



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
18.02.2009 Bulletin 2009/08

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

(21) Application number: **08150457.3**

(22) Date of filing: **21.01.2008**

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

- **Park, Sang Jun**
Banwoul-ri, Taeon-eup, Hwasung-si
Gyeonggi-do (KR)
- **Jeon, In Ki**
Gwonseon-dong, Gwonseon-gu, Suwon-si
Gyeonggi-do (KR)
- **Lee, Jong Hoon**
Gangseo-gu
Seoul (KR)
- **Jun, Seong Joon**
Seoul (KR)

(30) Priority: **17.08.2007 KR 20070082732**

(71) Applicant: **Samsung Electronics Co., Ltd.**
Suwon-si
Gyeonggi-do (KR)

(72) Inventors:
• **Kim, Kwang Keun**
Gyeonggi-do (KR)
• **Oh, Keun Seuk**
Apt., Bansong-dong, Hwaseong-si
Gyeonggi-do (KR)

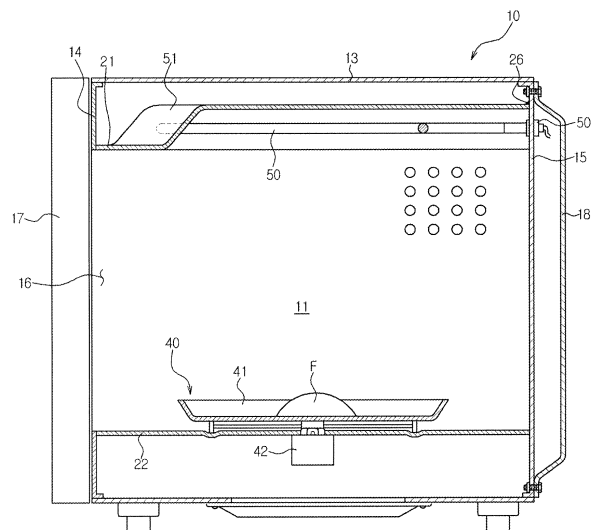
(74) Representative: **Grünecker, Kinkeldey,**
Stockmair & Schwanhäusser
Anwaltssozietät
Leopoldstrasse 4
80802 München (DE)

(54) **Heating cooker**

(57) A heating cooker capable of minimizing deformation of an upper plate and expanding the volume of a cooking chamber is disclosed. The heating cooker includes a main body which includes an upper plate and a

rear plate to define a cooking chamber, and a protruding portion which is formed by protruding a portion of the upper plate upward, wherein the protruding portion is extended to a rear end portion of the upper plate such that a rear end thereof is coupled to the rear plate.

FIG. 4



Description

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of Korean Patent Application No. 2007-0082732, filed on August 17, 2007 in the Korean Intellectual Property Office, the disclosure of which is incorporated herein by reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0002] The present invention relates to a heating cooker, and, more particularly, to a heating cooker which heats the inside of a cooking chamber using a heater disposed in the cooking chamber.

2. Description of the Related Art

[0003] A heating cooker is known as an apparatus which heats and cooks food by supplying high frequency waves into a cooking chamber or using a heater installed in the cooking chamber.

[0004] FIGS. 1 and 2 illustrate a heater installation structure of a conventional heating cooker. As shown in FIGS. 1 and 2, the conventional heating cooker includes a cooking chamber 2 formed in a main body 1 and a heater 3 installed at an inner upper portion of the cooking chamber 2 to heat the cooking chamber 2. The heater 3 is installed adjacent to an upper plate 4 which defines an upper portion of the cooking chamber 2. Further, a protruding portion 5 protruded upward is disposed on the upper plate 4 to minimize deformation caused by heat of the heater 3. A rear end portion of the upper plate 4 is coupled to a rear plate 6 of the main body 1 by welding.

[0005] In the above-mentioned heating cooker, since a welding line 7 of the rear end portion of the upper plate 4 and the rear plate 6 is formed in a linear shape, a coupling portion of the upper plate 4 and the rear plate 6 may be deformed due to high heat of the heater 3. When the upper plate 4 is deformed, paint or a coating layer of a lower surface of the upper plate 4 (upper surface of the cooking chamber) may be peeled off.

[0006] Further, in the above-mentioned heating cooker, although the protruding portion 5 is disposed on the upper plate 4, the protruding portion 5 has a shape incapable of accommodating the heater 3 and, thus, the heater 3 is positioned below the upper plate 4 (the inside of the cooking chamber), thereby reducing the volume of the cooking chamber 2.

SUMMARY OF THE INVENTION

[0007] The present invention has been made in order to solve the above problems. It is an aspect of the invention to provide a heating cooker capable of minimizing deformation of an upper plate and expanding the volume

of a cooking chamber.

[0008] In accordance with an aspect of the invention, there is provided a heating cooker comprising: a main body which includes an upper plate and a rear plate to define a cooking chamber; and a protruding portion which is formed by protruding a portion of the upper plate upward, wherein the protruding portion is extended to a rear end portion of the upper plate such that a rear end thereof is coupled to the rear plate.

[0009] Preferably, the rear end portion of the upper plate is formed to be bent in a trapezoidal shape and the bent portion is welded to the rear plate.

[0010] Preferably, the heating cooker further includes a heater disposed at an inner upper portion of the cooking chamber, wherein the protruding portion has a size capable of accommodating the heater and accommodates the heater therein.

[0011] Preferably, the heater is coupled to the rear plate while being accommodated in the protruding portion.

[0012] Preferably, the heater includes a first heater and a second heater which are respectively installed at inner opposite sides of the protruding portion, and the first heater and the second heater are coupled to the rear plate, respectively.

[0013] In accordance with another aspect of the invention, there is provided a heating cooker comprising: a main body which includes an upper plate and a side plate to define a cooking chamber; and a protruding portion which is formed by protruding a portion of the upper plate upward, wherein the protruding portion is extended to a side end portion of the upper plate such that a side end thereof is coupled to the side plate.

[0014] Preferably, the side end portion of the upper plate is formed to be bent in a trapezoidal shape and the bent portion is welded to the side plate.

[0015] Preferably, the heating cooker further includes a heater disposed at an inner upper portion of the cooking chamber, wherein the protruding portion has a size capable of accommodating the heater and accommodates the heater therein. The heater is coupled to the side plate while being accommodated in the protruding portion.

[0016] Preferably, the heater includes a first heater and a second heater which are respectively installed at inner opposite sides of the protruding portion, and the first heater and the second heater are coupled to the side plate, respectively.

[0017] The heating cooker according to the present invention includes the protruding portion protruded upward from the upper plate, wherein the protruding portion is extended to a rear end or a side end of the upper plate, and the rear end or the side end of the upper plate including a bent portion of the protruding portion is coupled to the rear plate or the side plate by welding. Accordingly, the stiffness of the upper plate is improved and the strength of the coupling portion is also remarkably improved compared to a conventional coupling structure of a linear shape. Thus, even though the upper plate is heat-

ed by the heater, the upper plate is hardly deflected or deformed.

[0018] Further, in the heating cooker according to the present invention, the protruding portion protruded upward from the upper plate is extended to the rear end or the side end of the upper plate, thereby accommodating the heater in the protruding portion. Thus, the heater is prevented from being protruded into the cooking chamber, thereby expanding the volume of the cooking chamber.

[0019] Additional aspects and/or advantages of the 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

[0020] These and/or other aspects and advantages of the exemplary embodiments of the invention will become apparent and more readily appreciated from the following description of the embodiments, taken in conjunction with the accompanying drawings, of which:

FIG. 1 illustrates a cross-sectional view showing a heater installation structure of a conventional heating cooker;

FIG. 2 illustrates a perspective view showing the heater installation structure of the conventional heating cooker;

FIG. 3 illustrates a cross-sectional view showing a heating cooker according to a first embodiment of the present invention;

FIG. 4 illustrates a cross-sectional view taken along a line IV-IV' of FIG. 3;

FIG. 5 illustrates a perspective view showing configurations of a heater and a heater accommodating portion of the heating cooker according to the first embodiment of the present invention;

FIG. 6 illustrates a perspective view showing a coupling structure of the heater accommodating portion and a rear plate of the heating cooker according to the first embodiment of the present invention;

FIG. 7 illustrates a perspective view showing configurations of a heater and a heater accommodating portion of a heating cooker according to a second embodiment of the present invention;

FIG. 8 illustrates a perspective view showing the heater and the heater accommodating portion of the heating cooker according to the second embodiment of the present invention, which shows a modified example of a second protruding portion; and

FIG. 9 illustrates a cross-sectional view showing a heating cooker according to a third embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0021] Reference will now be made in detail to exemplary embodiments of the present invention, examples of which are illustrated in the accompanying drawings, wherein like reference numerals refer to like elements throughout. The embodiments are described below to explain the present invention by referring to the figures.

[0022] Hereinafter, embodiments of the present invention will be described in detail with reference to the accompanying drawings.

[0023] FIGS. 3 to 6 illustrate a heating cooker according to a first embodiment of the present invention. As shown in FIG. 3, the heating cooker includes a cooking chamber 11 which is disposed inside the heating cooker to cook food F and a main body 10 which includes a machine room 12 to install various machine parts.

[0024] The main body 10 includes an external case 13 forming an outer shape and an internal case 20 installed in the external case 13 to define the cooking chamber 11. As shown in FIG. 4, the main body 10 includes a front plate 14 and a rear plate 15. An upper plate 21, a lower plate 22 and two opposite side plates 23 and 24 of the internal case 20 are coupled to the front plate 14 and the rear plate 15, respectively. An opening 16 disposed at the front side of the cooking chamber 11 is opened and closed by a door 17 installed at the front plate 14 of the main body 10. A cover 18 is installed on a rear surface of the rear plate 15 to cover machine parts (not shown), wires and the like disposed at the outside of the rear plate 15.

[0025] As shown in FIG. 3, the machine room 12 is disposed at the side of the cooking chamber 11 at the outside of internal case 20. A high frequency supply device (magnetron) 31 which supplies high frequency waves into the cooking chamber 11 and a high voltage transformer 32, which applies high voltage to the high frequency supply device 31, are installed in the machine room 12. The high frequency supply device 31 is mounted at the outside of the side plate 24 of the internal case 20. A high frequency guide path 33 is provided at the inside of the side plate 24 to guide high frequency waves generated from the high frequency supply device 31 into the cooking chamber 11. A cooling fan 34 is installed in the machine room 12 to cool the parts inside the machine room 12.

[0026] A food mounting portion 40 is provided at a lower portion of the cooking chamber 11. The food mounting portion 40 includes a turn table 41 which is rotatably installed at the bottom of the cooking chamber 11 and a driving motor 42 mounted at a lower portion of the lower plate 22 of the internal case 20 to rotate the turn table 41. The driving motor 42 rotates the turn table 41, thereby rotating food F during cooking. Although a turn table type food mounting portion is shown in FIG. 2, the food mounting portion may be a cooking shelf, a trivet or the like installed in the cooking chamber 11.

[0027] A heater 50 is installed at an upper portion of the cooking chamber 11 to heat the food F of the food mounting portion 40. As occasion demands, the high frequency supply device 31 or the heater 50 may be selectively operated to heat the food F, and both the high frequency supply device 31 and the heater 50 may be operated to heat the food F, thereby increasing cooking efficiency.

[0028] A protruding portion 51 is disposed on the upper plate 21 of the internal case 20 to reinforce a coupling portion of the upper plate 21 and the rear plate 15 while reinforcing the stiffness of the upper plate 21. As shown in FIGS. 3 to 6, the protruding portion 51 is formed such that a portion of the upper plate 21 is protruded upward. As shown in FIGS. 4 to 6, the protruding portion 51 is extended to a rear end portion of the upper plate 21 such that a rear end of the protruding portion 51 is coupled to the rear plate 15.

[0029] As shown in FIGS. 5 and 6, a rear end portion of the upper plate 21 including the rear end of the protruding portion 51 is welded to the rear plate 15. When the upper plate 21 is coupled to the rear plate 15 as shown in FIGS. 5 and 6, a coupling portion 26 is formed to be bent in a trapezoidal shape, thereby remarkably improving the strength of the coupling portion 26 compared to a conventional coupling structure of a linear shape. In particular, since the rear end (bent portion) of the protruding portion 51 is welded directly to the rear plate 15 in the present invention, a welding line is extended and, at the same time, structural stiffness is highly improved. Thus, even though the upper plate 21 is heated by the heater 50 during cooking, the upper plate 21 is hardly deflected or deformed.

[0030] As shown in FIG. 5, the heater 50 is formed by being bent several times on a plane to heat a large region at an upper portion of the cooking chamber 11. The heater 50 has opposite ends 50a and 50b which are connected to wires and fixed to the rear plate 15 by a coupling part 50c.

[0031] As shown in FIGS. 4 and 5, the protruding portion 51 formed on the upper plate 21 has a size larger than that of the heater 50 and is extended toward the rear plate 15 coupled to the heater 50, thereby completely accommodating the heater 50 therein. By this configuration, since the protruding portion 51 accommodates the heater 50 therein while functioning to reinforce the stiffness of the upper plate 21, as shown in FIGS. 3 and 4, the heater 50 is prevented from being protruded into the cooking chamber 11. Thus, it is possible to enlarge the volume of the cooking chamber 11.

[0032] Although the heater 50 is accommodated in the protruding portion 51 in this embodiment, the present invention is not limited thereto. The protruding portion 51 may have a size smaller than that of the heater 50 so as not to accommodate the heater 50. Even in this case, as described above, when the protruding portion 51 is extended toward the rear plate 15 to be coupled to the rear plate 15, there still exists an effect of reinforcing the stiff-

ness of the upper plate 21.

[0033] FIG. 7 illustrates a perspective view showing a heater mounting structure of a heating cooker according to a second embodiment of the present invention. In the second embodiment, a first heater 61 and a second heater 62 are installed at inner opposite sides of the protruding portion 51, respectively. The first heater 61 and the second heater 62 are coupled to the rear plate 15, respectively. Components having substantially the same configuration as those of the first embodiment are designated by the same reference numerals.

[0034] When the first heater 61 and the second heater 62 are provided as in the second embodiment, as shown in FIG. 7, a second protruding portion 51a may be additionally installed at the center of the protruding portion 51 to be further protruded downward. By this configuration, it is possible to also increase the stiffness of the protruding portion 51 of the upper plate 21. Further, as shown in FIG. 8, when the second protruding portion 51a is extended to the rear end portion of the upper plate 21 to be coupled to the rear plate 15, it is possible to firmly couple the upper plate 21 and the rear plate 15.

[0035] FIG. 9 illustrates a cross-sectional view showing a heating cooker according to a third embodiment of the present invention. In the third embodiment, an installation position of a heater 70 and a surrounding structure thereof are modified. Since the other structure is substantially the same as that of the first embodiment, components having substantially the same configuration as those of the first embodiment are designated by the same reference numerals.

[0036] In the third embodiment, a protruding portion 71 protruded upward is extended toward a side plate 23' and an end portion thereof is coupled to the side plate 23' of the internal case 20. Further, the heater 70 is fixed on the side plate 23' of the internal case 20. That is, a side end of an upper plate 21' including a side end of the protruding portion 71 is coupled to an upper end of the side plate 23' by welding. Also in this case, a coupling portion of the side end of an upper plate 21' and the upper end of the side plate 23' is formed to be bent in a trapezoidal shape, thereby improving the stiffness of the coupling portion of the upper plate 21' and the side plate 23' compared to a conventional case in the same way as in the first embodiment. Thus, even though the upper plate 21' is heated by the heater 70, the upper plate 21' is hardly deflected or deformed. A single heater may be installed in the protruding portion 71 as in the first embodiment, or a first heater and a second heater may be installed at opposite sides of the protruding portion 71 as in the second embodiment. Further, when the first and second heaters are provided, a second protruding portion may be provided at the protruding portion as in the second embodiment.

[0037] Although embodiments of the present invention have been shown and described, it would be appreciated by those skilled in the art that changes may be made in this embodiment without departing from the principles

and spirit of the invention, the scope of which is defined in the claims and their equivalents.

Claims

1. A heating cooker comprising:

a main body which includes an upper plate and a rear plate to define a cooking chamber; and a protruding portion which is formed by protruding a portion of the upper plate upward, wherein the protruding portion is extended to a rear end portion of the upper plate.

2. The heating cooker according to claim 1, wherein the rear end portion of the upper plate is formed to be bent in a trapezoidal shape and the bent portion is welded to the rear plate.

3. The heating cooker according to claim 1, further comprising a heater disposed at an inner upper portion of the cooking chamber, wherein the protruding portion has a size capable of accommodating the heater and accommodates the heater therein.

4. The heating cooker according to claim 3, wherein the heater is coupled to the rear plate while being accommodated in the protruding portion.

5. The heating cooker according to claim 3, wherein the heater includes a first heater and a second heater which are respectively installed at inner opposite sides of the protruding portion, and the protruding portion further includes a second protruding portion which is protruded downward between the first heater and the second heater.

6. The heating cooker according to claim 5, wherein the second protruding portion is extended to the rear end portion of the upper plate to be coupled to the rear plate.

7. A heating cooker comprising:

a main body which includes an upper plate and a side plate to define a cooking chamber; and a protruding portion which is formed by protruding a portion of the upper plate upward, wherein the protruding portion is extended to a side end portion of the upper plate.

8. The heating cooker according to claim 7, wherein the side end portion of the upper plate is formed to be bent in a trapezoidal shape and the bent portion is welded to the side plate.

9. The heating cooker according to claim 7, further comprising a heater disposed at an inner upper portion of the cooking chamber, wherein the protruding portion has a size capable of accommodating the heater and accommodates the heater therein.

10. The heating cooker according to claim 9, wherein the heater includes a first heater and a second heater which are respectively installed at inner opposite sides of the protruding portion, and the protruding portion further includes a second protruding portion which is protruded downward between the first heater and the second heater.

11. A heating cooker comprising:

a main body which includes an upper plate to define a cooking chamber;
a heater which heats an inside of the cooking chamber; and
a heater accommodating portion which is formed by protruding a portion of the upper plate upward and accommodates the heater therein.

FIG. 1

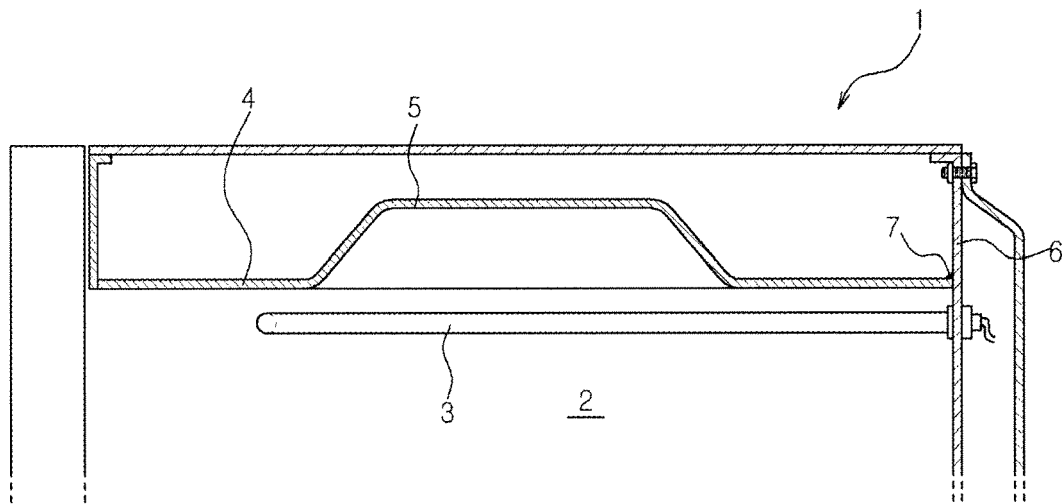


FIG. 2

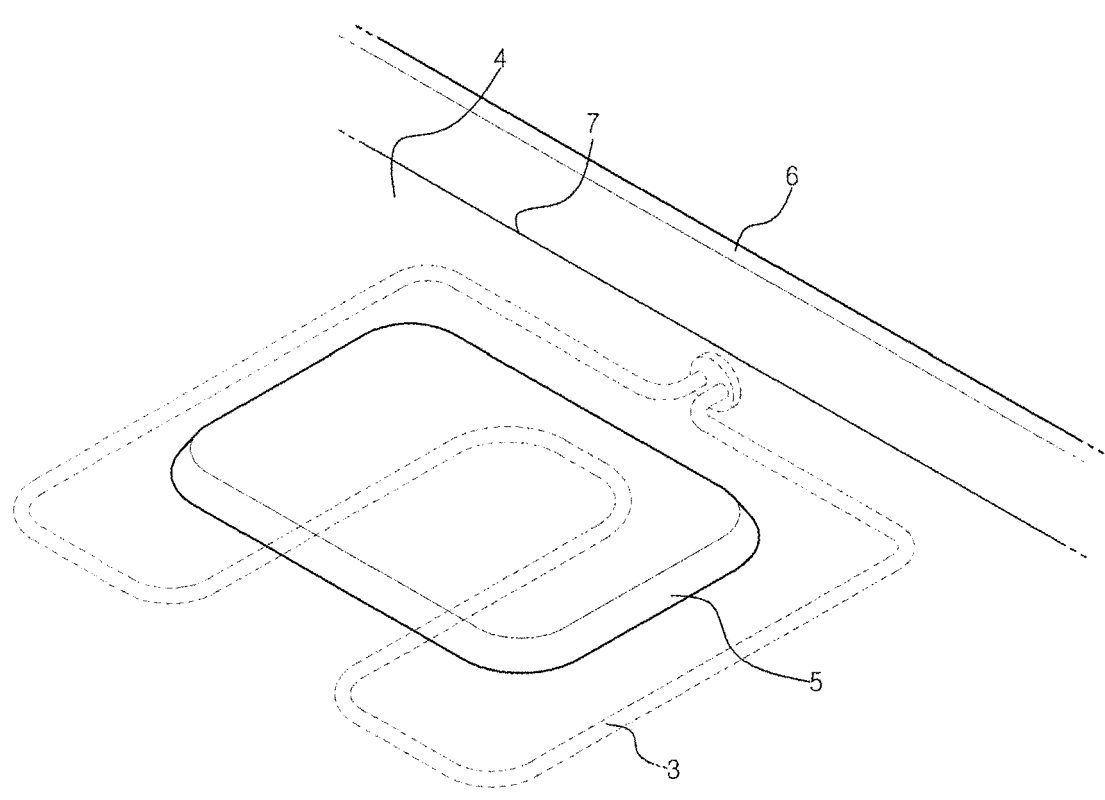


FIG. 3

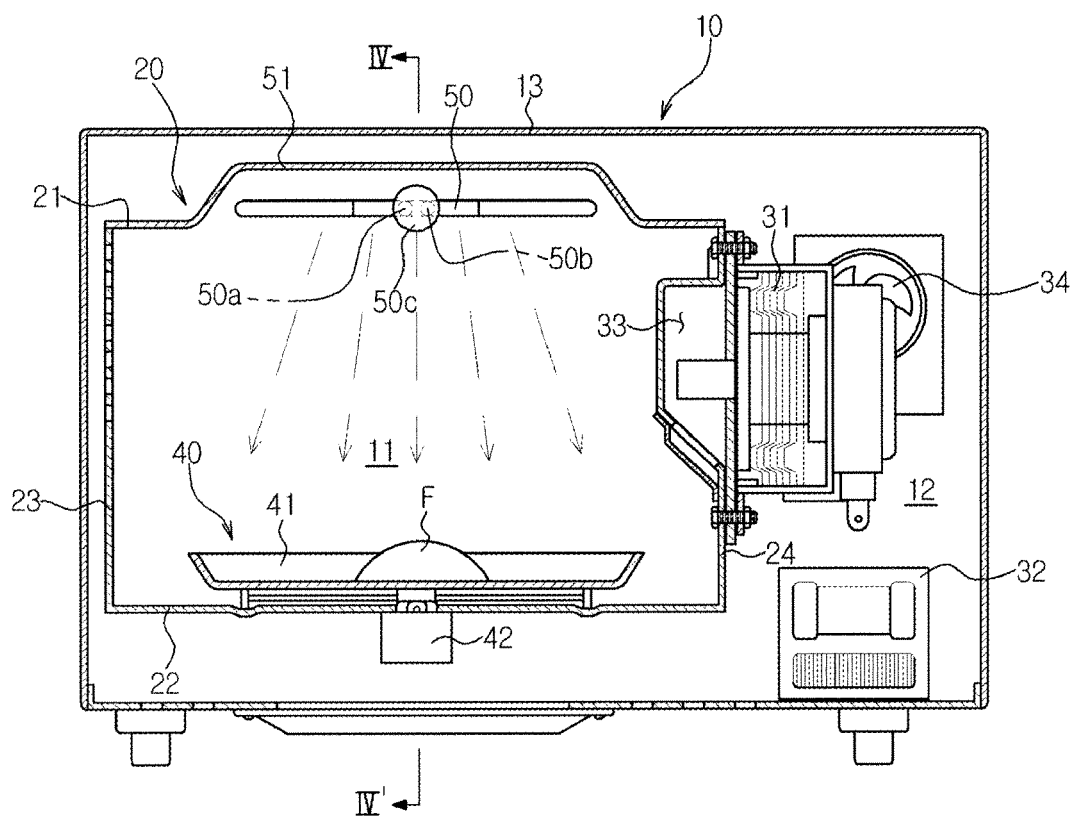


FIG. 4

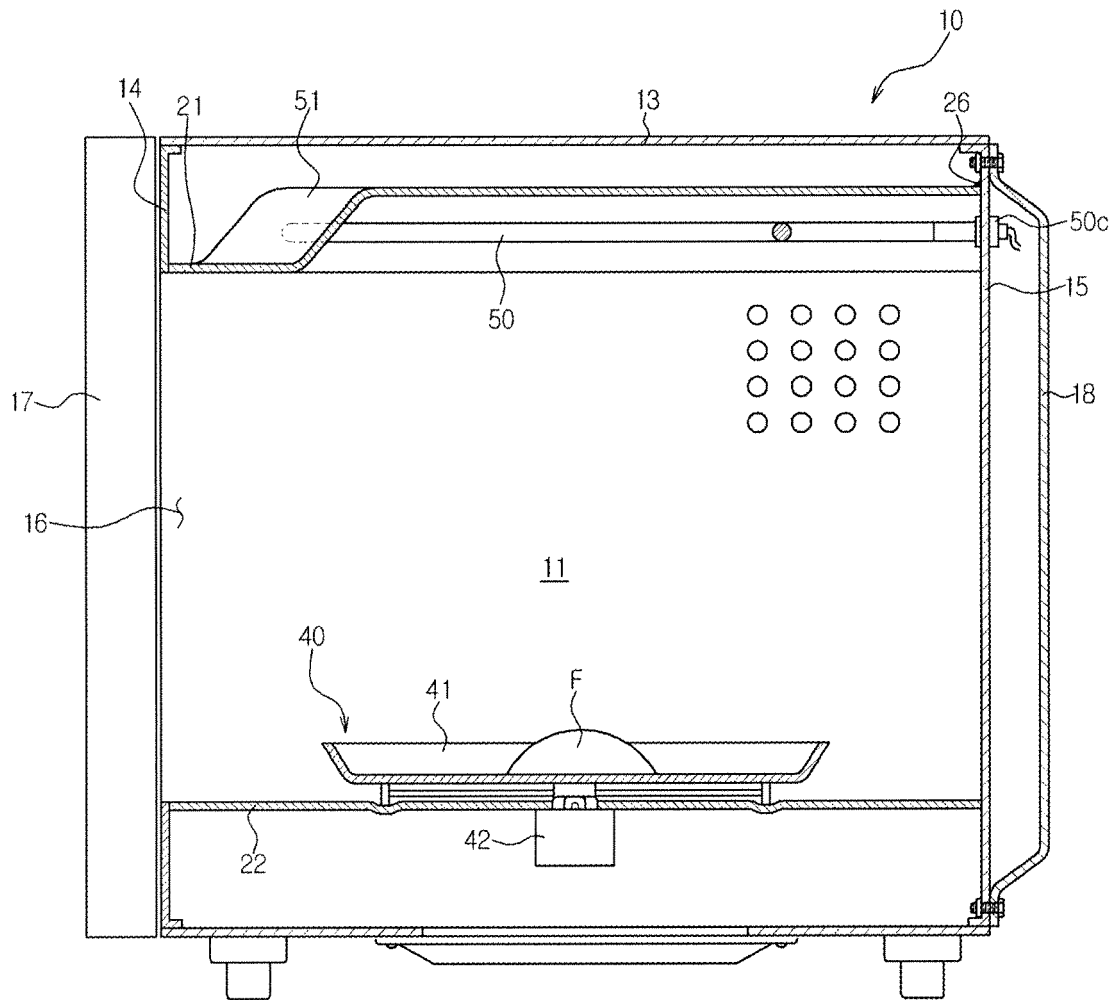


FIG. 5

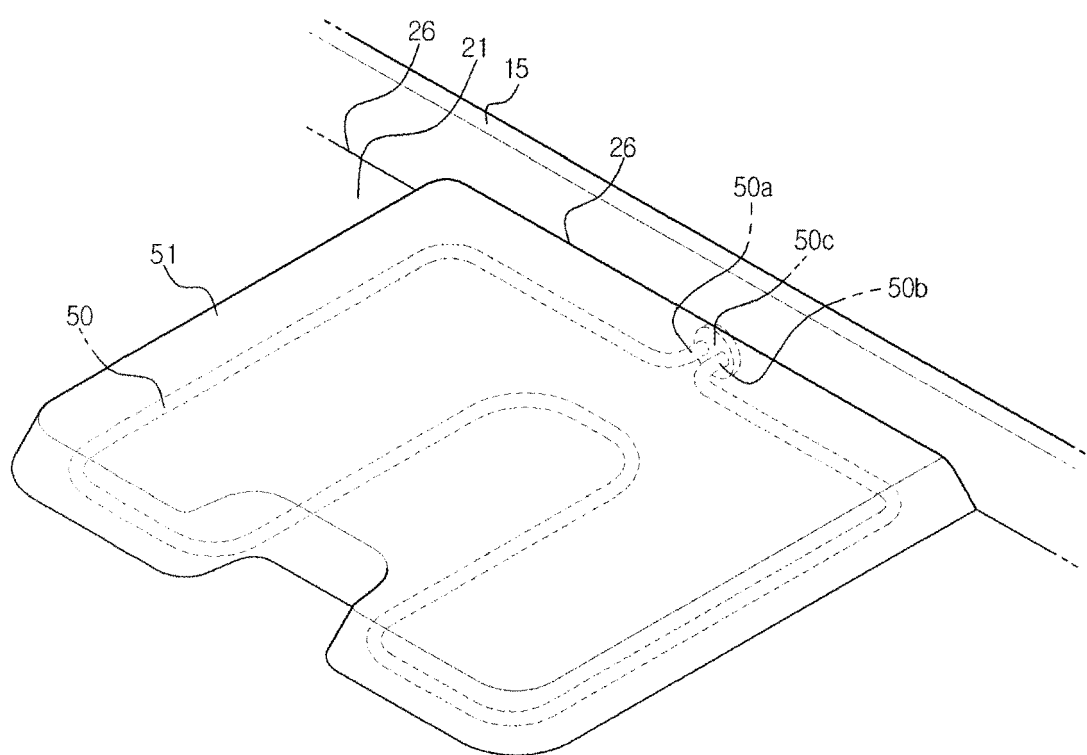


FIG. 6

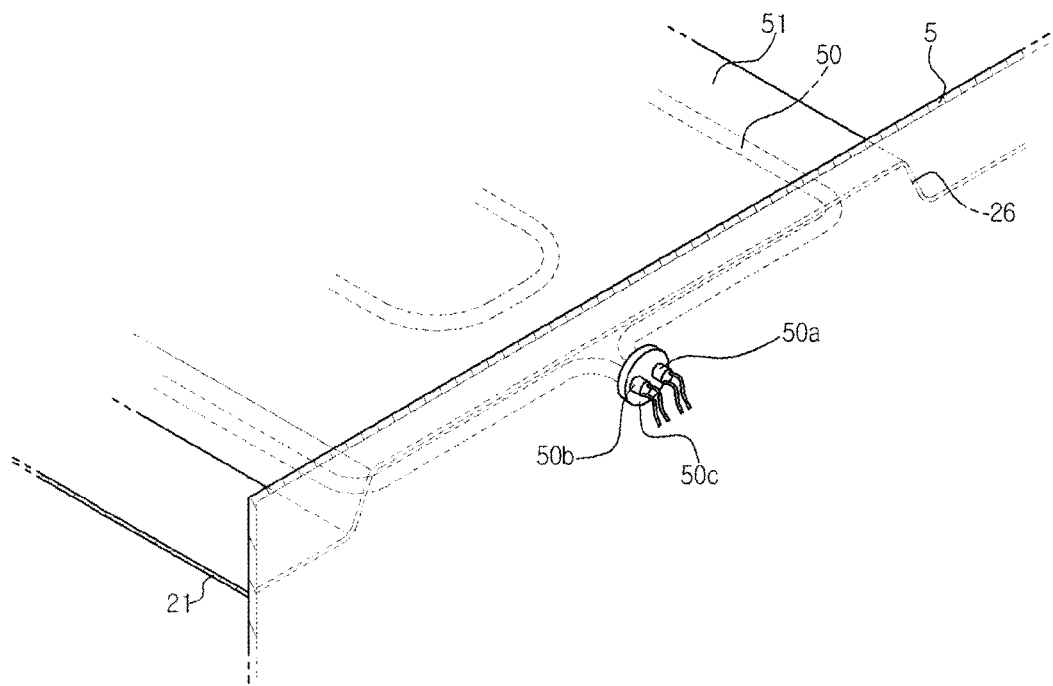


FIG. 7

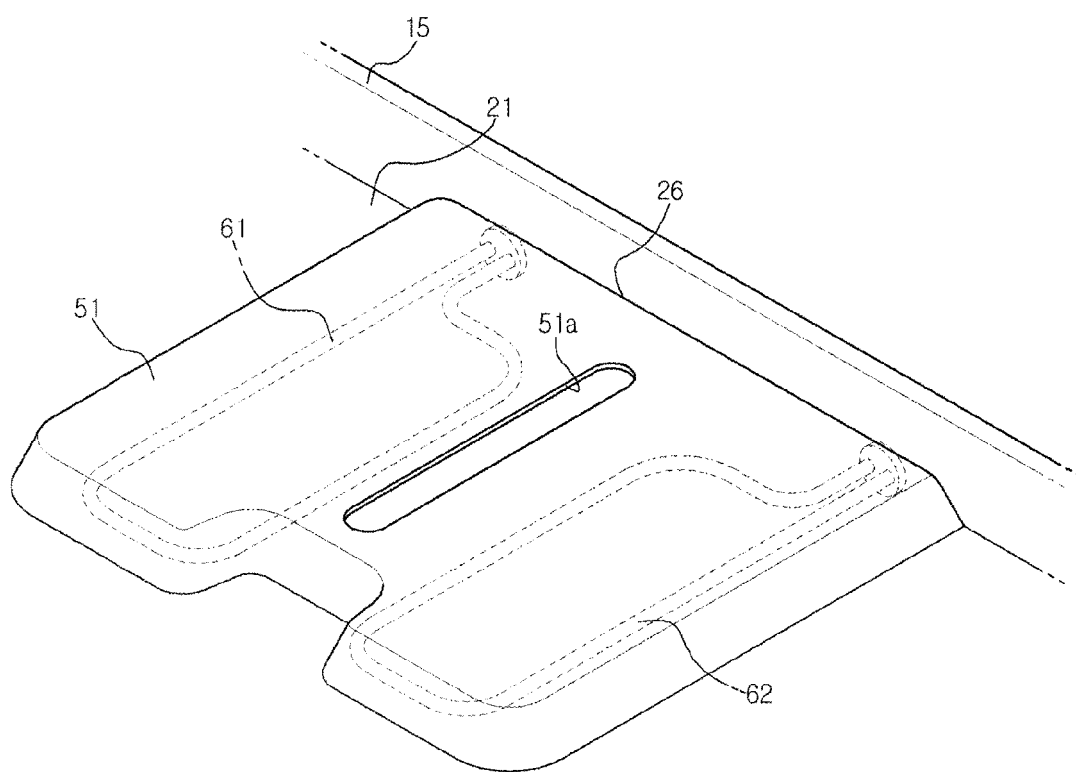


FIG. 8

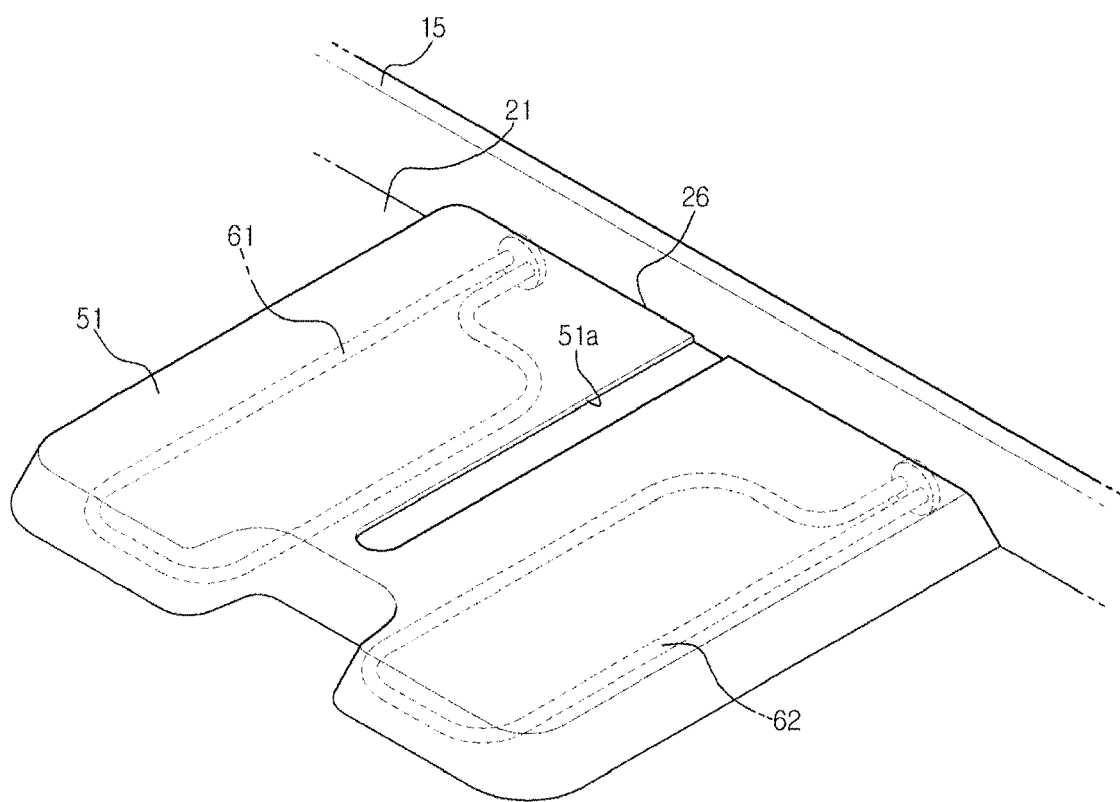
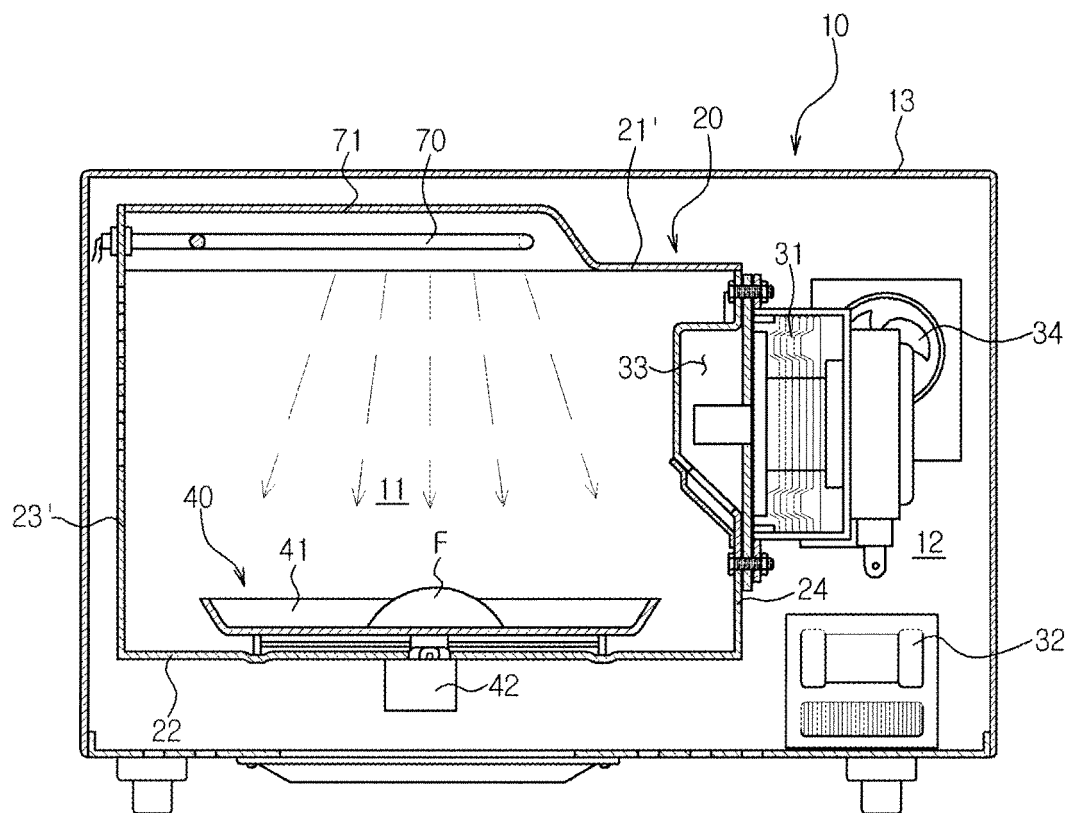


FIG. 9



REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- KR 0082732 [0001]