

Single-dose plastic capsule for powdered coffee and the like

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Description

5 The present invention relates to a single-dose capsule made of moulded plastic and intended for coffee and other alimentary raw materials which are used for the preparation of beverages by means of percolation.

10 A capsule consists essentially of a casing with a frustoconical shape which is filled with coffee powder (or other powdery raw material) and has a peripheral edge onto which a sealing foil is applied. Said foil, at the time of use of the capsule in a professional and/or domestic machine for the preparation of *espresso* coffee and/or other hot beverages, is directed downwards, namely on the opposite side to the point of entry of the hot water under pressure into the capsule.

15 As a typical example of the state of the art, the Applicant cites the European patent EP-A-0 521 510 where it is envisaged forming, with the said foil, the flat bottom of the capsule and creating zones of reduced thickness so as to favour tearing of the foil at the time of preparation of the beverage, under the pressure of the water which passes through the powdery raw material in a vertical direction of flow.

The resultant percolated beverage is conveyed along inaccessible pipes inside the coffee machine and then dispensed.

20 The use of conventional capsules - owing to their particular constructional design - has the drawback that, since it is not possible to ensure the absolute cleanliness of the said internal pipes, there is the risk of fermentation or putrefaction of the fatty substances contained in the beverage (in particular in coffee). The least negative consequence is an undesirable alteration of the taste of the beverage.

25 Moreover, it is more difficult, compared to the use of loose coffee powder, to obtain the emulsification of the fatty substances in the coffee - namely the creamy coffee texture which makes Italian-style *espresso* coffee so popular world-wide - precisely owing to the presence of said pipes.

30 Other documents representing the state of art are EP-A-469 079, EP-A-512 148 and US-A-5 287 797.

The object of the present invention is to provide a moulded-plastic capsule intended for coffee and other raw materials for the preparation of beverages by means of percolation, which does not have the abovementioned drawback and which allows

high-quality beverages to be obtained.

These and other objects are achieved by providing a capsule having the characteristic features of the appended claims, as will be clarified by the following description of a non-exclusive embodiment with reference to the accompanying drawing in which:

- Fig. 1 is a three-dimensional view, from above, of an open capsule according to the invention;

- Fig. 2 is a three-dimensional view from below;

- Fig. 3 is a plan view from above;

- Fig. 4 is a cross-section through the said capsule along line A-A in Fig. 3.

A capsule according to the invention consists of a casing 10 with a slightly frustoconical shape which is made by thermoforming a sheet of polypropylene for alimentary use. The casing 10 has a continuous upper peripheral edge 12 projecting outwards and a bottom non-projecting edge 14. The upper edge 12 is designed to be sealed with a foil 13 of plastic material and/or aluminium. A foil of this kind, as well as its function in single-dose containers of alimentary products, is well known per se to persons skilled in the art, so that it is not considered necessary to describe it in further detail.

According to a characteristic feature of the invention, the end wall 16 of the casing 10 is inset with respect to the bottom edge 14; basically, as shown in detail in Fig. 4, there exist at least two steps between the edge 14 and the outer surface 18 of the end wall 16. In this way, underneath the upper chamber 25, which contains the powdery raw material, a bottom chamber 30 is formed, said chamber being able to receive and convey the percolated beverage, as explained more fully below, and being closed by a second foil 17. This second foil is preferably formed by a triple layer of film combined with aluminium so as to ensure that the capsule is impermeable and hygienic, it not being considered necessary to describe said foil in greater detail for the same reasons given above in connection with the foil 13.

According to another characteristic feature of the invention, the end wall 16 of the casing 10 has, around a central core having an upper portion in the shape of conical cusp 20 and a substantially cylindrical lower portion 22, consisting of several longer cylindrical segments 31 separated from one another by shorter cylindrical

segments 32 (see Fig. 2), a plurality of orifices 24 which are distributed in segments separated by radial ribs 26 (see Figs. 2 and 4).

The present capsule is used in a machine equipped with punching or drilling means able to create in the upper foil 13 a path (not shown) for the incoming pressurized hot water and a spout (also not shown) directly in the second foil 17, immediately before the start of the percolation of the beverage through the orifices 24. Owing to the combined effect of the pressurized hot water fed from above into the capsule and the shape of the end wall 16, in particular the radial ribs 26, the beverage fills the abovementioned bottom chamber 30 with a turbulent movement which favours emulsification of the fatty substances. In this way, for example an Italian-style creamy coffee of excellent quality is obtained.

Moreover, the beverage is dispensed - through the spout created in the second foil 17 - directly into an underlying cup or glass, without being conveyed through the traditional pipes inside the machine and consequently without the risks mentioned hereinabove.

Although the description provided hereinabove relates to a preferred embodiment, it is understood that the invention may be developed with different forms and variants which are included within the following claims.

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Claims

1. Single-dose capsule for the preparation of a percolated beverage using a powdery raw material such as coffee, comprising

- a casing (10) having an upper peripheral edge (12) and a bottom peripheral edge (14) to which an upper sealing foil (13) and a bottom sealing foil (17) are attached, respectively,

- a lower end wall (16) provided with orifices (24) and inset with respect to said bottom edge (14),

- an upper chamber (25) filled with the raw material which is formed between said upper sealing foil (13) and said end wall (16),

characterized in that said end wall (16) comprises a central core and a plurality of radial ribs (26) directed downwards around said central core for the separation of the segments in which said orifices (24) are distributed, with the result to form a bottom chamber (30) underneath said upper chamber (25) and that the beverage percolated through the orifices (24) fills said bottom chamber (30) with a turbulent movement prior to be dispensed towards an underlying container through a spout created at the moment of opening or tearing of said bottom sealing foil (17).

2. Single-dose capsule for the preparation of a percolated beverage according to Claim 1, characterized in that said central core of the end wall (16) of the capsule has an upper portion in the shape of a conical cusp (20) and a lower portion (22) substantially cylindrical.

3. Single-dose capsule for the preparation of a percolated beverage according to Claim 2, characterized in that said substantially cylindrical lower portion (22) of the central core in the end wall (16) of the capsule consists of several longer cylindrical segments (31) separated from one another by shorter cylindrical segments (32).

4. Single-dose capsule for the preparation of a percolated beverage according to Claim 1, characterized in that the said bottom sealing foil (17) consists of a triple layer of film combined with aluminium.

5. Single-dose capsule for the preparation of a percolated beverage according to claim 1, characterized in that the casing (10) has a slightly frustoconical shape and is made preferably by means of thermoforming with a polypropylene grade compatible with foodstuff.

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6. Single-dose capsule for the preparation of a percolated beverage according to claim 1, characterized in that the upper edge (12) of the casing (10) is continuous and projecting outwards.

5 7. Single-dose capsule for the preparation of a percolated beverage according to claim 1, characterized in that the bottom edge (14) of the casing (10) is non-projecting.

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