



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
22.08.2012 Bulletin 2012/34

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

(21) Application number: **12155800.1**

(22) Date of filing: **16.02.2012**

(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

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(30) Priority: **17.02.2011 IT BO20110068**

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

(57) The capsule (1) for containing a preparation for a hot drink, 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; the capsule (1), for extraction of the hot drink, being able to cooperate with an apparatus comprising at least an internal chamber suitable for receiving and retaining, in proximity of the upper region, the body (10) of the capsule (1) during the preparation

of the drink, the 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. The capsule (1) comprises, at the lower surface of the collar (13), at least an annular groove (14) destined to couplingly sealingly receive the upper peripheral edge (17) of the containing wall (18).

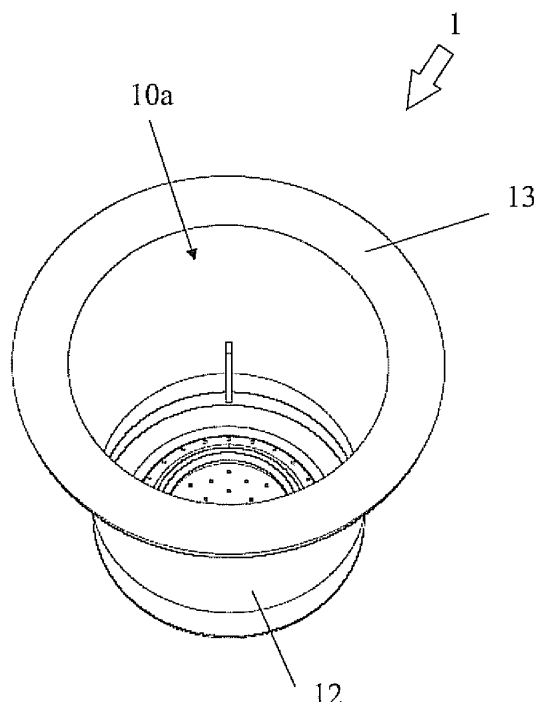


FIG. 1

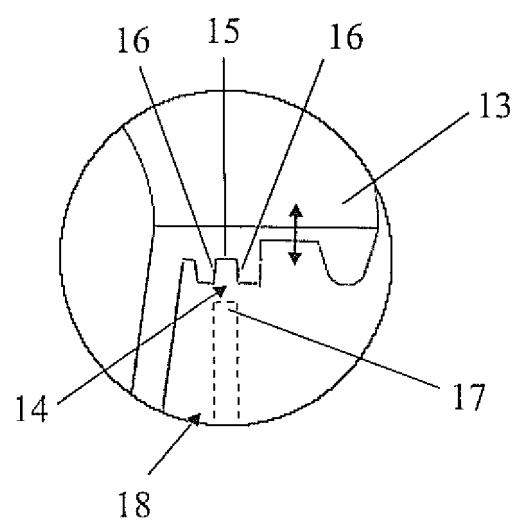


FIG. 4

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] The aim of the present invention is to provide a capsule for containing a preparation for 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.

[0019] A further aim of the invention is to provide a capsule for containing a preparation for a hot drink, having a relatively low cost.

[0020] The above aims are obtained by a capsule for containing a preparation for a hot drink, comprising a beaker-shaped body, destined to contain a batch of preparation, provided at a mouth thereof with a collar which extends in an external direction; the capsule, for extraction of the hot drink, being able to cooperate with an apparatus comprising at least an internal chamber suitable for receiving and retaining, in proximity of the upper region, the body of the capsule during the preparation of the drink, the internal chamber being delimited by at least a containing wall which identifies an upper peripheral edge destined to abut the lower surface of the collar of the body of the capsule during a step of coupling of the body with the internal chamber; the capsule being **characterised in that** it comprises, at the lower surface of the collar, at least an annular gully destined to couplingly sealingly receive the upper peripheral edge of the containing wall.

[0021] In preferred embodiments thereof, the capsule of the invention comprises one or more of the following characteristics, considered singly or in combination:

- the gully is shaped complementarily to the upper peripheral edge of the containing wall, such as to enable free insertion and/or extraction of the upper peripheral edge into and/or from the annular gully;
- the gully is shaped such as to enable an interference coupling with the upper peripheral edge of the containing wall;
- the gully deforms plastically during the coupling step with the upper peripheral edge, such as to maximise the seal of the coupling;
- the gully 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 gully 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.

[0022] 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;
- 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.

[0023] 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.

[0024] 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.

[0025] In known ways, the collar 13 extends from the lateral wall 12 in a substantially parallel direction with

respect to the bottom 11.

[0026] 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.

[0027] The body 10 is preferably made in a single body and made of polypropylene, which is completely non-toxic.

[0028] 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.

[0029] 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.

[0030] 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.

[0031] The capsule 1 comprises, in an innovative way, at least an annular gully 14 at the lower surface of the collar 13, which annular gully 14 is suitable for sealingly couplingly receiving the upper peripheral edge 17 of the containing wall 18.

[0032] In a preferred embodiment, the gully 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 gully 14.

[0033] To maximise the seal of the coupling, in a further embodiment the gully 14 is shaped such as to enable a friction coupling with the upper peripheral edge 17 of the containing wall 18.

[0034] The plastic deformation of the gully 14 during the coupling step with the upper peripheral edge 17 can also be comprised, by means of the edge itself.

[0035] 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 gully 14, which can deform during the step of coupling of the gully 14 with the upper peripheral edge 17.

[0036] From the above it clearly emerges how the capsule for containing a preparation for a hot drink of the invention is able to ensure excellent 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 step of dispensing the hot water.

[0037] The above is attained thanks to the excellent sealed coupling between the annular gully provided inferiorly of the collar of the capsule body, and the upper peripheral edge of the containing wall of the internal chamber.

[0038] In this case the bottom and the opposite lateral walls of the gully extendedly and stably embrace the upper peripheral edge of the containing wall of the internal chamber.

[0039] The realisation of the gully 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.

[0040] The capsule of the invention 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.

[0041] 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 capsule for containing a preparation for a hot drink, 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; the capsule (1), for extraction of the hot drink, being able to cooperate with an apparatus comprising at least an internal chamber suitable for receiving and retaining, in proximity of the upper region, the body (10) of the capsule (1) during the preparation of the drink, the 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; the capsule (1) being **characterised in that** it comprises, at the lower surface of the collar (13), at least an annular gully (14) destined to couplingly sealingly receive the upper peripheral edge (17) of the containing wall (18).
2. The capsule of claim 1, **characterised in that** the gully (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 gully (14).
3. The capsule of claim 1, **characterised in that** the gully (14) is shaped such as to enable an interference coupling with the upper peripheral edge (17) of the containing wall (18).
4. The capsule of one of claims from 1 to 3, **characterised in that** the gully (14) deforms plastically during the coupling step with the upper peripheral edge (17), such as to maximise the seal of the coupling.

5. The capsule of one of claims from 1 to 4, wherein the gully (14) identifies a bottom (15) and a pair of opposite lateral walls (16), **characterised in that** 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 gully (14) with the upper peripheral edge (17), such as to maximise the seal of the coupling.
6. The capsule of one of claims from 1 to 5, 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.

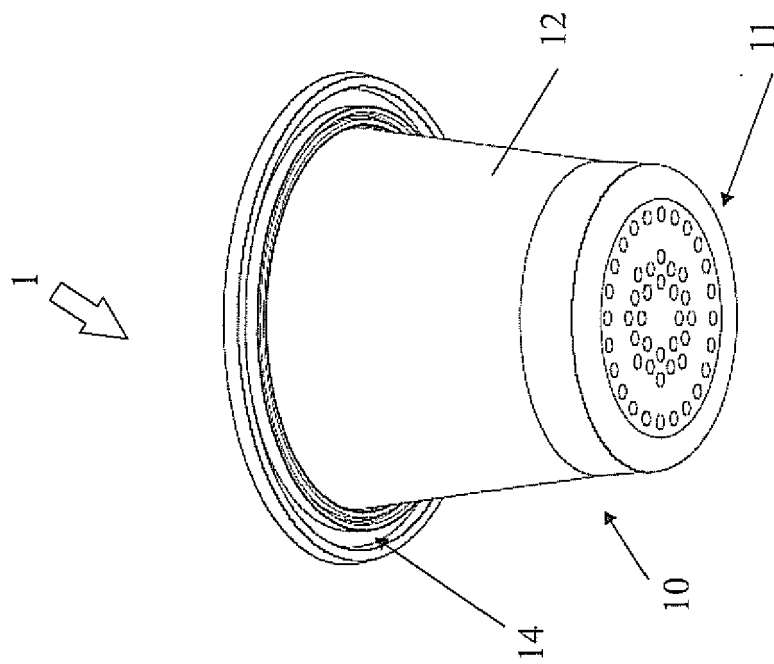


FIG. 2

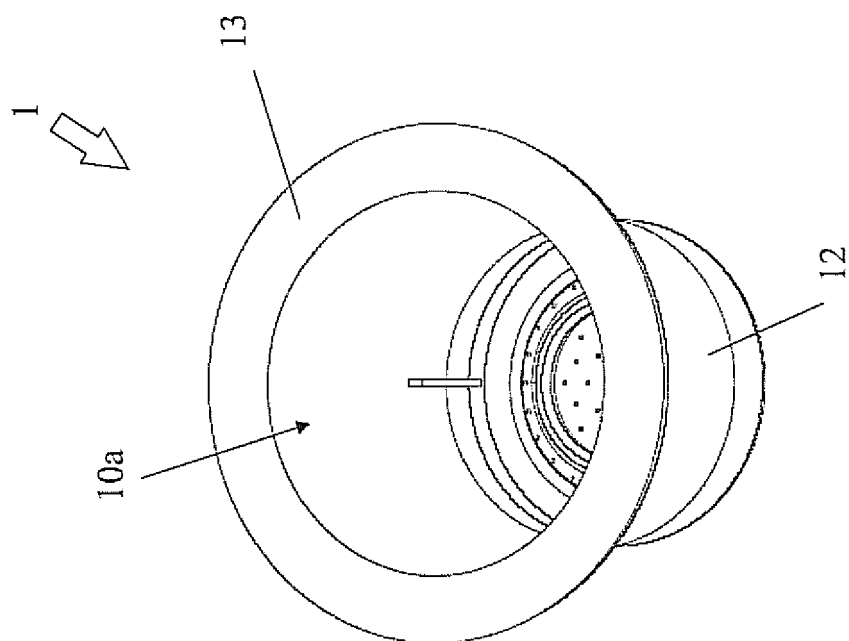
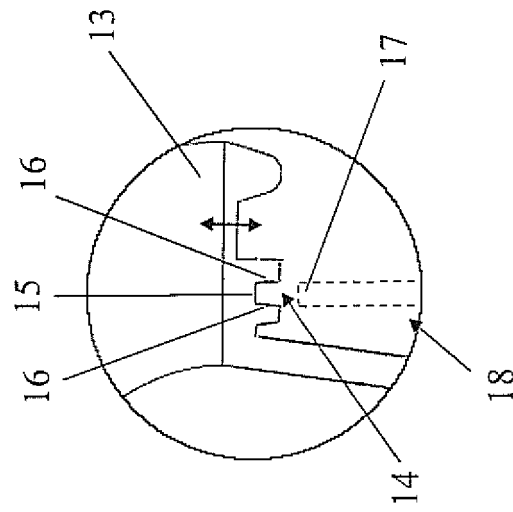
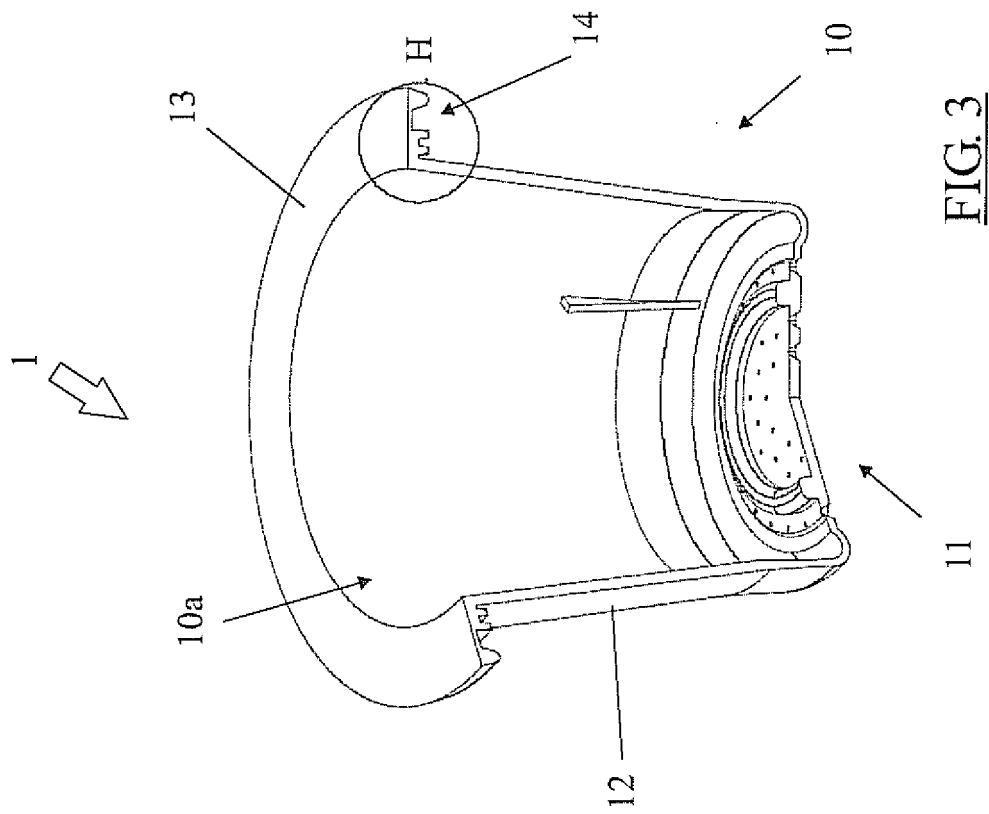


FIG. 1





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