(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 604 175 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
05.02.2020 Bulletin 2020/06

(51) Int Cl.:
B65D 85/804 *(2006.01)*

(21) Application number: **19188804.9**

(22) Date of filing: **29.07.2019**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA ME
Designated Validation States:
KH MA MD TN

(30) Priority: **02.08.2018 IT 201800007760**

(71) Applicant: **Capitani S.r.l.**
22070 Solbiate (CO) (IT)

(72) Inventor: **CAPITANI, Gionata**
22070 Albiolo (CO) (IT)

(74) Representative: **Parisi, Luigi**
Viale Beatrice d'Este, 20
20122 Milano (IT)

(54) CAPSULE FOR MACHINES FOR PREPARING INFUSED BEVERAGES AND PROCESS FOR MAKING A CAPSULE

(57) A capsule (100) for machines for preparing infused beverages is described, comprising:
a body (2) shaped like a bowl, comprising a side wall (4) extending around an axis (X-X) and a bottom wall (3); said body being made of paper or paper material;
said body (2) being sized so as to contain a predetermined amount of a powdered preparation for preparing an infused beverage;
said capsule (100) being further provided with an annular peripheral edge (18) designed to abut against a bearing surface of an infusion chamber of an infusion assembly when the capsule (100) is inserted into said chamber;
said annular peripheral edge (18) comprising a first annular portion (19) made integrally with said bowl body (2); said first annular portion (19) having a head surface (26) arranged substantially parallel to the axis (X-X) at its radially outer perimeter; and
an annular reinforcing element (20) comprising a second annular portion (21) applied to said first annular portion (19), said second annular portion (21) having a head surface (26) arranged substantially parallel to the axis (X-X) at its radially outer perimeter;
at least one liquid-proofing glue or resin layer applied at least at and covering said head surfaces (26, 27).

A process for making said capsule is also described.

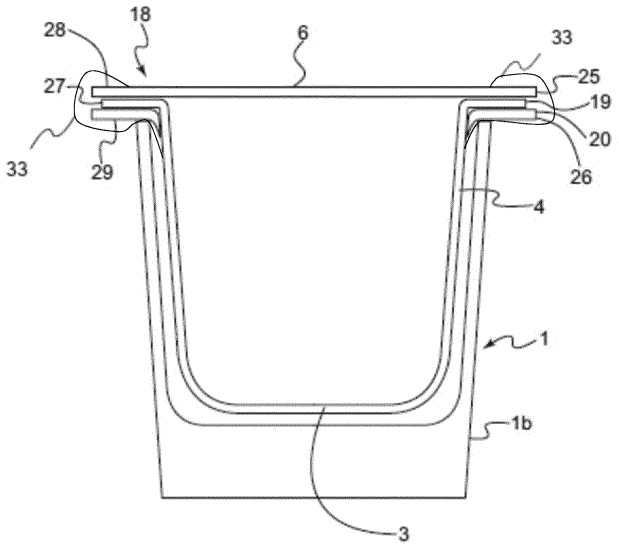

Fig. 1

EP 3 604 175 A1

Description

Field of the invention

[0001] The present invention concerns a capsule containing a powdered preparation for preparing infused beverages, in particular the present invention concerns a capsule of the aforesaid type made of paper material.

Known art

[0002] The capsule, containing the powdered preparation or aromatic essence, is placed or transported inside an infusion chamber of the machine, so that the injection of hot pressurized water into the infusion capsule achieves the extraction of the aromatic essence.

[0003] Capsules for this use are generally made of a bowl-like body formed by a side wall and a bottom wall. The side wall and the bottom wall are arranged so as to form a cavity inside the bowl-like body, the cavity being shaped to contain a predetermined amount of powdered preparation.

[0004] Generally, the bowl-like body further has an annular peripheral edge apt to abut against a bearing surface surrounding an infusion chamber of an infusion assembly when the capsule is inserted into said chamber.

[0005] Usually, these capsules are made of plastic material. In an attempt to solve the problem related to the disposal used plastic capsules, which is widely felt given the enormous number of capsules produced worldwide, capsules obtained from a sheet of paper were suggested.

[0006] However, the Applicant has noted that the paper capsules suggested until now do not always ensure the optimal operation provided by similar plastic capsules. For example, in some cases, sealing problems arose during the closing of the infusion chamber.

[0007] The Applicant believes that the cause of this malfunction is related to the annular peripheral edge, which allows water or infused beverage infiltrations, especially at the head end of the annular peripheral edge, if not made correctly.

[0008] The Applicant has thus identified the need to provide a capsule made of paper material for preparing an infused beverage which allows to eliminate or anyhow considerably reduce the water or infused beverage infiltration problems, especially at the head end of the annular peripheral edge.

Summary of the Invention

[0009] Thus, in its first aspect, the invention concerns a capsule for machines for preparing infused beverages, comprising:

a body shaped like a bowl, comprising a side wall extending around an axis (X-X) and a bottom wall;
the body being made of paper or paper material;
the body being sized so as to contain a predetermined amount of a powdered preparation for preparing an infused beverage;
the capsule being further provided with an annular peripheral edge designed to abut against a bearing surface of an infusion chamber of an infusion assembly when the capsule is inserted into said chamber;
the annular peripheral edge comprising a first annular portion made integrally with the bowl-like body;
the first annular portion having a head surface arranged substantially parallel to the axis at its radially outer perimeter; and
an annular reinforcing element comprising a second annular portion applied to said first annular portion, said second annular portion having a head surface arranged substantially parallel to the axis at its radially outer perimeter;
the capsule further having at least one liquid-proofing glue or resin layer applied at least at and covering said head surfaces.

[0010] In the aforesaid aspect, the present invention can have at least one of the preferred characteristics defined hereunder.

[0011] Preferably, said at least one liquid-proofing glue or resin layer is selected from proofing glues or resins for food use.

[0012] Conveniently, said at least one liquid-proofing glue or resin layer is selected from compostable proofing glues or resins.

[0013] Preferably, said at least one liquid-proofing glue or resin layer is selected from biodegradable proofing glues or resins.

[0014] Conveniently, the annular reinforcing element further comprises an elongate portion extending along a direction parallel to the axis to face towards said side wall; said elongate portion being arranged substantially orthogonal to said second annular portion.

[0015] Conveniently, the annular reinforcing element is made of paper or paper material.

[0016] Preferably, the capsule comprises a lid designed to close the opening, the lid comprises an inner surface facing said opening and comprising a third annular portion designed to be applied at an outer surface of said first annular portion; the lid having a head surface arranged substantially parallel to the axis at the radially outer perimeter of the third annular portion.

[0017] Preferably, said at least one liquid-proofing glue or resin layer is further applied at said head surface of said lid.

[0018] Conveniently, said at least one liquid-proofing glue or resin layer is further applied at at least one portion of an upper surface of said lid and on a surface of the reinforcing element.

[0019] According to a further aspect, the present invention concerns a process for making a capsule for machines for preparing infused beverages according to that which has been previously described.

[0020] The process comprises the steps of:

- cutting a paper material disk to predetermined sizes such as to allow to make at least the bottom wall and the side wall of the capsule;
- deep-drawing said disk to make it adopt a bowl-like shape;
- fitting the annular reinforcing element on the bowl-like body so that the second annular portion abuts against the first annular portion and so that the elongate portion is in contact with the side wall;
- exerting a pressure onto the annular reinforcing element and onto the bowl-like body so that they are put into contact substantially along the entire extension of the annular reinforcing element;
- welding the annular reinforcing element to the bowl-like body;
- inserting a powdered preparation amount in the bowl-like body for preparing the infused beverage;
- sealing, by the lid, the closure of the opening;
- applying a proofing glue or resin layer so that to create a barrier against the liquid passing at at least the head surface of the first annular portion, the head surface of the second annular portion.

[0021] Further characteristics and advantages of the invention will become clearer in the detailed description of some preferred, but not exclusive, embodiments of a capsule made of paper material containing a powdered preparation for preparing infused beverages and its implementation process according to the present invention.

Brief description of the drawings

[0022] Such description will be set forth hereunder with reference to the accompanying drawings, only provided by way of example and thus without limitations, in which:

- figure 1 shows a schematic view of a capsule made of paper material according to the present invention, inserted into an infusion chamber of an infusion assembly;
- figure 2 is a schematic view of a capsule made of paper material according to the present invention, wherein the annular peripheral edge is in exploded view;
- figure 3a is a schematic view of the annular reinforcing element according to the present invention;
- figure 3b is a schematic sectional view of the annular peripheral edge in exploded view; and
- figure 4 shows a schematic view of a capsule made of paper material according to the present invention.

Detailed description of embodiments of the invention

[0023] With reference to figures 1-4, a capsule containing a powdered preparation for preparing infused beverages such as coffee, infusions, herbal teas, etc. according to the present invention, is denoted by the numerical reference 100.

[0024] The capsule 100 is preferably a disposable capsule for preparing infused beverages such as coffee, tea, herbal teas and the like.

[0025] Each capsule 100, containing an aromatic essence in the form of powdered preparation, is placed or transported inside an infusion chamber of the machine so that the injection of hot pressurized water into the capsule 100 achieves the extraction of the aromatic essence. The capsules 100 typically have a bowl-like body 2 provided with a bottom wall 3, a side wall 4 substantially cylindrical or truncated-pyramid shaped, an upper opening 5 arranged at the end opposite the side wall 4 with respect to the bottom wall 3 and a lid 6 generally represented by a film or sealing film. The lid 6 is arranged to seal the upper opening 5.

[0026] The bowl-like body 2 is made of paper or paper material. Paper material not only means the widely used material made of cellulose pulp or wood, but also of other fibers such as cotton, linen, hemp and, of course, recycled paper.

[0027] Preferably, the bowl-like body 2 is made of plant-based parchment containing a low percentage of PLA (polylactic acid).

[0028] The lid 6 is also preferably made of paper or paper material and is shaped like a discoid element.

[0029] Preferably, the bowl-like body 2 is made of plant-based parchment containing a low percentage of PLA (polylactic acid).

[0030] The capsule 100 is further provided with an annular peripheral edge 18 apt to abut against a bearing surface surrounding an infusion chamber of an infusion assembly when the capsule is inserted into the same chamber.

[0031] The annular peripheral edge 18 comprises a first annular portion 19 made integrally with the bowl-like body 2 and an annular reinforcing element 20.

[0032] The first annular portion 19 is arranged so that to surround the upper opening 5 and extends radially for at least 1 mm, preferably at least 2 mm.

[0033] In any case, the first annular portion 19 extends for a maximum of 10 mm. In a preferred embodiment, the annular reinforcing element 20 has a second annular portion 21 designed to be applied to the first annular portion 19 and an elongate portion 22 extending along a direction substantially parallel to the axis X-X so that to face the side wall 4 of the bowl-like body 2.

[0034] The annular reinforcing element 20 is also made of paper or paper material.

[0035] Preferably, the annular reinforcing element 20 is also made of cardboard.

[0036] In the embodiment shown in the figures, the elongate portion 22 is arranged substantially orthogonal to the second annular portion.

[0037] In the embodiment shown in the figures, the elongate portion 22 extends without interruptions from the second annular portion 21.

[0038] Preferably, the elongate portion 22 is linked to

the second annular portion 21 such as not to create areas of structural weakening.

[0039] The shape of the annular reinforcing element 20, and especially the reciprocal positioning of the second annular portion 21 and the elongate portion 22 and their positioning with respect to the bowl-like body 2, is achieved during the production process of the capsule 100.

[0040] In particular, the shape of the annular reinforcing element 20, and especially the reciprocal positioning of the second annular portion 21 and of the elongate portion 22 and their positioning with respect to the bowl-like body 2, is achieved by bending through a pressure applied onto the annular reinforcing element 20.

[0041] The elongate portion 22 has a smaller extension than the second annular portion 21.

[0042] Preferably, the elongate portion 22 extends for at least 0.5 mm. Preferably, the elongate portion 22 extends for a maximum of 7 mm, still more preferably for a maximum of 5 mm.

[0043] The elongate portion 22 extends from the second annular portion 21 such as to be in contact, preferably along its entire extension, with the side wall 4 of the bowl-like body 2.

[0044] The elongate portion 22 is thus preferably glued for at least a length of its extension with the side wall 4 of the bowl-like body 2.

[0045] The elongate portion 22 has a section that tapers away from the second annular portion 21.

[0046] The annular reinforcing element 20 has a thickness s between 0.1 and 5 mm in section.

[0047] In the embodiment shown in the figures, the thickness of the section of the second annular portion 21 is substantially constant and between 0.3 and 5 mm, whereas the thickness of the elongate portion 22 is decreasing away from the second annular portion and less than 5 mm.

[0048] In any case, the material of the annular reinforcing element 20, as that anyway of the bowl-like body 2 and lid 6, is a compostable and biodegradable material for food.

[0049] The lid 6 is designed to close the opening 5 and, for this object, has a discoid shape provided with an inner surface facing the opening 5, in the embodiment shown in the figures.

[0050] The inner surface in turn comprises a circular portion 24 and a third annular portion 23 arranged radially outside of and concentrically to the circular portion 24.

[0051] The third annular portion 23 is designed to be applied at an outer surface 24 of the first annular portion 19. In this regard, the third annular portion 23 preferably has a radial extension substantially equal to that of the first annular portion 19.

[0052] The lid 6 further has, at its radially outer end, a head surface 25 arranged substantially parallel and concentrically to the axis X-X.

[0053] The first 19 and second 21 annular portions also comprise head surfaces 26, 27 arranged substantially parallel to the axis X-X.

[0054] The head surfaces 26, 27 of the first 19 and second 21 annular portions can be covered by a liquid-proofing glue or resin layer 33; this way, during the infusion, the water or infused beverage is prevented from penetrating the edge 18 made of a paper material, making it swell and compromising the operation of the machine and the quality of the infused beverage.

[0055] The layer 33 in the figure, depicted by greater sizes with respect to reality, is only for greater clarity.

[0056] The glue or resin layer 33 can not only be arranged at the head surface of the first and second food portions, but also at the head surface of the lid 5 and can extend on the upper surface 28 of the lid 5 or on the lower surface 29 of the reinforcing element 20.

[0057] The proofing glue or resin layer 30 can extend continuously from the outer surface of the third annular portion 2, on the head surface of the annular portion, on the head surfaces 26, 27 and on the lower surface of the first annular portion 19, such as to create a film or liquid-proofing barrier.

[0058] Preferably, a continuous barrier or film is created.

[0059] The resin or glue layer 33 can extend from the side wall 4. The resin or glue layer 33 can further extend between the annular reinforcing element 20 and the annular portion 19, as well as between the lid 6 and the first annular portion 19.

[0060] In other words, it can form a multilayer structure in which it is interposed between the lid 6, the annular element 20 and the first annular portion 19.

[0061] In this case, the structure of the capsule 100 is particularly stiffened in favor of, for example, the extraction thereof from the infusion chamber after the infusion.

[0062] The resin or glue layer 30 is selected from proofing glues or resins for food use.

[0063] Preferably, the resin or glue layer 30 is selected from compostable proofing glues or resins.

[0064] Preferably, the resin or glue layer 30 is selected from proofing glues or resins for food use.

[0065] The material of the annular reinforcing element 20, as that of the bowl-like body 2 and lid 6, is a material for food.

[0066] Preferably, the material of the annular reinforcing element 20, as that of the bowl-like body 2 and lid 6, is a compostable material.

[0067] Preferably, the material of the annular reinforcing element 20, as that of the bowl-like body 2 and lid 6, is a biodegradable material.

[0068] Preferably, the material of the annular reinforcing element 20, as that of the bowl-like body 2 and lid 6, is a biodegradable material.

[0069] The process for making the above-described capsule 100 of paper material generally starts with the step of cutting a paper material disk to predetermined sizes.

[0070] The disk will have a radius such as to preferably allow the implementation of the bottom wall 3 and of the

side wall 4 of the capsule 100.

[0071] Preferably, the disk has a radius such as to allow the implementation of the bottom wall 3, the side wall 4 and also the annular peripheral edge of the capsule.

[0072] In other words, the disk without cutting tolerances has a radius equal to at least the radius of the bottom wall 3, the extension, substantially in vertical direction, of the side wall 4 and the radial extension of the first annular portion 19.

[0073] The paper material disk, and especially the layer of material from which it is cut, is generally resin-coated paper for food.

[0074] Preferably, a resin-coated paper for compostable foods.

[0075] Still more preferably, a resin-coated paper for biodegradable foods.

[0076] The disk cut to the appropriate size is thus subjected to a deep-drawing process for making the bowl-like body.

[0077] In other words, the deep-drawing process allows to bring the capsule in its almost final configuration.

[0078] In this configuration, the capsule has the bottom wall 3, the side wall 4 extending substantially vertically with respect to the bottom wall 3, and the first annular portion 19 which extends radially and substantially orthogonally with respect to the side wall 4.

[0079] At this point, an annular reinforcing element is fitted on the side wall 4.

[0080] The annular reinforcing element 20, as previously described, has a second annular portion 21 applied to the first annular portion 19 and an elongate portion 22 extending along a direction substantially parallel to the axis X-X such as to face the side wall 4.

[0081] The annular reinforcing element 20 is fitted on the bowl-like body 2.

[0082] At this point, a pressure is exerted on the annular reinforcing element 20 and/or on the bowl-like body 2 so that the second annular portion 21 abuts against the first annular portion 19 and so that, by bending of the elongate portion 22, the latter is in contact with the side wall 4 along its entire extension.

[0083] This is followed by the welding of the annular reinforcing element 20 to the bowl-like body 2 and especially of the second annular portion 21 to the first annular portion 19 and of the elongate portion 22 to the side wall 4.

[0084] The welding can be of the heat type.

[0085] A dose of powdered preparation for preparing the infused beverage is thus inserted into the bowl-like body 2, especially into the inner cavity of the bowl-like body 2. The inner cavity of the bowl-like body 2 is defined by the side wall 4 and by the bottom wall 3.

[0086] Thus, the lid 6 is placed to close the opening 5, the lid 5 can generally be represented by a film or sealing film to close and seal the opening 5.

[0087] Thus, a proofing glue or resin layer is applied such as to create a barrier against the liquids passing at and covering the head surface 26 of the first annular portion 19, the head surface of the second annular portion 21 and the head surface of the lid 5.

[0088] The liquid-proofing glue or resin layer is selected from proofing glues or resins for food use.

[0089] Preferably, the liquid-proofing glue or resin layer is selected from compostable proofing glues or resins.

[0090] Preferably, the liquid-proofing glue or resin layer is selected from biodegradable proofing glues or resins.

[0091] The liquid-proofing glue or resin layer is preferably applied such as to extend at the at least one portion of an upper surface 28 of the lid 5 and of a surface 29 of the reinforcing element 20.

[0092] Preferably, the proofing glue or resin layer is applied such as to extend on the upper surface 28 of the lid in radial direction starting from the head surface for at least 2 mm, preferably at least 5 mm, to a maximum of 1 cm.

[0093] Preferably, the proofing glue or resin layer is applied such as to extend on the entire surface 29 of the reinforcing element 20, on the surface 32 of the elongate portion until reaching the side wall of the bowl-like body 2.

[0094] The glue or resin layer thus creates a barrier against water which does not allow infiltrations at the annular reinforcing element 20 during the infusion of the beverage.

[0095] Different changes may be made to the embodiments described in detail, anyhow remaining within the protection scope of the invention, defined by the following claims.

Claims

1. Capsule (100) for machines for preparing infused beverages, comprising:

a body (2) shaped like a bowl, comprising a side wall (4) extending around an axis (X-X) and a bottom wall (3); said body being made of paper or paper material;

said body (2) being sized so as to contain a predetermined amount of a powdered preparation for preparing an infused beverage;

said capsule (100) being further provided with an annular peripheral edge (18) designed to abut against a bearing surface of an infusion chamber of an infusion assembly when the capsule (100) is inserted into said chamber;

said annular peripheral edge (18) comprising a first annular portion (19) made integrally with said bowl body (2); said first annular portion (19) having a head surface (27) arranged substantially parallel to the axis (X-X) at its radially outer perimeter; and

an annular reinforcing element (20) comprising a second annular portion (21) applied to said first annular portion (19), said second annular portion (21) having a head surface (26) arranged

substantially parallel to the axis (X-X) at its radially outer perimeter;
at least one liquid-proofing glue or resin layer (33) applied at and covering said head surfaces (26, 27).

2. Capsule (100) according to claim 1, **characterized in that** said at least one liquid-proofing glue or resin layer (33) is selected from liquid-proofing glues or resins for food use.

3. Capsule (100) according to claim 1, **characterized in that** said at least one liquid-proofing glue or resin layer (33) is selected from compostable liquid-proofing glues or resins.

4. Capsule (100) according to claim 1, **characterized in that** said at least one liquid-proofing glue or resin layer (33) is selected from biodegradable liquid-proofing glues or resins.

5. Capsule (100) according to claim 1, **characterized in that** said annular reinforcing element (20) further comprises an elongate portion (22) extending along a direction parallel to the axis (X-X) to face towards said side wall (4); said elongate portion (22) being arranged substantially orthogonal to said second annular portion (21).

6. Capsule according to any of the preceding claims, **characterized in that** said annular reinforcing element (20) is made of paper or paper material.

7. Capsule according to any one of the preceding claims, **characterized by** comprising a lid (6) designed to close said opening (5), said lid (6) comprising a third annular portion (23) designed to be applied at an outer surface of said first annular portion (19); said lid (6) having a head surface (25) arranged substantially parallel to the axis (X-X) at its radially outer perimeter of the third annular portion (23).

8. Capsule according to claim 7, **characterized in that** said at least one liquid-proofing glue or resin layer is further applied at said head surface (25) of said lid (6).

9. Capsule according to claim 7, **characterized in that** said at least one liquid-proofing glue or resin layer (33) is further applied at at least one portion of an upper surface (28) of said lid (5) and on a surface (29) of the reinforcing element (20).

10. Process for making a capsule (100) for machines for preparing infused beverages according to any one of claims 1 to 9, comprising the steps of:

- cutting a paper material disk to such predetermined size so as to allow to make at least the bottom wall (3) and the side wall (4) of the capsule (100);
- deep-drawing said disk to make it adopt a bowl-like shape;
- fitting the annular reinforcing element (20) on the bowl-like body (2)
- exerting a pressure onto the annular reinforcing element (20) so that the second annular portion (21) abuts against the first annular portion (19) and the elongate portion (22), once the latter is bent, comes into contact with the side wall (4);
- welding the annular reinforcing element (20) on the bowl-like body (2);
- inserting a powdered preparation amount in the bowl-like body (2) for preparing the infused beverage;
- sealing, by the lid (6), the closure of the opening (5);
- applying at least one liquid-proofing glue or resin layer (33) so as to create a barrier against the liquid passing at and covering at least the head surface (27) of the first annular portion (19), the head surface (26) of the second annular portion (21).

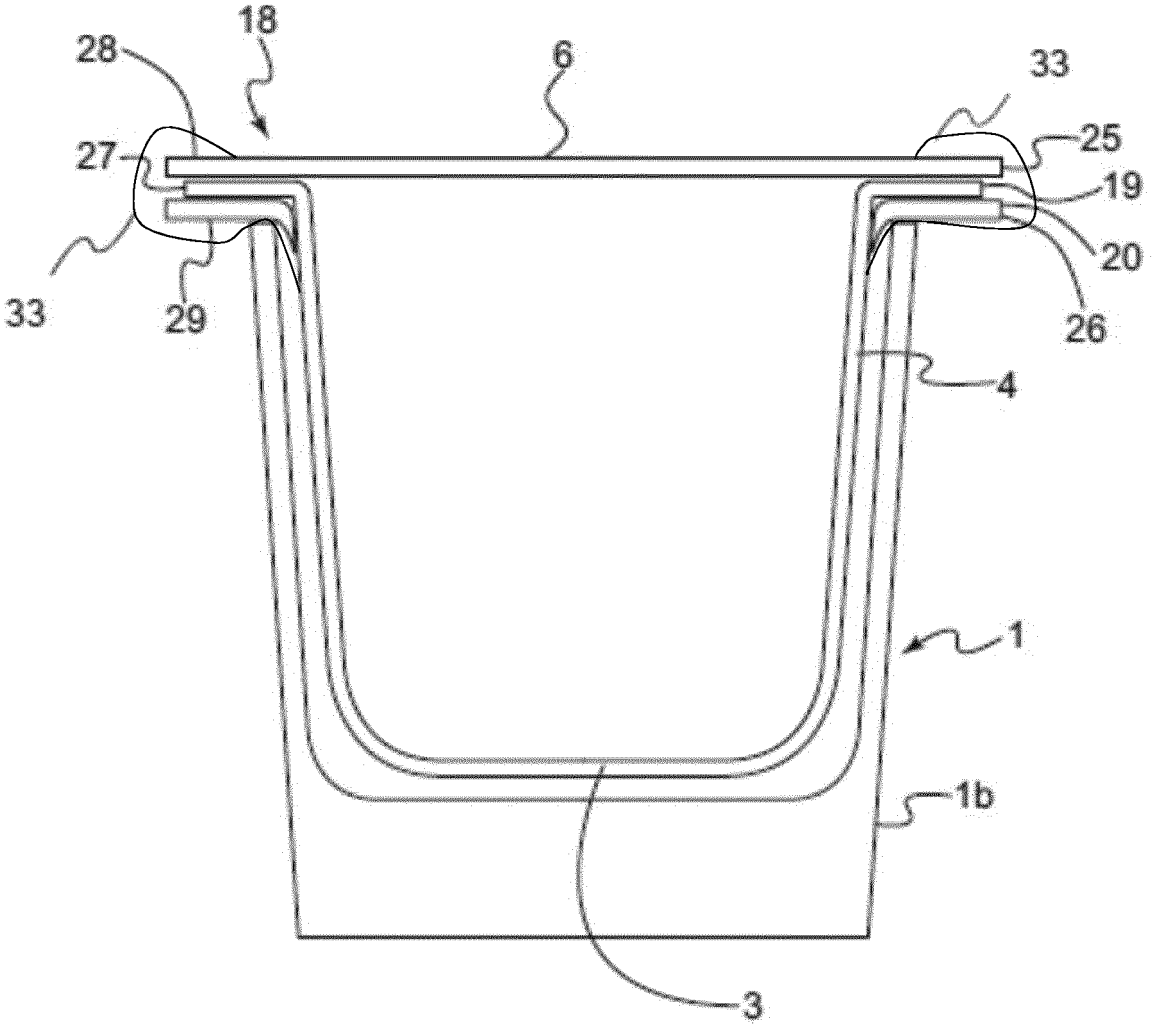

Fig. 1

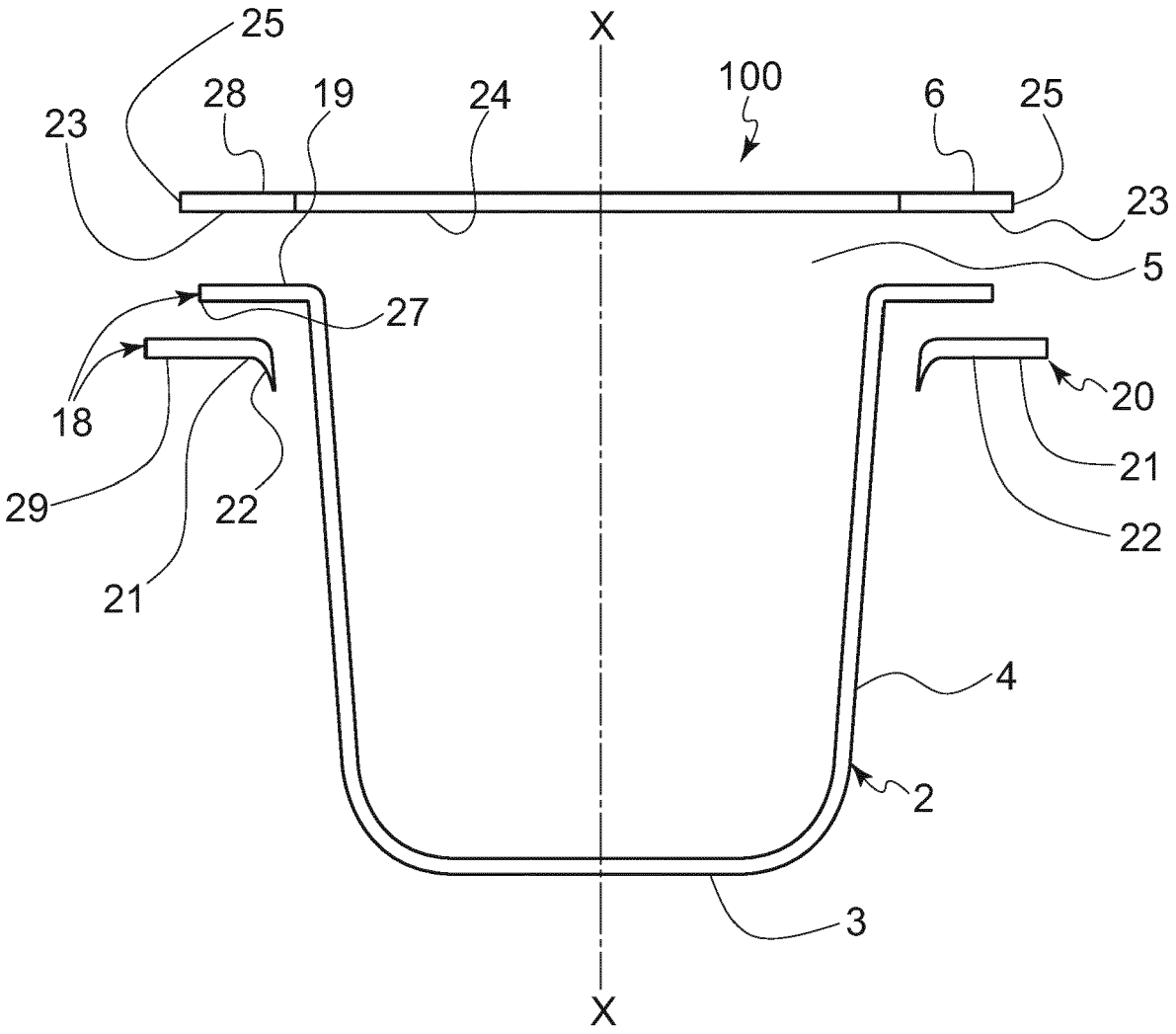

Fig. 2

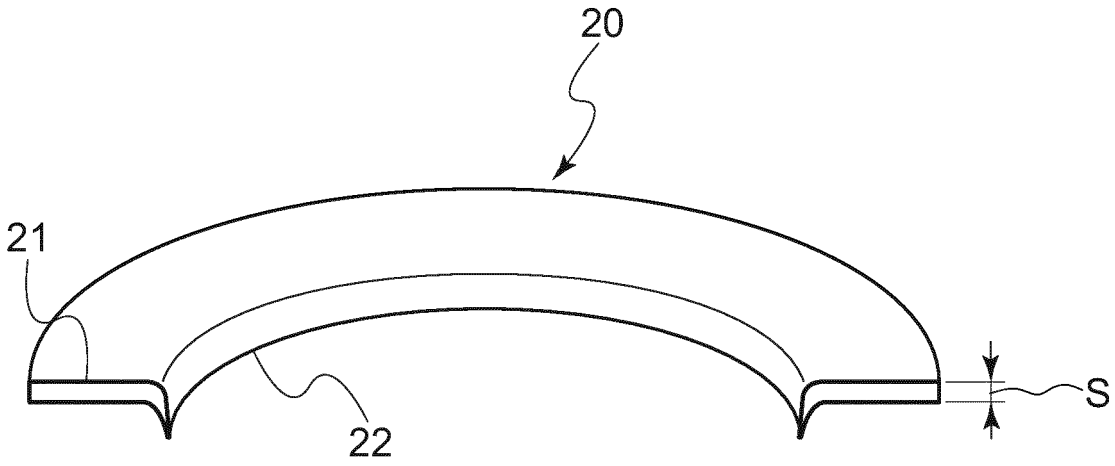

Fig. 3a

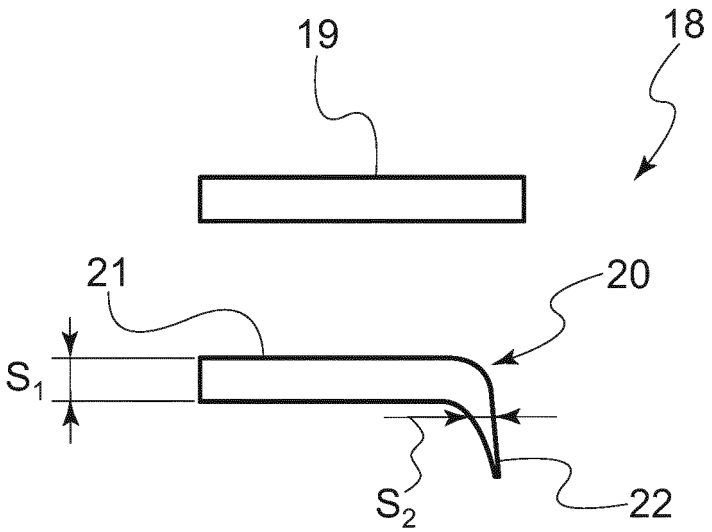

Fig. 3b

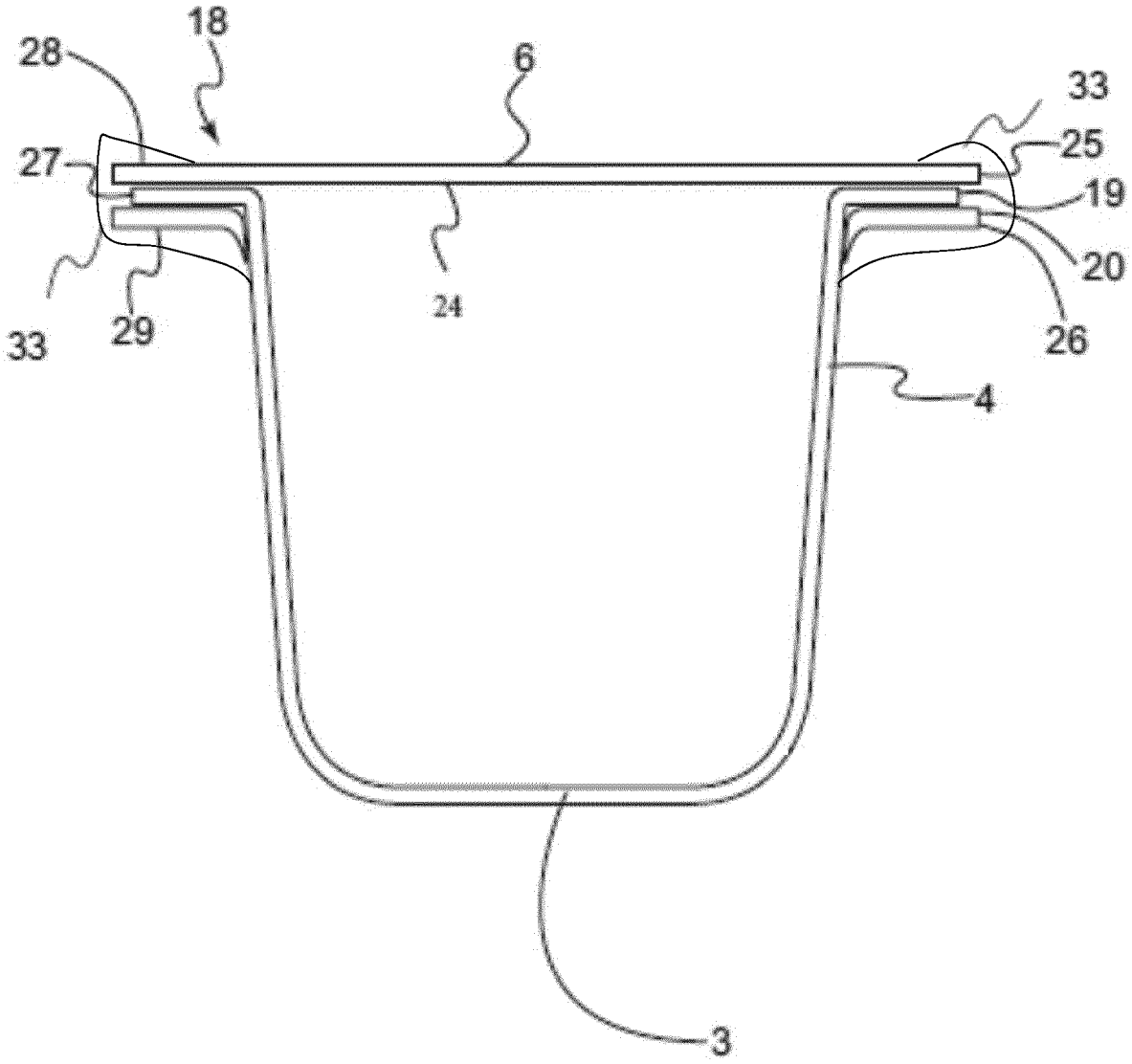

Fig. 4

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 19 18 8804

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	EP 2 573 008 A1 (CAPITANI SRL [IT]) 27 March 2013 (2013-03-27) * paragraphs [0014] - [0047]; figures 1-5 *	1-10	INV. B65D85/804
A	US 2011/247975 A1 (RAPPARINI GINO [IT]) 13 October 2011 (2011-10-13) * paragraphs [0053] - [0076], [0085]; figures 1-11 *	1-10	
A	WO 2010/006936 A1 (NESTEC SA [CH]; KAESER THOMAS [CH] ET AL.) 21 January 2010 (2010-01-21) * abstract; figures 1-7 *	1-10	
A	AU 2015 238 913 A1 (NESTEC SA) 12 November 2015 (2015-11-12) * paragraph [0203]; figure 7 *	1-10	
A	DE 20 2015 100812 U1 (HUBER CHRISTOPH [CH]) 27 May 2016 (2016-05-27) * paragraphs [0048] - [0049]; figure 1 *	1-10	TECHNICAL FIELDS SEARCHED (IPC)
A	DE 692 05 232 T2 (NESTLE SA [CH]) 14 March 1996 (1996-03-14) * paragraphs [0054], [0060], [0078]; figures 10,15 *	5	B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	3 September 2019	Leijten, René

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 19 18 8804

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

03-09-2019

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 2573008 A1	27-03-2013	EP 2573008 A1	27-03-2013
		ES 2553774 T3	11-12-2015
		US 2014083873 A1	27-03-2014
US 2011247975 A1	13-10-2011	CA 2795507 A1	13-10-2011
		CA 2795508 A1	13-10-2011
		EP 2555997 A2	13-02-2013
		EP 2555998 A2	13-02-2013
		RU 2012143358 A	20-05-2014
		RU 2012143359 A	20-05-2014
		US 2011247975 A1	13-10-2011
		WO 2011124988 A2	13-10-2011
		WO 2011124989 A2	13-10-2011
WO 2010006936 A1	21-01-2010	AT 529248 T	15-11-2011
		AU 2009272891 A1	21-01-2010
		BR PI0915757 A2	03-11-2015
		CA 2730053 A1	21-01-2010
		CN 102099177 A	15-06-2011
		DK 2318199 T3	01-09-2014
		EP 2151313 A1	10-02-2010
		EP 2318199 A1	11-05-2011
		ES 2377030 T3	21-03-2012
		ES 2515196 T3	29-10-2014
		HK 1138540 A1	27-07-2012
		IL 209659 A	24-09-2015
		JP 5426673 B2	26-02-2014
		JP 2011527920 A	10-11-2011
		KR 20110043586 A	27-04-2011
		PT 2151313 E	02-02-2012
		PT 2318199 E	10-09-2014
		RU 2011105396 A	20-08-2012
		US 2011259204 A1	27-10-2011
		US 2015225148 A1	13-08-2015
		WO 2010006936 A1	21-01-2010
		ZA 201101172 B	25-07-2012
AU 2015238913 A1	12-11-2015	NONE	
DE 202015100812 U1	27-05-2016	NONE	
DE 69205232 T2	14-03-1996	AT 128692 T	15-10-1995
		AU 649844 B2	02-06-1994
		BR 9202610 A	16-03-1993
		CA 2072300 A1	06-01-1993
		DE 69205232 D1	09-11-1995

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 19 18 8804

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

03-09-2019

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		DE 69205232 T2	14-03-1996
		DK 0524464 T3	12-02-1996
		EP 0524464 A1	27-01-1993
		ES 2078598 T3	16-12-1995
		FI 922897 A	06-01-1993
		JP 3150202 B2	26-03-2001
		JP H05199938 A	10-08-1993
		KR 930002201 A	22-02-1993
		NO 303536 B1	27-07-1998
		NZ 243239 A	27-06-1994
		ZA 9204490 B	31-03-1993

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82