

CLAIMS

1. An apparatus for making beverages using capsules (2) containing a food substance, comprising:

an extraction unit (3) in which an extraction chamber (4) is made in which, in use, a capsule (2) can be inserted, the extraction unit (3) in turn comprising a first part (7) and a second part (8), which are movable, at least one relative to the other, between a home position in which they are at a distance from one another and in which the extraction chamber (4) is open to allow the insertion of a capsule (2) in it, and an extraction position in which they are coupled together and close the extraction chamber (4);

an infeed section (9) where, in use, a capsule (2) can be fed to the apparatus (1), a feed path (10) for the capsule (2) in the apparatus (1) extending from the infeed section (9);

means for making a beverage for, in use, making water circulate through a capsule (2) contained in the closed extraction chamber (4), thereby causing the beverage to be formed, and for supplying the beverage to the outside of the apparatus (1);

at least one image acquisition device (12) positioned along the feed path (10) outside the extraction chamber (4), and designed, in use, when the capsule (2) is positioned in an image capture zone (13) located along the feed path (10), to capture images of at least an identification portion (14) of the capsule (2) on which a graphical element (15) is present and visible; the image acquisition device (12) operating at least in the range of visible light;

an electronic processing unit (20) connected to the image acquisition device (12) for receiving the images detected by it;

wherein the electronic processing unit (20) is programmed to selectively enable or not enable the making of a beverage by performing the following operating steps:

electronically comparing a first image detected by the image acquisition device (12), in which the identification portion (14) of the capsule (2) and the related graphical element (15) are visible, with one or more reference images saved in the apparatus (1);

verifying if there is a match between the graphical element (15) visible in the first

image and that visible in at least one of the saved reference images; and

enabling making of the beverage if and only if said match is verified;

wherein the image acquisition device (12) continues acquiring images even after the acquisition of a first image for which supplying of the beverage has been enabled, and wherein the electronic processing unit (20) is also programmed to examine said further images to determine if, after the acquisition of the first image for which said match has been found, the movement of the capsule (2) has continued towards the retaining means or if it has been inverted, and to inhibit supplying of the beverage if the movement has been inverted.

2. The apparatus according to claim 1, wherein the electronic processing unit (20) is also programmed to examine one after another a plurality of images detected one after another by the image acquisition device (12) for identifying amongst them the first image to be compared with the saved images.

3. The apparatus according to either of the preceding claims, wherein the electronic processing unit (20) is operatively connected to the image acquisition device (12) for controlling its operation and causing the acquisition of images at least when, in use, a capsule (2) is positioned in or passes at the image capture zone (13).

4. The apparatus according to any one of the preceding claims, also comprising means for detecting the presence of a capsule (2) at the feed path which are connected to the electronic processing unit, and wherein the electronic processing unit (20) controls the image acquisition device (12) in such a way as to cause the acquisition of images at least from when the detection means detect the presence of the capsule (2) until the capsule (2) has gone beyond the image capture zone (13).

5. The apparatus according to any one of the preceding claims, wherein the electronic processing unit (20) is also programmed to perform, before the step of electronically comparing the first image with one or more reference images saved in the apparatus (1), an operating step of determining the angular orientation of the first image relative to a reference orientation.

6. The apparatus according to any one of the preceding claims, wherein the image acquisition device (12) comprises at least one optical sensor facing the image capture zone (13) and at least one lighting element facing towards the image capture zone (13) for in use lighting the identification portion (14).

- 7.** The apparatus according to any one of the preceding claims, wherein the image acquisition device (12) comprises at least one CIS optical sensor.
- 8.** The apparatus according to any one of the preceding claims, also comprising at least one guide for in use guiding capsule (2) feeding along the feed path (10) and shaped, at the image capture zone (13), in such a way as to hold a lid (6) of the capsule (2) oriented towards the image acquisition device (12).
- 9.** The apparatus according to any one of the preceding claims, wherein the image acquisition device (12) has an angle of view such that it covers, at a plane that in use corresponds to an outer surface of the lid (6) of the capsule (2), an area comprising the entire identification portion (14), said identification portion (14) corresponding to a central area of the lid (6) or to the entire lid (6).
- 10.** The apparatus according to any one of the preceding claims, wherein the second part (8) forms a housing (22) for the capsule and is movable relative to the rest of the apparatus (1) between an outer position corresponding to the home position, in which the housing (22) is accessible from the outside of the apparatus and the capsule (2) can be inserted in the housing (22) and removed from it, and an inner position in which the capsule (2) cannot be inserted in the housing (22) or removed from it, the feed path (10) corresponding to at least part of a movement path of the second part (8) between the inner position and the outer position and in use the movement of the capsule along the feed path (10) occurring following the movement of the second part (8) along the movement path.
- 11.** The apparatus according to claim 10, wherein when the second part (8) is in the outer position it is separate from the rest of the apparatus (1), and wherein the second part can be coupled to and uncoupled from the rest of the apparatus (1) at said infeed section (9).
- 12.** The apparatus according to any one of claims 1 to 9, wherein the apparatus also comprises a supporting body movable along the feed path for in use transferring a capsule (2) from the infeed section (9) towards the extraction chamber.
- 13.** The apparatus according to any one of claims 1 to 9, wherein the second part (8) forms a housing (22) for the capsule (2) and wherein, when the second part (8) is in the home position the housing (22) delimits the feed path (10) and the capsule (2) can be inserted in the housing (22) by means of a movement along the feed path

(10).

14. The apparatus according to any one of claims 1 to 9, also comprising retaining means for retaining the capsule (2) between the first part (7) and the second part (8), when these parts are in the home position, the feed path extending as far as the retaining means.

15. The apparatus according to the preceding claim, wherein the image capture zone (13) is located upstream of the retaining means with reference to capsule (2) feeding along the feed path (10).

16. The apparatus according to claim 13, 14 or 15, also comprising a closing element (11) located along the feed path (10) and movable between a closed position in which it prevents capsule (2) feeding and a disengaged position in which it allows the passage of a capsule (2), the closing element (11) being operatively connected to the extraction unit (3) so that it is positioned in the closed position when the first part (7) and the second part (8) are in the extraction position, and in the disengaged position when the first part (7) and the second part (8) are in the home position.

17. The apparatus according to claim 16, wherein the image capture zone (13) is located upstream of the closing element (11) with reference to capsule (2) feeding along the feed path (10).

18. The apparatus according to claim 17, wherein said image capture zone (13) is delimited downstream by the closing element (11) in such a way that when the closing element (11) is in the closed position a capsule (2) resting on it is in the image capture zone (13).

19. The apparatus according to claim 18, wherein the electronic processing unit (20) is programmed to enable the shifting of the first part (7) and of the second part (8) from the extraction position to the home position if and only if it discovers said match with reference to a first image of a capsule (2) located in the image capture zone (13).

20. The apparatus according to claim 16, wherein the image capture zone (13) is located downstream of the closing element (11) with reference to capsule (2) feeding along the feed path (10).

21. A method for enabling the supplying of a beverage in an apparatus (1) for making beverages that uses capsules (2) containing a food substance, and that comprises:
an extraction unit (3) in which an extraction chamber (4) is made in which, in use,

a capsule (2) can be inserted, the extraction unit (3) in turn comprising a first part (7) and a second part (8), which are movable, at least one relative to the other, between a home position in which the extraction chamber (4) is open to allow the positioning of a capsule (2) in it, and an extraction position in which they are coupled together and close the extraction chamber (4);

an infeed section (9) where, in use, a capsule (2) can be fed to the apparatus (1), a feed path (10) for the capsule (2) in the apparatus (1) extending from the infeed section (9);

means for making a beverage for, in use, making water circulate through a capsule (2) contained in the closed extraction chamber (4), thereby causing the beverage to be formed, and for supplying the beverage to the outside of the apparatus (1);

at least one image acquisition device (12) positioned along the feed path (10) outside the extraction chamber (4), and designed, in use, when the capsule (2) is positioned in an image capture zone (13) located along the feed path (10), to capture images of at least an identification portion (14) of the capsule (2) on which a graphical element (15) constituted of a trademark is present and visible; the image acquisition device (12) operating at least in the range of visible light;

an electronic processing unit (20) connected to the image acquisition device (12) for receiving the images detected by it;

the method comprising the operating steps of:

when a capsule (2) is in the image capture zone (13), using the image acquisition device (12), detecting a first image, in which the identification portion (14) of the capsule (2) and the related graphical element (15) are visible;

electronically comparing the first image with one or more reference images saved in the apparatus (1);

verifying if there is a match between the graphical element (15) visible in the first image and that visible in at least one of the saved reference images; and

enabling making of the beverage if and only if said match is verified;

continuing to acquire images, using the image acquisition device (12), even after the acquisition of a first image for which supplying of the beverage has been enabled;

examining said further images to determine if, after the acquisition of the first

image for which said match has been verified, the movement of the capsule (2) has continued along the feed path or if it has been inverted; and

inhibiting supplying of the beverage if the movement has been inverted.

22. The method according to the preceding claim, wherein the identification portion (14) is identified on the lid (6) of the capsule (2) and wherein the graphical element (15) is constituted of a registered trademark.