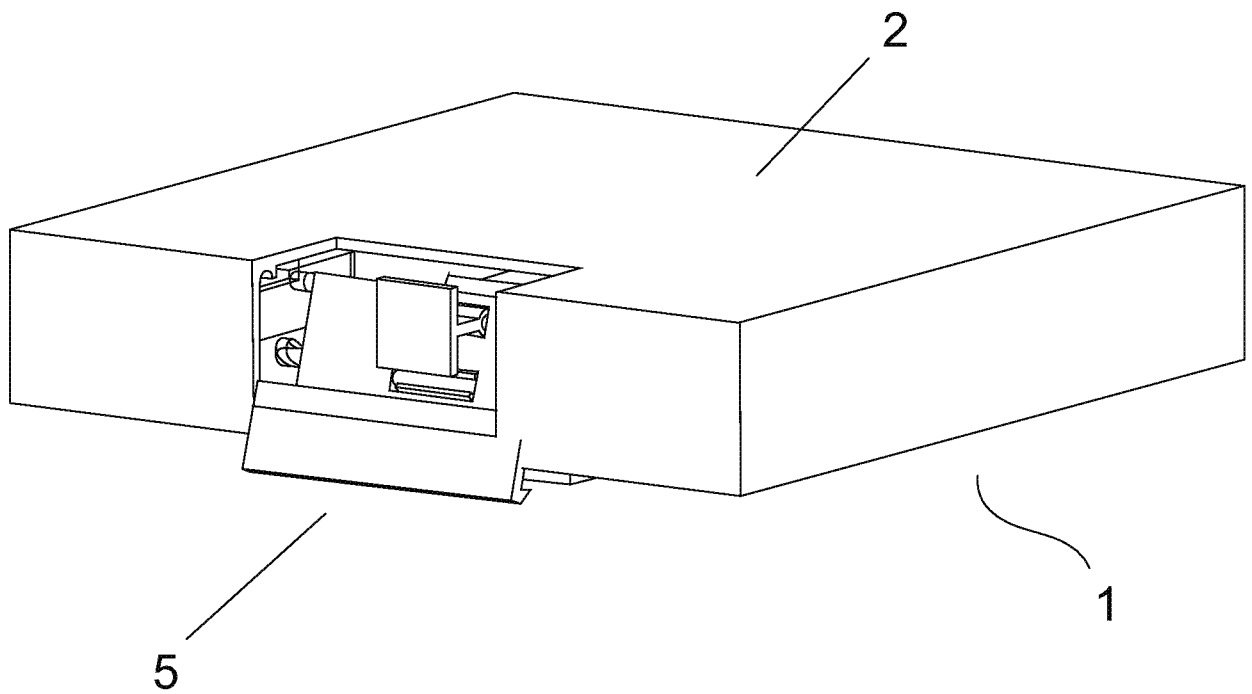


Fig. 4

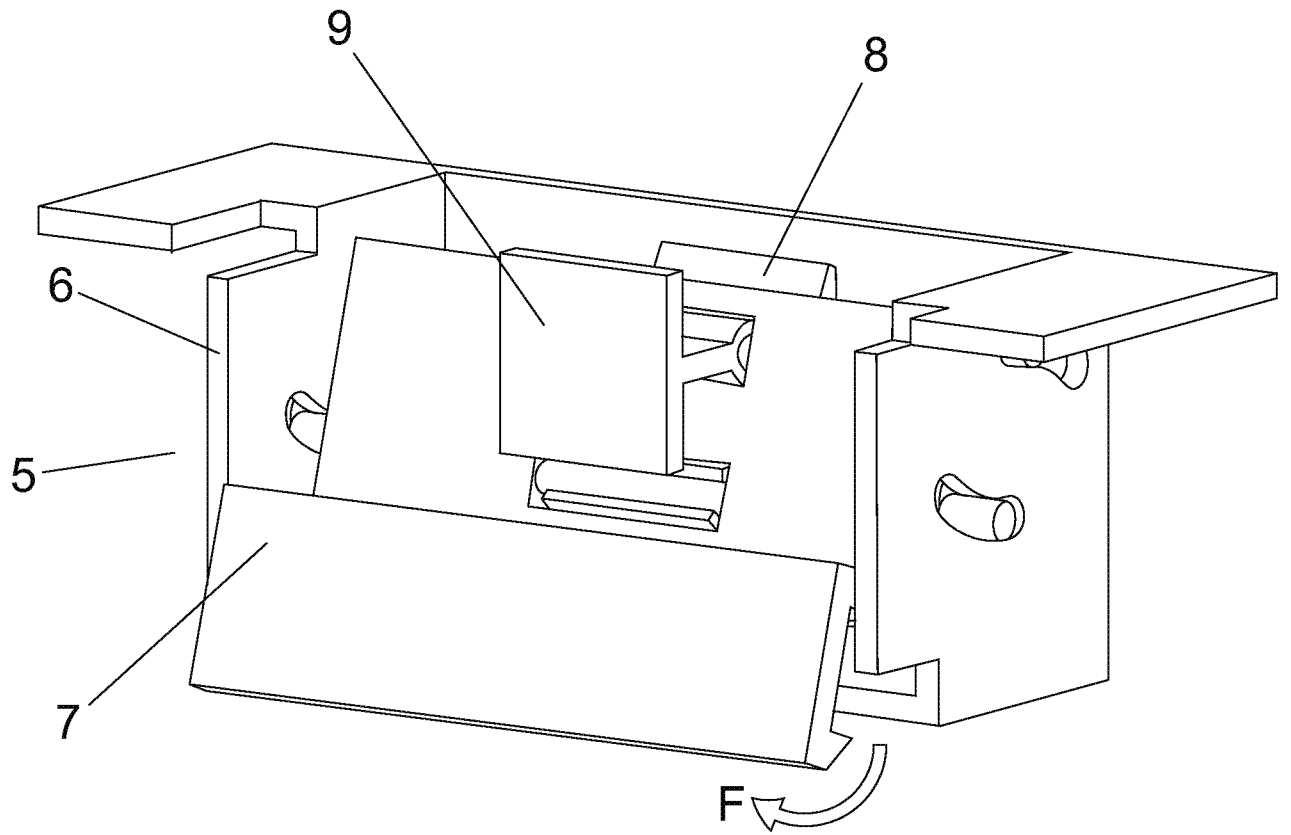


Fig. 5



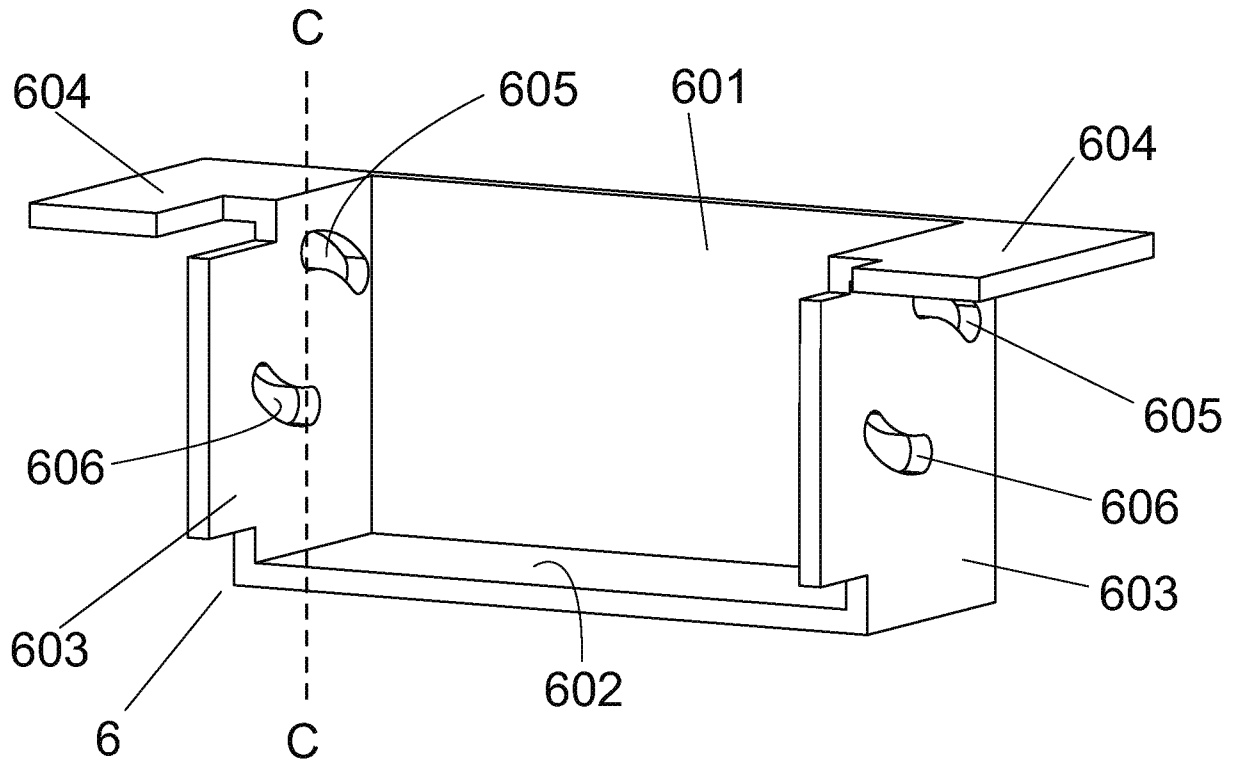


Fig. 6A

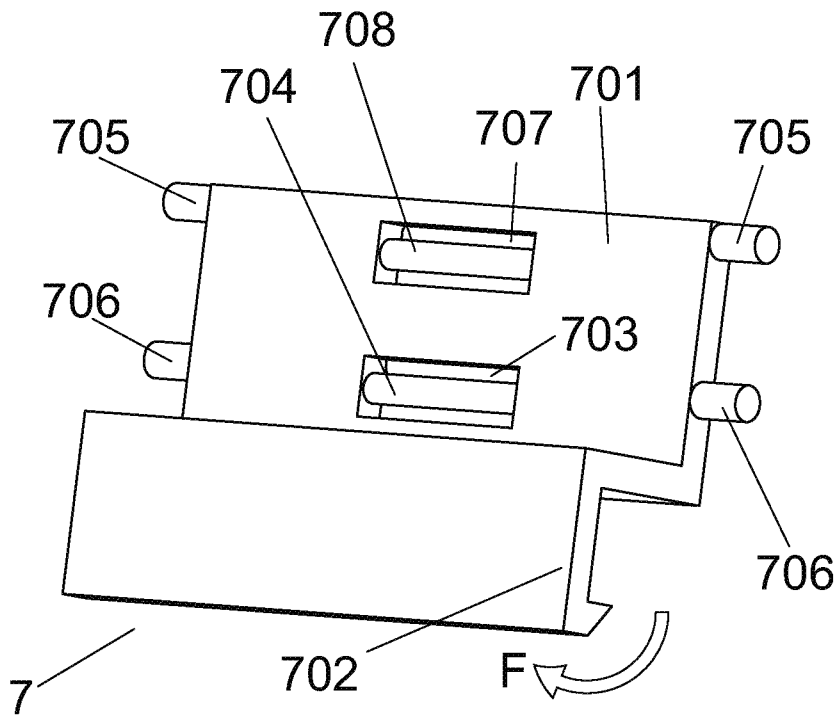


Fig. 6B

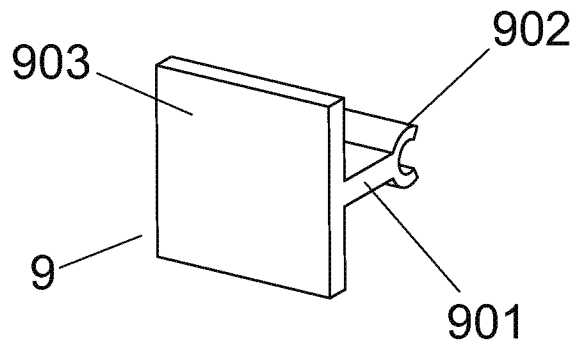


Fig. 6C

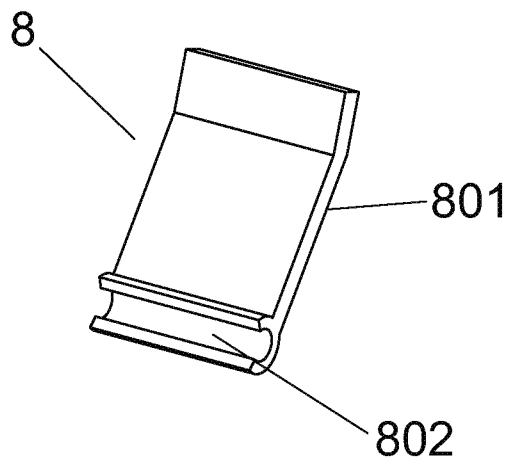


Fig. 6D

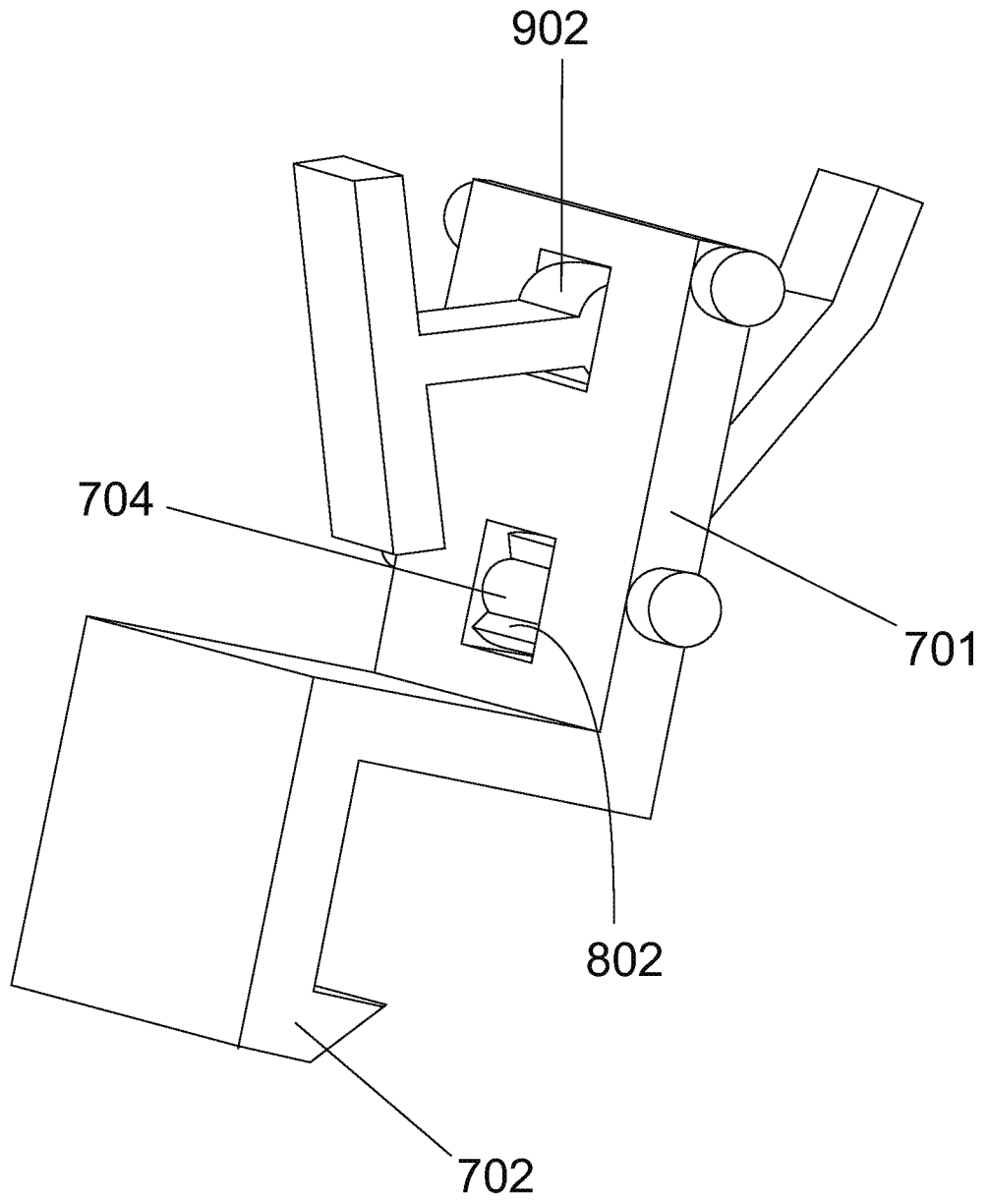


Fig. 7

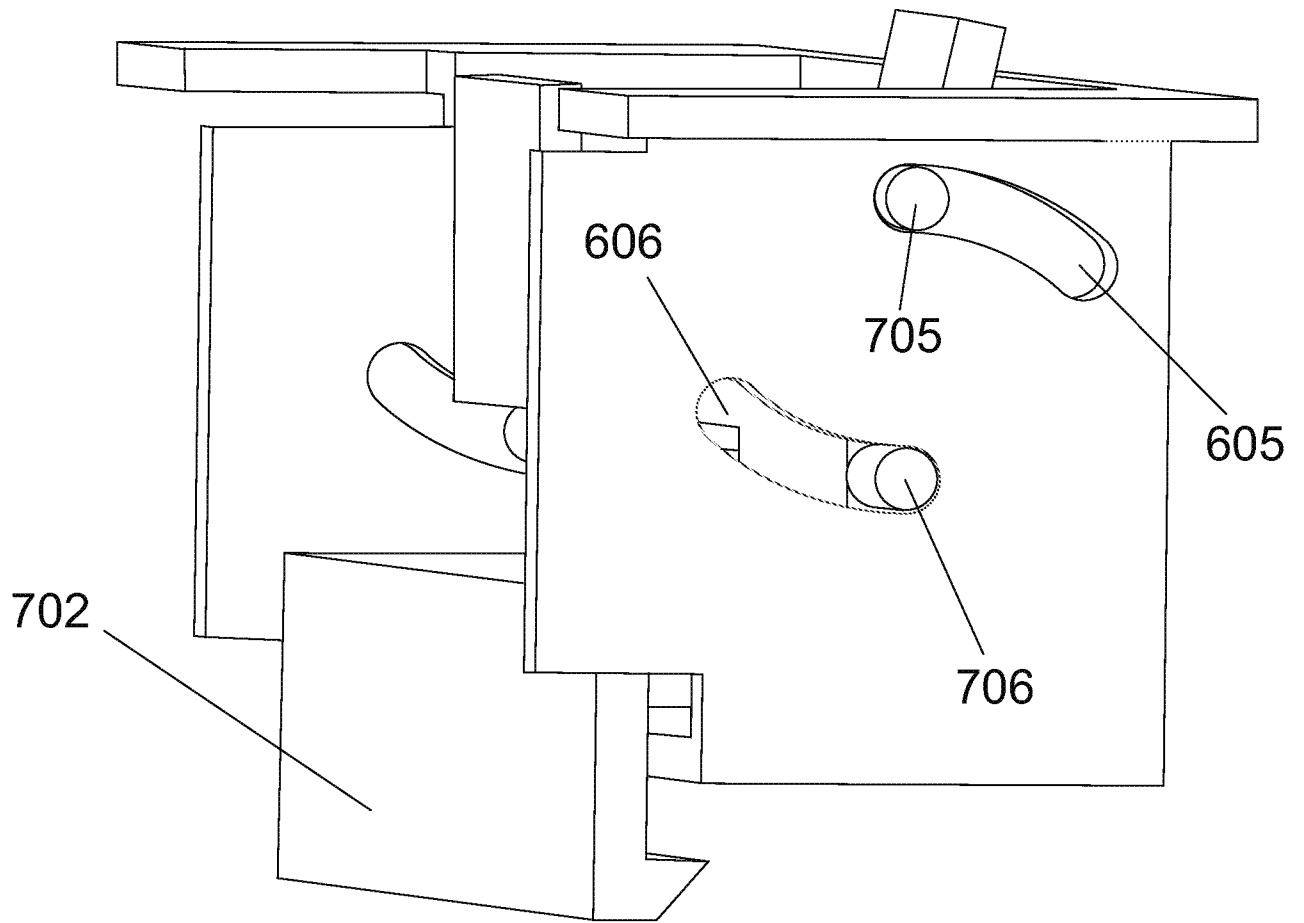


Fig. 8A

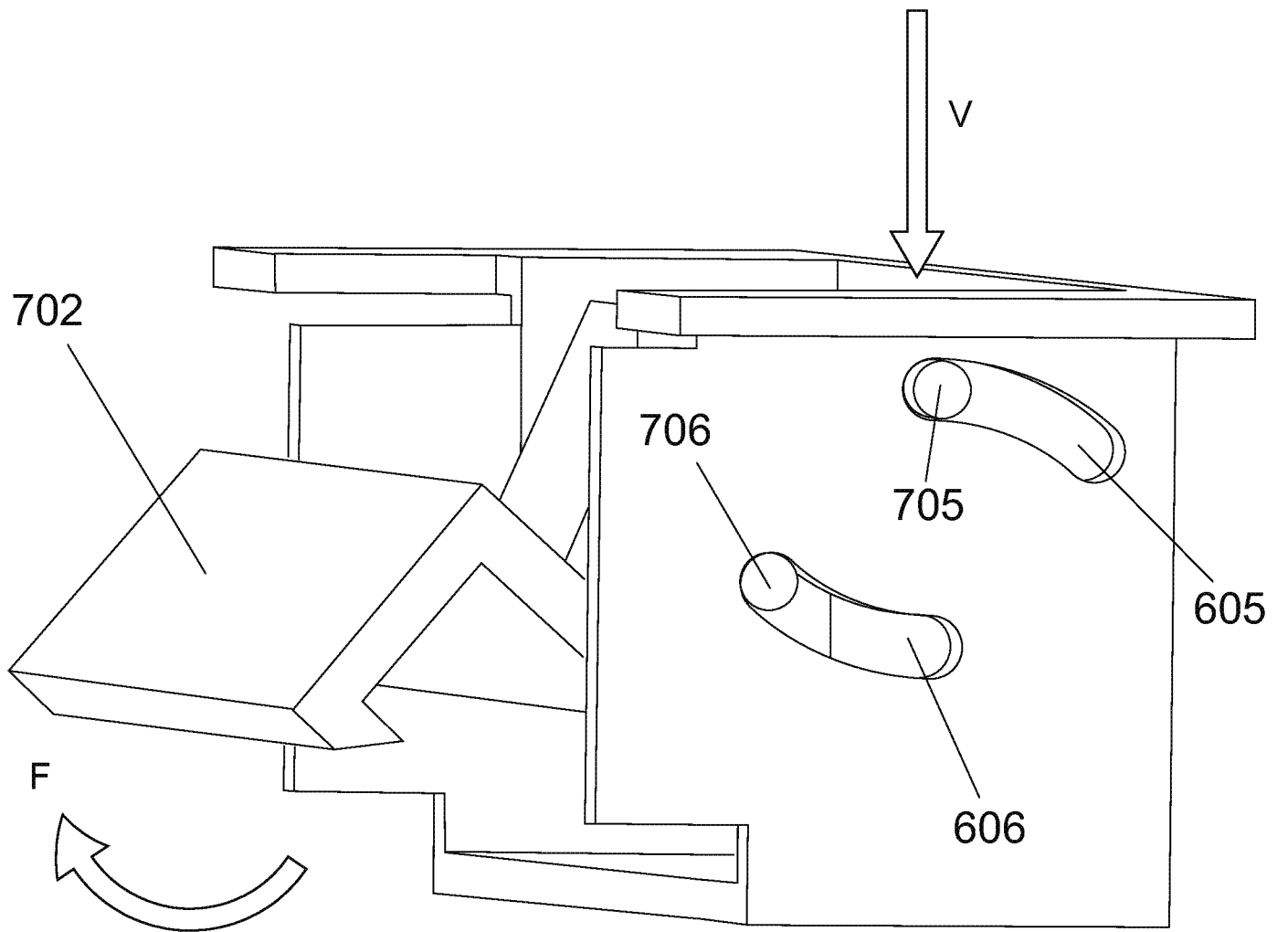


Fig. 8B

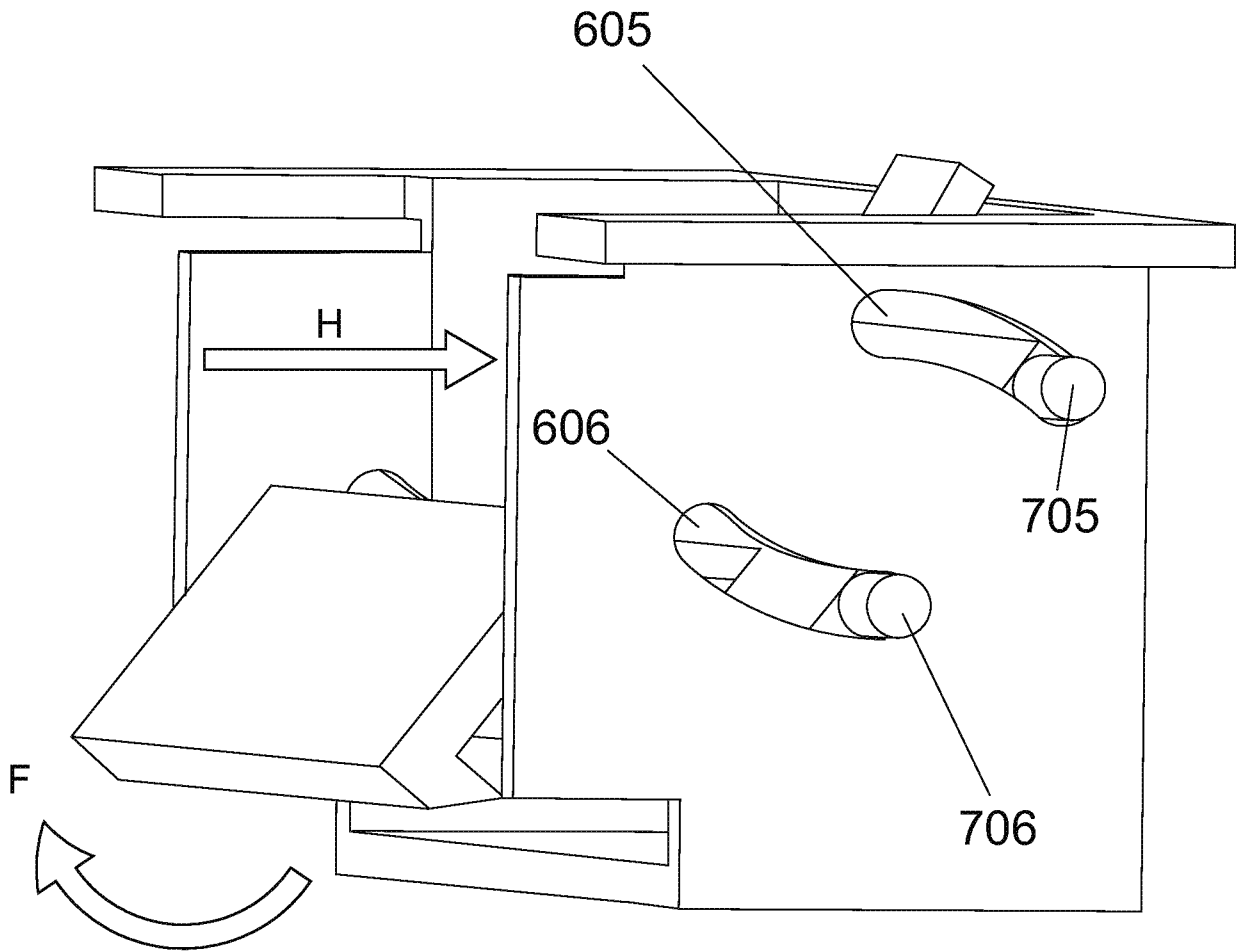


Fig. 8C

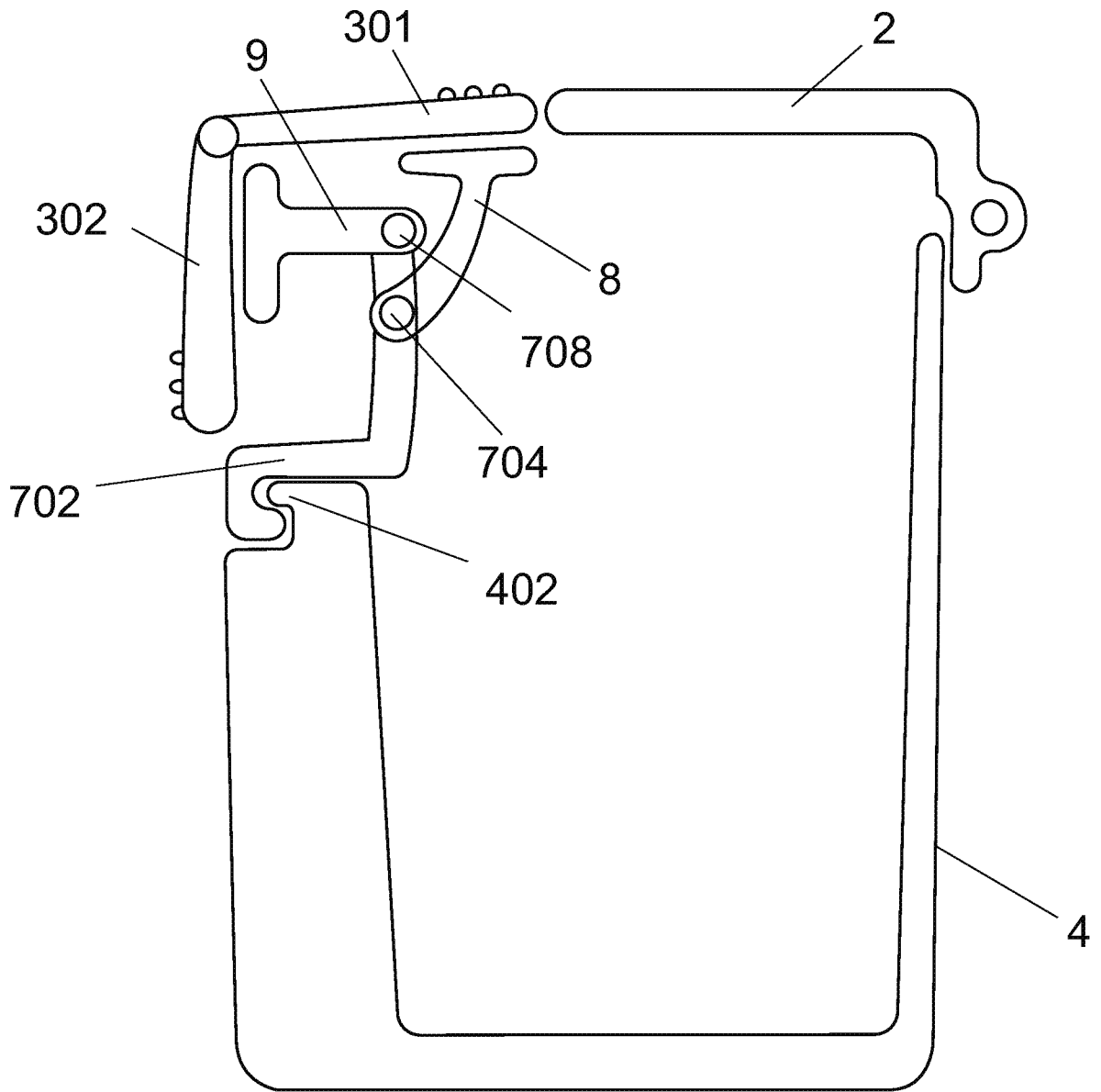


Fig. 9

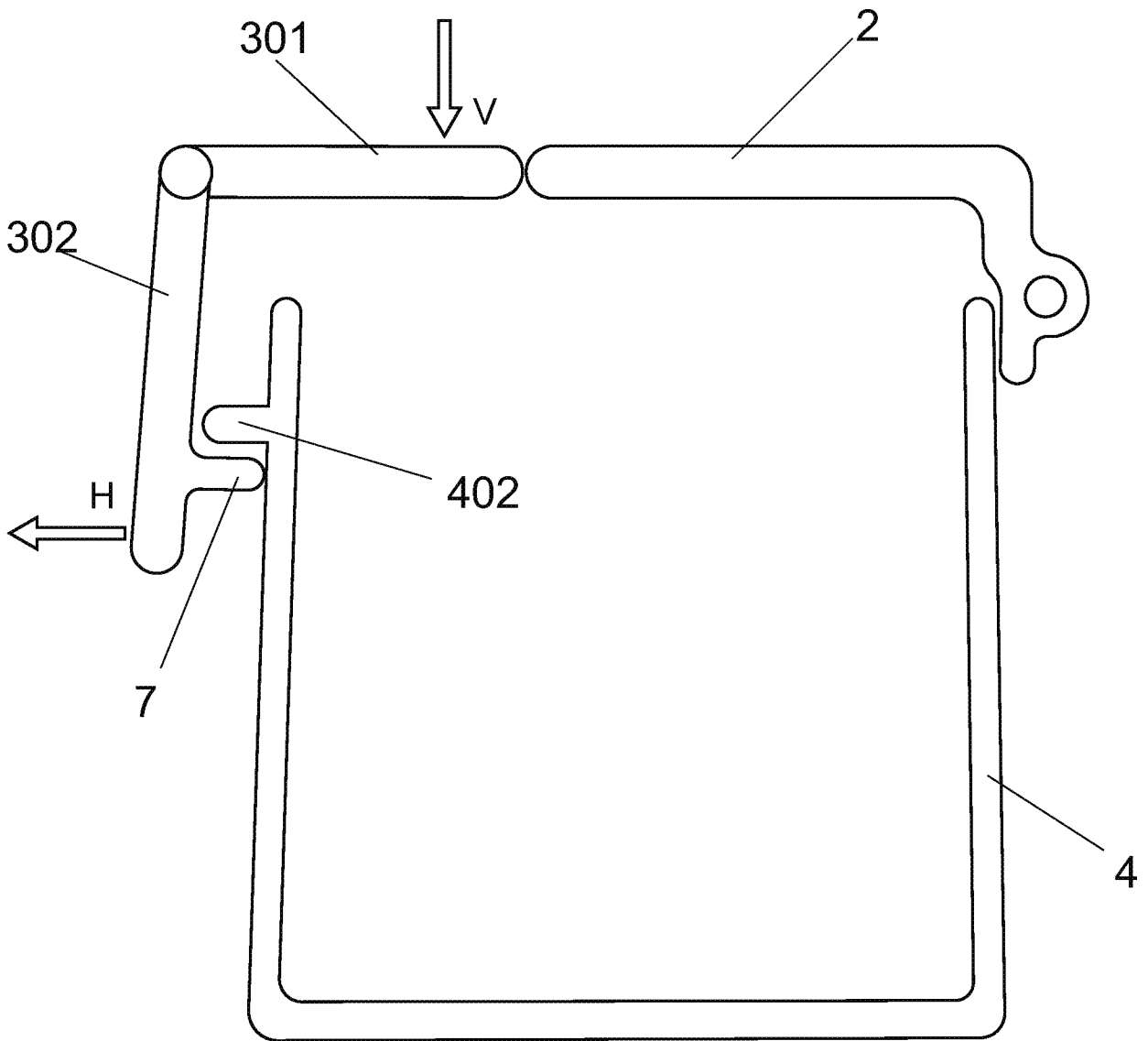


Fig. 10



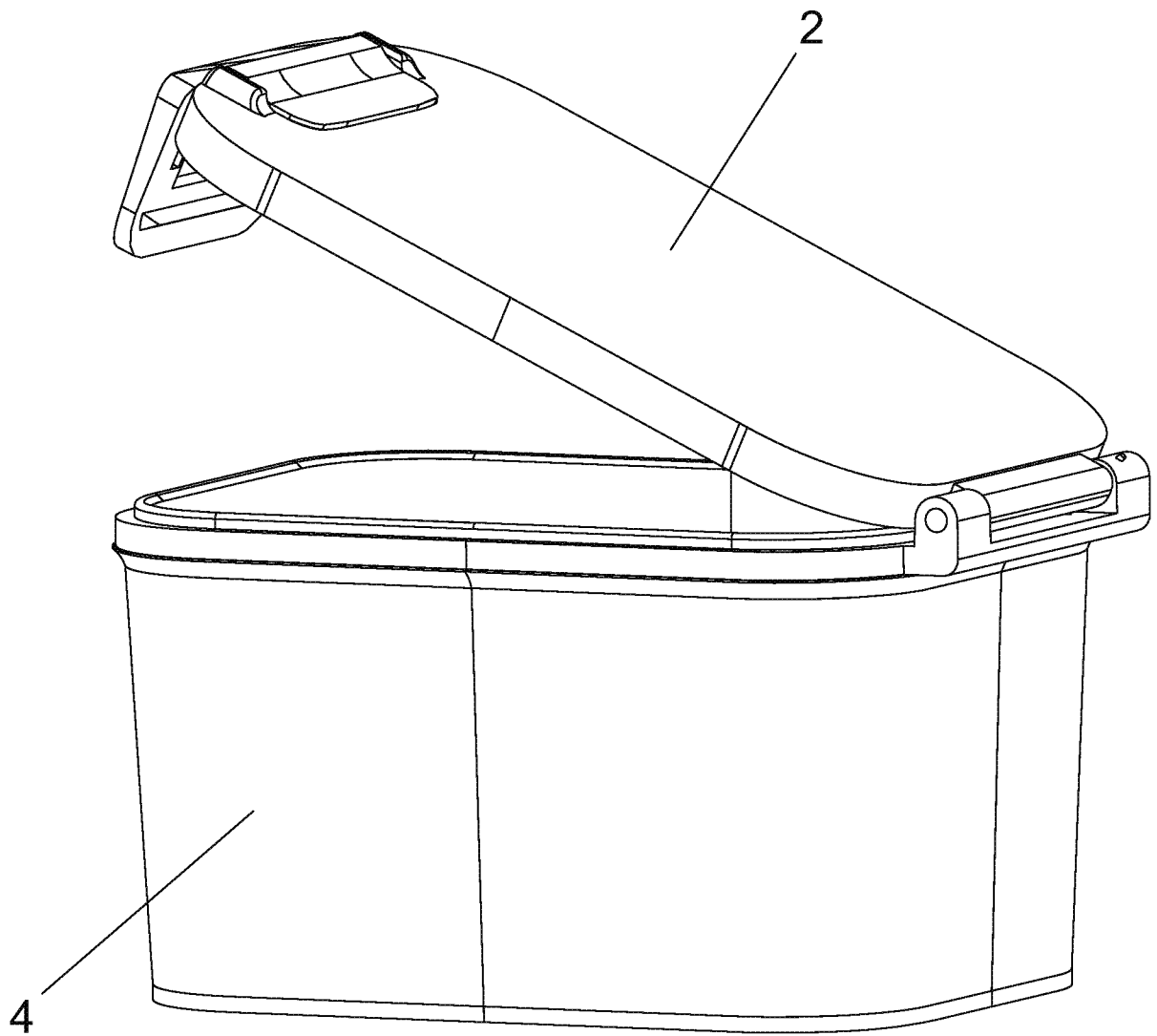


Fig. 11

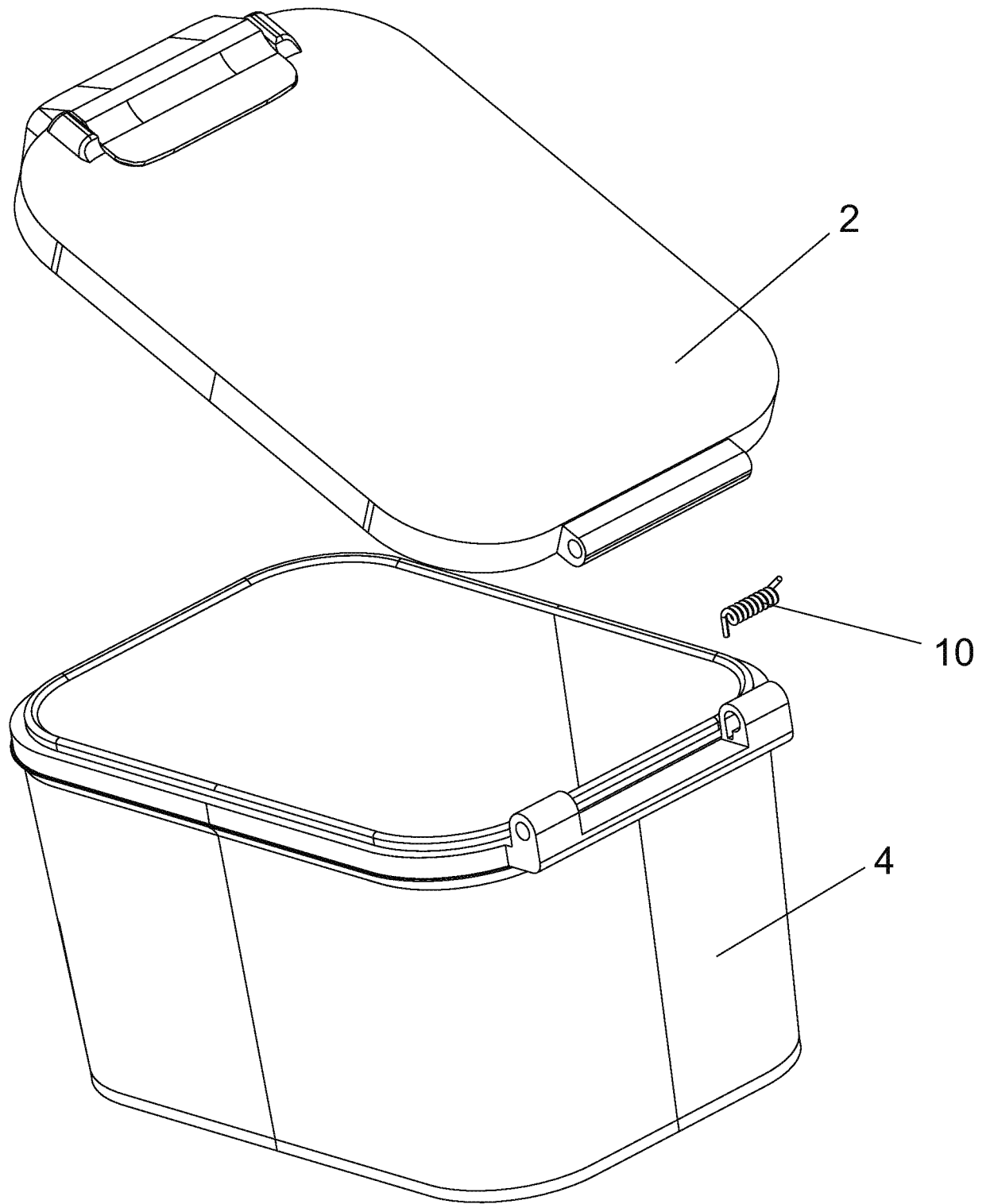


Fig. 12

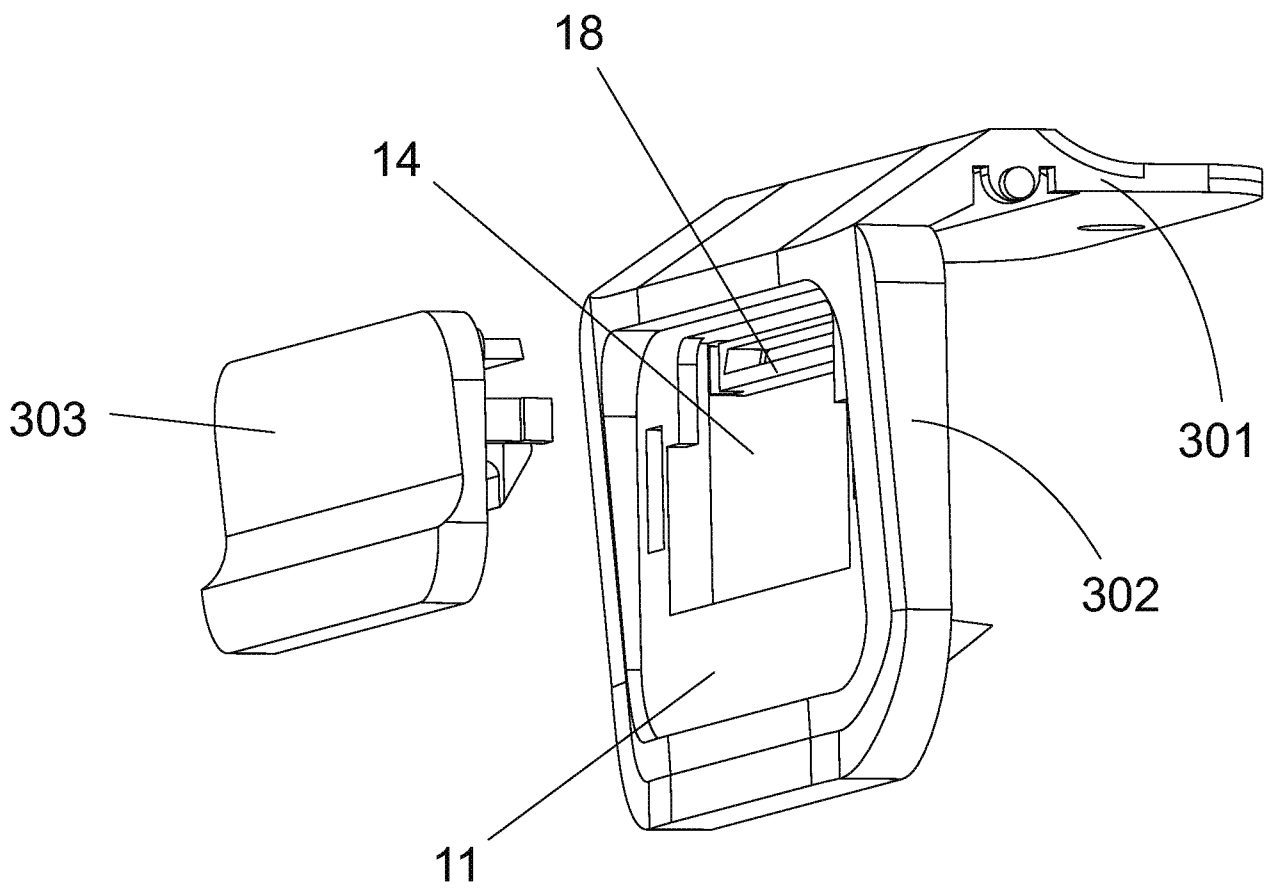


Fig. 13

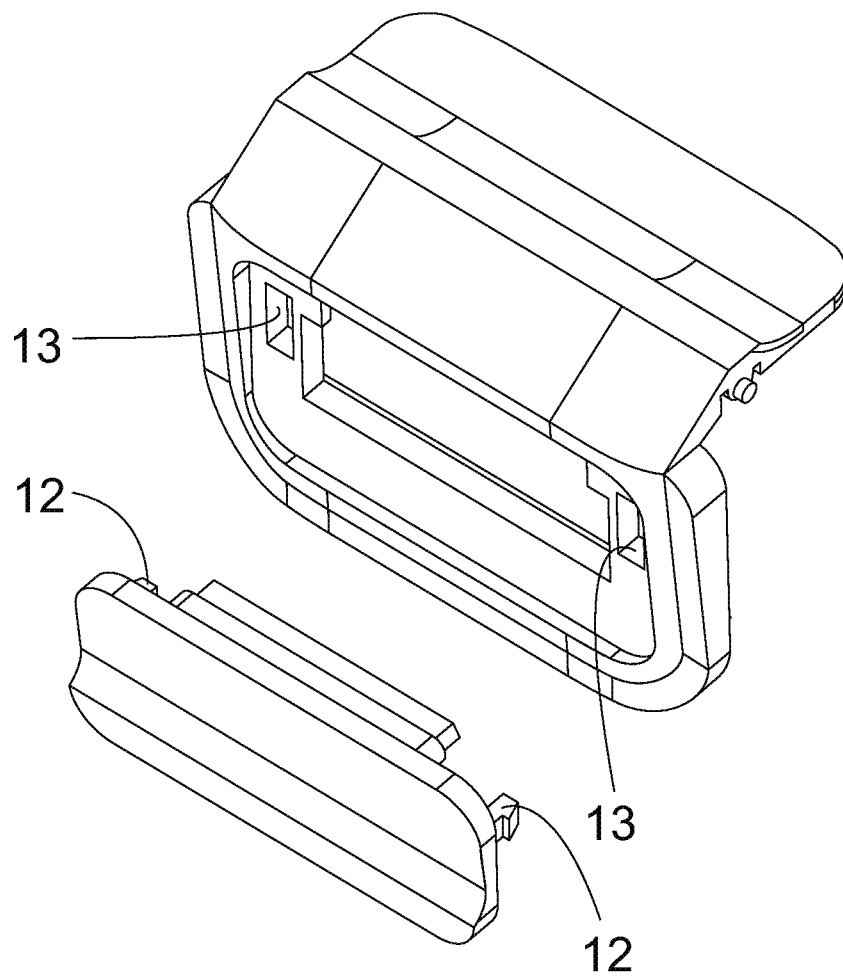


Fig. 14

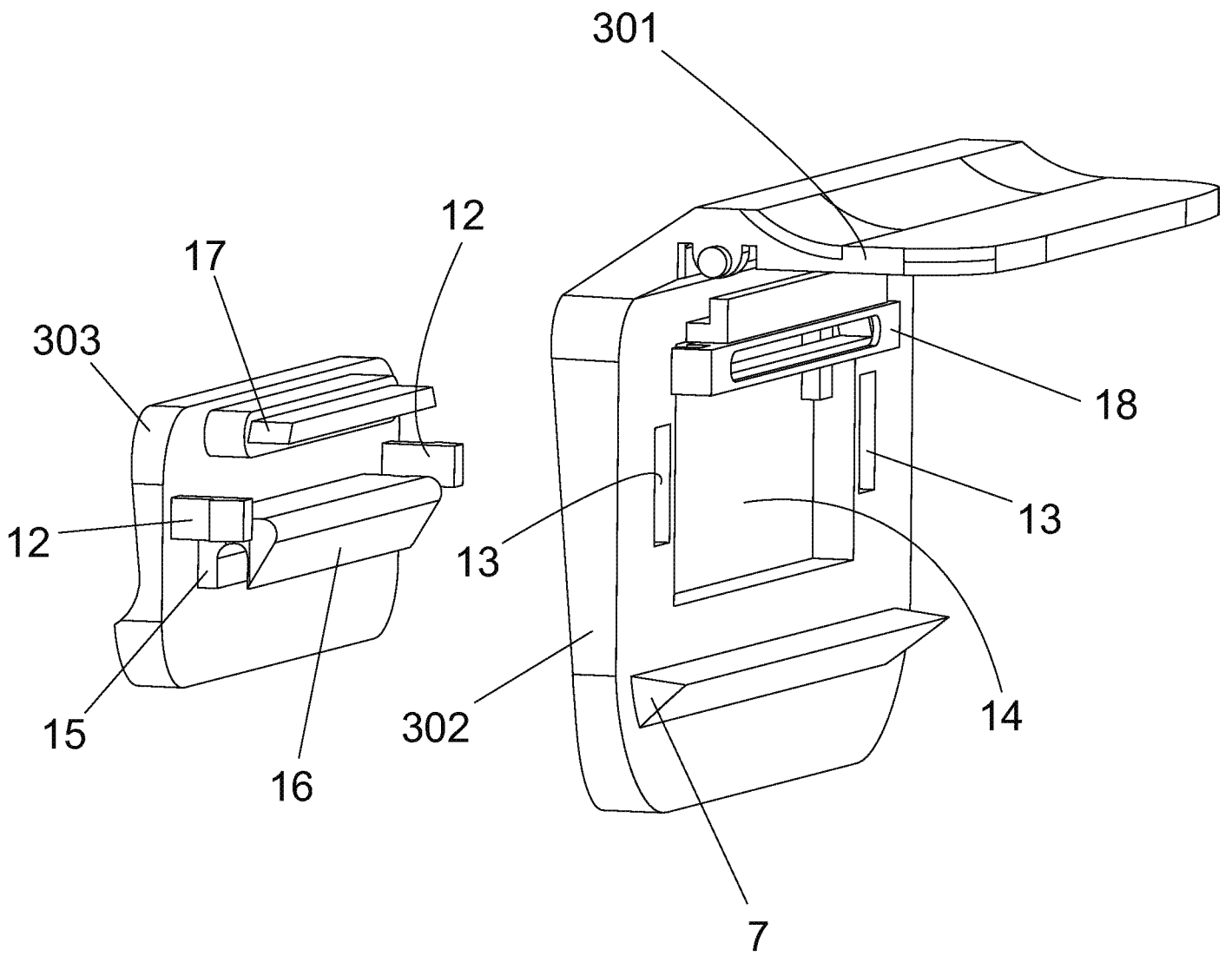


Fig. 15

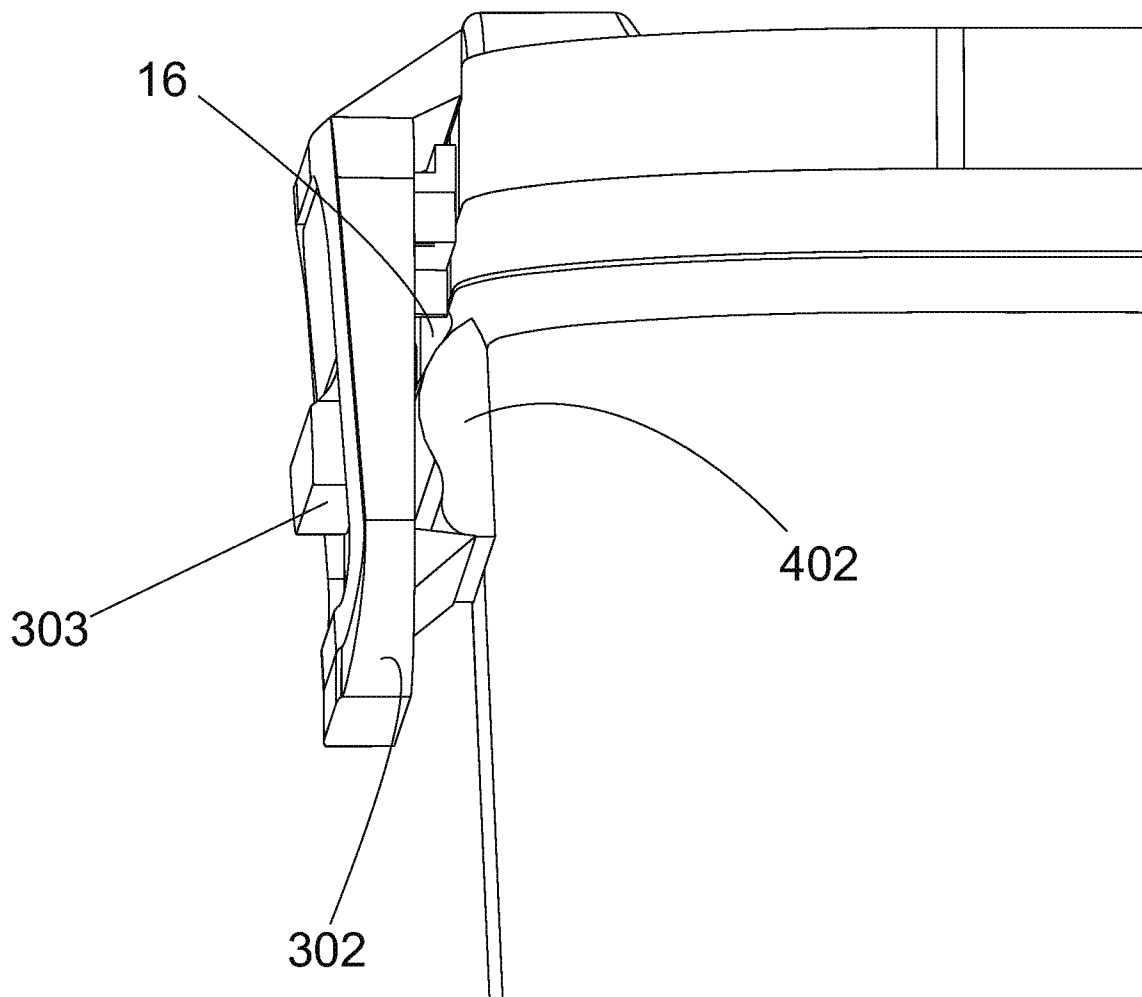


Fig. 16

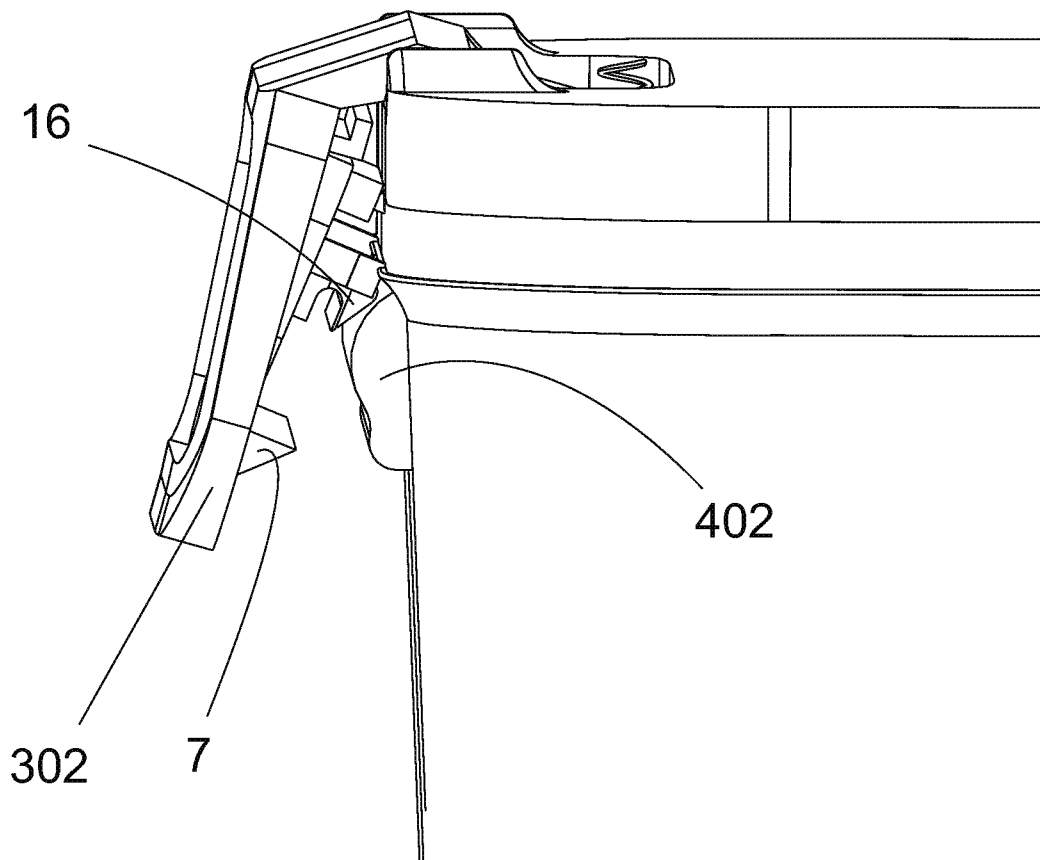


Fig. 17

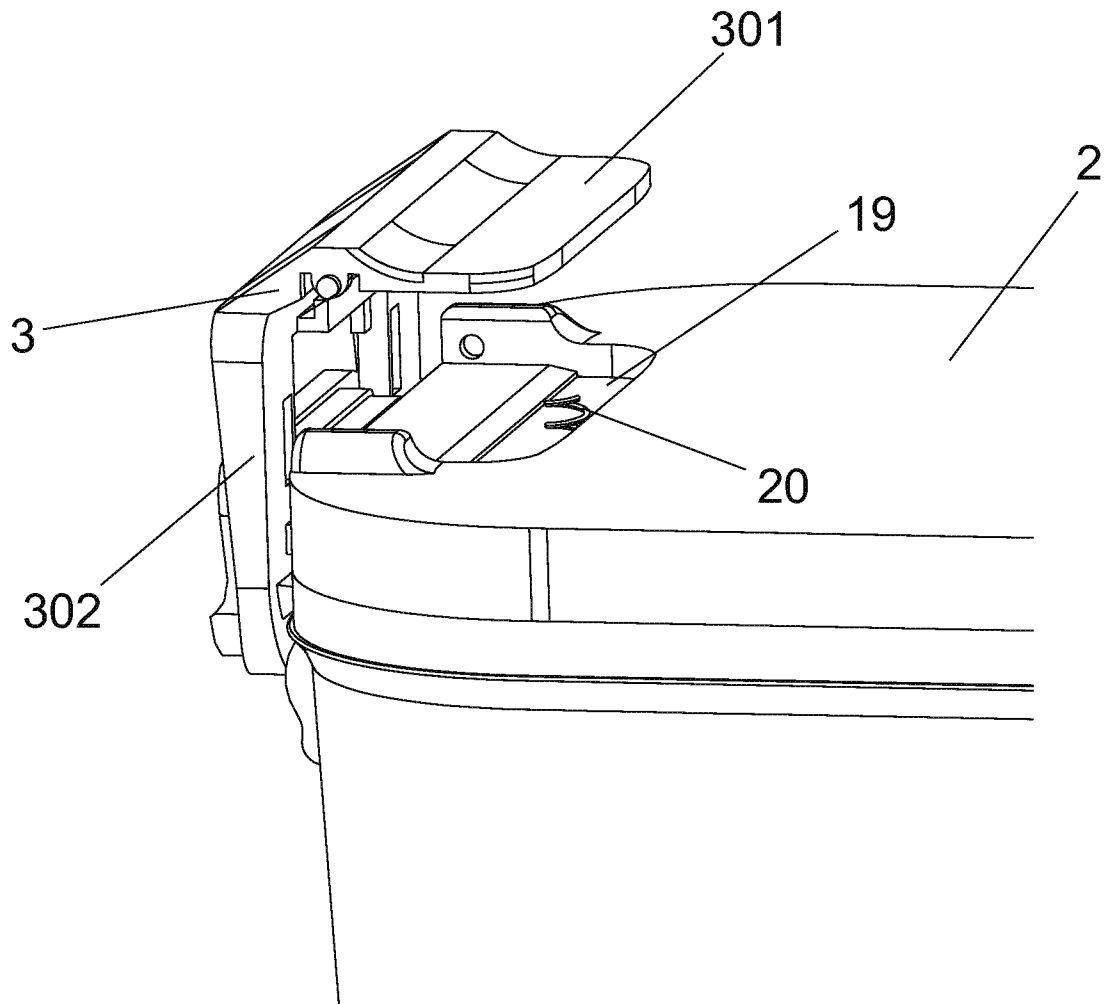


Fig. 18



## INTERNATIONAL SEARCH REPORT

International application No.

**PCT/CN2016/103811**

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
B65D 43/16(2006.01)i; A47J 36/10(2006.01)i		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols) B65D; A47J		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) CNABS, DWPI, SIPOABS: lid, cover, two, dual, mode, way, method, operat+, open+, actuat+, trigger+, press+, push+, pull+, button, vertical+, horizontal+, upward+, downward+, lateral+		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 101074057 A (SHIMANO KK) 21 November 2007 (2007-11-21) description, page 6 to page 13, line 7, page 19, lines 12-25, page 20, lines 14-16 and figures 1-7, 13	1-7, 19-22
A	US 2010089861 A1 (GUNN AND RICHARDS INC) 15 April 2010 (2010-04-15) the whole document	1-22
A	JP 2004238035 A (NIFCO INC ET AL.) 26 August 2004 (2004-08-26) the whole document	1-22
A	CN 104058161 A (THERMOS CHINA HOUSEWARES CO LTD ET AL.) 24 September 2014 (2014-09-24) the whole document	1-22
A	CN 203619359 U (ZHANJIANG HALL SMART ELECTRIC APPLIANCE CO LTD) 04 June 2014 (2014-06-04) the whole document	1-22
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search <b>28 December 2016</b>		Date of mailing of the international search report <b>23 January 2017</b>
Name and mailing address of the ISA/CN <b>STATE INTELLECTUAL PROPERTY OFFICE OF THE P.R.CHINA 6, Xitucheng Rd., Jimen Bridge, Haidian District, Beijing 100088 China</b>		Authorized officer <b>HUANG,Rong</b>
Facsimile No. <b>(86-10)62019451</b>		Telephone No. <b>(86-10)62085267</b>

**INTERNATIONAL SEARCH REPORT**  
**Information on patent family members**

International application No.

**PCT/CN2016/103811**

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	101074057	A	21 November 2007	TW	I376198	B	11 November 2012
				KR	20070110783	A	20 November 2007
				KR	100831152	B1	20 May 2008
				TW	200800013	A	01 January 2008
				JP	2007331839	A	27 December 2007
				JP	4963258	B2	27 June 2012
				CN	100591582	C	24 February 2010
US	2010089861	A1	15 April 2010	US	8292110	B2	23 October 2012
JP	2004238035	A	26 August 2004	CN	1518873	B	13 June 2012
				KR	20040071576	A	12 August 2004
				TW	I226917	B	21 January 2005
				JP	4305624	B2	29 July 2009
				KR	100536852	B1	14 December 2005
				TW	200415297	A	16 August 2004
				CN	1518873	A	11 August 2004
CN	104058161	A	24 September 2014	TW	I505969	B	01 November 2015
				TW	201441108	A	01 November 2014
				HK	1200794	A1	14 August 2015
CN	203619359	U	04 June 2014	None			