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(54) **DEVICE FOR REGULATING THE TEMPERATURE OF BEVERAGES IN A BOTTLE**

VORRICHTUNG ZUR REGELUNG DER GETRÄNKETEMPERATUR IN EINER FLASCHE

DISPOSITIF DE RÉGULATION DE LA TEMPÉRATURE DE BOISSONS DANS UNE BOUTEILLE

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(73) Proprietor: **CN Continental S.p.A.**
15057 Tortona (IT)

(72) Inventors:
• **BISIO, Pierluigi**
15057 Tortona (IT)
• **BISIO, Patrizia**
15057 Tortona (IT)

• **BISIO, Giovanni Carmelo**
15057 Tortona (IT)
• **LOLA, Danilo**
15057 Tortona (IT)

(74) Representative: **Garavelli, Paolo**
A.BRE.MAR. S.R.L.
Consulenza in Proprietà Industriale
Via Servais 27
10146 Torino (IT)

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Description

[0001] The present invention refers to a device for regulating the temperature of beverages in a bottle equipped with means adapted to keep said temperature, cold or hot, by using cold or hot, soft or rigid accumulators, which can be used many times.

[0002] The device of the invention is suitable to regulate the temperature of said bottles in a range included between 0°C and 55°C, depending on the composition of said cold or hot accumulators.

[0003] The prior art baskets for ice have mainly two inconveniences.

[0004] A first inconvenience consists in that the bottle to be kept cool is actually immersed in water and this means that, when it is extracted to pour the beverage, it is wetted and therefore drops on the table and wets the hands of the person taking it.

[0005] A second inconvenience consists in that ice, and therefore water in which the bottle is immersed, is at the equilibrium water-ice temperature of 0°C, and therefore the system which uses ice is not useful to keep temperatures far from 0°C. In practice, there will be temperatures of a beverage by some degrees above zero degrees centigrade, said temperatures being too high for some distilled beverages which are drunk much colder, and too low for some wines, if it is desirable to drink them at ambient temperature or only a few degrees below ambient temperature. In some cases, it can be desirable to keep the beverage hot, and this is impossible if ice is used.

[0006] Documents US-A1-2016/262979, US-A1-2015/166244, WO-A1-2017/072638, US-A1-2011/259894, DE-U1-85 26 612, WO-A1-2004/089175 and WO-A1-2018/097183 disclose devices according to the preamble of Claim 1.

[0007] Object of the present invention is providing a device adapted to keep beverages in a bottle at a desired temperature, said temperature being at will lower or higher than zero degrees centigrade.

[0008] The above and other objects and advantages of the invention, as will result from the following description, are obtained with a device for regulating the temperature of beverages in a bottle, as claimed in Claim 1, which is of the type comprising a bucket in which said bottle must be inserted, means being provided adapted to regulate said temperature, said means adapted to regulate the temperature comprising cold or hot accumulators, said cold or hot accumulators comprising phase-change substances.

[0009] In practice, the containers, which are usable many times, are extracted from the bucket and inserted in a freezer or in a heater, as the case may be.

[0010] If the object is keeping a wine fresh at the temperature of some degree above zero degrees centigrade, the containers can advantageously be filled with water and frozen in a freezer. In this case, once withdrawn from the freezer, they will be at a temperature near

-20°C, but they will quickly rise to the temperature of 0°C, namely at the phase change temperature, at which they will remain much longer.

[0011] Anyway, substances which can be easily found on the market can be used, currently used to keep fresh the foodstuff in the thermal bags.

[0012] If the object is keeping distilled beverages at temperatures rather lower than zero degrees centigrade (for example vodka or limoncello), then a phase-change substance can be advantageously used, which has a transition at the temperature of about -16°C.

[0013] If the object is keeping a beverage hot, for example sakè, then a phase-change substance can advantageously be used, which has a transition at the temperature of about 58÷60°C.

[0014] In practice, if the beverage has to be kept below ambient temperature, a phase-change substance must be used which has a transition temperature by some degrees lower than the temperature at which the beverage must be kept. If the beverage must be kept above ambient temperature, a phase-change substance must be used which has a transition temperature by some degrees higher than the temperature at which the beverage must be kept.

[0015] Preferred embodiments and non-trivial variations of the present invention are the subject matter of the dependent claims.

[0016] It will be immediately obvious that numerous variations and modifications (for example related to shape, sizes, arrangements and parts with equivalent functionality) can be made to what is described, without departing from the scope of the invention as defined in the enclosed claims.

[0017] The present invention will be better described by some preferred embodiments thereof, provided as a non-limiting example, with reference to the enclosed drawings, in which:

- Figure 1 shows an example embodiment of a device for regulating the temperature of a beverage in a bottle according to the present invention;
- Figure 2 shows an exploded view of the components of the device of the invention; and
- Figures 3(a, b) show construction details of the device of the invention.

[0018] With reference to Figure 1, (1) designates a device for regulating the temperature of a beverage in a bottle (2), according to the present invention.

[0019] According to a preferred embodiment of the invention (shown in an exploded view in Figure 2), said device (1) comprises a bucket (3) inside which one or more containers (4) are housed, which are preferably shaped in order to embrace said bottle (2), when it is inserted in the device (1).

[0020] These containers (4) are filled with a phase-change substance. Said substance is preferably a eutectic having a well-defined transition temperature; how-

ever, also non-eutectic mixtures can be employed, provided that the transition range is restricted enough, depending on the beverage whose temperature must be regulated.

[0021] In particular, for beverages whose temperature must be kept by a few degrees above zero degrees centigrade, such as wine or beer or soft beverages, water can be conveniently used, whose latent melting heat (335.5 kJ/kg) is the highest one among the normally available phase-change substances, in addition to having the advantage of a practically null cost and no toxicity.

[0022] For lower temperatures, the following compositions can be used:

- solution at -5°C: 1.5% carboxymethyl cellulose, 0.1% sodium bicarbonate, 0.1% sodium chloride, 98.3% water;
- solution at -11°C: 20% potassium chloride, 80% water;
- solution at -16°C: 19.4% ammonium chloride, 0.25% sodium chloride, 80.35% water;
- solution at -30°C: 30% calcium chloride, 70% water.

[0023] For beverages whose temperature must be kept above zero degrees centigrade, phase-change substances could be conveniently used of the paraffin type, available on the market with transition temperatures up to 60°C and above.

[0024] The containers (4) are preferably withdrawable from the bucket (3), in order to be able to be easily inserted in a freezer or a heater. According to the invention, said containers (4) are kept in position by a spring (5) which is housed in a seat (3a) of the bucket (3) (shown in detail in the enlarged part of Figure 3b). The spring (5) pushes the containers (4) towards inside the bucket (3), said thrust being contrasted by the reaction exerted by the containers (4) which mutually rest along the side edges (4a), as shown in detail in the enlarged part of Figure 3a).

[0025] Finally, on the upper part of the bucket (3), a cover (6) is advantageously applied.

[0026] The bucket (2) and the cover (6) could be made in a plastic material or a metallic material. However, for thermal reasons, the plastic material is preferable since it limits the thermal exchanges with the environment and, therefore, keeps the desired temperature longer. A possible alternative is a sandwich construction, namely outside a material having an aesthetic function (for example stainless steel) coupled with an insulating material of the type of foamed resins or aerogel.

[0027] According to a preferred embodiment, the device of the invention can be made in order to contain two or more bottles, in order to simultaneously satisfy many users.

As clearly appears from the above description, the device (1) of the invention is capable of keeping the bottle (2) at the desired temperature without it being immersed in a liquid, so that the bottle (2) itself remains substantially dry.

Moreover, differently from the prior art devices, the device of the invention allows a wide margin of regulation of the temperature of the bottle (2).

Claims

1. Device (1) for regulating the temperature of beverages in a bottle (2), of the type comprising a bucket (3) in which said bottle (2) can be inserted, means being provided designed to regulate said temperature, said means designed to regulate the temperature comprising a plurality of separate cold or hot accumulators (4), wherein said cold or hot accumulators (4) comprise phase-change substances, the device (1) comprising elastic means (5) adapted to be inserted inside said bucket (3) and to exert a thrust on said containers (4) in order to be able to block them inside said bucket (3), said thrust being contrasted by a reaction exerted by the containers (4) which mutually rest along the side edges (4a) of said containers (4),

wherein said phase-change substances are pure substances, having a well-defined melting temperature, namely paraffin, or said phase-change substance is an eutectic alloy, for temperatures below zero degrees centigrade, said phase-change substances being, alternatively:

- a solution at -5°C: 1.5% carboxymethyl cellulose, 0.1% sodium bicarbonate, 0.1% sodium chloride, 98.3% water;
- a solution at -11°C: 20% potassium chloride, 80% water;
- a solution at -16°C: 19.4% ammonium chloride, 0.25% sodium chloride, 80.5% water; or
- a solution at -30°C: 30% calcium chloride, 70% water;

characterized in that said elastic means (5) comprise a spring of a circular shape which is inserted in a circular seat (3a) placed next to the bottom of said bucket (3), wherein the circular spring is provided with a plurality of protrusions protruding to the containers (4), so as to push the containers (4) towards inside the bucket (3).

2. Device (1) according to claim 1, **characterized in that** it further comprises a cover (6).
3. Device (1) according to any one of claims 1 to 2, **characterized in that** it is designed to be built by coupling a material having an aesthetic function and an insulating material having a thermal insulation function.

4. Device (1) according to claim 3, **characterized in that** said insulating material is a foamed resin.
5. Device (1) according to claim 3, **characterized in that** said insulating material is aerogel.

Patentansprüche

1. Vorrichtung (1) zur Temperaturregelung von abgefüllten Getränken (2), bestehend aus einem Behälter (3), in den die Flasche (2) eingesetzt werden kann, mit einer Einrichtung zur Temperaturregelung, die aus mehreren separaten Kälte- oder Wärmespeichern (4) besteht, die Phasenwechselstoffe enthalten, wobei die Vorrichtung (1) ein elastisches Mittel (5) umfasst, das in den Behälter (3) eingesetzt werden kann und einen Druck auf die Behälter (4) ausübt, um diese im Behälter (3) zu fixieren, wobei diesem Druck eine Gegenkraft der Behälter (4) entgegenwirkt, die entlang ihrer Seitenkanten (4a) aufeinanderliegen,

wobei es sich bei den Phasenwechselstoffen um reine Stoffe mit einem wohldefinierten Schmelzpunkt handelt, z. B. Paraffin, oder wobei der genannten Phasenwechselschmelzsubstanz handelt es sich um eine eutektische Legierung für Temperaturen unter null Grad Celsius; alternativ dazu sind die genannten Phasenwechselschmelzsubstanzen:

- eine Lösung bei -5°C: 1,5% Carboxymethylcellulose, 0,1% Natriumhydrogencarbonat, 0,1% Natriumchlorid, 98,3% Wasser;
- eine Lösung bei -11°C: 20% Kaliumchlorid, 80% Wasser;
- eine Lösung bei -16 °C: 19,4 % Ammoniumchlorid, 0,25 % Natriumchlorid, 80,35 % Wasser; oder
- eine Lösung bei -30°C: 30% Calciumchlorid, 70% Wasser;

- dadurch gekennzeichnet, dass** die elastischen Mittel (5) eine kreisförmige Feder umfassen, die in eine kreisförmige Aufnahme (3a) nahe dem Boden des Eimers (3) passt, wobei die kreisförmige Feder mit einer Vielzahl von Vorsprüngen versehen ist, die aus den Behältern (4) herausragen, um die Behälter (4) in Richtung des Inneren des Eimers (3) zu drücken.
2. Vorrichtung (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** sie ferner einen Deckel (6) umfasst.
3. Vorrichtung (1) nach einem der Ansprüche 1 oder 2,

dadurch gekennzeichnet, dass sie so konstruiert ist, dass sie durch die Verbindung eines Materials mit ästhetischer Funktion und eines Isoliermaterials mit Wärmedämmfunktion hergestellt werden kann.

4. Vorrichtung (1) nach Anspruch 3, **dadurch gekennzeichnet, dass** das Isoliermaterial ein expandiertes Harz ist.
5. Vorrichtung (1) nach Anspruch 3, **dadurch gekennzeichnet, dass** das Isoliermaterial Aerogel ist.

Revendications

1. Dispositif (1) de régulation de la température des boissons en bouteille (2), comprenant un récipient (3) dans lequel la bouteille (2) peut être insérée, et des moyens destinés à réguler ladite température, ces moyens comprenant une pluralité d'accumulateurs de froid ou de chaleur séparés (4), ces accumulateurs (4) contenant des substances à changement de phase. Le dispositif (1) comprend également des moyens élastiques (5) pouvant être insérés dans le récipient (3) et exerçant une poussée sur les contenants (4) afin de les verrouiller dans le récipient (3). Cette poussée est compensée par une réaction exercée par les contenants (4) qui reposent l'un sur l'autre le long de leurs bords latéraux (4a),

dans lequel lesdites substances à changement de phase sont des substances pures, ayant un point de fusion bien défini, c'est-à-dire la paraffine, ou ladite substance à changement de phase est un alliage eutectique, pour des températures inférieures à zéro degré Celsius, lesdites substances à changement de phase étant, alternativement:

- une solution à -5°C: 1,5 % de carboxyméthylcellulose, 0,1 % de bicarbonate de sodium, 0,1 % de chlorure de sodium, 98,3 % d'eau;
- une solution à -11°C: 20 % de chlorure de potassium, 80 % d'eau;
- une solution à -16 °C: 19,4 % de chlorure d'ammonium, 0,25 % de chlorure de sodium, 80,35 % d'eau; ou
- une solution à -30°C: 30 % de chlorure de calcium, 70 % d'eau;

caractérisé en ce que lesdits moyens élastiques (5) comprennent un ressort de forme circulaire qui s'insère dans un siège circulaire (3a) positionné près du fond dudit seau (3), dans lequel le ressort circulaire est équipé d'une plu-

ralité de protubérances qui dépassent des conteneurs (4), de manière à pousser les conteneurs (4) vers l'intérieur du seau (3).

2. Dispositif (1) selon la revendication 1, **caractérisé en ce qu'il** comprend en outre un couvercle (6). 5
3. Dispositif (1) selon l'une quelconque des revendications 1 à 2, **caractérisé en ce qu'il** est conçu pour être construit en associant un matériau ayant une fonction esthétique et un matériau isolant ayant une fonction d'isolation thermique. 10
4. Dispositif (1) selon la revendication 3, **caractérisé en ce que** ledit matériau isolant est une résine expansée. 15
5. Dispositif (1) selon la revendication 3, **caractérisé en ce que** ledit matériau isolant est un aérogel. 20

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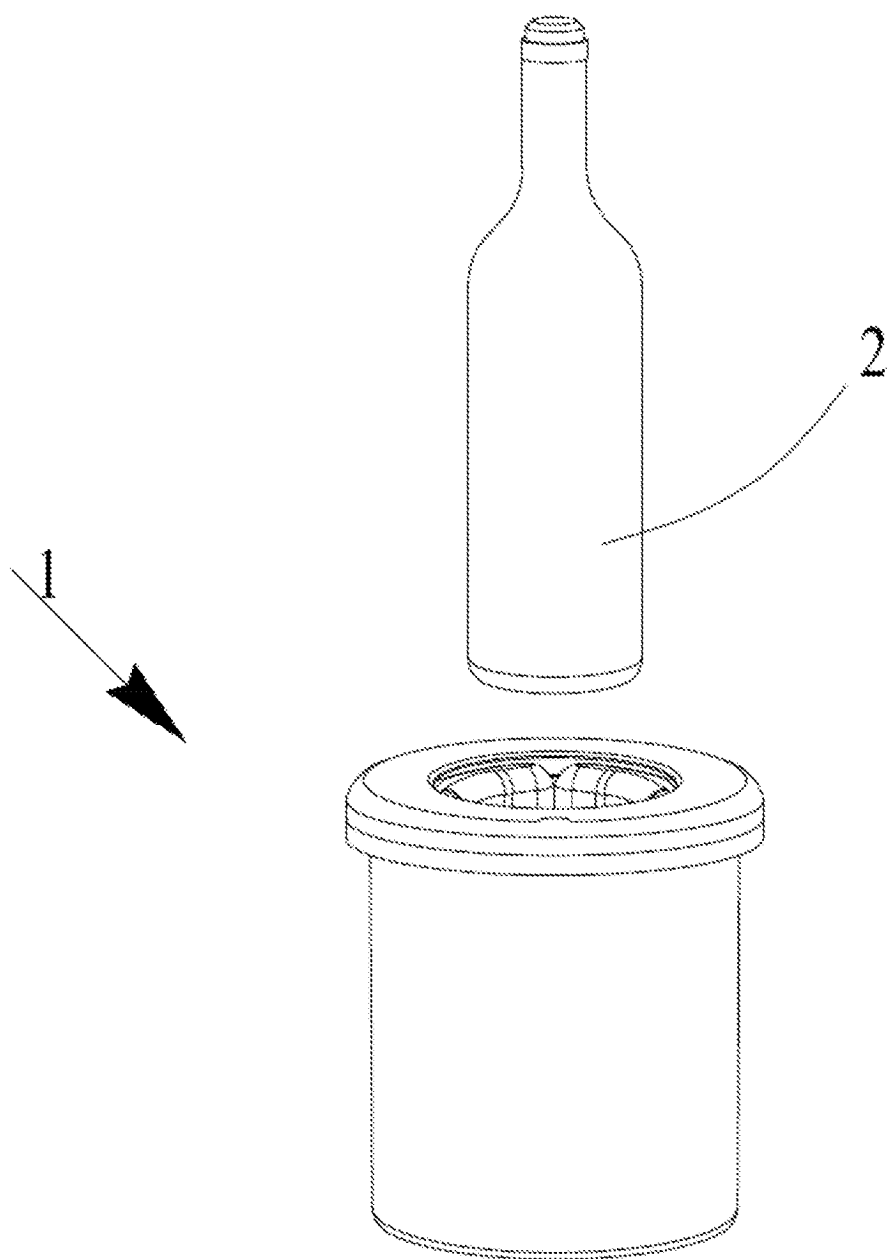


Fig. 1

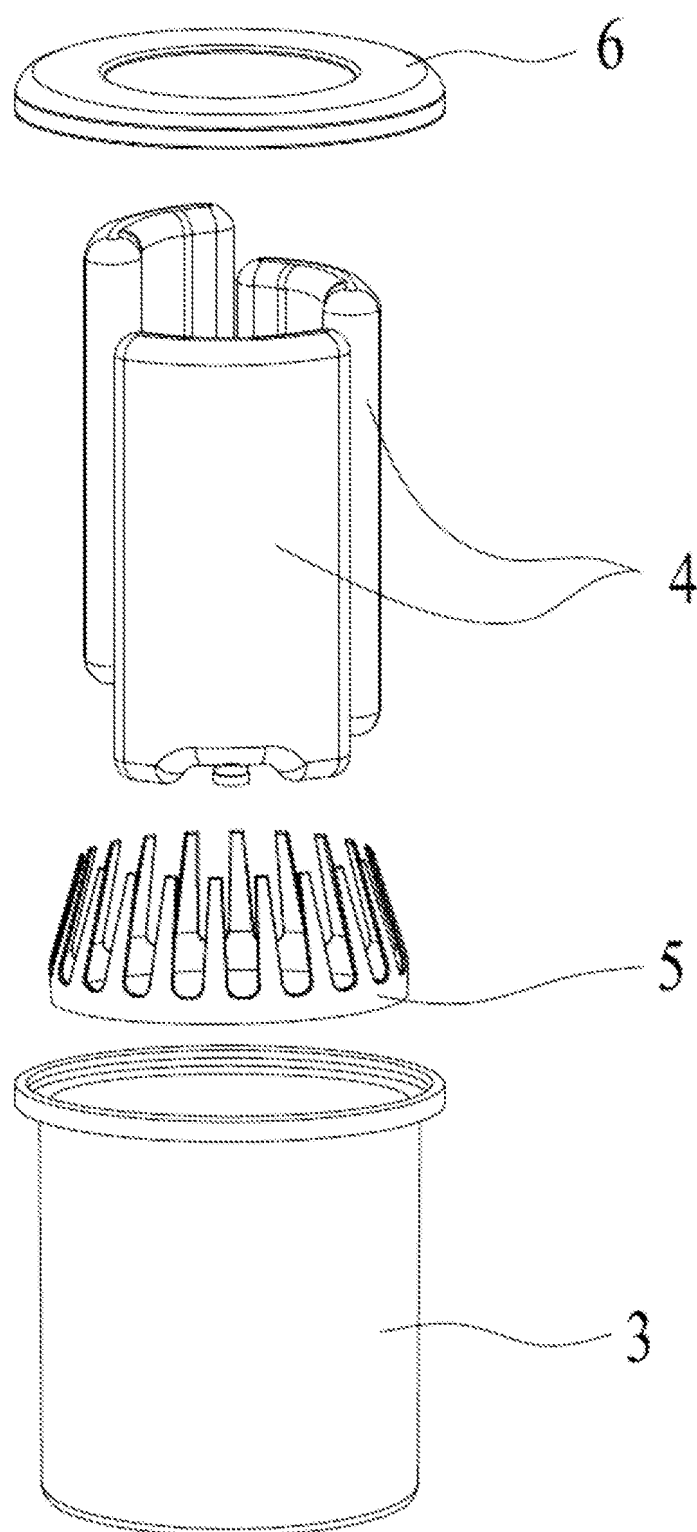
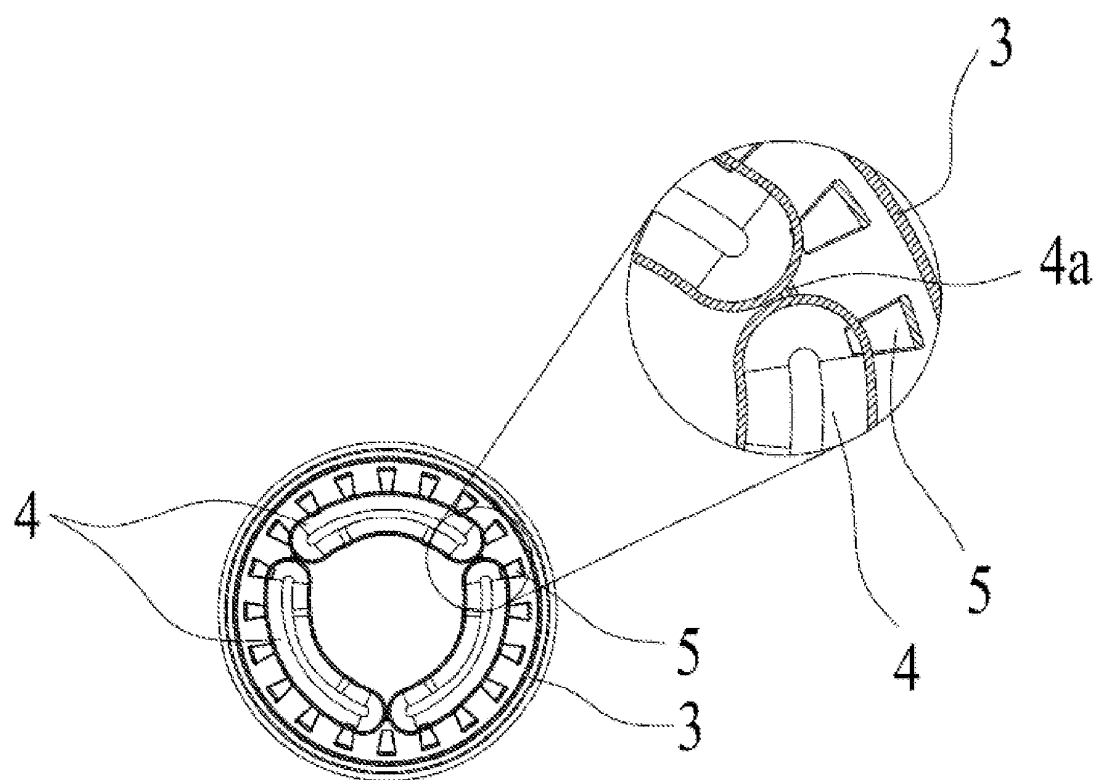
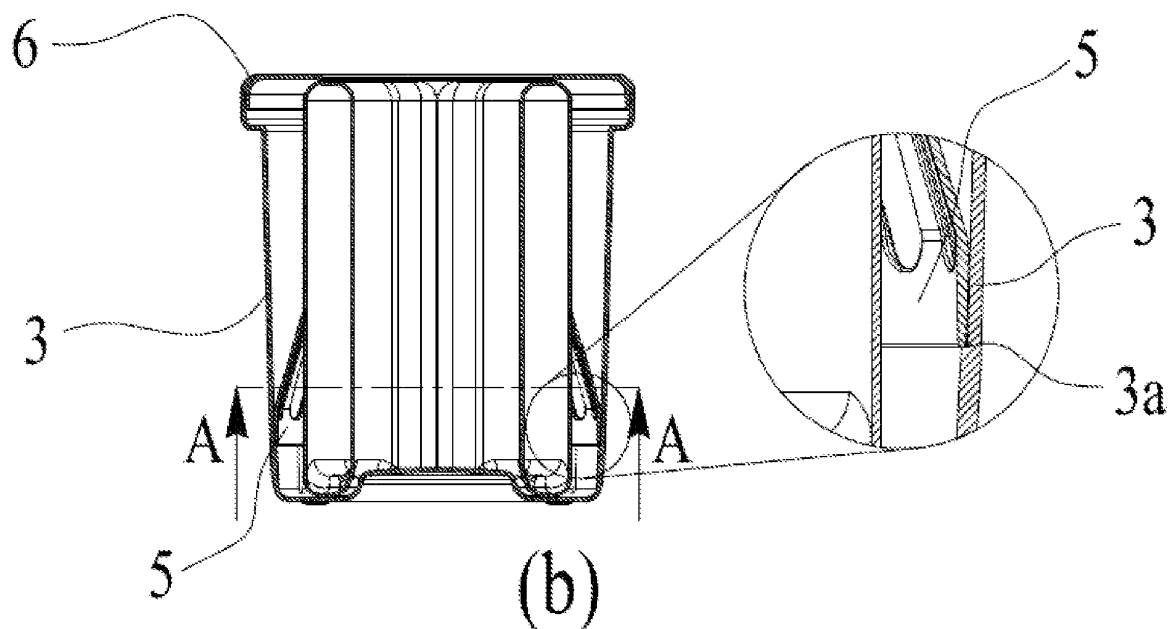


Fig. 2



(a)



(b)

Fig. 3

REFERENCES CITED IN THE DESCRIPTION

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