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(54) **CAPSULE FOR PREPARING BEVERAGES**

KAPSEL ZUR ZUBEREITUNG VON GETRÄNKEN

CAPSULE DE PRÉPARATION DE BOISSONS

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(73) Proprietor: **Bisio Progetti S.p.a.**
15121 Alessandria (IT)

(72) Inventor: **BISIO, Stefano**
I-15121 Alessandria (IT)

(74) Representative: **Gualeni, Nadia**
Jacobacci & Partners S.p.A.
Piazza della Vittoria, 11
25122 Brescia (IT)

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Description

[0001] The present invention refers to a capsule for preparing beverages according to the preamble of claim 1. As known, the art proposes a wide variety of automatic or semi-automatic machines equipped with a preparing and delivering assembly adapted to produce an infusion through the passage of hot water through a capsule containing the essence to be infused or to be solubilized, such as for example tea, coffee, milk, chocolate, etc.

[0002] In particular, capsules of the known type are with a disposable pre-packaged dose of the substance to be infused or to be solubilized closed inside a container made of plastic material closed by a cover made of plastic or an aluminium sheet. US 2010/0068361 discloses a coffee capsule according to the preamble of the main claim. Moreover, there are different types of automatic or semi-automatic preparing machines for preparing beverages, each one of which using a different type of capsule: in general, however, the common operating principle of such machines provides for the perforation of the base and of the cover of such capsule, thereby allowing the crossing of the essence to be infused or to be solubilized contained therein by a flow of hot water delivered by an infusing assembly of the machine itself and its exit as infusion beverage.

[0003] However, depending on the particular beverage to be prepared, the amount of substance to be infused or to be solubilized which must be contained inside the capsule can change, and therefore the internal volume of the capsule itself must be adequate for keeping a substance in a suitably compressed status though keeping unchanged the external sizes of such capsule in order to be able to use it with its related delivering machine.

[0004] Object of the present invention is solving the above prior-art problems, by providing a capsule for preparing beverages, in particular coffee, equipped with reducing means which allow reducing the internal volume of such capsule to contain different amounts of the substance to be infused or to be solubilized depending on the specific beverage to be prepared, though keeping substantially unchanged the sizes and the external shapes of the capsule itself.

[0005] The above and other objects and advantages of the invention, as will appear from the following description, are obtained by a capsule for preparing beverages as claimed in Claim 1. Preferred embodiments and non-trivial variations of the present invention are claimed in the dependent Claims

[0006] It is intended that all enclosed claims are an integral part of the present disclosure.

[0007] It will be immediately obvious that numerous variations and modifications (for example related to shape, sizes, arrangements and parts with equivalent functionality) could be made to what is described, without departing from the scope of the invention as appears from the enclosed claims.

[0008] The present invention will be better described by some preferred embodiments thereof, given as a non-limiting example, with reference to the enclosed drawings, in which:

- Figure 1 is a longitudinally sectioned view of a capsule according to the present invention;
- Figure 2 shows a longitudinally sectioned view of a capsule that is not part of the present invention.

[0009] With reference to Figure 1, it is possible to note that the capsule 1 according to the present invention for preparing beverages, in particular coffee, comprises at least one containing body 3 having at least one base 5 and at least one opening 6 opposite to such base 5 and adapted to be closed by at least one cover (for example through an aluminium protective layer), such containing body 3 internally defining at least one internal volume V_I: advantageously, the capsule 1 according to the present invention further comprises means for reducing such internal volume V_I adapted to define inside such containing body 3 at least one reduced internal volume V_{INF} adapted to contain at least one substance to be infused or solubilized, typically in grain shape or in powder, where $V_{INF} < V_I$.

[0010] With reference to Figure 1, it is possible to note the capsule 1 according to the present invention in which such reducing means comprise at least one internal containing chamber 15 placed inside the containing body 3, such internal containing chamber 15 being overlapped in a first end thereof to the base 5 and having a second end thereof opposite to such first end closed by at least one closing layer 17 made of a micro-holed material connected to the related perimeter edge, for example through welding or gluing, of such internal containing chamber 15.

[0011] Instead, with reference in particular to Figure 2, it is possible to note a capsule in which the reducing means comprise at least one perimeter abutment edge 19 arranged inside the containing body 3, such perimeter abutment edge 19 being adapted to support the connection, for example through welding or gluing, of at least one related closing layer 21 made of a microholed material.

[0012] In particular, the capsule of above-described Figure 1 advantageously allows obtaining, in an easy, practical and cheap way, a reduction of the internal volume V_I of the containing body 3, which can be applied in particular when inside the capsule it is necessary to house a volume V_{INF} of substance to be infused or to be solubilized lower than the total internal volume V_I of the containing body 3 without implying the modification of the external shapes of the body 3 itself and, consequently, of the shape of the related infusion chamber of the machine inside which the capsule 1 must be inserted for preparing the beverage.

[0013] Advantageously, the base 5 is equipped with at least one nozzle 4 for exiting such beverage from such internal volume V_I, V_{INF} and comprises at least one in-

ternal surface at least partially equipped with at least one integrated structure with labyrinth path, having functions and shapes substantially known in the art in order to create a turbulent motion of the flow of hot water inside the substance to be infused or to be solubilized, such base 5 further comprising at least one passage opening fluid communicating such internal volume V_I, V_{INF} with such nozzle 4 by interposing such integrated structure with labyrinth path.

[0014] Moreover, in order to slow down the flow going towards the central area of the base 5 and make hot water diffuse inside the volume of the capsule 1 containing the substance to be infused or to be solubilized, and compelling it also to propagate towards the periphery of such internal volume V_I, V_{INF} before outflowing through the nozzle 4, at least one portion of the internal surface of such base 5 can be covered with at least one protecting layer, for example made of an aluminium sheet welded or glued onto such surface, arranged in such a way as not to interfere with the fluid passage through at least such passage opening: advantageously therefore, the protecting layer is arranged on such base 5 in such a way as not to obstruct such passage opening and therefore in the capsule 1 according to the present invention it is not necessary, as instead provided in prior art capsules, that the integrated structure with labyrinth path is also equipped with drilling or cutting means of such layers adapted to drill or tear the protecting layer itself in order to allow the passage of the beverage towards the delivery nozzle 4.

[0015] Moreover, preferably, such nozzle 4 comprises at least one exit cone, adapted to make laminar the flow of beverage going out of the nozzle 4 itself through the passage opening and the integrated structure with labyrinth path: in a preferred variation of the capsule 1 according to the present invention, such protecting layer has a substantially circular shape and is arranged above such superficie substantially corresponding to such exit cone.

[0016] In addition, it is possible to provide that at least one edge of at least one of such passage openings is equipped with at least one shaped deviating outline oriented at least partially in counter-current with respect to the flow direction through the nozzle 4, such deviating outline being adapted to enable bubbling of the beverage going out of the nozzle 4 itself.

[0017] In another preferred variation of the capsule 1 according to the present invention, the exit cone is radially equipped with a plurality of flexible wings adapted to pass, under the action of the pressure of the substance to be infused or to be solubilized contained in the internal volume V_I, V_{INF} of the capsule 1 itself and/or of the flow of hot waer crossing such substance to be infused or to be solubilized, from a first operating position in which such wings are far away from the base, to a second operating position in which such wings are at least on their perimeter in contact with such base by interposing at least one of such passage openings: advantageously, such flexible wings arranged in such second operating position are adapted to slow down the flow going towards the central area of the base 5 and make hot water diffuse inside the volume of the capsule 1 containing the substance to be infused or to be solubilized and forced to propagate also towards the periphery of such internal volume V_I, V_{INF} before outflowing through the nozzle 4.

Claims

1. Capsule (1) for preparing beverages, in particular coffee, comprising a containing body (3) having a base (5) and an opening (6) opposite to said base (5) and adapted to be closed by a cover, said containing body (3) internally defining at least one internal volume (V_I), **characterized in that** it comprises means for reducing said internal volume (V_I) adapted to define, inside said containing body (3), at least one reduced internal volume (V_{INF}) for containing at least one substance to be infused or to be solubilized, where $V_{INF} < V_I$,
said means comprising an internal containing chamber (15) placed inside said containing body (3), said internal containing chamber (15) being overlapped in a first end thereof with said base (5) and having a second end thereof, opposite to said first end, closed by a closing layer (17), said closing layer (17) being made of a microholed material,
wherein said closing layer (17) is connected to a perimeter edge of said second end of said internal containing chamber (15) through welding or gluing.

2. Capsule (1) according to claim 1, **characterized in that** said base (5) is equipped with an exit nozzle (4) of said infusion beverage from said internal volume (V_I, V_{INF}) and comprises at least one internal surface equipped with an integrated structure with labyrinth path,
said base (5) further comprising at least one passage opening fluid communicating said internal volume (V_I, V_{INF}) with said nozzle (4) by interposing said integrated structure with labyrinth path.

3. Capsule (1) according to claim 2, **characterized in that** at least one portion of the internal surface of said base (5) is covered with at least one protecting layer arranged in order not to interfere with a fluid passage at least through said passage opening.

4. Capsule (1) according to claim 3, **characterized in that** said nozzle (4) comprises at least one exit cone and said protecting layer has a substantially circular shape and is arranged above said superficie substantially corresponding with said exit cone.

5. Capsule (1) according to the previous claim, **characterized in that** said exit cone is radially equipped

with a plurality of flexible wings adapted to pass, under the action of the pressure of said substance to be infused or to be solubilized contained in said internal volume (V_I, V_{INF}) and/or of a flow of hot water crossing said substance, from a first operating position in which said wings are away from said base (5) to a second operating position in which said wings are at least on their perimeter in contact with said base (5) by interposing at least one of said passage openings.

6. Capsule (1) according to any one of the previous claims, **characterized in that** at least one edge of at least one of said passage openings is equipped with at least one shaped deviating outline to be oriented at least partially in counter-current with respect to a flow direction through said nozzle.

Patentansprüche

1. Kapsel (1) zum Zubereiten von Getränken, insbesondere Kaffee, umfassend einen Beinhaltungskörper (3) aufweisend eine Basis (5) und eine Öffnung (6) gegenüberliegend zu der Basis (5) und ausgelegt, um durch eine Abdeckung verschlossen zu werden, wobei der Beinhaltungskörper (3) mindestens ein inneres Volumen (V_I) intern definiert,
dadurch gekennzeichnet, dass sie Mittel zum Reduzieren des internen Volumens (V_I) umfasst ausgelegt, um innerhalb des Beinhaltungskörpers (3) mindestens ein reduziertes internes Volumen (V_{INF}) zu definieren zum Beinhalten von mindestens einer Substanz, die aufzugießen ist oder die aufzulösen ist, wobei $V_{INF} < V_I$,
wobei die Mittel eine interne Beinhaltungskammer (15) umfassen, die innerhalb des Beinhaltungskörpers (3) platziert ist, wobei die interne Beinhaltungskammer (15) an einem ersten Ende davon mit der Basis (5) überlappend ist und ein zweites Ende davon gegenüberliegend zu dem ersten Ende aufweist, das durch eine Verschlussschicht (17) verschlossen ist, wobei die Verschlussschicht (17) aus einem mikrolöchrigen Material hergestellt ist,
wobei die Verschlussschicht (17) mit einem Umfangsrand des zweiten Endes der internen Beinhaltungskammer (15) verbunden ist durch Schweißen oder Kleben.

2. Kapsel (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** die Basis (5) mit einer Ausgangsdüse (4) des aufzugießenden Getränks aus dem internen Volumen (V_I, V_{INF}) ausgestattet ist und mindestens eine interne Fläche umfasst, die mindestens teilweise mit einer integrierten Struktur mit einem Labyrinthpfad (7) ausgestattet ist, wobei die Basis (5) ferner mindestens eine Durchgangsöffnung umfasst, die fluidisch das interne Volumen (V_I , V_{INF}) mit der Düse (4) verbindet durch Zwischenschalten der integrierten Struktur mit dem Labyrinthpfad.

3. Kapsel (1) nach Anspruch 2, **dadurch gekennzeichnet, dass** mindestens ein Bereich der internen Fläche der Basis (5) mit mindestens einer Schutzschicht abgedeckt ist, die arrangiert ist, um nicht mit einem Fluiddurchgang mindestens durch die Durchgangsöffnung zu interferieren.

4. Kapsel (1) nach Anspruch 3, **dadurch gekennzeichnet, dass** die Düse (4) mindestens einen Ausgangskegel umfasst und dass die Schutzschicht eine im Wesentlichen kreisförmige Form aufweist und über der Oberfläche im Wesentlichen korrespondierend mit dem Ausgangskegel arrangiert ist.

5. Kapsel (1) nach dem vorherigen Anspruch, **dadurch gekennzeichnet, dass** der Ausgangskegel radial mit einer Mehrzahl von flexiblen Flügeln ausgestattet ist, die ausgelegt sind, unter der Wirkung des Drucks von der in dem internen Volumen (V_I, V_{INF}) beinhalteten Substanz, die aufzugießen ist oder die aufzulösen ist, und/oder von einem Strom von heißem Wasser, der die Substanz durchquert, überzugehen von einer ersten Betriebsposition, in der die Flügel fern der Basis (5) sind, zu einer zweiten Betriebsposition, in der die Flügel wenigstens an ihrem Umfang in Kontakt mit der Basis (5) sind mittels dazwischen Stellen bei mindestens einer der Durchgangsöffnungen.

6. Kapsel (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** mindestens ein Rand von mindestens einer der Durchgangsöffnungen mit mindestens einer geformten abweichenden Außenlinie ausgestattet ist, die mindestens teilweise gegenströmig in Bezug auf eine Stromrichtung durch die Düse zu orientieren ist.

Revendications

1. Capsule (1) de préparation de boissons, en particulier de café, comprenant un corps de contenant (3) ayant une base (5) et une ouverture (6) opposée à ladite base (5) et adapté pour être fermé par un couvercle, ledit corps de contenant (3) définissant à l'intérieur au moins un volume interne (V_I),
caractérisée en ce qu'elle comprend des moyens de réduction dudit volume interne (V_I) adaptés pour définir, à l'intérieur dudit corps de contenant (3), au moins un volume interne réduit (V_{INF}) pour contenir au moins une substance à infuser ou à solubiliser, où $V_{INF} < V_I$,
lesdits moyens comprenant une chambre de contenant interne (15) placée à l'intérieur dudit corps de contenant (3), ladite chambre de contenant interne

(15) étant chevauchée dans une première extrémité de celle-ci avec ladite base (5) et ayant une deuxième extrémité de celle-ci, opposée à ladite première extrémité, fermée par une couche de fermeture (17), ladite couche de fermeture (17) étant réalisée en un matériau micro-troué,
dans laquelle ladite couche de fermeture (17) est reliée à un bord périmétrique de ladite deuxième extrémité de ladite chambre de contenant interne (15) par soudage ou collage.

2. Capsule (1) selon la revendication 1, **caractérisée en ce que** ladite base (5) est équipée d'une buse de sortie (4) de ladite boisson d'infusion dudit volume interne (V_I, V_{INF}) et comprend au moins une surface interne équipée d'une structure intégrée avec chemin de labyrinthe (7),
ladite base (5) comprenant en outre au moins une ouverture de passage, mettant en communication fluidique ledit volume interne (V_I, V_{INF}) avec ladite buse par interposition de ladite structure intégrée avec chemin de labyrinthe.

3. Capsule (1) selon la revendication 2, **caractérisée en ce qu'**au moins une partie de la surface interne de ladite base (5) est recouverte d'au moins une couche de protection agencée pour ne pas interférer avec un passage de fluide au moins à travers ladite ouverture de passage.

4. Capsule (1) selon la revendication 3, **caractérisée en ce que** ladite buse (4) comprend au moins un cône de sortie et ladite couche de protection a une forme sensiblement circulaire et est agencée au-dessus de ladite superficie correspondant sensiblement audit cône de sortie.

5. Capsule (1) selon la revendication précédente, **caractérisée en ce que** ledit cône de sortie est équipé radialement d'une pluralité d'ailes souples adaptée pour passer, sous l'action de la pression de ladite substance à infuser ou à solubiliser contenue dans ledit volume interne (V_I, V_{INF}) et/ou d'un flux d'eau chaude traversant ladite substance, d'une première position de fonctionnement dans laquelle lesdites ailes sont éloignées de ladite base (5) à une deuxième position de fonctionnement dans laquelle lesdites ailes sont au moins sur leur périmètre en contact avec ladite base (5) par interposition d'au moins une desdites ouvertures de passage.

6. Capsule (1) selon l'une quelconque des revendications précédentes, **caractérisée en ce qu'**au moins un bord d'au moins une desdites ouvertures de passage est équipé d'au moins un contour conformé de déviation à orienter au moins partiellement en contre-courant par rapport à une direction de flux à travers ladite buse.

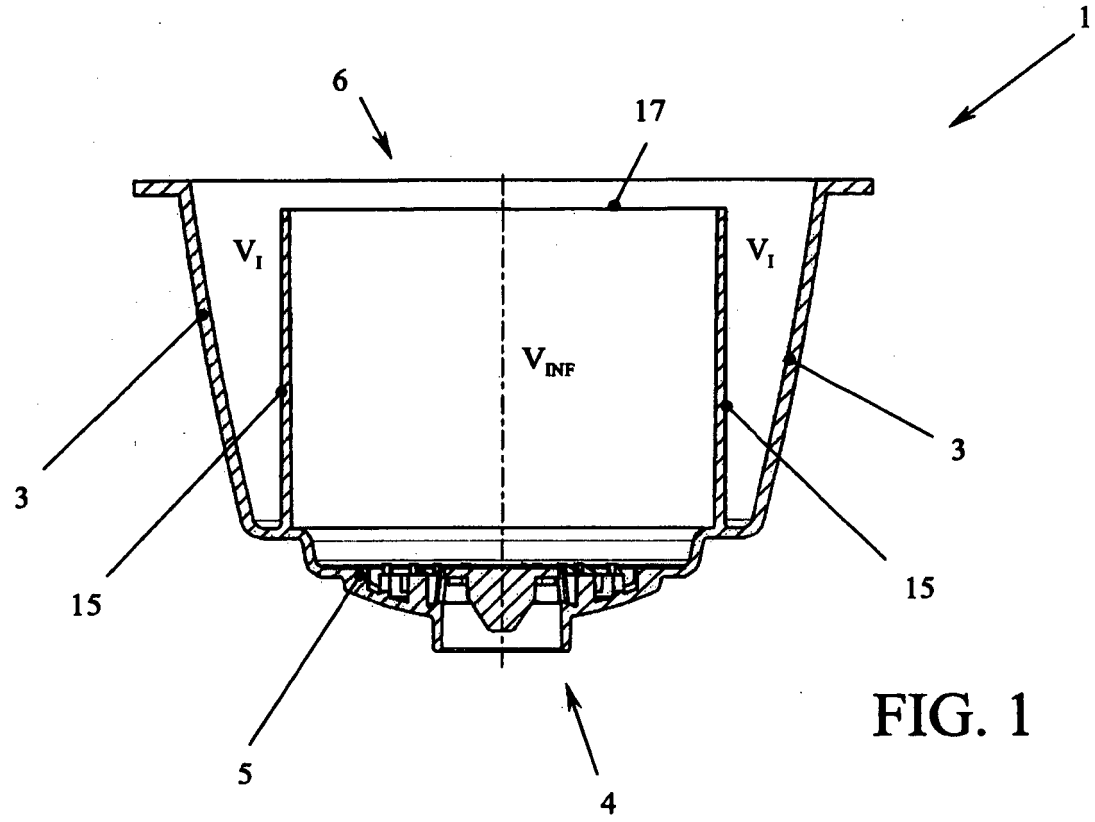

FIG. 1

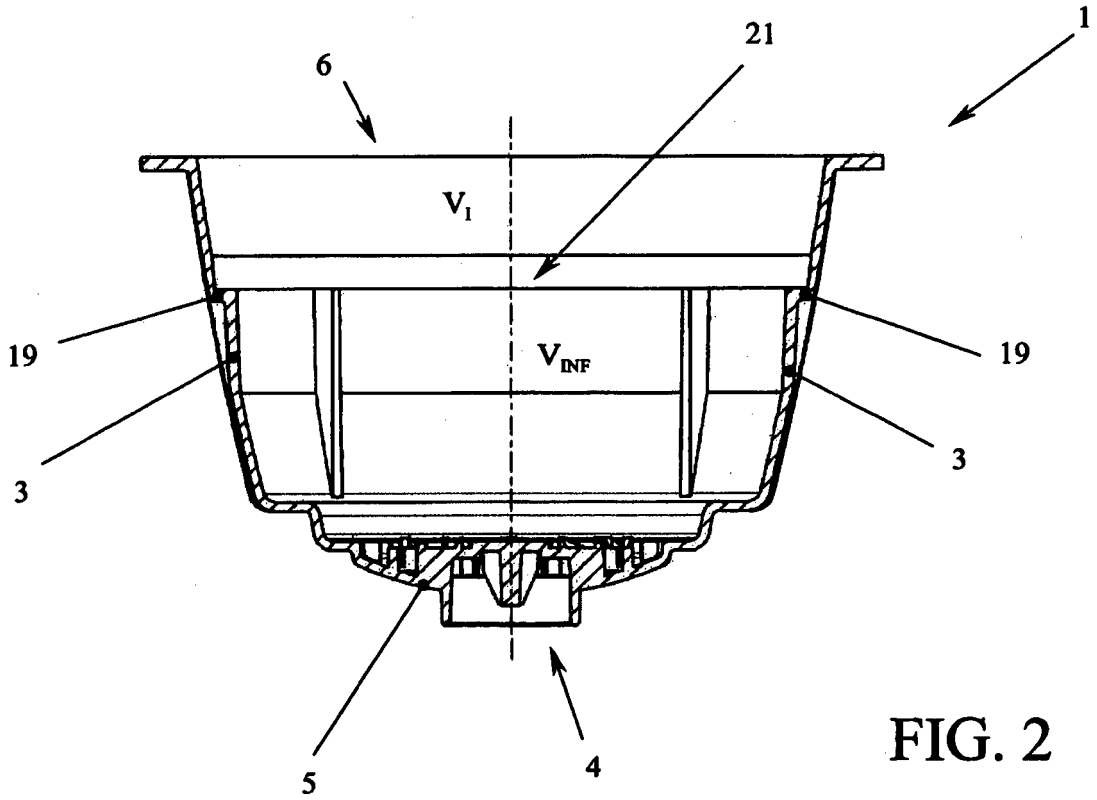

FIG. 2

REFERENCES CITED IN THE DESCRIPTION

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