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(54) **SINGLE MEASURE CAPSULE FOR ESPRESSO COFFEE MACHINES**

(57) The present invention relates to a capsule made of injected plastic which has a general frustoconical shape and a larger open base provided with a wide circumferential flange. Once the capsule is filled, this base is sealed with a cover made of aluminum or a suitable material. The bottom of the capsule has a perimetral supporting foot and a central area provided with multiple uni-

formly distributed perforations. Said central area is sunken or recessed towards the inside of the capsule, such that a hollow space with sufficient height so as to prevent the perforating means of the machine from penetrating into the capsule is established between the perforated central area and the support plane of the capsule, the cleanliness thus being fully maintained.

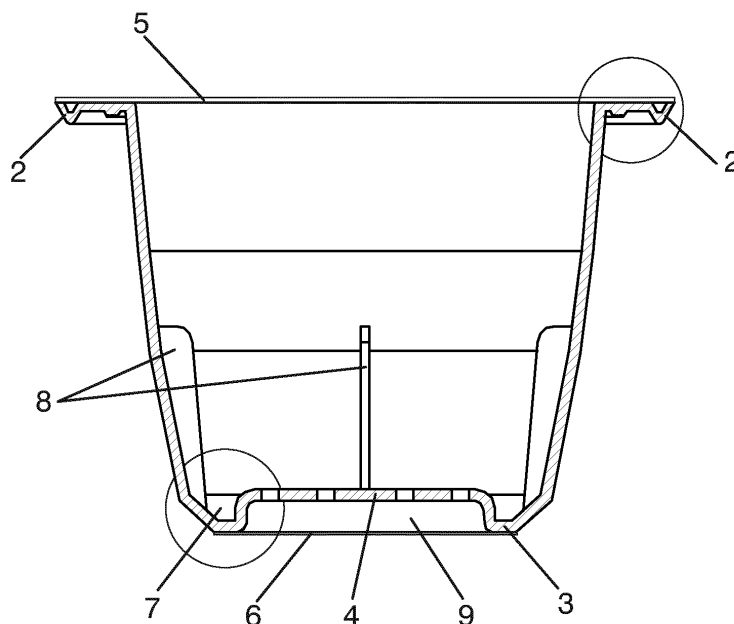


FIG. 2

Description

[0001] The present invention relates to a single-serve capsule for preparing espresso coffee which can be used in machines in which the supply thereof requires perforating the base of the capsule to allow the passage of pressurized hot water into the capsule.

Background of the Invention

[0002] Capsules such as those described in EP 1,190,959 manufactured from deep drawn aluminum and closed in a leak-tight manner with a cover which is also made of aluminum or of a suitable material are used today so that the product contained in the capsule does not lose its properties during transport and storage. The capsule has a frustoconical shape base or bottom which must be perforated so that the pressurized hot liquid penetrates into the capsule and causes the supply, for which purpose the machine has several perforating fingers or teeth. The base of the capsule which is closed with the cover is coupled in a leak-tight manner to the machine which has second perforating means, such that said second means perforate the cover so that the infusion goes into a cup once filtered, for which purpose the machine incorporates filtering means.

[0003] As described in EP 1,190,959, such capsule has a fabric layer, preferably made of polyurethane, which is located at the bottom of the capsule and the purposes of which are, on one hand, given flexibility of polyurethane, to prevent the perforating means from contacting the content of the capsule and, on the other, to form a barrier preventing the return of coffee residues, which is not always achieved in practice because the perforating means, i.e., the fingers or teeth perforating the base of the capsule, sometimes also go through also the thin polyurethane layer and contact the ground coffee of the capsule, the cleanliness of the extraction system thereby being lost.

[0004] On the other hand, capsules made of injected plastic which can be used in the type of machines described above have been introduced in the market. These frustoconical shaped capsules have a larger base closed with a leak-tight cover and lack the conical extension typical of deep drawn aluminum capsules that must be perforated for the passage of the supply liquid, so they are somewhat shorter in length and have a flat base with multiple perforations for the passage of supply liquid without the need of said bottom being perforated by the teeth or fingers of the machine. The capsule made in such a way is not leak-tight since, as indicated, its smaller base is perforated, which means that it is necessary to introduce it in a vacuum-packaging envelope or case for storage and transport, such that the capsule is removed from its container right at the time of use. The use of these capsules requires a more complex packaging system and a particular presentation and packing carton that are very different from that of deep drawn aluminum cap-

sules.

Description of the Invention

[0005] The applicant of the present Utility Model has developed a capsule which solves the aforementioned drawbacks of deep drawn aluminum and injected plastic capsules, such that it is extremely useful, practical and economical for application in espresso coffee machines with a filter and perforating means for perforating the base or bottom of the capsule.

[0006] In this case, the capsule is made of injected plastic, has a general frustoconical shape and has a larger open base provided with a wide circumferential flange. This base is sealed with a cover made of aluminum or a suitable material once the capsule is filled.

[0007] The bottom of the capsule has a perimetral supporting foot and a central area provided with multiple uniformly distributed perforations. Said central area is sunken or recessed towards the inside of the capsule, such that a hollow space with sufficient height so as to prevent the perforating means of the machine from penetrating into the capsule is established between the perforated central area and the support plane of the capsule, the cleanliness thus being fully maintained. It must be highlighted that the perforated central area has a dual purpose. On one hand, when the capsule is used in machines with perforating means for perforating the base or bottom, it does not require such perforation since the capsule itself internally has the perforations for the passage of the pressurized hot liquid into the capsule and, on the other hand, the plurality of uniformly distributed holes means that the supply is more homogenous. Furthermore, this capsule can be used interchangeably in machines of the type described, i.e., in machines having perforating means for perforating the base for the passage of the supply liquid and in machines lacking a filter, i.e., in machines in which the filter must be established in the capsule itself. In this latter case, the perforated base of the capsule acts as a filter.

[0008] Once the capsule is filled with the ground coffee, the bottom of the capsule is closed with a removable cover which can optionally be eliminated when introducing the capsule in the machine, whether or not said removable cover is eliminated depending on the type of machine to which the capsule is applied. Likewise, the open base is sealed with another cover, such that the content of the capsule is protected from the outside in a leak-tight manner. The closure cover of the open base can be a fixed or removable cover.

[0009] As indicated, the capsule has a wide circumferential flange in its open filling base having several purposes which include:

- To form a good base for coupling and fixing the leak-tight closure cover.
- To provide good flexibility for optimum coupling, which must be a completely leak-tight coupling, be-

tween the capsule and the machine during supply.

[0010] To that end, the face of the flange opposite to the coupling has a series of ribs providing it with rigidity where required and with the flexibility necessary at other points.

[0011] The capsule is complemented with internal vertical ribs stemming from the base and extending more or less to the middle area of the capsule, the purpose of which is to prevent the empty capsules from stacking together when they are moved by the centrifuge feeder responsible for directing them towards the filling area.

[0012] Like other capsules, the supply starts with the entry of pressurized hot water which penetrates into the capsule through the holes of the base or bottom. The liquid goes through the ground coffee mass uniformly and the infusion exits towards the cup through the upper cover, for which purpose said cover is perforated by means existing in the machine, which also provides the filtering means so that the infusion that fills the cup free is free of solid coffee residues.

Description of the Drawings

[0013] To complement the description that is being made and for the purpose of aiding to better understand the features of the invention according to a preferred practical example thereof, a set of drawings is attached as an integral part of said description wherein the following has been depicted with an illustrative and nonlimiting character:

Figure 1 shows a side view of the capsule object of the invention in which its general frustoconical shape and the wide flange of the larger base are observed. Figure 2 shows a longitudinal section view of the capsule with the leak-tight closure covers coupled to the larger filling base and to the smaller bottom or base.

Figure 3 shows in detail a section of the perimetral flange of the larger base.

Figure 4 depicts in detail another section of the supporting foot of the smaller base or bottom of the capsule.

Figure 5 depicts a top plan view of the capsule in which the bottom is provided with several uniformly distributed perforations.

Preferred Embodiment of the Invention

[0014] In view of the described drawings, it can be observed how the capsule proposed by the invention comprises a body (1) having a general frustoconical shape, a larger base provided with a wide circumferential flange (2) and a smaller bottom or base formed by a perimetral supporting foot (3) and a central area (4), that is sunken or recessed towards the inside of the capsule, having multiple uniformly distributed perforations, such that a

hollow (9) which is closed in a leak-tight manner with a second sealing cover (6) is established between the support plane of the capsule and the central area (4). This sealing cover is a removable cover and can be made of aluminum or of a material suitable for leak-tight closure.

[0015] Once filled with ground coffee, the capsule is closed on its larger base by means of a first sealing cover (5). Both the first and second sealing covers (5) and (6) close the capsule in a leak-tight manner which is necessary for preserving the product contained therein so that it does not lose its characteristics during capsule transport and storage.

[0016] The circumferential flange (2) has a substantially flat machine coupling surface (2a) which receives the sealing cover (5). The circumferential flange (2) has a circumferential end finishing (2b) and circumferential teeth (2c) providing said flange with rigidity and flexibility for an optimum leak-tight coupling to the machine in the supply phase.

[0017] An inner hollow area (7) which can be used as a space useful for filling the capsule with coffee is formed between the central area (4) and the perimetral supporting foot (3).

[0018] The capsule internally has vertical ribs (8) preventing the capsules from stacking together when they move in a chaotic manner in the feeder of the filling station, and the capsules are therefore completely separated from one another.

[0019] In view of this description and the set of drawings, the person skilled in the art will understand that the embodiments of the invention which have been described can be combined in many ways within the object of the invention. The invention has been described according to several preferred embodiments thereof, but for the person skilled in the art it will be evident that multiple variations can be introduced in said preferred embodiments without exceeding the object of the claimed invention.

Claims

1. Single-serve capsule for espresso coffee machines which is made of an injected plastic material and has a general frustoconical shape, comprising a smaller bottom or base and a larger open base for filling the capsule with ground coffee, provided with a circumferential flange (2) which is closed with a first sealing cover (5) once the capsule is filled, **characterized in that** the smaller bottom or base has a perimetral supporting foot (3) and a central area (4) sunken towards the inside of the capsule, said central area (4) having a plurality of uniformly distributed perforations, such that a hollow (9) which is closed in a leak-tight manner with a second removable sealing cover (6) is established between the support plane of the capsule and the central area (4).

2. Single-serve capsule for espresso coffee machines according to claim 1, **characterized in that** an inner hollow area (7) useful for filling the capsule with coffee is formed between the perimetral supporting foot (3) and the perforated central area (4). 5
3. Single-serve capsule for espresso coffee machines according to claim 1, **characterized in that** the face of the circumferential flange (2) opposite the machine coupling face has a circumferential end finishing (2b) and circumferential teeth (2c) providing said flange with rigidity and flexibility for an optimum leak-tight coupling to the machine in the supply phase. 10

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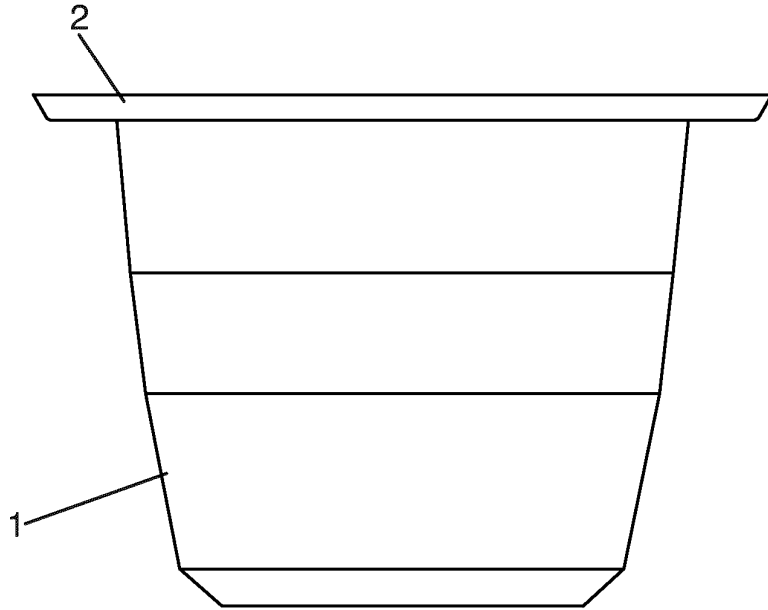


FIG. 1

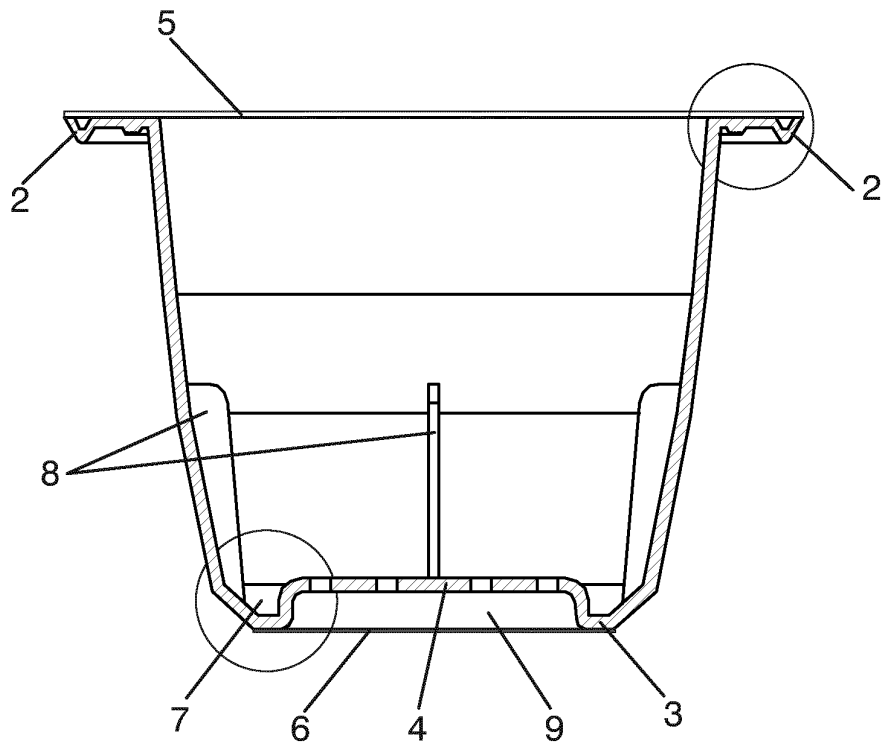


FIG. 2

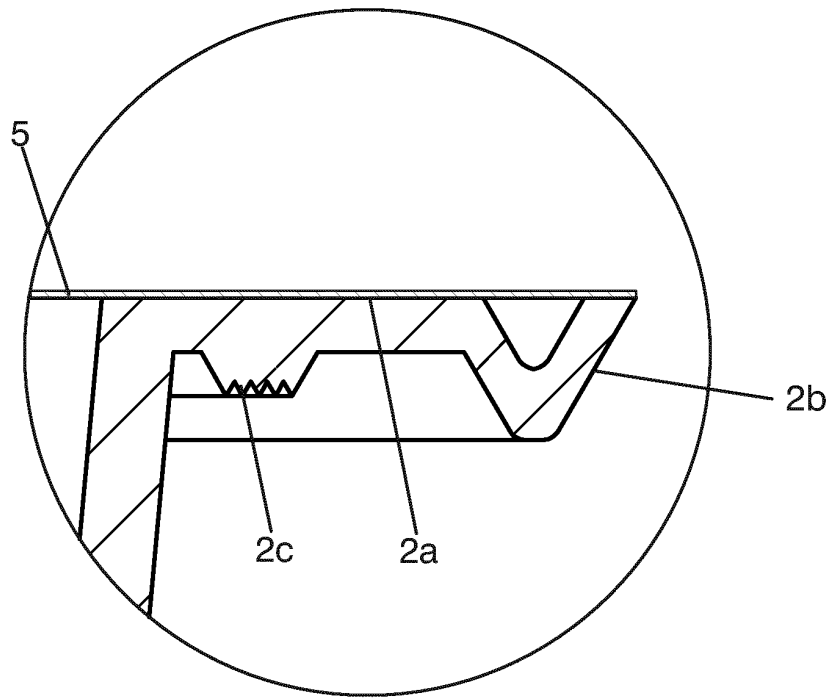


FIG. 3

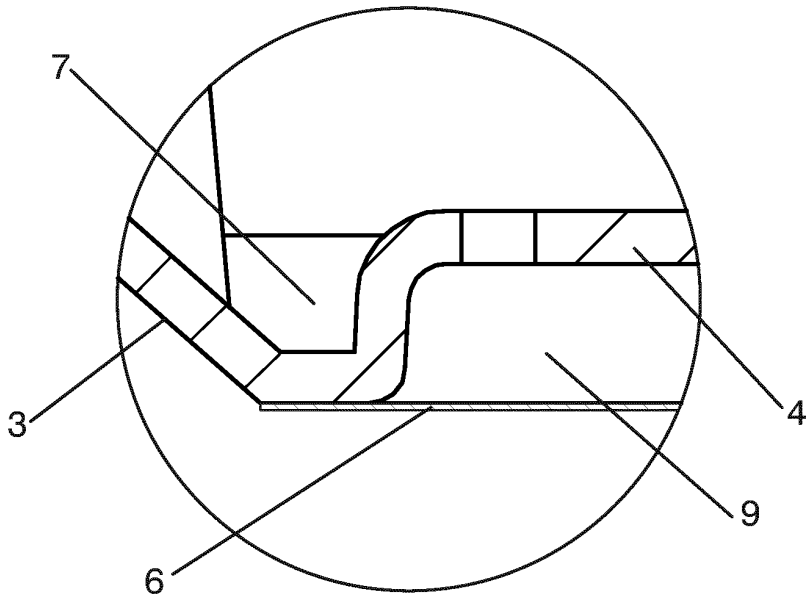


FIG. 4

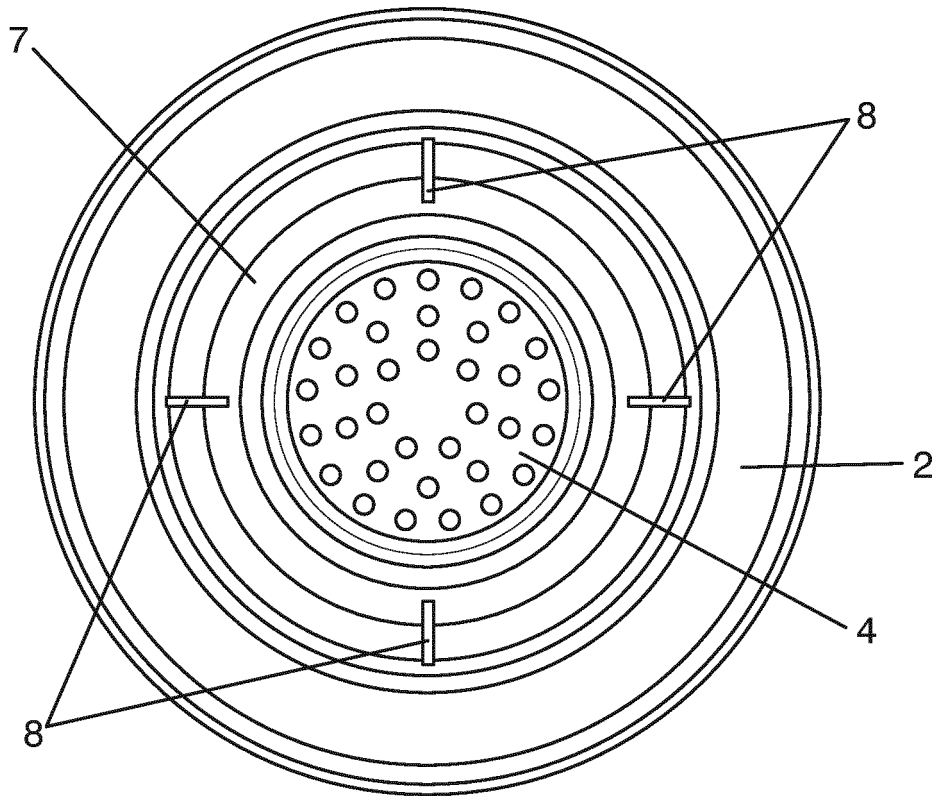


FIG. 5

INTERNATIONAL SEARCH REPORT

International application No.
PCT/ES2012/070738

A. CLASSIFICATION OF SUBJECT MATTER		
B65D85/804 (2006.01)		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) B65D		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) EPODOC, INVENES, WPI		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2011035360 A1 (SUNDAY PRODUCTS HANDELS GMBH CO KG ET AL.) 31/03/2011, page 2, lines 20 - 23; claims 1-17; figures 1 - 3, 5.	1-3
A	US 2010064899 A1 (AARDENBURG KEES) 18/03/2010, the whole document.	1-3
A	US 2011064852 A1 (MANN TORSTEN) 17/03/2011, the whole document.	1-3
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> See patent family annex.		
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Date of the actual completion of the international search 25/01/2013		Date of mailing of the international search report (29/01/2013)
Name and mailing address of the ISA/ OFICINA ESPAÑOLA DE PATENTES Y MARCAS Paseo de la Castellana, 75 - 28071 Madrid (España) Facsimile No.: 91 349 53 04		Authorized officer C. Marín Calvo Telephone No. 91 3495594

EP 2 650 234 A1

INTERNATIONAL SEARCH REPORT

International application No.

PCT/ES2012/070738

Information on patent family members

Patent document cited in the search report	Publication date	Patent family member(s)	Publication date
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Form PCT/ISA/210 (patent family annex) (July 2009)

REFERENCES CITED IN THE DESCRIPTION

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