

Title: Method, system and receptacle for preparing a beverage.

The invention relates to a method and a system for preparing a predetermined quantity of beverage, such as coffee, using an extractable product contained in an exchangeable capsule. The invention also relates to a receptacle for holding such an exchangeable capsule and for use in an apparatus for preparing, out of the extractable product, such a predetermined quantity of beverage. More in particular, the invention relates to such a method in which the capsule is pierced by at least one blade for letting fluid flow into the capsule, as well as to such a system and receptacle, wherein the receptacle has at least one blade arranged for piercing the capsule.

Such a method, system and receptacle are known, for example from EP1299022B1.

As to the exchangeable capsules, several embodiments thereof do exist, both in terms of shape and materials used. However, one of the problems still unsolved of the capsules at issue is represented by the optimization of brewing conditions, and in particular by the option of obtaining, through the capsule, a fluid flow even and optimal from the standpoint of the resulting beverage. For this purpose, a drawback often found is represented by the fact that the fluid passes through privileged portions of the capsule only, instead of throughout the internal housing receiving the infusion. Moreover, the significant parameters of the flow passing through the capsule, like, e.g., speed and direction, may variously be affected by its shape, often even in a way and to an extent a priori unforeseeable, to the detriment of the quality of the end beverage and of the repeatability of its features, e.g. in terms of taste and density.

Embodiments It is an object of the present invention seek to provide a solution according to which the process of extracting the extractable product in the exchangeable capsule is improved.

penetration depths that correspond to the mentioned percentages 80%, 75% and 70%. That is, even higher improvements are achieved for a method and a system according to the invention, when a length of the at least one blade is chosen such that during the said fluid supplying the shortest possible axial distance, measured along said central capsule axis, between the third wall and the at least one blade in the inner space is less than 60% (preferably less than 50%, more preferably less than 40%, or even more preferably less than 30%) of said overall axial capsule length. Similarly, even higher improvements are achieved for a receptacle according to the invention, when a length of the at least one blade is chosen such that in the said closed position the shortest possible axial distance, measured along said central cavity axis, between the support surface and the at least one blade in the internal cavity is less than 60% (preferably less than 50%, more preferably less than 40%, or even more preferably less than 30%) of said overall axial cavity length.

According to a first aspect of the present invention, there is provided a method for preparing a predetermined quantity of beverage, such as coffee, using an extractable product, comprising: providing an exchangeable capsule, comprising a circumferential first wall, a second wall closing the circumferential first wall at a first end, and a third wall closing the circumferential first wall at a second end opposite the second wall, wherein the first, second and third wall enclose an inner space comprising the extractable product, wherein the capsule has a longitudinal central capsule axis and an overall axial capsule length measured along said central capsule axis; piercing the second wall of the capsule by means of at least one blade; supplying, via the pierced second wall of the capsule, an amount of fluid, such as water, under a pressure to the inner space of the capsule; and draining through the third wall of the capsule the prepared beverage; characterized in that a length of the at least one blade is chosen such that during the said fluid supplying the shortest possible axial distance, measured along said central capsule axis, between the third wall and the at least one blade in the inner space is less than 80% of said overall axial capsule length.

According to a second aspect of the present invention, there is provided a system for preparing a predetermined quantity of beverage, such as coffee, using an extractable product, the system comprising: an exchangeable capsule comprising a circumferential first wall, a second wall closing the circumferential first wall at a first end, and a third wall closing the circumferential first wall at a second end opposite the second wall, wherein the first, second and third wall enclose an inner space comprising the extractable product, wherein the capsule has a longitudinal central capsule axis and an overall axial capsule length measured along said central capsule axis; and an apparatus, the apparatus comprising: a receptacle for holding the exchangeable capsule, the receptacle comprising a first holding part and a second holding part, wherein the second holding part in use is movable in the apparatus relative to the first holding part from an open position at which the two parts are distant relative to one another to enable the insertion of the capsule between the two parts and a closed position at which the first and second holding parts together are defining an internal cavity of the receptacle for containing the capsule to be extracted with the first and second holding parts closed about the capsule, wherein the second holding part comprises a fluid intake channel arranged for supplying an amount of fluid, such as water, under a pressure to the internal cavity, and a blade system comprising at least one blade arranged for piercing the second wall of the capsule in the internal cavity for letting the fluid flow into the capsule, and wherein the first holding part comprises a support surface arranged to abut against the third wall of the capsule in the internal cavity for draining through that third wall and through the support surface the prepared beverage; and a fluid dispensing device for said supplying of fluid to said fluid intake channel; **characterized in that** a length of the at least one blade is chosen such that during the said fluid supplying the shortest possible axial distance, measured along said central capsule axis, between the third wall and the at least one blade in the inner space is less than 80% of said overall axial capsule length.

According to a third aspect of the present invention, there is provided a receptacle for holding an exchangeable capsule containing an extractable product and for use in an apparatus for preparing, out of the extractable product, a

predetermined quantity of beverage, such as coffee, the receptacle comprising a first holding part and a second holding part; wherein the second holding part in use is movable in the apparatus relative to the first holding part from an open position at which the two parts are distant relative to one another to enable the insertion of the capsule between the two parts and a closed position at which the first and second holding parts together are defining an internal cavity of the receptacle for containing the capsule to be extracted with the first and second holding parts closed about the capsule, wherein the internal cavity has a longitudinal central cavity axis and an overall axial cavity length measured along said central cavity axis; wherein the second holding part comprises: a fluid intake channel arranged for supplying an amount of fluid, such as water, under a pressure to the internal cavity, and a blade system comprising at least one blade arranged for piercing the capsule in the internal cavity for letting the fluid flow into the capsule; and wherein the first holding part comprises a support surface arranged to abut against a wall of the capsule in the internal cavity for draining through that wall and through the support surface the prepared beverage; characterized in that a length of the at least one blade is chosen such that in the said closed position the shortest possible axial distance, measured along said central cavity axis, between the support surface and the at least one blade in the internal cavity is less than 80% of said overall axial cavity length.

According to a fourth aspect of the present invention, there is provided an apparatus for preparing a predetermined quantity of beverage, such as coffee, using an extractable product, comprising: a receptacle in accordance with the third aspect; and a fluid dispensing device for supplying an amount of fluid, such as water, under a pressure to the fluid intake channel of the receptacle.

The invention will now be further elucidated by means of, non-limiting, examples referring to the schematic figures in the enclosed drawing, in which:

Fig. 1 shows, in partial longitudinal section, an example of an embodiment of a receptacle according to the invention, wherein holding parts of the receptacle are in open position;

Fig. 2 shows the example of Fig. 1 once again, wherein, however, the holding parts are in closed position;

Fig. 3 shows, in perspective view, an example of a variant of at least one blade for use in a method, system and receptacle according to the invention.

Fig. 4 shows, in perspective view, an example of another variant of at least one blade for use in a method, system and receptacle according to the invention.

In Figs. 1 and 2 there is shown a receptacle for holding an exchangeable capsule 20 containing an extractable product and for use in an apparatus for preparing, out of the extractable product, a predetermined quantity of

Claims

1. Method for preparing a predetermined quantity of beverage, such as coffee, using an extractable product, comprising:

- providing an exchangeable capsule-(20), comprising a circumferential first wall-(21), a second wall-(22) closing the circumferential first wall at a first end,
5 and a third wall-(23) closing the circumferential first wall at a second end opposite the second wall, wherein the first, second and third wall enclose an inner space-(19) comprising the extractable product, wherein the capsule has a longitudinal central capsule axis-(C2) and an overall axial capsule length-(L2) measured along said central capsule axis;
- 10 - piercing the second wall of the capsule by means of at least one blade-(8; 108; 208);
- supplying, via the pierced second wall of the capsule, an amount of fluid, such as water, under a pressure to the inner space of the capsule; and
- draining through the third wall of the capsule the prepared beverage;

15 **characterized in that** a length of the at least one blade is chosen such that during the said fluid supplying the shortest possible axial distance-(D2), measured along said central capsule axis-(C2), between the third wall and the at least one blade in the inner space is less than 80% of said overall axial capsule length-(L2).

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2. Method according to claim 1, wherein a length of the at least one blade is chosen such that during the said fluid supplying the shortest possible axial distance, measured along said central capsule axis, between the third wall and the at least one blade in the inner space is less than 75% of said
25 overall axial capsule length.

3. Method according to claim 2, wherein a length of the at least one blade is chosen such that during the said fluid supplying the shortest possible axial distance, measured along said central capsule axis, between the third wall and the at least one blade in the inner space is less than 70% of said overall axial capsule length.

4. System for preparing a predetermined quantity of beverage, such as coffee, using an extractable product, the system comprising:

- an exchangeable capsule ~~(20)~~ comprising a circumferential first wall ~~(21)~~, a second wall ~~(22)~~ closing the circumferential first wall at a first end, and a third wall ~~(23)~~ closing the circumferential first wall at a second end opposite the second wall, wherein the first, second and third wall enclose an inner space ~~(19)~~ comprising the extractable product, wherein the capsule has a longitudinal central capsule axis ~~(C2)~~ and an overall axial capsule length ~~(L2)~~ measured along said central capsule axis; and
- an apparatus, the apparatus comprising:
 - a receptacle for holding the exchangeable capsule ~~(20)~~, the receptacle comprising a first holding part ~~(11)~~ and a second holding part ~~(12)~~, wherein the second holding part in use is movable in the apparatus relative to the first holding part from an open position at which the two parts are distant relative to one another to enable the insertion of the capsule between the two parts and a closed position at which the first and second holding parts together are defining an internal cavity ~~(9)~~ of the receptacle for containing the capsule to be extracted with the first and second holding parts closed about the capsule, wherein the second holding part comprises a fluid intake channel ~~(3)~~ arranged for supplying an amount of fluid, such as water, under a pressure to the internal cavity, and a blade system ~~(7; 107; 207)~~ comprising at least one blade ~~(8; 108; 208)~~ arranged for piercing the second wall ~~(22)~~ of the capsule in the internal cavity for letting the fluid flow into the capsule, and wherein the first holding part comprises a support surface ~~(4)~~ arranged to abut against the

third wall-~~(23)~~ of the capsule in the internal cavity for draining through that third wall and through the support surface the prepared beverage; and

- a fluid dispensing device-~~(30)~~ for said supplying of fluid to said fluid intake channel-~~(3)~~;

5 **characterized in that** a length of the at least one blade is chosen such that during the said fluid supplying the shortest possible axial distance-~~(D2)~~, measured along said central capsule axis-~~(C2)~~, between the third wall and the at least one blade in the inner space is less than 80% of said overall axial capsule length-~~(L2)~~.

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5. System according to claim 4, wherein a length of the at least one blade is chosen such that during the said fluid supplying the shortest possible axial distance, measured along said central capsule axis, between the third wall and the at least one blade in the inner space is less than 75% of said
15 overall axial capsule length.

6. System according to claim 5, wherein a length of the at least one blade is chosen such that during the said fluid supplying the shortest possible axial distance, measured along said central capsule axis, between the third
20 wall and the at least one blade in the inner space is less than 70% of said overall axial capsule length.

7. Receptacle for holding an exchangeable capsule-~~(20)~~ containing an extractable product and for use in an apparatus for preparing, out of the
25 extractable product, a predetermined quantity of beverage, such as coffee, the receptacle comprising a first holding part-~~(11)~~ and a second holding part-~~(12)~~;
 wherein the second holding part in use is movable in the apparatus relative to the first holding part from an open position at which the two parts are distant relative to one another to enable the insertion of the capsule
30 between the two parts and a closed position at which the first and second

holding parts together are defining an internal cavity-~~(9)~~ of the receptacle for containing the capsule to be extracted with the first and second holding parts closed about the capsule, wherein the internal cavity has a longitudinal central cavity axis-~~(C1)~~ and an overall axial cavity length-~~(L1)~~ measured along said
 5 central cavity axis;

wherein the second holding part comprises:

- a fluid intake channel-~~(3)~~ arranged for supplying an amount of fluid, such as water, under a pressure to the internal cavity, and
- a blade system-~~(7; 107; 207)~~ comprising at least one blade-~~(8; 108; 208)~~
 10 arranged for piercing the capsule in the internal cavity for letting the fluid flow into the capsule; and

wherein the first holding part comprises a support surface-~~(4)~~ arranged to abut against a wall-~~(23)~~ of the capsule in the internal cavity for draining through that wall and through the support surface the prepared
 15 beverage;

characterized in that a length of the at least one blade is chosen such that in the said closed position the shortest possible axial distance-~~(D1)~~, measured along said central cavity axis-~~(C1)~~, between the support surface and the at least one blade in the internal cavity is less than 80% of said overall
 20 axial cavity length-~~(L1)~~.

8. Receptacle according to claim 7, wherein a length of the at least one blade is chosen such that in the said closed position the shortest possible axial distance, measured along said central cavity axis, between the support surface
 25 and the at least one blade in the internal cavity is less than 75% of said overall axial cavity length.

9. Receptacle according to claim 8, wherein a length of the at least one blade is chosen such that in the said closed position the shortest possible axial
 30 distance, measured along said central cavity axis, between the support surface

and the at least one blade in the internal cavity is less than 70% of said overall axial cavity length.

10. Apparatus for preparing a predetermined quantity of beverage, such as coffee, using an extractable product, comprising:

- a receptacle ~~(11, 12)~~ according to any one of claims 7-9; and
- a fluid dispensing device ~~(30)~~ for supplying an amount of fluid, such as water, under a pressure to the fluid intake channel ~~(3)~~ of the receptacle.