BEVERAGE OR FOODSTUFF PREPARATION SYSTEM

TECHNICAL FIELD

The present disclosure relates generally to electrically operated beverage or foodstuff preparation systems, with which a beverage or foodstuff is prepared from a pre-portioned capsule.

BACKGROUND

Systems for the preparation of a beverage comprise a beverage preparation machine and a capsule. The capsule comprises a single serving of a beverage forming precursor material, e.g. ground coffee or tea. The beverage preparation machine is arranged to execute a beverage preparation process on the capsule, typically by the exposure of pressurized, heated water to said precursor material. Processing of the capsule in this manner causes the at least partial extraction of the precursor material from the capsule as the beverage.

This configuration of beverage preparation machine has increased popularity due to 1) enhanced user convenience compared to a conventional beverage preparation machines (e.g. compared to a manually operated stove-top espresso maker) and 2) an enhanced beverage preparation process, wherein: preparation information encoded by a code on the capsule is read by the machine to define a recipe, and; the recipe is used by the machine to optimise the preparation process in a manner specific to the capsule.

Document US2017/172340A1 discloses a beverage dispenser capable of preparing a variety of alternative types of beverages using different brewing parameters depending on the type of beverage. The beverage dispenser is configured to identify the type of beverage pod installed in the system and automatically prepare that beverage in accordance with optimized brewing parameters determined based on the ingredients and the particle sizes of those ingredients. A controller uses the identification number from the pod to obtain preparation parameters from a look-up table. This table can be preprogrammed or updated via a mobile device.

In particular, the encoded preparation information may comprise operating parameters selected in the beverage preparation process, including: fluid temperature; fluid pressure; preparation duration, and; fluid volume.

Codes for such capsules can encode a value of an operating parameter as a distance of a unit of the code from a reference point, where a magnitude of said distance is directly related to a magnitude of said value. A digital image of the code is then processed to extract the value.

A drawback is that errors may occur when extracting the value. Said errors may arise from one or more of: 1) printing errors when forming the units of the code may introduce a degree of variability in the value, for example there may be errors in a position of a centre point of the unit; 2) if the substrate carrying the code is deformed, e.g. due to handing, deformation or other non-uniformity of the substrate can also introduce errors in the value extracted from the digital image; 3) processing errors may also introduce a degree of error in the extracted value, for example if the code is misaligned when read such that a plane of the code is not normal to the direction the in which the digital image is taken, and; 4) other like issues.

CLAIMS

1. A system comprising:

a container for containing a precursor material for use with a machine for preparing a beverage and/or foodstuff or a precursor thereof, the container including a machine-readable code storing preparation information for use with a preparation process performed by said machine;

a machine for preparing a beverage and/or foodstuff or a precursor thereof, the machine including: a code reading system to read the code of the container; a processing unit for processing precursor material of the container, and;

electrical circuitry to control the processing unit based on preparation information read from the code, and comprising electronic memory to store corresponding preparation information;

characterized in that the stored preparation information is based on one or more prior reads of a corresponding code of a container;

wherein the electrical circuitry is configured to:

read the preparation information from the code;

retrieve the corresponding preparation information from the electronic memory;

correct the read preparation information based on the corresponding preparation information, and;

control the processing unit based on the corrected preparation information.

2. The system of claim 1, wherein the electrical circuitry is configured to:

identify the container, and;

retrieve the corresponding preparation information from the electronic memory based on a stored relationship between the identity and the corresponding preparation information obtained from prior containers of the same identity.

3. The system of claim 2, wherein the electrical circuitry is configured to identify the container based on an identifier encoded by the code.

4. The system of any preceding claim, wherein:

the preparation information stored by the code comprises a parameter value encoded for a parameter;

the corresponding preparation information stored by the electronic memory comprises a correction value for the parameter value, and;

the electrical circuitry is configured to correct the parameter value based on the correction value.

5. The system of claim 4, wherein the correction value comprises an average derived from a plurality of associated parameter values of the parameter obtained from said prior reads of a corresponding code of a container.

6. The system of claim 5, wherein the electrical circuity is configured with the plurality of parameter values of the parameter stored in a stack memory usage mechanism.

7. The system of claim 4, wherein the correction value comprise a weighted sum of prior parameter values.

8. The system of any preceding claim, wherein the electrical circuitry is configured to update the stored corresponding preparation information based on the read preparation information.

9. The system any preceding claim, wherein the electrical circuitry is configured to:

determine if the electronic memory includes an entry for the corresponding preparation information which is related to the code of the container, and;

if not then to control the processing unit based on the read preparation information without correction with the corresponding preparation information.

10. The system of any preceding claim, wherein the electrical circuitry is configured to:

determine if the read preparation information is within a threshold of the corresponding preparation information;

and if within said threshold to execute said correction of the read preparation information based on the corresponding preparation information;

if outside of said threshold not to execute said correction and/or to control the processing unit based on the corresponding preparation information from the electronic memory.

11. The system of any preceding claim, wherein: the code comprises a data portion arranged at a predetermined position with respect to a reference portion, wherein the data portion is arranged on an encoding line D, and a data unit is arranged a distance d from a starting position along the encoding line D as a variable to at least partially encode a parameter value of the preparation information.

12. A machine for preparing a beverage and/or foodstuff or a precursor thereof, the machine including: a code reading system to read a code of a container; a processing unit for processing precursor material of the container, and;

electrical circuitry to control the processing unit based on preparation information read from the code, and comprising electronic memory to store corresponding preparation information;

characterized in that the stored preparation information is based on one or more prior reads of a corresponding code of a container;

wherein the electrical circuitry is configured to:

read the preparation information from a code of a container; and

retrieve the corresponding preparation information from the electronic memory;

correct the read preparation information based on the corresponding preparation information, and;

control the processing unit based on the corrected preparation information.

13. Use of a container comprising a code for the machine of clam 12.

14. A method of determining preparation information for a beverage or foodstuff preparation process, the method comprising:

reading preparation information from a code of a container;

retrieving the corresponding preparation information from electronic memory;

correcting the read preparation information based on the corresponding preparation information, and;

controlling a processing unit to process the container based on the corrected preparation information.

15. Electrical circuitry to implement the method of claim 14.