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(54) **A capsule for containing a preparation for a hot drink**

Kapsel, enthaltend eine Bereitung zur Herstellung eines Heissgetränks

Capsule contenant une préparation pour boisson chaude

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(56) References cited:

EP-A1- 1 654 966	EP-A1- 1 849 715
EP-A1- 2 230 195	EP-A1- 2 239 211
EP-A1- 2 284 101	WO-A1-2006//045536
WO-A1-2010//137954	WO-A2-2007//137974
DE-A1-102008 014 758	FR-A1- 2 617 389
US-A- 4 775 048	

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Description

[0001] The present invention relates to the technical sector concerning capsules for containing a preparation for a hot drink, in particular coffee, tea, milk and the like.

[0002] In known ways, these capsules, known as pods, contain a batch of preparation and are engageable in combination with automatic machines able to allow extraction of the product.

[0003] These automatic machines comprise, in the extraction section thereof, an internal chamber for housing and temporarily retaining a capsule, and a device for supplying pressurised hot water into the chamber in which the capsule is inserted, in such a way as to enable extraction of the product therefrom.

[0004] In this case the active ingredients and/or aromas contained in the batch of preparation are extracted and/or dissolved in the hot water by means of infusion or by mixing, in this way obtaining the desired hot drink.

[0005] The capsules present on the market comprise a substantially beaker-shaped body sealed by a film applied on the entry collar of the body using known methods, for example gluing, heat-welding or ultrasound welding.

[0006] The beaker-shaped body of the capsules is generally made of aluminium with thicknesses which confer a predetermined rigidity, while the closing film is made using a slim sheet of aluminium which allows a minimum of deformability.

[0007] In order to extract the product, the hot water supplied into the internal chamber must be able to enter the capsule, interact with the batch of preparation, and then exit from the capsule in such a way as to allow dispensing of the drink internally of a suitable containing beaker.

[0008] For this purpose, first sharp elements operate in the internal chambers of the above-described automatic machines, which sharp elements are mobile and able to suitably perforate the bottom of the capsules and enable inlet of the hot water.

[0009] The pressure that forms internally of the capsule following the perforation leads to a deformation of the closing film, which therefore assumes a configuration that is convex towards the outside.

[0010] The deformation of the film leads to the laceration thereof by facing second sharp elements that are fixed and enable exit of the drink from the capsule and the conveying thereof into the containing beaker.

[0011] In known ways, during the step of dispensing the hot water internally of the capsule, the sealed coupling thereof with the internal chamber is guaranteed by a silicone ring, comprised inferiorly of the entry collar of the capsule body, which crushes against the upper peripheral edge of the containing walls of the internal chamber.

[0012] According to known methods, in order to increase the seal the peripheral edge is knurled, with grooves that extend radially with respect to the chamber, in such a way that during the coupling step with the sili-

cone ring the ring deforms and perpendicularly obstructs the radial grooves.

[0013] In other known methods, during the coupling step the upper peripheral edge of the internal chamber intercepts a prominence, fashioned inferiorly of the entry collar of the capsule body, which is knurled with grooves extending circumferentially with respect to the capsule body.

[0014] In this case the seal is guaranteed by the plastic deformation undergone by the circumferential knurling of the capsule body caused by the corresponding radial knurling of the upper peripheral edge of the internal chamber.

[0015] In both above-described known methods, however, the seal of the coupling of the capsule body with the internal chamber is not optimal and leads to pressure values internally of the chamber that are lower than specifications.

[0016] This leads to a smaller deformation of the closing film which is lacerated only partially by the fixed second sharp elements, with a consequently smaller dispensing of hot drink.

[0017] This problem leads to a waste of the preparation contained in the capsule, a part of which remains unused internally thereof, with a strong negative effect on the full-bodiedness and/or the taste of the hot drink dispensed.

[0018] Document EP1654966, discloses a capsule which contains beverage ingredients such as ground coffee, tea or other ingredients and is configured for insertion in a beverage production device so that a liquid under pressure enters the capsule and interacts with the ingredients in the capsule. The capsule comprises a base body and a foil member closing the base body by being attached to a flange-like rim extending from the side wall of the base body of the capsule. The base body of the capsule comprises a resilient sealing member, the sealing member being designed to be in sealing engagement with a bell member of the beverage production device.

[0019] Document EP1849715 discloses a method for producing a capsule containing beverage ingredients designed for insertion in a beverage production device in which a liquid under pressure enters the capsule in order to interact with the ingredients in the capsule and to form beverage. The method comprises: preforming the capsule body and at least a portion of said flange-like rim; placing a premade sealing member on the flange-like rim; crimping a portion of the flange-like rim on a portion of the sealing member so resulting in the sealing member becoming attached to the flange-like rim.

[0020] Document EP2230195 discloses a capsule for the production of coffee, in a beverage production machine comprising a capsule holder with relief and recessed elements; said capsule comprising: an inverted cup-shaped body forming a chamber containing ground coffee, a bottom injection wall, a sidewall; a delivery wall which is sealed to the body; wherein the delivery wall comprises a filtering insert including at least one portion of porous material capable of providing a backpressure

that is greater than the backpressure of the ground coffee in the chamber.

[0021] Document DE102008014758 discloses a package having a container provided with a base, a side wall and a cover, where the base guides an extraction fluid into the container. The side wall exhibits a flange serving as a sealing edge for the cover and extending radially outwards at a cover side based on a conical or cylindrical side wall section. The side wall has a carrier section e.g. aluminum foil, and an inner section, where the inner section is formed of a flexible plastic foil e.g. polypropylene foil, deformable under pressure and laminated on the carrier section.

[0022] The aim of the present invention is to provide a system for extracting a hot drink, able to ensure optimal sealed coupling of the capsule body with the internal chamber of the automatic machine internally of which the capsule is inserted, such as to guarantee the predetermined pressure values internally of the capsule during the dispensing step of the hot water.

[0023] A further aim of the invention is to provide a system for extracting a hot drink, having a relatively low cost.

[0024] The above aims are obtained by the system according to claim 1.

[0025] In preferred embodiments thereof, the system of the invention comprises one or more of the following characteristics, considered singly or in combination:

- the groove is shaped such as to enable an interference coupling with the upper peripheral edge of the containing wall;
- the groove deforms plastically during the coupling step with the upper peripheral edge, such as to maximise the seal of the coupling;
- the groove identifies a bottom and a pair of opposite lateral walls, and deformable means are included, provided at the bottom or at one of the lateral walls, able to deform during the step of coupling of the groove with the upper peripheral edge, such as to maximise the seal of the coupling;
- the beaker-shaped body identifies a bottom from which a lateral containing wall emerges, having a substantially truncoconical geometry, from the upper edge of which lateral containing wall the collar extends; the bottom, the lateral wall and the collar being realised in a single body and being made of polypropylene.

[0026] The characteristics of the invention will emerge in the following, in which some preferred but not exclusive embodiments are described by way of example, with reference to the accompanying tables of drawings, in which:

- figures 1, 2 are corresponding perspective views from above and below of the capsule for containing a preparation for a hot drink;

- figure 3 is a perspective view in enlarged scale and in partial section of the capsule illustrated in figures 1, 2;

- 5 - figure 4 is a view in enlarged scale of detail H of figure 3, in which a broken line denotes the containing wall of the internal chamber of the automatic machine in which the capsule is to be inserted.

10 **[0027]** With reference to the tables of drawings, reference numeral 1 generally denotes the capsule for containing a preparation for a hot drink, comprising, in known ways, a beaker-shaped body 10, destined to contain a batch of preparation, provided at the mouth 10a of a collar 13 which extends towards the outside.

15 **[0028]** The beaker body 10 comprises a bottom 11 from which a lateral containing wall 12 emerges, having a substantially truncoconical geometry, from an upper edge of which the collar 13 extends.

20 **[0029]** In known ways, the collar 13 extends from the lateral wall 12 in a substantially parallel direction with respect to the bottom 11.

25 **[0030]** A deformable aluminium film is generally applied (for example by gluing, heat-welding or ultrasound welding) in the upper part of the collar 13; the aluminium film is deformable and capable of sealing the internal volume of the body 10 of the capsule 1.

30 **[0031]** The body 10 is preferably made in a single body and made of polypropylene, which is completely non-toxic.

[0032] To extract the hot drink, the capsule 1 is inserted in an apparatus of known type (for the sake of simplicity this is not illustrated) of the type described in the above preamble.

35 **[0033]** Specifically, this apparatus comprises an internal chamber destined to receive and retain, in proximity of the upper region, the body 10 of the capsule 1 during the preparation of the drink.

40 **[0034]** The internal chamber is delimited by at least a containing wall 18 which identifies an upper peripheral edge 17 which can abut the lower surface of the collar 13 of the body 10 of the capsule 1, in a step of coupling the body 10 with the internal chamber.

45 **[0035]** The capsule 1 comprises, in an innovative way, at least an annular groove 14 at the lower surface of the collar 13, which annular groove 14 is suitable for sealingly couplingly receiving the upper peripheral edge 17 of the containing wall 18.

50 **[0036]** The groove 14 is shaped complementarily to the upper peripheral edge 17 of the containing wall 18, such as to enable free insertion and/or extraction of the upper peripheral edge 17 into and/or from the annular groove 14.

55 **[0037]** To maximise the seal of the coupling, in a further embodiment the groove 14 is shaped such as to enable a friction coupling with the upper peripheral edge 17 of the containing wall 18.

[0038] The plastic deformation of the groove 14 during

the coupling step with the upper peripheral edge 17 can also be comprised, by means of the edge itself.

[0039] Alternatively, in order further to increase the seal of the coupling, deformable means can be provided, positioned at the bottom 15 or at one of the opposite lateral walls 16 of the groove 14, which can deform during the step of coupling of the groove 14 with the upper peripheral edge 17.

[0040] From the above it clearly emerges how the capsule for containing a preparation for a hot drink is able to ensure excellent sealed coupling of the capsule body with the internal chamber of the automatic machine internal of which the capsule is inserted, such as to guarantee the predetermined pressure values internally of the capsule during the step of dispensing the hot water.

[0041] The above is attained thanks to the excellent sealed coupling between the annular groove provided inferiorly of the collar of the capsule body, and the upper peripheral edge of the containing wall of the internal chamber.

[0042] In this case the bottom and the opposite lateral walls of the groove extendedly and stably embrace the upper peripheral edge of the containing wall of the internal chamber.

[0043] The realisation of the groove in the lower region of the collar of the capsule body is extremely simple and economical, and does not influence production costs of the capsule.

[0044] The capsule further enables obtaining optimal deformation of the closing film (sealed on the upper portion of the collar) which is thus lacerated according to the description, with a consequent dispensing of the predetermined quantity of hot drink.

[0045] This leads to optimal use of the preparation contained in the capsule, which is wholly exploited, to the full advantage of the full-bodiedness and/or the taste of the hot drink dispensed.

Claims

1. A system for extracting a hot drink, comprising:

a capsule for containing a preparation for the hot drink, in turn comprising a beaker-shaped body (10), destined to contain a batch of preparation, provided at a mouth (10a) thereof with a collar (13) which extends in an external direction; and

an apparatus comprising at least an internal chamber suitable for receiving and retaining, in proximity of the upper region, said body (10) of the capsule (1), during the preparation of the drink, said internal chamber being delimited by at least a containing wall (18) which identifies an upper peripheral edge (17) destined to abut the lower surface of the collar (13) of the body (10) of the capsule (1) during a step of coupling

of the body (10) with the internal chamber; wherein the capsule (1) for extraction of the hot drink is able to cooperate with said apparatus and comprises, at the lower surface of the collar (13), at least an annular groove (14); said system being **characterised in that**:

the groove (14) is destined to couplingly sealingly receive the upper peripheral edge (17) of the containing wall (18); the groove (14) is shaped complementarity to the upper peripheral edge (17) of the containing wall (18), such as to enable free insertion and/or extraction of the upper peripheral edge (17) into and/or from the annular groove (14); and the bottom (15) and the opposite lateral walls (16) of the groove (14) extendedly and stably embrace the upper peripheral edge (17) of the containing wall (18) of the internal chamber.

2. The system of claim 1, **characterised in that** the groove (14) deforms plastically during the coupling step with the upper peripheral edge (17), such as to maximise the seal of the coupling.
3. The system of one of claims 1 or 2, **characterised in that** the groove (14) it comprises deformable means, provided at the bottom (15) or at one of the lateral walls (16), able to deform during the step of coupling of the groove (14) with the upper peripheral edge (17), such as to maximise the seal of the coupling.
4. The system of one of claims from 1 to 3, wherein the beaker-shaped body (10) identifies a bottom (11) from which a lateral containing wall (12) emerges, having a substantially truncoconical geometry, from the upper edge of which lateral containing wall (12) the collar (13) extends; **characterised in that** the bottom (11), the lateral wall (12) and the collar (13) are realised in a single body and are made of polypropylene.

Patentansprüche

1. System für die Extraktion eines Heißgetränks, umfassend:

eine Kapsel zum Enthalten einer Zubereitung für das Heißgetränk, wiederum umfassend einen becherförmigen Körper (10), der dazu bestimmt ist, eine Portion der Zubereitung zu enthalten, und der an seiner Mündung (10a) einen Bundring (13) aufweist, der sich nach außen hin erstreckt; und

ein Gerät, umfassend zumindest eine innere Kammer, die dafür geeignet ist, während der Zubereitung des Getränkes den Körper (10) der Kapsel (1) aufzunehmen und an seinem oberen Bereich festzuhalten, wobei diese innere Kammer durch zumindest eine Haltewand (18) begrenzt wird, die einen oberen umlaufenden Rand (17) aufweist, der dafür bestimmt ist, gegen die untere Oberfläche des Bundrings (13) des Körpers (10) der Kapsel (1) anzuschlagen, während der Schritt der Verbindung des Körpers (10) mit der inneren Kammer ausgeführt wird; wobei die Kapsel (1) für die Extraktion des Heißgetränks mit dem Gerät zusammenwirken kann und an der unteren Oberfläche des Bundrings (13) zumindest eine ringförmige Rille (14) umfasst; wobei das System **dadurch gekennzeichnet ist, dass:**

die Rille (14) dafür bestimmt ist, in abdichtender Verbindung den oberen umlaufenden Rand (17) der Haltewand (18) aufzunehmen;

die Rille (14) komplementär zu dem oberen umlaufenden Rand (17) der Haltewand (18) geformt ist, um das ungehinderte Einsetzen und/oder Entnehmen des oberen umlaufenden Randes (17) in die und/oder aus der ringförmigen Rille (14) zu ermöglichen; und der Boden (15) und die einander gegenüberliegenden Seitenwände (16) der Rille (14) dafür ausgelegt sind, in ausgedehnten und stabilen Eingriff mit dem oberen umlaufenden Rand (17) der Haltewand (18) der inneren Kammer zu treten.

2. System nach Anspruch 1, **dadurch gekennzeichnet, dass** sich die Rille (14) während des Schrittes der Verbindung mit dem oberen umlaufenden Rand (17) plastisch verformt, um eine maximale Abdichtung der Verbindung zu erreichen.
3. System nach einem der Ansprüche 1 oder 2, **dadurch gekennzeichnet, dass** die Rille (14) verformbare Mittel umfasst, die am Boden (15) oder an einer der Seitenwände (16) vorgesehen sind, die sich während des Schrittes der Verbindung der Rille (14) mit dem oberen umlaufenden Rand (17) so verformen können, dass eine maximale Abdichtung der Verbindung erreicht wird.
4. System nach einem der Ansprüche von 1 bis 3, worin der becherförmige Körper (10) einen Boden (11) aufweist, von dem aus sich eine seitliche Haltewand (12) erstreckt, die eine im Wesentlichen kegelförmige Geometrie aufweist, wobei sich ausgehend vom oberen Rand dieser seitlichen Haltewand (12) der Bundring (13) erstreckt; **dadurch ge-**

kennzeichnet, dass der Boden (11), die seitliche Wand (12) und der Bundring (13) einteilig ausgeführt sind und aus Polypropylen bestehen.

Revendications

1. Système pour l'extraction d'une boisson chaude, comprenant :

une capsule pour contenir une préparation pour la boisson chaude, comprenant à son tour un corps en forme de gobelet (10), destiné à contenir une dose de la préparation, doté au niveau d'une bouche (10a) de celui-ci d'un collier (13) qui s'étend dans une direction extérieure ; et un appareil, comprenant au moins une chambre intérieure destinée à recevoir et à retenir, à proximité de la zone supérieure, le corps (10) de la capsule (1) pendant la préparation de la boisson, la chambre intérieure étant délimitée par au moins une paroi de confinement (18) qui identifie un bord périphérique supérieur (17) destiné à venir en butée contre la surface inférieure du collier (13) du corps (10) de la capsule (1) pendant une phase d'accouplement du corps (10) avec ladite chambre intérieure ; dans lequel la capsule (1) pour l'extraction de la boisson chaude peut coopérer avec l'appareil et comprend, au niveau de la surface inférieure du collier (13), au moins une gorge annulaire (14) ; dans lequel le système est **caractérisé en ce que :**

ladite gorge (14) est destinée à recevoir en accouplement étanche le bord périphérique supérieur (17) de la paroi de confinement (18) ;

ladite gorge (14) est conformée de façon complémentaire au bord périphérique supérieur (17) de la paroi de confinement (18), de manière à permettre la libre introduction et/ou extraction dudit bord périphérique supérieur (17) dans et/ou de la gorge annulaire (14) ; et

le fond (15) et les parois latérales opposées (16) de la gorge (14) enfermant de façon étendue et stable le bord périphérique supérieur (17) de la paroi de confinement (18) de la chambre intérieure.

2. Système selon la revendication 1, **caractérisé en ce que** la gorge (14) se déforme plastiquement pendant la phase d'accouplement avec le bord périphérique supérieur (17), de manière à optimiser l'étanchéité de l'accouplement.
3. Système selon l'une des revendications 1 ou 2, **ca-**

caractérisé en ce que la gorge (14) comprend des moyens déformables, prévus au niveau du fond (15) ou au niveau d'une des parois latérales (16), pouvant se déformer pendant la phase d'accouplement de la gorge (14) avec le bord périphérique supérieur (17), de manière à optimiser l'étanchéité de l'accouplement. 5

4. Système selon l'une des revendications de 1 à 3, où le corps en forme de gobelet (10) identifie un fond (11) à partir duquel se dresse une paroi de confinement latérale (12) ayant une géométrie essentiellement troncoconique, le collier (13) s'étendant depuis le bord supérieur de ladite paroi de confinement latérale (12) ; **caractérisé en ce que** le fond (11), la paroi latérale (12) et le collier (13) sont réalisés en corps unique et sont fabriqués en polypropylène. 10 15

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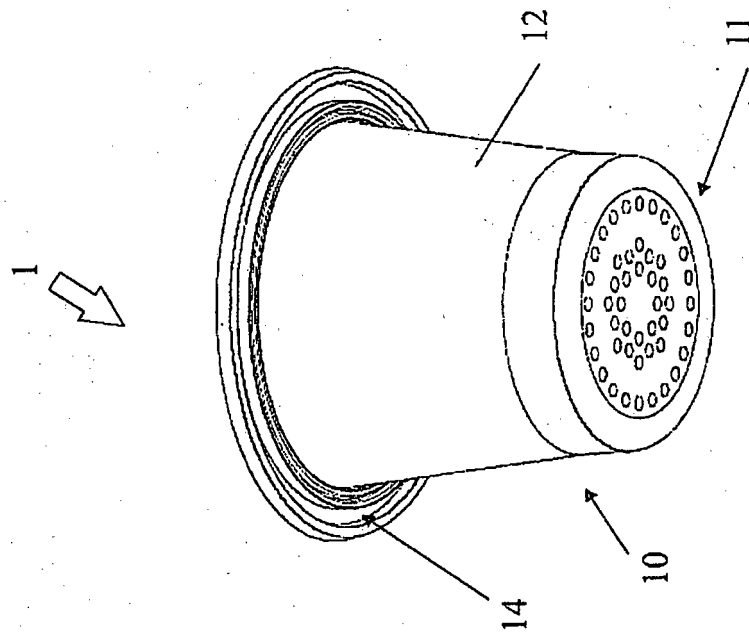


FIG. 2

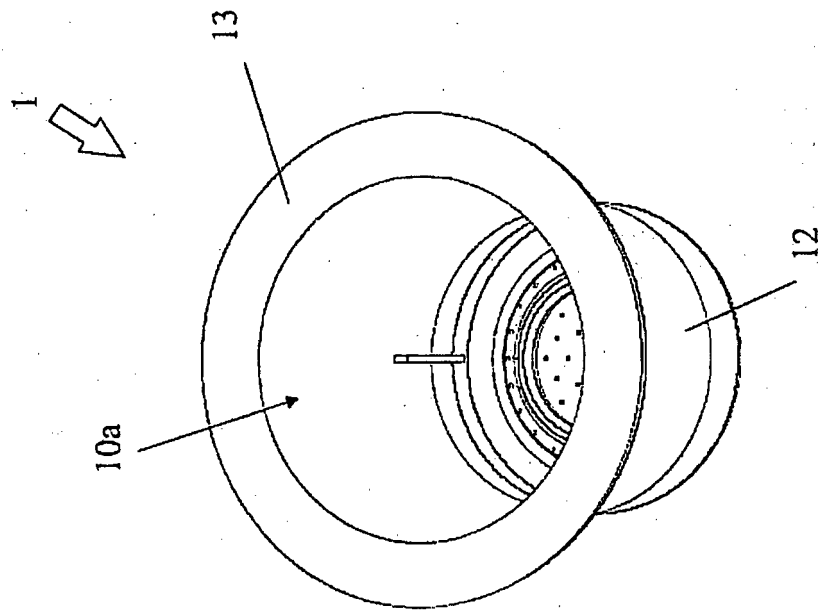
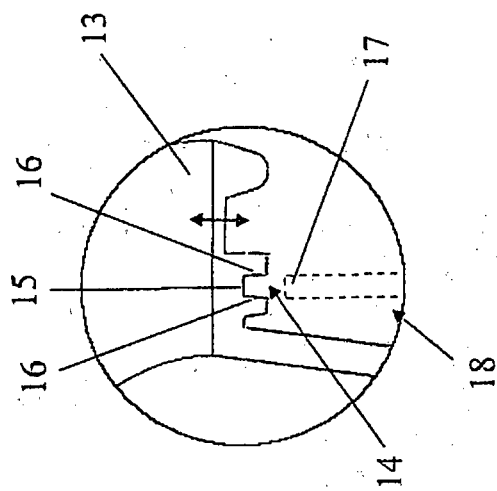
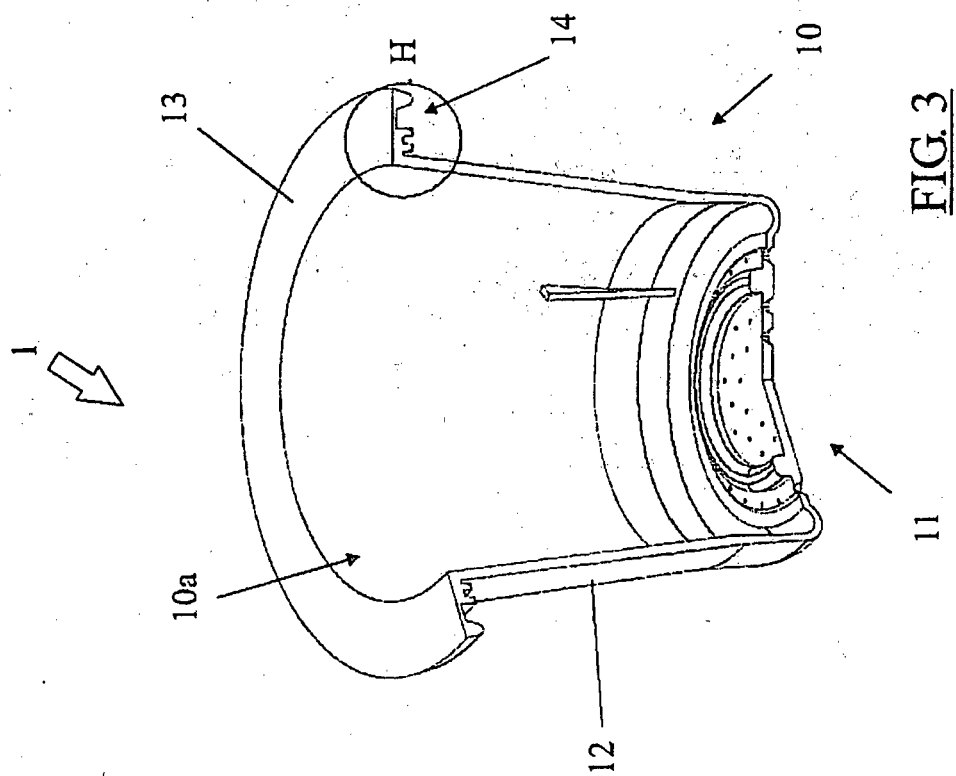


FIG. 1



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- EP 1654966 A [0018]
- EP 1849715 A [0019]
- EP 2230195 A [0020]
- DE 102008014758 [0021]