(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 4 346 333 A2**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
03.04.2024 Bulletin 2024/14

(21) Application number: **23199704.0**

(22) Date of filing: **26.09.2023**

(51) International Patent Classification (IPC):
H05B 6/06 *(2006.01)*

(52) Cooperative Patent Classification (CPC):
H05B 6/062

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR
Designated Extension States:
BA
Designated Validation States:
KH MA MD TN

(30) Priority: **27.09.2022 CN 202211186510**

(71) Applicant: **Guangdong Arcair Appliance Co., Ltd.**
Guangdong 528318 (CN)

(72) Inventors:
- **KANG, ZUOTIAN**
  Foshan, Guangdong 528318 (CN)
- **CHEN, JINHUA**
  Foshan, Guangdong 528318 (CN)

(74) Representative: **Ipey**
Apex House
Thomas Street
Trethomas
Caerphilly CF83 8DP (GB)

(54) POWER CONTROL METHOD AND INDUCTION COOKER

(57) The embodiments of the present disclosure provide a power control method and an induction cooker. The power control method include : obtaining a working mode of an induction cooker; when the induction cooker is in a working mode with a single heating zone working, obtaining a first Insulated Gate Bipolar Transistor (IGBT) temperature of the working heating zone, and based on the first IGBT temperature, obtaining a first maximum power value of the working heating zone; when the induction cooker is in a working mode with multiple heating zones working, obtaining a second IGBT temperature and a working time of the working heating zones, and based on the second IGBT temperature and the working time, obtaining a second maximum power value of the working heating zones. According to different working modes, different power control solutions can be prepared and by a proper temperature hysteresis error, an excessively high IGBT temperature can be avoided and thus the induction cooker is prevented from entering a high-temperature protection mode mistakenly.

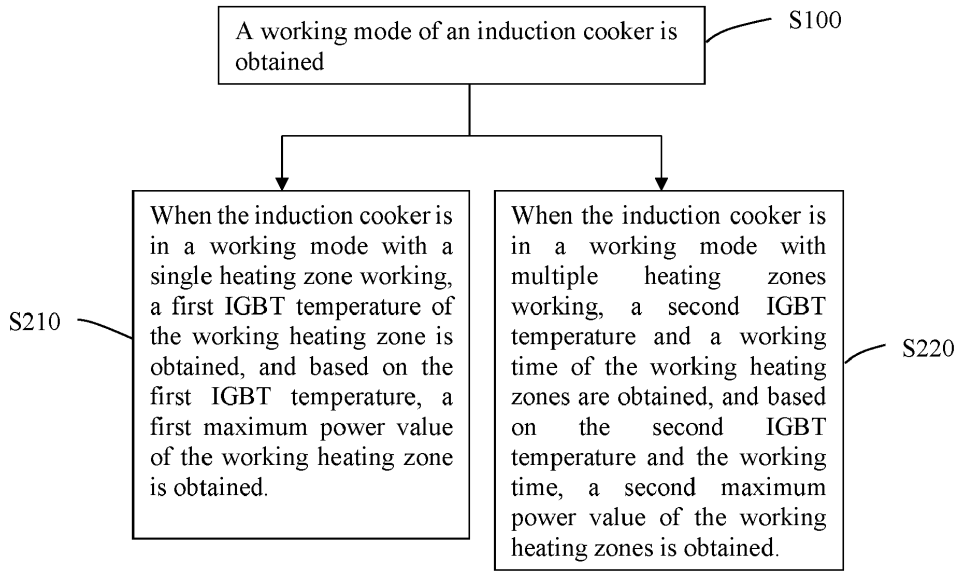

FIG.1

EP 4 346 333 A2

Description

TECHNICAL FIELD

[0001] The embodiments of the present disclosure relate to the field of kitchen appliances and in particular to a power control method and an induction cooker.

BACKGROUND

[0002] When an induction cooker works, a heating zone will generate heat which increases an Insulated Gate Bipolar Transistor (IGBT) temperature. When the IGBT temperature is excessively high, the induction cooker may enter a high-temperature protection mode mistakenly, affecting normal use. Furthermore, when multiple heating zones work, the multiple heating zones generate heat collectively, which greatly speeds up the increase of the IGBT temperature, and thus, the induction cooker is more easily caused to enter the high-temperature protection mode.

SUMMARY

[0003] Below is a summary of the subject detailed in the present disclosure and the summary is not intended to limit the scope of protection of the claims.

[0004] An embodiment of the present disclosure provides a power control method and an induction cooker.

[0005] According to a first aspect of the present disclosure, there is provided a power control method, which is applied to an induction cooker with multiple heating zones. The power control method includes:

obtaining a working mode of an induction cooker;
when the induction cooker is in a working mode with a single heating zone working, obtaining a first Insulated Gate Bipolar Transistor (IGBT) temperature of the working heating zone, and based on the first IGBT temperature, obtaining a first maximum power value of the working heating zone;
when the induction cooker is in a working mode with multiple heating zones working, obtaining a second IGBT temperature and a working time of the working heating zones, and based on the second IGBT temperature and the working time, obtaining a second maximum power value of the working heating zones.

[0006] In some embodiments of the first aspect of the present disclosure, based on the first IGBT temperature, obtaining the first maximum power value of the working heating zone includes:

when the first IGBT temperature is less than a first preset temperature, determining the first maximum power value as a first preset power value;
when the first IGBT temperature is greater than or equal to a second preset temperature and less than a third preset temperature, determining the first maximum power value as a second preset power value;
when the first IGBT temperature is greater than or equal to the third preset temperature and less than a fourth preset temperature, determining the first maximum power value as a third preset power value;
when the first IGBT temperature is greater than or equal to the fourth preset temperature and less than a fifth preset temperature, determining the first maximum power value as a fourth preset power value;
wherein the first preset power value, the second preset power value, the third preset power value and the fourth preset power value decrease gradually.

[0007] In some embodiments of the first aspect of the present disclosure, based on the second IGBT temperature and the working time, obtaining the second maximum power value of the working heating zones includes:

when the second IGBT temperature less than the first preset temperature, determining the second maximum power value as a fifth preset power value;
when the working time is greater than or equal to a first preset time threshold and less than a second preset time threshold, or the second IGBT temperature is greater than or equal to the second preset temperature and less than the third preset temperature, determining the second maximum power value as a sixth preset power value;
when the working time is greater than or equal to the second preset time threshold and less than a third preset time threshold, or the second IGBT temperature is greater than or equal to the third preset temperature and less than the fourth preset temperature, determining the second maximum power value as a seventh preset power value;
when the working time is greater than or equal to the third preset time threshold, or the second IGBT temperature is greater than or equal to the fourth preset temperature and less than the fifth preset temperature, determining the second maximum power value as an eighth preset power value;
wherein the fifth preset power value, the sixth preset power value, the seventh preset power value and the eighth preset power value decrease gradually.

[0008] In some embodiments of the first aspect of the present disclosure, the power control method includes: when the induction cooker runs with the fourth preset power value or the eighth preset power value, controlling a coil plate of the induction cooker to run in a heating manner of intermittent heating.

[0009] In some embodiments of the first aspect of the present disclosure, based on the first IGBT temperature, obtaining the first maximum power value of the working heating zone includes: when the first IGBT temperature is greater than or equal to the fifth preset temperature, determining the first maximum power value as zero and

outputting protection codes;
based on the second IGBT temperature and the working time, obtaining the second maximum power value of the working heating zones includes: when the second IGBT temperature is greater than or equal to the fifth preset temperature, determining the second maximum power value as zero and outputting protection codes.

[0010] According to a second aspect of the present disclosure, there is provided an induction cooker which includes multiple heating zones and a controller, where the heating zones are provided with an IGBT drive circuit and a coil plate, and the controller is connected to the IGBT drive circuit and the coil plate;

the controller comprises a working mode obtaining module, a first maximum power value calculating module and a second maximum power value calculating module;
the working mode obtaining module is configured to obtain a working mode of the induction cooker;
the first maximum power value calculating module is configured to, when the induction cooker is in a working mode with a single heating zone working, obtain a first IGBT temperature of the working heating zone, and based on the first IGBT temperature, obtain a first maximum power value of the working heating zone;
the second maximum power value calculating module is configured to, when the induction cooker is in a working mode with multiple heating zones working, obtain a second IGBT temperature and a working time of the working heating zones, and based on the second IGBT temperature and the working time, obtain a second maximum power value of the working heating zones.

[0011] In some embodiments of the second aspect of the present disclosure, the first maximum power value calculating module is further configured to:

when the first IGBT temperature is less than a first preset temperature, determining the first maximum power value as a first preset power value;
when the first IGBT temperature is greater than or equal to a second preset temperature and less than a third preset temperature, determining the first maximum power value as a second preset power value;
when the first IGBT temperature is greater than or equal to the third preset temperature and less than a fourth preset temperature, determining the first maximum power value as a third preset power value;
when the first IGBT temperature is greater than or equal to the fourth preset temperature and less than a fifth preset temperature, determining the first maximum power value as a fourth preset power value;
wherein the first preset power value, the second preset power value, the third preset power value and the fourth preset power value decrease gradually.

[0012] In some embodiments of the second aspect of the present disclosure, the second maximum power value calculating module is further configured to:

when the second IGBT temperature less than the first preset temperature, determining the second maximum power value as a fifth preset power value;
when the working time is greater than or equal to a first preset time threshold and less than a second preset time threshold, or the second IGBT temperature is greater than or equal to the second preset temperature and less than the third preset temperature, determining the second maximum power value as a sixth preset power value;
when the working time is greater than or equal to the second preset time threshold and less than a third preset time threshold, or the second IGBT temperature is greater than or equal to the third preset temperature and less than the fourth preset temperature, determining the second maximum power value as a seventh preset power value;
when the working time is greater than or equal to the third preset time threshold, or the second IGBT temperature is greater than or equal to the fourth preset temperature and less than the fifth preset temperature, determining the second maximum power value as an eighth preset power value;
wherein the fifth preset power value, the sixth preset power value, the seventh preset power value and the eighth preset power value decrease gradually.

[0013] In some embodiments of the second aspect of the present disclosure, when the induction cooker runs with the fourth preset power value or the eighth preset power value, the controller controls the coil plate of the induction cooker to run in a heating manner of intermittent heating.

[0014] In some embodiments of the second aspect of the present disclosure, the first maximum power value calculating module is further configured to, when the first IGBT temperature is greater than or equal to the fifth preset temperature, determine the first maximum power value as zero, and output protection codes; the second maximum power value calculating module is further configured to, when the second IGBT temperature is greater than or equal to the fifth preset temperature, determine the second maximum power value as zero and output protection codes.

[0015] The above solutions at least have the following beneficial effects: different power control solutions can be configured based on different working modes, and a proper temperature hysteresis error is designed to avoid excessively high IGBT temperature so as to prevent the induction cooker from entering a high-temperature protection mode mistakenly. Further, when the induction cooker is in a working mode with multiple heating zones working, since multiple heating zones work at the same time, the IGBT temperature can be increased more quick-

ly compared with the working mode with a single heating zone working. By two limiting conditions i.e. the working time and the temperature detection, the maximum power value can be limited to further prevent the induction cooker from entering the high-temperature protection mode mistakenly.

BRIEF DESCRIPTION OF DRAWINGS

[0016] The accompanying drawings are provided to help further understand the technical solutions of the present disclosure and constitute a part of the specification to explain the technical solutions of the present disclosure together with the embodiments of the present disclosure, without limiting the technical solutions of the present disclosure.

FIG. 1 is a step diagram illustrating a power control method according to an embodiment of the present disclosure.

FIG. 2 is a structural diagram illustrating an induction cooker according to an embodiment of the present disclosure.

FIG. 3 is a structural diagram illustrating a controller.

DETAILED DESCRIPTION

[0017] In order to make the objects, technical solutions and the advantages of the present disclosure clearer and more intelligible, the present disclosure will be further detailed below in combination with drawings and specific embodiments. It should be understood that the specific embodiments described herein are merely used to interpret the present disclosure rather than to limit the present disclosure.

[0018] It should be noted that although functional module division is performed in the apparatus diagrams and logic sequence is shown in the flowcharts, the steps shown or described herein can be, in some cases, performed with different module division and different sequence from shown in the apparatus diagrams and flowcharts. The terms such as "first" and "second" shown in the specification, the claims or the drawings are used to distinguish similar objects and not necessarily used to describe a specific sequence or order.

[0019] The embodiments of the present disclosure will be further set out below in combination with drawings.

[0020] An embodiment of the present disclosure provides an induction cooker.

[0021] With reference to FIG. 2, the induction cooker includes multiple heating zones and a controller 10. The heating zones are provided with an Insulated Gate Bipolar Transistor (IGBT) drive circuit 40 and a coil plate 30; the controller 10 is connected to the IGBT drive circuit 40 and the coil plate 30. The IGBT drive circuit 40 is provided with an IGBT. The coil plate 30 is parallel-connected with a resonant capacitor; an end of the coil plate 30 is connected to a collector electrode of the IGBT and the other end is connected to the controller 10.

[0022] The Insulated Gate Bipolar Transistor (IGBT) is a composite full control type voltage-driven power semiconductor device formed of a bipolar junction transistor and an insulated gate field effect transistor, which has the advantages of high input impedance of the Metal-Oxide-Semiconductor Field-Effect Transistor (MOSFET) and low conduction voltage drop of the giant transistor (GTR). For the GTR, the saturated voltage drop is low, the carrier density is large but the drive current is large; for the MOSFET, the drive power is very small, the switching speed is very fast but the conduction voltage drop is large and the carrier density is small. The IGBT has the advantages of both: the drive power is small and the saturated voltage drop is low.

[0023] Furthermore, the induction cooker is further provided with a touch display screen 20, and on/off and power control can be achieved for each heating zone of the induction cooker by using touch functions of the touch display screen 20; state of the induction cooker and various output information can be displayed by using the display function of the touch display screen 20.

[0024] The induction cooker controls power by the following power control method, and is prevented from entering a high-temperature protection mode with a proper temperature hysteresis error.

[0025] With reference to FIG. 1, the power control method includes:

[0026] At step S 100, a working mode of an induction cooker is obtained.

[0027] At step S210, when the induction cooker is in a working mode with a single heating zone working, a first Insulated Gate Bipolar Transistor (IGBT) temperature of the working heating zone is obtained, and based on the first IGBT temperature, a first maximum power value of the working heating zone is obtained.

[0028] At step S220, when the induction cooker is in a working mode with multiple heating zones working, a second IGBT temperature and a working time of the working heating zones are obtained, and based on the second IGBT temperature and the working time, a second maximum power value of the working heating zones is obtained.

[0029] In the step S100, when it is detected that only one heating zone of the induction cooker works, the induction cooker is in a working mode with a single heating zone working; when it is detected that multiple heating zones of the induction cooker work at the same time, the induction cooker is in a working mode with multiple heating zones working.

[0030] In the step S210, based on the first IGBT temperature, obtaining the first maximum power value of the working heating zone includes but not limited to the following steps:

when the first IGBT temperature is less than a first preset temperature, determining the first maximum power value as a first preset power value;

when the first IGBT temperature is greater than or equal to a second preset temperature and less than a third preset temperature, determining the first maximum power value as a second preset power value;
when the first IGBT temperature is greater than or equal to the third preset temperature and less than a fourth preset temperature, determining the first maximum power value as a third preset power value;
when the first IGBT temperature is greater than or equal to the fourth preset temperature and less than a fifth preset temperature, determining the first maximum power value as a fourth preset power value;
when the first IGBT temperature is greater than or equal to the fifth preset temperature, determining the first maximum power value as zero and outputting protection codes;
wherein the first preset power value, the second preset power value, the third preset power value and the fourth preset power value decrease gradually.

[0031] It can be understood that the first IGBT temperature is a real-time temperature value of the IGBT obtained by a temperature sensor.

[0032] The first preset temperature is A°C, the second preset temperature is B°C, the third preset temperature is C°C, the fourth preset temperature is D°C and the fifth preset temperature is E°C, where A°C<B°C<C°C<D°C<E°C.

[0033] For example, in a specific embodiment, A°C=30°C, B°C=40°C, C°C=50°C, D°C=55°CandE°C=60°C.

[0034] It can be understood that the above values cannot constitute any limitation to the specific values of the first preset temperature, the second preset temperature, the third preset temperature, the fourth preset temperature, and the fifth preset temperature.

[0035] For example, in a specific embodiment, the first preset power value is a power value corresponding to a level P, the second preset power value is a power value corresponding to a level P1, the third preset power value is a power value corresponding to a level P2, and the fourth preset power value is a power value corresponding to a level P3.

[0036] For example, in a specific embodiment, the power value corresponding to the level P is 1500W, the power value corresponding to the level P1 is 1000W, the power value corresponding to the level P2 is 800W, and the power value corresponding to the level P3 is 300W.

[0037] It can be understood that the above values cannot constitute any limitation to the specific values of the first preset power value, the second preset power value, the third preset power value and, the fourth preset power value in the embodiments of the present disclosure.

[0038] Furthermore, when the induction cooker runs with the fourth preset power value, the coil plate 30 of the induction cooker is controlled to run in a heating manner of intermittent heating, namely, the coil plate 30 is heated for a period of time and then not heated for a period of time, so as to achieve intermittent heating.

[0039] When it is determined that the first maximum power value of the induction cooker is zero, the induction cooker stops heating.

[0040] When it is detected that the IGBT temperature is increased, a maximum power level is automatically lowered, and the IGBT temperature is prevented from continuing increasing to an excessively high by a proper temperature hysteresis error and thus the induction cooker is prevented from mistakenly entering a high-temperature protection mode.

[0041] In the step S220, based on the second IGBT temperature and the working time, obtaining the second maximum power value of the working heating zones includes but not limited to the following steps:

when the second IGBT temperature less than the first preset temperature, determining the second maximum power value as a fifth preset power value;
when the working time is greater than or equal to a first preset time threshold and less than a second preset time threshold, or the second IGBT temperature is greater than or equal to the second preset temperature and less than the third preset temperature, determining the second maximum power value as a sixth preset power value;
when the working time is greater than or equal to the second preset time threshold and less than a third preset time threshold, or the second IGBT temperature is greater than or equal to the third preset temperature and less than the fourth preset temperature, determining the second maximum power value as a seventh preset power value;
when the working time is greater than or equal to the third preset time threshold, or the second IGBT temperature is greater than or equal to the fourth preset temperature and less than the fifth preset temperature, determining the second maximum power value as an eighth preset power value;
when the second IGBT temperature is greater than or equal to the fifth preset temperature, determining the second maximum power value as zero and outputting protection codes;
wherein the fifth preset power value, the sixth preset power value, the seventh preset power value and the eighth preset power value decrease gradually.

[0042] For example, for the fact that, when the working time is greater than or equal to the first preset time threshold and less than the second preset time threshold, or the second IGBT temperature is greater than or equal to the second preset temperature and less than the third preset temperature, the second maximum power value is determined as the sixth preset power value, it should be noted that, in one case, the induction cooker firstly satisfies the requirement that the working time is greater than or equal to the first preset time threshold and less than the second preset time threshold, but does not sat-

isfy the requirement that the second IGBT temperature is greater than or equal to the second preset temperature and less than the third preset temperature, and thus the second maximum power value can be determined as the sixth preset power value; in the other case, the induction cooker firstly satisfies the requirement that the second IGBT temperature is greater than or equal to the second preset temperature and less than the third preset temperature but does not satisfy the requirement that the working time is greater than or equal to the first preset time threshold and less than the second preset time threshold, and thus the second maximum power value can be determined as the sixth preset power value.

[0043] It can be understood that the second IGBT temperature is a real-time temperature value of the IGBT obtained by a temperature sensor.

[0044] The first preset temperature is A°C, the second preset temperature is B°C, the third preset temperature is C°C, the fourth preset temperature is D°C and the fifth preset temperature is E°C, where A°C<B°C<C°C<D°C<E°C.

[0045] For example, in a specific embodiment, A°C=30°C, B°C=40°C, C°C=50°C, D°C=55°C and E°C=60°C.

[0046] It can be understood that the above values cannot constitute any limitation to the specific values of the first preset temperature, the second preset temperature, the third preset temperature, the fourth preset temperature and the fifth preset temperature.

[0047] The first preset time threshold is X minutes, the second preset time threshold is Y minutes, and the third preset time threshold is Z minutes, where X<Y<Z.

[0048] For example, in a specific embodiment, X=20, Y=25 and Z=30.

[0049] It can be understood that the above values cannot constitute any limitation to the specific values of the first preset time threshold, the second preset time threshold, and the third preset time threshold in the embodiments of the present disclosure.

[0050] For example, in a specific embodiment, the fifth preset power value is a power value corresponding to the level P, the sixth preset power value is a power value corresponding to the level P1, the seventh preset power value is a power value corresponding to the level P2, and the eighth preset power value is a power value corresponding to the level P3.

[0051] For example, in a specific embodiment, the power value corresponding to the level P is 1500W, the power value corresponding to the level P1 is 1000W, the power value corresponding to the level P2 is 800W, and the power value corresponding to the level P3 is 300W.

[0052] It can be understood that the above values cannot constitute any limitation to the specific values of the fifth preset power value, the sixth preset power value, the seventh preset power value and the eighth preset power value in the embodiments of the present disclosure.

[0053] Furthermore, when the induction cooker runs with the eighth preset power value, the coil plate 30 of the induction cooker is controlled to run in a heating manner of intermittent heating, namely, the coil plate 30 is heated for a period of time and then not heated for a period of time, so as to achieve intermittent heating.

[0054] When it is determined that the second maximum power value of the induction cooker is zero, the induction cooker stops heating.

[0055] Further, when the induction cooker is in a working mode with multiple heating zones working, since multiple heating zones work at the same time, the IGBT temperature can be increased more quickly compared with the working mode with a single heating zone working. By two limiting conditions i.e. the working time and the temperature detection, the maximum power value can be limited to further prevent an excessively high IGBT temperature which causes the induction cooker to enter the high-temperature protection mode mistakenly.

[0056] With reference to FIG. 3, in an embodiment of the present disclosure, the controller 10 includes a working mode obtaining module 11, a first maximum power value calculating module 12 and a second maximum power value calculating module 13;

the working mode obtaining module 11 is configured to obtain a working mode of the induction cooker;
the first maximum power value calculating module 12 is configured to, when the induction cooker is in a working mode with a single heating zone working, obtain a first IGBT temperature of the working heating zone, and based on the first IGBT temperature, obtain a first maximum power value of the working heating zone;
the second maximum power value calculating module 13 is configured to, when the induction cooker is in a working mode with multiple heating zones working, obtain a second IGBT temperature and a working time of the working heating zones, and based on the second IGBT temperature and the working time, obtain a second maximum power value of the working heating zones.

[0057] In some embodiments of the present disclosure, the first maximum power value calculating module 12 is further configured to:

when the first IGBT temperature is less than a first preset temperature, determine the first maximum power value as a first preset power value;
when the first IGBT temperature is greater than or equal to a second preset temperature and less than a third preset temperature, determine the first maximum power value as a second preset power value;
when the first IGBT temperature is greater than or equal to the third preset temperature and less than a fourth preset temperature, determine the first maximum power value as a third preset power value;
when the first IGBT temperature is greater than or

equal to the fourth preset temperature and less than a fifth preset temperature, determine the first maximum power value as a fourth preset power value;
wherein the first preset power value, the second preset power value, the third preset power value and the fourth preset power value decrease gradually.

[0058] In some embodiments of the present disclosure, the second maximum power value calculating module 13 is further configured to:

when the second IGBT temperature less than the first preset temperature, determine the second maximum power value as a fifth preset power value;
when the working time is greater than or equal to a first preset time threshold and less than a second preset time threshold, or the second IGBT temperature is greater than or equal to the second preset temperature and less than the third preset temperature, determine the second maximum power value as a sixth preset power value;
when the working time is greater than or equal to the second preset time threshold and less than a third preset time threshold, or the second IGBT temperature is greater than or equal to the third preset temperature and less than the fourth preset temperature, determine the second maximum power value as a seventh preset power value;
when the working time is greater than or equal to the third preset time threshold, or the second IGBT temperature is greater than or equal to the fourth preset temperature and less than the fifth preset temperature, determine the second maximum power value as an eighth preset power value;
wherein the fifth preset power value, the sixth preset power value, the seventh preset power value and the eighth preset power value decrease gradually.

[0059] In some embodiments of the present disclosure, when the induction cooker runs with the fourth preset power value or the eighth preset power value, the controller 10 controls the coil plate 30 of the induction cooker to run in a heating manner of intermittent heating.
[0060] In some embodiments of the present disclosure, the first maximum power value calculating module 12 is further configured to, when the first IGBT temperature is greater than or equal to the fifth preset temperature, determine the first maximum power value as zero, and output protection codes; the second maximum power value calculating module 13 is further configured to, when the second IGBT temperature is greater than or equal to the fifth preset temperature, determine the second maximum power value as zero and output protection codes.
[0061] It can be understood that the working mode obtaining module, the first maximum power calculating module and the second maximum power calculating module of the controller are in one-to-one correspondence with the steps of the above power control method, and can solve the same technical problems with the same technical solutions, thus bringing the same technical effects.
[0062] Although the embodiments of the present disclosure have been illustrated, persons of ordinary skills in the prior arts can understand that without departing from the principle and tenet of the present disclosure, various changes, modifications, replacements and variations can be made to these embodiments, and the scope of the present disclosure is defined by the claims and its equivalents.
[0063] The above descriptions are made to the preferred embodiments of the present disclosure but not intended to limit the present disclosure. Those skilled in the art can make equivalent variations or replacements without departing from the spirit of the present disclosure and these equivalent variations or replacements are all incorporated in the scope defined by the claims of the present disclosure.

Claims

1. A power control method, applied to an induction cooker with multiple heating zones, and comprising:

   obtaining a working mode of an induction cooker;
   when the induction cooker is in a working mode with a single heating zone working, obtaining a first Insulated Gate Bipolar Transistor (IGBT) temperature of the working heating zone, and based on the first IGBT temperature, obtaining a first maximum power value of the working heating zone;
   when the induction cooker is in a working mode with multiple heating zones working, obtaining a second IGBT temperature and a working time of the working heating zones, and based on the second IGBT temperature and the working time, obtaining a second maximum power value of the working heating zones.

2. The power control method of claim 1, wherein based on the first IGBT temperature, obtaining the first maximum power value of the working heating zone comprises:

   when the first IGBT temperature is less than a first preset temperature, determining the first maximum power value as a first preset power value;
   when the first IGBT temperature is greater than or equal to a second preset temperature and less than a third preset temperature, determining the first maximum power value as a second preset power value;
   when the first IGBT temperature is greater than

or equal to the third preset temperature and less than a fourth preset temperature, determining the first maximum power value as a third preset power value;

when the first IGBT temperature is greater than or equal to the fourth preset temperature and less than a fifth preset temperature, determining the first maximum power value as a fourth preset power value;

wherein the first preset power value, the second preset power value, the third preset power value and the fourth preset power value decrease gradually.

3. The power control method of claim 1, wherein based on the second IGBT temperature and the working time, obtaining the second maximum power value of the working heating zones comprises:

when the second IGBT temperature less than the first preset temperature, determining the second maximum power value as a fifth preset power value;

when the working time is greater than or equal to a first preset time threshold and less than a second preset time threshold, or the second IGBT temperature is greater than or equal to the second preset temperature and less than the third preset temperature, determining the second maximum power value as a sixth preset power value;

when the working time is greater than or equal to the second preset time threshold and less than a third preset time threshold, or the second IGBT temperature is greater than or equal to the third preset temperature and less than the fourth preset temperature, determining the second maximum power value as a seventh preset power value;

when the working time is greater than or equal to the third preset time threshold, or the second IGBT temperature is greater than or equal to the fourth preset temperature and less than the fifth preset temperature, determining the second maximum power value as an eighth preset power value;

wherein the fifth preset power value, the sixth preset power value, the seventh preset power value and the eighth preset power value decrease gradually.

4. The power control method of claim 1, comprising: when the induction cooker runs with the fourth preset power value or the eighth preset power value, controlling a coil plate of the induction cooker to run in a heating manner of intermittent heating.

5. The power control method of claim 1, wherein based on the first IGBT temperature, obtaining the first maximum power value of the working heating zone comprises: when the first IGBT temperature is greater than or equal to the fifth preset temperature, determining the first maximum power value as zero and outputting protection codes;

based on the second IGBT temperature and the working time, obtaining the second maximum power value of the working heating zones comprises: when the second IGBT temperature is greater than or equal to the fifth preset temperature, determining the second maximum power value as zero and outputting protection codes.

6. An induction cooker, comprising multiple heating zones and a controller, wherein the heating zones are provided with an IGBT drive circuit and a coil plate, and the controller is connected to the IGBT drive circuit and the coil plate;

the controller comprises a working mode obtaining module, a first maximum power value calculating module and a second maximum power value calculating module;

the working mode obtaining module is configured to obtain a working mode of the induction cooker;

the first maximum power value calculating module is configured to, when the induction cooker is in a working mode with a single heating zone working, obtain a first IGBT temperature of the working heating zone, and based on the first IGBT temperature, obtain a first maximum power value of the working heating zone;

the second maximum power value calculating module is configured to, when the induction cooker is in a working mode with multiple heating zones working, obtain a second IGBT temperature and a working time of the working heating zones, and based on the second IGBT temperature and the working time, obtain a second maximum power value of the working heating zones.

7. The induction cooker of claim 6, wherein the first maximum power value calculating module is further configured to:

when the first IGBT temperature is less than a first preset temperature, determine the first maximum power value as a first preset power value;

when the first IGBT temperature is greater than or equal to a second preset temperature and less than a third preset temperature, determine the first maximum power value as a second preset power value;

when the first IGBT temperature is greater than or equal to the third preset temperature and less

than a fourth preset temperature, determine the first maximum power value as a third preset power value;

when the first IGBT temperature is greater than or equal to the fourth preset temperature and less than a fifth preset temperature, determine the first maximum power value as a fourth preset power value;

wherein the first preset power value, the second preset power value, the third preset power value and the fourth preset power value decrease gradually.

8. The induction cooker of claim 6, wherein the second maximum power value calculating module is further configured to:

when the second IGBT temperature less than the first preset temperature, determine the second maximum power value as a fifth preset power value;

when the working time is greater than or equal to a first preset time threshold and less than a second preset time threshold, or the second IGBT temperature is greater than or equal to the second preset temperature and less than the third preset temperature, determine the second maximum power value as a sixth preset power value;

when the working time is greater than or equal to the second preset time threshold and less than a third preset time threshold, or the second IGBT temperature is greater than or equal to the third preset temperature and less than the fourth preset temperature, determine the second maximum power value as a seventh preset power value;

when the working time is greater than or equal to the third preset time threshold, or the second IGBT temperature is greater than or equal to the fourth preset temperature and less than the fifth preset temperature, determine the second maximum power value as an eighth preset power value;

wherein the fifth preset power value, the sixth preset power value, the seventh preset power value and the eighth preset power value decrease gradually.

9. The induction cooker of claim 6, wherein when the induction cooker runs with the fourth preset power value or the eighth preset power value, the controller controls the coil plate of the induction cooker to run in a heating manner of intermittent heating.

10. The induction cooker of claim 6, wherein the first maximum power value calculating module is further configured to, when the first IGBT temperature is greater than or equal to the fifth preset temperature, determine the first maximum power value as zero, and output protection codes; the second maximum power value calculating module is further configured to, when the second IGBT temperature is greater than or equal to the fifth preset temperature, determine the second maximum power value as zero and output protection codes.

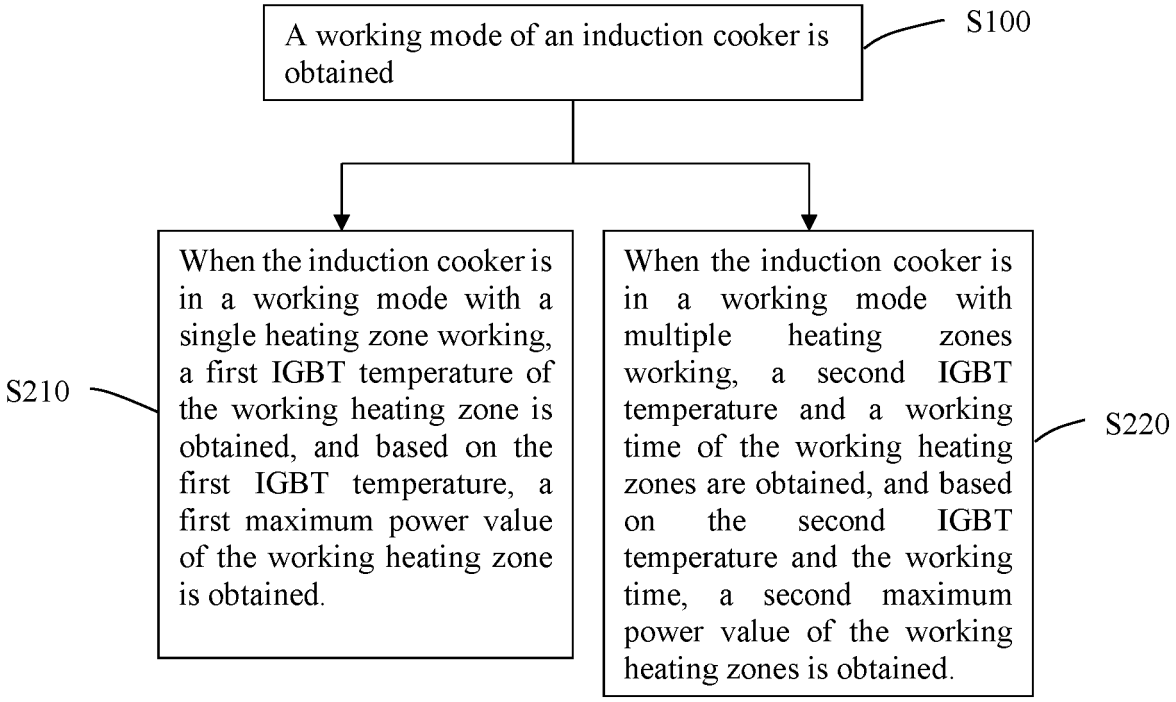
A working mode of an induction cooker is obtained
S100
When the induction cooker is in a working mode with a single heating zone working, a first IGBT temperature of the working heating zone is obtained, and based on the first IGBT temperature, a first maximum power value of the working heating zone is obtained.
S210
When the induction cooker is in a working mode with multiple heating zones working, a second IGBT temperature and a working time of the working heating zones are obtained, and based on the second IGBT temperature and the working time, a second maximum power value of the working heating zones is obtained.
S220

FIG.1

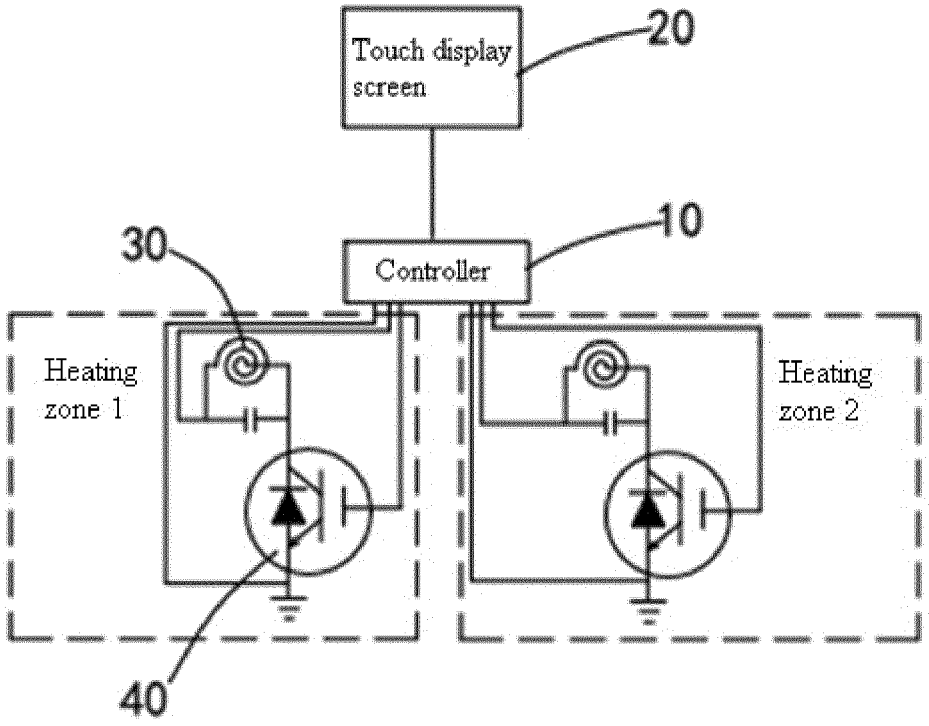
Touch display screen
20
Controller
10
30
Heating zone 1
Heating zone 2
40

FIG. 2

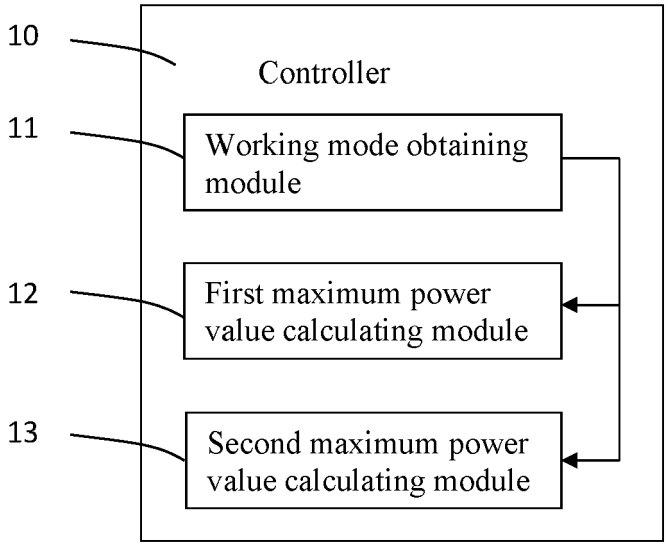
10
Controller
11
Working mode obtaining module
12
First maximum power value calculating module
13
Second maximum power value calculating module

FIG.3