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(54) SOLUBLE PRODUCTS CAPSULE

(57) Soluble products capsule (1) with a closure sheet (6) on a first end (1.1) and pressurisation channels (4) for the product and an exit opening (5) on a second end and which comprises an isolation sheet (7) on the pressurisation channels (4) and an intermediate sectorising piece (8) of the internal cavity (2) with a base (8.1) and two or three sectorising walls (8-2) emerging in a radial layout that divide the cavity into sectors (9).

The base (8.1) comprises a passing opening (11) for the product in each sector (9) and the pressurisation channels (4) are independent and form a route for the product from the outermost point of the pressurisation channels (4) in each sector (9) to the central exit opening (5) of the second end (1.2) of the capsule (1).

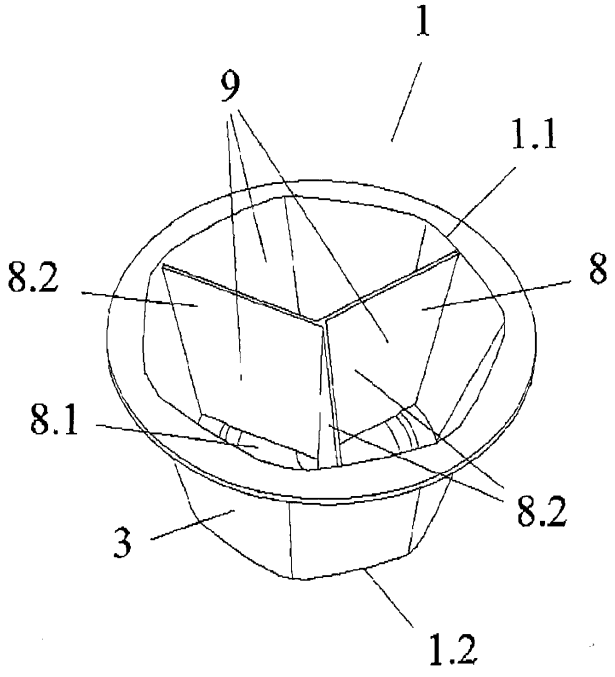

Fig. 5

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Description

Technical field of the invention

[0001] This invention lies within the technical field of capsules for soluble products used in various machines to prepare drinks after adding water and a given pressure to them, specifically those that comprises a main body with an internal cavity containing the soluble product, a first open end with a closure sheet, a second, opposite, end with channels for pressurising the product and an exit opening in its central area.

Background to the invention

[0002] Currently notable among the types of coffeemakers that exist, such as the traditional Italian coffeemaker, the filter coffeemaker, espresso coffeemakers, etc, are capsule coffeemakers which have revolutionised the method of preparing coffee due to their simplicity, convenience and quality.

[0003] Instead of using ground coffee, these machines use pre-packed sealed coffee capsules containing ground coffee. When the capsule is inserted in the machine, this perforates it and the hot water passes through the capsule at a certain pressure, resulting in a cup of hot coffee.

[0004] These machines, the initial function of which was to prepare coffee, have developed to be able to offer many other products or drinks from a soluble product, such as soluble chocolate drinks and those based on infusions such as tea, pennyroyal and similar ones. It is also possible that the coffee offered in these machines is not a simple espresso coffee but cappuccino, coffee with milk and other varieties can be prepared by adding an ingredient to the final drink.

[0005] The following reference documents can be mentioned as an example of the state of the art: ES1075191, ES2161964 and ES2631129.

[0006] Reference document ES1075191 defines a capsule for coffee, tea and other soluble products of the type of those based on a sheath to hold the soluble product, coffee or tea concerned and a rear lid that seals the capsule. The sheath of this capsule is made of biodegradable food-grade polypropylene prepared from vegetable starch such as maize or potatoes.

[0007] This capsule is hexagonal in shape and, according to the invention, the internal edges of its walls form channels that cause the soluble product to slide better under pressure. It may include an internal filter, also hexagonal, from which walls emerge at right angles to form small cells, giving the capsule stability.

[0008] This invention has various disadvantages. The first is that the channels formed in the edges of the walls are insufficient by themselves to supply a pressure to give a suitable foam to the final soluble product.

[0009] The foam is a very important aspect of this type of drink since it gives it a creaminess that improves the quality and flavour of the drink. This is one of the fundamental problems of this type of capsules, which do not provide a suitable quantity and consistence of foam.

[0010] Another disadvantage is that to prepare drinks that need more than one ingredient, such as a drink with coffee and milk, such as cappuccino, or chocolate and milk, or that even have three ingredients such as coffee, milk and chocolate, three capsules must be used, one for each ingredient.

[0011] This involves, on the one hand, the use of more capsules which, as well as being economically more expensive, causes greater environmental damage due to their discarding.

[0012] As well as all this, there is an additional problem in that in the process of extracting the soluble product from the capsule, the machine inserts pressurised water in it to expel the product, thus forming the drink. The disadvantage is that, once the process ends, part of the water inserted remains within the capsule. When the capsule is removed from the coffeemaker to insert the next one, the remaining water exits little by little through the drink exit opening so that the place in which it is discarded is flooded, with the nuisance that this may cause.

[0013] The solution could be to allow the capsule to rest in a container before discarding it so that all the water runs out first but this is also very awkward in certain situations and it is possible that water still remains in it when it is finally discarded.

[0014] This disadvantage is multiplied when preparing a drink that combines more than one ingredient such as coffee with milk, for example, in which case two capsules are used which, as well as polluting more as mentioned, will also dirty twice due to the mentioned disadvantage.

[0015] Reference document ES2161964 proposes a closed cartridge for extraction under pressure, containing a substance for preparing a drink. The cartridge comprises a small aluminium or aluminium alloy container with a bottom and a side wall in the shape of an inverted cone body.

[0016] The bottom of the container has thinner areas to favour the opening of the cartridge during extraction. These are produced by shearing and are in the form of concentric circular arcs with the same radius, concentric circular arcs of different radii, spiral or wavy sections or radial segments. With these thinner areas, the pressure reached inside the capsule is sufficient to open them, allowing the drink to exit as well as acting as a filter.

[0017] In this case, the problem of opening the capsule is solved since these weakened areas are sufficient so that the capsule does not need protruding areas for opening, which are more expensive. However, it still has the disadvantage that the drink with this capsule does not have the much-wanted foam since the pressure reached at the exit through the weakened areas is not sufficient to generate pressure in the mix of water and soluble product to generate it.

[0018] Additionally, it is still necessary to use as many capsules as there are soluble ingredients in the drink

and, taking into account that this capsule is made entirely of aluminium or an alloy of it, it generates considerable pollution when preparing a cappuccino, for example.

[0019] Reference document ES2531729 defines a cartridge for producing a drink that comprises a container for the coffee or soluble product, a lid on the container and a filter designed for positioning within the container above its bottom wall, through which the drink is extracted.

[0020] The bottom wall of the container has a thinner and weakened central part designed for breakage by external mechanical means or by the pressure of the liquid in the cartridge, thus forming at least one opening to allow the drink to exit the cartridge.

[0021] It also has at least one spiral channel on the bottom wall of the container that starts at a peripheral edge of the bottom wall and ends in the weakened centre part. In this case, the passing of the drink through the spiral channel on the bottom is achieved by providing it with a pressure that generates a given dense cream.

[0022] However, it is still necessary to use one capsule for each ingredient in the drink so that the preparation of a drink with more than one ingredient continues to be an awkward, dirty and polluting process.

Description of the invention

[0023] The soluble products capsule formed by a main body that comprises an internal cavity to contain the soluble product, delimited by a side surface, a first open end and a second opposite end with channels to pressurise the soluble product inside it and an exit opening for the soluble product in the central area and a closure sheet on the first open end proposed here, comprising a sheet isolating the soluble product from the exterior, placed on the pressurising channels of the second end and an intermediate piece sectorising the internal cavity.

[0024] This sectorising piece comprises a base located on the isolation sheet and two or three sectorising walls emerging from the base in a radial layout such that the cavity is divided Into two or three sectors, respectively.

[0025] The base in turn has a form and dimensions such that its contour is in contact with the inner face of the side surface of the main body throughout the internal contour of an adjustment section for it near the second end and comprising an opening for the passing of the soluble product in each of the two or three resulting sectors, where these openings are placed next to the distal end of one of the dividing walls, respectively, and arranged equidistantly apart.

[0026] On the other hand, the pressurising channels at the second end are independent for each sector and form a route for the soluble products between them that starts in each sector at the outermost point of the channels, located below the respective passing opening and terminating in the central exit opening of the second end of the capsule.

[0027] In accordance with a preferred form of manufacture, the pressurisation channels of at least one of the sectors have the form of concentric arcs connected together consecutively at alternate ends of the arc.

[0028] In accordance with another aspect, the main body of the capsule has a protuberance to support the intermediate sectorising piece located on the inner face of its side surface next to the adjustment section so that it is located between that adjustment section and the second end of the main body.

[0029] On the other hand, in accordance with a preferred form of manufacture, the main body has an adjustment tab on the intermediate piece located on the inner face of its side surface next to its adjustment section so that it is placed between this and the first end of the main body.

[0030] In this case, and in a preferred form of manufacture, this adjustment tab is arranged along the entire internal contour of a section next to the adjustment section.

[0031] In accordance with a preferred form of manufacture, both the closure sheet and the isolation sheet comprise a material with a barrier effect.

[0032] In accordance with another aspect, in a preferred form of manufacture, the side surface of the main body has a heptagonal shape. In another preferred form of manufacture, its side surface has a hexagonal shape. Likewise, the side surface of the main body may have other shapes in other forms of manufacture.

[0033] In accordance with a preferred form of manufacture, the main body has an IML label on the side surface.

[0034] With the soluble products capsule proposed here, a significant improvement in the state of the art is obtained.

[0035] This is because with the intermediate sectorising piece, it can contain two or three ingredients for preparing a drink containing them so that only one capsule is used and not one per ingredient as occurs currently.

[0036] Thus the preparation of this drink will be much less polluting than if various capsules are used in it and is also a much cleaner process given that there is only one capsule to be disposed of.

[0037] Likewise, this capsule has an additional advantage thanks to the existence of the pressurisation channels in its bottom. These channels, differentiated and independent for each sector, favour the exit of each ingredient from the capsule with a given pressure that generates the much-wanted dense cream.

[0038] Ali this means that the capsule is very effective for preparing drinks of soluble products while being at the same time environment-friendly, clean and simple to use since it facilitates the process of preparing drinks because there is no need to change capsules.

Brief description of the drawings

[0039] To help in the better understanding of the features of the invention, in accordance with a practical pre-

ferred example of its manufacture, a series of drawings is provided as an integral part of this description that show the following as an illustration but not a limitation:

Figure 1. Shows a plan view of the soluble products capsule, for a preferred form of manufacturing the invention.

Figure 2. Shows a view of cross section A-A' in Figure 1, for a preferred form of manufacturing the invention.

Figure 3. Shows a view of detail A in Figure 2, for a preferred form of manufacturing the invention.

Figure 4. Shows a plan view of the soluble products capsule without the sectorising intermediate piece, for a preferred form of manufacturing the invention.

Figure 5. Shows a perspective view of the soluble products capsule, for a preferred form of manufacturing the invention.

Figure 6. Shows an exploded view of the soluble products capsule, for a preferred form of manufacturing the invention.

Figure 7. Shows a perspective view of the interior of the soluble products capsule without the sectorising intermediate piece, for a preferred form of manufacturing the invention.

Detailed description of a preferred form of manufacturing the invention

[0040] In the supplied figures, it can be seen that in a preferred form of manufacturing the invention, the soluble products capsule (1) presented here a main body that comprises an internal cavity (2) to contain the soluble product, delimited by a side surface (3), a first open end (1.1) and a second opposite end (1.2) with pressurisation channels (4) for the soluble product inside it and an exit opening (5) for the soluble product in its central area and a closure sheet (6) in the first open end (1.1).

[0041] This capsule (1) also comprises an isolation sheet (7) for soluble product with respect to the exterior, placed on the pressurisation channels (4) of the second end (1.2) and an intermediate sectorising piece (8) for the internal cavity (2).

[0042] As can be seen in Figures 5 and 6, the intermediate sectorising piece (8) comprises a base (8.1) located on the isolation sheet (7) and three sectorising walls (8.2) emerging from the base (8.1) in a radial layout so that the internal cavity (2) of the capsule (1) is divided into three sectors (9).

[0043] As can be seen in Figures 1, 2, 5 and 6, the base (8.1) of this intermediate sectorising piece (8) has a shape and dimensions such that the contour of this base (8.1) is in contact with the inner face of the side surface (3) of the main body throughout the internal contour of an adjustment sector (10) of it near the second end (1.2) of the main body. In addition, the base (8.1) has a passing opening (11) for the soluble product in each of the resulting sectors (9), where these passing openings (11) are located next to the distal end (12) of one of the sectorising walls (8.2), respectively and located equidistantly apart.

[0044] Likewise, as can be seen in Figures 4 and 7, the pressurisation channels (4) of the second end (1.2) are independent for each of the three sectors (9). Thus, when pressurised water enters one of the sectors (9) of the capsule (1), this pressure breaks the isolation sheet (7) just below the passing opening (11) in that sector (9).

[0045] This breakage allows the water with the soluble product to pass through the passing opening (11), so that it enters the pressurisation channels (4) for the relevant sector (9) under the passing opening (11), which is the outermost point of the pressurisation channels (4). The mixed product must then circulate along the route formed between the pressurisation channels (4) for that sector (9), from this point on the route furthest from the central exit opening (5) of the second end (1.2) of the capsule (1) to that exit opening (5). The water enters the sectors (9) successively.

[0046] The route of the product between the pressurisation channels (4) generates a pressure in it that will favour the appearance of a dense cream in the final product.

[0047] In this preferred form of manufacturing the invention, these pressurisation channels (4) in the three sectors have the form of concentric arcs connected together consecutively at alternate ends of the arc.

[0048] As can be seen in Figures 2 and 3, the main body of the capsule (1) has a protuberance (13) to support the intermediate sectorising piece (8) located on its inner face of the side surface (3) next to the adjustment sector (10). This support protuberance (13) is located between the adjustment sector (10) and the second end (1.2) of the main body.

[0049] Thus the contour of the intermediate sectorising piece (8) Is supported on this support protuberance (13).

[0050] In addition, in this preferred form of manufacturing the invention, as can be seen in Figures 2 and 3, the main body has an adjustment tab (14) for the intermediate sectorising piece (8) located on the inner face of its side surface (3), next to its adjustment sector (10), such that it is located between this and the first end (1.1) of the main body. In this case, the adjustment tab (14) is located along the entire length of the internal contour of a section next to the adjustment sector (10). Thus, this adjustment tab (14) prevents an accidental exit of the intermediate sectorising piece (8).

[0051] In this preferred form of manufacturing the invention, the closure sheet (6) is made of a material comprising a layer with a barrier effect. This sheet prevents the entry of oxygen through the first end (1.1) of the cap-

sule (1) inside it. This closure sheet (6) in this mode of manufacture is printed with the instructions for using the capsule (1).

[0052] On the other hand, in this preferred form of manufacturing the invention, the isolation sheet (7) for the soluble product is also made of a material with a layer with a barrier effect.

[0053] As can be seen in Figures 1, 5 and 6, the side surface (3) of the main body in this preferred form of manufacturing the invention has a heptagonal shape. This side surface also has an IML label.

[0054] This capsule (1) therefore has an IML label which has the effect of an oxygen barrier on its side surface (3) as well as a closure sheet (6) on its first open end (1.1) and an isolation sheet (7) for the soluble product, on the pressurisation channels (4) of the second end (1.2), both comprising a material with a barrier effect.

[0055] The form of manufacturing described is only one example of this invention, therefore the details, terms and specific phrases used in this memorandum must not be considered as limiting but must be understood only as a base for the claims and as a representative base that provides an understandable description as well as sufficient information for the expert in the matter to apply this invention.

[0056] With the soluble products capsule presented here, important improvements are achieved with respect to the state of the art.

[0057] Thus a capsule is obtained that achieves a barrier effect to oxygen in all of its parts, preventing its entry from affecting the soluble product inside.

[0058] As well as this, the capsule for soluble products can contain more than one product as ingredients for a drink. Thanks to this, it is possible to prepare this drink quickly and simply with the use of a single capsule, considerably reducing the pollution arising from the use of several capsules to prepare a single drink.

[0059] With this capsule, a dense cream is also obtained thanks to the pressurisation channels in each of the sectors into which it is divided and that therefore affect each of the ingredients in the drink. This effect is much sought after in this type of drink and thanks to the distribution of these channels, a maximum route length is achieved for the product to be able to obtain the result sought.

[0060] Given that a single capsule is used to prepare each drink, fewer wastes and lower costs are generated and, at the same time, less dirt caused by the excess water ejected from the capsule after the drink has been prepared.

[0061] This is therefore a very effective capsule that is simple to use and environment-friendly.

Claims

1. Soluble products capsule (1) formed by a main body which comprises an internal cavity (2) to contain the soluble product, delimited by a side surface (3), a first open end (1.1) and a second opposite end (1.2) which contains pressurisation channels (4) for the soluble product inside it and an exit opening (5) for the soluble product in the central area and a closure sheet (6) in the first open end (1.1), **characterised by** comprising

   - an isolation sheet (7) for the soluble product with respect to the exterior, placed on the pressurisation channels (4) of the second end (1.2), and;
   - an intermediate sectorising piece (8) of the internal cavity (2) which comprises a base (8.1) located on the isolation sheet (7) and two or three sectorising walls (8.2) emerging from the base (8.1) in a radial layout such that the cavity is divided into two or three sectors (9), respectively;
   - where the base (8.1) has a form and dimensions such that its contour is in contact with the inner face of the side surface (3) of the main body throughout the internal contour of its adjustment sector (10) near the second end (1.2) and comprising a passing opening (11) for the soluble product in each of the resulting two or three sectors (9), where these passing openings (11) are located next to the distal end (12) of one of the sectorising walls (8.2), respectively, and located equidistantly apart, and;
   - where the pressurisation channels (4) are independent for each of the sectors (9) and form a route for the soluble product between them that starts in each of the sectors (9) in the outermost point of the pressurisation channels (4) located under the respective passing opening (11) and ending in the central exit opening (5) of the second end (1.2) of the capsule (1).

2. Soluble products capsule, according to claim 1, **characterised by** the pressurisation channels (4) of at least one of the sectors (9) having the form of concentric arcs connected together consecutively at alternate ends of the arc.

3. Soluble products capsule, according to any of the above claims, **characterised by** the main body having a support protuberance (13) for the intermediate sectorising piece (8) located on the inner face of its side surface (3) next to the adjustment sector (10), such that It is located between it and the second end (1.2) of the main body.

4. Soluble products capsule, according to any of the above claims, **characterised by** the main body having an adjustment tab (14) for the intermediate sectorising piece (8) located on the inner face of its side surface (3), next to its adjustment sector (10), such

that it is located between this and the first end (1.1) of the main body.

5. Soluble products capsule, according to claim 4, **characterised by** the adjustment tab (14) being placed throughout the length of the internal contour of a section next to the adjustment sector (10).

6. Soluble products capsule, according to any of the above claims, **characterised by** the closure sheet (6) and the isolation sheet comprising a material with a barrier effect.

7. Soluble products capsule, according to any of the above claims, **characterised by** the side surface (3) of the main body having a heptagonal shape.

8. Soluble products capsule, according to any of claims 1 to 6, **characterised by** the side surface (3) of the main body having a hexagonal shape.

9. Soluble products capsule, according to any of the above claims, **characterised by** the main body having an IML label on the side surface (3).

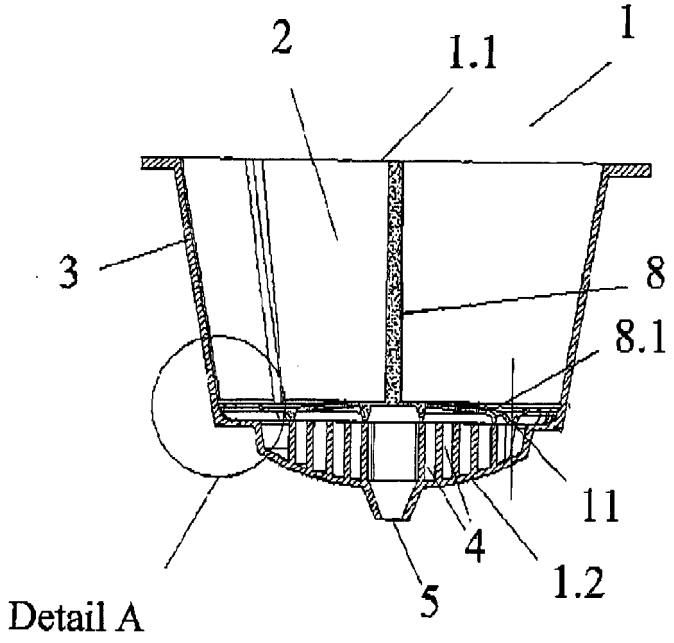

Fig. 2

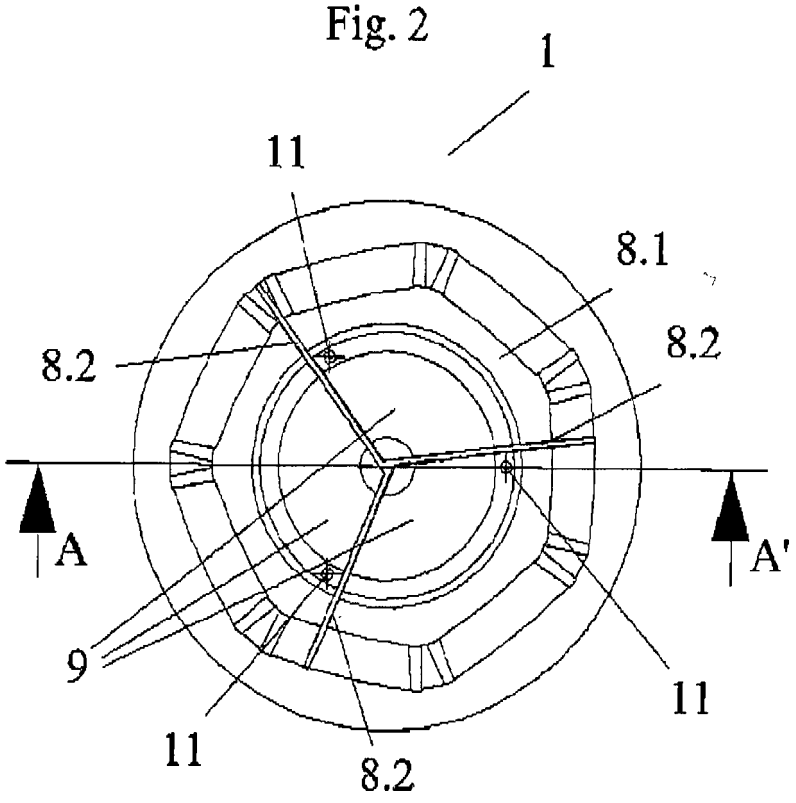

Fig. 1

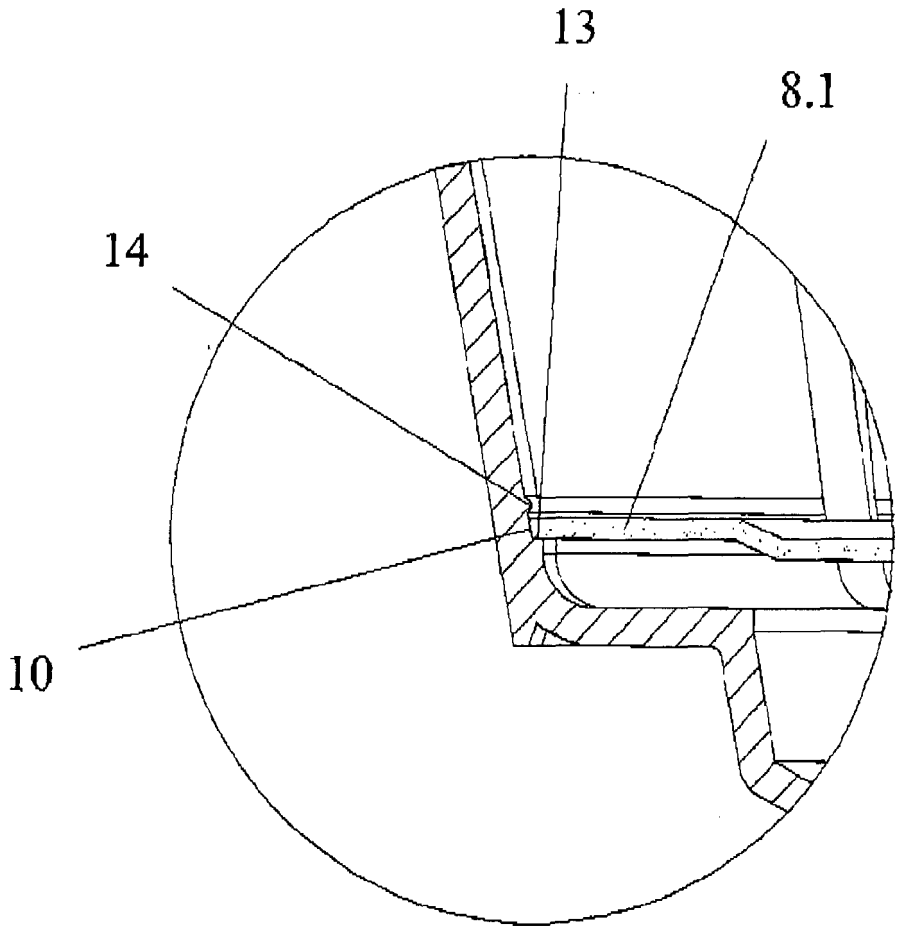

Fig. 3

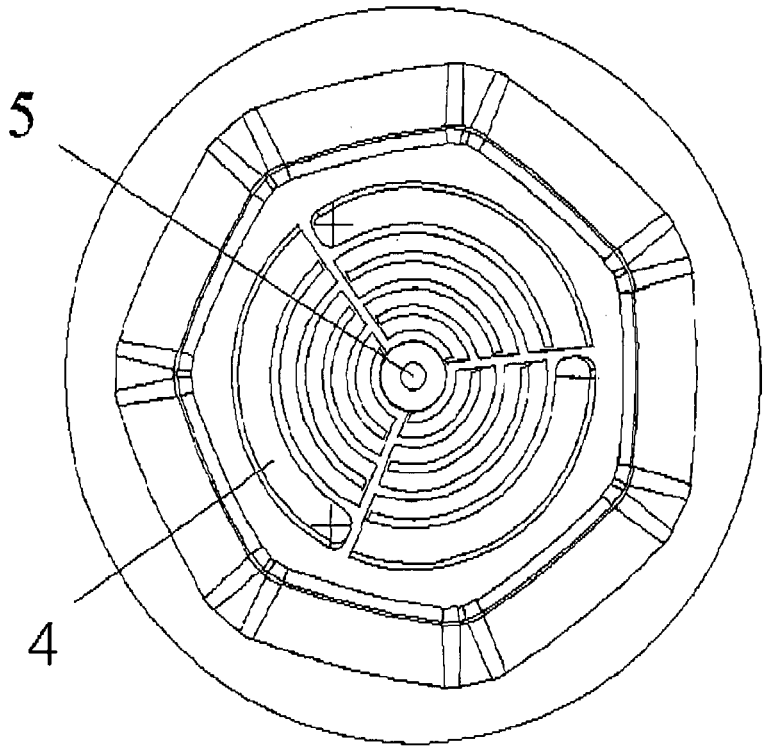

Fig. 4

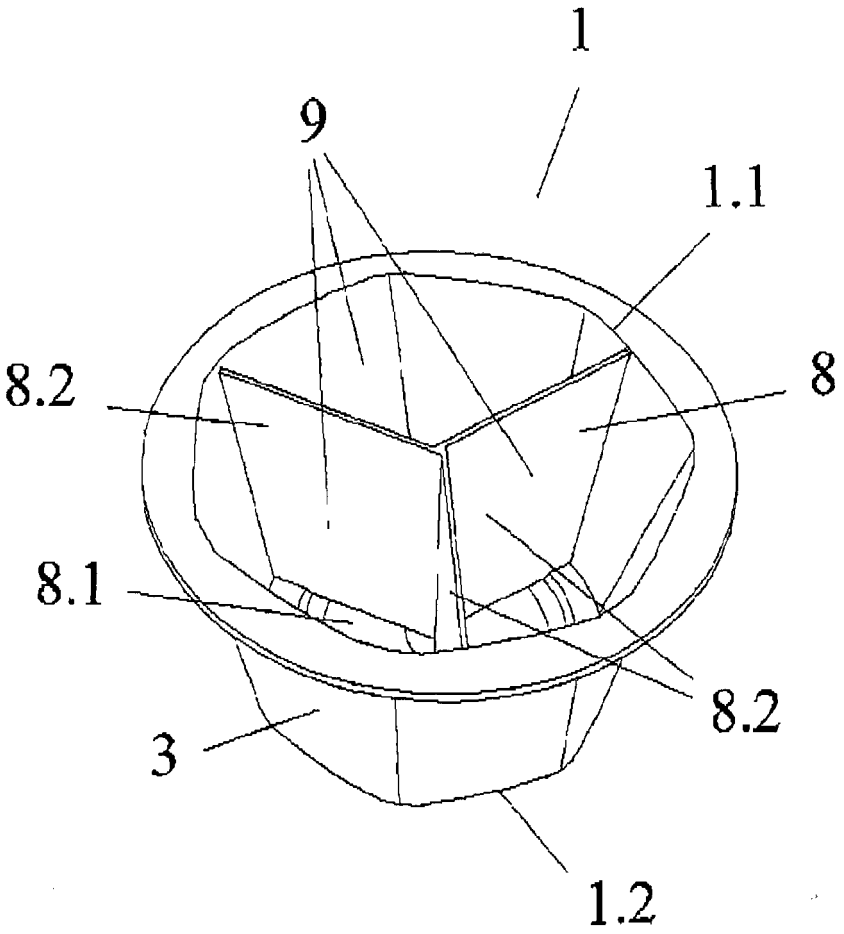

Fig. 5

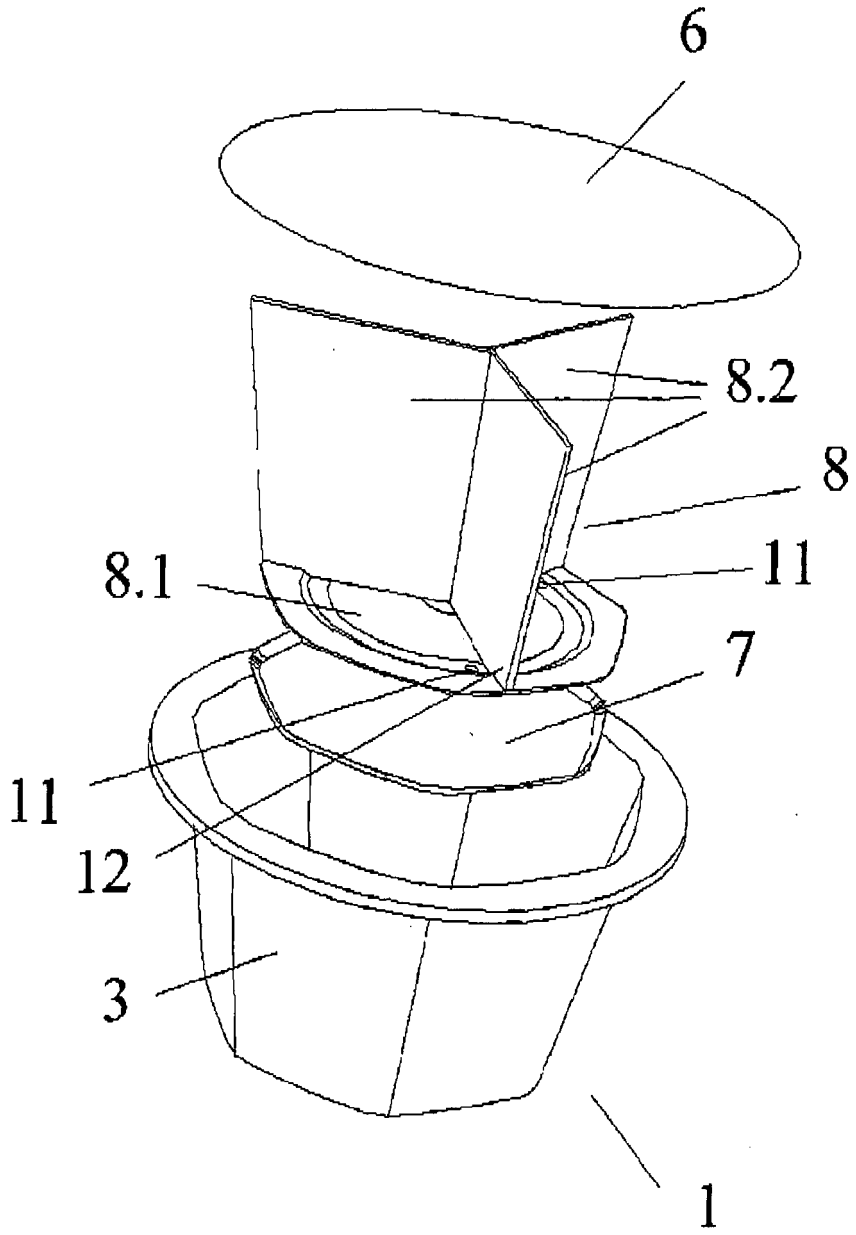

Fig. 6

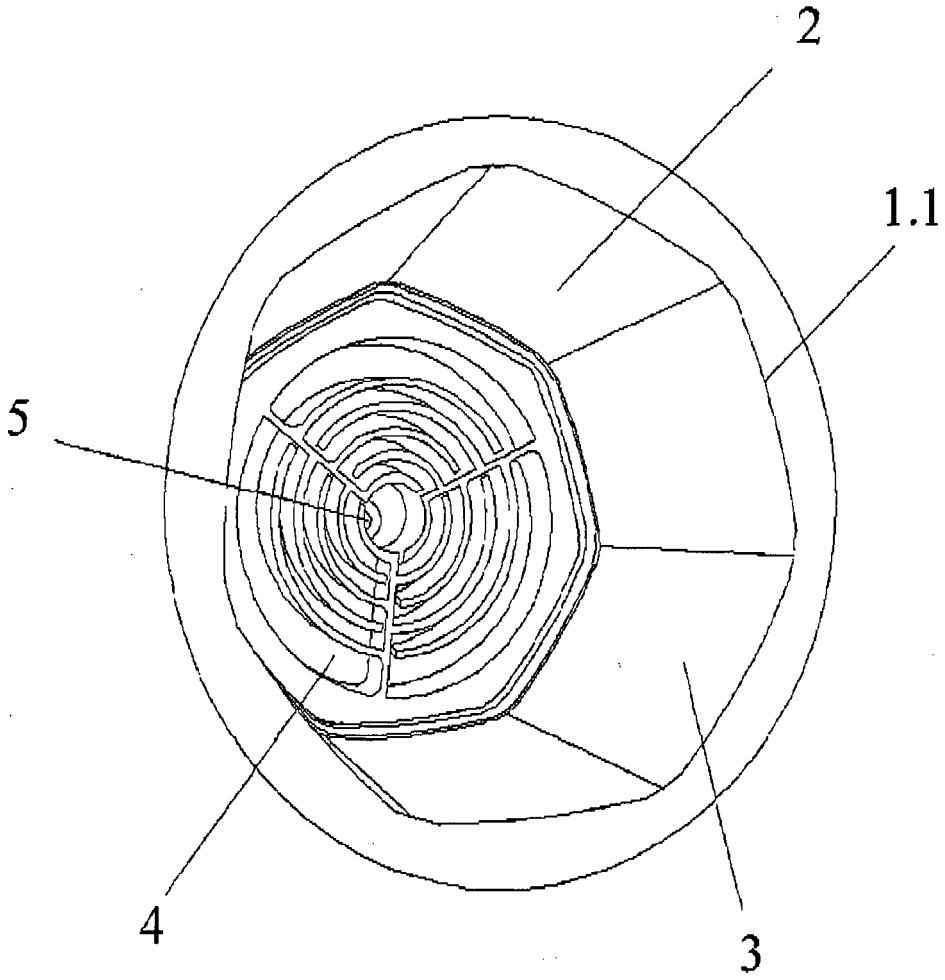

Fig. 7

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EUROPEAN SEARCH REPORT

Application Number
EP 16 00 2410

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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	23 March 2017	Brochado Garganta, M

CATEGORY OF CITED DOCUMENTS

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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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