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(54) Coffee capsule

(57) A coffee capsule, which is configured to receive roasted and ground coffee and is suitable for preparing an espresso beverage using pressurised hot water in an espresso machine, consists of a capsule part and a membrane attached thereto. The capsule part is a frustoconical plastics part with a conical side wall and has a top part (5) with a retaining plate (6) integrally formed on the small frustoconical diameter. The retaining plate (6) has at least one perforation zone with perforations (7) which permit the entry of hot water into the coffee capsule (1). The retaining plate (6) has a contact surface to which an aroma-protection foil (8) completely covering the at least one perforation zone may be attached.

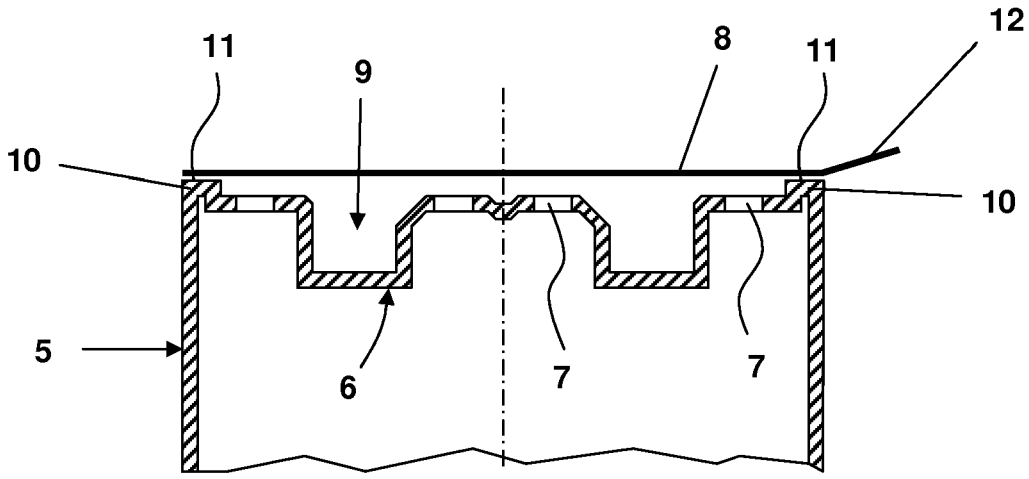

Fig. 2

EP 2 757 057 A1

Description

[0001] The invention relates to a coffee capsule according to Claim 1, consisting of a capsule part and a membrane attached thereto, the coffee capsule being configured to receive roasted and ground coffee and being suitable for preparing an espresso beverage using pressurised hot water in an espresso machine.

[0002] The invention relates, in particular, to a coffee capsule in which the capsule part is a frustoconical plastics part with a conical side wall and in which a top part with a retaining plate integrally formed on the small frustoconical diameter is present. In this case, the retaining plate has at least one perforation zone with perforations which permit the entry of hot water into the coffee capsule. The aforementioned membrane is tearable and is attached to a flange integrally formed on the large frustoconical diameter and covers the capsule part on the outlet side.

[0003] For over 20 years, Nestlé SA has successfully sold portion packs by which coffee is able to be extracted under pressure in espresso machines. Said portion packs are known in several shapes but conical capsules have particularly dominated the market. The machines available therefor have a so-called brewing chamber which substantially corresponds to the shape of the capsule. The capsules are retained in the machine in a clamped and sealed manner, whereupon a plurality of injection needles or tearing spikes on the top part penetrate the capsule and whereby pressurised hot water enters the capsule. The membrane attached to the other end is torn in a grid-like pattern under pressure on puncture teeth on a counterpressure plate in the espresso machine and thus the espresso beverage is effectively able to flow out through a sieve.

[0004] After various patents relating to said capsules have expired in the meantime, rival capsules have now come onto the market which are designed such that they are able to be used in a compatible manner for espresso machines which are already available.

[0005] For ecological reasons and also for economic reasons, the compatible capsules which are currently on the market consist of plastics. This means that the capsules have to be designed so that the injection needles on the machine side do not come into contact with the portion pack made of plastics as the hot injection needles would cause the plastics capsules to be fused thereon, which would lead to the injection needles sticking together and thus would result in the outlet openings of said injection needles becoming blocked. The spikes heated by the hot water would soften the plastics material and said plastics material would surround the spikes in a sealed manner and prevent the correct inflow of water. The plastics residue remaining on the spikes additionally leads to the spikes becoming blunt which over time would no longer be capable of functioning. Accordingly, said capsules are either generally lower in height than the original capsules from Nestlé SA or they have a suitable annular groove.

[0006] A further problem is the aroma preservation in alternative coffee capsules. In the original capsules from Nestlé SA, the ground coffee contained in the coffee capsule is enclosed on all sides by an aluminium wall. This is advantageous for long-term storage and for the preservation of the coffee aroma, but is complex and costly due to the aluminium used. In order to avoid the risk of infringement of protection rights in capsule systems which are closed on all sides, therefore, measures have been taken to market compatible capsules made of plastics material which are no longer closed on all sides but reliably enclose the ground coffee contained in the capsules, albeit not in an airtight manner. Naturally, further measures are required for the long-term storage and for ensuring the aroma preservation.

[0007] One of the options used for ensuring the quality and the aroma preservation is, therefore, to pack capsules made of plastics, which are compatible but which are no longer closed on all sides, either individually or in small portions additionally in individual airtight and aroma-preserving sachets. Such a solution is, for example, disclosed in EP-0 524 464.

[0008] Solutions with removable protective covers are also known in principle, for example from DE-202005021160-U1. This disclosure relates to a multipart portion capsule in which individual capsule components, such as for example a cover to be punctured, consist of a gastight multi-layered composite material with thermoplastic polymer components. On the outlet side, a removable foil also consisting of the gastight multi-layer composite material is provided. Due to the composite material provided, therefore, in principle the above-mentioned problem is also present here with the injection needles which tend to become gradually blocked. This solution is, therefore, unsuitable for Nespresso-compatible capsules made of plastics material as it is desirable to avoid any puncturing the plastics parts.

[0009] It is, therefore, the object of the invention to specify a Nespresso-compatible coffee capsule which consists of the largest possible proportion of plastics, in which materials which would impair the function do not have to be punctured and in which the capacity for long-term storage and the preservation of the coffee aroma are nevertheless ensured.

[0010] This object is achieved by the features of Claim 1.

[0011] In a generic coffee capsule with a capsule part made of plastics, the solution consists in the retaining plate having a contact surface to which an aroma-protection foil, which completely covers the at least one perforation zone which is present, is able to be attached on the inlet side.

[0012] Preferably, in this case the contact surface is an annular surface which is attached to an annular projection integrally formed on the retaining plate. This facilitates the production due to the simplicity of shape. Although there is no requirement for an annular surface,

it has to be a contact surface based on an enclosed line.

[0013] The object, namely a Nespresso-compatible coffee capsule with the largest possible proportion of plastics material, may be achieved by such a design, i. e. with a capsule part made of plastics with, for example, an aroma-preserving coating sprayed on the inside or outside, a thin tearable (outlet) membrane made of aluminium or similar-acting material and an aroma-protection foil also consisting of coated plastics. Before use, only the aroma-protection foil has to be removed. There is no risk of soiling or blockage of the injection needles. Alternatively, an aroma-protection foil made of aluminium may also be connected fixedly to the contact surface. Thus there is no longer a requirement for prior removal of the aroma-protection foil, as there is also no risk of soiling or blockage of the injection needles.

[0014] A preferred exemplary embodiment of the invention is described in more detail hereinafter with reference to the drawings, in which:

Fig. 1 shows a side view of a coffee capsule according to the invention, and

Fig. 2 shows a partial section through the top part of a coffee capsule according to Fig. 1.

[0015] Fig. 1 shows a side view of a coffee capsule 1 according to the invention. The coffee capsule 1 consists substantially of a capsule part 2 with an annular flange protruding laterally and a membrane 3 which is attached to the flange and seals the coffee capsule 1 but which is tearable. The capsule part 2 is a frustoconical plastics part with a conical side wall 4 and a top part 5 with a retaining plate 6 integrally formed on the small frustoconical diameter. The retaining plate 6 has at least one perforation zone with perforations 7 (see Fig. 2) which permit the entry of hot water into the coffee capsule. An aroma-protection foil 7 completely covering the at least one perforation zone is attached to the retaining plate 6.

[0016] Fig. 2 shows a partial section through the top part 5 of the coffee capsule 1 according to Fig. 1. The retaining plate 6 has an internal concentric annular groove 9 into which the aforementioned injection needles of the espresso machine are able to protrude, without coming into contact with the plastics material of the retaining plate 6. The retaining plate 6 also has an integrally formed, annular, external and also concentric projection 10 with a contact surface which is configured as an annular surface 11. The retaining plate 6 also has the aforementioned perforations 7, in this case in a first internal perforation zone in the vicinity of the centre and in a second external perforation zone in the vicinity of the projection. The through-holes of the perforations 7 are distributed in a circular manner in both perforation zones. The aroma-protection foil 8 is attached to the annular surface 11 of the projection 10. The aroma-protection foil 8 may, depending on the choice of material, be fixedly or removably attached to the annular surface 11. The aroma-protection foil 8 is attached such that all perforation zones present are covered and thus forms reliable aroma protection in the region of the retaining plate 6.

[0017] The retaining plate 6 and the contact surface may, however, also be configured differently. It has already been mentioned in the introduction that the coffee capsule 1 may also have a lower overall height than the original capsules from Nestlé SA. In this case, the annular groove 6 present in the example shown may be either smaller or even be entirely dispensed with. On the other hand, the contact surface itself may also have a different shape. In order to achieve a complete covering of the perforation zone(s) present, only a corresponding shaped piece is required for the aroma-protection foil 8. This could, for example, also be rectangular with perforations arranged in a rectangular manner.

[0018] The aroma-protection foil may be securely attached to the contact surface, for example by welding. If the aroma-protection foil 8 consists of aluminium or a different material having no negative effect on the injection needles over a long period, this solution may readily be taken into consideration. If the aroma-protection foil 8, however, consists of a plastics material, it may be attached releasably and/or removably to the contact surface, for example by adhesive bonding. In this case, a pull tab 12 may be present on the aroma-protection foil 8. If the aroma-protection foil 8 is thus made of plastics material, for improving the aroma preservation it may, for example, be provided with a vapour-deposited aluminium coating.

[0019] In order to ensure or to improve the capacity for long-term storage and aroma preservation of the coffee, the remaining components of the coffee capsule 1, namely the frustoconical capsule part 4 and the membrane 3, may also be naturally provided with aroma-preserving properties. In this case, the aroma-preserving properties may also be achieved in a similar manner to the aroma-protection foil by a suitable coating of the frustoconical capsule part and/or the membrane. Coatings in this case may applied to the inside or outside, for example also by being sprayed on.

List of reference numerals

[0020]

1	Coffee capsule
2	Capsule part
3	Membrane
4	Conical side wall
5	Top part
6	Retaining plate
7	Perforation
8	Aroma-protection foil
9	Annular groove
10	Projection
11	Annular surface
12	Pull tab

Claims

1. Coffee capsule (1) consisting of a capsule part (2) and a membrane (3) attached thereto, the coffee capsule (1) being configured to receive roasted and ground coffee and being suitable for preparing an espresso beverage using pressurised hot water in an espresso machine, wherein
the capsule part (1) being a frustoconical plastics part with a conical side wall (4), which has a top part (5) with a retaining plate (6) integrally formed on the small frustoconical diameter, and the retaining plate (6) having at least one perforation zone with perforations (7) which permit the entry of hot water into the coffee capsule (1),
characterised in that
the retaining plate (6) has a contact surface to which an aroma-protection foil (8) completely covering the at least one perforation zone is able to be attached.

2. Coffee capsule (1) according to Claim 1, **characterised in that** the contact surface is an annular surface (11) and **in that** the annular surface (11) is attached to an annular projection (10) integrally formed on the retaining plate (6).

3. Coffee capsule (1) according to Claim 1 or 2, **characterised in that** the aroma-protection foil (8) is an aluminium foil which is able to be punctured.

4. Coffee capsule (1) according to Claim 1 or 2, **characterised in that** the aroma-protection foil (8) is removably attached to the contact surface and has an integrally formed pull tab (12).

5. Coffee capsule (1) according to one of Claims 1 to 4, **characterised in that** the frustoconical capsule part (2) and the membrane (3) have aroma-preserving properties.

6. Coffee capsule (1) according to Claim 5, **characterised in that** a coating of the frustoconical capsule part (2) and/or the membrane (3) with aroma-preserving properties is present.

7. Coffee capsule (1) according to Claim 6, **characterised in that** the coating is sprayed onto the inside or outside.

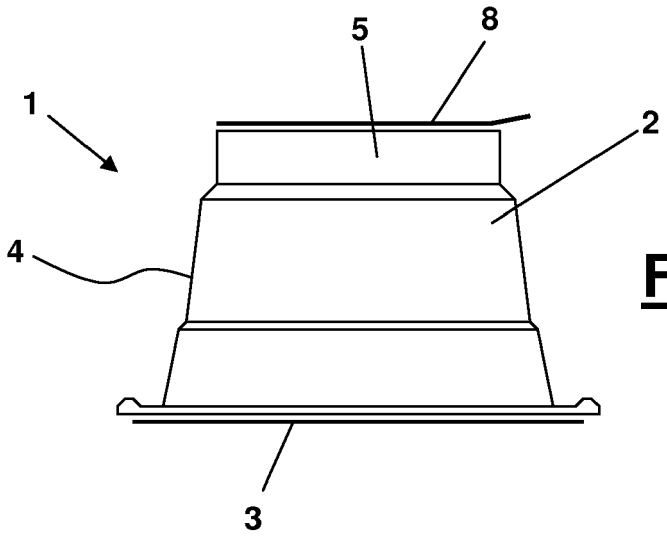

Fig. 1

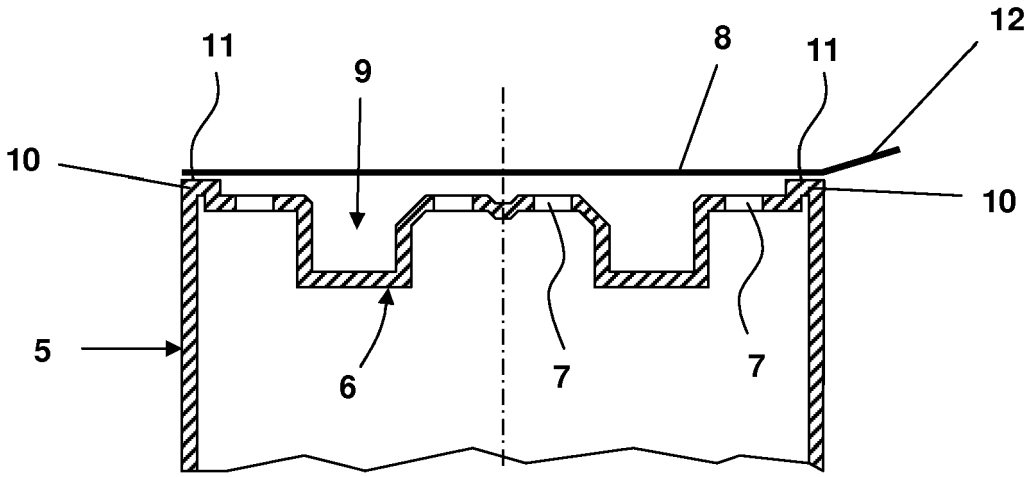

Fig. 2

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EUROPEAN SEARCH REPORT

Application Number
EP 14 15 0410

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	ES 1 075 815 U (INVENTOS PARA SIST S VENDING S L [ES]) 12 December 2011 (2011-12-12) * page 6, line 10 - page 7, line 14 * * figures 2, 4 *	1-7	INV. B65D85/816
X	ES 2 234 445 A1 (NAVARRO ALCANTARA FRANCISCO [ES]) 16 June 2005 (2005-06-16) * column 4, line 23 - column 8, line 7 * * figure 3 *	1-3,5-7	
A	US 5 108 768 A (SO PETER K L [CA]) 28 April 1992 (1992-04-28) * column 4, lines 10-16 *	4	
			TECHNICAL FIELDS SEARCHED (IPC)
			B65D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	2 May 2014	Duc, Emmanuel

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 14 15 0410

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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02-05-2014

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ES 1075815 U	12-12-2011	EP 2650234 A1	16-10-2013
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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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- EP 0524464 A **[0007]**
- DE 202005021160 U1 **[0008]**