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Container cap and container combined with same

Abstract

A container cap which is combined with a container containing a beverage or the like, and a container combined with the container cap. The container cap is combined with a container inlet of a container body. A plurality of close contact portions in contact with the container inlet are formed, and the close contact portions form a closed curve enclosing the container inlet so as to block inflow of external air from the outside into the container body.

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References Cited

U.S. PATENT DOCUMENTS

Patent No.	Issued Date	Patentee Name	U.S. Cl.	CPC
2818204	12/1956	Henchert	215/DIG.1	B65D 47/123
3001658	12/1960	Herter	215/45	B65D 53/04
3074579	12/1962	Miller	215/354	B65D 41/0421
3335774	12/1966	Reed	220/790	B65D 43/0208
3428208	12/1968	Kosar	215/44	B65D 41/0428
3441161	12/1968	Van Baarn	D9/446	B65D 41/0421
3474884	12/1968	Braun	184/6.4	F16N 19/003
3482725	12/1968	Exton	215/354	B65D 41/0428
3494496	12/1969	Livingstone	215/DIG.1	B65D 41/185
3532244	12/1969	Yates, Jr.	220/792	B65D 45/322
3568871	12/1970	Livingstone	215/354	B65D 41/185
3595418	12/1970	Adcock	215/354	B65D 41/0428
3596694	12/1970	Jaeniche	215/45	B65D 39/04
3707240	12/1971	Wilson	215/901	B65D 41/485
3747792	12/1972	Anthony	215/DIG.1	B65D 41/0428
3770156	12/1972	Yates, Jr.	215/DIG.1	B65D 43/0256

3815771	12/1973	Marks	215/344	B65D 41/0428
3830395	12/1973	Crisci	215/329	B65D 43/0227
3833141	12/1973	Leitz	215/354	B65D 41/0428
3844439	12/1973	Demers	215/344	B65D 41/0428
3881627	12/1974	Davolt	215/344	B65D 41/0421
3900122	12/1974	Dichter	215/355	B65D 39/04
3944104	12/1975	Watson	215/354	B65D 41/0421
4089463	12/1977	Babiol	215/DIG.1	B65D 41/0428
4322012	12/1981	Conti	215/DIG.1	B65D 41/3442
4418833	12/1982	Landis	220/792	B65D 43/0212
4444332	12/1983	Widen	220/792	B65D 43/0212
4489845	12/1983	Aichinger	215/DIG.1	B65D 41/0421
4560077	12/1984	Dutt	215/DIG.1	B65D 41/0421
4564112	12/1985	Breuer	215/246	B29C 45/4407
4711365	12/1986	Fomby	215/DIG.1	B65D 41/0428
5297688	12/1993	Beck	215/354	B65D 41/0421
5549213	12/1995	Robbins, III	215/354	B65D 43/0212
5630522	12/1996	Montgomery	215/354	B65D 41/0421
5725115	12/1997	Bosl	215/258	B65D 41/3428
5762218	12/1997	Sachau	215/354	B65D 41/0414
5954215	12/1998	Alter	215/354	B65D 41/185
6021912	12/1999	Hertrampf	215/270	B65D 41/0421
6283318	12/2000	Lee	215/354	B65D 41/485
6619498	12/2002	von Holdt, Jr.	220/792	B65D 43/0256
6679395	12/2003	Pfefferkorn	215/DIG.1	B65D 41/0421

6889857	12/2004	Francois	215/232	B65D 41/0421
7086551	12/2005	von Holdt, Jr.	220/276	B65D 43/0256
7575121	12/2008	Ooka	215/344	B65D 41/325
7922017	12/2010	Shingle	215/DIG.1	B65D 50/045
8066133	12/2010	Takamatsu	215/307	B65D 41/0421
8083094	12/2010	Caulfield	220/780	B65D 43/162
8393483	12/2012	Druitt	215/344	B65D 41/04
9199769	12/2014	Wood	N/A	B65D 41/0421
10246227	12/2018	Wada	N/A	B65D 43/162
2002/0162846	12/2001	Mercier	220/795	B65D 43/0212
2003/0026508	12/2002	Smith	N/A	N/A
2006/0138071	12/2005	Tsutsumi	215/354	B65D 41/0421
2006/0151423	12/2005	Seidita	215/341	B65D 41/325
2006/0255003	12/2005	Fuchs	N/A	N/A
2019/0023463	12/2018	Knight	N/A	N/A
2021/0086954	12/2020	Suzuki	N/A	B65D 41/325

FOREIGN PATENT DOCUMENTS

Patent No.	**Application Date**	**Country**	**CPC**
101600626	12/2008	CN	N/A
810349	12/1950	DE	N/A
202007012885	12/2006	DE	N/A
1327587	12/2002	EP	N/A
2050320	12/1980	GB	B01L 3/50825
S493782	12/1973	JP	N/A
S53129651	12/1977	JP	N/A
S5512040	12/1979	JP	N/A
S5512041	12/1979	JP	N/A
2002104452	12/2001	JP	N/A
2012232767	12/2011	JP	N/A
2015009824	12/2014	JP	N/A
1020040041302	12/2003	KR	N/A
1020080000543	12/2007	KR	N/A
101631438	12/2015	KR	N/A
2015194040	12/2014	WO	N/A

OTHER PUBLICATIONS

Extended European Search Report dated Jul. 12, 2023, in the counterpart European patent application No. EP20841180.1. cited by applicant

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Background/Summary

TECHNICAL FIELD

(1) The present invention relates to a container cap and a container combined with same, and more particularly, to a container cap combined with a container containing a beverage or the like and a container combined with the container cap.

BACKGROUND ART

(2) A plastic container includes a container containing contents such as a beverage and a container cap combined with a container inlet.

(3) However, the container cap combined with the container inlet may form a minute gap due to a tolerance with the container inlet. Through the gap, the contents such as a beverage may be leaked to the outside, or moisture and bacteria may be introduced from the outside into the container to contaminated or deteriorated.

(4) In order to prevent above described limitations, typically, 1) a sealing member is mounted to a top surface of the container inlet, 2) an inner ring is formed on an inner bottom surface of the container cap, or 3) a packing is mounted to an inner space of the container cap.

(5) However, although the 1) is the safest method, the method of the 1) may increase a manufacturing cost by adding a process of installing the sealing member to the top surface of the container inlet and may not be recycled because a different material is combined.

(6) The method of 2) has a limitation in completely blocking moisture, external air, or bacteria because the tolerance is generated between an inner wall or an outer wall of the container and an inner space of the container cap when the container cap is combined with the container inlet.

DISCLOSURE OF THE INVENTION

Technical Problem

(7) The present invention provides a container cap having a structure combined with a container inlet to completely block moisture, external air, or bacteria from being introduced into a container and a container combined with same to solve the above-described limitations.

Technical Solution

(8) The present invention is disclosed to achieve the objects of the invention. The present invention will solve the above-described limitations by deforming structures of various portions that are combined to have a blocking function when the container inlet is combined with the container cap.

(9) In order to achieve the objects, the present invention provides a container cap **20** which is combined with a container inlet **12** of a container body **10**, wherein a plurality of close contact portions in contact with the container inlet **12** are formed, and the close contact portions form a closed curve enclosing the container inlet **12** so as to block inflow of external air from the outside into the container body **10**.

(10) According to the present invention, a container includes: a container body **10** containing contents and having a container inlet **12**; and a container cap **20** combined with the container inlet **12**. Here, a plurality of close contact portions in close contact with each other are formed on at least

one of the container cap **20** and the container inlet **12**, and the close contact portions form a closed curve enclosing the container inlet **12** so as to block inflow of external air from the outside into the container body **10**.

(11) The container may include: a container body **10** containing contents and having a container inlet **12**; and a container cap **20** combined with the container inlet **12**. Here, the container cap **20** may include: a body part **26** in close contact with an upper end of the container inlet **12**; a sidewall part **25** which extends downward from the body part **26** and in which a female screw part **24** that is screw-coupled with a male screw part **14** formed on an outer circumferential surface of the container inlet **12** is formed; and an inner ring **100** protruding from a bottom surface of the body part **26** and inserted to an inner circumferential surface of the container inlet **12**.

(12) At least one inner circumferential protruding part **121** that protrudes toward the inner ring **100** to contact an outer circumferential surface of the inner ring **100** when the container cap **20** is combined with the container inlet **12** may be formed on an inner circumferential surface of the container inlet **12**.

(13) At least one inner ring protruding part that protrudes toward an inner circumferential surface of the container cap **20** to contact the inner circumferential surface of the container cap **20** when the container cap **20** is combined with the container inlet **12** may be formed on the container cap **20**.

(14) A middle ring **210** inserted to a recessed groove **220** having a circular shape formed on the upper end of the container inlet **12** and formed on the bottom surface of the body part **26** to form at least one close contact portion when the container cap **20** is combined with the container inlet **12** may be formed on the container cap **20**.

(15) An inner upper end **221** may be lower than an outer upper end **222** based on the recessed groove **220** in the upper end of the container inlet **12**.

(16) At least one of an inner upper end **221** and an outer upper end **222** of the container inlet **12** may have a curved outer circumferential surface, and an inclined surface **215** in contact with the curved outer circumferential surface when the container cap **20** is combined with the container inlet **12** may be formed on the container cap **20**.

Advantageous Effects

(17) The container cap and the container combined with the same according to the present invention have an advantage in that the close contact portions contacting the container inlet form the closed curve, and the plurality of close contact portions are combined with the container inlet to completely block moisture, external air, and bacteria from being introduced into the container.

(18) Also, the container cap and the container combined with the same according to the present invention have an advantage in that as the close contact portions contacting the container inlet form the closed curve, and the plurality of close contact portions completely block moisture, external air, and bacteria, the sealing force of the container is improved to secure safety of the contents contained in the container and diversify the kinds of the contents.

(19) Also, the container cap and the container combined with the same according to the present invention have an advantage in that as the close contact portions contacting the container inlet form the closed curve, and the plurality of close contact portions completely block moisture, external air, and bacteria, the sealing member for sealing the container is not necessary to remarkably reduce the manufacturing costs of the product including the container and contribute to the environment.

(20) Also, the container cap and the container combined with the same according to the present invention have an advantage in that the close contact portions contacting the container inlet form the closed curve, the plurality of close contact portions completely block moisture, external air, and bacteria, and the container cap is maximally recycled as the container and the container cap are made of the single material such as synthetic resin materials (e.g., PE, PP, PET).

(21) Furthermore, the container cap and the container combined with the same according to the present invention have an advantage in that as the container and the container cap are made of the

single material such as synthetic resin materials, the container cap and all sorts of containers are maximally recycled.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

(1) FIG. **1** is a perspective view illustrating a container according to a first embodiment of the present invention.

(2) FIG. **2**A is a cross-sectional view taken along line I-I of FIG. **1**, and FIG. **2**B is a cross-sectional view illustrating a state in which a container cap is separated from the container.

(3) FIG. **3** is an enlarged cross-sectional view illustrating portion A**1** of FIG. **2**A.

(4) FIG. **4**A is a cross-sectional view illustrating a container according to a second embodiment of the present invention, and FIG. **4**B is an enlarged cross-sectional view illustrating portion B**1** of FIG. **4**A.

(5) FIG. **5**A is a cross-sectional view illustrating a modified example of the container in FIG. **4**A, and FIG. **5**B is an enlarged cross-sectional view illustrating portion B**2** of FIG. **5**A.

(6) FIG. **5**C is an enlarged cross-sectional view illustrating portion B**3** of FIG. **5**A.

(7) FIGS. **6**A and **6**B are enlarged cross-sectional views respectively illustrating a modified example of a portion in FIG. **4**A and a modified example of a portion in FIG. **5**B.

(8) FIG. **7** is a cross-sectional view illustrating a container according to a third embodiment of the present invention.

(9) FIG. **8**A is an enlarged cross-sectional view illustrating portion C**1** of FIG. **7**.

(10) FIG. **8**B is an enlarged cross-sectional view illustrating a modified example of FIG. **8**A.

(11) FIG. **8**C is an enlarged cross-sectional view illustrating an example in which a flexibility applying groove is formed in a wall part as a modified example of FIG. **8**A.

(12) FIG. **8**D is an enlarged cross-sectional view illustrating an example in which a flexibility applying groove is formed in a scut combining projection as a modified example of FIG. **8**A.

(13) FIG. **9** is a cross-sectional view illustrating a container according to a fourth embodiment of the present invention.

(14) FIG. **10**A is an enlarged cross-sectional view illustrating portion D**1** of FIG. **9**.

(15) FIG. **10**B is an enlarged cross-sectional view illustrating a modified example of FIG. **10**A.

(16) FIG. **10**C is an enlarged cross-sectional view illustrating a modified example of FIG. **10**A.

(17) FIG. **10**D is an enlarged cross-sectional view illustrating a modified example of FIG. **10**C.

(18) FIGS. **11**A to **11**E are enlarged cross-sectional views illustrating various embodiments for sealing the container as a modified example of portion D**1** of FIG. **9**.

(19) FIG. **12** is a cross-sectional view illustrating a container according to a fifth embodiment of the present invention.

(20) FIG. **13** is an enlarged cross-sectional view illustrating portion E**1** of FIG. **12**.

(21) FIG. **14** is a cross-sectional view illustrating a modified example of the container of FIG. **12**.

(22) FIG. **15** is an enlarged cross-sectional view illustrating portion E**2** of FIG. **14**.

(23) FIG. **16** is an enlarged cross-sectional view illustrating a modified example of FIG. **13**.

(24) FIG. **17** is an enlarged cross-sectional view illustrating a modified example of FIG. **15**.

(25) FIGS. **18**A to **18**H are partial cross-sectional views illustrating examples of a structure of a container inlet used for the container according to the present invention.

(26) FIGS. **19**A to **19**C are partial cross-sectional views illustrating examples of a structure of a container cap used for the container according to the present invention.

(27) FIGS. **20**A to **20**D are partial cross-sectional views illustrating examples of structures of the container according to the present invention.

(28) FIGS. **21**A to **21**C are partial cross-sectional views illustrating examples of structures of the

container according to the present invention.
(29) FIG. **22** is a cross-sectional view illustrating a container according to a seventh embodiment of the present invention.
(30) FIG. **23** is a cross-sectional view illustrating a state in which the container cap is separated from the container of FIG. **22**.
(31) FIG. **24** is an enlarged cross-sectional view illustrating portion G of FIG. **22**.
(32) FIG. **25** shows cross-sectional views illustrating examples of contact structures between the container cap and the container inlet in the container according to the present invention.
(33) FIGS. **26**A and **26**B are partial cross-sectional views illustrating structures of at least one projection ring formed on a lower end of a sidewall part of the container cap and the container inlet contacting the same in the container according to the present invention.

MODE FOR CARRYING OUT THE INVENTION

(34) Hereinafter, a container cap and a container combined with same according to the present invention will be described with reference to the accompanying drawings.
(35) The present invention provides a novel container cap and a container structure, which are capable of preventing external air or bacteria from being introduced into a container or preventing contents from being leaked to the outside.
(36) Specifically, a container according to the present invention includes a container body **10** containing the contents and having a container inlet **12** and a container cap **20** combined with the container inlet **12**. Here, at least one of the container cap **20** and the container inlet **12** forms a plurality of close contact portions, and the close contact portions form a closed curve enclosing the container inlet **12** so as to block inflow of external air from the outside into the container body **10**.
(37) Here, the container body **10** may contain the contents including powder, tablets, and granules in addition to liquid materials such as a beverage and be made of various materials such as a synthetic resin material and a glass material according to shapes and materials of liquids, powder, or particles.
(38) Particularly, the container body **10** may be made of the same material as the container cap **20** such as PP, PE, and PET for combination with the container cap according to the present invention.
(39) The close contact portion, as a portion closely contacting at least one of the container cap **20** and the container inlet **12**, may include all sorts of structures of forming a portion closely contacting the container cap **20** and the container inlet **12**.
(40) Particularly, the close contact portion of the present invention may be combined with the container inlet to completely block moisture, external air, or bacteria from being introduced into the container as the container cap **20** closely contacts the container inlet **12** by a descending force when the container cap **20** is rotated and/or descended to be combined with the container inlet **12** (e.g., one piece or two piece one-touch cap and undercut cap (snap-type cap)).
(41) In the container body **10**, the container inlet **12** that is a portion combined with the container cap **20** has a basic shape of a cylindrical shape, and the rest portion may have various configurations according to a design.
(42) Also, the container inlet **12** may be an outlet formed in the container body **10** so that the contents are discharged to the outside and include various configurations according to a combining structure of the container because the container inlet **12** is coupled with the container cap **20**.
(43) Particularly, since the container cap **20** of main products is combined by rotation, the container inlet **12** may have a partially cylindrical shape. The cylindrical container inlet **12** may be applied to products having a combining structure, in which the container cap descends to be combined with the container inlet **12**, like one-piece one touch cap (also known as Duma cap), two-piece one touch cap in which a cap and a body are integrated by a hinge, and a undercut cap that is combined only with undercut (representative products: *lactobacillus* yogurt products).
(44) The container cap **20** is a component combined with the container inlet **12** of the container body **10**. The container cap **20** has the basic shape of an overall cylindrical shape corresponding to

a shape of the container inlet **12** and having an opened side heading toward the container inlet **12**.
(45) For example, the container cap **20** may include: a body part **26** closely contacting an upper end of the container inlet **12**; and a sidewall part **25** extending downward from the body part **26** and combined with the container inlet **12**.
(46) The body part **26** may be a portion closely contacting the upper end of the container inlet **12** and have various shapes according to an outer structure of the container cap **20**, e.g., a circular plate shape.
(47) The container cap **20** may include an inner ring **100**, so called a ring gasket, protruding from a bottom surface of the body part **26** and inserted to an inner circumferential surface of the container inlet **12** to increase a sealing force of the container body **10**.
(48) The inner ring **100**, as a portion protruding from the bottom surface of the body part **26** and inserted to the inner circumferential surface of the container inlet **12** to increase the sealing force of the container body **10**, may have various configurations according to a contact structure with the container inlet **12**.
(49) The sidewall part **25**, as a component extending downward from the body part **26** and combined with the container inlet **12**, may have various configurations according to a combining structure with the container inlet **12**.
(50) For example, the sidewall part **25** may be combined with the container inlet **12** through a screw combining structure, and here, a female screw part **24** screw-combined with a male screw part **14** formed on an outer circumferential surface of the container inlet **12** may be formed.
(51) Also, the sidewall part **25** may be combined with the container inlet **12** by a snap-type combining structure (e.g., one-piece and two-piece one touch cap and undercut cap structure).
(52) Here, as at least one ring-shaped combining projection may be formed on the outer circumferential surface of the container inlet **12**, and a ring-shaped combining groove to which the combining projection formed on the container inlet **12** is inserted is formed in an inner surface of the sidewall part **25**, the container cap **20** may be combined with the container inlet **12**.
(53) The container cap **20** according to the present invention may include a plurality of close contact portions closely contacting the container inlet **12** by relative close contact with the container inlet **12**.
(54) Also, the close contact portions may form a closed curve enclosing the container inlet **12** to block inflow of external air from the outside into the container body **10** and have various configurations according to the formation position, formation structure, and number of the close contact portions.
(55) A scut part **27** caught by and combined with a scut combining projection **13** formed on the container inlet **12** may be integrated with a lower end of the sidewall part **25** of the container cap **20**.
(56) The scut part **27** is a portion integrated with the lower end of the sidewall part **25** to be caught by and combined with the scut combining projection **13** formed on the container inlet **12** and a portion separated from the sidewall part **25** when the container cap **20** is initially opened.
(57) Here, the scut part **27** may have various configurations according to a combining structure with the scut combining projection **13**.
(58) Also, the scut part **27** may be connected with the sidewall part **25** by a plurality of bridges or a cutting line for easy separation from the sidewall part **25**.
(59) A separation preventing projection **15** for preventing the container cap **20** from being unintentionally separated from the container inlet **12** may be additionally formed at a position corresponding to a lower end of the scut part **27**.
(60) The separation preventing projection **15**, as a component formed at the position corresponding to the lower end of the scut part **27** of the container inlet **12** for preventing the container cap **20** from being unintentionally separated from the container inlet **12**, may protrude further than an outer circumferential surface of the sidewall part **25** of the container cap **20**.

(61) Also, a plurality of projections **21** may be formed along a circumferential direction of the container cap **20** so that a user easily rotates the container cap **20**.
(62) Hereinafter, a specific embodiment of the present invention will be described in detail. Also, characteristic parts will be described in detail for convenience of description.
(63) Although the present invention is described for each embodiment, one or more embodiments may be combined as long as the embodiments are not conflicted with each other.

First Embodiment

(64) As illustrated in FIGS. **1** to **3**, according to a first embodiment of the present invention, at least one inner circumferential protruding part **121** protruding toward the inner ring **100** to contact an outer circumferential surface of the inner ring **100** when the inner ring **100** of the container cap **20** is combined with the container inlet **12** may be formed.
(65) The inner circumferential protruding part **121**, as a portion protruding toward the inner ring **100** to contact the outer circumferential surface of the inner ring **100**, may have a ring shape in a circumferential direction based on a central axis of a longitudinal direction of the container inlet **12**.
(66) Also, the inner circumferential protruding part **121** may have a gentle curved shape so that a cross-section in the longitudinal direction of the container inlet **12** is in surface-contact with the outer circumferential surface of the inner ring **100** instead of line-contact.
(67) In the container cap **20**, at least one inner ring protruding part protruding toward an inner circumferential surface of the container cap **20** to contact the inner circumferential surface of the container cap **20** when the container cap **20** is combined with the container inlet **12** may be formed as a component similar to the inner circumferential protruding part **121**.
(68) The inner ring protruding part, as a component protruding toward an inner circumferential surface of the container cap **20** to contact the inner circumferential surface of the container cap **20** when the container cap **20** is combined with the container inlet **12**, may have a ring shape in a circumferential direction based on the central axis of the longitudinal direction of the container inlet **12**.
(69) Also, the inner ring protruding part may have a gentle curved shape so that a cross-section in the longitudinal direction of the container inlet **12** is in surface-contact with the inner circumferential surface of the container inlet **12** instead of line-contact.
(70) In the container cap **20**, a middle ring **210** inserted to a recessed groove **220** integrated along a circumference of the upper end of the container inlet **12** when the container cap **20** is combined with the container inlet **12** may be formed on the bottom surface of the body part **26** to increase a sealing force to the container body **10**.
(71) The middle ring **210** may have various configurations according to a contact structure with the recessed groove **220** as a ring formed on the bottom surface of the body part **26** and inserted to the recessed groove **220** integrated along the circumference of the upper end of the container inlet **12** when the container cap **20** is combined with the container inlet **12**.
(72) For example, the middle ring **210** may have a vertical cross-section having a reverse triangular shape or a reverse trapezoidal shape. Here, an end of the middle ring **210** may have various shapes such as a flat surface or a curved surface.
(73) Also, the recessed groove **220** to which the middle ring **210** is inserted may have a shape corresponding to a cross-sectional shape of the middle ring **210**. Here, the cross-sectional shape of the middle ring **210** may have a width that is decreased more than that of the recessed groove **220** so that the middle ring **210** closely contacts the recessed groove **220** when inserted.
(74) Alternatively, two or more recessed groove **220** and two or more middle ring **210** may be formed according to the sealing force.
(75) When the recessed groove **220** is formed, the recessed groove **220** may be formed by two (inner and outer) upper ends **211** and **222** forming the upper end of the container inlet **12**.
(76) Here, the two upper ends **221** and **222** may have a structure inclined at a portion in which the recessed groove **220** is formed and having elasticity.

(77) Also, at least one of the two upper ends **221** and **222** may have a curved outer circumferential surface.
(78) Here, as illustrated in FIG. **3**, as an inclined surface **215** contacting the curved outer circumferential surface of the upper ends **221** and **222** is formed in the container cap **20**, at least one close contact portion may be formed so that the container cap **20** closely contacts the container inlet **12** when the container cap **20** is combined with the container inlet **12**.
(79) Also, the upper end of the container inlet **12**, i.e., the two upper ends **221** and **222**, the inner upper end **221** may be lower than the outer upper end **222** based on the recessed groove **220**.
Second Embodiment
(80) As illustrated in FIGS. **4**A to **6**B, according to a second embodiment of the present invention, a tight sealing contact portion **330** supported by at least one contact support surface **310** and **320** formed on the container inlet **12** may be formed on the container cap **20**.
(81) The contact support surface **310** and **320** may include various structures capable of supporting the tight sealing contact portion **330** as a portion supporting the close contact portion **330** when the container cap **20** is combined with the container inlet **12**.
(82) For example, as illustrated in FIGS. **4**A to **5**C, the contact support surface **310** and **320** may be formed on the scut combining projection **13**.
(83) Specifically, as illustrated in FIGS. **4**B and **5**B, a ring-shaped groove **330** that is recessed so that a lower end of the tight sealing contact portion **330** is inserted when the container cap **20** is combined with the container inlet **12** may be formed in the scut combining projection **13**, and side surfaces of the groove **330** may form the contact support surfaces **310** and **320**.
(84) Specifically, sidewalls of the groove **330**, which are inclined in a downward direction to contact a lower end, e.g., a corner, of the tight sealing contact portion **330**, may form the contact support surfaces **310** and **320**.
(85) Here, the contact support surfaces **310** and **320** may include a first contact support surface **310** disposed at the inside and a second contact support surface **320** disposed at the outside, and when one contact support surface is provided, the second contact support surface **320** disposed at the outside may form the contact support surface.
(86) The scut combining projection **13** may have various shapes according to a combining structure of the scut part **27**.
(87) For example, the scut part **27** may extend from the lower end of the tight sealing contact portion **330**. Here, the scut part **27** may be combined with the scut combining projection **13** by passing through the groove **330**.
(88) As illustrated in FIGS. **4**A and **4**B, the scut part **27** may include a plurality of scut portions extending in the circumferential direction instead of having a ring structure integrated in the circumferential direction, and a plurality of through-holes **340** may be formed in the groove **330** so that the scut portions are respectively inserted thereto.
(89) For another example, as illustrated in FIGS. **5**A and **5**B, the scut part **27** may be installed beyond an outside of the scut combining projection **13**.
(90) The tight sealing contact portion **330** may have various configurations according to a contact structure of the contact support surface **310** and **320** as a portion formed on the container cap **20** and supported by at least one contact support surface **310** and **320** formed on the container inlet **12**.
(91) For example, the tight sealing contact portion **330** may be formed on a lower end of a wall part **25**. The tight sealing contact portion **330** may form the lower end of the wall part **25** or a projection formed at the lower end of the wall part **25** and having a thickness less than a cross-sectional thickness of the wall part in consideration of a connection structure of the scut part **27**.
(92) Here, the tight sealing contact portion **330** may close contact an inclined structure of the contact support surface **310** and **320** when descended to the container inlet **12** by rotation of the container cap **20**.
(93) That is, the tight sealing contact portion **330** is inserted to the groove forming the contact

support surface **310** and **320** and closely contacts the inclined structure of the contact support surface **310** and **320** when descended to the container inlet **12** by the rotation of the container cap **20**.

(94) When one pair of contact support surfaces **310** and **320** are provided, the tight sealing contact portion **330** may have a thickness greater than a minimum width of the one pair of contact support surfaces **310** and **320**.

(95) Also, in a cross-section of the lower end of the tight sealing contact portion **330**, each corner may have the right angle.

(96) The tight sealing contact portion **330** may have increased flexibility to increase a sealing effect when closely contacts the contact support surfaces **310** and **320**.

(97) To this end, as illustrated in FIGS. **6**A and **6**B, at least one deformed groove **160** adjacent to a contact portion contacting the contact support surfaces **310** and **320** may be formed in the tight sealing contact portion **330**.

(98) The deformed groove **160** has a ring shape formed along the circumferential direction at a position adjacent to the contact portion contacting the contact support surfaces **310** and **320**. The deformed groove **160** may be deformed when the contact portion contacting the contact support surfaces **310** and **320** contacts the contact support surfaces **310** and **320** to apply flexibility and increase the sealing effect.

(99) An upper end of the container inlet **12** may have the same or similar structure as that of the first embodiment.

(100) As illustrated in FIG. **5**C, at least one contact ring **150** and **160** may be formed on the upper end of the container inlet **12** by extending from the lower end of the body part **26** to closely contact the upper end of the container inlet **12** in addition to or separately from the same or similar structure as that of the first embodiment.

(101) The contact ring **150** and **160** may have a ring shape as a portion extending from the lower end of the body part **26** to closely contact the upper end of the container inlet **12**.

(102) Particularly, the contact ring **150** and **160** may include an inner ring **150** and an outer ring **160** so that the upper end of the container inlet **12** is inserted therebetween.

Third Embodiment

(103) In terms of sealing between the container cap **20** and the container inlet **12**, the sealing force of the container may be remarkably improved by applying flexibility to portions contacting each other.

(104) In the container according to a third embodiment of the present invention, at least one flexibility applying groove **231**, **232**, **233**, and **234** is formed in the container inlet **12**, and a pressing contact part **241**, **242**, **243**, and **215** may be formed in the container cap **20** at a position corresponding to the flexibility applying groove **231**, **232**, **233**, and **234**.

(105) The flexibility applying groove **231**, **232**, **233**, and **234** may be formed in any portion at which the container cap **20** and the container inlet **12** contact each other as a groove formed to improve the sealing force of the container by applying the flexibility to the portion at which the container cap **20** and the container inlet **12** contact each other.

(106) For example, as illustrated in FIGS. **7** to **8***b*, the flexibility applying groove **231** may be formed in the upper end of the container inlet **12**.

(107) The flexibility applying groove **231** formed in the upper end of the container inlet **12** may be as same as the recessed groove **220** of the first embodiment as a ring-shaped groove formed in the upper end of the container inlet **12**.

(108) Particularly, the flexibility applying groove **231** formed in the upper end of the container inlet **12** may be formed adjacent to the inner circumferential surface (refer to FIGS. **7** and **8**A) or the outer circumferential surface (refer to FIG. **8**B) of the upper end of the container inlet **12**, so as to be deformed when contacts the container cap **20**.

(109) For another example, as illustrated in FIGS. **7** to **8**A, when the flexibility applying groove

234 formed in the upper end of the container inlet **12** is formed adjacent to the inner circumferential surface of the upper end of the container inlet **12**, the container cap **20** may press and contact a portion at which the flexibility applying groove **234** is formed by the pressing contact part **215** when the container cap **20** is combined with the container inlet **12** as the inclined surface **215** is formed at a position corresponding to the flexibility applying groove **234**.

(110) As illustrated in FIG. **8**B, when the flexibility applying groove **231** formed in the upper end of the container inlet **12** is formed adjacent to the outer circumferential surface of the upper end of the container inlet **12**, the container cap **20** may press and contact a portion at which the flexibility applying groove **231** is formed by the pressing contact part **241** when the container cap **20** is combined with the container inlet **12** as the inclined surface **241** is formed at a position corresponding to the flexibility applying groove **231**.

(111) As illustrated in FIG. **8**B, when the pressing contact part **241** is formed in the container cap **20**, the pressing contact part **241** may be formed on the outer ring **160** of the second embodiment in addition to the simple inclined surface.

(112) For another example, as illustrated in FIG. **8**C, the flexibility applying groove **232** may be formed in the outer circumferential surface of the container inlet **12**.

(113) Here, a ring-shaped flexibility applying projection **230** may be formed on the outer circumferential surface of the container inlet **12** to form the flexibility applying groove **232** pressed by the container cap **20**, and the flexibility applying groove **232** may be recessed from an upper side to a lower side of the flexibility applying projection **230**.

(114) In the container cap **20**, the pressing contact part **242** may be formed on the inner circumferential surface of the container cap **20** in correspondence to the flexibility applying groove **232**.

(115) The pressing contact part **242** may be an inclined surface that is inclined upward to press a portion in which the flexibility applying groove **232** is formed in the flexibility applying projection **230** by descent of the container cap **20** when the container cap **20** is combined with the container inlet **12**.

(116) For another example, as illustrated in FIG. **8**D, the flexibility applying groove **233** may be formed in the outer circumferential surface, particularly the scut combining projection **13**, of the container inlet **12**.

(117) Here, the flexibility applying groove **233** pressed by the container cap **20** may be recessed from an upper side to a lower side of the scut combining projection **13**.

(118) Also, the pressing contact part **243** may be formed on the wall part **25** of the container cap **20** in correspondence to the flexibility applying groove **233**.

(119) The pressing contact part **243** may be an inclined surface that is inclined upward to press a portion in which the flexibility applying groove **13** is formed in the scut combining projection **13** by the descent of the container cap **20** when the container cap **20** is combined with the container inlet **12**.

(120) As described above, the pressing contact part **241**, **242**, **243**, and **215** may include various structures capable of pressing the portion in which the flexibility applying groove **231**, **232**, **233**, and **234** is formed as a portion pressing and contacting the flexibility applying groove at a position corresponding to the flexibility applying groove **231**, **232**, **233**, and **234** formed in the container inlet **12**.

(121) Specifically, the pressing contact part **241**, **242**, **243**, and **215** may be formed as an inclined surface in consideration that the container cap **20** rotates and/or is descended with respect to the container inlet **12** and the pressing contact part presses the portion in which the flexibility applying groove **231**, **232**, **233**, and **234** is formed by using a force applied by the descent.

(122) However, the pressing contact part **241**, **242**, **243**, and **215** may have various structures such as a projection in addition to the inclined surface, which are capable of pressing the portion in which the flexibility applying groove **231**, **232**, **233**, and **234** is formed by the force applied by the

descent.

Fourth Embodiment

(123) The present invention may include various embodiments of intentionally increasing the portion closely contacting each other when the container cap **20** is combined with the container inlet **12** to improve the sealing force of the container.

(124) As illustrated in FIGS. **9** and **10**A, the container according to a fourth embodiment of the present invention may have a configuration similar to that in FIGS. **7** and **8**A.

(125) Specifically, the container cap **20** may further include an auxiliary inner ring **190** between the inner ring **100** and the upper end of the container inlet **12** in comparison with the configuration in FIGS. **7** and **8**A.

(126) The auxiliary inner ring **190** may protrude downward from the container cap **20**, particularly the bottom surface of the body part **26**, between the inner ring **100** and the upper end of the container inlet **12**.

(127) Here, the auxiliary inner ring **190** may have a vertical length less than that of the inner ring **100** to prevent interference with the inner ring **100**.

(128) Also, the auxiliary inner ring **190** may form a surface inclined toward the upper end of the container inlet **12**, and the upper end of the container inlet **12** may also form an inclined surface at a portion contacting the auxiliary inner ring **190** as the pressing contact part **241**.

(129) In the container inlet **12**, an inner circumferential protruding part **121** contacting the outer circumferential surface of the inner ring **100** may be formed as described in the first embodiment.

(130) The container having the above-described structure may increase the contact portion between the container cap **20** and the container inlet **12** to improve the sealing force of the container.

(131) As illustrated in FIG. **10**B, as a modified example of FIG. **10**A, the container according to the fourth embodiment of the present invention may form an inclined surface as the pressing contact part **241** for pressing a portion at which the flexibility applying groove **234** is formed (a portion of the inner ring **100** and the auxiliary inner ring **190** are integrated instead of including the auxiliary inner ring **190**).

(132) In the embodiment in FIGS. **10**A and **10**B, the flexibility applying groove **234** or the recessed groove **220** may be formed by an inner upper end **222** and an outer upper end **221** as illustrated in FIG. **3**, and the inner upper end **222** and the outer upper end **221** may have the same height or different heights.

(133) Particularly, the inner upper end **222** may have a height less than that of the outer upper end **221** in FIGS. **10**A and **10**B.

(134) As a modified example of FIG. **10**A, the container according to the fourth embodiment of the present invention may include the flexibility applying groove **234** formed adjacent to the outer circumferential surface of the upper end of the container inlet **12** as illustrated in FIG. **10**C.

(135) Here, the container cap **20** may form an inclined surface **215** as the pressing contact part **215** to press the portion in which the flexibility applying groove **234** is formed.

(136) In FIG. **10**C, the outer upper end may have a height less than that of the inner upper end **222**.

(137) Also, as illustrated in FIG. **10**D, as a modified example of FIG. **10**B, the container according to the fourth embodiment of the present invention may include a projection **244***a* formed on the container cap **20** as the pressing contact part for pressing the portion in which the flexibility applying groove **234** is formed.

(138) In order to improve the sealing force of the container, the contact portion between the container cap **20** and the upper end of the container inlet **12** may be relatively increased. Particularly, the plurality of contact portions may be formed along a path from the outside to the inside of the container instead of being connected to each other.

(139) As a first example illustrated in FIG. **11**A, an auxiliary inner ring **190** closely contacting the upper end of the container inlet **12** may be formed on the container cap **20** in addition to the inner ring **100** and the inner circumferential protruding part **121** contacting the outer circumferential

surface of the inner ring **100** of the first embodiment.
(140) The auxiliary inner ring **190** may protrude downward from the container cap **20**, particularly the bottom surface of the body part **26**, between the inner ring **100** and the upper end of the container inlet **12**.
(141) Here, the auxiliary inner ring **190** may have a vertical length less than that of the inner ring **100** to prevent interference with the inner ring **100**.
(142) Also, the auxiliary inner ring **190** may contact the upper end of the container inlet **12** when the container cap **20** is combined with the container inlet **12**.
(143) To this end, the upper end of the container inlet **12** may have a curved cross-section, and an inner circumferential auxiliary protruding part **122** formed as the inner circumferential surface of the upper end of the container inlet **12** protrudes toward the inner circumferential surface of the auxiliary inner ring **190** may be formed.
(144) As a second example illustrated in FIG. **11**B, at least one surface of surfaces of the auxiliary inner ring **190** and the upper end of the container inlet **12**, which contact each other, may form an inclined surface **180** and **241***a* in a structure illustrated in FIG. **11***a*.
(145) In the first and second examples, the auxiliary inner ring **190** may be disposed between the upper end of the container inlet **12** and the wall part **25** instead of being disposed between the upper end of the container inlet **12** and the inner ring **100**, and a corresponding component may be symmetrically formed.
(146) As a third example illustrated in FIG. **1**C, the flexibility applying groove **231** may be additionally formed in the structure of FIG. **11**B.
(147) Here, an auxiliary projection **122** as in FIG. **11**A may be formed on the inner circumferential surface of the container inlet **12**.
(148) As a fourth example illustrated in FIG. **11**D, the flexibility applying groove **231** may be additionally formed in the structure of FIG. **11**A.
(149) As a fifth example illustrated in FIG. **11**E, a portion from the upper end of the container inlet **12** to the inner circumferential protruding part **121** in the structure of FIG. **11**D may be inclinedly formed.
(150) Specifically, in the container inlet **12**, the inner circumferential surface may be inclined from the upper end to the inner circumferential protruding part **121** in a direction in which the internal diameter is decreased.
(151) Due to the above-described structure, the outer circumferential surface of the auxiliary ring **190** may closely contact a portion between the upper end of the container inlet **12** and the inner circumferential protruding part **121** when the container cap **20** is combined with the container inlet **12** or when the container cap **20** is descended to the container inlet **12**.
Fifth Embodiment
(152) The present invention may include various embodiments of intentionally increasing the portion closely contacting each other when the container cap **20** is combined with the container inlet **12** to improve the sealing force of the container.
(153) Particularly, when the contact portion in which the upper end of the container inlet **12** contacts the container cap **20** is improved, the sealing force of the container may be improved.
(154) As illustrated in FIGS. **12** to **15**, in the container according to the fourth embodiment of the present invention, a recessed groove **220** may be formed between and by an inner upper end **222** and an outer upper end **221** of the container inlet **12**, and an inner inclined surface **241** and an outer inclined surface **242** respectively contacting an inner portion of the inner upper end **222** and an outer portion of the outer upper end **221** may be formed in the container cap **20**.
(155) Specifically, the recessed groove **220** may be formed at a center of the upper end of the container inlet **12** by the inner upper end **222** and the outer upper end **221**.
(156) Here, the inner portion of the inner upper end **222** and the outer portion of the outer upper end **221** may each have a curved surface shape to respectively closely contact the inner inclined

surface **241** and the outer inclined surface **242**.
(157) Also, sidewalls of the recessed groove **220** may be inclined upward so that upper ends of the inner upper end **222** and the outer upper end **221** are deformed in a direction in which a width of the recessed groove is decreased, i.e., the inner upper end **222** and the outer upper end **221** are contracted toward each other.
(158) In other words, the inner upper end **222** and the outer upper end **221** may have a 'V'-shape.
(159) The container cap **20** has the inner inclined surface **241** and the outer inclined surface **242**, which respectively contact an inner portion of the inner upper end **222** and an outer portion of the outer upper end **221**.
(160) The inner inclined surface **241** and the outer inclined surface **242** may have various structures to respectively contact the inner portion of the inner upper end **222** and the outer portion of the outer upper end **221** as a portion formed in the container cap **20**.
(161) For example, as illustrated in FIGS. **12** to **15**, the inner inclined surface **241** may be formed as a portion of the inner ring **100**.
(162) Also, the inner inclined surface **241** may be formed as a portion of an auxiliary inner ring **190** when the auxiliary inner ring **190** is provided.
(163) In the embodiments of the present invention in addition to the fifth embodiment, all of the screw-type combining structure and the snap-type combining structure (e.g., the one-piece and two-piece one touch cap and the undercut cap structure) may be applied to the container cap **20** and the container inlet **12**.
(164) As illustrated in FIGS. **14** and **15**, the container according to the embodiments including the fifth embodiment of the present invention may adopt the container cap in which the body part **26** is rotated around a portion of the wall part **25** by using a hinge.
(165) Specifically, in the container cap **20**, a portion of the wall part **25** may be cut in the circumferential direction by a cut part **170** formed on the wall part **25** as illustrated in FIGS. **14** and **15**. Here, a portion of the wall part **25**, which is not cut, may form a hinge portion **172** disposed at the right side in FIG. **15**.
(166) The reference numeral **171** that is not described indicates a handle installed to easily separate the cut part **170** from the wall part **25**.
(167) The structure in FIGS. **12** to **15** according to an embodiment may be variously deformed such that, e.g., components corresponding to each other of the container cap **20** and the container inlet **12** may be exchanged.
(168) Specifically, as illustrated in FIGS. **16** and **17**, in the container cap **20**, an inner contact ring **190** and an outer contact ring **191** may be formed by forming an opposed recessed groove **192** so that at least a portion of the upper end of the container inlet **12** is inserted therebetween.
(169) The inner contact ring **190** and the outer contact ring **191** may have various configurations as components formed by forming the opposed recessed groove **192** so that at least a portion of the upper end of the container inlet **12** is inserted therebetween.
(170) For example, each of the inner contact ring **190** and the outer contact ring **191** may extend downward from the bottom surface of the body part **26**.
(171) Here, a portion contacting the upper end of the container inlet **12** of each of the inner contact ring **190** and the outer contact ring **191** may have a curved surface shape.
(172) Also, the sidewalls of the opposed recessed groove **192** may be inclined upward so that lower ends of the inner contact ring **190** and the outer contact ring **191** are deformed in a direction in which a width of the opposed recessed groove **192** is increased, i.e., the inner contact ring **190** and the outer contact ring **191** are spaced apart from each other.
(173) In other words, the inner contact ring **190** and the outer contact ring **191** may have a reverse 'V'-shape.
(174) The upper end of the container inlet **12** may have a sharp shape to be easily inserted to the opposed recessed groove **192** formed by the inner contact ring **190** and the outer contact ring **191**.

(175) Also, the upper end of the container inlet **12** may form inclined surfaces **193** and **194** extending inward and outward from an uppermost end so as to be easily inserted to the opposed recessed groove **192**.
(176) The container in FIG. **16** includes the cut part **170** described above as a modified example of the container in FIG. **15**.
(177) Embodiments, particularly the first and second embodiments, may be applied to the fifth embodiment of the present invention except for conflicted portion (the inner circumferential protruding part **121** in FIG. **3** and the structure in FIG. **4**B or **5**B).
Sixth Embodiment
(178) Referring to the above-described embodiments, as a unit for increasing the sealing force of the container, the contact portion in which the container cap **20** contacts the container inlet **12** may be increased, and particularly the contact portion between the upper end of the container inlet **12** and the container cap **20** may be relatively increased.
(179) Here, the plurality of contact portions may be formed along the path from the outside to the inside of the container instead of being connected to each other.
(180) Particularly, the plurality of contact portions may be formed by structural deformation of the container inlet **12** and the container cap **20** and realized by forming the inclined surfaces having various angles and structures and the flexibility applying groove.
(181) Also, the plurality of contact portions may be deformed in structure by exchanging the structures of the container inlet **12** and the container cap **20**.
(182) Hereinafter, various deformation of the container inlet **12** for forming the plurality of contact portions along the path from the outside to the inside of the container will be described.
(183) As illustrated in FIG. **18**A, the container inlet **12** may be formed such that an inner upper end **222** and an outer upper end **221** are formed by using a recessed groove **220** as a center in the upper end thereof.
(184) Here, as the recessed groove is formed adjacent to the inner side or the outer side, one of the inner upper end **222** and the outer upper end **221** may have a width greater than that of the other so as to be easily deformed when one of the inner upper end **222** and the outer upper end **221** contacts the container cap **20**.
(185) Also, the inner upper end **222** and the outer upper end **221** may have the same height or different heights.
(186) FIG. **18***a* illustrates a case when the inner upper end **222** has a width less than that of the outer upper end **221**.
(187) Also, the recessed groove **220** may have a width that is gradually increased in a direction toward the upper side.
(188) FIG. **18**B is a modified example of the container inlet **12** in FIG. **18**A.
(189) The container inlet **12** in FIG. **18**B may be formed such that the inner upper end **222** has a height less than that of the outer upper end **221**.
(190) Furthermore, a minute ring projection **229** may be formed on the inner circumferential surface to increase a contact portion with the container cap **20**.
(191) FIG. **18**C is a modified example of the container inlet **12** in FIG. **18**A.
(192) The container inlet **12** in FIG. **18**C may be formed such that a central protruding upper end **225** protruding upward from the recessed groove **220** is additionally formed.
(193) Particularly, the central protruding upper end **225** may have a height greater than that of each of the inner upper end **222** and the outer upper end **221**, and the recessed groove **220** may include two divided recessed grooves **220***a* and **220***b*.
(194) Here, the container cap **20** combined with the container inlet **12** may include a ring-shaped groove to which the central protruding upper end **225** is inserted.
(195) FIG. **18**D is a modified example of the container inlet **12** in FIG. **18**A.
(196) The container inlet **12** in FIG. **18**D may be formed such that an inner upper end **222** is higher

than an outer upper end **221** and has a width less than that of the outer upper end **221**, and a stepped portion **226** smaller than each of the inner upper end **222** and the outer upper end **221** is formed.

(197) FIG. **18**E is a modified example of the container inlet **12** in FIG. **18**A.

(198) The container inlet **12** in FIG. **18**E may be formed such that an outer upper end **221** has a width less than that of an inner upper end **222** as an opposite case of FIG. **18***a*.

(199) FIGS. **18**A and **18**D illustrate a structure in which the inner upper end **222** or the outer upper end **221**, which has a relatively small width, has a blocking structure deformed by pressing of the container cap **20** or filling of hot contents, and the container inlet **12** may have a whole or a portion of the structures in FIGS. **18**E, **18**F, **18**G, **21**A, **21**B, **21**C, **26**A, and **26**B in addition to the structures in FIGS. **8**A and **8**B of the third embodiment.

(200) That is, as illustrated in FIGS. **18**D and **18**F, the flexibility applying groove **233** may be formed in the outer circumferential surface, particularly the scut combining projection **13**, of the container inlet **12**.

(201) Here, the flexibility applying groove **233** pressed by the container cap **20** may be recessed from the upper side to the lower side of the scut combining projection **13**.

(202) Here, the flexibility applying groove **233** may be relatively formed by a groove formation projection ring **237** extending upward.

(203) As illustrated in FIGS. **18***g* and **18***h*, the flexibility applying groove may be formed in the outer circumferential surface or the inner circumferential surface between the scut combining projection **13** and the upper end of the container inlet **12**.

(204) That is, as illustrated in FIGS. **18**C and **18**G, the flexibility applying groove **232** may be formed in the outer circumferential surface of the container inlet **12**.

(205) Here, a ring-shaped flexibility applying projection **230** may be formed on the outer circumferential surface of the container inlet **12** to form the flexibility applying groove **232** pressed by the container cap **20**, and the flexibility applying groove **232** may be recessed from the upper side to the lower side of the flexibility applying projection **230**.

(206) Here, the flexibility applying groove **232** may be relatively formed by a groove formation projection ring **238** extending upward.

(207) For another example, as illustrated in FIG. **18**H, a flexibility applying groove **235** may be formed in the inner circumferential surface of the container inlet **12**.

(208) Here, a ring-shaped flexibility applying projection **250** may be formed on the inner circumferential surface of the container inlet **12** to form the flexibility applying groove **250** pressed by the container cap **20**, and the flexibility applying groove **232** may be recessed from the upper side to the lower side of the flexibility applying projection **250**.

(209) Here, the flexibility applying groove **235** may be relatively formed by a groove formation projection ring **239** extending upward.

(210) The container cap **20** includes a structure such as the inclined surface or the inner ring for pressing the groove formation projection ring **239**.

(211) Hereinafter, various deformation of the container cap **20** for forming the plurality of contact portions along the path from the outside to the inside of the container will be described in addition to the container inlet **12**.

(212) The container cap **20** in FIG. **19**A may have the structure illustrated in FIG. **5**C or **8**B.

(213) The container cap **20** in FIG. **19**B, as a modified example of FIG. **19**A, illustrates a case in which a gap between the contact ring **150** and the inner ring **100** is relatively small.

(214) Also, an end of the contact ring **150** may be lower than that of the inner ring **100**.

(215) Here, the container inlet **12** may have an inclined surface or a projection ring at a portion contacting the contact ring **150**.

(216) In FIG. **19**C, as a modified example of FIG. **19**A, the contact ring **150** may protrude from the inner circumferential surface of the sidewall part **25** instead of the bottoms surface of the body part

26.
(217) Here, the container inlet **12** may have an inclined surface or a projection ring at a portion contacting the contact ring **150**.
(218) FIGS. **20**A to **20**D illustrate examples in which the container cap and the container inlet, which have various structures, are combined with each other.
(219) FIG. **20**A illustrates an example of a structure in which the container cap is combined with the container inlet in FIG. **18***g*. Since the structure of FIG. **20**A is similar to that of FIG. **8**C, a detailed description thereof will be omitted.
(220) FIG. **20**B illustrates a structure in which the container cap having a structure similar to that in FIG. **10**A is combined with the container inlet deformed from the structure of FIG. **18**A. Since FIG. **20**B has a similar structure to that of FIG. **10**A, a detailed description thereof will be omitted.
(221) In the container in FIG. **20**C, by comparing with the structure of the container according to other embodiments, an inner upper end **222**, an outer upper end **221**, and an auxiliary upper end may be formed in the upper end of the container inlet **12**, and an insertion projection ring **199** inserted to a recessed groove formed by the inner upper end **222** and the outer upper end **221** may be formed on the container cap **20**.
(222) Here, as an auxiliary upper end **220***d* having a height less than that of each of the inner upper end **222** and the outer upper end **221** is formed inside the inner upper end **222** of the container inlet **12**, an additional recessed groove **220***c* may be formed together with the inner upper end **222**.
(223) The container in FIG. **20**D is substantially same as or similar to that in FIG. **8**B except for the shape of the contact ring **150**.
(224) The container in FIG. **21**A is characterized in that a plurality of contact portions for blocking external air are formed on a projection formed on the outer circumferential surface of the container inlet **12** such as the scut combining projection **13** and the separation preventing projection **15**.
(225) Specifically, at least one recessed groove **271** and **272** is vertically formed in the projection formed on the outer circumferential surface of the container inlet **12** such as the scut combining projection **13** and the separation preventing projection **15**, and an insertion projection ring **273** inserted to at least one of the at least one recessed groove **271** and **272** may be formed in the sidewall part **25** of the container cap **20**.
(226) As the insertion projection ring **273** is inserted to at least one of the ring-shaped recessed groove **271** and **272** formed in the projection formed on the outer circumferential surface of the container inlet **12** such as the scut combining projection **13** and the separation preventing projection **15**, at least one contact portion may be formed.
(227) In the container of FIG. **21**B, a sealing ring **274** forming a recessed groove **275** defined from the lower side to the upper side may be formed on the inner circumferential surface of the container cap **20**. Here, a pressing portion **276** for pressing the sealing ring **274** when the container cap **20** is combined with the container inlet **12** may be formed on the outer circumferential surface of the container inlet **12**.
(228) The sealing ring **274** may have various configurations such that, e.g., the sealing ring **274** extends downward while being spaced apart from the inner circumferential surface of the sidewall part **25** of the container cap **20**, as a component for forming the recessed groove **275** defined from the lower side to the upper side on the inner circumferential surface of the container cap **20**.
(229) Also, the pressing portion **276** may be formed by an inclined surface, as a component formed on the outer circumferential surface of the container inlet **12** to press the sealing ring **274** (strengthen the sealing force) when the container cap **20** is combined with the container inlet **12**.
(230) In the container in FIG. **21**C, as a modified example of FIG. **21**B, at least one protruding part **278** protruding upward from the projection formed on the outer circumferential surface of the container inlet **12** along the circumferential direction in an integrated manner such as the scut combining projection **13** and the separation preventing projection **15** may be formed, and here, an insertion recessed groove ring **277** to which the protruding part **278** is inserted when the container

cap **20** is combined with the container inlet **12** may be formed in the container cap **20** at a position corresponding to the protruding part **278**.

Seventh Embodiment

(231) The above-described embodiments may have various combinations by combining or replacing each other in a range in which the embodiments are not conflicted.

(232) Also, the container cap may have various structures in addition to the embodiments.

(233) As illustrated in FIGS. **22** to **24**, the container according to a seventh embodiment of the present invention may include the double sidewall parts **25** of the container cap **20** and be combined with the above-described embodiments.

(234) Specifically, the container cap **20** may further include an auxiliary sidewall part **25***a* extending downward from the body part **26** while being spaced apart from the outer circumferential surface of the sidewall part **25** extending downward from the body part **26**.

(235) The auxiliary sidewall part **25***a* may include a scut part **27** combined with the scut combining projection **13** as a portion extending downward from the body part **26** while being spaced apart from the outer circumferential surface of the sidewall part **25** extending downward from the body part **26**.

(236) That is, the auxiliary sidewall part **25***a* may include the scut structure in FIG. **4***b* and the scut structure in FIG. **5**B.

(237) A contact projection ring **430** contacting a contact portion **440** formed on the container inlet **12** when the container cap **20** is combined with the container inlet **12** may be formed on the auxiliary sidewall part **25***a*.

(238) The contact projection ring **430** may have various structures as a component contacting the contact portion **440** formed on the container inlet **12** when the container cap **20** is combined with the container inlet **12**.

(239) For example, the contact projection ring **430** may form a lower end of the auxiliary sidewall part **25***a* and have a cross-sectional thickness that is relatively small to have flexibility.

(240) Furthermore, the contact projection ring **430** may have a sharp end.

(241) The contact portion **440** may be variously formed, e.g., an inclined surface or a projection, as a portion formed on the container inlet **12** to contact the contact projection ring **410** when the container cap **20** is combined with the container inlet **12**.

(242) Particularly, the contact portion **440** may be formed as an inclined surface in the scut combining projection **13**.

(243) A contact projection ring **410** contacting a contact portion **420** formed on the container inlet **12** when the container cap **20** is combined with the container inlet **12** may be formed on the sidewall part **25**.

(244) The contact projection ring **410** may have various structures as a component contacting the contact portion **420** formed on the container inlet **12** when the container cap **20** is combined with the container inlet **12**.

(245) For example, the contact projection ring **410** may form a lower end of the sidewall part **25***a* and have a cross-sectional thickness that is relatively small to have flexibility.

(246) Furthermore, the contact projection ring **410** may have a sharp end.

(247) Also, the contact projection ring **410** may have a cross-sectional thickness that is decreased by a plurality of steps at the lower end of the sidewall part

(248) The contact portion **420** may be variously formed, e.g., an inclined surface or a projection, as a portion formed on the container inlet **12** to contact the contact projection ring **410** when the container cap **20** is combined with the container inlet **12**.

(249) The contact portion **420** contacting the contact projection ring **410** formed on the sidewall part may be formed above the scut combining projection **13**.

(250) As illustrated in FIG. **24**, a protruding ring **234** protruding upward may be formed on the upper end of the container inlet **12**, and an inclined surface **244** or a projection contacting the

protruding ring **234** may be formed in the container cap **20**.
(251) FIG. **25** shows cross-sectional views illustrating examples of various structures such as projection-projection contact or projection-recessed groove contact when the container cap contacts the container inlet.
(252) The structures in FIG. **25** illustrate examples capable of realizing a blocking function as a flexible portion and a flexible portion or a hard portion and a flexible portion contact each other.
(253) FIGS. **26**A and **26**B are partial cross-sectional views illustrating structures of at least one projection ring **451**, **452**, **453**, and **454** formed on the lower end of the sidewall part of the container cap and the container inlet contacting the same in the container according to the present invention.
(254) At least one projection ring **451**, **452**, **453**, and **454** is formed on the lower end of the sidewall part **25** or the auxiliary sidewall part **25***a* and contact a contact portion **461**, **462**, **463**, and **464** formed on the container inlet **12**.
(255) Here, the contact portion **461**, **462**, **463**, and **464** includes an inclined surface or a projection, as a portion contacting the projection ring **451**, **452**, **453**, and **454** when the container cap **20** is combined with the container inlet **12**.
(256) Although the above description merely corresponds to some exemplary embodiments that may be implemented by the present disclosure, as well known, the scope of the present disclosure should not be interpreted as being limited to the above-described embodiments, and all technical spirits having the same basis as that of the above-described technical spirit of the present disclosure are included in the scope of the present disclosure.

Claims

1. A container assembly comprising: a container body containing contents and having a container inlet; and a container cap combined with the container inlet, wherein a plurality of contact portions are formed on at least one of the container cap and the container inlet, and the plurality of contact portions form a closed curve enclosing the container inlet so as to block inflow of external air from outside into the container body, wherein the container cap comprises: a body part in close contact with an upper end of the container inlet; a sidewall part which extends downward from the body part and in which a female screw part that is screw-coupled with a male screw part formed on an outer circumferential surface of the container inlet is formed; and an inner ring protruding from a bottom surface of the body part and inserted into an inner circumferential surface of the container inlet, and wherein the container inlet includes an inner upper end and an outer upper end, each having a curved outer circumferential surface, a recessed groove being formed between the inner upper end and the outer upper end, wherein an inclined surface is formed on the container cap, the inclined surface including a first inclined surface and a second inclined surface, the first inclined surface being in contact with the curved outer circumferential surface of the inner upper end and the second inclined surface being in contact with the curved outer circumferential surface of the outer upper end when the container cap is combined with the container inlet, wherein an inner circumferential protruding part is formed on the inner circumferential surface of the container inlet, and the inner circumferential protruding part protrudes toward the inner ring to contact an outer circumferential surface of the inner ring when the container cap is combined with the container inlet, wherein the inner circumferential protruding part has a curved shape so that a cross-section in the longitudinal direction of the container inlet is in surface-contact with the outer circumferential surface of the inner ring, wherein a middle ring is formed on a bottom surface of the body part of the container cap, the middle ring being inserted into the recessed groove formed between the inner upper end and the outer upper end, the middle ring forming at least one close contact portion with the container inlet when the container cap is combined with the container inlet, a bottom of the middle ring being positioned above and spaced apart from a surface defining a bottom of the recessed groove, creating a gap therebetween, and wherein each of the inner upper end and the

outer upper end has a structure inclined at a portion in which the recessed groove is formed and having elasticity.

2. The container assembly of claim 1, wherein the inner upper end of the container inlet is lower than the outer upper end of the container inlet based on the recessed groove in the upper end of the container inlet.