

TITLE OF INVENTION: AN AUTOMATIC FRIED BUN

EQUIPMENT

FIELD OF THE INVENTION

The invention related to a equipment for flying burn, in particular to an automatic fried burn equipment.

BACKGROUND OF THE INVENTION

Pan-fried bun is a kind of popular traditional snack in Shanghai, Zhejiang, Jiangsu and Guangdong. The making process is to wrap the fillings into the dough and then fry it in a frying pan so that the fillings are cooked and the bottom is golden and crispy. The frying process requires the chef to be proficient in the frying process, including the heating, time, etc. If the frying power is too high, the filling may not be fully well done but the bottom of the bun will be cooked. However, if the frying power is too low, the frying time will inevitably be too long, and the moisture in the buns may be excessively evaporated, affecting the taste of the buns. Therefore, at present, the production of pan-fried buns generally needs the chef to fry the pan-fried buns himself. For batch production of pan-fried buns, fully automated production cannot be achieved, and the labour cost of production is high.

SUMMARY OF THE INVENTION

In view of the shortcomings of the above-mentioned prior art, the present invention provides a fully automatic fried bun-making equipment, which realizes automatic control of the rotating device and the heating

device by a control circuit. During frying, it only needs to put the buns into the frying pan and add an appropriate amount of cooking oil and water, the control circuit can automatically complete the frying process, and the buns can be fried in a standardized manner without manual intervention.

The invention also provides a method for making pan-fried buns using the above-mentioned fully automatic fried bun-making equipment, so as to improve the production efficiency of pan-fried buns and realize batch automated production.

An automatic fried bun equipment, comprising a frying pan for frying bun, a rotating device, a heating device, and a control circuit for controlling the rotation speed of the rotating device and the heating power of the heating device ; the frying pan is placed on the rotating device, the heating device is arranged below the frying pan the rotating device drives the frying pan to rotate relative to the heating device; the control circuit includes a timing module, a power adjustment module and a rotational speed adjustment module; the output of the power adjustment module is connected to the heating device, and the output of the rotational speed adjustment module is connected to the rotating device.

In some embodiments, the rotating device includes a turning plate and a driving device for driving the turning plate; the turning plate is provided with a hollow in the middle, and the bottom of the frying pan is embedded in the said hollow, and the marginal of the frying pan is put on the turning plate.

In some embodiments, the driving device includes a motor; the output shaft of the motor is connected to a driving gear; the turning plate is fixed with a driven gear which connects to the driving gear; the motor drives the driving gear and then the driven gear drives the turning plate and the frying pan to rotate relative to the heating device.

In some embodiments, the turning plate is installed on the plain bearing, and the driven gear is arranged on the inner or outer ring of the upper cage of the plain bearing.

In some embodiments, the heating device is an electromagnetic induction heating device, and at least the frying pan is provided with a magnetically conductive material for being heated by electromagnetic induction.

In some embodiments, the frying pan is also covered with a lid; the lid is made of wood and a through hole is provided in the middle of the lid, a transparent observation window is provided at the through hole for observing frying progress.

In some embodiments, the through hole is provided with a slot for mounting the observation window, and a fixing ring is set at the through hole to lock the observation window in the slot.

In some embodiments, the frying pan is also provided with a rack for placing fried buns, and the rack is evenly provided with a grip for arranging the fried buns on the frying pan.

In some embodiments, the control circuit is provided with a wireless

communication circuit, and a wireless terminal is connected to the control circuit by the wireless communication circuit to remotely control the power adjustment module and the rotation speed adjustment module.

A method for making pan-fried buns using the automatic fried bun equipment of claim 3, wherein put the wrapped buns into the frying pan and keep the distance between the buns, add cooking oil and water to the frying pan, cover the lid, set the timing module of the control circuit; the power adjustment module starts the heating device and increases the heating power to heat the frying pan; the timing module begins the first phase of timing; when the first phase of timing is completed, the buns are cooked, and then the power adjustment module lowers the power of the heating device and continues to fry, and the timing module performs the second stage of timing; when the second stage of timing is completed, the bottom surface of the buns is fried as golden and crispy, and the buns are well done to take out of the pan.

In some embodiments, the added amount of cooking oil is 350-450ml, and water is 150-200ml.

In some embodiments, the method includes an insulation control step: setting the power adjustment module to the set power, starting the heating device to heat for 20 seconds; then turning off the heating device and maintaining for 30 seconds, repeating the above steps.

The beneficial effects of the embodiment of the present utility model are: the fully automatic fried bun-making equipment can automatically

control the heating power and heating time of the frying pan by setting each module in the control circuit. The rotating device drives the frying pan to rotate so that the heating device can evenly heat the entire frying pan. Even people, who are not familiar with making fried buns, can use this equipment to fully automatically complete the frying of buns to improve the production efficiency of fried buns and achieve standardized and batch-automated production. Moreover, this equipment can also adjust the control circuit according to the needs of other different products, and can also automatically complete the automatic production of various fried foods, such as fried dumplings, pot stickers, pancakes, etc.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be further described below in conjunction with the accompanying drawings:

FIG.1 is schematic structural diagram of the present invention;

Fig. 2 is a partial sectional enlarged view of the present invention;

Fig. 3 is a structural schematic diagram of the disk rack.

In the figures, 1. frying pan, 2. heating device, 3. turning plate, 4. motor, 5. driving gear, 6. driven gear, 7. plain bearing, 8. lid, 9. observation window, 10. rack, 11. grid.

DESCRIPTION OF THE EMBODIMENTS

Referring to Fig. 1 and Fig. 2, the automatic pan-fried bun equipment at least includes a frying pan 1, a rotating device, a heating device 2 and a control circuit for controlling the rotating speed of the rotating device and

the heating power of the heating device 2. The frying pan 1 is generally forged by pig iron, the middle of the frying pan 1 is concaved to form a frying surface, and the edge of the frying pan 1 is turned outward to be placed on the rotating device conveniently. The heating device 2 is arranged below the frying pan 1. Considering that the heating power needs to be adjusted by the control circuit during the frying process, the heating device 2 should preferably use an electric heating method, such as an electric ceramic stove or an induction cooker. The present invention considers that the frying pan 1 needs to be rotated when frying, it preferably uses a non-contact heating method, so the electromagnetic induction heating device 2 is the most suitable solution, and the frying pan 1 is made of iron material and can be heated by the electromagnetic induction heating device 2. In addition, the electromagnetic induction heating device 2 can also adjust its heating power conveniently. The rotating device is mainly used to drive the frying pan 1 to rotate relative to the heating device 2 so that the heating device 2 can evenly heat the entire frying pan 1.

The control circuit includes a timing module, a power adjustment module and a speed adjustment module. The timing module is used to control the time of each process of frying. While cooperating with the power adjustment module, the corresponding heating power is output to the electromagnetic induction heating device 2 at different processes to complete the entire frying. The rotation speed adjustment module allows the user to adjust the rotation speed of the frying pan 1 according to actual needs.

The timing module can be realized by using some common timing circuits or programs, for example, the control chip in the control circuit can be directly used to output corresponding control signals by counting down. The power adjustment module can generally use a PWM power controller to output signals to the heating coil. The speed regulating module depends on the type of motor 4. As the speed of the frying pan 1 is low and the torque of rotation is small, the DC motor 4 can be selected for driving and the speed controller can be selected on the market.

The rotating device is made up of the turning plate 3 and the driving device that drives the turning plate 3 to rotate. The frying pan 1 needs to be placed on the turning plate 3, so the middle of the turning plate 3 needs to be hollowed out into ring-shaped. And driving device comprises motor 4, and the output shaft of motor 4 is connected with driving gear 5, and turning plate 3 is fixed with the driven gear 6 which connects to the driving gear 5, and motor 4 drives the driving gear 5 to rotate the driven gear 6 and make the turning plate 3 and the frying pan 1 to rotate relative to the heating device 2. The rotation speed of the frying pan 1 can be adjusted by adjusting the rotation speed of the motor 4 by the rotation speed adjustment module. In order to reduce the resistance generated by relative rotation, the turning plate 3 is installed on the plain bearing 7, and the driven gear 6 is arranged on the inner ring or the outer ring of the upper cage of the plain bearing 7, which depends on the installation position of the motor 4 and actual use needs.

Traditionally, the frying pan 1 for making fried buns usually uses a

wooden lid 8 for which the wooden lid 8 can better fit the edge of the frying pan 1 to keep it sealed, and the wood will also emit the fragrance during use. However, the wooden lid 8 of the traditional frying pan 1 is all made of wood. After lid 8 is covered, the user cannot observe the situation and changes of the buns in the frying process. For this reason, the present invention also makes improvements to the existing wooden lid 8. The lid 8 is still made of wood, and a through hole is provided in the middle of the lid 8, and a transparent observation window 9 for observing the frying progress is provided at the through hole. Meanwhile, in order to facilitate the installation of the observation window 9, the through hole sets a slot for embedded observation window 9, and a fixed ring is set at the through hole to lock the observation window 9 in the slot. Because the fully automatic pan-fried bun equipment can automatically complete the pan-fried bun production, the user does not need to have experience in making fried buns, he can directly know the frying situation of the buns through the observation window 9, and if there is an abnormality of the equipment or any problems arise, he will see and take appropriate measures in time.

Referring to Fig. 3, a large number of wrapped buns are usually placed in the frying pan 1 so that all the buns can be fried at one time, and usually more than 50 buns can be fried. Since the buns will ferment to a certain extent during the heating process, if the buns are arranged too closely, the skins of adjacent buns will stick to each other, which makes bad appearance of the buns. For inexperienced users, it is difficult to decide the spacing

between steamed buns. So, the present invention also provides a rack 10 for convenient placement of fried buns. The rack 10 is evenly provided with grids 11. Before placing the steamed buns into the frying pan 1, the rack 10 is placed on the frying pan 1 first, then directly place the buns into the grid 11, and finally take the rack 10 out of the frying pan 1 after the buns are placed so as to improve the efficiency of placement.

In order to facilitate remote control of the fully automatic pan-fried bun equipment, a wireless communication circuit is provided in the control circuit. The wireless control circuit may include wireless communication modules, such as WIFI, bluetooth and mobile communication network, etc., the control circuit also add temperature, power, speed sensors, etc., to collect relevant parameters of the fully automatic pan-fried bun equipment, and then send them out by the wireless communication module, so that the user can receive the relevant data by the wireless terminal for display, at the same time, users can also adjust relevant parameters in real time by the wireless receiving terminal, and remotely control the fried bun equipment.

Then we will introduce the method of making pan-fried buns using fully automatic pan-fried bun equipment. First, put the wrapped buns into the frying pan 1 and keep the distance between the buns. If the rack 10 is used, just directly put the buns into the grid 11 of the rack 10. Then add 350-450ml cooking oil and 150-200ml water into frying pan 1. According to different tastes, sesame seeds can also be sprinkled on the buns. Then cover the lid 8 and set the timing module of the control circuit. The power

adjustment module starts the electromagnetic induction heating device 2 and increases the heating power to heat up the frying pan 1, and the timing module performs the first timing. When the first stage is over, the buns are fully cooked, but the bottom of the buns is not crispy. So, the power adjustment module will reduce the heating power of the electromagnetic induction heating device 2, and continue frying with slow heat. Meanwhile, the timing module will start the second stage of timing. When the second stage of timing is completed, the bottom surface of the buns is fried golden and crispy. Then sprinkle with chopped green onion on the surface to complete the cooking.

Generally, it is impossible to sell all fried buns immediately and unsold buns need to be kept warm to maintain their temperature and taste. So, the inventor also provides a method for fully automatic pan-fried bun equipment to keep the finished buns warm, which includes setting the power adjustment module to the set power, starting the heating device to heat for 20 seconds; and then turning off the heating for 30 seconds, repeat the above steps. According to the above heat preservation operation, the buns can maintain expansion and contraction process, so that the buns can keep the optimal state of flour and filling. Even if the above process repeats for 45 minutes, the buns will remain as fresh as they have just been fried. The buns maintain soft and smooth meat filling, nice and crispy skin, juicy and sweet.

WHAT IS CLAIMED IS:

[Claim 1] An automatic fried bun equipment, comprising

a frying pan (1) for frying bun, a rotating device,

a heating device (2), and

a control circuit for controlling the rotation speed of the rotating device and the heating power of the heating device (2) ,

the frying pan (1) is placed on the rotating device, the heating device (2) is arranged below the frying pan (1), the rotating device drives the frying pan (1) to rotate relative to the heating device (2);

the control circuit includes a timing module, a power adjustment module and a rotational speed adjustment module;

the output of the power adjustment module is connected to the heating device (2), and the output of the rotational speed adjustment module is connected to the rotating device;

the rotating device includes a turning plate (3) and a driving device for driving the turning plate (3); the turning plate (3) is provided with a hollow in the middle, and the bottom of the frying pan (1) is embedded in the said hollow, and the marginal of the frying pan (1) is put on the turning plate (3);

the driving device includes a motor (4); the output shaft of the motor (4) is connected to a driving gear (5); the turning plate (3) is fixed with a driven gear (6) which connects to the driving gear (5); the motor (4) drives the driving gear (5) and then the driven gear (6) drives the turning

plate (3) and the frying pan (1) to rotate relative to the heating device (2); the turning plate(3) is installed on the plain bearing (7), and the driven gear (6) is arranged on the inner or outer ring of the upper cage of the plain bearing (7).

[Claim 2] The equipment of claim 1, wherein the heating device (2) is an electromagnetic induction heating device (2), and at least the frying pan (1) is provided with a magnetically conductive material for being heated by electromagnetic induction.

[Claim 3] The equipment of claim 1, wherein the frying pan (1) is also covered with a lid (8); the lid (8) is made of wood and a through hole is provided in the middle of the lid (8), a transparent observation window (9) is provided at the through hole for observing frying progress.

[Claim 4] The equipment of claim 3, wherein the through hole is provided with a slot for mounting the observation window (9), and a fixing ring is set at the through hole to lock the observation window (9) in the slot.

[Claim 5] The equipment of claim 1, wherein the frying pan (1) is also provided with a rack (10) for placing fried buns, and the rack (10) is evenly provided with a grip (11) for arranging the fried buns on the frying pan (1).

[Claim 6] The equipment of claim 1, wherein the control circuit is provided with a wireless communication circuit, and a wireless terminal is connected to the control circuit by the wireless communication circuit to remotely control the power adjustment module and the rotation speed adjustment module.

[Claim 7] A method for making pan-fried buns using the automatic fried bun equipment of claim 3, wherein put the wrapped buns into the frying pan (1) and keep the distance between the buns, add cooking oil and water to the frying pan (1), cover the lid (8), and set the timing module of the control circuit;

the power adjustment module starts the heating device (2) and increases the heating power to heat the frying pan (1); the timing module begins the first phase of timing; when the first phase of timing is completed, the buns are cooked, and then the power adjustment module lowers the power of the heating device (2) and continues to fry, and the timing module performs the second stage of timing;

when the second stage of timing is completed, the bottom surface of the buns is fried as golden and crispy, and the buns are well done to take out of the pan.

[Claim 8] The method of claim 7, wherein the added amount of cooking oil is 350-450ml, and water is 150-200ml.

[Claim 9] The method of claim 7, wherein includes an insulation control step:

setting the power adjustment module to the set power, starting the heating device (2) to heat for 20 seconds; then turning off the heating device (2) and maintaining for 30 seconds, repeating the above steps.