

(19)



(11)

EP 2 061 995 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
22.09.2010 Bulletin 2010/38

(21) Application number: **06823991.2**

(22) Date of filing: **07.12.2006**

(51) Int Cl.:
H05B 6/80 (2006.01)

(86) International application number:
PCT/KR2006/005284

(87) International publication number:
WO 2008/032896 (20.03.2008 Gazette 2008/12)

(54) **COOKING APPARATUS**

KOCHVORRICHTUNG

APPAREIL DE CUISSON

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI
SK TR**

(30) Priority: **12.09.2006 KR 20060088289**

(43) Date of publication of application:
27.05.2009 Bulletin 2009/22

(73) Proprietor: **LG Electronics Inc.**
Seoul 150-010 (KR)

(72) Inventor: **LEE, Sang-Ki**
Changwon-si
Gyungsangnam-do 641-010 (KR)

(74) Representative: **Urner, Peter**
TER MEER STEINMEISTER & PARTNER GbR
Patentanwälte
Mauerkircherstrasse 45
81679 München (DE)

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Description

Technical Field

[0001] The present invention relates in general to a cooking apparatus, more specifically, to a cooking apparatus having a bracket installed in a door, thereby blocking heat transfer to a control panel as well as guiding air flow that passes through the door for a cooling process.

Background Art

[0002] Korean Patent Application Laid-Open No. 2005-0083504 discloses a typical example of a cooking apparatus that has major components inclusive of a magnetron, a high voltage transformer, a high voltage capacitor, and a cooling fan provided at one side of a cooking cavity. Korean Patent Application Laid-Open No. 2006-0037003 discloses a cooking apparatus that has major components inclusive of a magnetron, a high voltage transformer, and a high voltage capacitor installed at the upper side of a cooking cavity and accommodates a convection heater assembly at the rear wall of the cooking cavity. Korean Utility Model Application Laid-Open No. 1999-0010444 discloses a cooking apparatus that has major components inclusive of a magnetron, a high voltage transformer, and a cooling fan and an operating panel provided at the lower side of a cooking cavity.

[0003] In addition, Korean Utility Model Application Laid-Open No. 1998-0016489 discloses a cooking apparatus, which has major components inclusive of a magnetron, a high voltage transformer and a cooling fan installed at a side wall of a cooking cavity and which is provided with a cooling flow path starting from the upper wall of the cooking cavity to a lateral side thereof.

[0004] Korean Patent Application Laid-Open No. 1998-0053939 discloses a door of a microwave oven used as a typical example of cooking apparatuses, in which the door is provided with a door frame for blocking microwaves and a choke cover surrounding the door frame.

[0005] Korean Patent Application Laid-Open No. 1995-0003729 discloses a cooking apparatus that has a cooking flow path starting from a lateral side of a cooking cavity, going via the bottom side of the cooking cavity, to the door.

[0006] Korean Patent Application Laid-Open No. 2004-0108050 discloses an example of an operating panel for use in a cooking apparatus, in which the operating panel is provided with a glass-touch keyboard using static electricity.

[0007] JP 59 060128 A describes a heating device. Herein, a control board embedded into a door consists of a control piece and a displaying section and is adapted to input a heating instruction from an operator into a controller. A controller causes a lamp relay to turn on via a connector for lighting a lamp, when either a power key or a time presetting key is depressed or when a time

presetting volume is turned. Therefore, a transparent type liquid crystal displaying section is brightly illuminated by a lamp provided inside the body, and thereby allowing an operator to clearly and neatly read the display.

[0008] JP 58 214722 A describes a heating device. Herein, a pair of contact pieces are provided on a door as a contacting means for a controlled part such as a heat source. One end of said piece is connected to the output terminal of a controller, the other end is connected to the input terminal of the controller, and each terminal is electrically separated. Short-circuit pieces are arranged at the main body side locating oppositely to the contact pieces. At the closing of the door, the pair of contact pieces are communicated via the short-circuit pieces, while the opening or closing condition of the door can be detected by the controller. While the door is opened, no signal is detected at the input, and while the door is closed, the output of a microcomputer is short-circuited and inputted, thereby, opening or closing conditions can be detected. Also the disconnection of a clock circuit or occurrence of power service interruption can be detected, accordingly, those troubles can be treated by the same way for the door opening operation, even when said trouble occurs during the cooking operation, thereby, the safety can be achieved.

[0009] JP 58 213122 A describes a heating device. Herein, a device is constituted such that a control panel having a display part and a controller are mounted on a door for opening and closing a front opening of a heating chamber in an electronic oven, and a heating instruction is inputted to a controller through operation of control keys on a control panel. In this device, the controller and a part to be controlled such as a magnetron in a body are inter-connected through the medium of a radio means such as photo couplings. That is, coupling windows are provided in spots, positioned facing each other, at the inside of the door and on the body side, respectively, and a luminous element and a collecting element are disposed in the windows. Acoustic wave, FM wave, infrared rays, ultrasonic wave may be alternately used as the radio means.

[0010] US 4,255,640 A describes door mounted oven controls. Herein, a microwave oven has a control panel mounted on a door. The control panel includes a plurality of pushbutton switches for the user to push to control the speed, time, etc. for variable cooking in the microwave oven. The switches communicate to an electronic controller also mounted on the door. The controller converts user input into signals that control the various operating components of the oven, such as the magnetron. The controller is connected with these components via a flexible printed circuit cable which bridges the space between the door and the oven near or through the hinge area of the oven.

[0011] JP 60 223918 A describes a microwave oven. Herein, a door has a door frame having a window, and a microwave shielding sheet having several small holes therein is arranged in the window. A liquid crystal is held

and arranged by an ornamental plate installed at the front surface of the frame body and a key board is overlapped at the front surface of the ornamental plate. At the overlapped part of the door, it is not necessary to see the interior of the heating chamber it is possible to provide a cheap electrode of liquid crystal and an electrode of key-board is of opaque material and further a part of the liquid crystal can be used with the ornamental plate. Further, either a part of the liquid crystal or a part of the keyboard is made of transparent electrode and it can be expanded to the window part of the frame. In this case, the size of the keyboard or the display can be of a sufficient value and they may be facilitated in operation.

[0012] JP 01 189422 A describes a heating cooker. Herein, a tip part of a lead wire protective member for protecting lead wires for connecting between an electric apparatus on the side of a door body and an electric apparatus in a main body of a heating cooker is turnably connected to a large diameter part of a rotary shaft. The lead wires are inserted in the protective member, whereby the lead wires, are prevented from being supported in an exposed condition between the main body and the door body. Therefore, the lead wires can be securely prevented from being clamped between the main body and the door body when the door body is closed. Thus, the lead wires can be prevented from being damaged, and the door body can be smoothly opened and closed.

[0013] JP 2002 048346 A describes a heating cooking device. Herein, the heating cooking device is constituted that an electric accessory part situated at a door and a power source part situated in a body are interconnected through a lead wire. A lead wire in the door enters a support member through a second opening of the door and a first opening with a sleeve of a support member and reaches the interior of the body through a third opening of a front of the body.

Disclosure of Invention

Technical Problem

[0014] It is an object of the present invention to provide a cooking apparatus capable of protecting a control panel provided to a door from heat that is generated from a cooking cavity.

[0015] Another object of the present invention is to provide a cooking apparatus capable of protecting a control panel from heat that is generated from a cooking cavity, the control panel being provided to an upper portion of a door corresponding to the upper space of the cooking apparatus for the purpose of expanding a cooking cavity in height and width.

[0016] Still another object of the present invention is to provide a cooking apparatus capable of effectively guiding air flow that travels inside a door for a cooling process.

[0017] Still another object of the present invention is to provide a cooking apparatus, capable of protecting a

control panel provided to a door from heat that is generated from a cooking cavity and effectively guiding air flow that travels inside the door for a cooling process.

[0018] Yet another object of the present invention is to provide a cooking apparatus capable of cooling a door by using air flow traveling from the upper space of the cooking apparatus towards the door.

Technical Solution

[0019] To achieve the above objects and advantages, there is provided a cooking apparatus, comprising: a cooking cavity generating heat during cooking; a door for opening and closing the cooking cavity and provided with a control panel; and a bracket provided at the door to protect the control panel from the heat of the cooking cavity. Through this structure, the control panel can be incorporated with the door, and be protected from heat that is generated from the cooking cavity.

[0020] In another aspect of the present invention, the control panel is located at an upper portion of the door, and the bracket is located at the upper portion of the door from the rear of the control panel.

[0021] In another aspect of the present invention, the bracket is located in the door from the rear of the control panel and has a shape covering the rear side and lower side of the control panel.

[0022] In another aspect of the present invention, the cooking apparatus comprises a cooling flow path extended from one side of the cooking cavity into the door, along which a flow passes and the bracket is provided onto the cooling flow path inside the door to protect the control panel from the heat and the flow. Although the flow to the control panel is blocked by the bracket, it serves to block heat transfer to the control panel by being continuously supplied to the bracket.

[0023] In another aspect of the present invention, the cooking apparatus comprises a cooling flow path extended from one side of the cooking cavity into the door, along which a flow passes, and the bracket is provided onto the cooling flow path inside the door and guides the flow downward in the inside of the door. Through this structure, the bracket can block heat transfer to the control panel and, at the same time, guide the flow inside the door.

[0024] In another aspect of the present invention, the cooling flow path is extended from the upper space of the cooking cavity to the upper portion of the door, and the bracket is provided onto the cooling flow path at the upper portion of the door.

[0025] In another aspect of the present invention, the cooking apparatus comprises a front frame located at the front surface of the cooking cavity and provided with an opening communicating with the flow; and a door opening located at the door, through which the flow passing the opening travels into the door.

[0026] In another aspect of the present invention, the cooking apparatus comprises a middle plate located at

the door from the lower side of the bracket and preventing the heat of the cooking cavity from transferring to the outside. Through this structure, heat generated from the cooking cavity can be blocked and be not transferred to the outside of the door or to the handle.

[0027] In another aspect of the present invention, the cooking apparatus comprises a cooling flow path extended from one side of the cooking cavity to the door, along which a flow passes, and wherein the bracket is located on the cooling flow path for the flow to pass by one lateral side of the middle plate. Through this structure, one side of the middle plate can block heat by the flow, while the other side of the middle plate can block heat through a stagnant air layer.

[0028] In another aspect of the present invention, the bracket is provided with an inclined surface where the flow collides with the bracket and then turns towards one lateral side of the middle plate.

[0029] Additional and/or other aspects and advantages of the present invention will be set forth in part in the description which follows and, in part, will be obvious from the description, or may be learned by practice of the invention.

Brief Description of the Drawings

[0030] The above aspects and features of the present invention will be more apparent by describing certain embodiments of the present invention with reference to the accompanying drawings, in which:

FIG. 1 is an exploded schematic view of the main structure of a cooking apparatus according to the present invention;

FIG. 2 schematically shows an example of the rear space of a cooking apparatus according to the present invention;

FIGS. 3 and 4 schematically show other examples of the rear space of a cooking apparatus according to the present invention; and

FIGS. 5 and 6 schematically show a cooling flow path according to the present invention.

Mode for the Invention

[0031] The present invention will be described in detail herein below with reference to the accompanying drawings.

[0032] FIG. 1 is an exploded schematic view of the main structure of a cooking apparatus in accordance with the present invention, showing a cooking cavity 100, a door 200, an upper space 300 located over the cooking cavity 100, a rear space 400 located at the rear of the cooking cavity 100, lateral spaces 500 located on both sides of the cooking cavity 100, and a lower space 600 located under the cooking cavity 100.

[0033] The cooking cavity 100 is a space for cooking food, and is defined by an inner case 110. A heater 120

is provided at the upper portion of the inside of the cooking cavity 100, and a plate or a rack 130 is placed inside the cooking cavity 100. The inner case 110 includes an inlet (not shown) and an outlet 111 formed on the sides for forming an air flow path to remove heat and smell inside the cooking cavity 100. An example of the heater 120 is a sheath heater. The use of the plate 130 in replacement of a circular turn table brings change to width and length (depth) of the cooking cavity 100, the modification of which is restricted by the turn table. At one side of the cooking cavity 100 is provided a guide 140 for guiding the plate 130. In addition, at the front and rear sides of the cooking cavity 100 are provided a front frame 150 and a rear frame 160, respectively, and the front frame 150 has an opening 151 for forming a flow path between the upper space 300 and the door 200. The rear frame 160 also has an opening 161 formed at the upper side for communication with the rear space 400.

[0034] The lower portion of the door 200 is hinged to the cooking cavity 100 so that the door 200 can open and close the cooking cavity 100. The door 200 is formed to cover the cooking cavity 100 and the upper space 200. The door 200 is composed of a handle 210, a front plate 220, an input sensing unit 230, a door panel 240, a control panel 250, a middle plate 260, a bracket 270, a door frame 280, and a choke cover 290.

[0035] The handle 210 is a part that a user uses to open or close the door 200, and can be fixed to the front plate 220 by bolts (not shown). Desirably, the handle 210 has at least one channel (not shown) formed inside along its longitudinal direction in a manner that the channel is communicated with outside, so that the total weight can be reduced and the amount of heat transferred to the user from the cooking cavity 100 during cooking can be minimized.

[0036] The front plate 220 is desirably made of a transparent glass for the user to be able to see the inside of the cooking cavity 100, and a display unit (not shown) including buttons may be attached or coated thereto, the buttons being used for the user to select a cooking course or for the indication of an operating status of the cooking apparatus.

[0037] The input sensing unit 230 is a part that recognizes which button is selected by the user. In the case that the input sensing unit 230 is located at the rear of the front plate 220 made of glass, it can be composed of a glass touch unit and serve as an electrostatic sensor. The glass touch unit can be attached to the front plate 220 using a tape. The input sensing unit 230 is located at the upper region of the door 200 facing the upper space 300 of the cooking cavity 100, and this structure ensures a broader cooking cavity and helps the user easily see the inside of the cooking cavity 100 without hindrance.

[0038] The door panel 240 is a part that fixes other components 220, 250 and the like of the door 200, and has an opening 241 for the user to see the inside of the cooking cavity 100. Moreover, the door panel 240 has in its lower side an outlet (not shown) through which the

flow traveling along a cooling flow path extended from a cooling fan 420 (to be described) to the door 200 via the upper space 300 is discharged.

[0039] The control panel 250 is a part for controlling the overall operation of the cooking apparatus according to a user input. To this end, it cooperates with the input sensing unit 230 and a relay substrate 350 (to be described), and is fixed to the door panel 240 from the rear side of the input sensing unit 230. Desirably, the control panel 250 is provided with a light-emitting source such as an LED (light emitting diode), and irradiates the light emitted from the light-emitting source to the display unit (not shown).

[0040] The middle plate 260 is a part fixed to the door panel 240, while being spaced out from the front plate 220 and the door frame 280, respectively. Its primary function is to block heat transfer from the cooking cavity 100 to the front frame 220 and the handle 210. Desirably, the middle plate 260 is installed at the door panel 240 so that a flow generated from the cooling fan 420 (to be described) enters the door 200 via the rear space 400 and the upper space 300 and then travels between the middle plate 260 and the front plate 220 under the guidance of a bracket 270 (to be described). Such a flow vents through the outlet (not shown) of the door panel 240.

[0041] The bracket 270 is fixed to the door panel 240 from the rear side of the control panel 250. It serves to protect the input sensing unit 230 and the control panel 250, each including electronic components, against heat and microwaves from the cooking cavity 100 and against the flow by the cooling fan 420, and guides the flow to travel between the door panel 240 and the front plate 220.

[0042] The door frame 280 is accommodated in the door panel 240, and serves to block leakage of microwaves to the outside of the cooking apparatus.

[0043] The choke cover 290 is a cover for the door 200 located towards the cooking cavity 100, and has an opening 291 formed on its upper side in correspondence to the opening 151 of the front frame 150. The opening 291 is preferably composed of tiny holes in order to prevent food or foreign substances from getting into the door 200 while the door 200 is being open.

[0044] The upper space 300 is a space over the cooking cavity 100 defined by an external case 310, and includes a heater 320, a waveguide 330, an insulating upper plate 340, and a relay substrate 350. Optionally, a lamp (not shown) for lightening the cooking cavity 100 may be provided as well.

[0045] The external case 310 has a shape that encompasses the top and both sides of the cooking cavity 100 at a distance away, and is connected to the front frame 150 and the rear frame 160. If necessary, it may have an outlet 311 so that a flow having traveled around the cooking cavity 100 and the heating elements installed in the cooking apparatus can be vented to the outside.

[0046] An example of the heater 320 is a halogen heater. Since such a heater 320 is influenced by microwaves,

unlike the heater 120 formed of a sheath heater, the heater 320 is installed at the upper side of the inner case 110 so as to provide heat downwardly into the cooking cavity 100 from above.

[0047] The waveguide 330 is extended from the rear space 400 to the upper space 300, and serves to provide microwaves generated from a magnetron (not shown) to the cooking cavity 100. To do this, at the upper surface of the cooking cavity 100 is provided a port 331 (see Fig. 2).

[0048] The insulating upper plate 340 prevents heat generated by the heater 120 housed in the inner case 110 from transferring to the upper space 300, and has a shape that covers the upper portion of the cooking cavity 100 except for the heater 320 and the waveguide 330.

[0049] The relay substrate 350 is mounted on the insulating upper plate 340 from one side of the upper space 300, and interworks with the control panel 250 to operate components inclusive of the magnetron (to be described) placed at the rear space 400.

[0050] FIG. 2 schematically shows an example of the rear space of a cooking apparatus according to the present invention. Referring to FIGS. 1 and 2, the rear space 400 is a space behind the cooking cavity 100 defined by the cover 410, and includes a cooling fan 420, a convection heater assembly 430, and heating elements such as a magnetron 440, a high voltage transformer 450, and a high voltage capacitor 460, together building a component room of the cooking apparatus.

[0051] The cover 410 is connected to the rear frame 160 or the outer case 310 so as to cover the upper space 300 and the rear space 400, and its lower portion is connected to a base 610. At the lower portion of the cover 410 or the base 610 is provided an inlet 411 for air inflow to the cooling fan 420.

[0052] The cooling fan 420 is located at the lower portion of the rear space 400 along the width direction thereof, and includes flow-generating units 421 and 422 on both sides to cool the components installed at the upper side. As the rear space 400, the upper space 300 and the door 200 are built in a way to be communicated, the entire area of the cooking apparatus can be cooled by means of the cooling fan 420. In addition, the cooling fan 420 is provided with a partition wall 423 for preventing the flow generated by the cooling fan 420 from flowing back to the cooling fan 420. The partition wall 423 has openings 424 and 425 formed on both sides in a manner to make the flow go up to the upper portion of the rear space 400. At the space 426 between the flow-generating units 421 and 422 is provided a motor (not shown) for driving the flow-generating units 421 and 422.

[0053] FIGS. 3 and 4 schematically show other application examples of the rear space of a cooking apparatus according to the present invention. Referring to FIGS. 1-4, the rear space is provided, in addition to the structure shown in FIG. 2, with a flow guide 441 for guiding air flow to the magnetron 440, and an flow guide 442 for guiding the air flow coming out of the magnetron 440 to the inlet

112 that is formed on the lateral face of the cooking cavity 100. This structure, especially the flow guide 442, makes it possible to guide the air flow generated from the cooling fan 420 into the cooking cavity 100 stably and efficiently, and to effectively cool the magnetron, one of core components.

[0054] The convection heater assembly 430 includes a fan 431, a heater 432, an inner heater cover 433, an outer heater cover 434, and a motor 435. Desirably, a heat insulating material (not shown) is placed between the inner heater cover 433 and the outer heater cover 434. Such a convection heater assembly 430 must have the motor 435. Since the motor 435 is installed being protruded backwardly from the rear space 400, the rear space 400 must have a room that is deep enough at least to accommodate the motor 435. Based on the attention to this space, such a large volume component 440, 450, and/or 460 among the major components used in the operation of the cooking apparatus can be placed in the rear space 400. In this way, even though part of the cooking cavity 100 in the longitudinal direction is sacrificed, the cooking cavity 100 is expanded in the lateral and vertical directions. Also, by using a plate instead of a turntable, a cooking apparatus according to the present invention can change the height, width and depth of the cooking cavity 100. Also, by placing the cooling fan 420 at the lower portion of the rear space 400, a cooking apparatus according to the present invention can utilize the rear space 400 and can cool the heating elements 440, 450, and/or 460 as well. Also, by providing the cooling fan 420 at the lower portion of the rear space 400 and building the rear space 400, the upper space 300, the door 200, the cooking cavity 100, and the lateral spaces 500 to be communicated with one another, the whole part of a cooking apparatus according to the present invention can be effectively cooled by the cooling fan 420. Also, as the cooling fan 420 is installed along the width direction of the rear space 400, the heating elements such as the convection heater assembly 430, the magnetron 440, the high voltage transformer 450, and the high voltage capacitor 460, which are provided in the rear space 400, can be cooled effectively, the flow can be traveled to the upper space 300, the lateral spaces 500 and the cooking cavity 100 and be vented through an outlet 611 formed on the base at the lower portion of the cooking cavity 100. Also, by providing the partition wall 423 and the openings 424 and 425, a cooking apparatus according to the present invention can form the flow path and flow and cool the heating elements, effectively and selectively. Also, the rear frame 160 may further comprise an opening 162 for communicating the lateral space 500. The opening 162 enables a direct air flow from the rear space 400 to the lateral space 500 and creates air flow to both sides of the rear space 400, thereby promoting the cooling process and the air flow onto both sides of the rear space 400.

[0055] The magnetron 440, the high voltage transformer 450, and the high voltage capacitor 460 are major com-

ponents used in the operation of the cooking apparatus, each generating a lot of heat. The magnetron 440 is placed above the opening 424, while the high voltage transformer 450 and the high voltage capacitor 460 are placed above the opening 425. The arrangement of these heating elements can be changed.

[0056] The lateral spaces 500 are spaces on both sides of the cooking cavity 100 defined by the outer case 100, and they desirably communicate with the upper space 300, the rear space 400, and the lower space 600, and also with the cooking cavity 100 through the inlet 112 and the outlet 111. The flow generated from the cooling fan 420 travels from the rear space 400, the upper space 300, the cooking cavity 100, the lateral spaces 500, and eventually to the lower space 600. At this time, the flow traveling the upper space 300 and heading to the lateral space 500 can guide the flow that came out of the cooking cavity 100 through the outlet 111 to the lower space 600.

[0057] The lower space 600 is a space below the cooking cavity 100 defined by the base 610. The base 610 is connected to the front frame 150 and the rear frame 160 to support the cooking apparatus, and includes the outlet 611 so as to exhaust the flow originated from the cooling fan 420 and the smell and heat generated in the cooking cavity 100. Even though the lower space 600 is defined by the rear frame 160 from the rear side, the base 610 is connected to the cover 410 over the rear frame 160. Therefore, the base 610 also functions as a member for limiting the lower portion of the rear space 400. The location of the outlet 611 is not particularly limited, so it can be on the side of the outlet 111, or preferably at the center of the base 610 to give a sufficiently long flow path. Since hot air flow is vented through the outlet 611, the cooking apparatus should not be placed on a kitchen appliance that is sensitive to heat. To protect such a kitchen appliance from any damages due to overheated air, a plate (not shown) may be connected to the base 610 at a distance so that heat may be exhausted in the lateral directions.

[0058] FIGS. 5 and 6 schematically show a cooling flow path according to the present invention. As shown in the drawings, flow generated from the rear space 400 travels to the lateral spaces 500 formed on both sides of the cooking cavity 100 via the upper space 300, while part of the flow comes out of the opening 151 and turns towards the door 200. Also, another part of the flow may turn towards the lateral spaces through the opening 162 formed in the rear frame 160. The flow coming to the upper space 400 cools the heater 320 and the relay substrate 350. Desirably, the relay substrate 350 is provided to the insulating upper plate 340 along the direction of the flow, so as to minimize the hindrance to the flow. The flow passing through the lateral spaces 500 turns towards the lower space 600, and is vented through the outlet 611 (refer to FIG. 1) formed at the center of the base 610. Even though there is no particular restriction to the location of the outlet 610, it is preferably located around the center of the base 610 because a sufficient amount of

heat exchange is performed as the flow travels or circulates inside the cooking apparatus as long as possible. At this time, to protect a bottom surface where the cooking apparatus is placed, a protective plate 612 may be connected to the base 610 at a distance so that the flow may be exhausted in the lateral directions. In addition, the flow passing by the lateral spaces 500 guides the flow vented through the outlet 111 of the cooking cavity 100 to the lower space 600. Meanwhile, the air flow that comes through the opening 291 of the choke cover 290 travels between the front plate 220 and the middle plate 260 being guided by the bracket 270, and is vented through the outlet 242 formed in the bottom surface of the door panel 240. As such, the input sensing unit 230 (see FIG. 1) and the control panel 250 (see FIG. 1) covered by the bracket 270 can be protected from heat and air flow, one side of the middle plate 260 blocks heat through the air flow (Although the air flow is blocked by the bracket 270, the air flow serves to block heat transfer to the input sensing unit 230 and the control panel 240.), and the other side of the middle plate 260 blocks heat through a stagnant air layer. In result, heat generated from the cooking cavity 100 is blocked and not transferred to the outside of the door 200 or the handle 210 (see FIG. 1).

[0059] In the meantime, an area of the choke cover 290 having the opening 291 may be formed slightly inward to the door 200 in order to promote the air flow from the cooking cavity 100.

[0060] As explained so far, according to a cooking apparatus of the present invention, the control panel provided at the door can be protected from heat generated from the cooking cavity.

[0061] Also, according to a cooking apparatus of the present invention, the control panel can be protected from heat generated from the cooking cavity, the control being provided at the upper portion of the door corresponding to the upper space of the cooking apparatus for the purpose of expanding the cooking cavity in height and width.

[0062] Also, according to a cooking apparatus of the present invention, the flow traveling inside the door for a cooling process can be guided effectively.

[0063] Also, according to a cooking apparatus of the present invention, the control panel provided at the door can be protected from heat that is generated from the cooking cavity and the flow that travels inside the door for a cooling process can be guided effectively.

[0064] Also, according to a cooking apparatus of the present invention, the door can be cooled by using air flow that travels from the upper space of the cooking apparatus towards the door.

[0065] Although the preferred embodiment of the present invention has been described, it will be understood by those skilled in the art that the present invention should not be limited to the described preferred embodiment, but various changes and modifications can be made within the spirit and scope of the present invention as defined by the appended claims.

Claims

1. A cooking apparatus, comprising:

- a cooking cavity (100) generating heat during cooking;
- a door (200) for opening and closing the cooking cavity and provided with a control panel (250); and
- a bracket (270) provided at the door (200) **characterized in that** the cooking apparatus further comprising:
 - a cooling flow path extended from one side over the cooking cavity (100) into the door (200), along which a flow passes: and
 - wherein the bracket (270) is provided onto the cooling flow path inside the door (200) to protect the control panel (250) from the heat of the cooking cavity (100) and the flow.

2. The cooking apparatus as set forth in claim 1, wherein the control panel (250) is located at an upper portion of the door (200), and the bracket (270) is located at the upper portion of the door (200) between a rear side of the control panel (250) and a rear side of the door (200).

3. The cooking apparatus as set forth in claim 1, wherein the bracket (270) has a shape covering the rear side and lower side of the control panel (250).

4. The cooking apparatus as set forth in claim 1, wherein the bracket (270) guides the flow downward in the inside of the door (200).

5. The cooking apparatus as set forth in claim 4, wherein the cooling flow path is extended from the upper space (300) over the cooking cavity (100) to the upper portion of the door (200), and the bracket (270) is provided onto the cooling flow path at the upper portion of the door (200).

6. The cooking apparatus as set forth in claim 5, further comprising:

- a front frame (150) located at the front surface of the cooking cavity (100) and provided with an opening (151) communicating with the flow; and
- a door opening (291) located at the door (200), through which the flow passing the opening (151) travels into the door through the door opening (291).

7. The cooking apparatus as set forth in any one of claims 1 to 6, further comprising:

- a middle plate (260) located at the door (200) from the lower side of the bracket (270) and pre-

venting the heat of the cooking cavity (100) from transferring to the outside.

8. The cooking apparatus as set forth in claim 7, where-
in the bracket (270) passes by one lateral side of the
middle plate. 5
9. The cooking apparatus as set forth in claim 8, where-
in the bracket (270) is provided with an inclined sur-
face where the flow collides with the bracket (270) 10
and then turns towards one lateral side of the middle
plate (250).

Patentansprüche

1. Kochvorrichtung, die umfasst:

- einen Kochhohlraum (100), um während des Kochens Wärme zu erzeugen; 20
- eine Tür (200) zum Öffnen und Schließen des Kochhohlraums, die mit einer Steuerkonsole (250) versehen ist; und
- eine Stütze (270), die an der Tür (200) vorge-
sehen ist, 25

dadurch gekennzeichnet, dass die Kochvorrichtung ferner umfasst:

- einen Kühlungsströmungsweg, der von einer Seite über den Kochhohlraum (100) in die Tür (200) verläuft und entlang dessen sich eine Strömung bewegt; 30
- wobei die Stütze (270) auf dem Kühlungsströmungsweg in der Tür (200) vorgesehen ist, um die Steuerkonsole (250) vor der Wärme des Kochhohlraums (100) und vor der Strömung zu schützen. 35

2. Kochvorrichtung nach Anspruch 1, wobei sich die Steuerkonsole (250) an einem oberen Abschnitt der Tür (200) befindet und die Stütze (270) am oberen 40
Abschnitt der Tür (200) zwischen einer Rückseite der Steuerkonsole (250) und einer Rückseite der Tür (200) vorhanden ist.
3. Kochvorrichtung nach Anspruch 1, wobei die Stütze 45
(270) eine Form hat, die die Rückseite und die Unterseite der Steuerkonsole (250) abdeckt.
4. Kochvorrichtung nach Anspruch 1, wobei die Stütze 50
(270) die Strömung in der Tür (200) nach unten leitet.
5. Kochvorrichtung nach Anspruch 4, wobei der Kühlungsströmungsweg von dem oberen Raum (300) über den Kochhohlraum (100) zu dem oberen Abschnitt der Tür (200) verläuft und die Stütze (270) 55
auf dem Kühlungsströmungsweg am oberen Abschnitt der Tür (200) vorgesehen ist.

6. Kochvorrichtung nach Anspruch 5, die ferner umfasst:

- einen vorderen Rahmen (150), der sich an der vorderen Oberfläche des Kochhohlraums (100) befindet und mit einer Öffnung (151) versehen ist, die mit der Strömung kommuniziert; und
- eine Türöffnung (291), die sich an der Tür (200) befindet und durch die sich die Strömung, die sich durch die Öffnung (151) bewegt, durch diese Türöffnung (291) in die Tür bewegt.

7. Kochvorrichtung nach einem der Ansprüche 1 bis 6, die ferner umfasst:

- eine Mittelplatte (260), die ausgehend von der Unterseite der Stütze (270) an der Tür (200) vorhanden ist und verhindert, dass Wärme des Kochhohlraums (100) an die äußere Umgebung übertragen wird.

8. Kochvorrichtung nach Anspruch 7, wobei die Stütze (270) an einem seitlichen Bereich der Mittelplatte vorbei verläuft.

9. Kochvorrichtung nach Anspruch 8, wobei die Stütze (270) mit einer geneigten Oberfläche versehen ist, wo die Strömung auf die Stütze (270) trifft und dann zu einem seitlichen Bereich der Mittelplatte (250) umgelenkt wird.

Revendications

1. Appareil de cuisson comprenant :

- une cavité de cuisson (100) produisant de la chaleur pendant la cuisson ;
- une porte (200) pour ouvrir et fermer la cavité de cuisson et pourvue d'un panneau de commande (250) ; et
- un support (270) placé au niveau de la porte (200), **caractérisé en ce que** l'appareil de cuisson comprend en outre :
 - un chemin de flux de refroidissement s'étendant dans la porte (200) depuis un côté au-dessus de la cavité de cuisson (100), le long duquel passe un flux ; et
 - dans lequel le support (270) est placé sur le chemin de flux de refroidissement à l'intérieur de la porte (200) pour protéger le panneau de commande (250) de la chaleur de la cavité de cuisson (100) et du flux.

2. Appareil de cuisson selon la revendication 1, dans lequel le panneau de commande (250) est situé dans une partie supérieure de la porte (200), et le support (270) est situé dans la partie supérieure de la porte

(200), entre un côté arrière du panneau de commande (250) et un côté arrière de la porte (200).

3. Appareil de cuisson selon la revendication 1, dans lequel le support (270) a une forme telle qu'il couvre le côté arrière et le côté inférieur du panneau de commande (250). 5

4. Appareil de cuisson selon la revendication 1, dans lequel le support (270) guide le flux vers le bas à l'intérieur de la porte (200). 10

5. Appareil de cuisson selon la revendication 4, dans lequel le chemin de flux de refroidissement s'étend de l'espace supérieur (300) situé au-dessus de la cavité de cuisson (100) à la partie supérieure de la porte (200), et le support (270) est placé sur le chemin de flux de refroidissement dans la partie supérieure de la porte (200). 15

6. Appareil de cuisson selon la revendication 5, comprenant en outre : 20
 - un châssis avant (150) situé au niveau de la surface avant de la cavité de cuisson (100) et pourvu d'une ouverture (151) communiquant avec le flux ; et 25
 - une ouverture de porte (291) située au niveau de la porte (200), par laquelle le flux passant dans l'ouverture (151) se propage dans la porte par l'ouverture de porte (291). 30

7. Appareil de cuisson selon l'une quelconque des revendications 1 à 6, comprenant en outre une plaque médiane (260) située au niveau de la porte (200) depuis le côté inférieur du support (270) et empêchant la chaleur de la cavité de cuisson (100) de se transférer à l'extérieur. 35

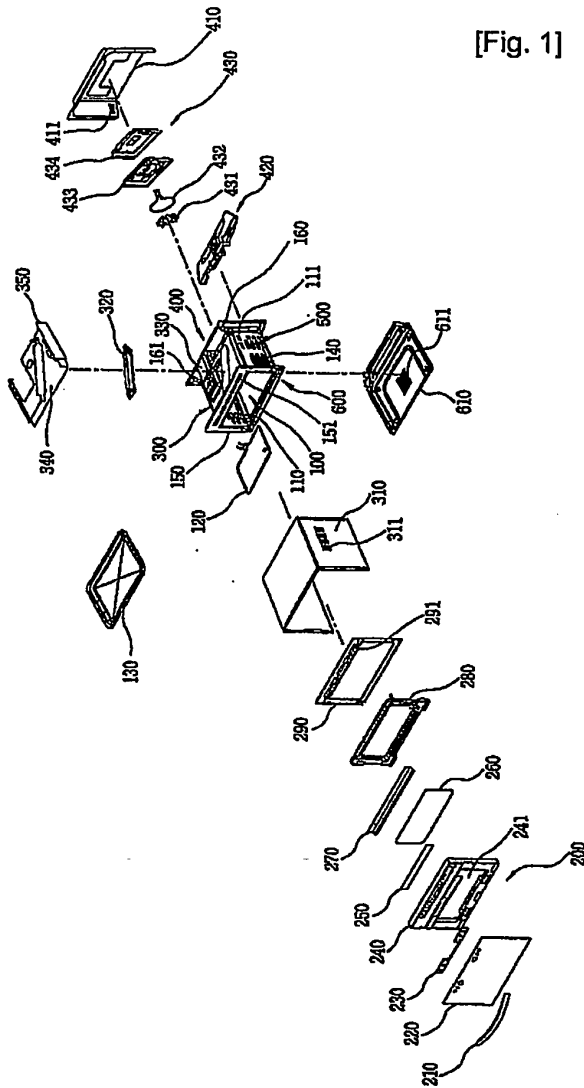
8. Appareil de cuisson selon la revendication 7, dans lequel le support (270) passe par un côté latéral de la plaque médiane. 40

9. Appareil de cuisson selon la revendication 8, dans lequel le support (270) est pourvu d'une surface inclinée où le flux heurte le support (270) puis tourne vers un côté latéral de la plaque médiane (250). 45

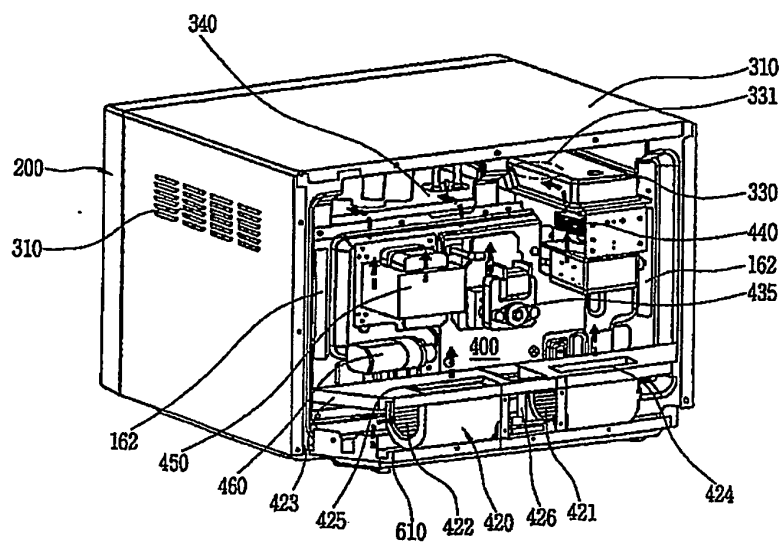
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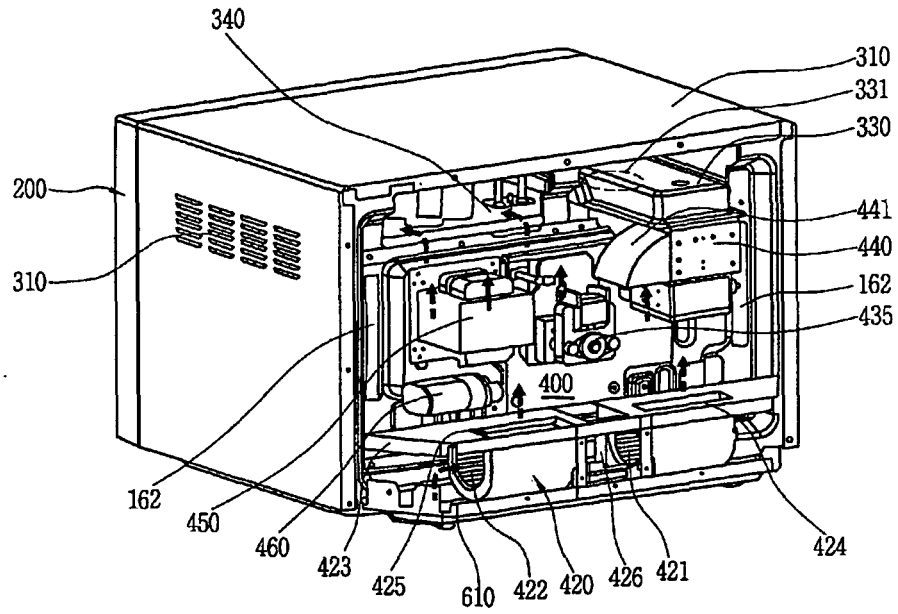
[Fig. 1]



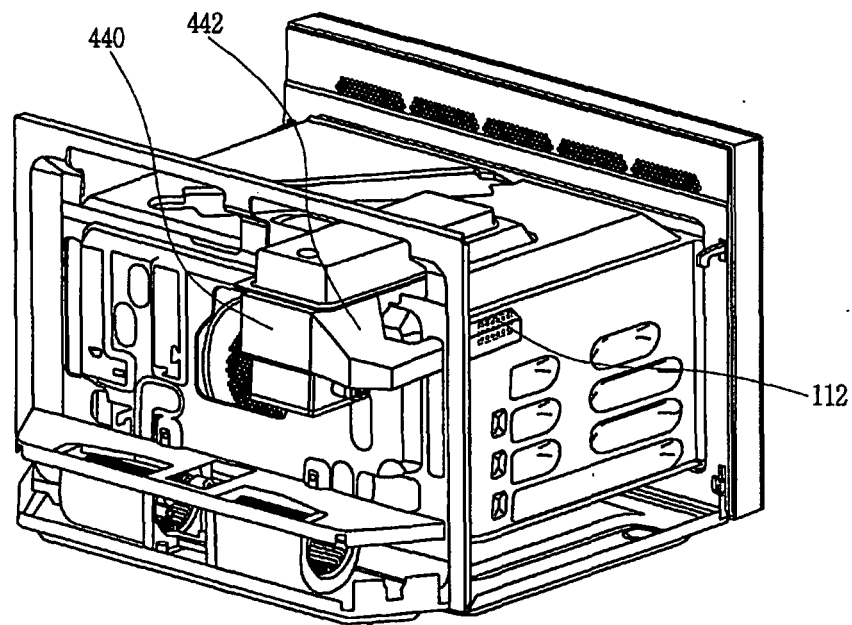
[Fig. 2]



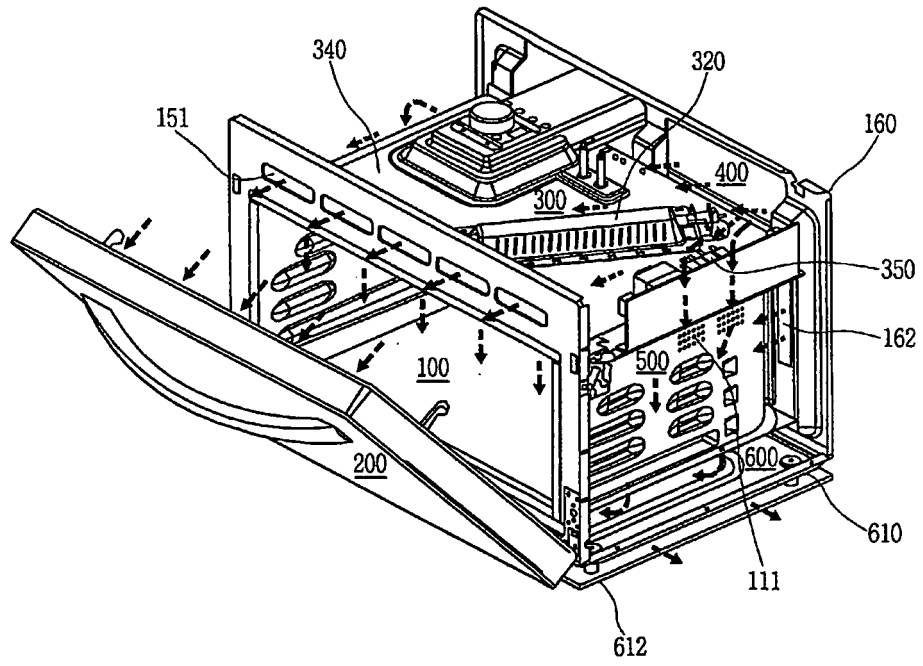
[Fig. 3]



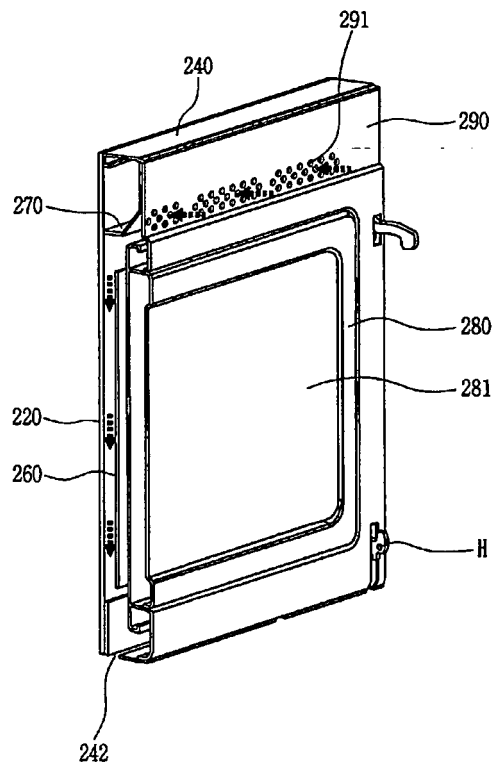
[Fig. 4]



[Fig. 5]



[Fig. 6]



REFERENCES CITED IN THE DESCRIPTION

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