

(19)



(11)

EP 3 024 755 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:

04.04.2018 Bulletin 2018/14

(51) Int Cl.:

B65D 85/804 ^(2006.01)

(86) International application number:

PCT/IB2014/063431

(21) Application number: **14759323.0**

(22) Date of filing: **25.07.2014**

(87) International publication number:

WO 2015/011689 (29.01.2015 Gazette 2015/04)

(54) **CAPSULE FOR INFUSION PRODUCTS**

KAPSEL FÜR INFUSIONSPRODUKTE

CAPSULE DESTINÉE À DES PRODUITS D'INFUSION

(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**

(30) Priority: **25.07.2013 IT BO20130402**

(43) Date of publication of application:

01.06.2016 Bulletin 2016/22

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GB-A- 2 488 799

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Description

TECHNICAL FIELD

[0001] The present invention relates to a capsule for infusion of products in granules, powder or leaves, such as, for example, coffee, barley, powered milk, tea, chamomile etc.

BACKGROUND ART

[0002] Generally, the capsules for infusion products comprise a cup made of a plastic material in which the infusion product is housed, and a lid arranged so as to close the cup; the lid is either made of a plastic material or defined by a film. When the capsule is inserted in a percolation chamber of a beverage extraction machine, pressurized hot water is injected and crosses at least one hole made in the lid so as to mix with the infusion product inside the cup. The beverage then exits from the cup through at least one hole made in the bottom wall of the cup.

[0003] The capsules described above have a plurality of drawbacks.

[0004] In particular, in the currently marketed capsules, the main problems are the impregnation of the infusion product with the water to form the beverage, the possibility that some of the infusion product may not be concerned by the water entering into the capsule and the possibility that part of the infusion product may exit from the bottom wall. The first two problems are mainly due to preferential channels that the water uses to pass from the inlet to the outlet of the capsule. Furthermore, the first two problems are also due to the excessive passage speed of the water across the capsule.

[0005] WO-A1-2005/092160 describes all the features contained in the preamble portion of claim 1.

DISCLOSURE OF INVENTION

[0006] It is the object of the present invention to make an infusion capsule for products in granules, powder or leaves, which is free from the mentioned drawbacks and which has a particular conformation which allows a correct, effective mixing of water and infusion product without part of the same exiting from the capsule.

[0007] According to the present invention, a capsule for infusion products is made comprising:

a cup-shaped body made of a plastic material and defined by a bottom wall, which is provided with a beverage outlet area, and by a lateral wall;
a lid, which is arranged so as to close said cup-shaped body and is provided with a water inlet area;
an infusion product contained in said cup-shaped body; wherein a plurality of abutments originate from the inner face of said bottom wall and define labyrinth-shaped channels for the path of the beverage

towards said outlet area, a disc being fixed onto said abutments, and wherein it comprises a passage for the beverage from the chamber defined in said cup-shaped body and said labyrinth-shaped channels, characterized in that said disc is water-proof and has a diameter that is smaller than the inner diameter of the inner face of said lateral wall at the same level of said disc, so as to create an annular passage between the peripheral edge of said disc and the inner face of said lateral wall, through which the beverage flows from the chamber defined in said cup-shaped body to the said labyrinth-shaped channels.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] For a better understanding of the invention, an embodiment will be described by way of non-limitative example only, with the aid of the figures of the accompanying drawings, in which:

figure 1 is a perspective top view of a capsule made according to the dictates of the present invention;
figure 2 is a perspective bottom view of the capsule in figure 1;

figure 3 is a section view of a cup-shaped body of the capsule in figure 1;

figure 4 is a view on enlarged scale of a part of the cup-shaped body in figure 3; and

figure 5 is a plan view of the cup-shaped body in figure 3.

BEST MODE FOR CARRYING OUT THE INVENTION

[0009] With reference to figures 1 and 2, reference numeral 1 indicates as a whole an embodiment of the capsule for infusion products according to the present invention; capsule 1 is adapted to contain an infusion product. Capsule 1 is adapted to be inserted in a percolation chamber (not shown). Capsule 1 comprises a one-piece cup-shaped body 2, preferably made of a plastic material, of slightly truncated cone shape defined by a lateral wall 3 and by a bottom wall 4. Capsule 1 further comprises a lid 5, made of a plastic material and fixed by restraining or welding at the upper part of the cup-shaped body 2. The lid 5 has a water inlet area and the bottom wall 4 has a beverage outlet area. In the illustrated example, the water inlet area is defined by holes 6 made in lid 5 and the beverage outlet area is defined by holes 7 made in bottom wall 4. Naturally, lid 5 and bottom wall 4 could have valves adapted to open the respective holes by effect of the water pressure, instead of holes 6 and 7, or the lid and bottom wall 4 could be pierced by appropriate means present in the percolation chamber to make the aforesaid holes. In all cases, holes 7 are made in the central part of bottom wall 4.

[0010] Lateral wall 3 has an upper annular edge 8 onto which lid 5 is fixed, which is in close contact with the lower face of the upper body of the percolation chamber in use:

furthermore, lateral wall 3 has a lower annular edge 9 which extends beyond the level of bottom wall 4 and is in close contact with the upper face of the lower body of the percolation chamber in use. Furthermore, an annular abutment 10, which defines an annular groove 11 with the edge 9, extends outwards from bottom wall 4 (figures 3 and 4) .

[0011] With reference to figures 3, 4 and 5, a plurality of abutments 12 arranged on several rows concentric to one another extend from the inner face of the bottom wall 4. In particular, holes 7 are made in the central part of the bottom wall 4, and then a first row of abutments 12 arranged equidistant from one another along a first circumference with center in the center of the bottom wall 4 is defined about them. A second row of abutments 12, also equidistant from one another and with the space defined between two subsequent abutments 12 at an abutment 12 of the first row of abutments 12, is defined about that, at a given distance and concentrically to the first row of abutments 12. A third row of abutments 12, also equidistant from one another and with the space defined between two subsequent abutments 12 at an abutment 12 of the second row of abutments 12, is defined about that, at a given distance and concentrically to the second row of abutments 12. Finally, a fourth row of abutments 12, also equidistant from one another and with the space defined between two subsequent abutments 12 at an abutment 12 of the third row of abutments 12, is defined about that, at a given distance and concentrically to the third row of abutments 12. It is worth noting that the abutments 12 of each row are equal in size and that the size of the abutments 12 of each row is different from the size of the abutments of the other rows. Furthermore, the longitudinal axis of the abutments 12 of the first and of fourth row are defined along a diametrical axis with center in the center of the bottom wall 4, while the longitudinal axis of the abutments 12 of the second and third row is tangent to the circumference of the respective row. The abutments 12 of the fourth row have a longitudinal end which originates from the inner face of the lateral wall 3.

[0012] A water-proof disc 13, with a circular peripheral profile and center in the center of the bottom wall 4, which in the illustrated example is defined by a preferably transparent film, is fixed to the abutments 12. It is fixed by welding. Obviously, the disc 13 may be made of any other material and fixed to the abutments 12 by restrain-fitting or other system. The disc 13 has a diameter that is smaller than the diameter of the inner face of the lateral wall 3 at the same level of the disc 13, and for this reason, the disc 13 rests only on an inner portion of the fourth row of abutments 12. In this manner, an annular passage 14 of the water is created between the peripheral edge of the disc 13 and the inner face of the lateral wall 3.

[0013] In use, the water which mixes with the infusion product present in the chamber defined in the cup-shaped body 2 over the disc 13 is made to enter into the cup-shaped body 2 through the holes 6. The beverage

thus defined by such a mixing is conveyed through the passage 14 into the labyrinth-shaped channels created by the rows of abutments 12 and from such channels the beverage exits from the capsule 1 through the holes 7.

[0014] It is immediately apparent that the labyrinth defined by the rows of the abutments 12 slows down the speed of the beverage allowing the water to remain inside the cup-shaped body 2 for a longer time. On one hand, this implies a longer contact time between water and product, and thus a longer infusion, and on the other it implies the possibility of the water to infuse all of the infusion product contained in said cup-shaped body 2. Finally, the labyrinth obstructs the exiting of the granules of the infusion product from the cup-shaped body.

[0015] In a further embodiment (not shown) of the present invention, disc 13 has micro holes appropriately spaced out from one another so that the water may be channeled towards the labyrinth either through passage 14 and micro holes or through the micro holes alone when the 13 has a diameter equal to the inner diameter of lateral wall 3 and thus when the passage 14 is not present.

[0016] By making the labyrinth described above, empirical tests have shown an effective, total infusion of water and product allowing a product with better organoleptic properties. Furthermore, the increased efficacy of the infusion allows to insert a smaller amount of product in cup-shaped body 2. Finally, it is found to form a more effective obstacle to the exiting of granules of the infusion product from the cup-shaped body during the step of percolating and before the step of percolating.

[0017] Preferably, cup-shaped body 2 and/or lid 5 are made of PET and/or PP, which, as known, are plastic materials of the polyolefin class. Furthermore, the entire capsule 1 is preferably made of a biodegradable plastic material, which, as known, is defined by a plastic material appropriately blended with already known substances, or alternatively by using biopolymers which make the capsules 1 biodegradable.

Claims

1. A capsule (1) for infusion products comprising:

- a cup-shaped body (2) made of a plastic material and defined by a bottom wall (4), which is provided with a beverage outlet area, and by a lateral wall (3);
- a lid (5), which is arranged so as to close said cup-shaped body (2) and is provided with a water inlet area;
- an infusion product contained in said cup-shaped body (2) ;
- wherein a plurality of abutments (12) originate from said bottom wall (4) and define labyrinth-shaped channels for the path of the beverage towards said outlet area, a disc (13) being fixed onto said abutments (12), and wherein it com-

prises a passage (14) for the beverage from the chamber defined in said cup-shaped body (2) to said labyrinth-shaped channels;

characterized in that said disc (13) is waterproof and has a diameter that is smaller than the inner diameter of the inner face of said lateral wall (3) at the same level of said disc (13), so as to create an annular passage (14) between the peripheral edge of said disc (13) and the inner face of said lateral wall (3), through which the beverage flows from the chamber defined in said cup-shaped body (2) to the said labyrinth-shaped channels.

2. A capsule (1), according to Claim 1, **characterized in that** at least two rows of said abutments (12) originate from the bottom wall (4).
3. A capsule (1), according to Claim 2, **characterized in that** said rows of abutments (12) are concentric to one another as well as concentric to the center of said bottom wall (4) where said outlet area is defined.
4. A capsule (1), according to Claim 2 and/or 3, **characterized in that**, for each row, said abutments (12) are equally spaced apart from one another.
5. A capsule (1), according to at least one of the Claims from 2 to 4, **characterized in that** said abutments (12) of at least one row have their longitudinal axis arranged along a diameter axis having its center at the center of said bottom wall (4).
6. A capsule (1), according to at least one of the Claims from 2 to 5, **characterized in that** said abutments (12) of at least one row have their longitudinal axis arranged tangent to the circumference of the respective row.
7. A capsule (1), according to Claims 5 and 6, **characterized in that** each row has its abutments (12) arranged in correspondence to the space defined between two following abutments (12) of the adjacent row.

Patentansprüche

1. Eine Kapsel (1) für Infusionsprodukte, die Folgendes umfasst:

einen becherförmigen Körper (2) aus einem Kunststoffmaterial, der durch eine Bodenwand (4) definiert wird, die mit einem Getränke-Auslassbereich versehen ist, und durch eine Seitenwand (3);

einen Deckel (5), der so angeordnet ist, dass er den becherförmigen Körper (2) verschließt, und

der mit einem Wasser-Einlassbereich versehen ist;

ein Infusionsprodukt, das im becherförmigen Körper (2) enthalten ist;

wobei eine Vielzahl von Widerlagern (12) von der genannten Bodenwand (4) ausgehen und Labyrinth-förmige Kanäle für den Weg des Getränks in Richtung des genannten Auslassbereichs definieren, wobei eine Scheibe (13) auf den Widerlagern (12) befestigt ist, und wobei sie einen Durchgang (14) für das Getränk von der im genannten becherförmigen Körper (2) definierten Kammer zu den genannten Labyrinth-förmigen Kanälen aufweist;

dadurch gekennzeichnet, dass die genannte Scheibe (13) wasserdicht ist und einen Durchmesser aufweist, der kleiner ist als der Innendurchmesser der Innenfläche der genannten Seitenwand (3) auf derselben Höhe der Scheibe (13), sodass ein ringförmiger Durchgang (14) zwischen dem Umfangsrand der genannten Scheibe (13) und der Innenfläche der genannten Seitenwand (3) geschaffen wird, durch den das Getränk von der im genannten becherförmigen Körper (2) definierten Kammer zu den genannten Labyrinth-förmigen Kanälen fließt.

2. Eine Kapsel (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** mindestens zwei Reihen der genannten Widerlager (12) von der Bodenwand (4) ausgehen.
3. Eine Kapsel (1) nach Anspruch 2, **dadurch gekennzeichnet, dass** die genannten Reihen von Widerlagern (12) konzentrisch zueinander sowie konzentrisch zur Mitte der genannten Bodenwand (4) sind, wo der genannte Auslassbereich definiert ist.
4. Eine Kapsel (1) nach Anspruch 2 und/oder 3, **dadurch gekennzeichnet, dass** die genannten Widerlager (12), für jede Reihe, gleich weit voneinander entfernt sind.
5. Eine Kapsel (1), nach mindestens einem der Ansprüche von 2 bis 4, **dadurch gekennzeichnet, dass** die genannten Widerlager (12) von mindestens einer Reihe ihre Längsachse entlang einer Durchmesserachse angeordnet haben, deren Mittelpunkt in der Mitte der genannten Bodenwand (4) liegt.
6. Eine Kapsel (1), nach mindestens einem der Ansprüche von 2 bis 5, **dadurch gekennzeichnet, dass** die genannten Widerlager (12) von mindestens einer Reihe ihre Längsachse tangential zum Umfang der jeweiligen Reihe angeordnet haben.
7. Eine Kapsel (1) nach den Ansprüchen 5 und 6, **dadurch gekennzeichnet, dass** jede Reihe ihre Wi-

derlager (12) entsprechend dem zwischen zwei aufeinanderfolgenden Widerlagern (12) der angrenzenden Reihe definierten Raum angeordnet hat.

Revendications

1. Capsule (1) pour produits d'infusion comprenant:

un corps cupuliforme (2) en matière plastique et délimité par une paroi de fond (4), pourvue d'une zone de sortie de boisson, et par une paroi latérale (3) ;
 un couvercle (5), qui est agencé de manière à fermer ledit corps cupuliforme (2) et est pourvu d'une zone d'entrée d'eau;
 un produit d'infusion contenu dans ledit corps cupuliforme (2);
 dans laquelle se trouvent une pluralité de butées (12) provenant de ladite paroi de fond (4) et définissant des canaux en forme de labyrinthe pour le passage de la boisson vers ladite zone de sortie, un disque (13) étant fixé sur lesdites butées (12), et un passage (14) pour la boisson depuis la chambre définie dans ledit corps cupuliforme (2) jusqu'auxdits canaux en forme de labyrinthe,
caractérisée en ce que ledit disque (13) est étanche et possède un diamètre inférieur au diamètre interne de la face interne de ladite paroi latérale (3) au niveau dudit disque (13), de manière à créer un passage annulaire (14) entre le bord périphérique dudit disque (13) et la face interne de ladite paroi latérale (3), à travers laquelle la boisson s'écoule de la chambre définie dans ledit corps cupuliforme (2) jusque dans lesdits canaux en forme de labyrinthe.

2. Capsule (1), selon la revendication 1, **caractérisée en ce qu'**au moins deux rangées desdites butées (12) proviennent de la paroi de fond (4).

3. Capsule (1), selon la revendication 2, **caractérisée en ce que** lesdites rangées de butées (12) sont concentriques l'une par rapport à l'autre et concentriques par rapport au centre de ladite paroi de fond (4) où ladite zone de sortie est définie.

4. Capsule (1) selon la revendication 2 et / ou 3, **caractérisée en ce que**, pour chaque rangée, lesdites butées (12) sont équidistantes les unes des autres.

5. Capsule (1) selon l'une au moins des revendications 2 à 4, **caractérisée en ce que** lesdites butées (12) d'au moins une rangée ont leur axe longitudinal disposé selon un axe formé par un diamètre passant par le centre de ladite paroi de fond (4).

6. Capsule (1) selon au moins l'une des revendications 2 à 5, **caractérisée en ce que** lesdites butées (12) d'au moins une rangée ont leur axe longitudinal disposé tangentiellement à la circonférence de la rangée respective.

7. Capsule (1), selon les revendications 5 et 6, **caractérisée en ce que** chaque rangée a ses butées (12) disposées en correspondance avec l'espace défini entre deux butées consécutives (12) d'une rangée adjacente.

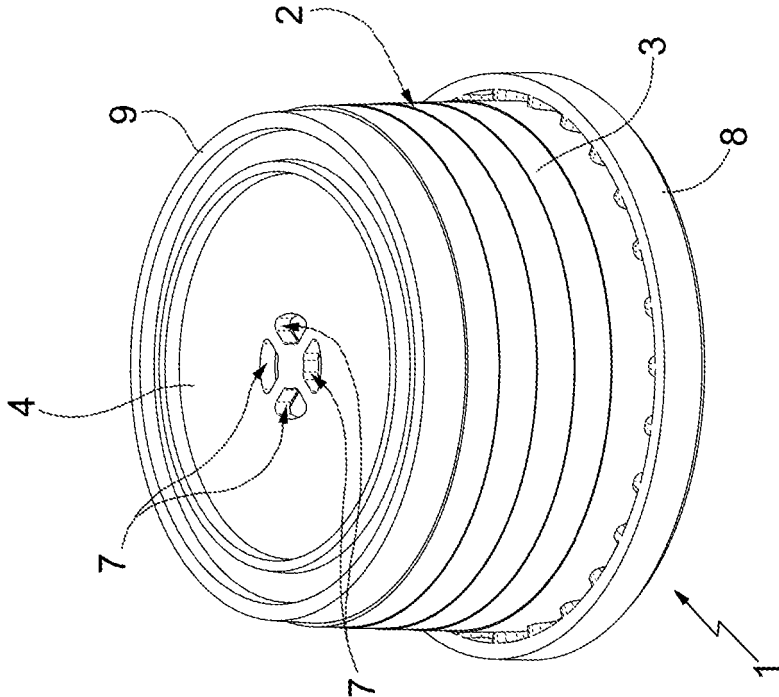


FIG.2

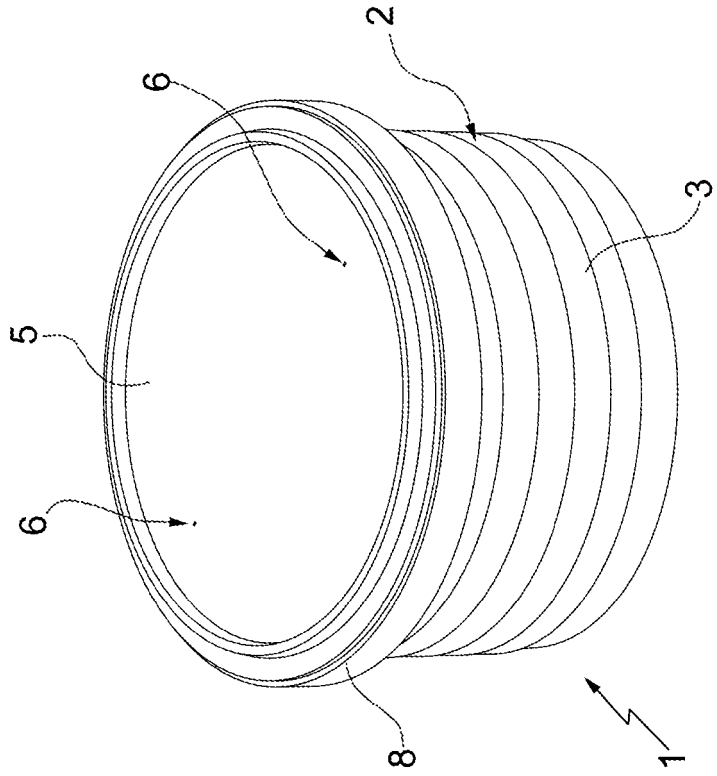


FIG.1

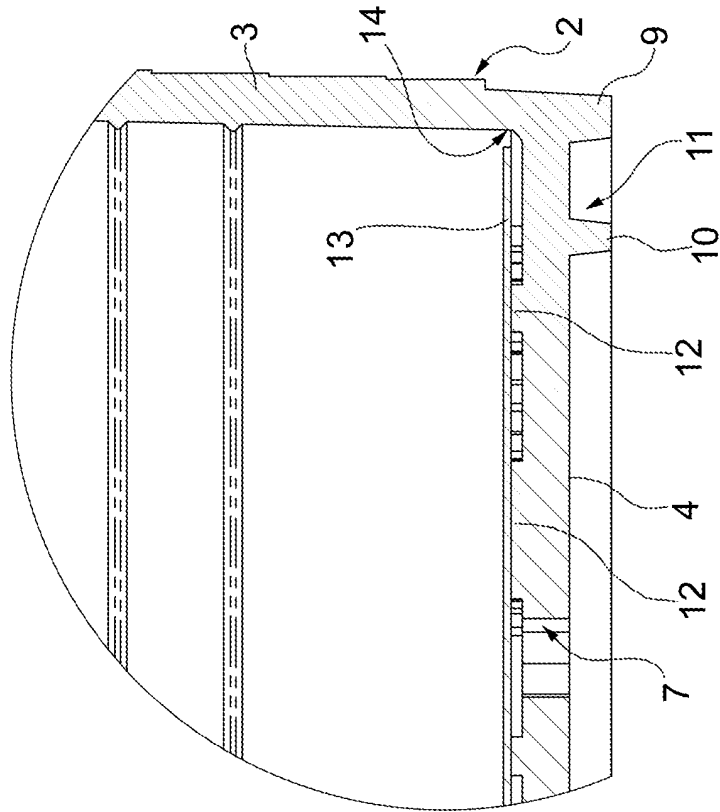


FIG. 4

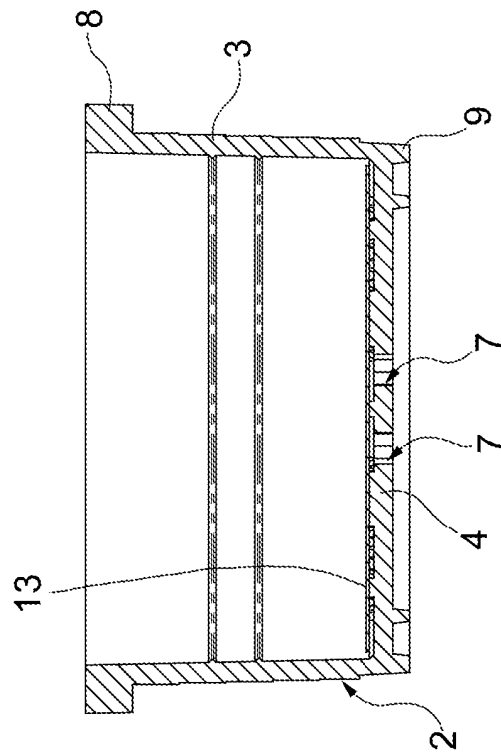


FIG. 3

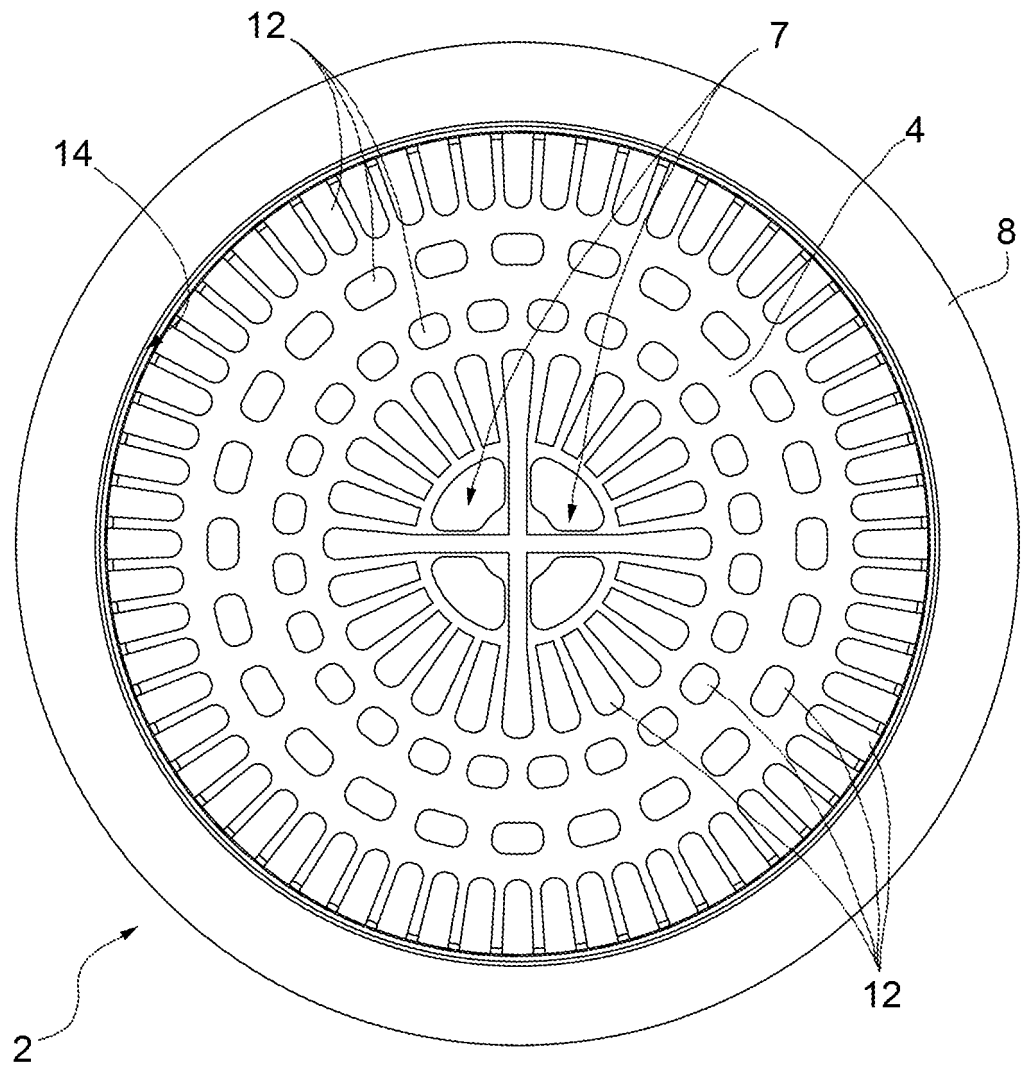


FIG.5

REFERENCES CITED IN THE DESCRIPTION

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