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(54) CAPSULE FOR MACHINES FOR PREPARING INFUSED BEVERAGES

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CAPSULE POUR MACHINES POUR PRÉPARER UNE BOISSON INFUSÉE

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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. Examples of known capsules are disclosed in the documents DE 692 05 232 T, US 2011/247975 A and EP 2 573 008 A1, the latter disclosing a capsule according to the preamble of claim 1.

[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 connected to the annular peripheral edge, which allows water or infused beverage infiltrations between the annular edge itself and the side wall of the capsule, if not made correctly.

[0008] The infiltration problems can also be amplified whenever the capsule and the infusion chamber are improperly centered.

[0009] The Applicant has thus identified the need to provide a capsule made of paper material for preparing an infused beverage that allows to eliminate or anyhow considerably reduce the infiltration problems between the side wall and the annular peripheral edge thereof.

Summary of the Invention

[0010] Thus, in its first aspect, the invention concerns a capsule for machines for preparing infused beverages

according to claim 1.

[0011] In the aforesaid aspect, the present invention can have at least one of the preferred characteristics defined hereunder.

5 **[0012]** Preferably, the elongate portion is arranged substantially orthogonal to said second annular portion.

[0013] Conveniently, the elongate portion extends for at least 0.5 mm.

10 **[0014]** Preferably, the elongate portion extends for 7 mm at the most.

[0015] Conveniently, the elongate portion is applied to the side wall.

[0016] Preferably, the elongate portion extends from the second annular portion in contact with the side wall.

15 **[0017]** Preferably, the capsule comprises a lid designed to close the opening, the lid comprising an inner surface comprising a third annular portion designed to be applied at an outer surface of the first annular portion.

[0018] Advantageously, the capsule comprises a liquid-proofing glue or resin layer applied at the head surfaces of the first and second annular portions.

[0019] 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 according to the present invention.

Brief description of the drawings

[0020] Such description will be set forth hereunder with reference to the accompanying drawings, provided only by way of example and thus without limitations, in which:

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- 35 - 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;
- 40 - 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;
- 45 - figure 3a is a schematic view of the annular reinforcing element according to the present invention;
- figure 3b is a schematic and sectional view of the annular peripheral edge in exploded view.

Detailed description of embodiments of the invention

50 **[0021]** With reference to figures 1-3b, a capsule containing a powdered preparation for preparing infused beverages such as coffee, infusions, herbal tea, etc. according to the present invention, is denoted by the numerical reference 100.

55 **[0022]** The capsule 100 is preferably a disposable capsule for preparing infused beverages such as coffee, tea, herbal teas and the like.

[0023] Each capsule 100, containing an aromatic es-

sence 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.

[0024] 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 or plants, but also of other fibers such as cotton, linen, hemp and, obviously, recycled paper.

[0025] Preferably, the bowl-like body 2 is made of plant-based parchment containing a low percentage of PLA (polylactic acid).

[0026] The lid 6 is also preferably made of paper or paper material and is shaped like a discoid element.

[0027] Preferably, the lid 6 is made of plant-based parchment containing a low percentage of PLA (polylactic acid).

[0028] 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.

[0029] 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.

[0030] The first annular portion 19 is arranged so as to surround the upper opening 5 and extends radially for at least 1 mm, preferably at least 2 mm.

[0031] 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 as to face towards the side wall 4 of the bowl-like body 2.

[0032] The annular reinforcing element 20 is also made of paper or paper material.

[0033] Preferably, the annular reinforcing element 20 is also made of cardboard.

[0034] In the embodiment shown in the figures, the elongate portion 22 is arranged substantially orthogonal to the second annular portion 21.

[0035] In the embodiment shown in the figures, the elongate portion 22 extends without interruptions from the second annular portion 21.

[0036] Preferably, the elongate portion 22 is linked to the second annular portion 21 such as not to create areas of structural weakening.

[0037] 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.

[0038] 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.

[0039] The elongate portion 22 has a smaller extension than the second annular portion 21. Preferably, the elongate portion 22 extends for at least 0.5 mm. Preferably, the elongate portion 22 extends for 10 mm at the most.

[0040] 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.

[0041] 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.

[0042] The elongate portion 22 has a section tapering away from the second annular portion 21. The annular reinforcing element 20 has a thickness s between 1 and 5 mm in section.

[0043] According to the invention, the thickness of the section of the second annular portion 21 is substantially constant and between 0.3 and 5mm, whereas the thickness of the elongate portion 22 is decreasing away from the second annular portion and less than 5.

[0044] In any case, the material of the annular reinforcing element 20, as that of the bowl-like body 2 and lid 6, is a material for food.

[0045] The material of the annular reinforcing element is for example cardboard.

[0046] 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.

[0047] 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.

[0048] 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.

[0049] The lid 6 further has, at its radially outer end, a head surface 25 arranged substantially parallel and concentrically to the axis X-X.

[0050] The first 19 and second 21 annular portions also comprise head surfaces 26,27 arranged substantially parallel to the axis X-X.

[0051] 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; this way, during the infusion, the water or infused beverage is prevented from penetrating the edge 18 made of a paper material, thus from making it swell and compromising the operation of the machine

and the quality of the infused beverage.

[0052] The glue or resin layer, not shown in the figure, is selected from proofing glues or resins for food use.

[0053] Preferably, the resin or glue layer is selected from compostable proofing glues or resins. The glue or resin layer 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 6 and can extend on the upper surface 28 of the lid 6 or on the lower surface 29 of the reinforcing element 20. The resin or glue layer 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. The material of the annular reinforcing element 20, as that of the bowl-like body 2 and lid 6, is a material for food.

[0054] Preferably, the material of the annular reinforcing element 20, as that of the bowl-like body 2 and lid 6, is a compostable material.

[0055] Different changes can 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) integrally made with said bowl body (2); and

an annular reinforcing element (20) comprising a second annular portion (21) applied to said first annular portion (19) **characterized by** said annular reinforcing element (20) comprising elongate portion (22) that extends along a direction parallel to the axis (X-X) to face towards said side wall (4);

said elongate portion has a section tapering along the direction away from said second annular portion (21); the thickness of the section of the second annular portion (21) is substantially constant and between 0.3 and 5mm, whereas the thickness of the elongate portion (22) is decreasing away from the second annular

portion and is less than 5mm.

2. Capsule (100) according to claim 1, **characterized in that** said elongate portion (22) is arranged substantially orthogonal to said second annular portion (21).
3. Capsule (100) according to claim 1, **characterized in that** said elongate portion (22) extends for at least 0.5 mm.
4. Capsule (100) according to claim 1, **characterized in that** said elongate portion (22) extends for 7 mm at the most.
5. Capsule (100) according to claim 1, **characterized in that** said elongate portion (22) is applied to said side wall (4).
6. Capsule (100) according to claim 1, **characterized in that** said elongate portion (22) extends from said second annular portion (21) in contact with said side wall (4).
7. Capsule according to any one of the preceding claims, **characterized in that** said annular reinforcing element (20) is made of paper or paper material.
8. Capsule according to any one of the preceding claims, **characterized by** comprising a lid designed to close said opening, said lid comprising an inner surface facing said opening and comprising a third annular portion (23) designed to be applied at an outer surface of said first annular portion (19).
9. Capsule according to any one of the preceding claims, **characterized by** a liquid-proofing glue or resin layer applied at head surfaces (26, 27) of at least said first and second annular portions (19, 21).

Patentansprüche

1. Kapsel (100) für Maschinen zur Zubereitung von infundierten Getränken, aufweisend:

einen Körper (2) in Form einer Schale, aufweisend eine Seitenwand (4), die sich um eine Achse (X-X) erstreckt, und eine Bodenwand (3); wobei der Körper aus Papier oder Papiermaterial gefertigt ist;

wobei der Körper (2) so bemessen ist, dass er eine vorbestimmte Menge einer pulverförmigen Zubereitung zur Herstellung eines infundierten Getränks enthält;

wobei die Kapsel (100) ferner mit einer ringförmigen Umfangskante (18) versehen ist, die so ausgelegt ist, dass sie an einer Auflagefläche

- einer Infusionskammer einer Infusionsanordnung anliegt, wenn die Kapsel (100) in die Kammer eingeführt wird;
wobei die ringförmige Umfangskante (18) einen ersten ringförmigen Abschnitt (19) aufweist, der einstückig mit dem Schalenkörper (2) hergestellt ist; und ein ringförmiges Verstärkungselement (20), aufweisend einen zweiten ringförmigen Abschnitt (21), der an dem ersten ringförmigen Abschnitt (19) angebracht ist, **dadurch gekennzeichnet, dass** das ringförmige Verstärkungselement (20) einen längliche Abschnitt (22) aufweist, der sich entlang einer Richtung parallel zur Achse (X-X) erstreckt, um der Seitenwand (4) zugewandt zu sein,;
wobei der längliche Abschnitt einen Abschnitt aufweist, der sich entlang der Richtung weg von dem zweiten ringförmigen Abschnitt (21) verjüngt; wobei die Dicke des Abschnitts des zweiten ringförmigen Abschnitts (21) im Wesentlichen konstant ist und zwischen 0,3 und 5 mm liegt, während die Dicke des länglichen Abschnitts (22) von dem zweiten ringförmigen Abschnitt weg abnimmt und weniger als 5 mm beträgt.
2. Kapsel (100) nach Anspruch 1, **dadurch gekennzeichnet, dass** der längliche Abschnitt (22) im Wesentlichen orthogonal zu dem zweiten ringförmigen Abschnitt (21) angeordnet ist.
 3. Kapsel (100) nach Anspruch 1, **dadurch gekennzeichnet, dass** sich der längliche Abschnitt (22) über mindestens 0,5 mm erstreckt.
 4. Kapsel (100) nach Anspruch 1, **dadurch gekennzeichnet, dass** sich der längliche Abschnitt (22) höchstens 7 mm erstreckt.
 5. Kapsel (100) nach Anspruch 1, **dadurch gekennzeichnet, dass** der längliche Abschnitt (22) an der Seitenwand (4) angebracht ist.
 6. Kapsel (100) nach Anspruch 1, **dadurch gekennzeichnet, dass** sich der längliche Abschnitt (22) von dem zweiten ringförmigen Abschnitt (21) in Kontakt mit der Seitenwand (4) erstreckt.
 7. Kapsel nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** das ringförmige Verstärkungselement (20) aus Papier oder Papiermaterial gefertigt ist.
 8. Kapsel nach einem der vorhergehenden Ansprüche, **gekennzeichnet durch, dass** sie einen Deckel zum Verschließen der Öffnung aufweist, wobei der Deckel eine der Öffnung zugewandte Innenfläche aufweist und einen dritten ringförmigen Abschnitt

(23) aufweist, der zum Aufbringen auf eine Außenfläche des ersten ringförmigen Abschnitts (19) ausgelegt ist.

9. Kapsel nach einem der vorhergehenden Ansprüche, **gekennzeichnet durch** eine flüssigkeitsbeständige Klebstoff- oder Harzschicht, die auf Kopfoberflächen (26, 27) von mindestens dem ersten und zweiten ringförmigen Abschnitt (19, 21) aufgebracht ist.

Revendications

1. Capsule (100) pour machines pour préparer des boissons infusées, comprenant :

un corps (2) en forme de bol, comprenant une paroi latérale (4) s'étendant autour d'un axe (X-X) et une paroi inférieure (3) ; ledit corps étant réalisé en papier ou en matériau de papier ; ledit corps (2) étant dimensionné de manière à contenir une quantité prédéterminée d'une préparation en poudre pour préparer une boisson infusée ;

ladite capsule (100) étant en outre pourvue d'un bord périphérique annulaire (18) conçu pour venir en butée contre une surface d'appui d'une chambre d'infusion d'un ensemble d'infusion lorsque la capsule (100) est insérée dans ladite chambre ;

ledit bord périphérique annulaire (18) comprenant une première partie annulaire (19) réalisée d'un seul tenant avec ledit corps de bol (2) ; et un élément de renfort annulaire (20) comprenant une deuxième partie annulaire (21) appliquée sur ladite première partie annulaire (19), **caractérisée par** ledit élément de renfort annulaire (20) comprenant une partie allongée (22) qui s'étend le long d'une direction parallèle à l'axe (X-X) pour faire face à ladite paroi latérale (4) ;

ladite partie allongée présente une partie se rétrécissant dans la direction opposée à ladite deuxième partie annulaire (21) ; l'épaisseur de la partie de la deuxième partie annulaire (21) est sensiblement constante et se situe entre 0,3 et 5 mm, alors que l'épaisseur de la partie allongée (22) diminue dans la direction opposée de la deuxième partie annulaire et est inférieure à 5 mm.

2. Capsule (100) selon la revendication 1, **caractérisée en ce que** ladite partie allongée (22) est agencée sensiblement orthogonale à ladite deuxième partie annulaire (21).
3. Capsule (100) selon la revendication 1, **caractérisée en ce que** ladite partie allongée (22) s'étend sur

au moins 0,5 mm.

4. Capsule (100) selon la revendication 1, **caractérisée en ce que** ladite partie allongée (22) s'étend au plus sur 7 mm. 5

5. Capsule (100) selon la revendication 1, **caractérisée en ce que** ladite partie allongée (22) est appliquée sur ladite paroi latérale (4). 10

6. Capsule (100) selon la revendication 1, **caractérisée en ce que** ladite partie allongée (22) s'étend depuis ladite deuxième partie annulaire (21) en contact avec ladite paroi latérale (4). 15

7. Capsule selon l'une quelconque des revendications précédentes, **caractérisée en ce que** ledit élément de renfort annulaire (20) est réalisé en papier ou en matériau de papier. 20

8. Capsule selon l'une quelconque des revendications précédentes, **caractérisée en ce qu'elle** comprend un couvercle conçu pour fermer ladite ouverture, ledit couvercle comprenant une surface intérieure faisant face à ladite ouverture et comprenant une troisième partie annulaire (23) conçue pour être appliquée au niveau d'une surface extérieure de ladite première partie annulaire (19). 25

9. Capsule selon l'une quelconque des revendications précédentes, **caractérisée par** une colle étanche aux liquides ou une couche de résine appliquée au niveau de surfaces de tête (26, 27) d'au moins lesdites première et deuxième parties annulaires (19, 21). 30
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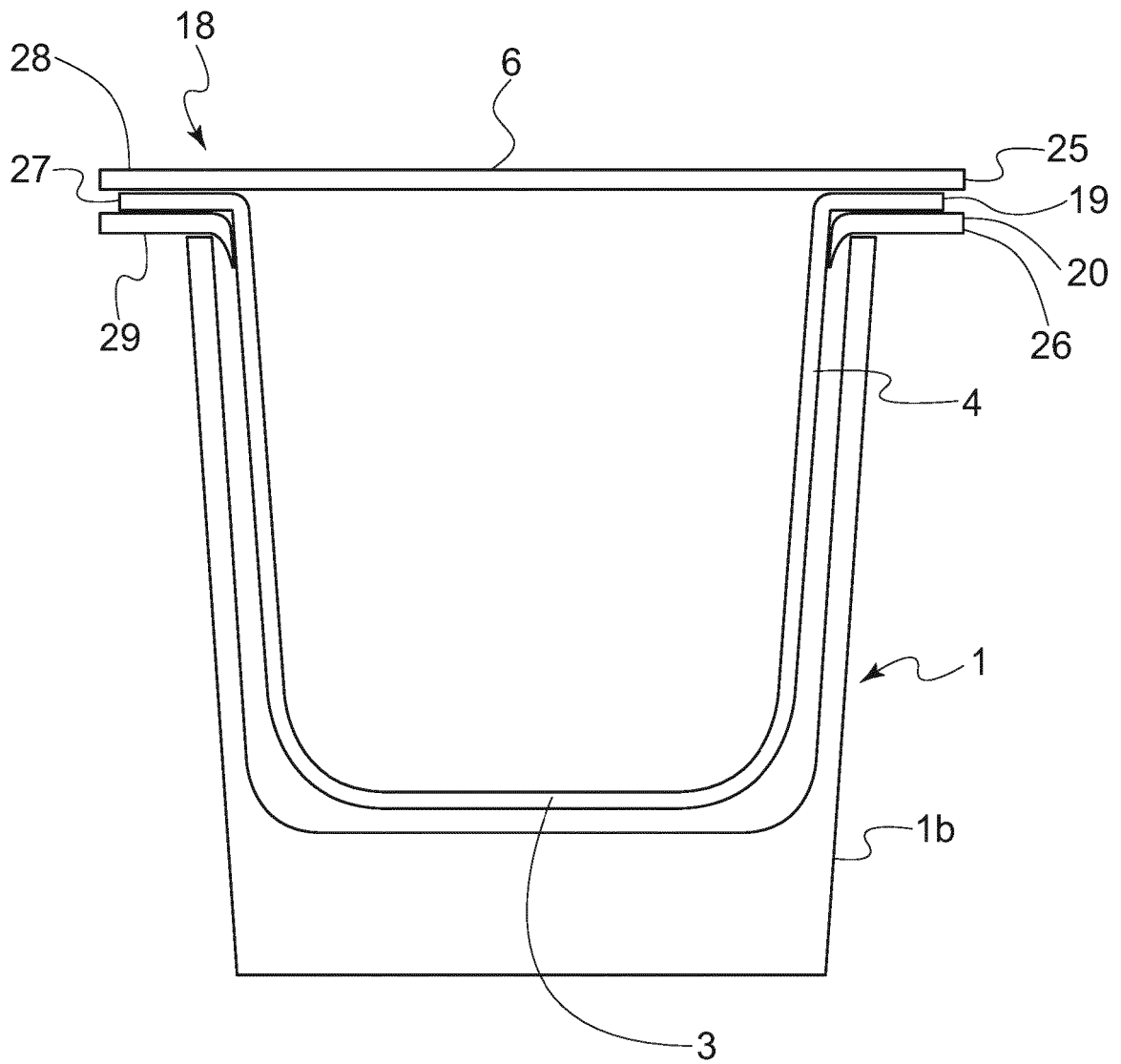


Fig. 1

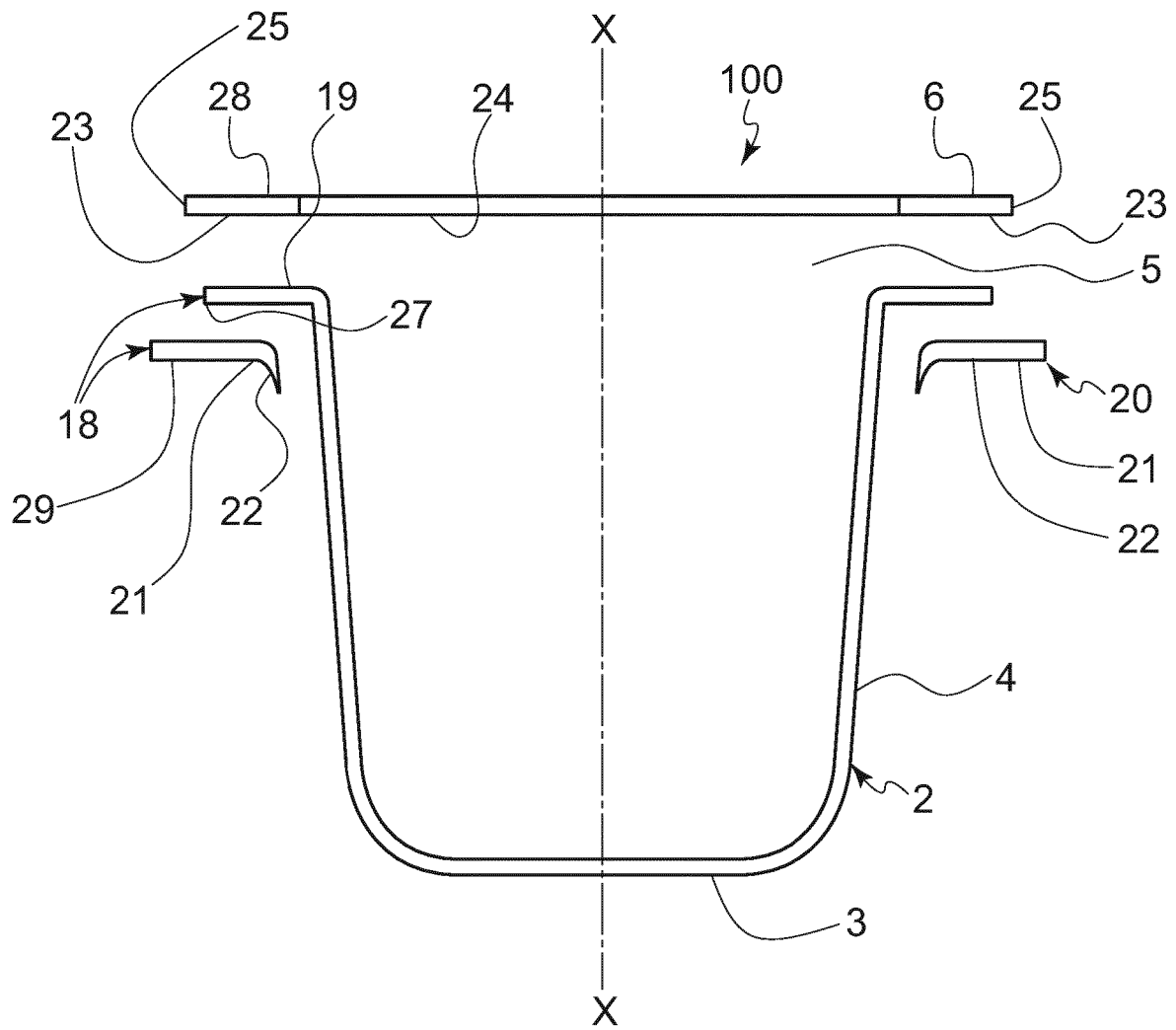


Fig. 2

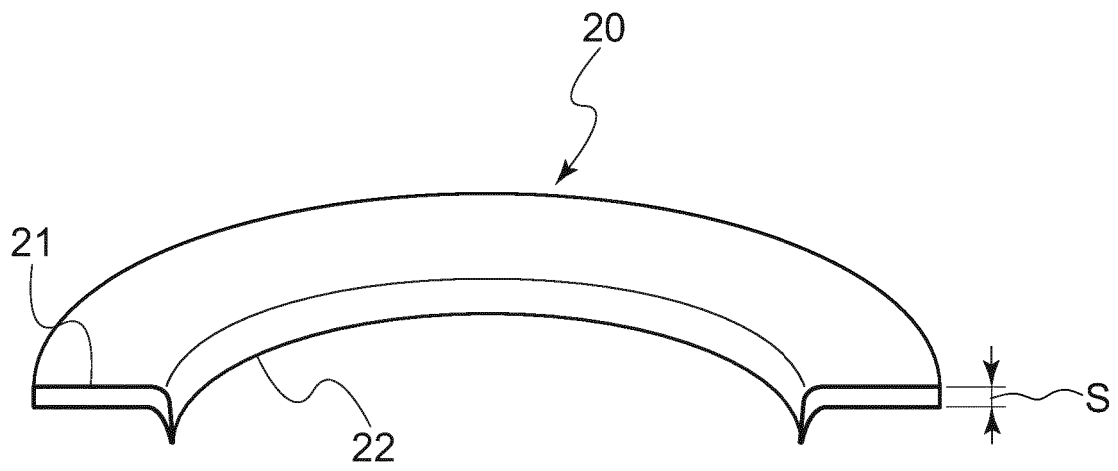


Fig. 3a

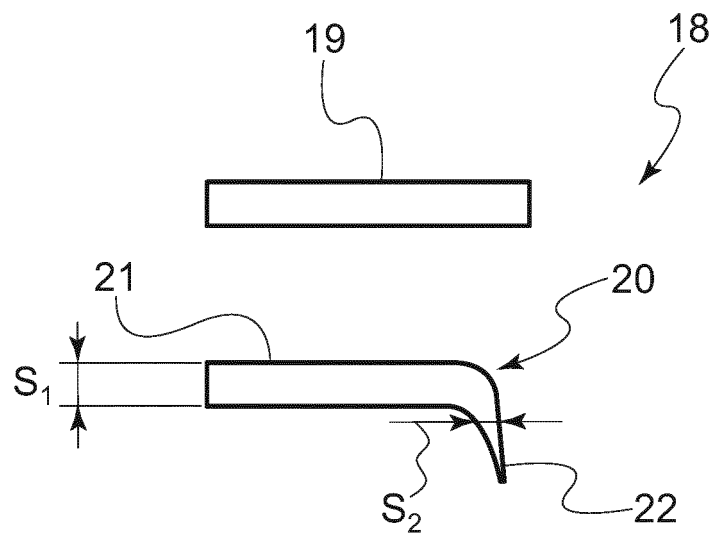


Fig. 3b

REFERENCES CITED IN THE DESCRIPTION

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