Coffee infusion bag

The invention relates to a coffee infusion bag comprising at least one chamber (11; 21; 31; 41), at least a part of said at least one chamber (11; 21; 31; 41) being formed by a filter material, said at least one chamber being expandable in the vertical direction when positioned in a container in a ratio of at least two to one.

According to the invention, a flow may be provided through the infusion bag, initially without the need of imparting any pressure downwards, when the infusion bag is positioned in a fluid holding container, such as a cup. In this way, the prime direction of expansion obtained in the up down direction, and moreover, the bag may facilitate a substantial expansion. This fact, moreover, facilitates a substantial increasing of the volume of the at least one chamber.

![Fig. 3a](image-url)
Description

Field of the invention

[0001] The invention relates to coffee infusion bag as described in claim 1.

Background of the invention

[0002] Coffee infusion bags are well known for the purpose of providing an alternative to conventional filtered coffee and instant coffee.

[0003] Filtered coffee on the one hand provides a high-quality coffee product whereas instant coffee on the other hand offers a high degree of flexibility.

[0004] One example of a coffee infusion bag is disclosed in US patent 4,844,914. The disclosed coffee bag is provided with a rigid handle facilitating the establishment of a pump-through like movement, by means of which water may be pumped through the bag. A problem of the disclosed bag is that the obtained flow through the bag requires quite some handling by a user.

[0005] It is the object of the invention to overcome the above-mentioned disadvantages of the prior art coffee producing techniques.

Summary of the invention

[0006] The invention relates to a coffee infusion bag comprising at least one chamber, at least a part of said at least one chamber being formed by a filter material, wherein said at least one chamber is more than 25 cubic centimeters, more preferably at least 50 cubic centimeters in its expanded position.

[0007] According to an embodiment of the invention, the initially unexpanded infusion bag should be expanded substantially when lowered into the liquid, typically hot water, in order to obtain a satisfactory coffee brew.

[0008] In fact, according to an advantageous embodiment of the invention, the coffee bag should preferably almost fill up the container when expanded. In other words, such infusible bags should preferably be carefully designed to fit into the expected container to be used.

[0009] This volume matching is quite important when dealing with coffee, compared to other types of materials such as tea, which by nature increases in volume when infused by for example water. Coffee material, e.g. powder, is less infusible than tea, and therefore a very good interaction between the coffee material and the water is needed in order to obtain a satisfactory brew.

[0010] In an embodiment of the invention, the coffee infusion bag comprises at least one chamber according to claim 1, wherein said at least one chamber being expandable in a ratio of at least two to one.

[0011] In an embodiment of the invention, the coffee infusion bag comprises at least one chamber according to claim 1 or 2, wherein at least a part of said at least one chamber being expandable in the vertical direction when positioned in a container in a ratio of at least two to one.

[0012] In an embodiment of the invention, said at least one chamber is more than 25 cubic centimeters in its expanded position, preferably more than 100 cubic centimeters.

[0013] In an embodiment of the invention, the bag has a cross-section (in the vertical direction) of at least four square centimeters in its unexpanded position.

[0014] In an embodiment of the invention, said coffee infusion bag being formed with a handle fitted in the upper end of the coffee bag.

[0015] In an embodiment of the invention, said coffee infusion bag being fitted with a handle mechanically communicating with the bottom of the coffee infusion bag.

[0016] In an embodiment of the invention, said filter material comprising filter paper.

[0017] In an embodiment of the invention, said coffee material moreover comprises a soluble additive.

[0018] In an embodiment of the invention, said soluble material comprises sweetener.

[0019] In an embodiment of the invention, said soluble material comprises cream.

[0020] In an embodiment of the invention, at least a part of said at least one chamber being formed by a filter material defines accommodation areas or volumes on which coffee may rest or accommodate when the infusion bag is expanding, thereby distributing the coffee over the filter material.

[0021] According to this embodiment of the invention, the expansion of the chamber may moreover not only increase the volume of liquid, typically water, but also facilitate a distribution of the coffee material within this increased volume.

[0022] In an embodiment of the invention, said accommodation areas or volumes comprises infusible compartments, mechanically connected to said chamber so as to mutually displaced when the chamber is expanded.

[0023] According to an embodiment of the invention, a multi-chamber bag may be applied for the purpose of distributing the infusible material, e.g. the coffee, as much as possible in the liquid, when the bag is expanded in the liquid, typically water, during the brew.

[0024] In an embodiment of the invention, the coffee bag comprises at least one liquid inlet.

[0025] In an embodiment of the invention, the coffee bag comprises at least one liquid inlet formed in the top of the coffee bag.

[0026] In an embodiment of the invention, the liquid inlet comprised in the top of the coffee bag forms a funnel.

[0027] In an embodiment of the invention, the amount of coffee powder is between 2 grams to 30 grams.

[0028] According to the invention, a flow may be pro-
vided through the infusion bag, initially without the need of imparting any pressure downwards, when the infusion bag is positioned in a fluid holding container, such as a cup. In this way, the prime direction of expansion obtained in the up down direction, and moreover, the bag may facilitate a substantial expansion. This fact, moreover, facilitates a substantial increasing of the volume of the at least one chamber.

**[0029]** According to this embodiment of the invention, the handle facilitates a compression of the infusion bag by pulling whereas the expansion may eventually be established more or passive. In this way spilling or splashing associated with a kind of pumping movements may be avoided or at least counteracted.

**[0030]** In an embodiment of the invention, at least a part of said at least one chamber being formed by a filter material defines accommodation areas or volumes on which coffee may rest or accommodate when the infusion bag is expanding, thereby distributing the coffee over the filter material.

**Figures**

**[0031]** The invention will be described in the following description with reference to the drawings of which

figs. 1a and 1b illustrate a coffee infusion bag according to an embodiment of the invention,

figs. 2a and 2b illustrate a further coffee infusion bag according to an embodiment of the invention,

figs. 3a and 3b illustrate a coffee infusion bag when positioned in a container,

figs. 4a and 4b illustrate a further coffee infusion bag,

fig. 5 illustrates a cross-section of the coffee infusion bag illustrated in

fig. 4,

figs. 6 to 9 illustrate further embodiments of the invention.

**Detailed description**

**[0032]** The following examples of the invention primarily serve the purpose of illustrating different embodiments of the invention applying the high-volume expansion to be explained in detail subsequently.

**[0033]** Fig. 1a and 1b illustrate a coffee infusion bag 10 according to an embodiment of the invention comprising a square like foundation.

**[0034]** The coffee bag 10 is fitted with a handle 12 in the form of a string fitted in the top of the bag 10. The handle 12 may comprise any suitable material, e.g. a plastic string, flexible rubber, polyester string, etc.

**[0035]** The illustrated coffee infusion bag 10 comprises an inner volume indicated by arrow 11. The illustrated coffee bag contains a quantity of finely grounded coffee beans (not shown).

**[0036]** In fig. 1a, the coffee infusion bag is unexpanded and the bag may be dipped into e.g. a liquid containing cup, typically hot water, and thereby obtaining a coffee brew.

**[0037]** The illustrated coffee infusion bag has a square-like foundation, from which the internal volume may be increased "vertically".

**[0038]** Evidently, any suitable shape of the foundation may be applied according to the invention.

**[0039]** In its unexpanded position, the illustrated coffee bag may have a height of approximately between 3mm to 20mm, typically not more than 8mm.

**[0040]** In fig. 1b, the coffee infusion bag is expanded and the internal volume 11 is increased. The expansion may be performed prior to any dipping into the liquid or, preferably, expanded subsequently to the dipping.

**[0041]** In its expanded position, the illustrated coffee bag may have a height of approximately between 30mm to 120mm, typically not less than 40mm.

**[0042]** According to the illustrated, non-limiting example of an embodiment of the invention, the initially unexpanded infusion bag 10 should be expanded substantially when lowered into liquid, typically hot water, in order to obtain a satisfactory coffee brew.

**[0043]** In other words, the volume of the internal coffee containing chamber(s) must be expanded substantially in order to obtain a high-quality brew.

**[0044]** The infusion bag may preferably be lowered into a relatively small open container, such as a cup made of china, glass, metal, paper, etc.

**[0045]** The walls of the infusion bag 10 are wholly or partly porous. It may be formed of any suitable polymeric, fibrous or paper-like material. Evidently, the mesh size should be sufficiently small to ensure that the infusible coffee material contained in the bag is kept within the bag or the chambers of the bag. Moreover, the mesh size should be sufficiently large to facilitate relatively unhindered infusion of the soluble base into the bag.

**[0046]** The fabric thickness may vary significantly within the scope of the invention, depending on the applied infusible material, type, grinding, etc. and the desired purpose.

**[0047]** Different sizes and shapes of infusion bags are disclosed below. Again, it should be noted that the above-mentioned requirements with respect to materials do apply to all the below-mentioned bags.

**[0048]** Infusion bags according to the invention may have different sizes such that one or more cups or containers may be produced by one or several infusion bags.

**[0049]** According to a preferred embodiment of the invention, the size (in combination with the applied materials and infusible coffee) should facilitate the brewing of one cup of coffee.

**[0050]** The coffee applied as infusible material according to the invention is preferably powdered. The powdered coffee residing within the chamber defining
infusion bag may be of very different nature, depending on purpose and desired aroma.

For this purpose, different raw material, coffee beans, may be chosen as the initial starting material.

Some types of coffee powder have the texture of fine sand or cornmeal. It is the most popular and versatile grind used for the drip machine, flip-drip, filter drip or press pot.

Finest grind almost powdery may e.g. be applied for making espresso, or brewing regular coffee in a vacuum pot.

Course grind resembles cake crumbs and is seldom used because they do not produce the best flavor. But if you have this grind, you can boil or use the percolator.

Again, it should be noted that the term coffee powder includes any state and form of loose particles.

Moreover, the roasting of the coffee may vary depending on the desired end-aroma.

The amount of coffee in the bag may vary significantly, again depending on the nature of the bag, the applied coffee powder and not least the desired aroma.

The amount of coffee powder may e.g. vary between 2 grams to 30 grams, preferably from 5 grams to 15 grams depending on the tamped density and quality of the coffee powder.

The volume of coffee powder may e.g. vary between 1 cc to 15 cc, preferably from 2 cc to 12 cc, again depending on the tamped density and quality of the coffee powder.

According to the general concept of the invention, the illustrated coffee bag 10 facilitates a high-quality brewing due to the high-volume expansion obtained according to the invention. When the infusion bag is expanded, e.g. by the mere dragging in the handle 12, liquid, typically hot water, is infused into the chamber(s) defined by the expanded coffee bag. The large infusion volume facilitates an improved interaction between the coffee powder, and the soluble base, typically water.

Typically, according to the invention, the inner-space of the infusion bag must be as large as possible in order to create and efficient infusion. Thereby at least temporary water flow around the individual powdered coffee particles invoked during infusion and/or the expansion of the coffee infusion bag. Moreover, this large space requirement leads to water not turning cold before a satisfactory brew is obtained.

According to an advantageous embodiment of the invention, the coffee infusion bag chamber(s) should form an accordion- or bellows-like expandable chamber or chambers. This is due to the fact that this structure facilitates a relatively significant expansion ratio, when comparing the initial unexpanded volume and packet size with the expansion obtained during use.

It should be remembered that the unexpanded volume, preferably but not necessarily, must be relatively small in order to optimize package manufacturing costs and logistics.

Moreover, it has been observed that the folds/pleats initially increase the desired flow, typically a slightly turbulent flow, within the bag and subsequently facilitate the sedimentation of coffee powder over a relatively large area of the available infusible walls.

Figs. 2a and 2b illustrate a coffee infusion bag 20 according to an embodiment of the invention comprising a circular-like foundation.

The coffee bag 20 is fitted with a handle 22 in the form of a string fitted in the top of the coffee bag 20. The handle 22 may comprise any suitable material, e.g. a plastic string, flexible rubber, polyester string, etc.

The illustrated coffee infusion bag 20 comprises an inner volume indicated by arrow 21. The illustrated coffee bag contains a quantity of powdered coffee beans (not shown).

In fig. 2a, the coffee infusion bag is unexpanded and the bag may be dipped into e.g. a liquid containing cup, typically hot water, and thereby obtaining a coffee brew.

The illustrated coffee infusion bag has a circular-like foundation, from which the internal volume may be increased "vertically".

Evidently, any suitable shape of the foundation may be applied according to the invention.

In its unexpanded position, the illustrated coffee bag may have a height of approximately between 3mm to 20mm, typically not more than 8mm.

In fig. 2b, the coffee infusion bag is expanded and the internal volume is increased. The expansion may be performed prior to any dipping into the liquid or, preferably, expanded subsequently to the dipping.

In fig. 3a a coffee infusion bag 30 as described in figs. 2a and 2b is positioned in a container, hereafter referred to as a cup 36. The coffee powder 35 contained in bag is initially unexpanded and liquid, hereafter referred to as water, may be poured into the cup 36.

Subsequently, in fig. 3b, the coffee infusion bag 30 has been expanded, e.g. by pulling in a handle 32, mounted in the top of the coffee infusion bag.

It should be noted that the illustrated expanded coffee infusion bag has a relatively large size, when expanded. In other words, most of the hot water contained in the cup 36 is also contained in the coffee infusion bag 30.

It has moreover been observed that the expansion of the coffee infusion bag and/or the pouring of hot water into the cup invoke a flow inside the expanded chamber 31 of both water and coffee powder.

Fig. 4a and 4b illustrate a coffee infusion bag 40 according to a further embodiment of the invention comprising a circular-like foundation.

The illustrated coffee bag basically comprises a variation of the coffee bag illustrated in figs. 2a and 2b.

The coffee bag 40 is fitted with a handle 42 in the form of a string fitted in the top of the coffee bag 40. The handle 42 may comprise any suitable material, e.g. a plastic string, flexible rubber, polyester string, etc.
The illustrated coffee infusion bag 40 comprises an inner volume (not shown). The illustrated coffee bag contains a quantity of powdered coffee beans (not shown).

In fig. 4a, the coffee infusion bag is unexpanded and the bag may be dipped into e.g. a liquid containing cup, typically hot water, and thereby obtaining a coffee brew.

The illustrated coffee infusion bag has a circular-like foundation, from which the internal volume may be increased "vertically".

Evidently, any suitable shape of the foundation may be applied according to the invention.

In its unexpanded position, the illustrated coffee bag may have a height of approximately between 3mm to 20mm, typically not more than 8mm.

In fig. 4b, the coffee infusion bag is expanded and the internal volume is increased. The expansion may be performed prior to any dipping into the liquid or it may be expanded subsequently to the dipping.

The illustrated bag is fitted with a funnel-shaped liquid inlet 47. The liquid inlet is adapted for guiding water, when poured from the top of the bag 40, into the chamber of the coffee bag 40 and thereby creating a natural sought of flow through the bag. This feature increases the initial distribution of coffee powder within the coffee bag.

It should be noted that the liquid inlet generally, according to an embodiment of the invention, might be formed by more or less infusible material. Generally, the liquid inlet should feature an infusibility that is greater than the other chamber forming filter material.

It should be noted that the handle 42 is fitted to the coffee bag at the circumference of the upper part of the coffee filter.

Fig. 5 illustrates a cross-section of the coffee infusion bag illustrated in fig. 4. It should be noted that the upper part of the coffee infusion bag 40 features a mechanically defined liquid inlet of the bag.

It should of course be noted that fluid might of course be infused into the bag 40 via the other walls of the chamber defining walls.

The liquid inlet serves the purpose of guiding liquid, in the following referred to as water, into the infusion bag and thereafter, to a certain degree, out of the bag again via the infusible material defining the chamber or chambers of the bag. In this way, the expanding of the coffee bag may be established partly or wholly simply by pouring water into the liquid inlet.

It should be noted that this feature most of all serves to ensure that water intended to interact with the coffee material within the coffee bag does not counteract the expansion of the bag.

Moreover, this inlet may advantageously be applied for and facilitate a certain degree of flow within the chamber or chambers of the coffee bag, thereby causing some flow and distribution of coffee material.

Fig. 6 illustrates a further ball-shaped embodiment of the invention comprising a coffee infusion bag 60 having a top mounted handle 62.

Figs. 7a and 7b illustrate further embodiments of the invention of a coffee infusion bag 70 comprising a handle 72.

Figs. 8a and 8b illustrate further embodiments of the invention of a coffee infusion bag 80 comprising a handle 82.

Fig. 9 illustrates the cross-section of a further advantageous embodiment of the invention.

The illustrated coffee infusion bag 90 comprises a liquid inlet 97.

The coffee infusion bag comprises a number (here: four) of sub chambers 98, 99, defined by inner infusible walls 96.

An advantage of this embodiment is that water may pass into all the chambers 98, 99 of the coffee infusion bag 90, via the liquid inlet of the other infusible chamber-defining walls.

By dividing the bag 90 into sub chambers, more coffee sediments may be available for easy interaction with the infused water.

For reasons of explanation, liquid is generally referred to as water, although the invention may be applied in connection with other liquids than water. It should be noted that the invention is in particular advantageous for use with water or water mixed slightly with other suitable ingredients.

It should be noted that the above coffee infusion bag typically will be poured into the cup prior to the filling of water and subsequently expanded.

According to the above described non-limiting embodiments of the invention, the expanded coffee bag volume formed by one or several chambers is more than 25 cubic centimeters (cc), more preferably at least 50 cubic centimeters, even more preferably at least 100 cubic centimeters, irrespective of the applied shape of the expanded coffee containing chamber.

Even expanded volumes larger than 200 cubic centimeters have proved successful.

Claims

1. Coffee infusion bag comprising at least one chamber (11; 21; 31; 41), at least a part of said at least one chamber (11; 21; 31; 41) being formed by a filter material, wherein said at least one chamber (11; 21; 31; 41) is more than 25 cubic centimeters, more preferably at least 50 cubic centimeters in its expanded position.

2. Coffee infusion bag comprising at least one chamber (11; 21; 31; 41) according to claim 1, wherein said at least one chamber being expandable in a ratio of at least two to one.
3. Coffee infusion bag comprising at least one cham-
ber (11; 21; 31; 41) according to claim 1 or 2, where-
in at least a part of said at least one chamber (11;
21; 31; 41) being formed by a filter material,
said at least one chamber being expandable in the
vertical direction when positioned in a container in
a ratio of at least two to one.

4. Coffee infusion bag according to any of the claims
1 to 3, wherein said at least one chamber (11; 21;
31; 41) is more than at least 100 cubic centimeters
in its expanded position, preferably more than 200
cubic centimeters.

5. Coffee infusion bag according to any of the claims
1 to 4, wherein the bag has a cross-section (in the
vertical direction) of at least four square centimeters
in its unexpanded position.

6. Coffee infusion bag according to any of the claims
1 to 5, wherein said coffee infusion bag being
formed with a handle (42; 82) fitted in the upper end
of the coffee bag.

7. Coffee infusion bag according to any of the claims
1 to 6, wherein said coffee infusion bag being fitted
with a handle (42; 82) mechanically communicating
with the bottom of the coffee infusion bag.

8. Coffee infusion bag according to any of the claims
1 to 7, wherein said filter material comprising filter paper.

9. Coffee infusion bag according to any of the claims
1 to 8, wherein said coffee material moreover comprises a
soluble additive.

10. Coffee infusion bag according to any of the claims
1 to 9, wherein said soluble material comprises sweeten-
er.

11. Coffee infusion bag according to any of the claims
1 to 10, wherein said soluble material comprises cream.

12. Coffee infusion bag according to any of the claims
1 to 11, wherein at least a part of said at least one
chamber (11; 21; 31; 41) being formed by a filter
material defines accommodation areas or volumes
on which coffee may rest or accommodate when the
infusion bag is expanding, thereby distributing the
coffee over the filter material.

13. Coffee infusion bag according to any of the claims
1 to 12, wherein said accommodation areas or vol-
umes comprise infusible compartments, mechani-
cally connected to said chamber so as to mutually
displaced when the chamber is expanded.

14. Coffee infusion bag according to any of the claims
1 to 13, wherein the coffee bag comprises at least
one liquid inlet (47).

15. Coffee infusion bag according to any of the claims
1 to 14, wherein the coffee bag comprises at least
one liquid inlet (47) formed in the top of the coffee
bag.

16. Coffee infusion bag according to any of the claims
1 to 15, wherein the liquid inlet (47) comprised in
the top of the coffee bag forms comprises a funnel.

17. Coffee infusion bag according to any of the claims
1 to 16, wherein the amount of coffee powder is be-
tween 2 grams to 30 grams.
Fig. 4a

Fig. 4b
### DOCUMENTS CONSIDERED TO BE RELEVANT

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<th>Category</th>
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The present search report has been drawn up for all claims.

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**CATEGORY OF CITED DOCUMENTS**

- **T**: theory or principle underlying the invention
- **E**: earlier patent document, but published on, or after the filing date
- **D**: document cited in the application
- **L**: document cited for other reasons
- **O**: non-written disclosure
- **P**: intermediate document
- **&**: member of the same patent family, corresponding document
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 The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

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