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(54) **Airtight container with a vacuum valve**

Luftdichter Behälter mit Vakuumventil

Conteneur étanche à l'air de type soupape sous vide

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Description

TECHNICAL FIELD

[0001] The present invention relates to a vacuum valve type airtight container.

BACKGROUND ART

[0002] Generally, in an airtight container for air-tightly storing a certain thing by covering a lid on a container body, a packing is engaged at a container lid, and a lid is covered. So, a certain gap is sealed as the packing air-tightly engages a rim of the container body. So as to enhance an engaging force of the lid, an airtight container having a locking wing is widely used.

[0003] However, in case that a lid is simply engaged with the container body, a reliable sealing force is not obtained. In case of an engaging method using a locking wing, a sealing force of the lid is good, but the locking wing is generally repeatedly opened and closed when in use, so that it is inconvenient to use.

[0004] As shown in a prior art container in Figure 6, in a state that a vacuum valve 31 is installed at a container lid 30, and the container lid 30 having a packing 32 is covered on the container body 33, the container lid 30 is pressed from an upper side, and the air is discharged to the outside via the vacuum valve 31 by the amount of volume decreased in the container, and the vacuum valve 31 is pressed and closely contacts with a valve seat 37, so that a communication state between the inner and outer sides is disconnected. In this state, even when the container lid is forced to be opened, since the vacuum valve 31 keeps closing a valve hole 34 of the container lid, a certain vacuum pressure is formed in the container, so that the container lid 30 is not opened. When the container lid 30 is needed to be opened, the vacuum valve 31 is lifted up from the valve seat 37, so that the inner and outer sides communicate with each other via the valve hole 34, and the container lid 30 can be easily opened in the conventional vacuum valve type airtight container.

[0005] In case that it is needed to store a certain food for a long time period, not for simply enhancing a convenience when opening and closing a container lid, it is preferred to make the interior of the container a full vacuum state by discharging the air from the interior of the container. In this case, as the container lid 30 is simply pressed, since the air is discharged to the outside via the vacuum valve 31 by the amount of volume decreased depending on the transformation of the surface of the container lid, an inner volume change of the container is smaller as compared to the whole volume of the container, so that it is effective to prevent the container lid 30 from being opened, but the air of the container may affect the food in the container, whereby it is not preferred to store the food for a long time period.

[0006] So, all the air in the container is forcibly sucked and discharged to the outside using a vacuum pump 35. In case that the air is forcibly discharged to the outside using the vacuum pump 35, since air does not remain in the interior of the container, a rotting speed may be decreased when storing a certain food for a long time period, so that it is possible to safely store the food while preventing rotting.

[0007] As shown in Figure 6, when it is needed to discharge the air from the interior of the container to the outside by using the vacuum pump 35, since a sucker shaped connection part 36 substantially surrounds the whole portions of the vacuum valve 31, a too large size connection part 36 is needed. So, the engaging connection of the connection part 36 may be limited depending on the surrounding situations of the container lid. It is impossible to manufacture a compact size vacuum pump. The silicon rubber sucker shaped connection part 36 is made much larger, so that it may be easily broken.

[0008] From WO 2005/063595 A1 a cover of a container, especially of a vacuum receptacle for storage of foodstuffs, is known. The cover of the container has a hollow with an elliptical outline pointed towards the inside of the container. The hollow has a spherical projection, pointed upwards, and the projection has a cylindrical cavity with an opening housing a valve head. The valve head as the form of a circular plate and has an edge with a triangular outline, cooperating with a gasket of the valve. The valve head is installed loosely in the opening by means of a sleeve ending with a flange with distancing projections in the form of radial ribs.

DISCLOSURE OF THE INVENTION

[0009] Accordingly, it is an object of the present invention to provide a vacuum valve type airtight container which overcomes the problems encountered in the conventional art.

[0010] It is another object of the present invention to provide an airtight container with a vacuum valve in a double structure which is able to enhance an engaging force of a lid by sealing an interior of a container in a vacuum state, and is able to store a food for a long time period without rotting by making an interior of a container vacuum by discharging the air from the interior of the container to the outside with the assistance of a vacuum pump, the connection part of which is made in a compact size for thereby obtaining an easier storing and preventing damage.

[0011] To achieve the above objects, a container according to claim 1 is provided.

[0012] A handle may protrude from one side of the valve circular plate of the first valve.

[0013] The handle may be slanted upward, away from the surface of the container lid.

[0014] The first and second valves may be made of silicon rubbers.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The present invention will become better understood with reference to the accompanying drawings which are given only by way of illustration and thus are not limitative of the present invention, wherein;

Figure 1 is a front cross sectional view illustrating a vacuum valve type airtight container according to the present invention;
Figure 2 is an enlarged cross sectional view illustrating a first valve of a vacuum valve type airtight container according to the present invention;
Figure 3 is a plane view illustrating a first valve of a vacuum valve type airtight container according to the present invention;
Figure 4 is a bottom view illustrating a first valve of a vacuum valve type airtight container according to the present invention;
Figure 5 is a view illustrating a structure of a second valve of a vacuum valve according to the present invention; and
Figure 6 is a view illustrating a conventional container.

MODES FOR CARRYING OUT THE INVENTION

[0016] The preferred embodiments of the present invention will be described with reference to the accompanying drawings.

[0017] The airtight container 1 according to the present invention comprises a container body 2 made by injecting a plastic material, a container lid 3 and a vacuum valve 4 which is made of a silicon rubber material. The container lid 3 is air-tightly engaged at the container body 2 with the packing 5 being disposed between them.

[0018] The vacuum valve 4 comprises a first valve 6 and a second valve 7. The first valve 6 comprises a cylindrical part 8, and a valve circular plate 9 integrally provided at an upper side of the cylindrical part 8 and being formed in a large circular plate shape. A flange plate 10 is provided at a lower side of the cylindrical part 8 for preventing an escape of the same.

[0019] The cylindrical part 8 of the first valve 6 is inserted into a first valve engaging hole 11 formed at the container lid 3 and is movable in up and down directions. While contracting or expanding, the silicon rubber flange plate 10 flexibly passes through a first valve engaging hole 11 having a diameter smaller than the silicon rubber flange plate 10, so that it is not escaped from the first valve engaging hole 1 unless a certain external force is applied thereto.

[0020] In addition, a first air flow slit groove 12 with a narrow width is formed on the cylindrical part 8 and the flange plate 10 in an up and down direction. In a state that the valve circular plate 9 closely contacts with a surface of the container lid 3, all air communication is disconnected between the inner and outer sides of the container. When the valve circular plate 9 moves up and is spaced apart from the surface of the container lid 3, the first air flow slit groove 12 is exposed to the outside, and the inner and outer sides of the container communicate with each other along the groove 12, so that air communicates.

[0021] A handle 13 protrudes from one side of the valve circular plate 9 for removing the vacuum state. The handle 13 has an inclination gradually rising up in an outward direction and spacially separated all the time from the surface of the container lid 3.

[0022] A second valve engaging hole 14 is formed at the center of the first valve 6 and passes through the same in an up and down direction. A diameter contraction part 16 (an intermediate portion of the hole is narrower than the upper and lower sides of the same) having a step surface 15 is formed at an intermediate portion of the second valve engaging hole 14 and operates as a valve seat. The second valve 7 is inserted via the second valve engaging hole 14.

[0023] Here, the second valve 7 is made of a silicon rubber having a good elastic and adhering property and comprises a valve shaft rod 17 passing through the diameter contraction part 16, a valve head 18 which is formed at an upper side of the valve shaft rod 17 and contacts with the step surface 15 which forms the valve seat, and an escape prevention head 19 which is formed at a lower side of the valve shaft rod 17. When the escape prevention head 19 passes through the inner diameter of the diameter contraction part 16 and is exposed through the expanded hole, the lower step surface 20 catches the same. In this case, it is impossible for the escape prevention head to escape from the hole without a certain external force. The valve shaft rod 17 is longer than the up and down height of the diameter contraction part 16 protruded into an inner side of the hole, so that the second valve 7 can move up and down.

[0024] At least one second air flow slit groove 21 having a narrow width is formed at the diameter contraction part 16 in an up and down direction. The second air flow slit groove 21 is not covered even when the escape prevention head 19 of the lower side is closely contacted with the lower step surface 20, so that it is exposed via its up and down sides all the time.

[0025] In the present invention, when a certain food is stored in the container body 2, and the container lid 3 is engaged at the container body 2, the packing 5 is closely contacting the inner wall surface 22 thereby sealing the gap between the contact surfaces. In this state, the first valve 6 of the vacuum valve 4 is pressed, and the valve circular plate 9 is closely contacts the surface of the container lid 3, and the connection part 24 of the vacuum pump 23 is connected with the upper hole 14a of the second valve engaging hole 14. When the vacuum pump 23 is driven, the second valve 7 moves up by means of a suction force, and the valve head 18 is spaced apart from the step surface 15 which corresponds to the valve seat. The air of the interior of the container is sucked via

the second air flow slit groove 21, the upper hole 14a, the connection part 24 and the vacuum pump 23, so that the air is removed from the interior of the container, and the interior of the same becomes vacuum.

[0026] In this state, when the connection part 24 is separated, the second valve 7 is sucked by means of a vacuum pressure of the interior of the container and is closely contacted with the valve seat 15, so that air communication is cut. So, the air is substantially removed from the interior of the container, so that the food can be stored for a long time period.

[0027] When the container lid 3 is to be opened, the first valve 6 is lifted in an upward direction by lifting the handle 13 of the first valve 6. The first valve 6 is moved up. When the valve circular plate 9 is spaced apart from the surface of the container lid 3, it contacts with the first valve engaging hole 11 of the container lid 3 at the upper side of the first air flow slit groove 12 or is exposed toward an upper side. So, the inner and outer sides of the container communicate with each other via the first air flow slit groove 12. The air enters the interior of the container via the first air flow slit groove 12 communicating with the outside having a relatively higher atmospheric pressure as compared to the interior of the container, so that the vacuum state is removed. As the suction force of the container lid 3 is removed, the container lid 3 can be easily removed from the container body 2.

[0028] As described above, the second valve is provided at the center of the first valve so that air is removed from the interior of the container for generating a vacuum state in the interior of the container with the assistance of the vacuum pump. A vacuum valve is provided in a double structure. So, it is possible to make the vacuum pump compact-sized. The suction force of the air is enhanced, and the life span of the connection part can be extended.

[0029] As the present invention may be embodied in several forms without departing from the essential characteristics thereof, it should be understood that the above-described examples are not limited by any of the details of the foregoing description, unless otherwise specified, but rather should be construed as defined in the appended claims, and therefore all changes and modifications that fall within the meets and bounds of the claims, are intended to be embraced by the appended claims.

Claims

1. An airtight container (1) comprising a container body (2), and a container lid (3) which is air-tightly engaged with the container body (2) with a packing (5) being disposed between them, further comprising:

   a first valve engaging hole (11) provided at the container lid (3);
   a first valve (6) comprising a cylindrical part (8) inserted into the first valve engaging hole (11) and being movable in an up and down direction, a valve circular plate (9) for disconnection a communication between the interior of the container and the outside when it is closely contacted with a surface of the container lid (3) which operates as a valve seat at an upper side of the cylindrical part (8), and a flange plate (10) which passes through the first valve engaging hole (11) at the lower side of the cylindrical part (8) for thereby preventing an escape of the same;
   characterised in that the container further comprises
   a second valve engaging hole (14) formed at a center portion of the first valve (6) passing through the same in an up and down direction and having a diameter contraction part (16) provided with a step surface (15) forming a valve seat at an intermediate portion of the second valve engaging hole;
   a second valve (7) comprising a valve head (18) disposed at the step surface (15) for closing the second valve engaging hole (14), a valve shaft rod (17) extending to a lower side of the valve head (18) and passing through the diameter contraction part (16), and an escape prevention head (19) provided at a lower side of the valve shaft rod (17) with a certain distance from the lower surface of the diameter contraction part (16), so that the second valve (7) can move in the second valve engaging hole (14) in an up and down direction;
   a first air flow slit groove (12) formed at an outer surface of the cylindrical part (8) of the first valve (6) in an up and down direction for allowing air to flow between the inner and outer sides of the container when the cylindrical part (8) moves up; and
   at least one second air flow slit groove (21) formed at the diameter contraction part (16) for allowing air to flow up and down along an axial direction when the second valve (7) moves up.

2. The container (1) of claim 1, wherein a handle (13) protrudes from one side of the valve circular plate (9) of the first valve (6).

3. The container (1) of claim 2, wherein said handle (13) is slanted upward, away from the surface of the container lid (3).

4. The container (1) of one among claims 1 through 3, wherein said first (6) and second valves (7) are made of silicon rubbers.

Patentansprüche

1. Luftdichter Behälter (1), der umfasst: einen Behälterkörper (2) und einen Behälterdeckel (3), der luftdicht mit dem Behälterkörper (2) in Eingriff ist, mit einer Dichtung (5), die zwischen ihnen angeordnet ist, der ferner umfasst:

   ein erstes Ventileingreifloch (11), das an dem Behälterdeckel (3) bereitgestellt ist;
   eine erstes Ventil (6), das umfasst: einen zylindrischen Teil (8), der in das erste Ventileingreifloch (11) eingesetzt ist und in einer Auf- und Abrichtung beweglich ist, eine kreisförmige Ventilplatte (9) zum Trennen einer Verbindung zwischen dem Inneren des Behälters und dem Äußeren, wenn sie eng mit einer Oberfläche des Behälterdeckels (3) in Kontakt kommt, die als ein Ventilsitz an einer Oberseite des zylindrischen Teils (8) wirkt, und eine Flanschplatte (10), die durch das erste Ventileingreifloch (11) an der Unterseite des zylindrischen Teils (8) geht, um dadurch ein Herausfallen desselben zu verhindern,
   dadurch gekennzeichnet, dass der Behälter ferner umfasst:

      ein zweites Ventileingreifloch (14), das in einem Mittelabschnitt des ersten Ventils (6) ausgebildet ist, welches in einer Auf- und Abrichtung durch dieses verläuft und einen Durchmesserverengungsteil (16) hat, der mit einer Stufenfläche (15) versehen ist, die an einem Zwischenabschnitt des zweiten Ventileingreiflochs einen Ventilsitz bildet;
      ein zweites Ventil (7), das umfasst: einen Ventilkopf (18), der an der Stufenfläche (15) angeordnet ist, um das zweite Ventileingreifloch (14) zu schließen, eine Ventilschaftstange (17), die sich zu einer Unterseite des Ventilkopfs (18) erstreckt und durch den Durchmesserverengungsteil (16) geht, und einen Herausfallschutzkopf (19), der mit einem gewissen Abstand von der unteren Oberfläche des Durchmesserverengungsteils (16) an einer Unterseite der Ventilschaftstange (17) bereitgestellt ist, so dass das zweite Ventil sich in dem zweiten Ventileingreifloch (14) in einer Auf- und Abrichtung bewegen kann;
      einen erste Luftströmungsschlitznut (12), die an einer äußeren Oberfläche des zylindrischen Teils (8) des ersten Ventils in einer Auf- und Abrichtung ausgebildet ist, um zuzulassen, dass Luft zwischen den Innen- und Außenseiten des Behälters strömt, wenn der zylindrische Teil (8) sich nach oben bewegt; und
      wenigstens eine zweite Luftströmungsschlitznut (21), die an dem Durchmesserverengungsteil (16) ausgebildet ist, um zuzulassen, dass Luft entlang einer Axialrichtung auf und ab strömt, wenn das zweite Ventil (7) sich nach oben bewegt.

2. Behälter (1) nach Anspruch 1, wobei ein Griff (13) von einer Seite der kreisförmigen Ventilplatte (9) des ersten Ventils (6) vorsteht.

3. Behälter (1) nach Anspruch 2, wobei der Griff (13) von der Oberfläche des Behälterdeckels (3) weg nach oben abgeschrägt ist.

4. Behälter (1) nach einem der Ansprüche 1 bis 3, wobei die ersten (6) und zweiten Ventile (7) aus Silikonkautschuken gefertigt sind.

Revendications

1. Conteneur étanche à l'air (1) comprenant un corps de conteneur (2), et un couvercle de conteneur (3) qui est engagé de manière étanche à l'air avec le corps de conteneur (2) avec une garniture (5) qui est disposée entre eux, comprenant en outre :

   un premier trou d'engagement de soupape (11) fourni sur le couvercle de conteneur (3) ;
   une première soupape (6) comprenant une partie cylindrique (8) insérée dans le premier trou d'engagement de soupape (11) et qui est mobile dans une direction ascendante et descendante, une plaque circulaire de soupape (9) pour la déconnexion d'une communication entre l'intérieur du conteneur et l'extérieur quand elle est en contact étroit avec une surface du couvercle de conteneur (3) qui fonctionne en tant que siège de soupape sur un côté supérieur de la partie cylindrique (8), et une plaque d'appui (10) qui passe à travers le premier trou d'engagement de soupape (11) sur le côté inférieur de la partie cylindrique (8) pour empêcher ainsi un échappement de celle-ci ;
   caractérisé en ce que le conteneur comprend en outre
   un second trou d'engagement de soupape (14) formé au niveau d'une portion centrale de la première soupape (6) passant à travers celle-ci dans une direction ascendante et descendante et présentant une partie de rétrécissement de diamètre (16) fournie avec une surface de gradin (15) formant un siège de soupape au niveau d'une portion intermédiaire du second trou d'engagement de soupape ;
   une seconde soupape (7) comprenant une tête de soupape (18) disposée au niveau de la sur-

face de gradin (15) pour fermer le second trou d'engagement de soupape (14), une tige d'arbre de soupape (17) s'étendant vers un côté inférieur de la tête de soupape (18) et passant à travers la partie de rétrécissement de diamètre (16), et une tête de prévention d'échappement (19) fournie au niveau d'un côté inférieur de la tige d'arbre de soupape (17) à une certaine distance de la surface inférieure de la partie de rétrécissement de diamètre (16), de sorte que la seconde soupape (7) peut se déplacer dans le second trou d'engagement de soupape (14) dans une direction ascendante et descendante ;
une première rainure fendue d'écoulement d'air (12) formée au niveau d'une surface extérieure de la partie cylindrique (8) de la première soupape (6) dans une direction ascendante et descendante pour permettre à l'air de s'écouler entre les côtés intérieur et extérieur du conteneur quand la partie cylindrique (8) se déplace vers le haut ; et
au moins une seconde rainure fendue d'écoulement d'air (21) formée au niveau de la partie de rétrécissement de diamètre (16) pour permettre à l'air de s'écouler vers le haut et vers le bas le long d'une direction axiale quand la seconde soupape (7) se déplace vers le haut.

2. Conteneur (1) selon la revendication 1, dans lequel un manche (13) dépasse d'un côté de la plaque circulaire de soupape (9) de la première soupape (6).

3. Conteneur (1) selon la revendication 2, dans lequel ledit manche (13) est oblique vers le haut, s'éloignant de la surface du couvercle de conteneur (3).

4. Conteneur (1) selon l'une des revendications 1 à 3, dans lequel lesdites première (6) et seconde soupapes (7) sont fabriquées en caoutchouc de silicone.

Figure 1

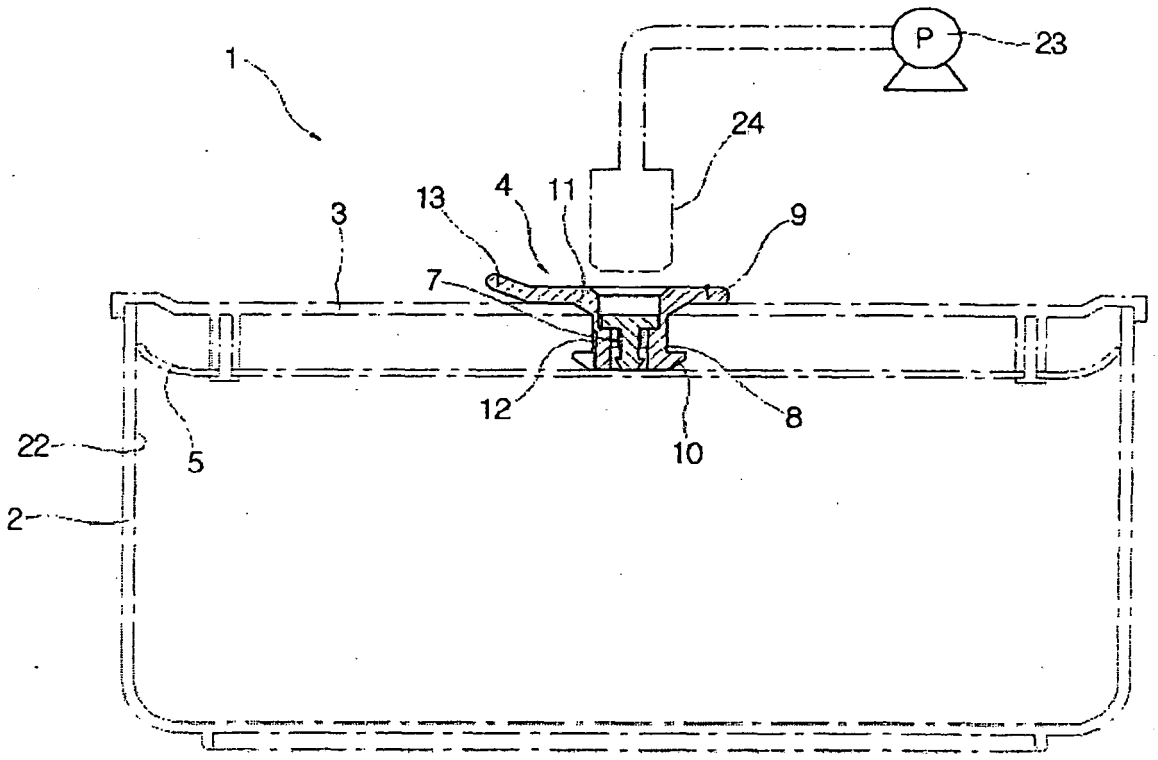


Figure 2

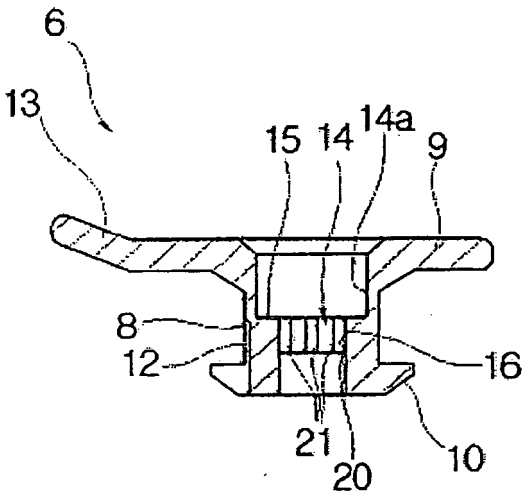


Figure 3

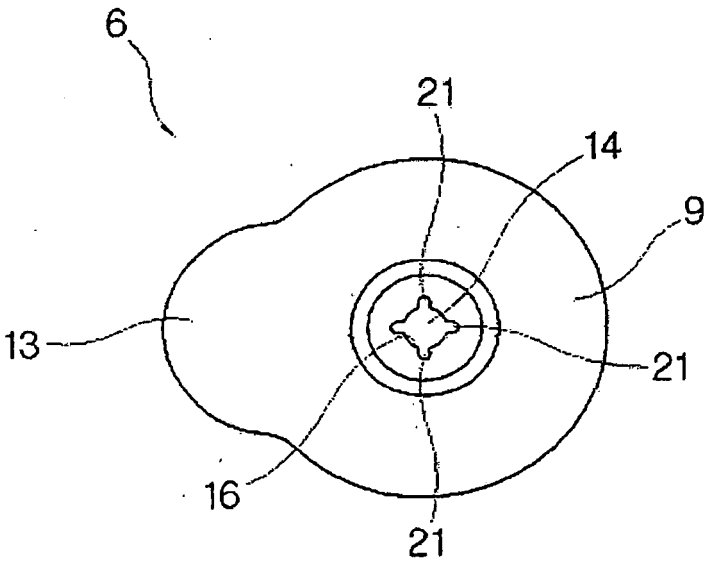


Figure 4

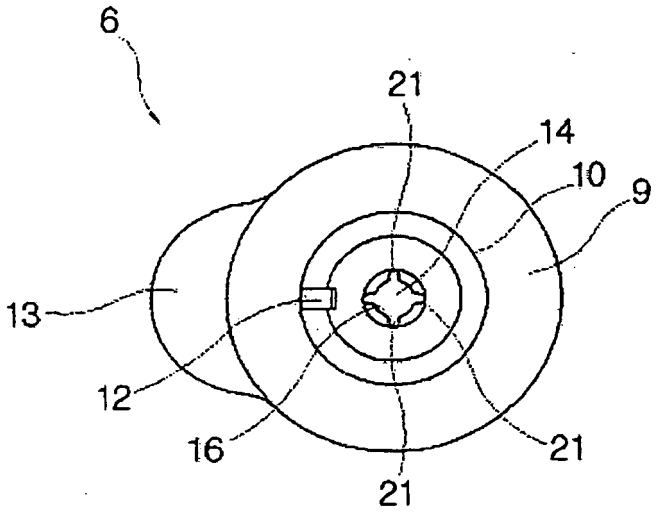


Figure 5

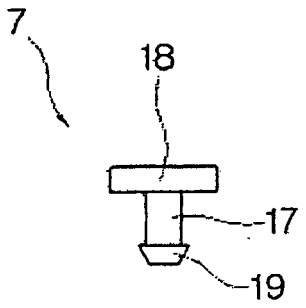
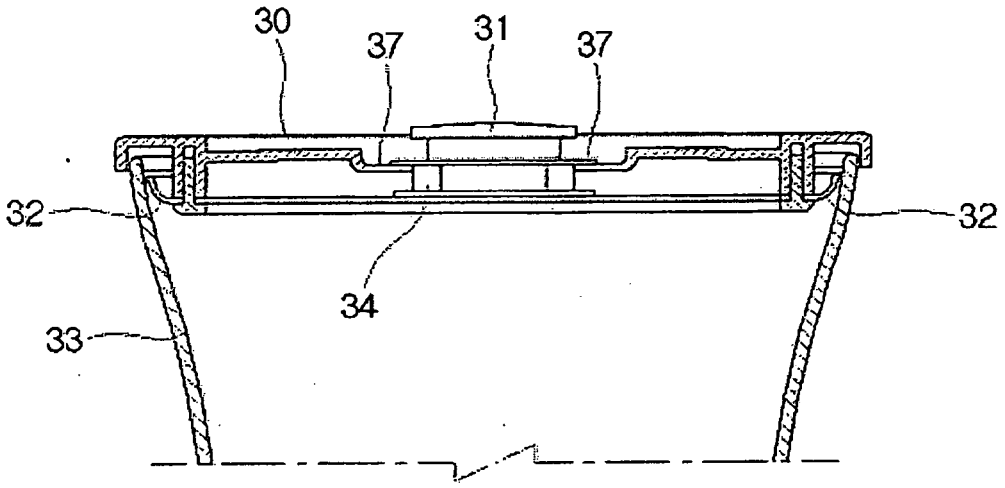


Figure 6

PRIOR ART



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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