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(54) **MICROWAVE GENERATION SYSTEM FOR COOKING APPLIANCE, AND COOKING APPLIANCE**

(57) Provided are a microwave generation system (1000) for a cooking appliance (1) and the cooking appliance (1). The microwave generation system (1000) includes: a waveguide box (10), a magnetron (420), and a microwave stirring assembly (30). The waveguide box (10) defines a first chamber (4031) and a second chamber (4032) that are connected with each other. The first chamber (4031) is located above the second chamber (4032), and a dimension of the first chamber (4031) in a

horizontal direction is smaller than a dimension of the second chamber (4032) in the horizontal direction. The magnetron (420) is mounted at a side wall of the first chamber (4031) and configured to transmit microwaves into the first chamber (4031). The microwave stirring assembly (30) is mounted at a top wall of the second chamber (4032) and includes a stirring member (440) configured to reflect the microwaves.

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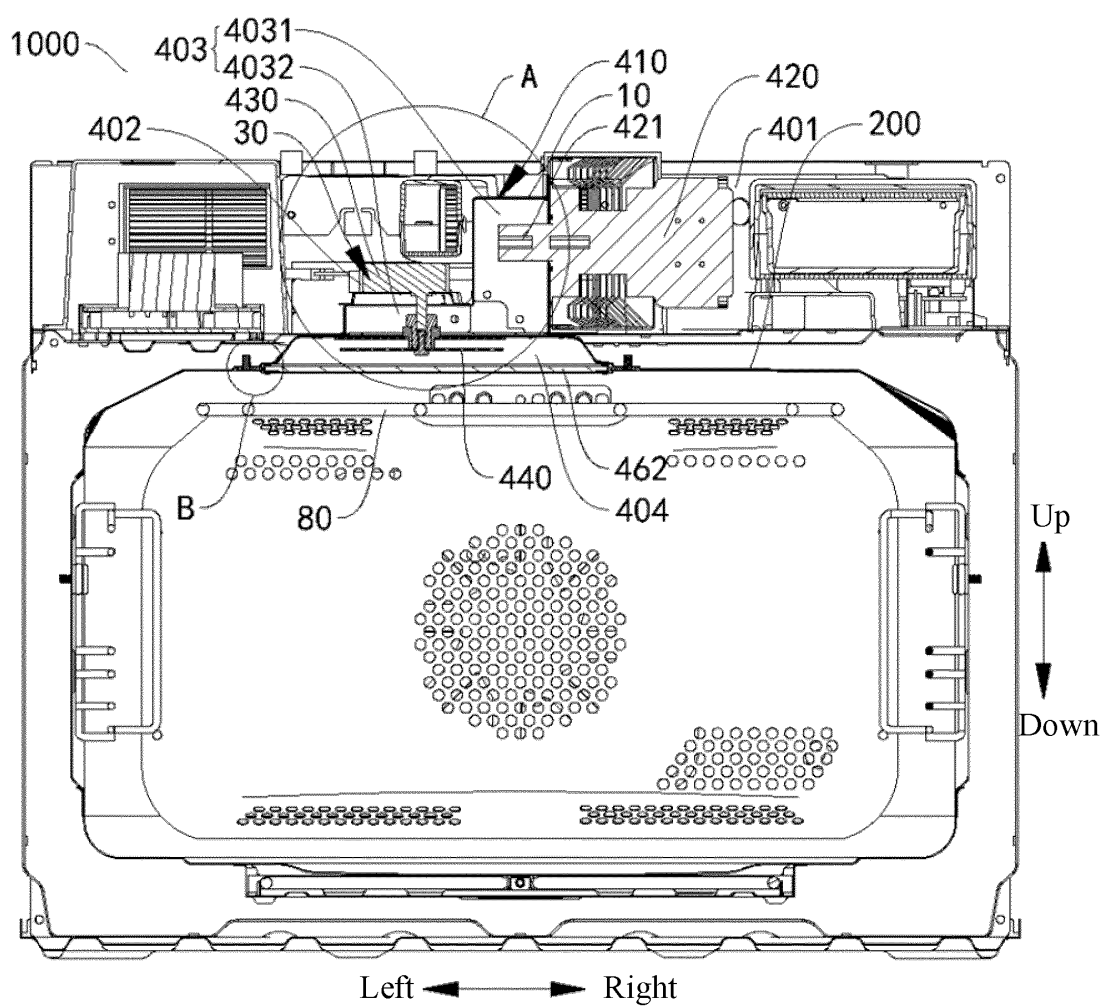


FIG. 3

Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priorities to Chinese Patent Applications No. 202110586459.4, No. 202121168521.X, and No. 202121170957.2, filed by GUANGDONG MIDEA KITCHEN APPLIANCES MANUFACTURING CO., LTD. and MIDEA GROUP CO., LTD. on May 27, 2021, the entire contents of which are incorporated herein by reference.

FIELD

[0002] The present disclosure relates to the field of cooking appliance technologies, and more particularly, to a microwave generation system for a cooking appliance and the cooking appliance.

BACKGROUND

[0003] In the related art, a microwave generation system has a large volume, which results in a small space and a low space utilization rate of a cooking cavity body. Therefore, a large-volume requirement of customers cannot be satisfied. Moreover, microwaves generated by the microwave generation system enter the cooking cavity body in a centralized manner, which results in a non-uniform distribution of the microwaves and an unsatisfactory microwave result, leading to uneven doneness of the food. Therefore, user experience is unsatisfactory.

SUMMARY

[0004] The present disclosure aims to solve at least one of the technical problems in the related art. To this end, an embodiment of the present disclosure is to provide a microwave generation system for a cooking appliance. The microwave generation system has a compact structure and provides improved microwave distribution uniformity.

[0005] Another embodiment of the present disclosure is to provide a cooking appliance having the above-mentioned microwave generation system.

[0006] According to an embodiment of the present disclosure, a microwave generation system for a cooking appliance includes: a waveguide box, a magnetron, and a microwave stirring assembly. The waveguide box comprises a first chamber and a second chamber that are connected with each other, the first chamber is located above the second chamber, and a dimension of the first chamber in a horizontal direction is smaller than a dimension of the second chamber in the horizontal direction. The magnetron is mounted at a side wall of the first chamber and configured to transmit microwaves into the first chamber. The microwave stirring assembly is mounted at a top wall of the second chamber and includes a stirring member configured to reflect the microwaves.

[0007] With the microwave generation system for the cooking appliance according to the embodiment of the present disclosure, a horizontal dimension of the first chamber is greater than that of the second chamber, the magnetron is mounted at the side wall of the first chamber, and the microwave stirring member is mounted at the top wall of the second chamber. Therefore, the microwave generation system has a compact structure, and a space occupied by the microwave generation system is reduced, which are conducive to improving a space utilization rate of a machine body, and noticeably improve distribution uniformity of microwaves. Therefore, even doneness of the food is achieved, and customer experience is improved.

[0008] In addition, the microwave generation system for the cooking appliance according to the above embodiment of the present disclosure can further have the following additional technical features.

[0009] According to some embodiments of the present disclosure, the first chamber has a first side wall and a second side wall that are opposite to each other; the magnetron has a transmitting end penetrating the first side wall and extending into the first chamber; and the microwave stirring assembly is at least partially located at a side of the second side wall facing away from the first side wall.

[0010] According to some embodiments of the present disclosure, the microwave stirring assembly further includes a driver located above the top wall of the second chamber. The driver has an output shaft penetrating the top wall of the second chamber and connected to the stirring member.

[0011] According to some embodiments of the present disclosure, the stirring member is a metallic plate, the metallic plate having a through hole for allowing for a passage of the microwaves.

[0012] According to some embodiments of the present disclosure, the stirring member is a rectangular plate.

[0013] According to an embodiment of the present disclosure, a cooking appliance includes the microwave generation system according to the embodiments of the present disclosure.

[0014] According to some embodiments of the present disclosure, the cooking appliance further includes a machine body, the waveguide box is disposed above the machine body, and the stirring member is located in the machine body and at least partially located below a microwave outlet of the second chamber.

[0015] According to some embodiments of the present disclosure, the microwave stirring assembly further includes a driver. A top wall of the machine body has a first mounting hole. A metallic shaft sleeve and a plastic shaft sleeve are provided at the first mounting hole, and the plastic shaft sleeve is arranged around the metallic shaft sleeve. The metallic shaft sleeve is arranged around an output shaft of the driver and connected to the stirring member.

[0016] According to some embodiments of the present

disclosure, the cooking appliance further includes a spacer engaged with a top wall of the machine body to define an accommodation space, and the stirring member is disposed in the accommodation space.

[0017] According to some embodiments of the present disclosure, the machine body is provided with a heating member, and the heating member is disposed at a side of the spacer facing away from the stirring member.

[0018] According to some embodiments of the present disclosure, the cooking appliance further includes a fixation member connected to the top wall of the machine body, and a seal ring. A peripheral edge of the spacer is sandwiched between the fixation member and the top wall of the machine body, and the seal ring is connected to the peripheral edge of the spacer.

[0019] According to some embodiments of the present disclosure, the spacer is made of borosilicate glass, mica sheet, transmissive plastic, or transmissive foam.

[0020] According to some embodiments of the present disclosure, the cooking appliance further includes: a machine body, a plurality of to-be-cooled members, and an air duct housing. The machine body has a cooking cavity, an air inflow cavity, a first air inlet, and an air outlet. The air inflow cavity is located above the cooking cavity, the first air inlet is connected to a rear part of the air inflow cavity, and the air outlet is connected to a front part of the air inflow cavity. The plurality of to-be-cooled members is disposed in the air inflow cavity, and the plurality of to-be-cooled members includes a frequency converter, a controller, and a magnetron. The frequency converter and the magnetron are arranged in a left-right direction, and the controller is located in front of the frequency converter. The air duct housing is disposed in the air inflow cavity and has a first air flowing channel, a second air flowing channel, and a third air flowing channel that are connected with the air inflow cavity. At least part of the frequency converter is disposed in the first air flowing channel, at least part of the controller is disposed in the second air flowing channel, and at least part of the magnetron is disposed in the third air flowing channel.

[0021] According to some embodiments of the present disclosure, the air duct housing includes a first air duct member. The first air flowing channel is formed in the first air duct member, and the frequency converter is disposed in the first air flowing channel.

[0022] According to some embodiments of the present disclosure, the first air duct member includes a first ventilation pipe and a first air guide member. The first ventilation pipe has an end connected to the first air inlet and another end connected to a rear end of the first air guide member. The first air guide member has a front end connected to the air outlet. The frequency converter is disposed in the first ventilation pipe. The first air guide member has a ventilation area decreasing gradually from rear to front.

[0023] According to some embodiments of the present disclosure, the first air guide member is detachably disposed at the first ventilation pipe.

[0024] According to some embodiments of the present disclosure, the air duct housing includes a second ventilation pipe adapted to blow air towards the controller, and the controller is disposed in the second air flowing channel.

[0025] According to some embodiments of the present disclosure, the second ventilation pipe includes a lower half pipe segment and an upper half pipe segment detachably disposed at the lower half pipe segment.

[0026] According to some embodiments of the present disclosure, the air duct housing includes a third air duct member, the third air flowing channel is formed in the third air duct member, and the magnetron is disposed in the third air flowing channel.

[0027] According to some embodiments of the present disclosure, the plurality of to-be-cooled members further includes a condenser pipe disposed in the third air flowing channel and located in front of the magnetron.

[0028] According to some embodiments of the present disclosure, the first air flowing channel, the second air flowing channel, and the third air flowing channel extend in a front-rear direction and are arranged in parallel in the left-right direction.

[0029] According to some embodiments of the present disclosure, the cooking appliance further includes a driving device disposed in the air inflow cavity and located between the first air inlet and the air duct housing.

[0030] According to some embodiments of the present disclosure, the first air inlet has a first inlet and a second inlet, and the first inlet and the second inlet is formed at a left cavity wall and a right cavity wall of the air inflow cavity, respectively.

[0031] According to some embodiments of the present disclosure, the machine body further includes a third inlet connected to the front part of the air inflow cavity, the air duct housing has an air inflow channel connecting the third inlet and the driving device.

[0032] According to some embodiments of the present disclosure, the cooking appliance further includes a machine body, a door body assembly, and an air duct assembly. The machine body has a cooking cavity with an access opening at a side of the cooking cavity. The cooking cavity has a wall surface with an enamel coating, and the microwave generation system is disposed at the machine body. The door body is assembly pivotally disposed at the machine body, to expose or cover the access opening. The air duct assembly is disposed at the machine body and has a plurality of air flowing channels.

[0033] According to some embodiments of the present disclosure, the microwave generation system includes: a microwave housing, a microwave generation device, the stirring member, and a driver. The microwave housing has a first receiving cavity, a second receiving cavity, a waveguide cavity, and an accommodation space. The microwave generation device is disposed in the first receiving cavity and configured to transmit microwaves towards the waveguide cavity. The stirring member is disposed in the accommodation space. The driver is dis-

posed in the second receiving cavity and in a transmission connection with the stirring member.

[0034] According to some embodiments of the present disclosure, the waveguide cavity has the first chamber and the second chamber connected to a lower part of the first chamber. The first receiving cavity is located at a side of the waveguide cavity. The microwave generation device has a transmitting end extending into the first chamber from a side wall of the first chamber. The accommodation space is located below the waveguide cavity. The second receiving cavity is located above the second chamber.

[0035] According to some embodiments of the present disclosure, a rotation axis of a drive shaft of the driver extends in a vertical direction. A first through hole is formed between the second receiving cavity and the second chamber. A second through hole is formed between the second chamber and the accommodation space. The drive shaft passes through the first through hole and the second through hole to be connected to the stirring member.

[0036] According to some embodiments of the present disclosure, a shaft sleeve assembly is provided at the second through hole. The shaft sleeve assembly includes a first shaft sleeve and a second shaft sleeve. The first shaft sleeve is arranged around the drive shaft, and the first shaft sleeve is a metallic shaft sleeve. The second shaft sleeve is arranged around the first shaft sleeve, and the second shaft sleeve is an insulation shaft sleeve.

[0037] According to some embodiments of the present disclosure, the microwave housing is located above the cooking cavity. A first microwave passing opening is formed between the waveguide cavity and the accommodation space. A second microwave passing opening is formed between the accommodation space and the cooking cavity. A first transparent isolation member is provided at the first microwave passing opening. A second transparent isolation member is provided at the second microwave passing opening.

[0038] According to some embodiments of the present disclosure, the cooking appliance is provided with a plurality of to-be-cooled members. The air duct assembly includes an air duct housing having an air inlet, an air outlet, and the plurality of air flowing channels corresponding to the plurality of to-be-cooled members. Each of the plurality of air flowing channels is connected to each of the air inlet and the air outlet, and each of the plurality of to-be-cooled members is at least partially disposed in a corresponding one of the plurality of air flowing channels.

[0039] According to some embodiments of the present disclosure, the door body assembly includes: a panel adapted to cover the access opening, and a protrusion disposed at a side of the panel facing towards the machine body and being extendable into the cooking cavity. The protrusion is provided with a wave suppression structure.

[0040] According to some embodiments of the present

disclosure, the panel is provided with an outer glass layer, an intermediate glass layer, and an inner glass layer.

[0041] According to some embodiments of the present disclosure, the cooking appliance further includes an outer casing having an accommodation cavity, and the machine body is engaged within the accommodation cavity.

[0042] According to some embodiments of the present disclosure, the access opening is located at a front side of the machine body. The machine body is provided with a control board, and the control board is disposed at the front side of the machine body and located above the access opening.

[0043] Additional aspects and advantages of the present disclosure will be provided at least in part in the following description, or will become apparent at least in part from the following description, or can be learned from practicing of the present disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

[0044] The above and/or additional aspects and advantages of the present disclosure will become more apparent and more understandable from the following description of embodiments taken in conjunction with the accompanying drawings, in which:

FIG. 1 is an exploded view of a cooking appliance according to an embodiment of the present disclosure.

FIG. 2 is an exploded cross-sectional view of a cooking appliance according to an embodiment of the present disclosure.

FIG. 3 is a cross-sectional view of a cooking appliance according to an embodiment of the present disclosure.

FIG. 4 is an enlarged schematic structural view of circle A in FIG. 3.

FIG. 5 is an enlarged schematic structural view of circle B in FIG. 3.

FIG. 6 is an exploded view of a cooking appliance according to an embodiment of the present disclosure.

FIG. 7 is a schematic partial structural view of a cooking appliance according to an embodiment of the present disclosure.

FIG. 8 is a partial exploded view of a cooking appliance according to an embodiment of the present disclosure.

[0045] Reference numerals of the accompanying drawings:

microwave generation system 1000; cooking appliance 1;

microwave housing 410; waveguide box 10; first receiving cavity 401; second receiving cavity 402; waveguide cavity 403; first chamber 4031; first side wall 4111; second side wall 4112; second chamber

4032;
 magnetron 420; transmitting end 421;
 microwave stirring assembly 30; stirring member
 440; driver 430; output shaft 450;
 machine body 200; accommodation space 404; first
 mounting hole 42; second mounting hole 43;
 spacer 462; fixation member 51; seal ring 52; fas-
 tener 53; mica sheet 461;
 metallic shaft sleeve 451; plastic shaft sleeve 452;
 heating member 80;
 outer cover 90; door body assembly 300; air duct
 assembly 100; electric water box system 600; left
 outer cover 520; top outer cover 530; rear outer cover
 550; right outer cover 510; bottom outer cover 540;
 rack 921; water receiving groove 922; driving device
 12;
 first inlet 1011; second inlet 1012; third inlet 1013;
 air outlet 102; first air duct member 110; first venti-
 lation pipe 111; first air guide member 112; second
 ventilation pipe 120; upper half pipe segment 121;
 lower half pipe segment 122; third air duct member
 130; air inflow channel 140; controller 13;
 cooking cavity 201; access opening 202; air inflow
 cavity 103; control board 210.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0046] Embodiments of the present disclosure will be described in detail below with reference to examples thereof as illustrated in the accompanying drawings, throughout which same or similar elements, or elements having same or similar functions, are denoted by same or similar reference numerals. The embodiments described below with reference to the drawings are illustrative only, and are intended to explain, rather than limiting, the present disclosure.

[0047] In the description of the present disclosure, it should be understood that, the orientation or the position indicated by terms such as "center", "longitudinal", "lateral", "length", "width", "thickness", "over", "below", "front", "rear", "left", "right", "vertical", "horizontal", "top", "bottom", "inner", "outer", "clockwise", "anti-clockwise", "axial", "radial", and "circumferential" should be construed to refer to the orientation and the position as shown in the drawings, and is only for the convenience of describing the present disclosure and simplifying the description, rather than indicating or implying that the pointed device or element must have a specific orientation, or be constructed and operated in a specific orientation, and therefore cannot be understood as a limitation of the present disclosure.

[0048] In the description of the present disclosure, "first feature" and "second feature" may include one or more of the features, and "plurality" means at least two. The first feature "on" or "under" the second feature may mean that the first feature is in direct contact with the second feature, or the first and second features are in indirect contact through another feature between the first and

second features. The first feature "above" the second feature may mean that the first feature is directly above or obliquely above the second feature, or simply mean that the level of the first feature is higher than that of the second feature.

[0049] A microwave generation system 1000 for a cooking appliance 1 and the cooking appliance 1 having same according to embodiments of the present disclosure are described below with reference to the accompanying drawings.

[0050] As illustrated in FIG. 1 to FIG. 3, the cooking appliance 1 according to the embodiments of the present disclosure includes the microwave generation system 1000 for the cooking appliance 1 according to the embodiments of the present disclosure. The microwave generation system 1000 for the cooking appliance 1 according to the embodiments of the present disclosure may include a waveguide box 10, a magnetron 420, and a microwave stirring assembly 30.

[0051] Exemplarily, the cooking appliance 1 may further include a machine body 200 (i.e., a cooking cavity body). The machine body 200 has a cooking cavity that can be used for cooking ingredients. For example, microwave heating, steaming, baking, and other cooking functions may be performed.

[0052] In some embodiments, the cooking appliance 1 may be a micro combination steam and grill machine or a steam microwave oven, which can satisfy a customer's demand for microwave, grilling, and steam functions, and reduce a quantity of and a space occupied by cooking devices. In some embodiments, the cooking appliance 1 may have an embedded structure. With the embedded structure, the kitchen may have a style of one integrated mass and be neatly arranged, which are in line with the simple and elegant sense of style of modern people. The embedded structure requires a cabinet and overall decoration. In a case where the customer has needs for all of the microwave, grill, and steam functions, a plurality of cooking devices is required to satisfy the needs if single-function embedded products are adopted, which is very uneconomical and occupies a large room area. However, the embedded micro combination steam and grill machine can meet requirements of a large capacity, easy to clean, a reduction in both the quantity of and the space occupied by the cooking devices.

[0053] In the related art, a microwave generation system still has a problem of occupying a large space. When applied in an embedded product, a volume of a cooking cavity body of the cooking device is greatly compressed under a fixed profile dimension of the embedded product, which results in a small space of the cooking cavity body, leading to a low space utilization rate. Therefore, a large-volume requirement of the customer cannot be satisfied. Moreover, microwaves generated by the microwave generation system in the related art enter the cooking cavity body in a centralized manner, which results in a non-uniform distribution of the microwaves and an unsatisfactory microwave result, leading to uneven doneness of

the food. Therefore, user experience is unsatisfactory.

[0054] However, in an embodiment of the present disclosure, as illustrated in FIG. 2 to FIG. 4, a first chamber 4031 and a second chamber 4032 may be defined by the waveguide box 10. The first chamber 4031 is located above the second chamber 4032. Also, the first chamber 4031 and the second chamber 4032 are connected with each other. A dimension of the first chamber 4031 is smaller than a dimension of the second chamber 4032 in a horizontal direction, in such a manner that the waveguide box 10 can be formed with a corner region at least one side of the first chamber 4031 in the horizontal direction. For example, in an example illustrated in FIG. 4, one side wall of the first chamber 4031 is coplanar with one side wall of the second chamber 4032, and thus the waveguide box 10 is formed as a substantially "L"-shaped box.

[0055] With continued reference to FIG. 2 to FIG. 4, the magnetron 420 may be mounted at a side wall of the first chamber 4031, and the microwave stirring assembly 30 may be mounted at a top wall of the second chamber 4032, fully utilizing a spatial area around the waveguide box 10. For example, a part of the microwave stirring assembly 30 may be located at the corner region, to enable the microwave generation system 1000 to have a compact structure and reduce a space occupied by the microwave generation system 1000. At least part of the magnetron 420 may be located at a side of the waveguide box 10 in the horizontal direction to reduce a vertical height of the microwave generation system 1000, which fully utilizes a space in the horizontal direction, reducing a compression of a space of the machine body 200 in the vertical direction. Therefore, an increase in a volume and a space of the machine body 200 is facilitated, and the space utilization rate is improved, which satisfies a demand of the customer for a large volume.

[0056] In some specific embodiments of the present disclosure, as illustrated in FIG. 4, the first chamber 4031 may have a first side wall 4111 and a second side wall 4112 that are arranged opposite to each other (e.g., a left side wall and a right side wall as illustrated in FIG. 4). The magnetron 420 has a transmitting end 421 that may penetrate the first side wall 4111 and extend into the first chamber 4031. Other parts of the magnetron 420 may be located at an outer side of the first side wall 4111 (e.g., a right side of the first side wall 4111) to avoid interfering with a reflection and propagation of microwaves in the first chamber 4031. For example, the transmitting end 421 of the magnetron 420 may be mounted vertically at the first side wall 4111. At least part of the microwave stirring assembly 30 may be located at a side of the second side wall 4112 facing away from the first side wall 4111 (e.g., at a left side of the second side wall 4112) to fully utilize a spatial area outside the shaped waveguide box 10, realizing an improved space utilization rate and a compact structure.

[0057] In addition, the first chamber 4031 and the second chamber 4032 inside the waveguide box 10 form a

shaped chamber. During an operation of the microwave generation system 1000, the magnetron 420 transmits microwaves into the first chamber 4031 from a side of the first chamber 4031. The microwaves are reflected in the first chamber 4031 to improve distribution uniformity, and are then further propagated to the second chamber 4032 having a greater horizontal dimension to further improve the distribution uniformity. Therefore, twostage reflection and dispersion of the microwaves are realized in the waveguide box 10, achieving a uniform distribution of the microwaves. In addition, as illustrated in FIG. 2 to FIG. 4, the microwave stirring assembly 30 further includes a stirring member 440. The stirring member 440 is capable of performing periodic rotations and reflecting microwaves to mechanically disperse the microwaves. The above-mentioned three ways of dispersing the microwaves effectively increase the distribution uniformity of the microwaves entering the machine body 200, which improves a microwave cooking result and achieves even doneness of the food, improving customer experience. In some embodiments, the stirring member 440 may be a metallic member to improve a microwave reflection effect.

[0058] With the microwave generation system 1000 for the cooking appliance 1 according to the embodiments of the present disclosure, the horizontal dimension of the first chamber 4031 is greater than that of the second chamber 4032, the magnetron 420 is mounted at the side wall of the first chamber 4031, and the microwave stirring member 440 is mounted at the top wall of the second chamber 4032. In this way, the microwave generation system 1000 has a compact structure, and a space occupied by the microwave generation system 1000 is reduced, which are conducive to improving the space utilization rate of the machine body 200, and noticeably improve the distribution uniformity of the microwaves. Therefore, the even doneness of the food is achieved, and the customer experience is improved.

[0059] The microwave generation system 1000 for the cooking appliance 1 according to the embodiments of the present disclosure can provide the above-mentioned advantageous technical effects. Therefore, with the cooking appliance 1 according to the embodiments of the present disclosure, the horizontal dimension of the first chamber 4031 is greater than that of the second chamber 4032, the magnetron 420 is mounted at the side wall of the first chamber 4031, and the microwave stirring member 440 is mounted at the top wall of the second chamber 4032. In this way, the microwave generation system 1000 has the compact structure, and the space occupied by the microwave generation system 1000 is reduced, which are conducive to improving the space utilization rate of the machine body 200, and noticeably improve the distribution uniformity of the microwaves. Therefore, the even doneness of the food is achieved, and the customer experience is improved.

[0060] According to some embodiments of the present disclosure, as illustrated in FIG. 2 to FIG. 4, the micro-

wave stirring assembly 30 may further include a driver 430. The driver 430 has an output shaft 450 that may be connected to the stirring member 440 to drive the stirring member 440 to rotate, achieving mechanical dispersion of the microwaves. In some embodiments, also, a rotation state of the stirring member 440 can be adjusted through controlling a rotational speed of the driver 430, a rotation direction of the driver 430, or the like, to adjust a dispersion state of the microwaves. Therefore, uniformity of the microwaves is adjustable, which satisfies more use demands.

[0061] In some embodiments, as illustrated in FIG. 4, the driver 430 may be located above the top wall of the second chamber 4032. The output shaft 450 may penetrate the top wall of the second chamber 4032, in such a manner that the output shaft 450 may be connected to the stirring member 440 to drive the stirring member 440 to rotate. The driver 430 is located outside the second chamber 4032 to avoid interfering with a reflection and propagation of the microwaves in the second chamber. In addition, the driver 430 may be located at a side surface of the first chamber 4031 to realize the compact structure.

[0062] In the embodiments of the present disclosure, a specific structure of the stirring member 440 may be flexibly set as desired.

[0063] In some embodiments, the stirring member 440 has a shape different from that of a microwave outlet of the waveguide box 10, in such a manner that a part of the microwaves emitted from the microwave outlet can be propagated to the stirring member 440 and be reflected by the stirring member 440, and another part of the microwaves emitted from the microwave outlet can be directly transmitted into the cooking cavity. Therefore, the microwaves can be propagated in all directions, improving the distribution uniformity of the microwaves in the cooking cavity.

[0064] In some specific embodiments, the stirring member 440 may be a metallic plate. The metallic plate has a through hole. A part of the microwaves may pass through the through hole, while another part of the microwaves may be reflected by a region of the metallic plate having no through hole. Therefore, the microwaves can be propagated in all directions.

[0065] In some specific embodiments, the stirring member 440 may be a rectangular plate. A part of the microwaves emitted from the microwave outlet of the waveguide box 10 may be reflected by the rectangular plate, while another part of the microwaves emitted from the microwave outlet of the waveguide box 10 may be staggered with the rectangular plate. Therefore, the microwaves propagated in all directions can be formed.

[0066] Of course, the rectangular plate may also be provided with a structure such as the through hole as desired, or the stirring member 440 may also be in an oval shape, a square shape, an irregular shape, etc.

[0067] In addition, in the embodiments of the present disclosure, a position of the stirring member 440 may be flexibly set as desired.

[0068] In some embodiments, the stirring member 440 may be located in the waveguide box 10 and arranged close to the microwave outlet of the waveguide box 10. In other embodiments, the stirring member 440 may be located in the machine body 200 and arranged close to the microwave outlet of the waveguide box 10, in such a manner that the microwaves emitted from the microwave outlet can be reflected by the stirring member 440 to a larger area in the cooking cavity. In addition, a better dispersion of the microwaves can be realized through cooperation between the stirring member 440 and a cavity wall of the machine body 200.

[0069] According to some embodiments of the present disclosure, as illustrated in FIG. 3, the waveguide box 10 may be disposed above the machine body 200, and the microwave outlet of the second chamber 4032 faces towards the machine body 200. The stirring member 440 may be located in the machine body 200 and at least partially below the microwave outlet. In this way, the microwaves emitted from the microwave outlet can be reflected by the stirring member 440 to achieve the mechanical dispersion of the microwaves.

[0070] In the embodiments where the microwave stirring assembly 30 includes the driver 430, as illustrated in FIG. 4, a top wall of the machine body 200 may have a first mounting hole 42. The output shaft 450 of the driver 430 may pass through the first mounting hole 42 and be connected to the stirring member 440 in the machine body 200. Alternatively, the output shaft 450 may be indirectly connected to the stirring member 440 by another structure disposed at the first mounting hole 42.

[0071] In some embodiments, as illustrated in FIG. 4, a fastener 53 may penetrate the stirring member 440, the first mounting hole 42, and the output shaft 450, to connect the output shaft 450 to the stirring member 440.

[0072] In some embodiments, as illustrated in FIG. 4, a plastic shaft sleeve 452 and a metallic shaft sleeve 451 may be provided at the first mounting hole 42. The metallic shaft sleeve 451 is connected to the stirring member 440 and arranged around the output shaft 450, to connect the stirring member 440 and the output shaft 450. The plastic shaft sleeve 452 is arranged around the metallic shaft sleeve 451. The plastic shaft sleeve 452 and the metallic shaft sleeve 451 facilitate a reduction in a resistance to a rotation of the output shaft 450, which reduces wear at the top wall of the machine body 200. In addition, the metallic shaft sleeve 451 is of high strength, while the plastic shaft sleeve 452 is of satisfactory insulation. With the metallic shaft sleeve 451 and the plastic shaft sleeve 452, dual requirements of rigidity and insulation can be satisfied. In addition, the fastener 53 may penetrate the stirring member 440 and extend into the metallic shaft sleeve 451 to connect the stirring member 440 and the metallic shaft sleeve 451, realizing a rigid connection between the plastic shaft sleeve 452, the metallic shaft sleeve 451, and the stirring member 440.

[0073] In some specific embodiments, as illustrated in FIG. 4, the cooking appliance 1 may further include mica

sheet 461 disposed below the top wall of the machine body 200. In addition, the mica sheet 461 may have a second mounting hole 43. The plastic shaft sleeve 452 may pass through the second mounting hole 43, and has an outer peripheral surface provided with a plastic outer protuberance. The plastic outer protuberance is abutted with an upper surface of the mica sheet 461 to realize an axial position limitation of the plastic shaft sleeve 452. The metallic shaft sleeve 451 has an outer peripheral surface provided with a metallic outer protuberance. The metallic outer protuberance is abutted with an upper surface of the plastic shaft sleeve 452 to realize an axial position limitation of the metallic shaft sleeve 451. With the mica sheet 461, the first mounting hole 42 can have a larger aperture, which increases a spacing between and avoids direct contact between the top wall of the machine body 200 and each of the shaft sleeve and the output shaft 450, facilitating an improvement of an anti-static effect. Also, the mica sheet 461, which is high temperature resistant and insulating, can seal the first mounting hole 42, which is conducive to realizing sealing of the cooking cavity.

[0074] According to some embodiments of the present disclosure, as illustrated in FIG. 2 to FIG. 4, the cooking appliance 1 may further include a spacer 462. The top wall of the machine body 200 may be engaged with the spacer 462 to define an accommodation space 404. The stirring member 440 may be located in the accommodation space 404. The spacer 462 separates the stirring member 440 from other components in the machine body 200, and thus the microwave generation system 1000 is separated from the other components in the machine body 200. For example, the microwave generation system 1000 may be separated from a high temperature and high humidity environment to prevent the microwave generation system 1000 from being affected by a high temperature and steam environment, improving stability of the microwave generation system 1000.

[0075] In some embodiments, the cooking appliance 1 may be a micro combination steam and grill machine, which may perform microwave, grill, and steam cooking. With separation and protection provided by the spacer 462, the microwave generation system 1000 can be prevented from being damaged by the high temperature and high humidity environment in a high temperature and steam environment cooking process during grilling.

[0076] In some specific embodiments, as illustrated in FIG. 3 and FIG. 4, the machine body 200 may be provided with a heating member 80. The heating member 80 may perform a cooking function such as grilling on the food in the machine body 200. The heating member 80 may be disposed at a side of the spacer 462 facing away from the stirring member 440 (for example, a lower side), in such a manner that the spacer 462 separates the heating member 80 from the microwave generation system 1000, realizing sealing protection of the microwave generation system 1000. The microwave generation system 1000 can withstand a high temperature environment in a bar-

becue state or other states.

[0077] In some embodiments of the present disclosure, the top wall of the machine body 200 may be partially recessed upwards to form molding of a recess. The spacer 462 covers an opening of the recess to define the accommodation space 404. Alternatively, the spacer 462 may be a spacing cover. The top wall of the machine body 200 covers an opening of the spacing cover to define the accommodation space 404. Alternatively, the top wall of the machine body 200 defines the recess, and the spacer 462 is the spacing cover.

[0078] In some embodiments, the spacer 462 may be made of a high temperature resistant, high strength, microwave transmissive material. For example, the spacer 462 may be made of borosilicate glass, mica sheet, transmissive plastic (e.g., ABS plastic), or transmissive foam, etc., all of which fall within the protection scope of the present disclosure.

[0079] According to some embodiments of the present disclosure, the spacer 462 is sealingly engaged with the top wall of the machine body 200. The spacer 462 is formed as a protective seal cover to completely separate the accommodation space 404 from the cooking cavity, further improving a protection effect for the microwave generation system 1000. In some embodiments, the spacer 462 may be connected to the top wall of the machine body 200 by various means such as silicone adhesion, steel ring fixation, and the like.

[0080] In some specific embodiments, as illustrated in FIG. 3 and FIG. 5, the cooking appliance 1 may further include a fixation member 51 and a seal ring 52. The fixation member 51 is connected to the top wall of the machine body 200. A peripheral edge of the spacer 462 may be sandwiched between the fixation member 51 and the top wall of the machine body 200 to realize a circumferential fixation of the spacer 462. Such a fixation is firm and reliable. In addition, the seal ring 52 may be connected to the peripheral edge of the spacer 462, in such a manner that the seal ring 52 may be in sealing contact with the fixation member 51 and the top wall of the machine body 200. Therefore, the accommodation space 404 is sealed, while neither the fixation member 51 nor the seal ring 52 affects microwave performance.

[0081] In some embodiments, the seal ring 52 has a surface that may be provided with a sealing protuberance. The sealing protuberance may be in contact with at least one of the fixation member 51 and the top wall of the machine body 200 to further improve a sealing effect.

[0082] In some embodiments, the fixation member 51 may be an annular member to improve fixation stability and sealing of the spacer 462. The fixation member 51 may be made of steel. The steel has high strength and is less prone to a deformation, and thus the fixation stability of the spacer 462 may be further improved. The fixation member 51 may be connected to the top wall of the machine body 200 by means of snap-fit, adhesion, or the fastener 53 (e.g., a shank), etc. The fastener 53

is detachable to facilitate subsequent maintenance and replacement.

[0083] In some embodiments of the present disclosure, as illustrated in FIG. 6 and FIG. 7, the cooking appliance 1 may have an outer cover 90. The outer cover 90 includes a left outer cover 520, a top outer cover 530, a rear outer cover 550, and a right outer cover 510, and can protect an internal structure of the cooking appliance 1 and prevent a microwave leakage.

[0084] In some embodiments, as illustrated in FIG. 6 and FIG. 7, the cooking appliance 1 further includes a door body assembly 300. The door body assembly 300 may be designed with three layers of glass, including outer glass, intermediate glass, and inner glass, which can effectively insulate heat inside the cooking appliance 1. In addition, the door body assembly 300 may be of a wave suppression door body structure, which can effectively contain the microwave leakage to provide safety protection, ensuring the health of a user.

[0085] According to some embodiments of the present disclosure, as illustrated in FIG. 6 and FIG. 7, the machine body 200 has an inner wall adopting the enamel surface processing technology, which allows the inner wall of the machine body 200 to be less likely to be stained with oil and dirt, facilitates cleaning of the machine body 200, is low in cost, and has a high volume utilization rate that can satisfy a demand for a large capacity. The machine body 200 has a side wall that may be further provided with a rack 921. The rack 921 can be used for carrying cooking accessories (such as a grill pan, etc.), in such a manner that the cooking appliance 1 can be applied to a variety of cooking methods to meet a use demand of the user. In addition, the machine body 200 may further have a water receiving groove 922 at a lower side of a cavity opening of the machine body 200. The water receiving groove 922 is used for collecting a residual liquid to prevent the residual liquid from soaking a mounting portion (e.g., a cabinet) for the cooking appliance 1, which ensures a better use effect.

[0086] In some embodiments of the present disclosure, as illustrated in FIG. 6 and FIG. 7, the cooking appliance 1 includes an air duct assembly 100, which is a heat dissipation system of the cooking appliance 1. The air duct assembly 100 is used for dissipating heat in the cooking appliance 1 to keep each electronic control element at an appropriate temperature, ensuring normal use of the cooking appliance 1.

[0087] In some embodiments, as illustrated in FIG. 6 and FIG. 7, the air duct assembly 100 may include a driving device 12 capable of drawing an airflow from outside, in such a manner that the airflow can be blown towards the electronic control element to dissipate heat from the electronic control element. For example, the driving device 12 may be a vortex fan.

[0088] In some embodiments, the air duct assembly 100 may pass through different ventilation paths to achieve heat dissipation for different electronic control elements (e.g., a frequency converter, a printed circuit

board (PCB), the magnetron 420, and a condenser pipe). Each ventilation path can dissipate heat from at least one electronic control element. At least two electronic control elements dissipate heat through different ventilation paths. Each electronic control element can be ensured to operate at a low ambient temperature, which prolongs service life of the electronic control element.

[0089] For example, in some embodiments, as illustrated in FIG. 6 and FIG. 7, a first ventilation path has an airflow inlet that may be formed at a left side of the cooking appliance 1 and an airflow outlet that may be formed at a front side of the cooking appliance 1. The airflow enters the cooking appliance 1 from a left airflow inlet of the cooking appliance 1, flows through the frequency converter of the cooking appliance 1, and finally flows out from a front airflow outlet of the cooking appliance 1. Cooling of the frequency converter is realized, which satisfies normal operation requirements.

[0090] For example, in some embodiments, as illustrated in FIG. 6 and FIG. 7, a second ventilation path has an airflow inlet that may be formed at a right side of the cooking appliance 1 and an airflow outlet that may be formed at the front side of the cooking appliance 1. The airflow enters the cooking appliance 1 from a right airflow inlet of the cooking appliance 1, flows through the PCB (e.g., the PCB may include a circuit board of a knob assembly) of the cooking appliance 1, and finally flows out from the front airflow outlet of the cooking appliance 1. Cooling of the PCB is realized to keep a surface temperature rise of the PCB at an appropriate temperature to satisfy the normal operation requirements.

[0091] For example, in some embodiments, as illustrated in FIG. 6 and FIG. 7, an airflow of a third ventilation path enters the cooking appliance 1 from the right airflow inlet of the cooking appliance 1, flows through the magnetron 420 of the cooking appliance 1 and the condenser pipe of the cooking appliance 1, and then flows out from the front airflow outlet of the cooking appliance 1. Heat dissipation and cooling of the magnetron 420 and the condenser pipe are realized, which satisfies the normal operation requirements.

[0092] For example, in some embodiments, as illustrated in FIG. 6 and FIG. 7, a fourth ventilation path has an airflow inlet that may also be formed at the front side of the cooking appliance 1 and connected to at least one of the first ventilation path, the second ventilation path, and the third ventilation path. The airflow enters the cooking appliance 1 from the front airflow inlet of the cooking appliance 1 to compensate for an insufficient airflow intake at side airflow inlets of the first ventilation path, the second ventilation path, and the third ventilation path. The air duct assembly 100 may be fed with air through the front airflow inlet to increase an intake of cold air, which improves a cooling efficiency of the air duct assembly 100.

[0093] In some embodiments, as illustrated in FIG. 6 and FIG. 7, the air duct assembly 100 may include a plurality of kinds of ventilation paths simultaneously to

form a composite path air duct structure, which greatly improves a heat dissipation efficiency and makes a cooling effect better.

[0094] It should be noted that, a specific limitation structure for the plurality of ventilation paths can be flexibly set as desired, as long as a requirement of dissipating heat from the plurality of electronic control elements by the plurality of ventilation paths to improve the cooling effect can be satisfied. Details thereof will be omitted herein.

[0095] According to some embodiments of the present disclosure, as illustrated in FIG. 6 and FIG. 7, the cooking appliance 1 includes an electric water box system 600. The electric water box system 600 has advantages of satisfactory stability and being free from getting stuck, which can ensure the normal use of the cooking appliance 1.

[0096] The cooking appliance 1 according to the embodiments of the present disclosure is described below with reference to the accompanying drawings.

[0097] As illustrated in FIG. 1 to FIG. 8, the cooking appliance 1 according to the embodiments of the present disclosure may be provided with a plurality of to-be-cooled members. For example, the cooking appliance 1 is an embedded micro combination steam and grill machine. The plurality of to-be-cooled members may include parts such as the frequency converter, the magnetron, the condenser pipe, and a main control PCB. The magnetron is a part of the microwave generation system 1000. An integration of the kitchen and the appliance can realize the style of one integrated mass of the kitchen and reduce a quantity of to-be-purchased cooking devices, which save costs and can reduce a floor area. The neatly arranged kitchen is in line with the simple and elegant sense of style of modern people and satisfies a market demand.

[0098] It should be understood that the cooking appliance 1 is formed with an air duct system. As a heat dissipation system of the body, the air duct system is mainly used for heat dissipation in the body, in such a manner that each to-be-cooled member (to-be-cooled electronic element) is at an appropriate temperature, which is very important for the embedded cooking appliance 1.

[0099] In some embodiments, the cooking appliance 1 includes the machine body 200, the plurality of to-be-cooled members, and an air duct housing. The machine body 200 has a cooking cavity 201, an air inflow cavity 103 (which may also be referred to as a mounting cavity), a first air inlet, and an air outlet 102. The air inflow cavity 103 is located above the cooking cavity 201. The first air inlet is connected to a rear part of the air inflow cavity 103. The air outlet 102 is connected to a front part of the air inflow cavity 103. The plurality of to-be-cooled members is disposed in the air inflow cavity 103. The plurality of to-be-cooled members includes a frequency converter, the controller, and the magnetron. The frequency converter and the magnetron are arranged in a left-right direction. The controller is located in front of the frequency

converter. The air duct housing is disposed in the air inflow cavity 103 and has a first air flowing channel, a second air flowing channel, and a third air flowing channel that are connected to the air inflow cavity 103. At least part of the frequency converter is disposed in the first air flowing channel. At least part of the controller is disposed in the second air flowing channel. At least part of the magnetron is disposed in the third air flowing channel.

[0100] In this way, air in an ambient environment can enter an air flowing channel through the first air inlet, flow through the air flowing channel, and then be discharged from the air outlet 102, forming a plurality of airflow paths connected to the ambient environment. The airflow in each airflow path performs air-cooled heat dissipation on the to-be-cooled member from rear to front. At least part of each to-be-cooled member is disposed in the air flowing channel corresponding to the to-be-cooled member, in such a manner that the air-cooled heat dissipation can be performed on the to-be-cooled member in the cooking appliance 1. For example, the frequency converter is disposed in the first air flowing channel, the main control PCB is disposed in the second air flowing channel, and the magnetron is disposed in the third air flowing channel. Such a manner facilitates a targeted heat dissipation processing on the to-be-cooled member disposed in the air flowing channel. Both the frequency converter and the magnetron have a high demand for heat dissipation, while the controller has a low demand for heat dissipation. Therefore, a cross sectional area of the second air flowing channel may be set to be smaller than that of each of the first air flowing channel and the third air flowing channel.

[0101] With the cooking appliance 1 according to the embodiments of the present disclosure, a plurality of air flowing channels is provided. The plurality of air flowing channels corresponds to the plurality of to-be-cooled members. In this way, the plurality of to-be-cooled members can be set in the plurality of air flowing channels as desired. An increase in a total ventilation volume of the cooking appliance 1 is facilitated, and heat dissipation performance of the cooking appliance 1 is improved. Also, for a specific air flowing channel, the air-cooled heat dissipation can be exclusively performed on the to-be-cooled member corresponding to the specific air flowing channel, in such a manner that cooling and heat dissipation can be performed on different to-be-cooled members in a more targeted manner, which improves the heat dissipation efficiency and heat dissipation reliability of the to-be-cooled member. As a result, the to-be-cooled member can be prevented from rising to an excessively high temperature to avoid a sharp increase in a temperature of the body, which facilitates an improvement of system stability of the cooking appliance 1, prolonging service life of the to-be-cooled member and other elements.

[0102] Therefore, the cooking appliance 1 according to the embodiments of the present disclosure has advantages such as large ventilation volume, satisfactory heat dissipation, high system stability, and ease of prolonging

the service life of the electronic control element.

[0103] The cooking appliance 1 according to specific embodiments of the present disclosure is described below with reference to the accompanying drawings.

[0104] In some embodiments, as illustrated in FIG. 7, the air duct housing may include a first air duct member 110. The first air flowing channel is formed in the first air duct member 110. The frequency converter is adapted to be disposed in the first air flowing channel. In this way, a special air flowing channel can be set up for the frequency converter to facilitate targeted air-cooled heat dissipation of the frequency converter. Since the frequency converter is one of the devices that generate a large amount of heat, such a manner can effectively improve a cooling effect of the frequency converter and reliably control an operation temperature of the frequency converter.

[0105] For example, the to-be-cooled member may include the frequency converter. The air duct housing may include the first air duct member 110. The first air flowing channel is formed in the first air duct member 110. The frequency converter is disposed at an upper part of the machine body 200 and close to a left edge of the machine body 200. The first air duct member 110 is disposed at the upper part of the machine body 200 and close to the left edge of the machine body 200. The first air flowing channel has an end connected to the first air inlet and another end connected to the air outlet 102. The frequency converter is adapted to be disposed in the first air flowing channel. In this way, the special air flowing channel can be set up for the frequency converter to facilitate the targeted air-cooled heat dissipation of the frequency converter. Since the frequency converter is one of the devices that generate a large amount of heat, such a manner can effectively improve the cooling effect of the frequency converter and reliably control the operation temperature of the frequency converter.

[0106] In some embodiments, as illustrated in FIG. 7, the first air duct member 110 may include a first ventilation pipe 111 and a first air guide member 112. The first ventilation pipe 111 has an end adapted to be connected to the first air inlet and another end adapted to be connected to a rear end of the first air guide member 112. The first air guide member 112 has a front end connected to the air outlet 102. The frequency converter is adapted to be disposed in the first ventilation pipe 111. The first air guide member 112 has a ventilation area decreasing gradually from rear to front. In this way, not only mounting and setting of the frequency converter are facilitated, but also the airflow can be guided to facilitate smooth discharging of the airflow from the air outlet 102.

[0107] For example, the first air duct member 110 substantially extends in a front-rear direction. The first air duct member 110 may include the first ventilation pipe 111 and the first air guide member 112. The first ventilation pipe 111 has a shape adapted to a shape of the frequency converter. For example, the first ventilation pipe 111 is a rectangular-shaped housing. The first ven-

tilation pipe 111 has a rear end connected to the first air inlet and a front end connected to the first air guide member 112. The front end of the first air guide member 112 is adapted to be connected to the air outlet 102. The frequency converter is disposed in the first ventilation pipe 111. An air guide member has a ventilation area decreasing gradually from rear to front. In this way, not only the mounting and the setting of the frequency converter are facilitated, but also the airflow can be guided to facilitate the smooth discharging of the airflow from the air outlet 102.

[0108] In some embodiments, as illustrated in FIG. 8, the first air guide member 112 is arranged as being detachably disposed at the first ventilation pipe 111. Such a manner not only facilitates processing and manufacturing of the first air duct member 110, but also facilitates maintenance and replacement of members in the first air flowing channel, which facilitates an improvement of maintainability of the cooking appliance 1.

[0109] For example, the rear end of the first air guide member 112 is engaged with the front end of the first ventilation pipe 111.

[0110] In some embodiments, as illustrated in FIG. 7, the air duct housing may include a second ventilation pipe 120. A controller 13 is disposed in the second air flowing channel. The second ventilation pipe 120 is adapted to blow air towards the controller 13. In this way, a special air flowing channel can be set up for the controller 13 to facilitate targeted air-cooled heat dissipation of the controller 13. Therefore, a surface temperature rise of the controller 13 can be kept at an appropriate temperature to satisfy normal operation requirements of the controller 13, which prolongs service life of electronic control elements and components.

[0111] For example, the to-be-cooled member may include the controller 13 that may be the main control PCB. The air flowing channel may include the second air flowing channel. The second air flowing channel substantially extends in the front-rear direction. The air duct housing may include the second ventilation pipe 120. In the second air flowing channel, the controller 13 is disposed in front of the second ventilation pipe 120. The second ventilation pipe 120 has a rear end connected to the first air inlet and a front end blowing air towards the controller 13. In this way, the special air flowing channel can be set up for the controller 13 to facilitate the targeted air-cooled heat dissipation of the controller 13. Therefore, the surface temperature rise of the controller 13 can be kept at the appropriate temperature to satisfy the normal operation requirements of the controller 13, which prolongs the service life of the electronic control elements and components. It should be understood that, the second ventilation pipe 120 may be disposed in the second air flowing channel or may be formed as a part of the second air flowing channel.

[0112] In some embodiments, as illustrated in FIG. 8, the second ventilation pipe 120 may include an upper half pipe segment 121 and a lower half pipe segment

122. The upper half pipe segment 121 is arranged as being detachably disposed at the lower half pipe segment 122. In this way, mounting and setting of the second ventilation pipe 120 can be facilitated, and processing and molding of the second ventilation pipe 120 can be facilitated.

[0113] For example, the upper half pipe segment 121 is engaged with the lower half pipe segment 122.

[0114] In some embodiments, as illustrated in FIG. 7, the air duct housing may include a third air duct member 130. The third air flowing channel is formed in the third air duct member 130. The magnetron is adapted to be disposed in the third air flowing channel. In this way, a special air flowing channel can be set up for the magnetron to facilitate targeted air-cooled heat dissipation of the magnetron. Since the magnetron is one of the most important devices for microwave generation and one of the sources of heat generation, such a manner can effectively improve a cooling effect of the magnetron to reliably control an operation temperature of the magnetron.

[0115] For example, the to-be-cooled member may include the magnetron. The air duct housing may include the third air duct member 130. The third air flowing channel is formed at the third air duct member 130. At least part of the magnetron is adapted to be disposed in the third air flowing channel. For example, the magnetron includes a main body portion and an outer shell portion. The outer shell portion is connected to the third air duct member 130 as a whole. In this way, the air flowing through the magnetron can perform the air-cooled heat dissipation on the magnetron. The special air flowing channel can be set up for the magnetron to facilitate the targeted air-cooled heat dissipation of the magnetron. Since the magnetron is one of the most important devices for microwave generation and one of the sources of heat generation, such a manner can effectively improve the cooling effect of the magnetron to reliably control the operation temperature of the magnetron.

[0116] In some embodiments, the to-be-cooled member may further include the condenser pipe used for steam cooling of the body. The condenser pipe is adapted to be disposed in the third air flowing channel and is located in front of the magnetron. That is, the condenser pipe is arranged to be located downstream of the magnetron in an air flowing direction. In this way, a demand of the heat dissipation of the magnetron can be prioritized over the heat dissipation of the condenser pipe. In addition, setting the magnetron and the condenser pipe in the third air flowing channel makes the third air flowing channel the most important main path in an air duct channel, which facilitates reliable cooling and heat dissipation of the magnetron and the condenser pipe.

[0117] In some embodiments, the first air flowing channel, the second air flowing channel, and the third air flowing channel extend in the front-rear direction and are arranged in parallel in the left-right direction. In this way, targeted efficient heat dissipation and cooling can be per-

formed on the to-be-cooled member, and a flowing resistance of the airflow in the air flowing channel can be reduced, further improving the ventilation volume and the heat dissipation efficiency.

[0118] For example, the first air inlet may be located at a rear end of the air inflow cavity 103. The air outlet 102 may be located at a front end of the air inflow cavity 103. The plurality of air flowing channels extend in the front-rear direction, are arranged in parallel in the left-right direction, and may include the first air flowing channel, the second air flowing channel, and the third air flowing channel. The first air flowing channel, the second air flowing channel, and the third air flowing channel are sequentially arranged at intervals from left to right. In this way, the targeted efficient heat dissipation and cooling can be performed on the to-be-cooled member, and the flowing resistance of the airflow in the air flowing channel can be reduced, further improving the ventilation volume and the heat dissipation efficiency.

[0119] In some embodiments, as illustrated in FIG. 7, the cooking appliance 1 may further include the driving device 12. The driving device 12 may be disposed in the air inflow cavity 103 and located between the first air inlet and the air duct housing. In this way, the connections between the first air inlet and the plurality of air flowing channels are facilitated, which facilitates delivery of the airflow from the first air inlet to the plurality of air flowing channels.

[0120] In some embodiments, as illustrated in FIG. 8, the first air inlet may include a first inlet 1011 and a second inlet 1012. The first inlet 1011 and the second inlet 1012 may be formed at a left cavity wall and a right cavity wall of the air inflow cavity 103, respectively. The driving device 12 may be the vortex fan. In this way, not only an increase in an air inflow area of the first air inlet is facilitated, but also cooperation between the first air inlet and the vortex fan is facilitated, which improves a driving effect on the airflow.

[0121] For example, the cooking appliance 1 may further include the driving device 12. The driving device 12 may be the vortex fan and is located at the rear end of the air inflow cavity 103. The first air inlet may include the first inlet 1011 and the second inlet 1012. The first inlet 1011 and the second inlet 1012 may be formed at a left side and a right side of the air inflow cavity 103, respectively, and each of the first inlet 1011 and the second inlet 1012 is connected to the air inflow cavity 103. The air inflow cavity 103 is connected to an inlet of each of the plurality of air flowing channels. Driven by the vortex fan, the airflow can flow from the first air inlet to the plurality of air flowing channels. In this way, the connections between the first air inlet and the plurality of air flowing channels are facilitated, which facilitates delivery of the airflow from the first air inlet to the plurality of air flowing channels. Not only the increase in the air inflow area of the first air inlet is facilitated, but also the cooperation between the first air inlet and the vortex fan is facilitated, which improves the driving effect on the air-

flow.

[0122] In other specific embodiments, as illustrated in FIG. 7, the machine body 200 may further include a third inlet 1013. The third inlet 1013 is connected to the front part of the air inflow cavity 103. The air duct housing may have an air inflow channel 140 connecting the third inlet 1013 to the driving device 12. In this way, an increase in an air inflow area of an air inlet is facilitated, which increases an air inflow volume of the air inflow cavity 103. Also, since typically only a front end face of the embedded cooking appliance 1 is exposed to the ambient environment, forming the third inlet 1013 at a front end of the air duct housing can compensate for an insufficient airflow intake of the first inlet 1011 and the second inlet 1012 at a side, which facilitates an increase in the intake of cold air, improving a cooling efficiency of the cooking appliance 1.

[0123] For example, each of the third inlet 1013 and the air outlet 102 is formed at an upper part of a front end face of the machine body 200. The third inlet 1013 and the air outlet 102 are arranged in parallel. The air duct housing has the air inflow channel 140 connecting the third inlet 1013 to the driving device 12, which facilitates the increase in the air inflow area of the air inlet, increasing an air inflow volume of the cooking appliance 1. Also, since typically only the front end face of the embedded cooking appliance 1 is exposed to the ambient environment, forming the third inlet 1013 at the front end of the air duct housing can compensate for the insufficient airflow intake of the first inlet 1011 and the second inlet 1012 at the side, which facilitates the increase in the intake of cold air, improving the cooling efficiency of the cooking appliance 1.

[0124] According to some specific examples of the present disclosure, the machine body 200 has a total of six airflow inlets and outlets, including three air inlets and three air outlets 102. Main circulation paths are as follows. The cold air enters the machine body 200 from the first inlet 1011 and the second inlet 1012 that are located at a rear outer side of the machine body 200 and from the third inlet 1013 located at a front face of the machine body 200. The airflow is drawn in by the vortex fan from two sides and blown out from a front side. The airflow is blown towards an electrical component to dissipate heat. Due to driving of the vortex fan, the airflow is blown out from the air outlet 102 at the front face after passing through a main body of an air guide hood at a leftmost side, the first ventilation pipe 111 outside the frequency converter, and the first air guide member 112. A leftmost air duct path is a path 1. That is, the air enters from the air inlet and leaves from the air outlet 102. This air duct path mainly cools the frequency converter. The frequency converter is one of the devices that generate a large amount of heat. The first air guide member 112 is formed as an air guide cover plate. The air guide cover plate has a detachable structure, which facilitates maintenance of components in the air duct. Such a design can improve the maintainability.

[0125] An intermediate air duct path is a path 2. That is, the air enters from the air inlet and leaves from the air outlet 102. The cold air enters from a side. Driven by the vortex fan, the cold air enters the second ventilation pipe 120. The second ventilation pipe 120 has an outlet facing towards the controller 13. The controller 13 may be the main control PCB. This air duct path is mainly used for cooling of the main control PCB to keep a surface temperature rise of the main control PCB at an appropriate temperature, for satisfying normal operation requirements of the main control PCB. The second ventilation pipe 120 may be assembled from the upper half pipe segment 121 and the lower half pipe segment 122. Such a design facilitates mounting and molding. Also, a temperature is lowered, which can prolong the service life of the electronic control elements and components.

[0126] An air duct path at a right side of the path 2 is a path 3. That is, the air enters from the air inlet and leaves from the air outlet 102. The cold air enters from a side. Driven by the vortex fan, the cold air enters the third air duct member 130. This path passes through the magnetron. The magnetron is one of the most important devices for microwave generation and one of the sources of heat generation. Then, the cold air passes through the condenser pipe at a main body of an air guide member. The condenser pipe is used for the steam cooling of the body. The cold air is blown out from the air outlet 102 at the front face. This path is mainly for the heat dissipation of the frequency converter and the condenser pipe, which is a main path of the entire air duct.

[0127] A rightmost air duct path is a path 4, which is an air inflow path. That is, the air enters from the third inlet 1013 at a front end of the machine body 200. An addition of one air intake channel can compensate for the insufficient airflow intake of the first inlet 1011 and the second inlet 1012 at the side. Since the embedded cooking appliance 1 is in the cabinet except for the front face of the embedded cooking appliance 1, the third inlet 1013 can increase the intake of cold air, improving a cooling efficiency of the air duct.

[0128] According to some embodiments of the present disclosure, the cooking appliance 1 may include the machine body 200, the door body assembly 300, and the microwave generation system 1000. The machine body 200 may have the cooking cavity 201 with an access opening 202 at a side of the cooking cavity 201. The door body assembly 300 is disposed at the machine body 200 and can be pivoted relative to the machine body 200, to expose or cover the access opening 202 by the door body assembly 300. In this way, when cooking the food, the user can smoothly pick up and put down the food through the access opening 202, which is convenient for operations. The air duct housing is disposed at the machine body 200 and may have a plurality of air flowing channels. In this way, the air from the ambient environment may enter the air flowing channels through the air inlet, flow through the air flowing channels, and then be discharged from the air outlet 102. Therefore, the plurality

of airflow paths connected to the ambient environment is formed. At least part of each to-be-cooled member is disposed in the air flowing channel corresponding to the to-be-cooled member, which enables the air-cooled heat dissipation to be performed on the to-be-cooled member accordingly. For example, the frequency converter may be disposed in one air flowing channel, while the main control PCB may be disposed in another air flowing channel. In this way, the targeted heat dissipation processing on the to-be-cooled member disposed in the air flowing channel can be facilitated, which is conducive to controlling an operation temperature of each to-be-cooled member within an appropriate range, ensuring operation stability and reliability of each to-be-cooled member. The microwave generation system 1000 may be disposed at the machine body 200. In some embodiments, the microwave generation system 1000 may include a microwave housing 410 and the magnetron. Therefore, the microwave generation system 1000 can be used to generate microwaves for microwave heating of the food.

[0129] With the cooking appliance 1 according to the embodiments of the present disclosure, the plurality of air flowing channels is provided. The plurality of air flowing channels may correspond to the plurality of to-be-cooled members. In this way, the plurality of to-be-cooled members can be set in the plurality of air flowing channels as desired. The increase in the total ventilation volume of the cooking appliance 1 is facilitated, and the heat dissipation performance of the cooking appliance 1 is improved. Also, for the specific air flowing channel, the air-cooled heat dissipation can be exclusively performed on the to-be-cooled member corresponding to the specific air flowing channel, in such a manner that cooling and heat dissipation can be performed on different to-be-cooled members in a more targeted manner, which improves the heat dissipation efficiency and heat dissipation reliability of the to-be-cooled member. As a result, the to-be-cooled member can be prevented from rising to the excessively high temperature to avoid the sharp increase in the temperature of the body, which facilitates the improvement of system stability of the cooking appliance 1, prolonging the service life of the to-be-cooled member and other elements.

[0130] Therefore, the cooking appliance 1 according to the embodiments of the present disclosure has advantages such as large ventilation volume and satisfactory heat dissipation.

[0131] In some embodiments, as illustrated in FIG. 3 and FIG. 4, the microwave generation system 1000 may include the microwave housing 410, the microwave generation device, the stirring member 440, and the driver 430. The microwave generation device is the magnetron 420. The microwave housing 410 is arranged to have a first receiving cavity 401 for receiving the magnetron 420, a second receiving cavity 402 for receiving the driver 430, a waveguide cavity 403 for conducting the microwaves, and the accommodation space 404 for accommodating the stirring member 440. At least part of the magnetron

420 is disposed in the first receiving cavity 401 and can be configured to transmit microwaves towards the waveguide cavity 403. The accommodation space 404 is connected to the waveguide cavity 403. The stirring member 440 is disposed in the accommodation space 404, and can be configured to stir and disperse the microwaves delivered to the accommodation space 404. At least part of the driver 430 is disposed in the second receiving cavity 402. The driver 430 is in a transmission connection with the stirring member 440, and can be configured to provide a driving force for the stirring member 440, to drive the stirring member 440 to rotate automatically. In this way, uniformity and a filling ability of the microwaves can be improved to shorten cooking time and improve the cooking result. In addition, a separation between the magnetron 420, the stirring member 440, and the driver 430 can be facilitated, which is conducive to realizing separate protection for the magnetron 420, the stirring member 440, and the driver 430, improving operation reliability of the cooking appliance 1, and prolonging the service life of members inside the cooking appliance 1. In some embodiments, the microwave housing 410 includes the waveguide box 10.

[0132] In some embodiments, the stirring member 440 may be a metallic stirring sheet.

[0133] For example, the first receiving cavity 401 is located at a right side of the waveguide cavity 403. The waveguide cavity 403 is substantially L-shaped. The accommodation space 404 is located below the waveguide cavity 403. The second receiving cavity 402 is located in a region surrounded and defined by the waveguide cavity 403. A main body of the magnetron 420 is disposed in the first receiving cavity 401. The transmitting end 421 of the magnetron 420 extends into the waveguide cavity 403 to facilitate transmitting the microwaves to the waveguide cavity 403. The accommodation space 404 is connected to the waveguide cavity 403, and thus the microwaves can be delivered from the waveguide cavity 403 to the accommodation space 404. The stirring member 440 is rotatably disposed in the accommodation space 404, and can be configured to stir and disperse the microwaves. The microwaves can be output more uniformly through reflection or transmission. The accommodation space 404 is connected to the cooking cavity 201. The dispersed microwaves can enter the cooking cavity 201 smoothly to heat the food in the cooking cavity 201 by means of microwave heating. A main body of the driver 430 is disposed in the second receiving cavity 402. A drive shaft of the driver 430 is in a transmission connection with the stirring member 440 to provide for the stirring member 440 the driving force that drives the stirring member 440 to rotate automatically. In this way, the uniformity and the filling ability of the microwaves can be improved to shorten the cooking time and improve the cooking result. In addition, the separation between the magnetron 420, the stirring member 440, and the driver 430 can be facilitated, which is conducive to realizing the separate protection for the magnetron 420, the stirring

member 440, and the driver 430, improving the operation reliability of the cooking appliance 1, and prolonging the service life of the members inside the cooking appliance 1.

[0134] In some embodiments, as illustrated in FIG. 3 and FIG. 4, the waveguide cavity 403 may have the first chamber 4031 and the second chamber 4032. The first chamber 4031 is a vertical segment, while the second chamber 4032 is a horizontal segment. That is, the waveguide cavity 403 includes a vertically-extending chamber part and a horizontally-extending chamber part. The second chamber 4032 is connected to a lower part of the first chamber 4031 (an up-down direction is as illustrated in FIG. 6). The first receiving cavity 401 is arranged to be located at a side of the waveguide cavity 403. The transmitting end 421 of the magnetron 420 can extend into the first chamber 4031 from the side wall of the first chamber 4031. The accommodation space 404 is located below the waveguide cavity 403. The second receiving cavity 402 is located above the second chamber 4032. In this way, each chamber in the microwave housing 410 can have a more compact and reasonable layout to reduce a space occupied by the microwave housing 410, which is conducive to maximizing a volume of the cooking cavity 201, improving a volume utilization rate of the cooking appliance 1. In addition, the microwaves propagated in the waveguide cavity 403 can be dispersed to a predetermined degree, which is convenient for improving the uniformity and the filling ability of the output microwaves, improving the cooking result.

[0135] For example, the waveguide cavity 403 has the first chamber 4031 and the second chamber 4032. The second chamber 4032 has an end connected to a lower end of the first chamber 4031 and another end extending to the left. The first receiving cavity 401 is located at a right side of the first chamber 4031. The first receiving cavity 401 and the first chamber 4031 are spaced apart by a vertically-arranged partition plate having a mounting opening. The transmitting end 421 of the magnetron 420 extends into the first chamber through the mounting opening. The accommodation space 404 is located below the waveguide cavity 403. A first microwave passing opening is formed between the waveguide cavity 403 and the accommodation space 404. The microwaves pass through the first microwave passing opening to enter the accommodation space 404 from the waveguide cavity 403. The second receiving cavity 402 is located above the second chamber 4032. The main body of the driver 430 is disposed in the second receiving cavity 402. The drive shaft of the driver 430 passes through the second chamber 4032 to be connected to the stirring member 440 in the accommodation space 404. In this way, each chamber in the microwave housing 410 can have a more compact and reasonable layout to reduce the space occupied by the microwave housing 410, which is conducive to maximizing the volume of the cooking cavity 201. In addition, the microwaves propagated in the waveguide cavity 403 can be dispersed to the predeter-

mined degree, which is convenient for improving the uniformity of the output microwaves, improving the cooking result.

[0136] In some embodiments, the microwave generation device may be the magnetron 420. The magnetron 420 is vertically fixed to the first chamber 4031. The driver 430 may be a rotary motor.

[0137] In some embodiments, as illustrated in FIG. 3 and FIG. 4, a rotation axis of the drive shaft of the driver 430 is arranged to extend in a vertical direction. A first through hole is formed between the second receiving cavity 402 and the second chamber 4032. A second through hole is formed between the second chamber 4032 and the accommodation space 404. The drive shaft passes through the first through hole and the second through hole to be connected to the stirring member 440. In this way, a reliable connection between the driver 430 and the stirring member 440 can be realized to facilitate driving, by the driver 430, the stirring member 440 to rotate.

[0138] In some embodiments, as illustrated in FIG. 3 and FIG. 4, a shaft sleeve assembly may be provided at the second through hole. The shaft sleeve assembly may include a first shaft sleeve and a second shaft sleeve. The first shaft sleeve is arranged around the drive shaft and may be the metallic shaft sleeve 451. The second shaft sleeve is arranged around the first shaft sleeve and may be an insulation shaft sleeve. In this way, a rotational friction of the drive shaft can be reduced to enable the drive shaft to rotate more smoothly and reliably. Further, a double-layer shaft sleeve structure can not only ensure structural strength of the shaft sleeve assembly, but also improve insulation performance of the shaft sleeve assembly.

[0139] In some embodiments, the second shaft sleeve may be the plastic shaft sleeve 452.

[0140] In some embodiments, as illustrated in FIG. 3 and FIG. 4, the microwave housing 410 is arranged to be located above the cooking cavity 201. The first microwave passing opening may be formed between the waveguide cavity 403 and the accommodation space 404. A second microwave passing opening may be formed between the accommodation space 404 and the cooking cavity 201. A first transparent isolation member may be provided at the first microwave passing opening. A second transparent isolation member may be provided at the second microwave passing opening. In this way, the microwaves can be smoothly delivered from the waveguide cavity 403 to the accommodation space 404, and then smoothly delivered from the accommodation space 404 to the cooking cavity 201. Further, reliable isolation and protection can be realized between the accommodation space 404 and the waveguide cavity 403 and between the accommodation space 404 and the cooking cavity 201. Therefore, each chamber can be in a suitable operation environment, which avoids mutual interference between the chambers.

[0141] For example, the first transparent isolation

member may be made of the mica sheet 461, and the second transparent isolation member is the spacer 462. The spacer 462 may be made of high-temperature borosilicate glass. The high-temperature borosilicate glass is suitable for isolation of the cooking cavity 201 to protect the microwave generation system 1000, and needs to be arranged at a high position in a cavity body of the cooking cavity 201. A seal ring is provided around the high-temperature borosilicate glass. The high-temperature borosilicate glass is fixed to an upper top plate of the cooking cavity 201 by a steel fixation ring. A number of rivets are riveted around the steel fixation ring to connect the steel fixation ring to a top plate of the cavity body of the cooking cavity 201.

[0142] In some examples, an entire microwave conduction path is as follows. High-energy microwaves are produced by the magnetron, generated in the first chamber 4031 of the waveguide cavity 403 by an antenna of the magnetron, and then conducted to the second chamber 4032 of the waveguide cavity 403. A rotary motor is disposed above the second chamber 4032 and connected to the stirring member 440. A drive shaft of the rotary motor is engaged with the metallic shaft sleeve and the plastic shaft sleeve. The rotary motor is rotated to disperse the microwaves, in such a manner that the microwaves are distributed more uniformly in the cooking cavity 201. The dispersed microwaves pass through the high-temperature borosilicate glass to irradiate into the cooking cavity 201, and thus the microwave heating is performed on the food. The microwave generation system 1000 has a compact design. Uniformity of the microwaves in the cooking cavity 201 can be increased by means of mechanical stirring. Such a design provides a satisfactory cooking result.

[0143] The cooking appliance 1 according to the embodiments of the present disclosure is described below. The cooking appliance 1 according to the embodiments of the present disclosure includes the machine body 200. The machine body 200 has the cooking cavity 201 for cooking the food. The access opening is formed at a front end of the cooking cavity 201. The air inflow cavity 103 is located above the cooking cavity 201.

[0144] In some embodiments, the cooking appliance 1 is the micro combination steam and grill machine with a microwave cooking function, a bake cooking function, and a steam cooking function.

[0145] The cooking appliance 1 according to the embodiments of the present disclosure is described below with reference to the accompanying drawings.

[0146] As illustrated in FIG. 1 to FIG. 8, the cooking appliance 1 according to the embodiments of the present disclosure may include the machine body 200, the door body assembly 300, the air duct assembly 100, and the microwave generation system 1000.

[0147] For example, the cooking appliance 1 may be provided with the plurality of to-be-cooled members. For example, the cooking appliance 1 is the embedded micro combination steam and grill machine. The plurality of to-

be-cooled members may include one or more of parts such as the frequency converter, the magnetron, the condenser pipe, and the main control PCB. The magnetron is a part of the microwave generation system 1000. The integration of the kitchen and the appliance can realize the style of one integrated mass of the kitchen and reduce the quantity of to-be-purchased cooking devices, which save costs and can reduce the floor area. The neatly arranged kitchen is in line with the simple and elegant sense of style of modern people and satisfies the market demand.

[0148] It should be understood that the air duct assembly 100 is formed with an air duct system. As a heat dissipation system of the body, the air duct system is mainly used for heat dissipation in the body, in such a manner that each to-be-cooled member (to-be-cooled electronic element) is at an appropriate temperature, which is very important for the embedded cooking appliance 1.

[0149] In some embodiments, the machine body 200 may have the cooking cavity 201. The access opening 202 is formed at the side of the cooking cavity 201. The cooking cavity 201 has a wall surface with an enamel coating. Since the enamel surface processing technology provides characteristics of being less likely to be stained with oil and dirt and being easy to clean, the cooking cavity 201 can be cleaned easily, which is convenient to improve aesthetics of the cooking cavity 201. The door body assembly 300 is disposed at the machine body 200 and can be pivoted relative to the machine body 200, to expose or cover the access opening 202 by the door body assembly 300. In this way, when cooking the food, the user can smoothly pick up and put down the food through the access opening 202, which is convenient for operations. The air duct assembly 100 is disposed at the machine body 200 and may have a plurality of air flowing channels. In this way, the air from the ambient environment may enter the air flowing channels through the air inlet, flow through the air flowing channels, and then be discharged from the air outlet 102. Therefore, a plurality of airflow paths connected to the ambient environment is formed. At least part of each to-be-cooled member is disposed in the air flowing channel corresponding to the to-be-cooled member, which enables air-cooled heat dissipation to be performed by the air duct assembly 100 on the to-be-cooled member accordingly. For example, the frequency converter may be disposed in one air flowing channel, while the main control PCB may be disposed in another air flowing channel. In this way, the targeted heat dissipation processing on the to-be-cooled member disposed in the air flowing channel can be facilitated, which is conducive to controlling the operation temperature of each to-be-cooled member within the appropriate range, ensuring the operation stability and the reliability of each to-be-cooled member. The microwave generation system 1000 may be disposed at the machine body 200. In some embodiments, the microwave generation system 1000 may include the microwave housing 410 and the magnetron. Therefore, the microwave genera-

tion system 1000 can be used to generate microwaves for microwave heating of the food.

[0150] With the cooking appliance 1 according to the embodiments of the present disclosure, the plurality of air flowing channels is provided. The plurality of air flowing channels may correspond to the plurality of to-be-cooled members. In this way, the plurality of to-be-cooled members can be set in the plurality of air flowing channels as desired. An increase in the total ventilation volume of the air duct assembly 100 is facilitated, and the heat dissipation performance of the air duct assembly 100 is improved. Also, for the specific air flowing channel, the air-cooled heat dissipation can be exclusively performed on the to-be-cooled member corresponding to the specific air flowing channel, in such a manner that the cooling and heat dissipation can be performed on different to-be-cooled members in a more targeted manner, which improves the heat dissipation efficiency and heat dissipation reliability of the to-be-cooled member. As a result, the to-be-cooled member can be prevented from rising to the excessively high temperature to avoid the sharp increase in the temperature of the body, which facilitates the improvement of system stability of the cooking appliance 1, prolonging the service life of the to-be-cooled member and other elements.

[0151] Therefore, the cooking appliance 1 according to the embodiments of the present disclosure has advantages such as large ventilation volume and satisfactory heat dissipation.

[0152] The cooking appliance 1 according to specific embodiments of the present disclosure is described below with reference to the accompanying drawings.

[0153] In some specific embodiments of the present disclosure, as illustrated in FIG. 1 to FIG. 8, the cooking appliance 1 according to the embodiments of the present disclosure may include the machine body 200, the door body assembly 300, the air duct assembly 100, and the microwave generation system 1000.

[0154] In some embodiments, as illustrated in FIG. 3 and FIG. 4, the microwave generation system 1000 may include the microwave housing 410, the microwave generation device, the stirring member 440, and the driver 430. The microwave generation device is the magnetron 420. The microwave housing 410 is arranged to have the first receiving cavity 401 for receiving the magnetron 420, the second receiving cavity 402 for receiving the driver 430, the waveguide cavity 403 for conducting the microwaves, and the accommodation space 404 for accommodating the stirring member 440. The at least part of the magnetron 420 is disposed in the first receiving cavity 401 and can be configured to transmit microwaves towards the waveguide cavity 403. The accommodation space 404 is connected to the waveguide cavity 403. The stirring member 440 is disposed in the accommodation space 404, and can be configured to stir and disperse the microwaves delivered to the accommodation space 404. The at least part of the driver 430 is disposed in the second receiving cavity 402. The driver 430 is in the

transmission connection with the stirring member 440, and can be configured to provide the driving force for the stirring member 440, to drive the stirring member 440 to rotate automatically. In this way, the uniformity and the filling ability of the microwaves can be improved to shorten the cooking time and improve the cooking result. In addition, the separation between the magnetron 420, the stirring member 440, and the driver 430 can be facilitated, which is conducive to realizing the separate protection for the magnetron 420, the stirring member 440, and the driver 430, improving the operation reliability of the cooking appliance 1, and prolonging the service life of members inside the cooking appliance 1. In some embodiments, the microwave housing 410 includes the waveguide box 10.

[0155] In some embodiments, the stirring member 440 may be the metallic stirring sheet.

[0156] For example, the first receiving cavity 401 is located at the right side of the waveguide cavity 403. The waveguide cavity 403 is substantially L-shaped. The accommodation space 404 is located below the waveguide cavity 403. The second receiving cavity 402 is located in the region surrounded and defined by the waveguide cavity 403. The main body of the magnetron 420 is disposed in the first receiving cavity 401. The transmitting end 421 of the magnetron 420 extends into the waveguide cavity 403 to facilitate transmitting the microwaves to the waveguide cavity 403. The accommodation space 404 is connected to the waveguide cavity 403, and thus the microwaves can be delivered from the waveguide cavity 403 to the accommodation space 404. The stirring member 440 is rotatably disposed in the accommodation space 404, and can be configured to stir and disperse the microwaves. The microwaves can be output more uniformly through reflection or transmission. The accommodation space 404 is connected to the cooking cavity 201. The dispersed microwaves can enter the cooking cavity 201 smoothly to heat the food in the cooking cavity 201 by means of microwave heating. The main body of the driver 430 is disposed in the second receiving cavity 402. The drive shaft of the driver 430 is in the transmission connection with the stirring member 440 to provide for the stirring member 440 the driving force that drives the stirring member 440 to rotate automatically. In this way, the uniformity and the filling ability of the microwaves can be improved to shorten the cooking time and improve the cooking result. In addition, the separation between the magnetron 420, the stirring member 440, and the driver 430 can be facilitated, which is conducive to realizing the separate protection for the magnetron 420, the stirring member 440, and the driver 430, improving the operation reliability of the cooking appliance 1, and prolonging the service life of the members inside the cooking appliance 1.

[0157] In some embodiments, as illustrated in FIG. 3 and FIG. 4, the waveguide cavity 403 may have the first chamber 4031 and the second chamber 4032. The first chamber 4031 is the vertical segment, while the second

chamber 4032 is the horizontal segment. That is, the waveguide cavity 403 may include the vertically-extending chamber part and the horizontally-extending chamber part. The second chamber 4032 is connected to the lower part of the first chamber 4031 (the up-down direction is as illustrated in FIG. 6). The first receiving cavity 401 is arranged to be located at the side of the waveguide cavity 403. The transmitting end 421 of the magnetron 420 can extend into the first chamber 4031 from the side wall of the first chamber 4031. The accommodation space 404 is located below the waveguide cavity 403. The second receiving cavity 402 is located above the second chamber 4032. In this way, each chamber in the microwave housing 410 can have a more compact and reasonable layout to reduce the space occupied by the microwave housing 410, which is conducive to maximizing the volume of the cooking cavity 201, improving the volume utilization rate of the cooking appliance 1. In addition, the microwaves propagated in the waveguide cavity 403 can be dispersed to the predetermined degree, which is convenient for improving the uniformity and the filling ability of the output microwaves, improving the cooking result.

[0158] For example, the waveguide cavity 403 has the first chamber 4031 and the second chamber 4032. The second chamber 4032 has the end connected to the lower end of the first chamber 4031 and the other end extending to the left. The first receiving cavity 401 is located at the right side of the first chamber 4031. The first receiving cavity 401 and the first chamber 4031 are spaced apart by the vertically-arranged partition plate having the mounting opening. The transmitting end 421 of the magnetron 420 extends into the first chamber through the mounting opening. The accommodation space 404 is located below the waveguide cavity 403. The first microwave passing opening is formed between the waveguide cavity 403 and the accommodation space 404. The microwaves pass through the first microwave passing opening to enter the accommodation space 404 from the waveguide cavity 403. The second receiving cavity 402 is located above the second chamber 4032. The main body of the driver 430 is disposed in the second receiving cavity 402. The drive shaft of the driver 430 passes through the second chamber 4032 to be connected to the stirring member 440 in the accommodation space 404. In this way, each chamber in the microwave housing 410 can have the more compact and reasonable layout to reduce the space occupied by the microwave housing 410, which is conducive to maximizing the volume of the cooking cavity 201. In addition, the microwaves propagated in the waveguide cavity 403 can be dispersed to the predetermined degree, which is convenient for improving the uniformity of the output microwaves, improving the cooking result.

[0159] In some embodiments, the microwave generation device may be the magnetron 420. The magnetron 420 is vertically fixed to the first chamber 4031. The driver 430 may be the rotary motor.

[0160] In some embodiments, as illustrated in FIG. 3

and FIG. 4, the rotation axis of the drive shaft of the driver 430 is arranged to extend in the vertical direction. The first through hole is formed between the second receiving cavity 402 and the second chamber 4032. The second through hole is formed between the second chamber 4032 and the accommodation space 404. The drive shaft passes through the first through hole and the second through hole to be connected to the stirring member 440. In this way, the reliable connection between the driver 430 and the stirring member 440 can be realized to facilitate driving, by the driver 430, the stirring member 440 to rotate.

[0161] In some embodiments, as illustrated in FIG. 3 and FIG. 4, the shaft sleeve assembly may be provided at the second through hole. The shaft sleeve assembly may include the first shaft sleeve and the second shaft sleeve. The first shaft sleeve is arranged around the drive shaft and may be the metallic shaft sleeve 451. The second shaft sleeve is arranged around the first shaft sleeve and may be the insulation shaft sleeve. In this way, the rotational friction of the drive shaft can be reduced to enable the drive shaft to rotate more smoothly and reliably. Further, the double-layer shaft sleeve structure can not only ensure the structural strength of the shaft sleeve assembly, but also improve the insulation performance of the shaft sleeve assembly.

[0162] In some embodiments, the second shaft sleeve may be the plastic shaft sleeve 452.

[0163] In some embodiments, as illustrated in FIG. 3 and FIG. 4, the microwave housing 410 is arranged to be located above the cooking cavity 201. The first microwave passing opening may be formed between the waveguide cavity 403 and the accommodation space 404. The second microwave passing opening may be formed between the accommodation space 404 and the cooking cavity 201. The first transparent isolation member may be provided at the first microwave passing opening. The second transparent isolation member may be provided at the second microwave passing opening. In this way, the microwaves can be smoothly delivered from the waveguide cavity 403 to the accommodation space 404, and then smoothly delivered from the accommodation space 404 to the cooking cavity 201. Further, the reliable isolation and protection can be realized between the accommodation space 404 and the waveguide cavity 403 and between the accommodation space 404 and the cooking cavity 201. Therefore, each chamber can be in the suitable operation environment, which avoids the mutual interference between the chambers.

[0164] For example, the first transparent isolation member may be made of the mica sheet 461, and the second transparent isolation member is the spacer 462. The spacer 462 may be made of high-temperature borosilicate glass. The high-temperature borosilicate glass is suitable for isolation of the cooking cavity 201 to protect the microwave generation system 1000, and needs to be arranged at the high position in the cavity body of the cooking cavity 201. The seal ring is provided around the

high-temperature borosilicate glass. The high-temperature borosilicate glass is fixed to the upper top plate of the cooking cavity 201 by the steel fixation ring. A number of rivets are riveted around the steel fixation ring to connect the steel fixation ring to the top plate of the cavity body of the cooking cavity 201.

[0165] In some examples, the entire microwave conduction path is as follows. The high-energy microwaves are produced by the magnetron, generated in the first chamber 4031 of the waveguide cavity 403 by the antenna of the magnetron, and then conducted to the second chamber 4032 of the waveguide cavity 403. The rotary motor is disposed above the second chamber 4032 and connected to the stirring member 440. The drive shaft of the rotary motor is engaged with the metallic shaft sleeve and the plastic shaft sleeve. The rotary motor is rotated to disperse the microwaves, in such a manner that the microwaves are distributed more uniformly in the cooking cavity 201. The dispersed microwaves pass through the high-temperature borosilicate glass to irradiate into the cooking cavity 201, and thus the microwave heating is performed on the food. The microwave generation system 1000 has the compact design. The uniformity of the microwaves in the cooking cavity 201 can be increased by means of mechanical stirring. Such a design provides the satisfactory cooking result.

[0166] The air duct assembly 100 for the cooking appliance 1 according to the embodiments of the present disclosure is described below with reference to the accompanying drawings.

[0167] In some embodiments, the air duct assembly 100 may include the air duct housing having an air inlet, the air outlet 102, and the plurality of air flowing channels arranged correspondingly to the plurality of to-be-cooled members. Each of the plurality of air flowing channels is connected to each of the air inlet and the air outlet, and each of the plurality of to-be-cooled members being at least partially disposed in a corresponding one of the plurality of air flowing channels. In this way, the air from the ambient environment may enter the air flowing channels through the air inlet, flow through the air flowing channels, and then be discharged from the air outlet 102. Therefore, the plurality of airflow paths connected to the ambient environment is formed. The at least part of each to-be-cooled member is disposed in the air flowing channel corresponding to the to-be-cooled member, which enables air-cooled heat dissipation to be performed by the air duct assembly 100 on the to-be-cooled member in the cooking appliance 1. For example, the frequency converter may be disposed in one air flowing channel, while the main control PCB may be disposed in another air flowing channel. In this way, the targeted heat dissipation processing on the to-be-cooled member disposed in the air flowing channel can be facilitated.

[0168] With the air duct assembly 100 for the cooking appliance 1 according to the embodiments of the present disclosure, the plurality of air flowing channels is provided. The plurality of air flowing channels corresponds to

the plurality of to-be-cooled members. In this way, the plurality of to-be-cooled members can be set in the plurality of air flowing channels as desired. The increase in the total ventilation volume of the air duct assembly 100 is facilitated, and the heat dissipation performance of the air duct assembly 100 is improved. Also, for the specific air flowing channel, the air-cooled heat dissipation can be exclusively performed on the to-be-cooled member corresponding to the specific air flowing channel, in such a manner that the cooling and heat dissipation can be performed on different to-be-cooled members in a more targeted manner, which improves the heat dissipation efficiency and heat dissipation reliability of the to-be-cooled member. As a result, the to-be-cooled member can be prevented from rising to the excessively high temperature to avoid the sharp increase in the temperature of the body, which facilitates the improvement of system stability of the cooking appliance 1, prolonging the service life of the to-be-cooled member and other elements.

[0169] Therefore, the air duct assembly 100 for the cooking appliance 1 according to the embodiments of the present disclosure has advantages such as large ventilation volume, satisfactory heat dissipation, high system stability, and ease of prolonging the service life of the electronic control element.

[0170] The air duct assembly 100 for the cooking appliance 1 according to specific embodiments of the present disclosure is described below with reference to the accompanying drawings.

[0171] In some embodiments, the to-be-cooled member may include the frequency converter. The air duct housing may include the first air duct member 110. The air flowing channel may include the first air flowing channel. The first air flowing channel is formed in the first air duct member 110. The frequency converter is adapted to be disposed in the first air flowing channel. In this way, the special air flowing channel can be set up for the frequency converter to facilitate the targeted air-cooled heat dissipation of the frequency converter. Since the frequency converter is one of the devices that generate a large amount of heat, such a manner can effectively improve the cooling effect of the frequency converter and reliably control the operation temperature of the frequency converter.

[0172] For example, the to-be-cooled member may include the frequency converter. The air duct housing may include the first air duct member 110. The first air flowing channel is formed in the first air duct member 110. The first air duct member 110 is disposed at the upper part of the machine body 200 and close to the left edge of the machine body 200. The first air flowing channel has the end connected to the air inlet and the other end connected to the air outlet 102. The frequency converter is adapted to be disposed in the first air flowing channel. In this way, the special air flowing channel can be set up for the frequency converter to facilitate the targeted air-cooled heat dissipation of the frequency converter. Since the frequency converter is one of the devices that generate

a large amount of heat, such a manner can effectively improve the cooling effect of the frequency converter and reliably control the operation temperature of the frequency converter.

[0173] In some embodiments, as illustrated in FIG. 7 and FIG. 8, the first air duct member 110 may include the first ventilation pipe 111 and the first air guide member 112. The first ventilation pipe 111 has an end adapted to be connected to the air inlet and another end adapted to be connected to an end of the first air guide member 112. The first air guide member 112 has another end connected to the air outlet 102. The frequency converter is adapted to be disposed in the first ventilation pipe 111. The ventilation area of the first air guide member 112 decreases gradually from an end of the first air guide member 112 connected to a first air guide pipe to another end of the first air guide member 112 connected to the air outlet 102. In this way, not only the mounting and the setting of the frequency converter are facilitated, but also the airflow can be guided to facilitate the smooth discharging of the airflow from the air outlet 102.

[0174] For example, the first air duct member 110 substantially extends in the front-rear direction. The first air duct member 110 may include the first ventilation pipe 111 and the first air guide member 112. The shape of the first ventilation pipe 111 is adapted to the shape of the frequency converter. For example, the first ventilation pipe 111 is the rectangular-shaped housing. The first ventilation pipe 111 has the rear end connected to the air inlet and the front end connected to the first air guide member 112. The front end of the first air guide member 112 is adapted to be connected to the air outlet 102. The frequency converter is disposed in the first ventilation pipe 111. The air guide member has the ventilation area decreasing gradually from rear to front. In this way, not only the mounting and the setting of the frequency converter are facilitated, but also the airflow can be guided to facilitate the smooth discharging of the airflow from the air outlet 102.

[0175] In some embodiments, the first air guide member 112 is disposed in the first ventilation pipe 111 and formed into a detachable structure. Such a manner not only facilitates the processing and the manufacturing of the first air duct member 110, but also facilitates the maintenance and the replacement of the members in the first air flowing channel, which facilitates an improvement of maintainability of the air duct assembly 100.

[0176] For example, the rear end of the first air guide member 112 is engaged with the front end of the first ventilation pipe 111.

[0177] In some embodiments, as illustrated in FIG. 7, the to-be-cooled member may include the controller 13. The air flowing channel may include the second air flowing channel. The air duct housing may include the second ventilation pipe 120. Both the controller 13 and the second air flowing channel are disposed in the second air flowing channel. The second ventilation pipe 120 is adapted to blow air towards the controller 13. In this way,

the special air flowing channel can be set up for the controller 13 to facilitate the targeted air-cooled heat dissipation of the controller 13. Therefore, the surface temperature rise of the controller 13 can be kept at the appropriate temperature to satisfy the normal operation requirements of the controller 13, which prolongs the service life of the electronic control elements and components.

[0178] For example, the to-be-cooled member may include the controller 13 that may be the main control PCB. The air flowing channel may include the second air flowing channel. The second air flowing channel substantially extends in the front-rear direction. The air duct housing may include the second ventilation pipe 120. In the second air flowing channel, the controller 13 is disposed in front of the second ventilation pipe 120. The second ventilation pipe 120 has the rear end connected to the air inlet and the front end blowing air towards the controller 13. In this way, the special air flowing channel can be set up for the controller 13 to facilitate the targeted air-cooled heat dissipation of the controller 13. Therefore, the surface temperature rise of the controller 13 can be kept at the appropriate temperature to satisfy the normal operation requirements of the controller 13, which prolongs the service life of the electronic control elements and components. It should be understood that, the second ventilation pipe 120 may be disposed in the second air flowing channel or may be formed as the part of the second air flowing channel.

[0179] In some embodiments, as illustrated in FIG. 8, the second ventilation pipe 120 may include the upper half pipe segment 121 and the lower half pipe segment 122. The upper half pipe segment 121 is arranged as being detachably disposed at the lower half pipe segment 122. In this way, the mounting and the setting of the second ventilation pipe 120 can be facilitated, and the processing and the molding of the second ventilation pipe 120 is facilitated.

[0180] For example, the upper half pipe segment 121 is engaged with the lower half pipe segment 122.

[0181] In some embodiments, the to-be-cooled member may include the magnetron. The air duct housing may include the third air duct member 130. The air flowing channel may include the third air flowing channel formed in the third air duct member 130. The magnetron is adapted to be disposed in the third air flowing channel. In this way, the special air flowing channel can be set up for the magnetron to facilitate the targeted air-cooled heat dissipation of the magnetron. Since the magnetron is one of the most important devices for microwave generation and one of the sources of heat generation, such a manner can effectively improve the cooling effect of the magnetron to reliably control the operation temperature of the magnetron.

[0182] For example, the to-be-cooled member may include the magnetron. The air duct housing may include the third air duct member 130. The third air duct member 130 has the third air flowing channel. The at least part of

the magnetron is adapted to be disposed in the third air flowing channel. For example, the magnetron includes the main body portion and the outer shell portion. The outer shell portion is connected to the third air duct member 130 as a whole. In this way, the air flowing through the magnetron can perform the air-cooled heat dissipation on the magnetron. The special air flowing channel can be set up for the magnetron to facilitate the targeted air-cooled heat dissipation of the magnetron. Since the magnetron is one of the most important devices for microwave generation and one of the sources of heat generation, such a manner can effectively improve the cooling effect of the magnetron to reliably control the operation temperature of the magnetron.

[0183] In some embodiments, the to-be-cooled member may further include the condenser pipe used for steam cooling of the body. The condenser pipe is adapted to be disposed in the third air flowing channel and is arranged to be located downstream of the magnetron in the air flowing direction. In this way, the demand of the heat dissipation of the magnetron can be prioritized over the heat dissipation of the condenser pipe. In addition, setting the magnetron and the condenser pipe in the third air flowing channel makes the third air flowing channel the most important main path in the air duct channel, which facilitates the reliable cooling and heat dissipation of the magnetron and the condenser pipe.

[0184] In some embodiments, the air inlet may be located at a rear end of the air duct housing. The air inlet may be located at a front end of the air duct housing. The plurality of air flowing channels extends in the front-rear direction and is arranged in parallel in the left-right direction. In this way, the targeted efficient heat dissipation and cooling can be performed on the to-be-cooled member, and the flowing resistance of the airflow in the air flowing channel can be reduced, further improving the ventilation volume and the heat dissipation efficiency.

[0185] For example, the air inlet may be located at the rear end of the air duct housing. The air inlet may be located at the front end of the air duct housing. The plurality of air flowing channels extends in the front-rear direction, is arranged in parallel in the left-right direction, and may include the first air flowing channel, the second air flowing channel, and the third air flowing channel. The first air flowing channel, the second air flowing channel, and the third air flowing channel are sequentially arranged at intervals from left to right. In this way, the targeted efficient heat dissipation and cooling can be performed on the to-be-cooled member, and the flowing resistance of the airflow in the air flowing channel can be reduced, further improving the ventilation volume and the heat dissipation efficiency.

[0186] In some embodiments, as illustrated in FIG. 7, the air duct assembly 100 may further include the driving device 12. The air duct housing may have the air inflow cavity 103. The driving device 12 may be disposed in the air inflow cavity 103. The air inflow cavity 103 is adapted to be connected to the air inlet and the inlet of each of

the plurality of air flowing channels. In this way, the connections between the air inlet and the plurality of air flowing channels are facilitated by the air inflow cavity 103, which facilitates delivery of the airflow from the air inlet to the plurality of air flowing channels.

[0187] In some embodiments, as illustrated in FIG. 7, the air inlet may include the first inlet 1011 and the second inlet 1012. The first inlet 1011 and the second inlet 1012 may be formed at a left side and a right side of the rear end of the air duct housing, respectively. The driving device 12 may be the vortex fan. In this way, not only an increase in an air inflow area of the air inlet is facilitated, but also cooperation between the air inlet and the vortex fan is facilitated, which improve the driving effect on the airflow.

[0188] For example, the air duct assembly 100 may further include the driving device 12. The driving device 12 may be the vortex fan. The air duct housing may have the air inflow cavity 103. The air inflow cavity 103 is located at the rear end of the air duct housing. The driving device 12 may be disposed in the air inflow cavity 103. The air inlet may include the first inlet 1011 and the second inlet 1012. The first inlet 1011 and the second inlet 1012 may be formed at the left side and the right side of the rear end of the air duct housing, respectively, and each of the first inlet 1011 and the second inlet 1012 is connected to the air inflow cavity 103. The air inflow cavity 103 is connected to the inlet of each of the plurality of air flowing channels. Driven by the vortex fan, the airflow can flow from the air inlet to the plurality of air flowing channels. In this way, the connections between the air inlet and the plurality of air flowing channels are facilitated by the air inflow cavity 103, which facilitates delivery of the airflow from the air inlet to the plurality of air flowing channels. Not only the increase in the air inflow area of the air inlet is facilitated, but also the cooperation between the air inlet and the vortex fan is facilitated, which improves the driving effect on the airflow.

[0189] In other specific embodiments, as illustrated in FIG. 7, the air inlet may further include the third inlet 1013. The third inlet 1013 may be formed at the front end of the air duct housing. The air duct housing may have the air inflow channel 140 connecting the third inlet 1013 to the air inflow cavity 103. In this way, the increase in the air inflow area of the air inlet is facilitated, which increases an air inflow volume of the air duct assembly 100. Also, since typically only the front end face of the embedded cooking appliance 1 is exposed to the ambient environment, forming the third inlet 1013 at the front end of the air duct housing can compensate for the insufficient airflow intake of the first inlet 1011 and the second inlet 1012 at the side, which facilitates the increase in the intake of cold air, improving the cooling efficiency of the air duct assembly 100.

[0190] For example, each of the third inlet 1013 and the air outlet 102 is formed at an upper part of a front end face of the air duct housing. The third inlet 1013 and the air outlet 102 are arranged in parallel. The air duct hous-

ing has the air inflow channel 140 connecting the third inlet 1013 to the air inflow cavity 103, which facilitates the increase in the air inflow area of the air inlet, increasing the air inflow volume of the air duct assembly 100. Also, since typically only the front end face of the embedded cooking appliance 1 is exposed to the ambient environment, forming the third inlet 1013 at the front end of the air duct housing can compensate for the insufficient airflow intake of the first inlet 1011 and the second inlet 1012 at the side, which facilitates the increase in the intake of cold air, improving the cooling efficiency of the air duct assembly 100.

[0191] According to some specific examples of the present disclosure, the air duct assembly 100 has a total of six airflow inlets and outlets, including three air inlets and three air outlets 102. Main circulation paths are as follows. The cold air enters the machine body 200 from the first inlet 1011 and the second inlet 1012 that are located at the rear outer side of the machine body 200 and from the third inlet 1013 located at the front face of the machine body 200. The airflow is drawn in by the vortex fan from the two sides and blown out from the front side. The airflow is blown towards the electrical component to dissipate heat. Due to the driving of the vortex fan, the airflow is blown out from the air outlet 102 at the front face after passing through the main body of the air guide hood at the leftmost side, the first ventilation pipe 111 outside the frequency converter, and the first air guide member 112. The leftmost air duct path is a path 1. That is, the air enters from the air inlet and leaves from the air outlet 102. This air duct path mainly cools the frequency converter. The frequency converter is one of the devices that generate a large amount of heat. The first air guide member 112 is formed as the air guide cover plate. The air guide cover plate has the detachable structure, which facilitates the maintenance of the components in the air duct. Such a design can improve the maintainability.

[0192] The intermediate air duct path is a path 2. That is, the air enters from the air inlet and leaves from the air outlet 102. The cold air enters from the side. Driven by the vortex fan, the cold air enters the second ventilation pipe 120. The second ventilation pipe 120 has the outlet facing towards the controller 13. The controller 13 may be the main control PCB. This air duct path is mainly used for cooling of the main control PCB to keep the surface temperature rise of the main control PCB at the appropriate temperature, for satisfying the normal operation requirements of the main control PCB. The second ventilation pipe 120 may be assembled from the upper half pipe segment 121 and the lower half pipe segment 122. Such a design facilitates mounting and molding. Also, the temperature is lowered, which can prolong the service life of the electronic control elements and components.

[0193] The air duct path at the right side of the path 2 is a path 3. That is, the air enters from the air inlet and leaves from the air outlet 102. The cold air enters from

the side. Driven by the vortex fan, the cold air enters the third air duct member 130. This path passes through the magnetron. The magnetron is one of the most important devices for microwave generation and one of the sources of heat generation. Then, the cold air passes through the condenser pipe at the main body of an air guide member. The condenser pipe is used for the steam cooling of the body. The cold air is blown out from the air outlet 102 at the front face. This path is mainly for the heat dissipation of the frequency converter and the condenser pipe, which is the main path of the entire air duct.

[0194] The rightmost air duct path is a path 4, which is the air inflow path. That is, the air enters from the third inlet 1013 at the front end of the machine body 200. The addition of one air intake channel can compensate for the insufficient airflow intake of the first inlet 1011 and the second inlet 1012 at the side. Since the embedded cooking appliance 1 is in the cabinet except for the front face of the embedded cooking appliance 1, the third inlet 1013 can increase the intake of cold air, improving the cooling efficiency of the air duct.

[0195] In some embodiments, the door body assembly 300 may include a panel and a protrusion. The panel is adapted to be engaged with the machine body 200 to cover the access opening 202. The protrusion may be disposed at a side of the panel facing towards the machine body 200, protrudes towards the machine body 200 from the panel, and extends into the cooking cavity 201. The protrusion is arranged to be provided with a wave suppression structure. In this way, the microwave leakage can be effectively contained to provide the safety protection.

[0196] In some embodiments, the panel may be provided with an outer glass layer, an intermediate glass layer, and an inner glass layer. In this way, heat transfer from the cooking cavity 201 to the ambient environment can be prevented to some extent.

[0197] In some embodiments, as illustrated in FIG. 6, the cooking appliance 1 may further include an outer casing. The outer casing is arranged to have an accommodation cavity. The machine body 200 is adapted to be engaged within the accommodation cavity. In this way, an inner structure such as the machine body 200 can be protected by the outer casing.

[0198] Exemplarily, the outer casing includes the right outer cover 510, the left outer cover 520, the top outer cover 530, a bottom outer cover 540, and the rear outer cover 550, which together define the accommodation cavity.

[0199] In some embodiments, as illustrated in FIG. 6, the access opening 202 may be arranged to be located at a front side of the machine body 200. The machine body 200 may be provided with a control board 210. The control board 210 is disposed at the front side of the machine body 200 and is arranged to be located above the access opening 202. The control board 210 is mainly used for interaction and control of the machine body. In this way, it is convenient for the user to perform control

operations through the control board 210, improving operation convenience for the user.

[0200] For example, the control board 210 adopts a thin film transistor (TFT) color screen for interaction, and also adopts a touch panel (TP) for a superimposed fusion. Therefore, the screen can provide visual interaction and touch interaction. In addition, touch and mechanical knob control is adopted to satisfy control and manipulation needs of the customer in different situations.

[0201] In some embodiments, the rack is provided at a side wall at each of a left side and a right side of the cooking cavity 201 and used for carrying the cooking accessories. The cooking cavity 201 is provided with a front plate at a front side of the cooking cavity 201. The water receiving groove is formed at a lower part of the front plate, and is used for collecting residual water to prevent the residual water from soaking the cabinet. The cavity body of the cooking cavity 201 is provided with a hot-air motor cover at a rear side of the cavity body of the cooking cavity 201. The hot-air motor cover has a ventilation hole used for allowing hot air to enter the cavity body. An upper part of the cavity body is provided with an upper heating pipe used for heating the upper part of the cavity body. A bottom of a main body of the cavity body is provided with a lower heating pipe.

[0202] In some embodiments, as illustrated in FIG. 6, the cooking appliance 1 may further include the electric water box system 600. The electric water box system 600 has the advantages of satisfactory stability and being free from getting stuck, which facilitates the steam cooking.

[0203] Other compositions and operations of the microwave generation system 1000 and the cooking appliance 1 according to the embodiments of the present disclosure are known to those skilled in the art, and thus details thereof will be omitted herein.

[0204] In the description of the embodiments of the present disclosure, it should be noted that, unless otherwise clearly specified and limited, terms such as "install", "connect", "connect to" and the like should be understood in a broad sense. For example, it may be a fixed connection or a detachable connection or connection as one piece; mechanical connection or electrical connection; direct connection or indirect connection through an intermediate; internal connection of two components. For those skilled in the art, the specific meaning of the above-mentioned terms in the present disclosure can be understood according to specific circumstances.

[0205] Reference throughout the description of this specification to phrases "an embodiment", "a specific embodiment", or "an example" means that a particular feature, structure, material, or characteristic described in connection with the embodiment or example is included in at least one embodiment or example of the present disclosure. The appearances of the above phrases in various places throughout this specification are not necessarily referring to the same embodiment or example. Further, the particular features, structures, materials, or

characteristics may be combined in any suitable manner in one or more embodiments or examples.

[0206] Although embodiments of the present disclosure have been illustrated and described, it is conceivable for those skilled in the art that various changes, modifications, replacements, and variations can be made to these embodiments without departing from the principles and spirit of the present disclosure. The scope of the present disclosure shall be defined by the claims as appended and their equivalents.

Claims

1. A microwave generation system for a cooking appliance, the microwave generation system comprising:

a waveguide box comprising a first chamber and a second chamber that are connected with each other, the first chamber being located above the second chamber, and a dimension of the first chamber in a horizontal direction being smaller than a dimension of the second chamber in the horizontal direction;

a magnetron mounted at a side wall of the first chamber and configured to transmit microwaves into the first chamber; and

a microwave stirring assembly mounted at a top wall of the second chamber and comprising a stirring member configured to reflect the microwaves.

2. The microwave generation system according to claim 1, wherein:

the first chamber has a first side wall and a second side wall that are opposite to each other; the magnetron has a transmitting end penetrating the first side wall and extending into the first chamber; and the microwave stirring assembly is at least partially located at a side of the second side wall facing away from the first side wall.

3. The microwave generation system according to claim 1 or 2, wherein the microwave stirring assembly further comprises a driver located above the top wall of the second chamber, wherein the driver has an output shaft penetrating the top wall of the second chamber and being connected to the stirring member.

4. The microwave generation system according to any one of claims 1 to 3, wherein the stirring member is a metallic plate, the metallic plate having a through hole for allowing for a passage of the microwaves.

5. The microwave generation system according to any

one of claims 1 to 4, wherein the stirring member is a rectangular plate.

6. A cooking appliance, comprising a microwave generation system according to any one of claims 1 to 5. 5
7. The cooking appliance according to claim 6, further comprising:
a machine body, the waveguide box being disposed above the machine body, and the stirring member being located in the machine body and at least partially located below a microwave outlet of the second chamber. 10
8. The cooking appliance according to claim 7, wherein: 15
the microwave stirring assembly further comprises a driver;
a top wall of the machine body has a first mounting hole; 20
a metallic shaft sleeve and a plastic shaft sleeve are provided at the first mounting hole, the plastic shaft sleeve being arranged around the metallic shaft sleeve; and
the metallic shaft sleeve is arranged around an output shaft of the driver and connected to the stirring member. 25
9. The cooking appliance according to claim 7 or 8, further comprising: 30
a spacer engaged with a top wall of the machine body to define an accommodation space, the stirring member being disposed in the accommodation space. 35
10. The cooking appliance according to claim 9, wherein the machine body is provided with a heating member, the heating member being disposed at a side of the spacer facing away from the stirring member. 40
11. The cooking appliance according to claim 9 or 10, further comprising: 45
a fixation member connected to the top wall of the machine body, a peripheral edge of the spacer being sandwiched between the fixation member and the top wall of the machine body; and
a seal ring connected to the peripheral edge of the spacer. 50
12. The cooking appliance according to any one of claims 9 to 11, wherein the spacer is made of borosilicate glass, mica sheet, transmissive plastic, or transmissive foam. 55
13. The cooking appliance according to claim 6, further comprising:

a machine body having a cooking cavity, an air inflow cavity, a first air inlet, and an air outlet, the air inflow cavity being located above the cooking cavity, the first air inlet being connected to a rear part of the air inflow cavity, and the air outlet being connected to a front part of the air inflow cavity;

a plurality of to-be-cooled members disposed in the air inflow cavity, the plurality of to-be-cooled members comprising a frequency converter, a controller, and a magnetron, the frequency converter and the magnetron being arranged in a left-right direction, and the controller being located in front of the frequency converter; and
an air duct housing disposed in the air inflow cavity and having a first air flowing channel, a second air flowing channel, and a third air flowing channel that are connected with the air inflow cavity, at least part of the frequency converter being disposed in the first air flowing channel, at least part of the controller being disposed in the second air flowing channel, and at least part of the magnetron being disposed in the third air flowing channel.

14. The cooking appliance according to claim 13, wherein the air duct housing comprises a first air duct member, the first air flowing channel being formed in the first air duct member, and the frequency converter being disposed in the first air flowing channel.
15. The cooking appliance according to claim 14, wherein the first air duct member comprises a first ventilation pipe and a first air guide member, wherein:
the first ventilation pipe has an end connected to the first air inlet and another end connected to a rear end of the first air guide member;
the first air guide member has a front end connected to the air outlet;
the frequency converter is disposed in the first ventilation pipe; and
the first air guide member has a ventilation area decreasing gradually from rear to front.
16. The cooking appliance according to claim 15, wherein the first air guide member is detachably disposed at the first ventilation pipe.
17. The cooking appliance according to any one of claims 13 to 16, wherein the air duct housing comprises a second ventilation pipe adapted to blow air towards the controller, the controller being disposed in the second air flowing channel.
18. The cooking appliance according to claim 17, wherein the second ventilation pipe comprises a lower half pipe segment and an upper half pipe segment de-

tachably disposed at the lower half pipe segment.

19. The cooking appliance according to any one of claims 13 to 18, wherein the air duct housing comprises a third air duct member, the third air flowing channel being formed in the third air duct member, and the magnetron being disposed in the third air flowing channel.

20. The cooking appliance according to claim 19, wherein the plurality of to-be-cooled members further comprises a condenser pipe disposed in the third air flowing channel and located in front of the magnetron.

21. The cooking appliance according to any one of claims 13 to 20, wherein the first air flowing channel, the second air flowing channel, and the third air flowing channel extend in a front-rear direction and are arranged in parallel in the left-right direction.

22. The cooking appliance according to any one of claims 13 to 21, further comprising a driving device disposed in the air inflow cavity and located between the first air inlet and the air duct housing.

23. The cooking appliance according to claim 22, wherein the first air inlet has a first inlet and a second inlet, the first inlet and the second inlet being formed on a left cavity wall and a right cavity wall of the air inflow cavity, respectively.

24. The cooking appliance according to claim 23, wherein the machine body further comprises a third inlet connected to the front part of the air inflow cavity, the air duct housing having an air inflow channel connecting the third inlet and the driving device.

25. The cooking appliance according to claim 6, further comprising:

a machine body having a cooking cavity with an access opening at a side of the cooking cavity, the cooking cavity having a wall surface with an enamel coating, and the microwave generation system being disposed at the machine body; a door body assembly pivotally disposed at the machine body, to expose or cover the access opening; and an air duct assembly disposed at the machine body and having a plurality of air flowing channels.

26. The cooking appliance according to claim 25, wherein the microwave generation system comprises:

a microwave housing having a first receiving cavity, a second receiving cavity, a waveguide cavity, and an accommodation space;

a microwave generation device disposed in the first receiving cavity and configured to transmit microwaves towards the waveguide cavity; the stirring member disposed in the accommodation space; and a driver disposed in the second receiving cavity and in a transmission connection with the stirring member.

27. The cooking appliance according to claim 26, wherein:

the waveguide cavity has the first chamber and the second chamber connected to a lower part of the first chamber; the first receiving cavity is located at a side of the waveguide cavity; the microwave generation device has a transmitting end extending into the first chamber from a side wall of the first chamber; the accommodation space is located below the waveguide cavity; and the second receiving cavity is located above the second chamber.

28. The cooking appliance according to claim 27, wherein:

a rotation axis of a drive shaft of the driver extends in a vertical direction; a first through hole is formed between the second receiving cavity and the second chamber; a second through hole is formed between the second chamber and the accommodation space; and the drive shaft passes through the first through hole and the second through hole to be connected to the stirring member.

29. The cooking appliance according to claim 28, wherein a shaft sleeve assembly is provided at the second through hole, the shaft sleeve assembly comprising:

a first shaft sleeve arranged around the drive shaft, the first shaft sleeve being a metallic shaft sleeve; and a second shaft sleeve arranged around the first shaft sleeve, the second shaft sleeve being an insulation shaft sleeve.

30. The cooking appliance according to any one of claims 26 to 29, wherein:

the microwave housing is located above the cooking cavity; a first microwave passing opening is formed between the waveguide cavity and the accommodation space;

a second microwave passing opening is formed between the accommodation space and the cooking cavity;
 a first transparent isolation member is provided at the first microwave passing opening; and
 a second transparent isolation member is provided at the second microwave passing opening.

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- 31.** The cooking appliance according to any one of claims 25 to 30, wherein:

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the cooking appliance is provided with a plurality of to-be-cooled members; and
 the air duct assembly comprises an air duct housing having an air inlet, an air outlet, and the plurality of air flowing channels corresponding to the plurality of to-be-cooled members, each of the plurality of air flowing channels being connected to each of the air inlet and the air outlet, and each of the plurality of to-be-cooled members being at least partially disposed in a corresponding one of the plurality of air flowing channels.

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- 32.** The cooking appliance according to any one of claims 25 to 30, wherein the door body assembly comprises:

a panel adapted to cover the access opening;
 and
 a protrusion disposed at a side of the panel facing towards the machine body and being extendable into the cooking cavity, the protrusion being provided with a wave suppression structure.

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- 33.** The cooking appliance according to claim 32, wherein the panel is provided with an outer glass layer, an intermediate glass layer, and an inner glass layer.

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- 34.** The cooking appliance according to any one of claims 25 to 33, further comprising an outer casing having an accommodation cavity, the machine body being engaged within the accommodation cavity.

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- 35.** The cooking appliance according to any one of claims 25 to 34, wherein:

the access opening is located at a front side of the machine body; and
 the machine body is provided with a control board, the control board being disposed at the front side of the machine body and located above the access opening.

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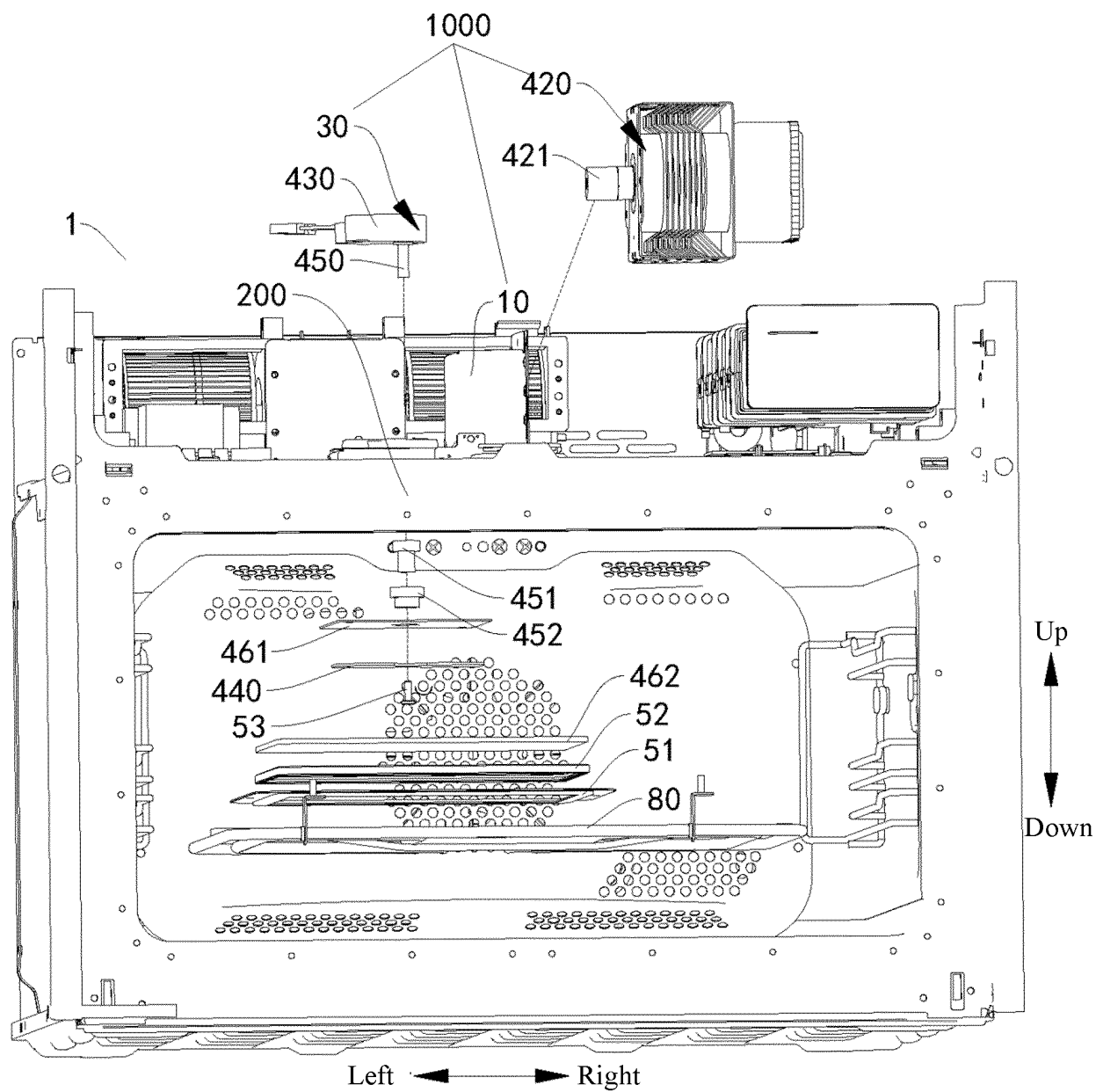


FIG. 1

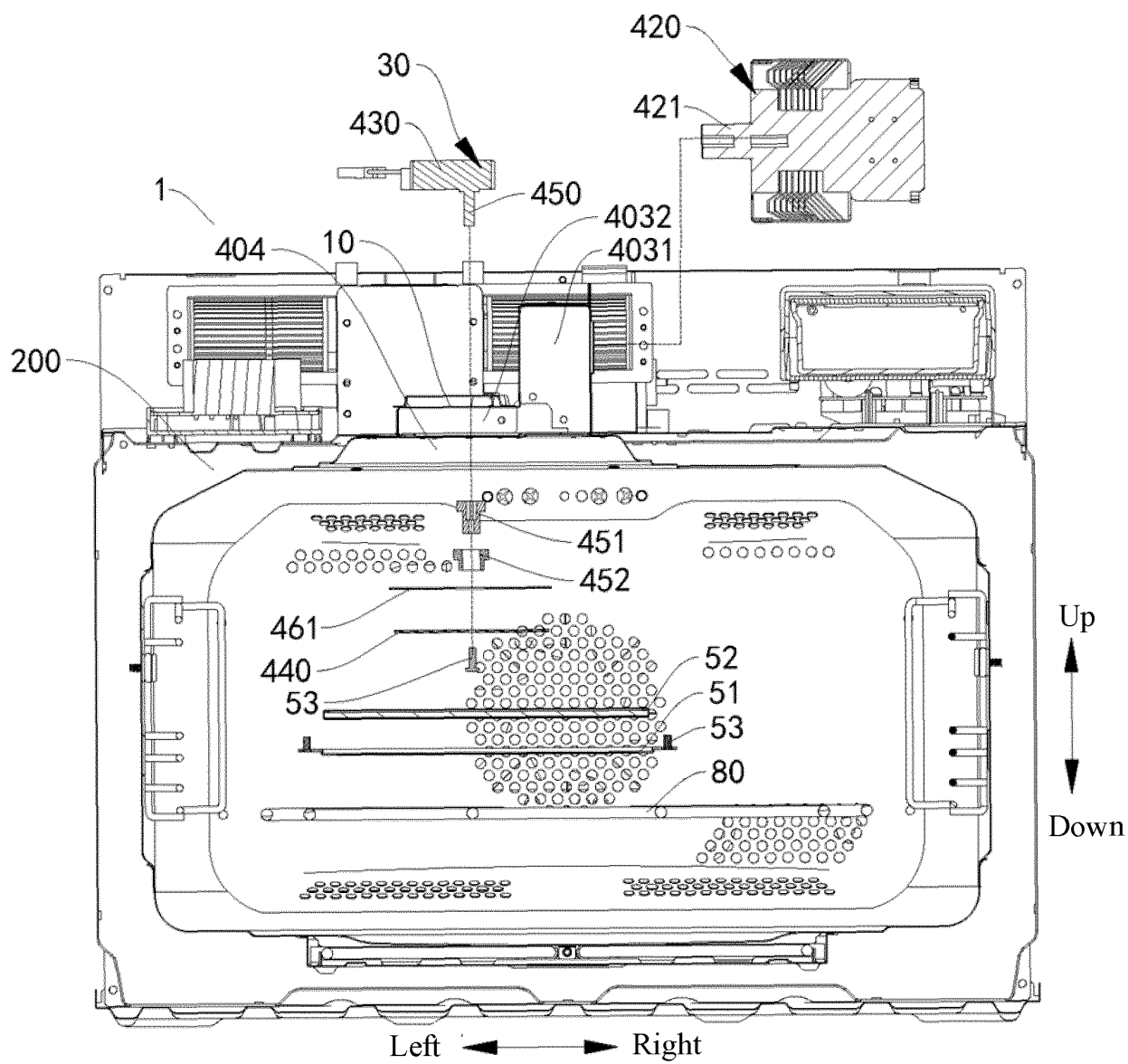


FIG. 2

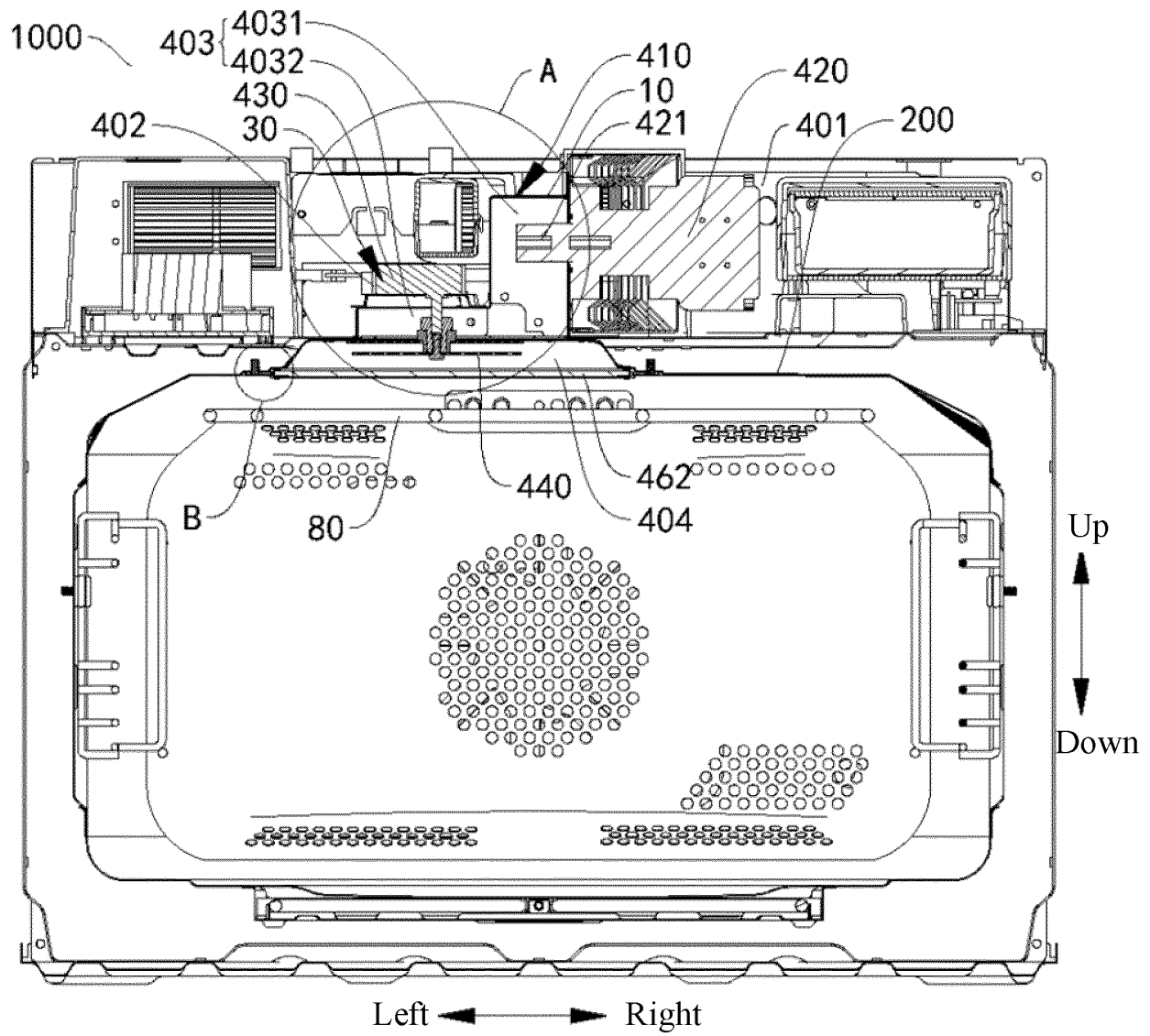


FIG. 3

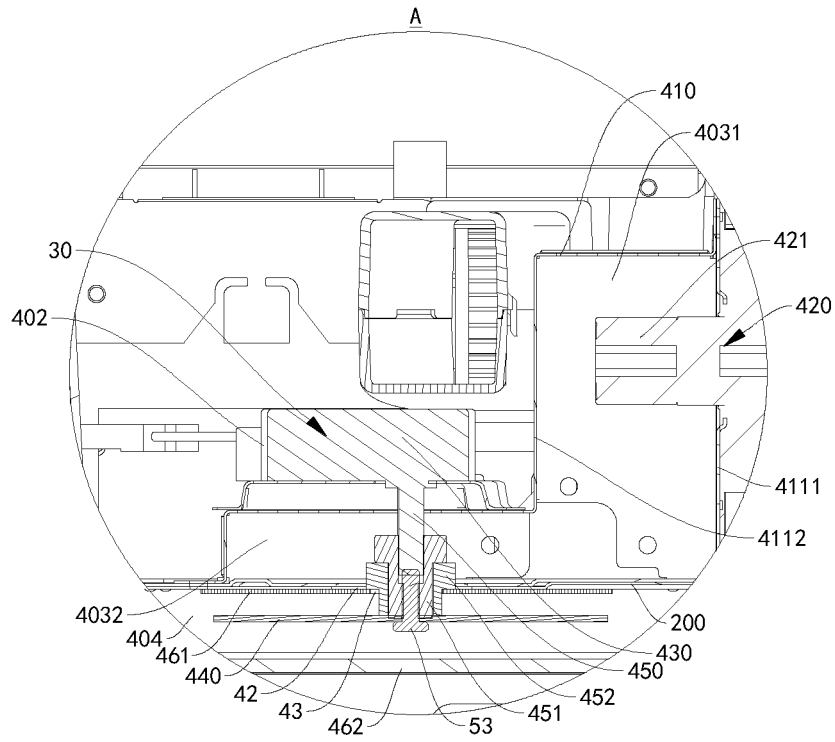


FIG. 4

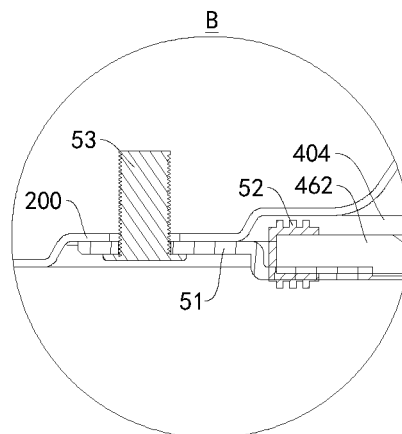


FIG. 5

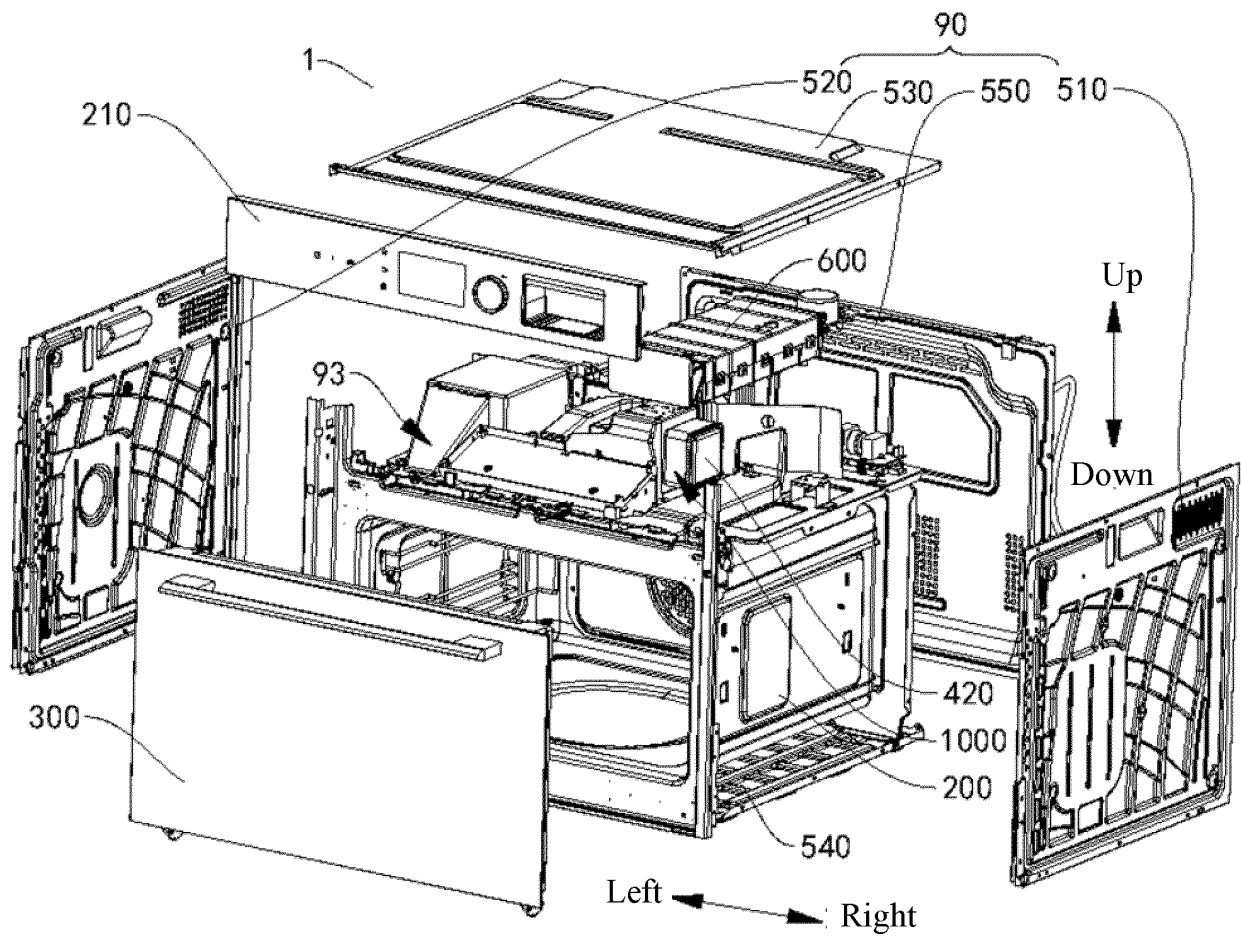


FIG. 6

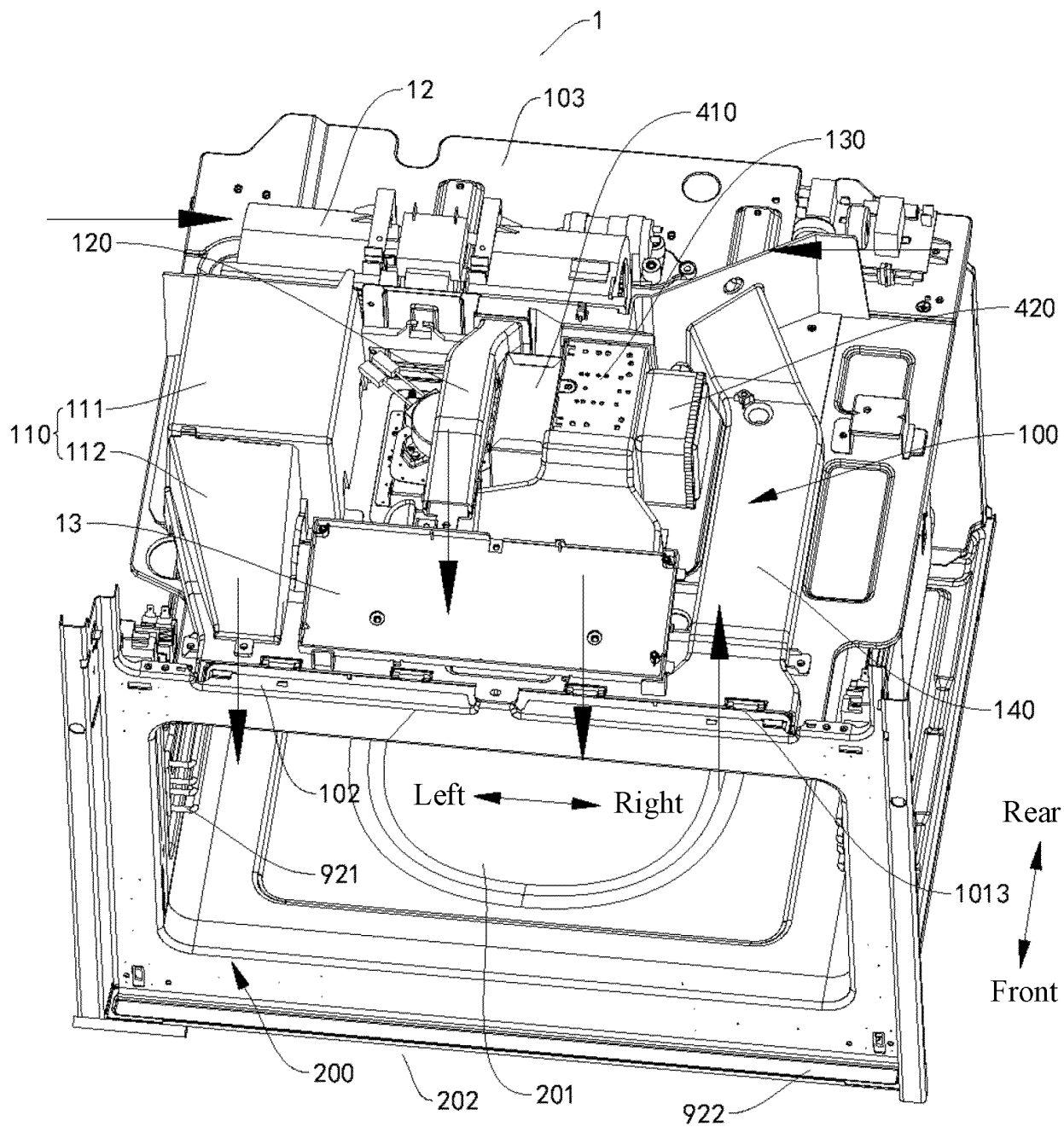


FIG. 7

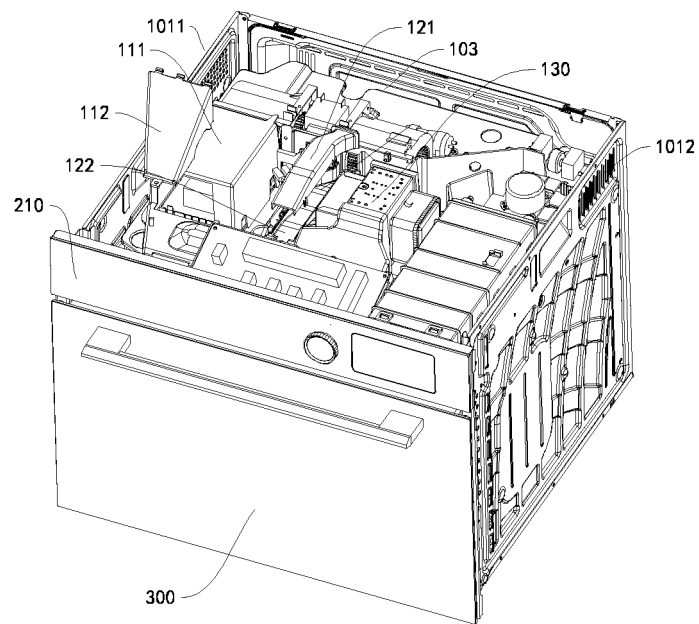


FIG. 8

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2022/080196

A. CLASSIFICATION OF SUBJECT MATTER

H05B 6/70(2006.01)i; H05B 6/74(2006.01)i; H05B 6/64(2006.01)i; A47J 27/04(2006.01)i; A47J 36/00(2006.01)i; A47J 37/04(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H05B A47J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNTXT, CNKI, ENTXT, ENTXTC, DWPI: 微波, 波导, 空腔, 磁控管, 搅拌, 冷却, 散热, 风道, 通风, 过风, microwave, waveguide, cavity, magnetron, stir+, cool+, air, passage, channel, flow+, circulat+, current

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 113260105 A (GUANGDONG MIDEA KITCHEN APPLIANCES MANUFACTURING CO., LTD. et al.) 13 August 2021 (2021-08-13) claims 1-12	1-12
PX	CN 214804103 U (GUANGDONG MIDEA KITCHEN APPLIANCES MANUFACTURING CO., LTD. et al.) 23 November 2021 (2021-11-23) claims 1-12, description, paragraphs 32-79, and figures 1-4	13-24
PX	CN 215226921 U (GUANGDONG MIDEA KITCHEN APPLIANCES MANUFACTURING CO., LTD. et al.) 21 December 2021 (2021-12-21) claims 1-11, description, paragraphs 31-87, and figures 1-4	25-35
X	CN 110410831 A (GUANGDONG MIDEA KITCHEN APPLIANCES MANUFACTURING CO., LTD. et al.) 05 November 2019 (2019-11-05) description, paragraphs 5-17 and 35-48, and figures 1-3	1-12
Y	CN 110410831 A (GUANGDONG MIDEA KITCHEN APPLIANCES MANUFACTURING CO., LTD. et al.) 05 November 2019 (2019-11-05) description, paragraphs 5-17 and 35-48, and figures 1-3	13-35

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

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Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2022/080196

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
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Y	CN 106322454 A (GUANGDONG MIDEA KITCHEN APPLIANCES MANUFACTURING CO., LTD. et al.) 11 January 2017 (2017-01-11) description, paragraphs 4-15 and 40-72, and figures 1-6	13-35
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INTERNATIONAL SEARCH REPORT
Information on patent family members

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REFERENCES CITED IN THE DESCRIPTION

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