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(54) **INTEGRALLY MOLDED HINGE CAP**

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(57) **ABSTRACT**

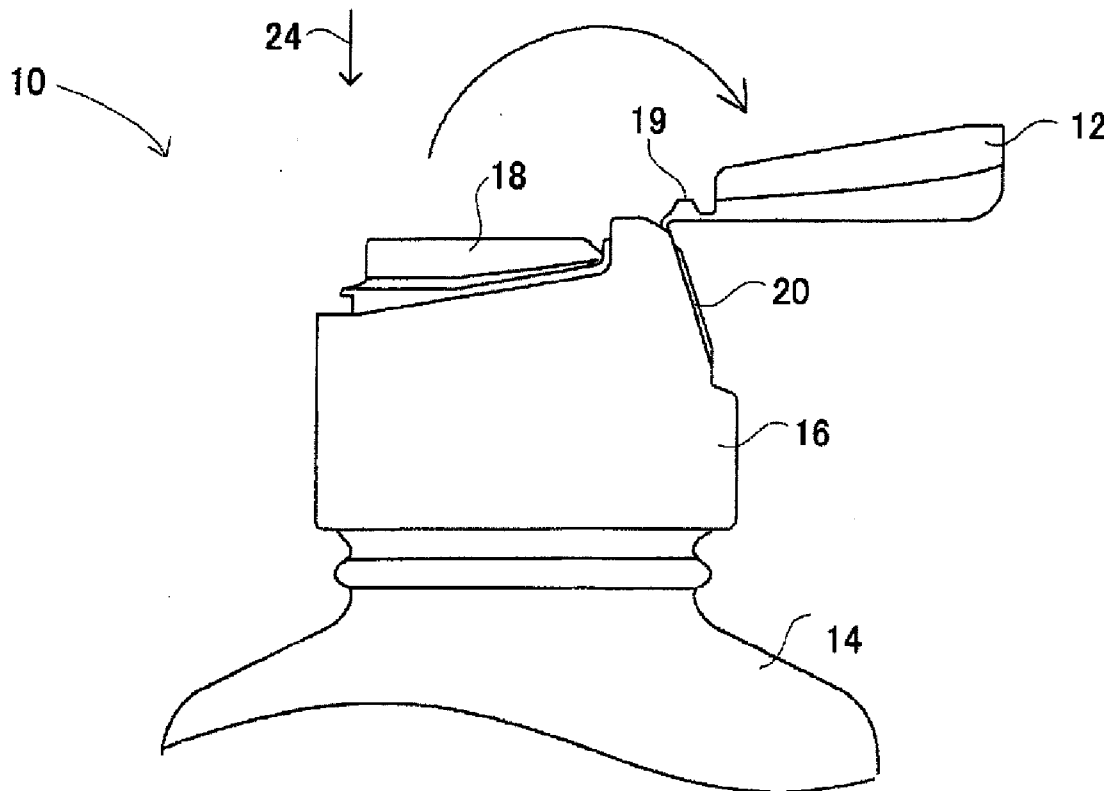
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A hinge cap (10) fitted to a slant opening wall (26), which is provided around the opening of a hinge cap body (12), by means of two adjacently standing slant plugs (30, 32) of a lid (12). Because the slant plugs (30, 32) of the lid (12) are fitted by a large contact area to the slant opening wall (26) of the hinge cap body (12), the slant plugs can be applied to the hinge cap (10) having a relatively large area. Also, with the lid extended, the wall height of the slant outer plug (32) decreases as it approaches the rotation axis of the lid (12) and the wall height of the slant inner plug (30) decreases as it is away from the rotating shaft of the lid (12), so that the lid (12) can be smoothly rotated and opened in pressing and opening operation.

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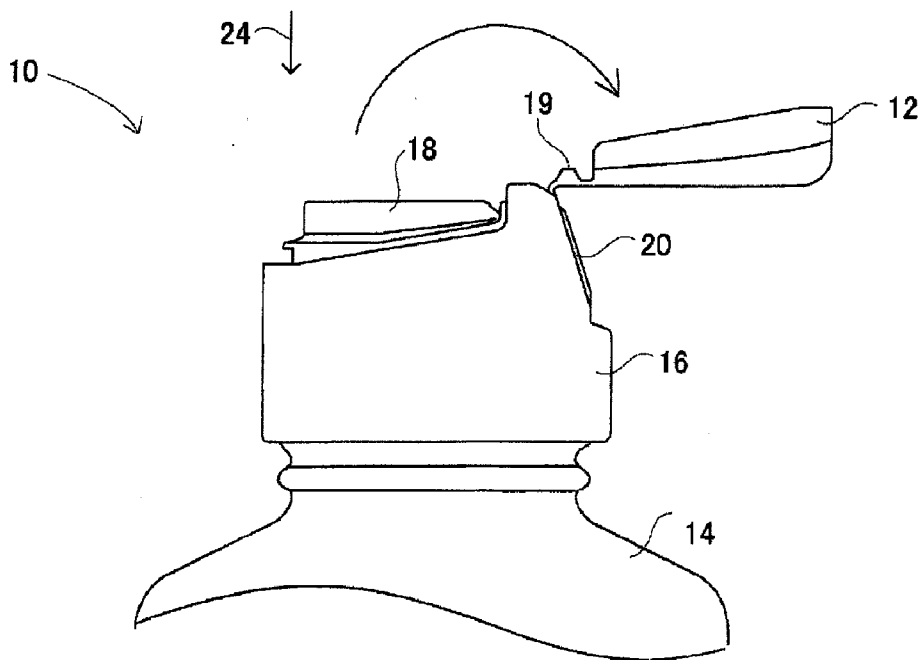


Fig. 1

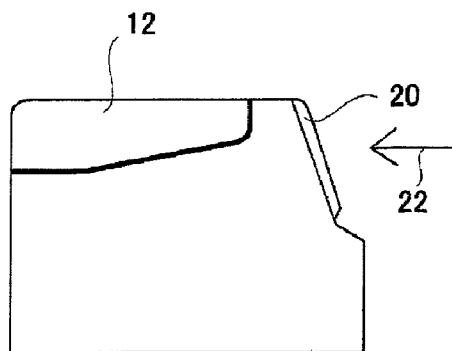


Fig. 2

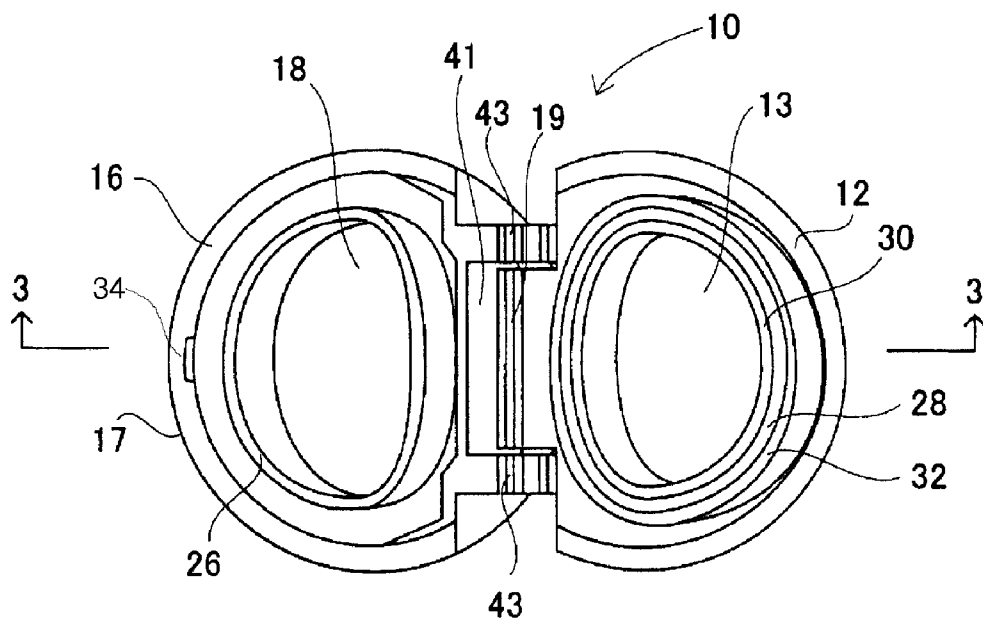


Fig. 3

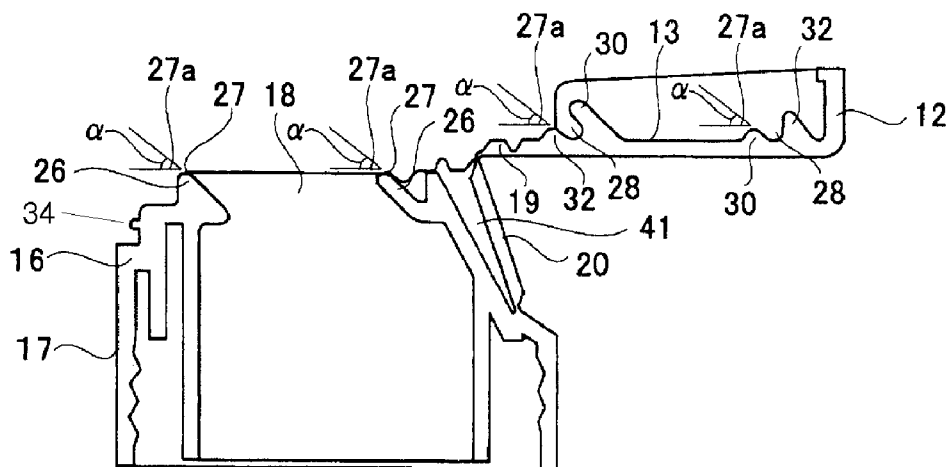


Fig. 4

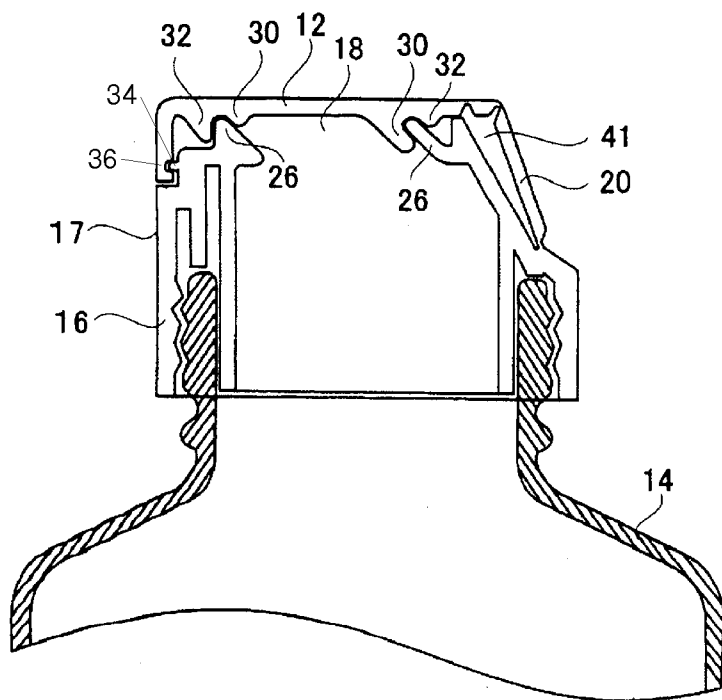


Fig. 5

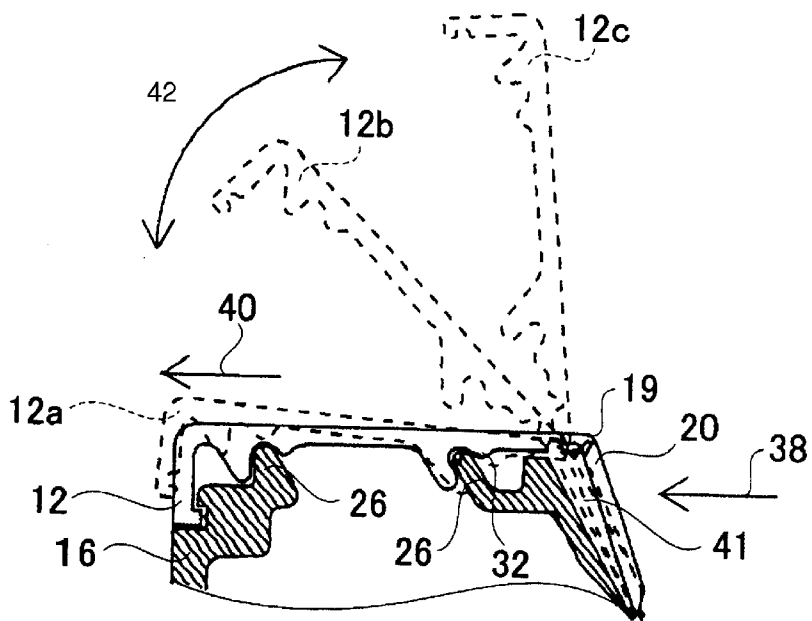


Fig. 6

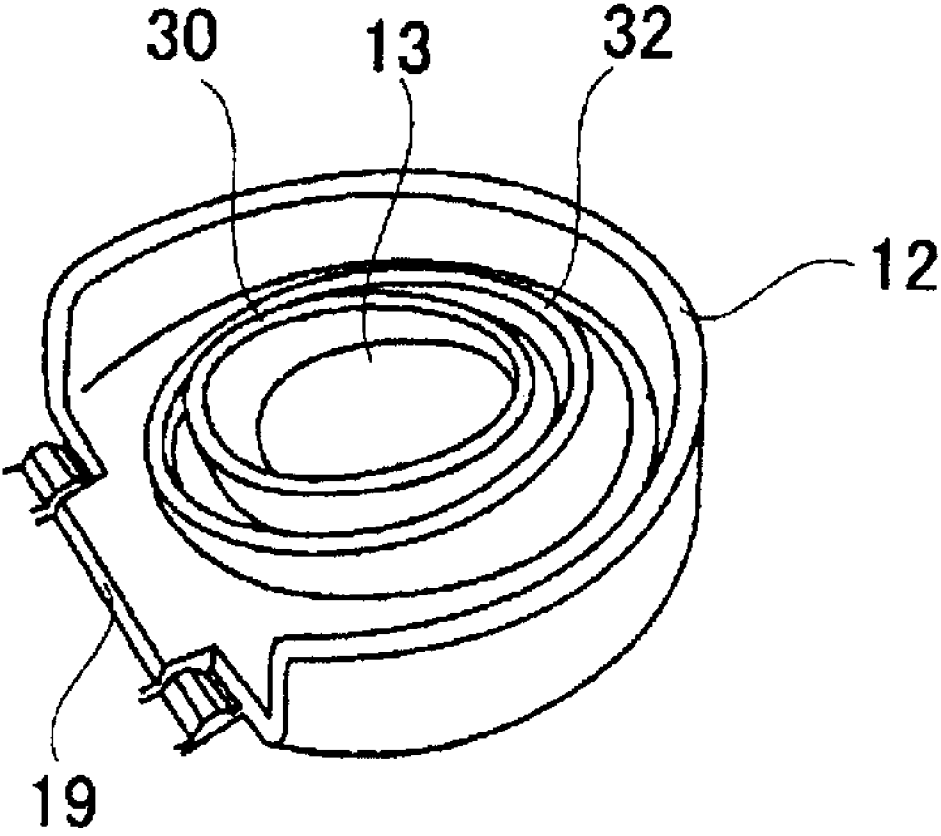


Fig. 7

INTEGRALLY MOLDED HINGE CAP

TECHNICAL FIELD

[0001] The present invention relates to a lid molded integrally via a hinge portion and a cap or container, more particularly, to a highly sealable lid mechanism provided with a ring-shaped slant groove that fits to a slant opening wall provided around an opening of a cap or a container body, and a cap or container the lid of which can be opened in a single pushing motion.

BACKGROUND ART

[0002] A hinge cap or container that is provided with a mechanism capable of opening a lid in a single pushing motion and can be realized by integral molding is in great demand. An invention for meeting such a demand has been disclosed, for example, in Japanese Patent Laid-Open No. 10-338256 filed by the inventor of the present invention, and the contents of the invention are incorporated in this description. The invention includes a cap structure opened in a single pushing motion in which a cap body and a lid are connected to each other via a hinge portion, and further a pushing and opening part provided in parallel with the hinge portion is provided.

[0003] According to the above-mentioned invention, by pushing the pushing and opening part, the lid is turned with the hinge being the axis of rotation, and resultantly a plug provided on the lid is released from a pouring opening in the cap body. In this invention, since the cross section of pouring opening is relatively small, by pushing the plug into the pouring opening, the pouring opening can be closed sufficiently.

Problem to be Solved by the Invention

[0004] However, the diameter of pouring opening must be increased depending on the kind of contents held in the container. In the case where the above-mentioned invention is applied to such a pouring opening having a relatively large diameter, it is difficult to sufficiently close the pouring opening by means of the plug. In other words, for example, if the container falls down, the contents thereof may leak out.

Means for Solving Problem

[0005] Accordingly, the present invention has been made to solve the above problems, and is characterized in that, in a hinge cap or a container in which a lid can be opened in a single pushing motion, and a cap body and the lid are molded integrally, when the lid is closed, a slant opening wall provided around an opening of a hinge cap body fits in a ring-shaped slant groove provided in the lid, and especially at the time of pushing operation, the side surfaces of the opening, plugs, and the ring-shaped groove have a respective arbitrary inclination so that the lid can be turned smoothly.

[0006] Also, the ring-shaped slant groove may be formed by doubly and adjacently standing slant plugs of a slant inner plug and a slant outer plug both rising from the lid floor surface. Further, the configuration is made such that the wall height of the slant inner plug from the lid floor surface decreases as it goes away from the axis of rotation, and the

wall height of the slant outer plug from the lid floor surface increases as it goes away from the axis of rotation.

ADVANTAGES OF THE INVENTION

[0007] The present invention is configured to fit the slant opening wall on the hinge cap body into the ring-shaped slant groove in the lid, so that the sealability of the cap can be secured by increasing the contact area between the slant opening wall and the ring-shaped groove.

[0008] Also, since the side surface on which the slant opening wall is fitted in the ring-shaped slant groove is provided with a tilt angle, the release of a hook due to the advancing movement of the lid at the start time of pushing operation and the turning movement of the lid due to the further pushing force, that is, the opening operability of the lid of hinge cap or container for making the opening of lid smooth and opening the lid in a single pushing motion can be improved.

[0009] Further, the configuration is made such that, in the state in which the lid is closed, the wall height of the slant inner plug decreases gradually toward the turning side of the lid, and the wall height of the slant outer plug increases gradually toward the turning side of the lid. Thereby, when the lid is opened in a single pushing motion, the hindrance of operation between the slant plugs and the slant opening wall of the cap body is prevented by the slant inner plug and the slant outer plug of the lid, and the turning operation of the lid is realized smoothly.

[0010] Further, according to the present invention, the hinge cap body and the lid can be molded integrally, so that the manufacturing process can be simplified, and also the manufacturing cost can be reduced.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] FIG. 1 is a side view showing a state in which a lid of a hinge cap in accordance with one embodiment of the present invention is opened;

[0012] FIG. 2 is a side view showing a state in which a lid of a hinge cap in accordance with one embodiment of the present invention is closed;

[0013] FIG. 3 is a plan view showing the internal structure of a hinge cap;

[0014] FIG. 4 is a sectional view taken along the line 3-3 of FIG. 3;

[0015] FIG. 5 is a sectional view of a hinge cap in a state in which a lid is closed;

[0016] FIG. 6 is a sectional view showing the movement of a lid from a closed state to an opened state; and

[0017] FIG. 7 is a perspective view of a slant inner plug and a slant outer plug of the lid shown in FIG. 3.

DESCRIPTION OF REFERENCE NUMBERS

- [0018] 10 hinge cap
- [0019] 12 lid
- [0020] 14 container
- [0021] 16 hinge cap body
- [0022] 17 side wall
- [0023] 18 opening
- [0024] 20 pushing and opening part
- [0025] 26 slant opening wall
- [0026] 28 slant groove
- [0027] 30 slant inner plug
- [0028] 32 slant outer plug
- [0029] 34 locking piece
- [0030] 36 locking hole
- [0031] 41 gap for operation

BEST MODE FOR CARRYING OUT THE
INVENTION

[0032] FIG. 1 is a side view showing a state in which a lid 12 of a hinge cap 10 in accordance with one embodiment of the present invention is open, and FIG. 2 is a side view of the hinge cap 10 in a state in which the lid 12 is closed. In FIG. 1, the contents held in a container 14 can be taken out through an opening 18 of a hinge cap body 16 in the state in which the lid 12 is open. In order to make the lid 12 in an open state, a pushing and opening part 20 is pushed in the direction indicated by an arrow 22 in FIG. 2 in the state in which the lid 12 is closed as shown in FIG. 2, by which, as described later, the lid 12 is turned to the position shown in FIG. 1 to be opened.

[0033] Next, the internal structure of the hinge cap 10 is explained. FIG. 3 is a plan view showing the internal structure of the hinge cap 10, which is viewed from the direction indicated by an arrow 24 in FIG. 1. Also, FIG. 4 is a sectional view taken along the line 3-3 of FIG. 3. In FIG. 3, the hinge cap body 16 has a through hole parallel with a side wall 17 of the hinge cap body 16, and is formed with the opening 18 in the upper part of the through hole. Around the opening 18, a slant opening wall 26 surrounding the opening 18 is formed. The lid 12 is connected to the hinge cap body 16 by hinge portion 19.

[0034] The lid 12 has a ring-shaped slant groove 28 that fits to the slant opening wall 26 when the lid 12 is closed, and the ring-shaped slant groove 28 is formed by two slant plugs of a slant inner plug 30 and a slant outer plug 32 that rise from a floor part 13 of the lid 12. The engagement surfaces of the slant opening wall 26 of the cap body 16 and the ring-shaped slant groove 28 of the lid 12 preferably have the same shapes to improve the closing ability of cap, but they need not necessarily have the same shapes. Also, in an example shown in FIG. 3, the ring-shaped slant groove 28 engaging with the slant opening wall 26 is formed by two walls of the slant inner plug 30 and the slant outer plug 32. However, the ring-shaped slant groove 28 need not necessarily be formed by two walls, and may be provided merely by forming a ring-shaped slant groove in a plane.

[0035] As shown in FIG. 4, the side surface of the slant opening wall 26 has a tilt angle α with respect to a plane 27a that is tangential to a vertex 27 of the slant opening wall 26. This tilt angle is preferably 45 degrees, but may be any other angle. In FIG. 3, at least, in a portion of the left half A of the slant opening wall 26, the inside surface of the slant opening wall 26 has the tilt angle α with respect to a plane 27b parallel with the floor part (surface) 13 of the lid 12, and in a portion of the right half B of the slant opening wall 26, the outside surface of the slant opening wall 26 has the tilt angle α with respect to the plane 27b parallel with the floor part 13 of the lid 12. As described later, the tilt angle α is provided to allow the slant inner plug 30 and the slant outer plug 32 of the lid 12 to move smoothly on the slant opening wall 26 when the lid 12 is opened, and to ensure the closing ability.

[0036] FIG. 5 shows the state in which the lid 12 formed as shown in FIGS. 3 and 4 closes the opening 18. The slant opening wall 26 of the hinge cap body 16 is fitted between two walls of the slant inner plug 30 and the slant outer plug 32 formed on the lid 12 to close the opening 18. To lock the lid 12 to the hinge cap body 16, for example, a locking piece 34 projecting from the side wall 17 of the hinge cap body 16 is fitted in a locking hole 36 provided in the lid 12, by which the lid 12 can be locked to the hinge cap body 16.

[0037] Next, the opening and closing operation of the lid 12 is explained. FIG. 6 is sectional view for explaining the rotational movement of the lid 12 from a closed state to an open state. Explanation is given of a series of operations for opening the lid 12 from the state in which the lid 12 is locked to the hinge cap body 16, that is, the state in which the locking piece 34 is fitted in the locking hole 36.

[0038] When the pushing and opening part 20 is pushed in the direction indicated by an arrow 38, the lid 12 advances slightly in the direction indicated by the arrow 38, and at the same time, slidingly moves upward gradually to a position of a lid 12a while the slant inner plug 30 and the slant outer plug 32 are in contact with the slant opening wall 26. By this movement 40, the locking hole 36 slips off from the locking piece 34, by which the lid 12a is unlocked and becomes in a rotatable state.

[0039] By further pushing the pushing and opening part 20 in the direction indicated by the arrow 38, the lid 12 is forcibly advanced into a gap for operation 41. However, this advancing movement is hindered by correcting parts 43 at the right and left of the pushing and opening part, so that, between two actions, the lid reactionally begins a rotational movement 42 with the hinge portion 19 being the axis of rotation, by which the lid 12 is turningly opened from the position of a lid 12b to the position of a lid 12c. By continuously pushing the pushing and opening part 20 in the direction indicated by the arrow 38, the open state of the lid 12 can be realized in a single pushing motion.

[0040] FIG. 7 is a perspective view of the slant inner plug 30 and the slant outer plug 32 of the lid 12 shown in FIG. 3. As for the wall heights of the slant inner plug 30 and the slant outer plug 32 from the floor part 13, to turn the lid 12 smoothly, the configuration is made such that the wall height of the slant inner plug 30 decreases gradually toward the rotation axis side of the lid, and the wall height of the slant outer plug 32 increases gradually toward the rotation axis side of the lid.

[0041] By decreasing the wall height of the slant inner plug 30 gradually toward the hinge portion 19 and increasing the wall height of the slant outer plug 32 gradually toward the hinge portion 19, when the lid 12 advances to the position of the lid 12a (FIG. 6), the movement of the slant inner plug 30 and the slant outer plug 32 can be prevented from being hindered by the slant opening wall 26.

[0042] The lid 12 having two adjacently standing slant plugs of the slant inner plug 30 and the slant outer plug 32 has been explained as an example of the present invention. In the present invention, however, as described above, the ring-shaped slant groove fitting to the slant opening wall provided around the opening 18 of the hinge cap body 16 has only to be provided in the lid 12. In this case, the edge heights of the ring-shaped slant groove correspond to the wall heights of the slant inner plug 30 and the slant outer plug 32.

INDUSTRIAL APPLICABILITY

[0043] The present invention can be used for a hinge cap attached to the mouth of a container, and can especially be applied to a container having a large mouth area.

1. An integrally molded hinge cap capable of being opened in a single pushing motion, which has a cap body and a lid rotatably connected to the cap body via a hinge portion, the integrally molded hinge cap comprising:

a pushing and opening part having one end connected to the cap body via the hinge portion and the other end being

opposite to the one end and connected to the cap body, wherein the pushing and opening part moves to a gap for operation interposed between the pushing and opening part and the cap body by pushing the pushing and opening part, whereby the lid is turned with the hinge portion being the axis of rotation on receipt of reaction from a correcting part which is provided in parallel with the pushing and opening part between the lid and the cap body;

a slant opening wall provided around an opening of the cap body, the slant opening wall being configured so that the inside wall thereof has an inclination having a predetermined angle with respect to a plane that is tangential to a vertex of the slant opening wall; and

a ring-shaped slant groove provided in a floor surface of the lid contactingly fitting to the slant opening wall, the ring-shaped slant groove being configured so that the wall surface thereof has an inclination having the same angle as the predetermined angle with respect to the floor surface, wherein the outside edge height of the ring-shaped slant groove from the lid floor surface decreases as it approaches the axis of rotation, and the

inside edge height of the ring-shaped slant groove from the lid floor surface decreases as it goes away from the axis of rotation.

2. The integrally molded hinge cap according to claim 1, wherein the slant groove is formed by two adjacently standing slant plugs of a slant inner plug and a slant outer plug both rising from the lid floor surface.

3. The integrally molded hinge cap according to claim 2, wherein the wall height of the slant outer plug from the lid floor surface decreases as it approaches the axis of rotation, and the wall height of the slant inner plug from the lid floor surface decreases as it goes away from the axis of rotation.

4. The integrally molded hinge cap of claim 1, wherein the hinge cap further comprises a container connected to the cap body, the container being molded integrally with the hinge cap at the same time.

5. The integrally molded hinge cap of claim 1 wherein the predetermined angle is approximately 45 degrees.

6. The integrally molded hinge cap of claim 1 wherein the lid is locked with the cap body when the lid is closed.

7. The integrally molded hinge cap of claim 1 wherein two correcting parts are located at both sides of the pushing and opening part with a gap.

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