

Method and apparatus for cooking raw Chinese Wheat Noodle (yew mian or chu mian in Mandarin)

Description

Field of the Invention

The present invention relates to a method for controlling a noodle cooking basket attached with a pivoted cylindrical stirrer and a computer program performing such a method. One of the embodiment of this invention relates to cooking wanton noodles (Cantonese egg noodles) using the motion of the noodle cooking basket attached with a pivoted cylindrical stirrer to stir the noodles to ensure the characteristic springy on the outside and well cooked on the inside noodle texture.

Background

To date, to cook raw wheat based noodles like wanton noodles to perfection requires an experienced cook with years of experience, to produce noodles with springiness on the outside and thoroughly cooked through on the inside. There are 4 processes that helps to achieve this result, namely (a) continuous stirring and spreading of noodles between temperatures of 96-98 deg Celsius to prevent sticking and lumpy noodles (b) Cold water treatment to reduce the surface temperature of the cooked noodles so that the outside will achieve the springiness while the inside continues to cook through (c) cooking duration (d) ensuring that the cooking water remains clear as opposed to high viscosity.

Looking at the prior art in cooking the noodles, experienced cooks normally fire up the temperature of the water to a rolling boil representing close to 100 deg Celsius, they will then either drip down or add a ladle of room temperature water to still the water surface (effectively bringing it down to between 96-98 deg Celsius), before throwing in the noodle. After stirring and spreading the noodle in the hot water for a predetermined number of seconds, the almost cooked noodles are transferred to a room temperature water bath (which have to be changed regularly due to its rising temperature). This will cool down the surface of the noodles, while the noodle interior continues to be cooked. The noodles are transferred back to the hot water to reheat up the noodles surface. This ensures that the noodles are springy on the outside and thoroughly cooked on the inside. In addition, experienced cooks will change the cooking water regularly to keep it as clear as possible.

Summary of the Invention

An object of the invention is to design a noodle cooker that achieves the following:-

1. Constant temperature range between 96 – 98 deg Celsius;
2. Constant stirring of noodles to prevent sticky and lumpy noodles;
3. Room temperature water treatment of the noodles to lower the surface temperature of the noodles in order to achieve the springy on the outside and cooked through on the inside texture;
4. Regular hot water change to ensure clear boiling water;
5. Constant water addition to compensate for evaporation and achieve overflow that removes the foam floating at the top of the water

Hence, in a first aspect there is provided a method for controlling a noodle cooking basket attached with a pivoted cylindrical stirrer. The method comprises the steps of tapping a selector switch, determining a type of noodle to be cooked, where the type of noodle is one of at least a thin type and a thick type. Depending on the determined type of noodle, sequence of a first motion configuration is initiated when the determined type of noodles is the thin type and a sequence of a second motion configuration is initiated when the determined type of noodle is the thick type.

The first and second motion configuration may correspond to a respective first and second timed motion scale wherein the first duration motion scale is of shorter duration than the second timed motion scale.

In another aspect there is provided a method for controlling the release of room temperature water onto the almost cooked noodles in the midst of cooking to cool down the surface temperature of the noodles.

In another aspect there is provided a method for controlling the release of the thickening water from the operating tank and adding an equal amount of hot water of at least 96 degrees Celsius from the spare tank at regular intervals. Thereafter, water is added to the spare tank from a water inlet to be heated up to be ready for the next release.

Brief description of the Drawings

Having thus described the invention in general terms, reference will now be made to the accompanying drawings, which are not drawn to scale, and wherein Figs 1 & 7 shows an overview of how the machine looks like.

Fig. 2 shows schematically a block diagram of the controller according to one embodiment of the present invention.

Fig. 3 is a flow diagram illustrating a number of steps of a method according to one embodiment of the present invention.

Fig. 4 illustrates the detail flow of the operation of the method of fig. 3

Fig. 5 shows the construction of the noodle cooking basket attached with a pivoted cylindrical stirrer.

Fig. 6 shows the schematic drawing for the operating tank and spare tank.

Fig 7 shows an overview of the machine on a larger scale

Detailed Description of the Invention

The present invention now will be described more fully hereinafter with reference to the accompanying drawings, in which one example of the embodiments of the invention are shown. Indeed, these inventions may be embodied in many different forms and should not be construed as limited to the embodiment set forth herein, rather, these embodiment are provided by way of example so that this disclosure will satisfy applicable legal requirements. Like numbers refer to like elements throughout.

Fig. 2 illustrates the controller block diagram in which an embodiment of the present invention is implemented. It comprises a PLC circuit as well as input/output units in the form of a touch screen control & display (1), mechanical armed bracket driven by a stepper motor with controller which hooks up the noodle cooking basket attached with a pivoted cylindrical stirrer (4) and solenoid discharge valves (5a & 6a) as shown in Fig. 1

The method according to the present invention will in general reside in the form of software instructions, together with other software components necessary for the operation of the interface, in the memory of the interface.

Turning now to Figs 3 and 4, a method according to one embodiment of the invention will be described in terms of a number of steps to be taken by controlling software in an interface.

The exemplifying method starts at a point in time when a touch action, for example tapping performed on the touch screen control & display (1). Sensors inputs (2) will feedback to the controller (3) on the readiness of the system, for example, water level and temperature). Depending on the machine readiness and input selected, the controller (3) will send instructions on the motion sequence to motor control output (4), said motion sequence corresponding to the various noodle types. This will lower the noodle cooking basket attached with a pivoted cylindrical stirrer (4a) vertically into the operating tank of boiling water (5) and starts to move in a horizontal motion. This horizontal motion will initiate the pendulum motion of the cylindrical stirrer to stir the noodles.

After the specified duration, the noodle cooking basket attached with a pivoted cylindrical stirrer (4a) is lifted out of the operating tank (5) and room temperature water is showered on the noodles from water spray (4b), the noodle cooking basket attached with a pivoted cylindrical stirrer (4a) moving horizontally all the time, stirring and spreading the noodles. The noodle cooking basket attached with a pivoted cylindrical stirrer (4a) is lowered once again into the operating tank (5) for another specified duration to reheat the surface of the cooked noodles, after which the noodle cooking basket attached with a pivoted cylindrical stirrer (4a) is restored back to its start position, completing the cooking process.

Fig 6 shows the schematic diagram of the operating and spare tanks. The temperature in the operating tank (5) is maintained between 96 -98 deg Celsius through the use of thermocouple, which will cut out heating at 98 deg Celsius and restart reheating when the temperature drops to 96 degree Celsius. An additional safeguard to prevent noodles being cooked at temperatures below 96 degree Celsius, controller (3) will check whether the prevailing temperature of operating tank (5) is at least 96 deg Celsius before initiating motion sequence.

The numerical counter controlling water release is incremented by one, which is then compared with a pre-set value. If it matches, solenoid valve (5a) located on the operating tank (5) will be turn on to discharge a pre-determined amount of water. At the same time, solenoid valve (6a) located on the spare tank (6) will also turn on to discharge an equal amount of hot water into operating tank (5).

Claims

1. A method of controlling a noodle cooking basket attached with a pivoted cylindrical stirrer comprising a control panel, the method comprising the steps of : determining a type of noodle being selected, said type of noodle being one of at least a thin egg noodle type and a thick egg noodle type, and depending on the determined type of noodle, activating a noodle cooking basket attached with a pivoted cylindrical stirrer motion sequence of a first configuration when the determined type of noodle is the thin type and activating a noodle cooking basket attached with a pivoted cylindrical stirrer motion sequence of a second configuration when the determined type of noodle is the thick type.
2. The method according to Claim 1, wherein the first and second motion configurations correspond to a respective first and second motion sequence and wherein the first motion sequence is shorter in duration compared to the second motion sequence.
3. The method according to Claim 1, wherein the motion process causes the pendulum motion of the cylindrical stirrer to achieve the optimal stirring of the noodles.
4. A noodle cooking basket attached with a pivoted cylindrical stirrer controlled with inputs from a PLC (Programmable Logic Controller or any other computer programmed) terminal determining type of noodles to be cooked, said type of noodles being one of at least thin noodles and a thick noodles.
5. The noodle cooking basket attached with a pivoted cylindrical stirrer according to Claim 1, wherein the first and second motion configurations correspond to respective first and second motion timing and wherein the first motion timing is shorter than the second motion timing.
6. A computer program product comprising readable medium having computer readable software instructions embodied therein, wherein the computer readable software instructions comprise : Computer readable software instructions capable of determining a type of noodles having been selected on the control panel, said type of noodles being one of at least a thin noodle and a thick noodle and computer readable software instructions capable of depending on the determined type of noodle, initiate a sequence of motion of a first motion sequence configuration when the determined type of noodle is the thin type and initiating a sequence of motion of a second motion sequence configuration when the determined type of noodle is the thick type.
 Computer readable software instructions capable of depending on the determined type of noodle, initiate cold water shower release at intervals of a first configuration when the determined type of noodle is the thin type and initiating cold water shower release at intervals of a second configuration when the determined type of noodle is the thick type.
 Computer readable software instructions capable of initiating the release of hot water from the operating tank at specified intervals while at the same time initiate release of clear hot water into the operating tank from the spare tank, thereby keeping the level of hot water in operating tank within prescribed range.
 Computer readable software instructions of initiating the release of cold water into the spare tank to heat up to a minimum temperature of 96 deg C.

7. The computer program product according to Claim 6, wherein the first and second motion sequence configurations correspond to a respective first and second motion scale and wherein the first motion scale is shorter than the second motion scale.
8. The computer program product according to Claim 6, wherein the first and second water shower configurations correspond to a first and second temporal scale wherein the first scale is shorter than the second scale.