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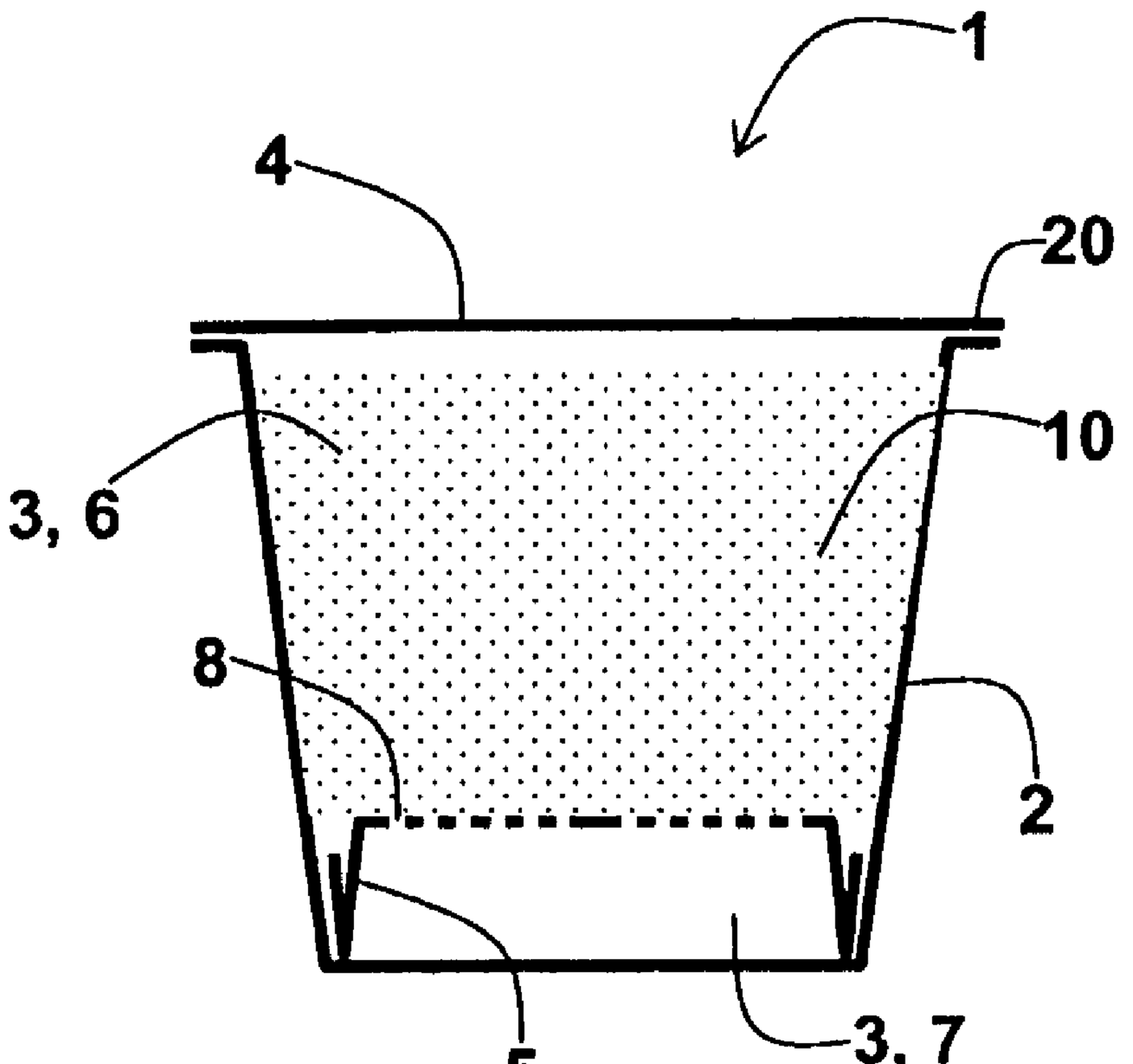
(54) **Titre : SUBSTANCE POUR BOISSON, CAPSULE-DOSETTE ET PROCEDE POUR PREPARER UNE BOISSON**
(54) **Title: BEVERAGE SUBSTANCE, PORTION CAPSULE AND METHOD FOR PRODUCING A BEVERAGE**



(57) **Abrégé/Abstract:**
A beverage substance for producing a tea beverage is proposed, wherein the beverage substance is intended to be stored in a portion capsule and to be infused in the portion capsule by means of hot water introduced under pressure into the portion capsule, wherein the beverage substance is substantially particulate and at least in part comprises tea, and wherein the beverage substance has a mean particle size of between 500 micrometres and 1,500 micrometres.

ABSTRACT

A beverage substance for producing a tea beverage is proposed, wherein the beverage substance is intended to be stored in a portion capsule and to be infused in the portion capsule by means of hot water introduced under pressure into the portion capsule, wherein the beverage substance is substantially particulate and at least in part comprises tea, and wherein the beverage substance has a mean particle size of between 500 micrometres and 1,500 micrometres.

DESCRIPTION

Title

Beverage substance, portion capsule and method for producing a beverage

Prior art

The present invention relates to a beverage substance for producing a tea beverage, wherein the beverage substance is provided to be stored in a portion capsule and to be brewed in the portion capsule by means of hot water being introduced under pressure into the portion capsule, and wherein the beverage substance is substantially granulate and comprises tea at least in part.

Such beverage substances are generally known and are frequently filled into portion capsules. For example, FR 2 556 323 A1 makes known a portion capsule for producing a beverage which has a substantially truncated-cone-shaped or cylindrical base element, which has a hollow space, and a membrane which seals the hollow space, a filter element being arranged inside the hollow space, said filter dividing the hollow space into a first region for accommodating the beverage substance and a second region for accommodating a beverage extract. The beverage substance, in this case, however, comprises a coffee powder. The portion capsule is consequently used for producing a coffee beverage. To produce the beverage, the portion capsule is arranged in a brewing chamber of a brewing chamber machine in which the membrane is perforated and an extraction liquid, in particular hot water is brought into the first region. The beverage substance is traversed by the extraction liquid during

an extraction operation such that a beverage extract, in this case a coffee beverage is formed which passes right through filter openings in the filter element into the second region of the hollow space. The sieving function of the filter element prevents the beverage substance from also passing into the second region. In the brewing chamber, a bottom region of the portion capsule is also perforated such that the beverage extract is able to leave the portion capsule and, where applicable, pass into a beverage vessel, such as for example a coffee cup.

Over and above this, it is known to use these types of portion capsules filled with a tea substance in order to produce a tea beverage in an analogous manner using the brewing chamber machine. In this connection, however, the problem arises that a high quality tea beverage has to be prepared in a comparatively short brewing time. The user of such brewing chamber machines is used to receiving a finished beverage within a maximum of 1 to 1.5 minutes. In addition, the known brewing chamber machines can, as a rule, supply hot boiling water to the portion capsule for a maximum of 60 to 90 seconds. In order to produce a cup of tea, the boiling water has to be pumped comparatively quickly through the volume of the portion capsule. The interaction time between the tea substance and the boiling water is consequently comparatively short and in particular clearly shorter than in the case of a classic or manual brewing operation for a classic tea beverage. The quality of the tea beverage produced in a brewing chamber machine using a portion capsule is consequently comparatively bad.

It is consequently the object of the present invention to make available a beverage substance, as a result of which the disadvantages of the prior art are avoided

and a more efficient, quicker and more reliable brewing operation for producing a tea beverage is achieved.

Disclosure of the invention

The object is achieved with a beverage substance for producing a tea beverage, wherein the beverage substance is provided to be stored in a portion capsule and to be brewed in the portion capsule by means of hot water being introduced under pressure into the portion capsule, wherein the beverage substance is substantially particulate and comprises tea at least in part and wherein the beverage substance has an average particle size of between 500 micrometers and 1500 micrometers.

The advantage of the beverage substance as claimed in the invention compared to the prior art is that a clearly more efficient, quicker and cleaner brewing of the beverage substance is made possible. On the one hand, the particle sizes are selected small in such a manner that the beverage substance has a large surface and, as a result, even in a comparatively short brewing time, it is possible to brew the tea efficiently with a good development of taste and aroma. On the other hand, the particle sizes are selected large in such a manner that the beverage substrate is able to be filtered out of the generated tea beverage in a simple manner and consequently the tea beverage prepared for a consumer is not contaminated by beverage substrate nor is its taste impaired. The term 'particulate' in particular in the sense of the present invention means the same as 'granulate'. The average particle size comprises in particular the $D_{4,3}$-value (also referred to as the volume median diameter of the particle) when the beverage substance is measured using the Malvern laser diffraction method. The Malvern Mastersizer 3000 with Aero S dry dispersing, 4 bar dispersive pressure and a

feed rate of between 60 and 90 has been used for this type of measuring.

As claimed in a preferred embodiment of the present invention, it is provided that the beverage substance has an average particle size $D_{4,3}$ of between 650 micrometers and 1320 micrometers. In a preferred manner, the beverage substance has a proportion of particles with a particle size greater than 500 micrometers which is between 40 percent and 90 percent and is preferably between 50 and 80 percent. In a particularly preferred manner, the beverage substance has a proportion of particles with a particle size smaller than 100 micrometers which is smaller than 10 percent and is preferably smaller than 8 percent. It has been shown in a manner that is unexpected and surprising to the expert that a beverage substance with a particle distribution of this type exhibits optimum extraction behavior. In particular, efficient extraction and a satisfying aroma are achieved where the amount of raw tea material used is less than in the prior art. In particular, an extract content of between 1 and 3 percent is achieved as a result. The extract content specifies the percentage amount of extracted dry substance. In this connection, the amount of the substances from the vegetable parts released during the preparation which remain behind as a solid after drying in the drying cabinet is divided by the amount of vegetable parts present in the capsule. The result is the extract content as a percentage.

As claimed in a preferred embodiment of the present invention, it is provided that the beverage substance has a specific swelling capacity of between 1.5 and 3 and in particular between 1.0 and 2.6. The swelling capacity comprises in particular the specific swelling capacity and is calculated as a quotient from the volume of the dry vegetable parts and the volume of the

vegetable parts swollen after the brewing process. The defined swelling capacity advantageously enables an optimum brewing efficiency of the beverage substance in the portion capsule. In particular, as a result, during the brewing operation an absorption of the water of the beverage particles is achieved which ensures optimum development of the tea aroma.

As claimed in a preferred embodiment of the present invention, it is provided that the beverage substance is thermally preheated to reduce germs. Herbal teas are subject to a very unstable germ load. Priority attention has been directed to enterobacters (salmonella, coliforms) as these can result in stomach upsets through to very serious and even fatal illnesses. In an advantageous manner, the beverage substance is consequently pretreated thermally in order to reduce enterobacters, but also yeasts and moulds. Even if the water is not boiling when it flows into the capsule, consequently it is ensured that the few germs still present are killed and as a result it is possible to produce a hygienically perfect beverage.

The object of the present invention is also achieved with a beverage substance for producing a tea beverage, wherein the beverage substance is provided to be stored in a portion capsule and to be brewed in the portion capsule by means of hot water being introduced under pressure into the portion capsule, wherein the beverage substance is substantially granulate and comprises tea at least in part and wherein at least 90 percent of the beverage substance has a median particle size of between 0.1 and 2 millimeters.

In a preferred manner, it is provided that at least 90 percent of the beverage substance has a median particle size of between 1 and 2 millimeters. The filtering of beverage substrate out of the tea beverage is

particularly efficient in this connection as almost all particles get caught in the filter and at the same time, however, individual filter openings of the filter are prevented from being obstructed by particles that are too small. In terms of the present invention, the percentage specifications relate in particular to the percentage by mass of the particles, i.e. that those particles of the beverage substance which have a median particle size of between 0.1 and 2 millimeters make up at least 90 percent of the mass of the beverage substance. In terms of the present invention, the particle size comprises in particular the particle median diameter of the beverage substance. This latter is preferably measured using a sieve analysis where the beverage substance is sieved, for example, using a sieve tower which is produced from several test sieves which are stacked one on top of the other. The mesh width of the individual test sieves, in this case, decreases from top to bottom. For carrying out the sieve analysis, the beverage substance is deposited onto the topmost test sieve and is then exposed to a defined shaking motion. The grain size distribution of the beverage substance is determined by weighing out the residues on the individual test sieves. To produce the beverage substance, tea leaves, in particular after the wilting process, are crushed, torn and/or curled (for example by means of a mechanical CTC process) in order to achieve the above-mentioned desired particle size or particle size distribution. It is additionally conceivable for wilted tea leaves to be chopped, cut and crumbled or the like. The beverage substance is produced, for example, by using the named CTC method, the particle size distribution is then measured using the above-mentioned sieve analysis method and a decision is made by way of the analysis results obtained as to whether further size reduction steps are necessary or whether the desired particle size distribution is already present.

Advantageous developments and further developments of the invention can be found in the sub-claims as well as the description with reference to the drawings.

As claimed in a preferred embodiment of the present invention, it is provided that the beverage substance includes an anti-foaming means. In an advantageous manner, too strong a foaming of the beverage substance during or after the brewing operation is prevented by the anti-foaming means. In particular when leaving the portion capsule, the tea beverage is strongly swirled, as a result of which large foam bubbles are formed. These latter make it difficult to fill the tea beverage in a proper manner into a receiving vessel, such as a cup or a pot. The anti-foaming means comprises in particular hydrophobic, vegetable constituents. In a preferred embodiment, the anti-foaming means comprises a vegetable oil. The vegetable oil is preferably sprayed onto a grain of tea which is then filled into the portion capsule. This has shown in a surprising and unforeseeable manner that with a maximum proportion of anti-foaming means of 5 percent, in a preferred manner a maximum of 2 percent and in a particularly preferred manner a maximum of 1.5 percent of the overall mass of the beverage substance, foam formation is effectively prevented and at the same time there is sufficient tea substance in the beverage substance to generate a high quality tea beverage. Along with the above-described content substances, the beverage substance can also include further aromatizing and coloring components, such as for example sugar, caramel coloring, natural coloring from vegetables, dried aqueous extracts from fruit, spices and herbs, oily extracts and extract mixtures of spices, herbs, citrus fruit peel and other vegetables and vegetable parts, aroma substances for rounding off, typifying and standardizing or the like.

Said content substances, after preparation, produce a tea beverage which corresponds to the traditionally prepared beverage in all characteristics such as aroma, taste, color and appearance.

As claimed in a preferred embodiment of the present invention, it is provided that the beverage substance comprises green tea and/or black tea. In particular, the beverage substance comprises overall substantially between 2 and 4 grams, in a preferred manner between 2.5 and 3.5 grams and in a particularly preferred manner substantially 3 grams of green tea and/or black tea.

A further object of the present invention is a portion capsule for producing a tea beverage, said portion capsule having a substantially closed container which is filled at least in part with a brewing substance which is provided for brewing, wherein the portion capsule is insertable into a brewing chamber machine for brewing the brewing substance and wherein the brewing substance comprises a beverage substance as claimed in the invention. The advantage of the portion capsule compared to the prior art is that it is possible to brew the beverage substance which is located in the portion capsule in a clearly more efficient, quicker and cleaner manner. The portion capsule preferably has a filter element which in a particularly preferred manner has filter openings which have a median hole diameter of between 0.01 and 1 millimeter. The advantage of this compared to the prior art is that there is no contamination of the tea beverage to be produced by particles of the beverage substance, at the same time a more efficient brewing behavior of the beverage substance being achieved. The high level of efficiency of the brewing operation additionally enables in an advantageous manner a reduction in the amount of the required beverage

substance, as well as a high brewing speed, as a result of which the duration of the beverage brewing procedure is reduced. It has been shown in a surprising and unforeseeable manner that in particular with a beverage substance where at least 90 percent of the beverage substance has a median particle size of between 0.1 and 2 millimeters, combined with a filter element which has filter openings with a median hole diameter of between 0.01 and 1 millimeter, an optimum ratio between brewing efficiency and brewing speed on the one hand and filtration rate on the other is achieved.

As an alternative to this, it is conceivable for the filter element to comprise a filter felt, by way of which a similarly optimum result can be achieved. The material of the filter felt preferably comprises polyester such that cost-efficient production and a high degree of tearing resistance can be achieved. The filter felt has, in particular, a weight per unit area of between 100 and 2000 grams per square meter, in a preferred manner of between 400 and 900 grams per square meter, in a particularly preferred manner of between 600 and 700 grams per square meter and in a quite particularly preferred manner of substantially 650 grams per square meter. In addition, the filter felt, at right angles to its main extension plane, has in particular a thickness which is between 1.5 and 5.0 millimeters, in a preferred manner between 2 and 4 millimeters and in a particularly preferred manner is substantially 2.8 millimeters. As an option, the filter felt is realized in such a manner that, at a pressure of 200 Pa, the filter felt has an air permeability of between 100 and 1000 $l/(dm^2 \cdot min)$, in a preferred manner of between 200 and 300 $l/(dm^2 \cdot min)$ and in a preferred manner of substantially 250 $l/(dm^2 \cdot min)$. The defined filter felt makes possible in an advantageous manner a quick, efficient and aromatic extraction of the beverage substance without, in this connection,

particles of the beverage substance being washed out of the portion capsule and the beverage consequently becoming contaminated. As an alternative to this, it is also conceivable for the filter element to comprise a filter fleece or filter non-woven.

The closed container preferably has a substantially truncated-cone-shaped base element with a closed bottom which is sealed on its side remote from the bottom with a covering foil, wherein a hollow space for accommodating the brewing substance is realized between the bottom and the covering foil. In an advantageous manner, the portion capsule as claimed in the invention is consequently able to be used in traditional brewing chamber machines.

A further object of the present invention is a method for producing a tea beverage with a portion capsule, wherein in a first method step the portion capsule is inserted into a brewing chamber of a brewing chamber machine, wherein in a second method step boiling water is introduced into the portion capsule and the brewing substance is brewed by means of the boiling water to produce the tea beverage and wherein in a third method step the tea beverage is discharged out of the portion capsule. By using the portion capsule as claimed in the invention, a tea beverage, which is higher in quality compared to the prior art, is produced in a comparatively short brewing time without any beverage substrate residues.

It has been shown that the named advantages are achieved in particular when an extract content is kept between 1 and 50 percent, in a preferred manner between 1 and 10 percent and in a particularly preferred manner between 1 and 3 percent. The extract content is kept in particular by an average particle size $D_{4,3}$ of the beverage substance being provided between 500

micrometers and 1500 micrometers and in a preferred manner between 650 micrometers and 1320 micrometers and/or the beverage substance being provided with a proportion of particles with a particle size greater than 500 micrometers which is between 40 percent and 90 percent and preferably between 50 and 80 percent, and/or the beverage substance being provided with a proportion of particles with a particle size smaller than 100 micrometers which is smaller than 10 percent and preferably smaller than 8 percent.

As claimed in a preferred embodiment of the present invention, it is provided that in the first method step an inlet opening for the boiling water and an outlet opening for the tea beverage is generated in the closed container of the portion capsule, wherein the closed container is preferably perforated by perforating means of the brewing chamber machine and/or wherein a sealing foil which covers the inlet and/or outlet opening is preferably removed from the closed container. The advantage of this is that the beverage substance does not lose or only loses an insignificant amount of aroma during storage of the portion capsule as, prior to the opening or producing of the inlet and/or outlet opening, the portion capsule is substantially hermetically sealed.

As claimed in a preferred embodiment of the present invention, it is provided that in the second method step boiling water is introduced into the portion capsule for a time period of between 30 and 100 seconds, in a preferred manner of between 50 and 80 seconds and in a particularly preferred manner of between 60 and 70 seconds. It has been shown that an optimum between a still justifiable brewing duration and comparatively good brewing results can be ensured in this way.

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The method as claimed is characterized in that the pressure of the boiling water, the inner volume of the portion capsule, the amount of the brewing substance arranged in the portion capsule, the amount of the boiling water introduced into the portion capsule in the second method step, the particle size distribution of the brewing substance and/or the median hole diameter of the filter element are matched to one another in such a manner that in the third method step an amount of between 150 and 250 millilitres, in a preferred manner between 180 and 220 millilitres and in a particularly preferred manner of substantially 200 millilitres of tea beverage is discharged out of the portion capsule.

In accordance with this invention there is provided a portion capsule for producing a tea beverage, said portion capsule having a substantially closed container which is filled at least in part with a brewing substance which is provided for the brewing process, wherein for brewing the brewing substance the portion capsule can be inserted into a brewing chamber machine, wherein the closed container has a substantially truncated-cone-shaped base element with a closed bottom which is sealed on its side remote from the bottom by means of a covering foil, wherein a hollow space for accommodating the brewing substance is realized between the bottom and the covering foil, wherein the portion capsule has a filter element, wherein the filter element comprises a filter felt or a filter non-woven and in that the brewing substance comprises a beverage substance for producing a tea beverage, wherein the beverage substance is provided to be stored in the portion

capsule and to be brewed in the portion capsule by means of hot water introduced into the portion capsule under pressure, wherein the beverage substance is substantially particulate and comprises tea at least in part, wherein the beverage substance has an average particle size ($D_{4,3}$) of between 500 micrometers and 1500 micrometers.

Exemplary embodiments of the invention are shown in the figures and are explained in more detail in the following description. The figures are described purely as an example and do not limit the general concepts of the invention.

Brief description of the figures

Figure 1 shows a schematic side view of a sectional drawing of a portion capsule having a beverage substance as claimed in an exemplary embodiment of the present invention.

Figure 2 shows a schematic side view of a sectional drawing of a portion capsule as claimed in an exemplary embodiment of the present invention during a brewing operation.

Figure 3 shows a schematic side view of a sectional drawing of a portion capsule having a beverage substance as claimed in a further exemplary embodiment of the present invention.

Figure 4 shows a schematic side view of a sectional drawing of the portion capsule as claimed in a further exemplary embodiment of the present invention during a brewing operation.

Embodiments of the invention

Figure 1 shows a schematic side view of a sectional drawing of a portion capsule 1 as claimed in a first embodiment of the present invention, the portion capsule 1 having a substantially truncated-cone-shaped base element 2 which is realized in the manner of a pot and surrounds a hollow space 3. The hollow space 3 is sealed by a covering foil 4 in the form of a membrane. The base element 2 comprises in particular a soft or rigid plastics material. The covering foil 4 preferably comprises a thin plastics material or aluminum foil. The base element 2 has a circumferential fastening flange 20 in the region of the membrane 4, the membrane 4 being positively bonded, in particular welded or glued, to the fastening flange 20. Inside the base element 2 is arranged a filter element 5 which is produced from a thermoplastic plastics material, for example polypropylene. The filter element 5 divides the hollow space 3 into a first region 6 and into a second region 7. The first region 6 is provided for accommodating a powdery beverage substance 10 which is only illustrated schematically in the figures for reasons of clarity. The beverage substance 10 comprises granulated tea. The beverage substance 10 is filled, for example, into the first region 6 and is then compacted before the hollow space 3 is sealed by the covering foil 4. The second region 7 serves for accommodating and in particular for collecting a tea beverage (not shown) during a brewing operation of the portion capsule 1. The portion capsule 1 is provided for the purpose of being inserted into a brewing chamber 12 of a brewing chamber machine (not shown in

figure 1), in which a brewing liquid (for example hot water) is supplied preferably at high pressure to the first region 6. Said brewing liquid interacts with the beverage substance 10 such that a tea beverage is formed. The filter element 5 has a plurality of filter openings 8 and functions as a filter for the beverage, as a result of which particles of the beverage substance 10 are filtered out of the produced beverage. The tea beverage, in this connection, passes through the filter openings 8 into the second region 7, whilst no particles of the beverage substrate 10 pass into the second region 7. The second region 7 is defined by a bottom region of the base element 2 which is pierced in the brewing chamber 12, for example by a piercing mandrel of the brewing chamber machine in order to produce an outlet opening for the beverage. As an alternative to this, it is conceivable for an outlet opening to be formed automatically in the base region under the pressure of the brewing liquid and/or for an outlet opening or an outlet valve to be already implemented in the bottom region. The outlet opening is sealed, for example, by way of a sealing foil which is removable by hand and is removed manually by a user prior to inserting the portion capsule 1 into the brewing chamber machine. The beverage substance 10 is substantially granulate and comprises at least in part green tea and/or black tea. However, it is equally conceivable for the beverage substance 10 to comprise any other sort or combination of commercially available teas, such as, for example, fruit tea, herb tea, peppermint tea, chamomile tea, rose-hip tea and the like. It would also be conceivable for the beverage substance 10 to comprise a granulate for ice tea. The grain size distribution of the beverage substrate 10 is selected additionally in such a manner that at least 90 percent of the beverage substance 10 has a median particle size of between 0.1 and 2 millimeters. The grain size distribution, in this case, is matched in

particular to a median diameter of filter openings 8 which comprises substantially between 0.01 and 1 millimeter. The ratio between the grain size distribution of the beverage substance 10 and the diameter and cross section of the individual filter openings 8, in this case, is selected in such a manner that almost no particles of the beverage substance 10 pass from the first to the second region 6, 7 and at the same time as quick and efficient a brewing of the beverage substance 10 as possible is achieved. The overall mass of the beverage substance 10 in the portion capsule 1 preferably comprises substantially 3 grams. The beverage substance 10 additionally has an anti-foaming means which is in particular granulate and comprises at least one oil. The anti-foaming means, in this case, preferably comprises a maximum proportion of 1.5 percent of the overall mass of the beverage substance 10. It is conceivable for the beverage substance 10 to be thermally pretreated to reduce germs.

As an option or as an alternative to this, it is provided that the beverage substance 10, when it is measured using the Malvern laser diffraction method (for example by means of a Malvern Mastersizer 3000 with Aero S dry dispersing, 4 bar dispersive pressure and a feed rate of between 60 and 90), has an average particle size $D_{4,3}$ of between 650 micrometers and 1320 micrometers. In addition, the beverage substance 10 has a proportion of particles with a particle size greater than 500 micrometers which is between 50 and 80 percent and a proportion of particles with a particle size smaller than 100 micrometers which is smaller than 8 percent. The specific swelling capacity of the beverage substance 10 is between 1.0 and 2.6.

Figure 2 shows a schematic side view of a sectional drawing of the portion capsule 1 described by way of

figure 1 during a brewing operation. The portion capsule 1, in this case, is arranged in a brewing chamber 12 of a brewing chamber machine which can be, for example, a coffee machine for brewing coffee portion capsules. The brewing chamber 12 comprises a receiving element 13 for receiving the portion capsule 1 and a sealing element 14 for sealing the receiving element 13. The brewing chamber 12 is movable by axially displacing the sealing element 14 in relation to the receiving element between a loading position (not shown) and a brewing position shown in figure 2. In the loading position, the receiving element 13 and the sealing element 14 are at a spacing from one another along the axial direction 100 such that the portion capsule 1 can be inserted into the brewing chamber 12 or can be arranged along the axial direction 100 between the sealing element 14 and the receiving element 13. The sealing element 14 is then moved along the axial direction 100 in the direction of the receiving element 13 such that the flange 20 is clamped between the edge of the receiving element 13 and the sealing element 14 and consequently a closed brewing chamber 12 is formed. In addition, the receiving element 13 has a mandrel 15 and the sealing element 14 has a plurality of perforating tips 16. When the brewing chamber 12 is closed, the bottom region of the portion capsule 1 is perforated by means of the mandrel 15 and the covering foil 4 is perforated by means of the perforating tips 16. The sealing element 14 has a liquid feed opening 17, through which the brewing liquid is fed to the first region 6 of the portion capsule 1 in the form of pressurized, hot or cold water. The boiling water, in this case, is introduced into the portion capsule 1 for a time period of between 60 and 70 seconds. The brewing liquid, in this case, passes into the portion capsule 1 through the perforation holes, which are generated in the covering foil 4 by means of the perforation tips 16. The brewing

liquid interacts with the beverage substance 10 inside the first region 6, as a result of which a tea beverage is formed or brewed which passes through the filter openings 8 of the filter element 5 into the second region 7. The tea beverage is additionally directed out of the second region 7 through the output hole, which is generated by means of the mandrel 15 in the bottom region, and is then supplied to a beverage vessel (not shown), such as, for example, a tea cup or teapot. In particular, an amount of substantially 200 milliliters of tea beverage is supplied to the beverage vessel in one single brewing operation. The extract content, in this connection, is in particular between 1 and 3 percent. Once the brewing operation has been completed, the sealing element 14 is moved away from the receiving element 13 again such that the used portion capsule 1 can be removed or automatically ejected and the brewing chamber machine, where applicable, can be filled with a new portion capsule 1.

Figure 3 shows a schematic side view of a sectional drawing of a portion capsule 1 having a beverage substance 10 as claimed in a further exemplary embodiment of the present invention, the portion capsule 1 being substantially the same as the portion capsule 1 illustrated in figure 1 and the only difference being the filter element 5 realized as a filter felt. The beverage substance 10 corresponds in particular to the beverage substance 10 described in conjunction with figures 1 and 2.

The material of the filter felt preferably comprises polyester. The filter felt has a weight per unit area of between 600 and 700 grams per square meter and in particular of substantially 650 grams per square meter. The thickness of the filter felt at right angles to its main extension plane is substantially 2.8 millimeters.

At a pressure of 200 Pa, the filter felt preferably has an air permeability of substantially 250 $l/dm^2 \cdot min$.

Figure 4 shows a schematic side view of a sectional drawing of the portion capsule 1 described by way of figure 3 during a brewing operation, the mandrel piercing the capsule bottom from below - similar to as in figure 2. In the present example, however, the mandrel tip enters into the filter felt such that the beverage is able to flow out of the portion capsule 1. The extract content, in this connection, is also in particular between 1 and 3 percent. It is also conceivable for the mandrel tip to pierce the filter felt completely and/or for the filter felt to be lifted up slightly in the region of the mandrel tip. An efficient flowing-out of the beverage is made possible by means of the cross flow inside the filter felt (parallel to the main extension plane of the filter felt), the individual particles of the beverage substance being filtered out through the filter felt and consequently not contaminating the beverage as it flows out.

List of references

1	Portion capsule
2	Base element
3	Hollow space
4	Covering foil
5	Filter element
6	First region
7	Second region
8	Filter openings
10	Beverage substance
10'	Brewing substance
11	Tea beverage
12	Brewing chamber
13	Receiving element
14	Sealing element
15	Mandrel
16	Perforating tips
17	Liquid feed opening
20	Flange
100	Axial direction

CLAIMS:

1. A portion capsule for producing a tea beverage, said portion capsule having a substantially closed container which is filled at least in part with a brewing substance which is provided for the brewing process, wherein for brewing the brewing substance the portion capsule can be inserted into a brewing chamber machine, wherein the closed container has a substantially truncated-cone-shaped base element with a closed bottom which is sealed on its side remote from the bottom by means of a covering foil, wherein a hollow space for accommodating the brewing substance is realized between the bottom and the covering foil, wherein the portion capsule has a filter element, wherein the filter element comprises a filter felt or a filter non-woven and in that the brewing substance comprises a beverage substance for producing a tea beverage, wherein the beverage substance is provided to be stored in the portion capsule and to be brewed in the portion capsule by means of hot water introduced into the portion capsule under pressure, wherein the beverage substance is substantially particulate and comprises tea at least in part, wherein the beverage substance has an average particle size ($D_{4,3}$) of between 500 micrometers and 1500 micrometers.

2. The portion capsule as claimed in claim 1, wherein the beverage substance has an average particle size ($D_{4,3}$) of between 650 micrometers and 1320 micrometers.

3. The portion capsule as claimed in claim 1 or 2, wherein the beverage substance has a proportion of particles with a particle size greater than 500 micrometers which is between 40 percent and 90 percent.

4. The portion capsule as claimed in claim 1 or 2, wherein the beverage substance has a proportion of particles with a particle size greater than 500 micrometers which is between 50 and 80 percent.

5. The portion capsule as claimed in any one of claims 1 to 4, wherein the beverage substance has a proportion of particles with a particle size smaller than 100 micrometers which is smaller than 10 percent.

6. The portion capsule as claimed in any one of claims 1 to 4, wherein the beverage substance has a proportion of particles with a particle size smaller than 100 micrometers which is smaller than 8 percent.

7. The portion capsule as claimed in any one of claims 1 to 6, wherein the beverage substance has a specific swelling capacity of between 1.5 and 3.

8. The portion capsule as claimed in any one of claims 1 to 6, wherein the beverage substance has a specific swelling capacity of between 1.0 and 2.6.

9. The portion capsule as claimed in any one of claims 1 to 8, wherein the beverage substance is thermally preheated to reduce germs.

10. The portion capsule as claimed in any one of claims 1 to 9, wherein at least 90 percent of the beverage substance has a median particle size of between 0.1 and 2 millilitres.

11. The portion capsule as claimed in any one of claims 1 to 10, wherein the beverage substance comprises an anti-foaming means.

12. The portion capsule as claimed in claim 11, wherein the anti-foaming means comprises a vegetable oil.

13. The portion capsule as claimed in claims 11 or 12, wherein the anti-foaming means comprises a maximum of 5 percent of the beverage substance.

14. The portion capsule as claimed in claims 11 or 12, wherein the anti-foaming means comprises a maximum of 2 percent of the beverage substance.

15. The portion capsule as claimed in claims 11 or 12, wherein the anti-foaming means comprises a maximum of 1.5 percent of the beverage substance.

16. The portion capsule as claimed in any one of claims 1 to 15, wherein the beverage substance comprises green tea and/or black tea.

17. The portion capsule as claimed in any one of claims 1 to 16, wherein the beverage substance comprises substantially between 2 and 4 grams of green tea and/or black tea.

18. The portion capsule as claimed in any one of claims 1 to 16, wherein the beverage substance comprises substantially between 2.5 and 3.5 grams of green tea and/or black tea.

19. The portion capsule as claimed in any one of claims 1 to 16, wherein the beverage substance comprises substantially 3 grams of green tea and/or black tea.

20. The portion capsule as claimed in any one of claims 1 to 19, wherein the material of the filter felt comprises polyester.

21. The portion capsule as claimed in any one of claims 1 to 20, wherein the filter felt has a weight per unit area of between 100 and 2000 grams per square meter.

22. The portion capsule as claimed in any one of claims 1 to 20, wherein the filter felt has a weight per unit area of between 400 and 900 grams per square meter.

23. The portion capsule as claimed in any one of claims 1 to 20, wherein the filter felt has a weight per unit area of between 600 and 700 grams per square meter.

24. The portion capsule as claimed in any one of claims 1 to 20, wherein the filter felt has a weight per unit area of substantially 650 grams per square meter.

25. The portion capsule as claimed in any one of claims 1 to 24, wherein the filter felt, at right angles to its main extension plane, has a thickness which is between 1.5 and 5.0 millimetres.

26. The portion capsule as claimed in any one of claims 1 to 24, wherein the filter felt, at right angles to its main extension plane, has a thickness which is between 2 and 4 millimetres.

27. The portion capsule as claimed in any one of claims 1 to 24, wherein the filter felt, at right angles to its main

extension plane, has a thickness which is substantially 2.8 millimetres.

28. The portion capsule as claimed in any one of claims 1 to 27, wherein, at a pressure of 200 Pa, the filter felt has an air permeability of between 100 and 1000 $l/(dm^2 \cdot min)$.

29. The portion capsule as claimed in any one of claims 1 to 27, wherein, at a pressure of 200 Pa, the filter felt has an air permeability of between 200 and 300 $l/(dm^2 \cdot min)$.

30. The portion capsule as claimed in any one of claims 1 to 27, wherein, at a pressure of 200 Pa, the filter felt has an air permeability of substantially 250 $l/(dm^2 \cdot min)$.

Fig. 1

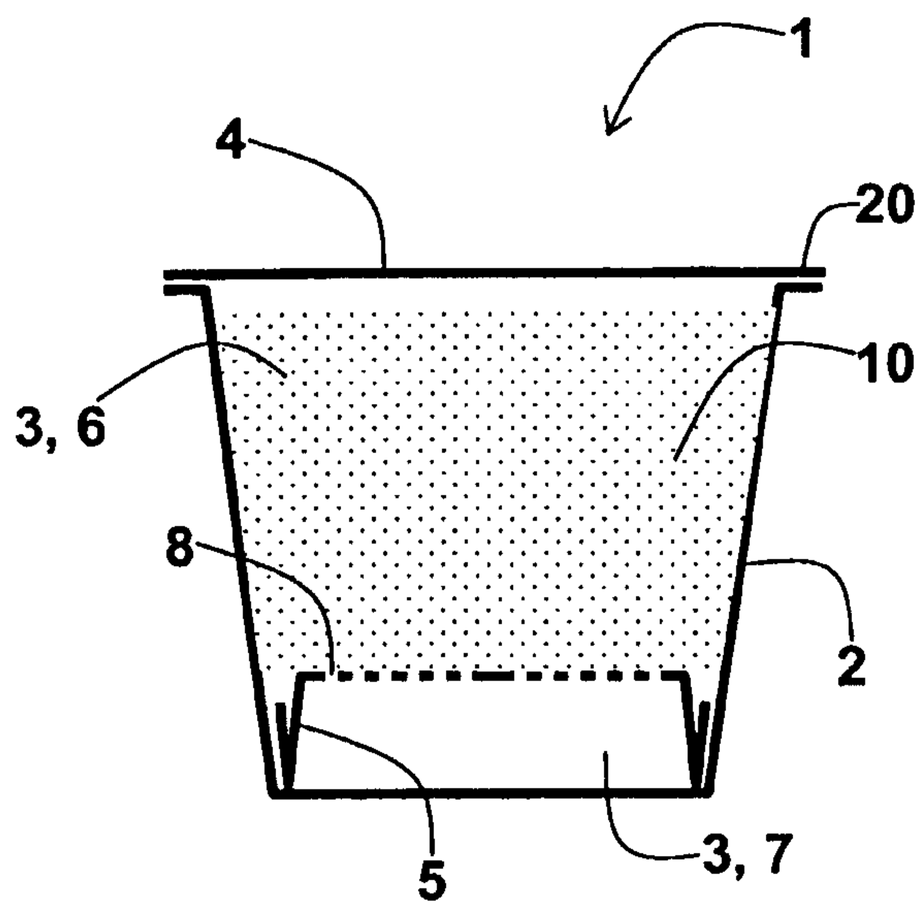


Fig. 2

Fig. 3

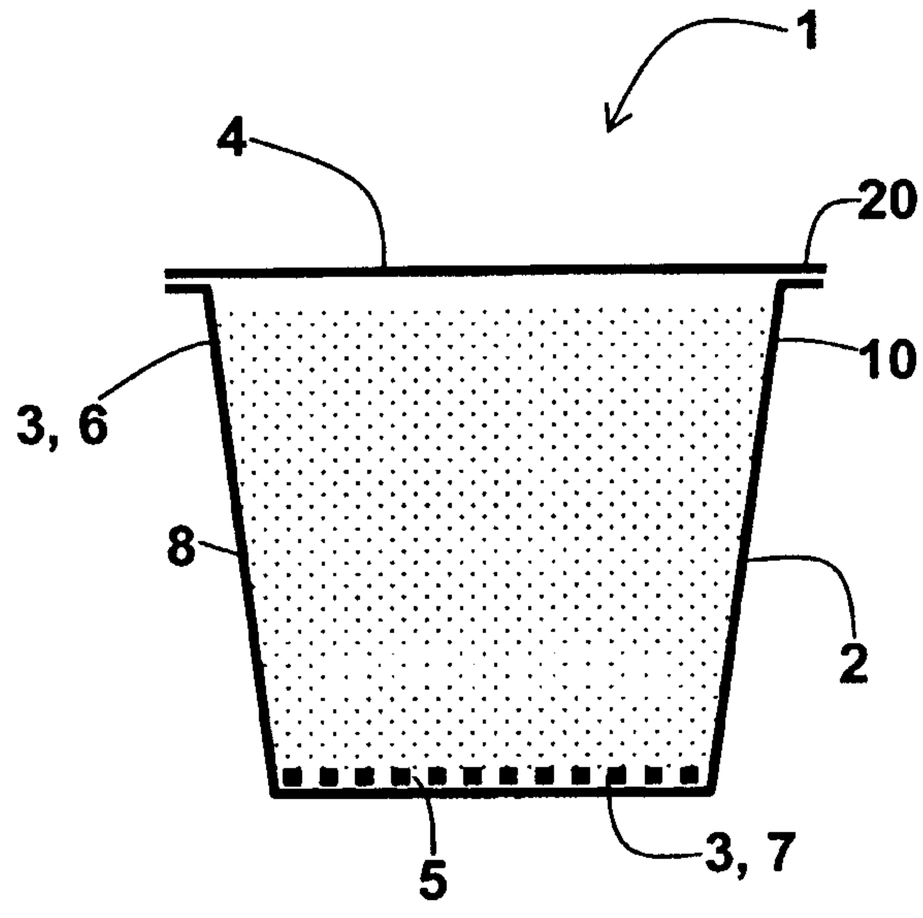
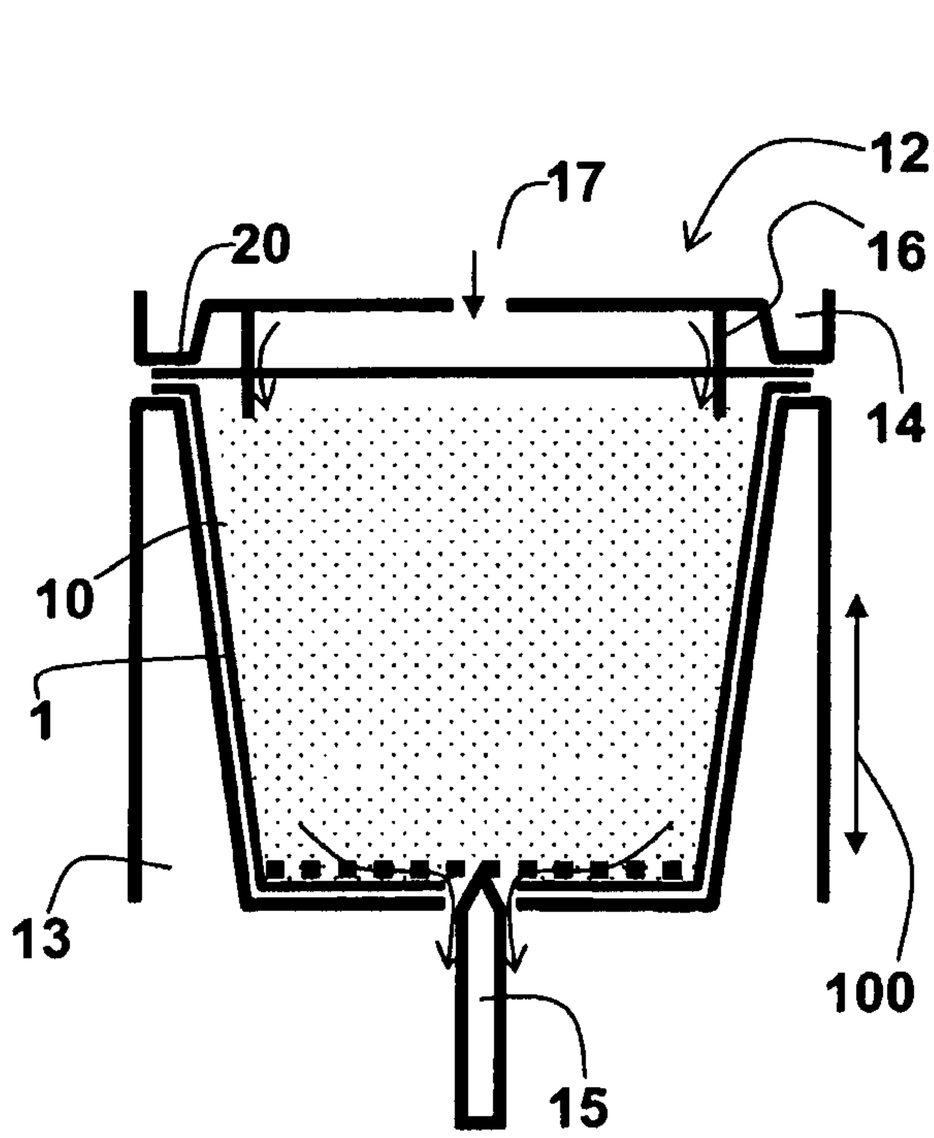
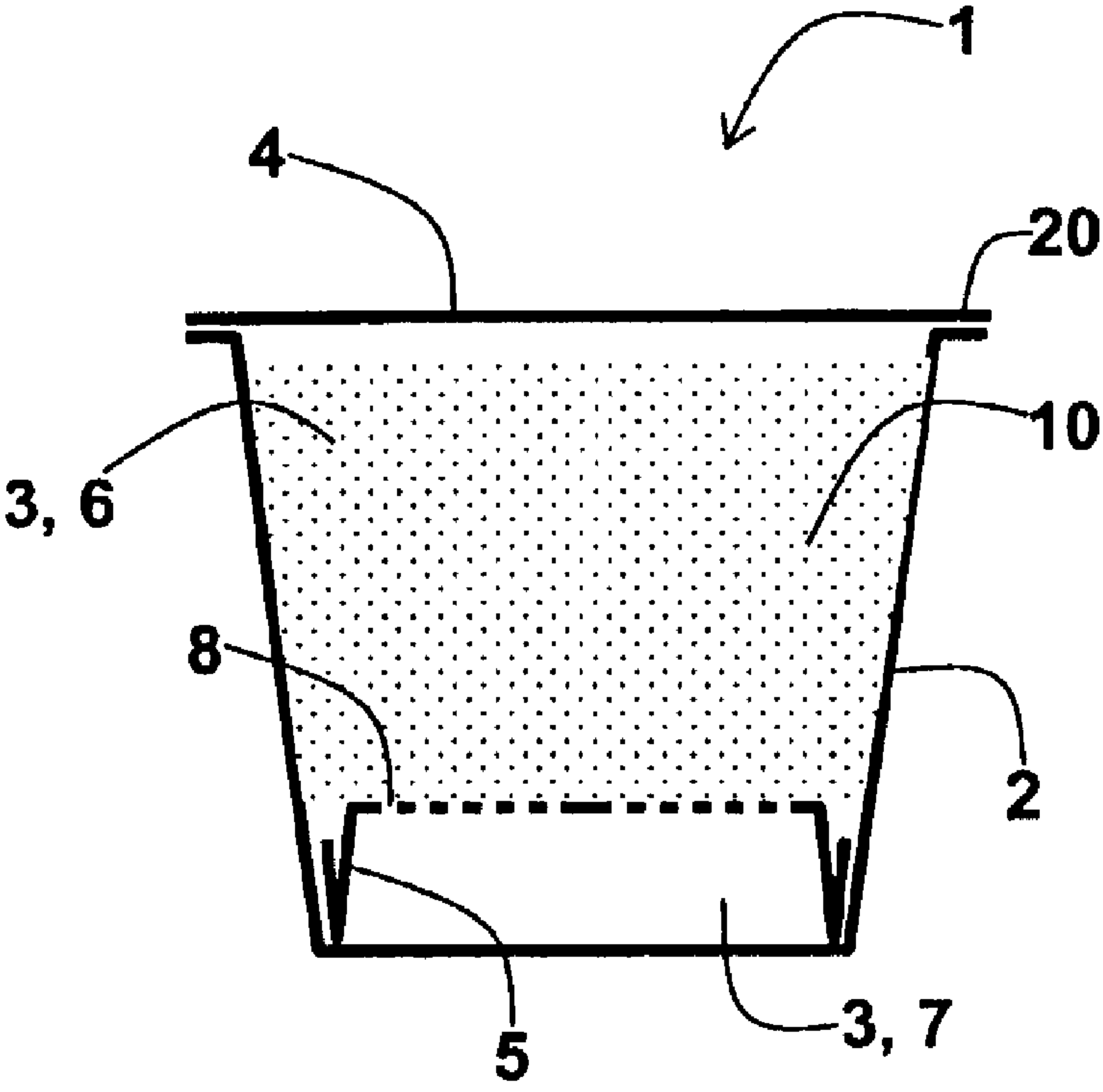


Fig. 4

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