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(54) **Title**: A CAPSULE SUITABLE TO BE USED IN COFFEE MACHINES

Figure 1a

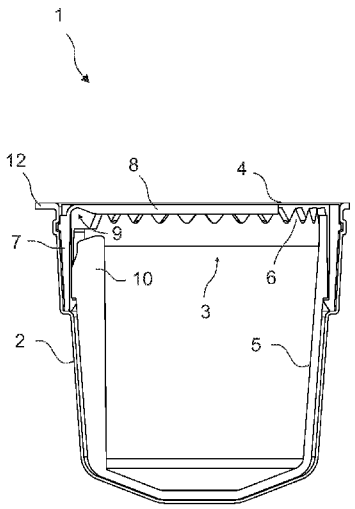
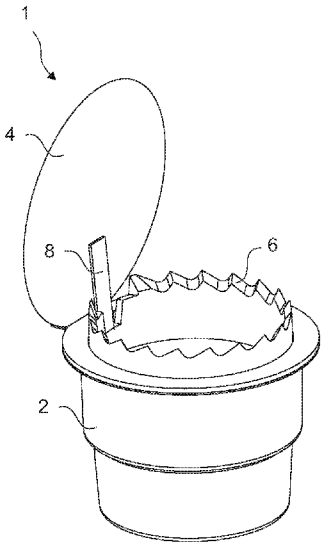


Figure 1b



(57) **Abstract**: The present invention relates to a capsule (1) suitable to be used in coffee machines, comprising housing (2) wherein the coffee to be brewed is stored, an opening (3) that is arranged on the lower surface of the housing (2) and that enables the coffee to be poured, a folio (4) that provides the covering of the opening (3), and a cutting apparatus (5) that is disposed inside the housing (2) concentrically, that has at least one cutter thread (6) arranged partially along its lower side, that moves downwards inside the housing (2) when pressure is exerted by the housing (2) ceiling and that partially cuts the folio (4) so that the folio (4) remains connected to the housing (2) from one side.

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A CAPSULE SUITABLE TO BE USED IN COFFEE MACHINES

The present invention relates to a capsule suitable to be used in coffee machines and wherein the coffee raw material is stored.

In coffee machines, the usage of the single use capsule wherein the coffee raw material is stored is known. During the preparation of coffee, for example by mixing the raw material of Turkish coffee by water, the raw ingredient stored in the capsule has to be delivered to the brewing chamber or the cup. In the state of the art, coffee machines are known, providing that some portion of the folio covering the capsule is torn/cut and as the folio opens like a lid, the coffee raw material in the capsule is poured or emptied by turning the capsule upside down. One of the problems encountered in the capsules suitable to be used in this type of machines is that the coffee raw material cannot be discharged completely from the capsule. The powder coffee raw material such as Turkish coffee having thin particles remains inside the capsule or on the folio due to reasons like the folio not opening entirely or folding.

In the state of the art International Patent Application No. WO2011007266, a coffee machine and a capsule comprising the blades that cut the folio are disclosed.

In the state of the art International Patent Application No. WO2011154866, a capsule is disclosed which is turned upside down by the arm on the coffee machine pushing thereon, thus pouring the contents therein.

The aim of the present invention is the realization of a capsule suitable to be used in coffee machines and where the coffee raw material therein is enabled to be discharged properly.

The capsule realized in order to attain the aim of the present invention and explicated in the claims, comprises a frame that is seated on the sides surrounding the opening of the housing wherein the coffee is stored and an arm that is disposed on the frame, that extends towards the opening, that bears against the folio from under the folio that provides the covering of the housing, that pushes the folio away when the folio is cut and that enables the coffee in the housing to be entirely emptied. In the capsule of the

present invention, the arm is situated under the folio and supports the folio from below when the capsule is not opened so as to remain inside the housing. When the capsule is placed into the coffee machine, the cutting apparatus providing the cutting of the folio disposed inside the housing moves downwards in the housing and cuts the folio partially. As the folio is cut, the arm pushes the folio around the uncut portion and enables the folio to be entirely opened. Thus, almost all the coffee raw material inside the housing is poured into the brewing chamber or the glass.

In another embodiment of the present invention, the arm is connected to the frame with a self-spring hinge. The self-spring hinge enables the arm to push the folio and the arm to remain stretched when the capsule is closed and when the folio is partially cut, any forces holding the folio are eliminated and the arm pushes the folio, enabling the coffee to be poured.

In another embodiment of the present invention, the frame, the arm and the self-spring hinge, together enabling the folio to open effectively, are produced as a single piece from plastic material. In order to provide ease of production, the frame and the arm are produced from plastic material and the self-spring hinge, providing the connection between the frame and the arm, is produced as a single piece together with the frame and the arm.

In a version of this embodiment, the frame, the arm and the self-spring hinge are produced as a single piece together with the cutting apparatus so as to remain at the lower side of the cutting apparatus that provides the cutting of the folio. In this embodiment, in order to decrease the number of parts on the capsule, the arm providing the opening of the folio by pushing and the frame whereto the arm is connected are produced as a single piece together with the cutting apparatus.

In another embodiment of the present invention, the capsule comprises a pusher rib that is disposed at the inner part of the cutting apparatus providing the cutting of the folio and that enables the folio to be pushed as the cutting apparatus moves to cut the folio. In order that the arm connected to the frame is not broken by the pressure exerted by the sides of the cutting apparatus on the point where the arm is connected to the frame when the cutting apparatus moves to cut the folio, the pusher rib at the inner surface of

the cutting apparatus contacts preferably the middle portion of the arm and enables the arm to be pushed when the cutting apparatus moves.

In another embodiment of the present invention, the capsule comprises a preferably flat daubing surface with no cutter threads thereon, that is disposed between the cutter threads situated at the lower side of the cutting apparatus providing the cutting of the folio and that enables the folio to be cut partially so that some portion thereof remains connected to the housing. The daubing surface on the cutting apparatus provides that the folio is partially cut, in other words, some portion thereof remains connected to the housing after being cut. The daubing surface is arranged between the cutter threads and is configured so as not to damage and cut the folio when in contact with the folio.

In another embodiment of the present invention, the arm is connected to the frame at the level of the daubing surface and thus folds the folio over the uncut portion that is connected to the housing. In this embodiment, the arm is enabled to open the folio from the uncut portion by folding.

In another embodiment of the present invention, the capsule comprises an extension that is disposed on the housing, that is aligned with the uncut portion of the folio, in other words with the daubing surface or the arm and that prevents the uncut portion from breaking by increasing the surface area that the folio grasps. The folio contacts with the housing only by the uncut portion thereof after being cut. The surface area that the folio grasps on the housing is increased so that the folio does not break away from the housing and falls into the brewing chamber or the glass while the arm pushes the folio.

In another embodiment of the present invention, in the capsule, the claws disposed on the cutting apparatus, the channels disposed on the frame, wherein the claws move and wherein the movement of the cutting apparatus is guided and a stopper that is disposed at the end of the channels and whereto the claws bear against to prevent the cutting apparatus from separating from the housing, all together prevent the cutting apparatus from being separated from the housing during the folio cutting operation. The claws on the cutting apparatus bear against the stopper so as to allow only some part of the cutting apparatus to go out of the housing which is enough for cutting the folio.

By means of the arm in the capsule of the present invention, the folio is enabled to be opened entirely like a lid without folding by exerting pressure on the partially cut folio.

The capsule realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

Figure 1a – is the cross-sectional view of a closed capsule.

Figure 1b – is the perspective view of a capsule when the cover is open.

Figure 2a – is the exploded view of a capsule.

Figure 2b – is the exploded view of the capsule related to an embodiment of the present invention.

Figure 3 – is the cross sectional view of the capsule related to an embodiment of the present invention.

Figure 4 – is the exploded view of the capsule related to another embodiment of the present invention.

The elements illustrated in the figures are numbered as follows:

1. Capsule
2. Housing
3. Opening
4. Folio
5. Cutting apparatus
6. Cutter thread
7. Frame
8. Arm
9. Self-spring hinge
10. Pusher rib
11. Daubing surface

12. Extension

13. Claw

14. Channel

15. Stopper

The capsule (1) is suitable to be used in beverage preparation machines and comprises a housing (2) wherein the coffee to be brewed is stored, an opening (3) that is arranged on the lower surface of the housing (2) and that enables the coffee to be poured into the brewing chamber to be brewed in the coffee machine, a folio (4) that provides the covering of the opening (3), and a cutting apparatus (5) that is disposed inside the housing (2) concentrically, that has at least one cutter thread (6) arranged partially along its lower side, that moves downwards inside the housing (2) when pressure is exerted by the housing (2) ceiling and that partially cuts the folio (4) so that the folio (4) remains connected to the housing (2) from one side. The folio (4) is preferably produced from aluminum or tin. The housing (2) can be in form of a cylinder or quadrangular prism. The coffee in the housing (2) can be particularly Turkish coffee or instant coffee. The folio (4) is attached on the sides surrounding the housing (2) opening (3) so that the cutting apparatus (5) remains inside the housing (2). The capsule (1) opens as the cutting apparatus (5) cuts the folio (4) by moving along the housing (2) when force is applied on the housing (2).

The capsule (1) of the present invention is suitable to be used in beverage preparation machines and comprises a frame (7) that is disposed on the periphery of the opening (3) as a single piece with the housing (2) or fixed on the inner surface of the housing (2) and an arm (8) that is fastened to the side of the frame (7), that extends towards the center of the opening (3) over the folio (4) surface facing the interior of the housing (2), providing that the folio (4), the sides of which are cut, is moved away from the opening (3) by resting against the folio (4) when the cutting apparatus (5) is moved downwards in the housing (2). When the capsule (1) is closed, the arm (8) is located under the folio (4) and the folio (4) is pushed by the arm (8) however the folio (4) is not opened since the latter is connected to the housing (2). As the cutting apparatus (5)

is pushed out of the housing (2), the folio (4) is partially cut and the arm (8) pushes the folio (4) outwards. The arm (8) exerts pressure on the folio (4) and enables the folio (4) to open like a lid by rotating around the uncut portion thereof, in other words, the arm (8) pushes the folio (4), preventing the folio (4) from fold over itself and enabling the latter to be opened entirely.

In another embodiment of the present invention, the capsule (1) comprises a self-spring hinge (9) that enables the arm (8) to be connected to the side of the frame (7) and that moves the arm (8) outwards from the opening (3) when the sides of the folio (4) are cut and becomes partially free during the folio (4) cutting operation. The arm (8) remains stretched under the folio (4) by means of the self-spring hinge (9) and the arm (8) pushes the folio (4) when the folio (4) becomes free by being cut partially.

In another embodiment of the present invention, in the capsule (1), the frame (7), the arm (8) and the self-spring hinge (9) are produced as a single piece from plastic material.

In another embodiment of the present invention, the frame (7) is produced in an integrated manner with the cutting apparatus (5). In this embodiment, the frame (7), the self-spring hinge (9) situated thereon and the arm (8) are produced as a single piece together with the cutting apparatus (5) and the number of parts used in the production of the capsule (1) are decreased. The arm (8) tries to push the folio (4) outwards by means of the self-spring hinge (9) and as soon as the folio (4) is cut, the arm (8) pushes the folio (4) such that the latter is moved away from the opening (3).

In another embodiment of the present invention, the capsule (1) comprises a pusher rib (10) that is connected to the cutting apparatus (5), that is disposed on the inner surface of the cutting apparatus (5) and that enables the arm (8) to be moved away from the opening (3) by pushing the arm (8) during the folio (4) cutting operation. The pusher rib (10) pushes the arm (8) by preferably contacting the latter from the center section thereof and thus provides the moment required for the arm (8) to push the folio (4) or in other words to be able to rotate around the point where the arm (8) is connected to the frame (7).

In another embodiment of the present invention, the capsule (1) comprises a daubing surface (11) with no cutter threads (6) thereon, that is arranged on the lower side of the cutting apparatus (5), that extends between the cutter threads (6) and that enables the folio (4) to be cut partially such that the latter remains connected to the housing (2) from one side.

In another embodiment of the present invention, the arm (8) is connected to the frame (7) at the level of the daubing surface (11) and enables the folio (4) to be opened by bending around the side remaining connected to the housing (2) and outwards from the opening (3). As the arm (8) and the daubing surface (11) are aligned, the folio (4) opens by turning around the portion thereof that is uncut and is connected to the housing (2).

In another embodiment of the present invention, the capsule (1) comprises an extension (12) that extends outwards from the lower side of the housing (2) surrounding the opening (3) and whereto the folio (4) is adhered, that is aligned with the daubing surface (11) and the arm (8) and that provides that the surface area where the side of the folio (4), where cutting operation is not performed by means of the daubing surface (11) and that remains connected to the housing (2), grasps the housing (2) is increased. As the surface area where the folio (4) is connected to the housing (2) is increased, the connection of the folio (4) with the housing (2) is strengthened and the folio (4) is prevented from breaking from the housing (2) and falling into the portion wherein the coffee is poured.

In another embodiment of the present invention, the capsule (1) comprises at least one claw (13) that is disposed on the outer surface of the cutting apparatus (5), at least one channel (14) that is disposed on the frame (7) and that allows the claws (13) to also move while the cutting apparatus (5) moves downwards during the folio (4) cutting operation and a stopper (15) that is disposed close to the opening (3) and at the end of the channels (14), against which the claws (13) bear at the end of the folio (4) cutting operation and that prevents the cutting apparatus (5) from going out of the housing (2) and falling into the brewing chamber in the coffee machine.

By means of the arm (8) of the present invention, the cutting apparatus (5) is not required to go out of the housing (2) entirely for completely opening the folio (4) covering the capsule (1) and the arm (8) enables the folio (4) to be opened by pushing the folio (4) when the folio (4) is partially cut and the force that prevents the arm (8) from pushing the folio (4) is removed.

CLAIMS

1 – A capsule (1) that is suitable to be used in coffee machines, **comprising** a housing (2) wherein the coffee to be brewed is stored, an opening (3) that is arranged on the lower surface of the housing (2) and that enables the coffee to be poured, a folio (4) that provides the covering of the opening (3), and a cutting apparatus (5) that is disposed inside the housing (2) concentrically, that has at least one cutter thread (6) arranged partially along its lower side, that moves downwards inside the housing (2) when pressure is exerted by the housing (2) ceiling and that partially cuts the folio (4) so that the folio (4) remains connected to the housing (2) from one side, **characterized by** a frame (7) that is disposed on the periphery of the opening (3) as a single piece with the housing (2) or fixed on the inner surface of the housing (2) and an arm (8) that is fastened to the side of the frame (7), that extends towards the center of the opening (3) over the folio (4) surface facing the interior of the housing (2), providing that the folio (4), the sides of which are cut, is moved away from the opening (3) by resting against the folio (4) when the cutting apparatus (5) is moved downwards in the housing (2).

2 – A capsule (1) as in Claim 1, **characterized by** a self-spring hinge (9) that enables the arm (8) to be connected to the side of the frame (7) and that moves the arm (8) outwards from the opening (3) during the folio (4) cutting operation.

3 – A capsule (1) as in any one of the above claims, **characterized by** the frame (7), the arm (8) and the self-spring hinge (9) that are produced from plastic material as a single piece.

4 – A capsule (1) as in Claim 3, **characterized by** the frame (7) produced in an integrated manner with the cutting apparatus (5).

5 - A capsule (1) as in any one of the above claims, **characterized by** a pusher rib (10) that is connected to the cutting apparatus (5), that is disposed on the inner surface of the cutting apparatus (5) and that enables the arm (8) to be moved away from the opening (3) by pushing the arm (8) during the folio (4) cutting operation.

6 - A capsule (1) as in any one of the above claims, **characterized by** a daubing surface (11) that is arranged on the lower side of the cutting apparatus (5), that extends between the cutter threads (6) and that enables the folio (4) to be cut partially such that the latter remains connected to the housing (2) from one side.

7 - A capsule (1) as in any one of the above claims, **characterized by** the arm (8) that is connected to the frame (7) at the level of the daubing surface (11) and that enables the folio (4) to be opened outwards from the opening (3) by bending around the side remaining connected to the housing (2).

8 - A capsule (1) as in any one of the above claims, **characterized by** an extension (12) that extends outwards from the lower side of the housing (2) surrounding the opening (3) and whereto the folio (4) is adhered, that is aligned with the daubing surface (11) and the arm (8) and that provides that the surface area where the side of the folio (4), that remains connected to the housing (2), grasps the housing (2) is increased.

9 - A capsule (1) as in any one of the above Claims, **characterized by** at least one claw (13) that is disposed on the outer surface of the cutting apparatus (5), at least one channel (14) that is arranged on the frame (7) and that allows the claws (13) to move while the cutting apparatus (5) moves downwards and a stopper (15) that is disposed close to the opening (3) and at the end of the channels (14), against which the claws (13) bear and that prevents the cutting apparatus (5) from going out of the housing (2).

Figure 1a

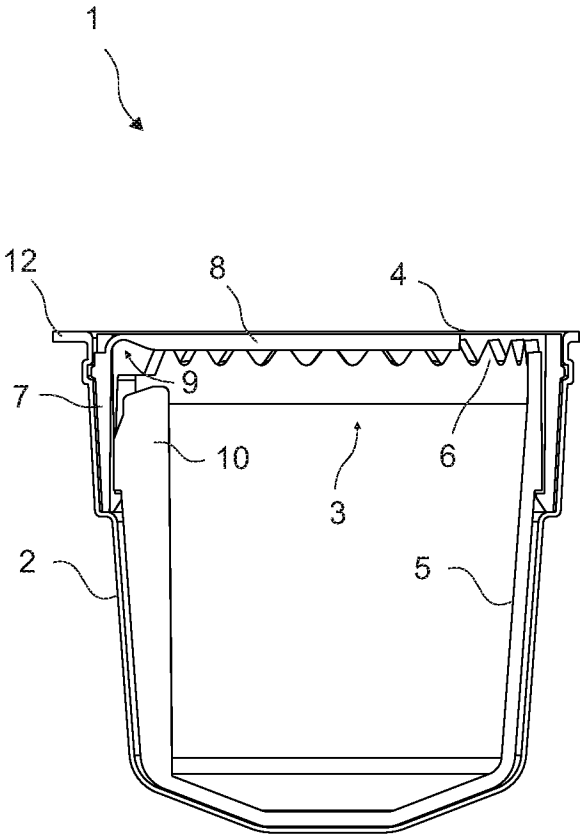


Figure 1b

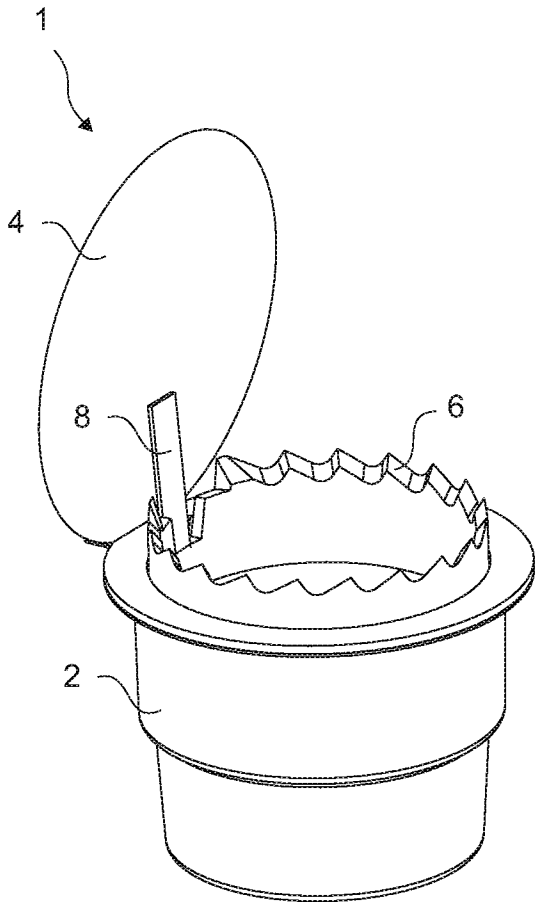


Figure 2a

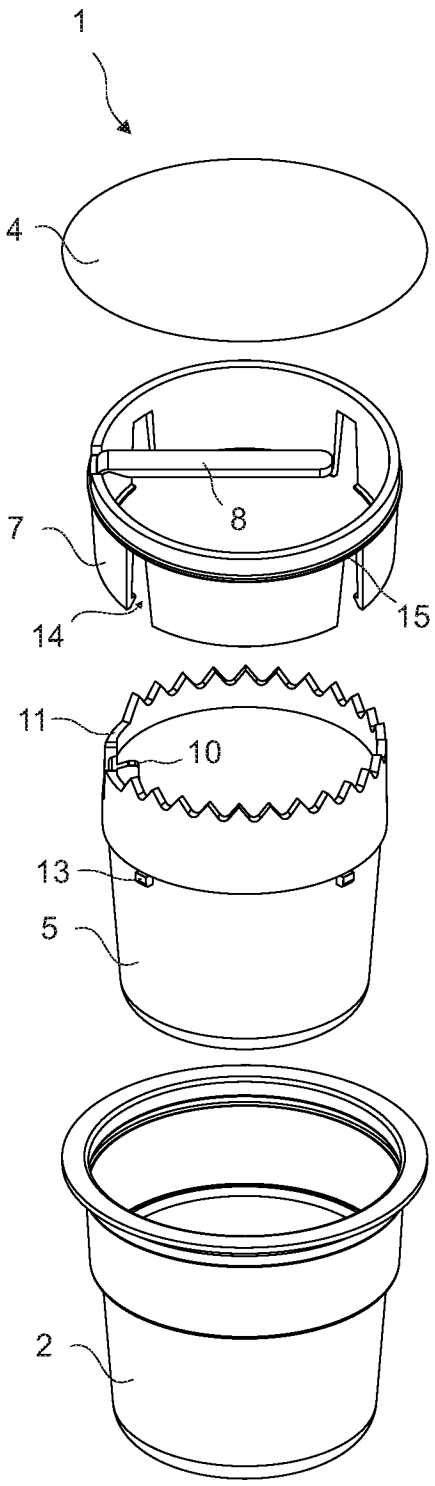


Figure 2b

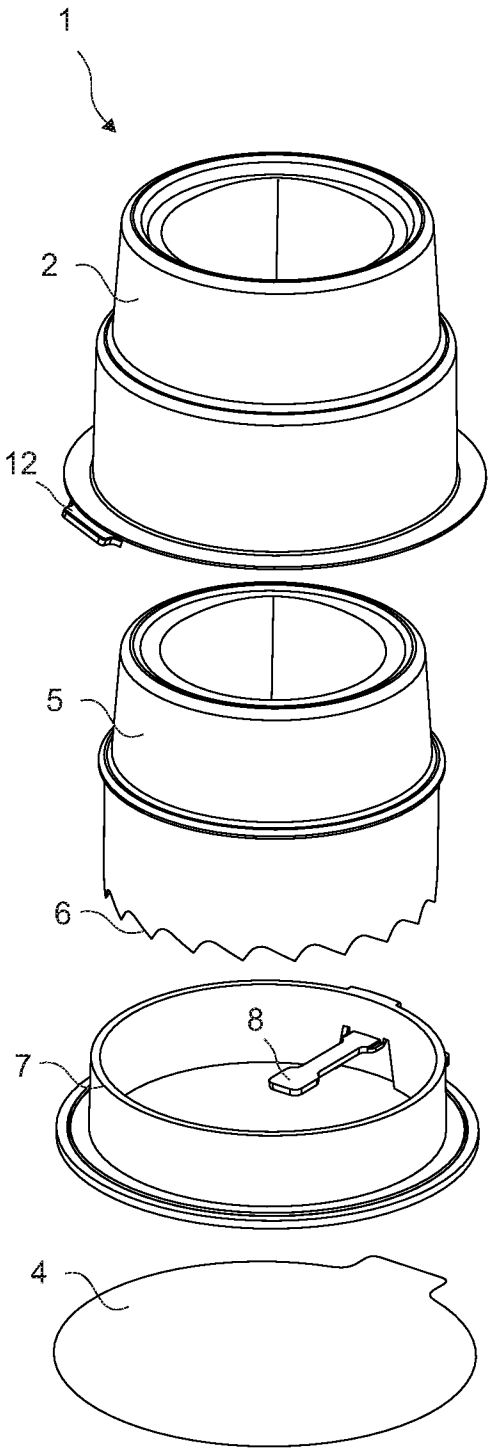


Figure 3

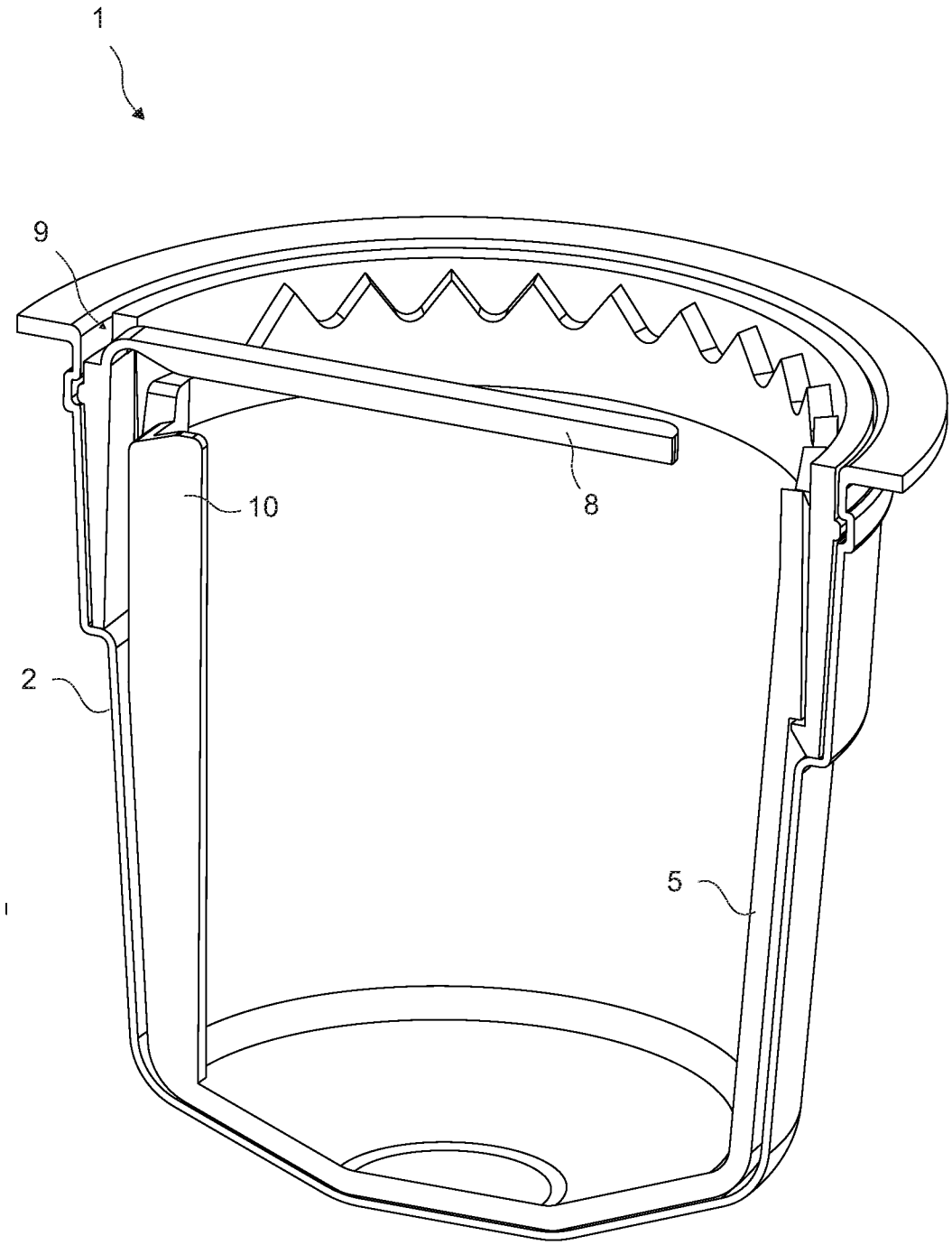
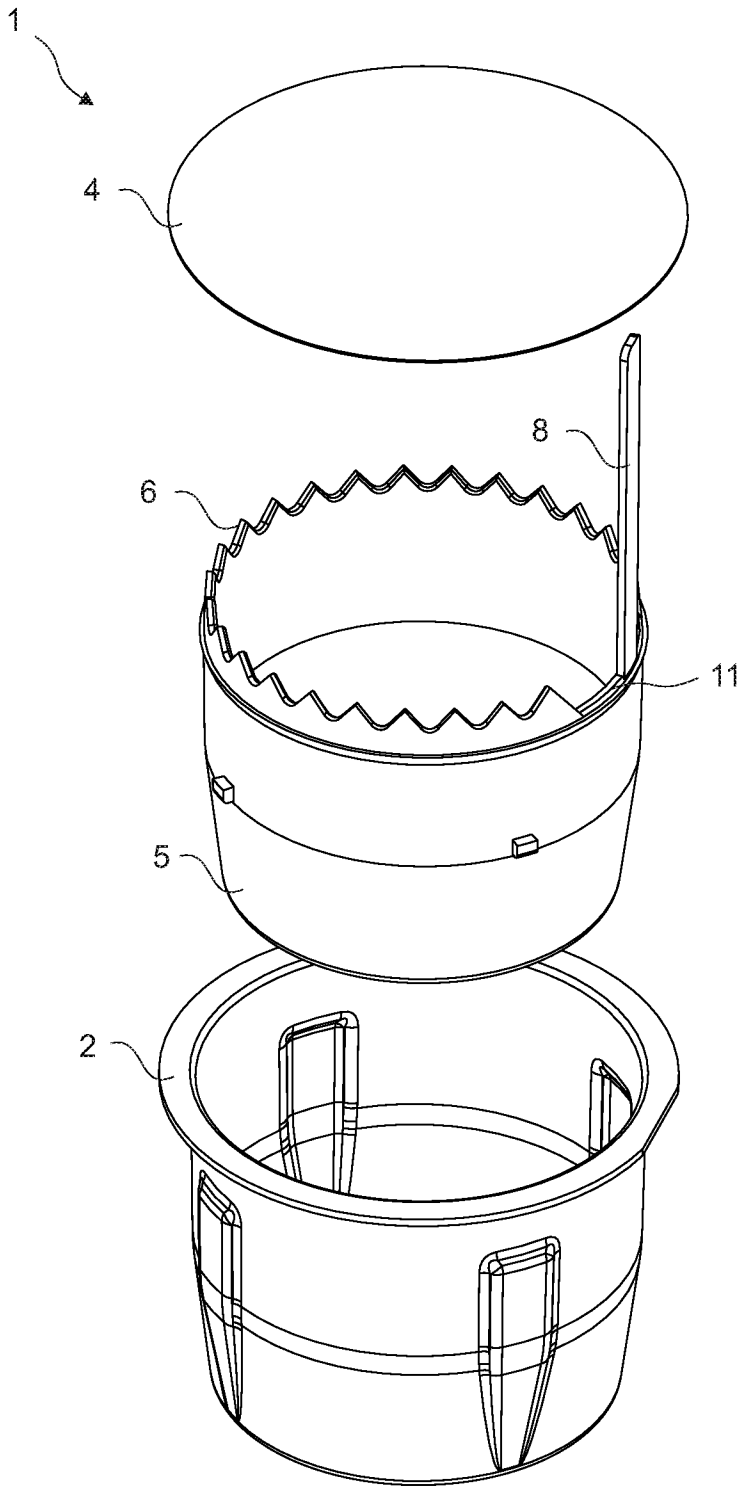


Figure 4



INTERNATIONAL SEARCH REPORT

International application No
PCT/TR2015/050189

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65D85/804
ADD.

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)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 2 239 207 A1 (YOSHINO KOGYOSHO CO LTD [JP]) 13 October 2010 (2010-10-13)	1-8
A	abstract; figures 8-10 paragraph [0031] - paragraph [0033] paragraph [0045] - paragraph [0046]	9
A	US 6 443 307 B1 (BURRIDGE MICHAEL D [US]) 3 September 2002 (2002-09-03) abstract; figures 2-4	1-9
A	US 5 123 570 A (DUBOW BRIAN C [US] ET AL) 23 June 1992 (1992-06-23) the whole document	1-9

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
22 March 2016	01/04/2016

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Schnitzhofer, Markus

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Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/TR2015/050189

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2012/069758 A1 (BIOMERIEUX SA [FR]; FARGE AGATHE [FR]; JANUEL DENIS [FR]) 31 May 2012 (2012-05-31) page 6, line 13 - line 18 abstract; figures 1,2	1-9
A	WO 2011/007266 A1 (HAREMLIK GIDA DEKORASYON VE EKIPMANLARI TICARET SANAYI LTD SIRKETI [TR]) 20 January 2011 (2011-01-20) cited in the application the whole document	1-9

1

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/TR2015/050189

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