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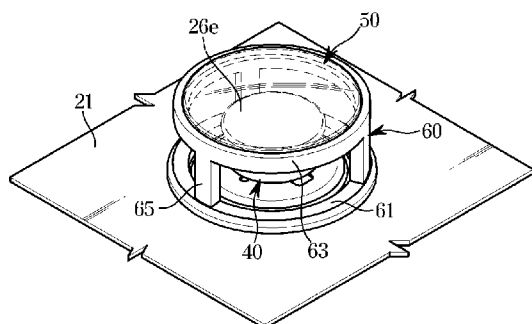
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(54) Title: COOKING APPLIANCE



(57) Abstract: Provided is a cooking apparatus. The cooking apparatus includes a counter, a burner arranged to protrude upwards from the counter to heat a food container, and a grate arranged on top of the counter to support the food container. The cooking apparatus also includes a simmer plate formed of a glass material and arranged between the grate and the burner to retard transfer of heat produced from the burner to the food container, and a support arranged on top of the counter to support the simmer plate.



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## Description

### Title of Invention: COOKING APPLIANCE

#### Technical Field

- [1] The disclosure relates to a cooking appliance improved to enhance cooking performance with a simmer burner.

#### Background Art

- [2] Cooking appliances are devices for cooking foods by heating, which provide various functions related to cooking, such as heating, thawing, drying, and sterilizing of an object. The cooking appliance include, for example, ovens such as gas ovens or electric ovens, microwave heating devices (also referred to as microwaves), gas ranges, oven ranges, electric ranges, gas grills or electric grills.
- [3] The oven range has a combined form of an oven and a gas cooktop which is arranged on top of the oven. The gas cooktop of the oven range or the gas range includes a plurality of burners to heat a food container. The plurality of burners include a simmer burner that slowly heats the food container. The simmer burner is used to slowly heat a food by keeping flames at a minimum, so it is important to maintain the flames at a minimum because the food might be burned and stuck to the container when a large amount of heat is transferred to the food.
- [4] As the simmer burner keeps the flames at a minimum, the flames may go out when wind blows from the outside or a user suddenly turns an associated knob, and the unburned gas may leak out, causing the risk of fire and personal liability (PL) accidents. Furthermore, the simmer burner has constraints on the design to keep it small in size.

#### Disclosure of Invention

##### Technical Problem

- [5] The disclosure provides a cooking appliance capable of enhancing cooking performance with a simmer burner by retarding transfer of heat generated from the simmer burner to a food container.
- [6] The disclosure also provides a cooking appliance capable of preventing accidents caused by flames of a simmer burner going out by increasing an amount of gas required for the simmer burner to keep flames at a minimum.

##### Solution to Problem

- [7] According to an embodiment of the disclosure, a cooking appliance includes a counter, a burner arranged to protrude upwards from the counter to heat a food container, a grate arranged on top of the counter to support the food container, a simmer plate arranged between the grate and the burner to retard transfer of heat

produced from the burner to the food container, and formed of a glass material, and a support arranged on top of the counter to support the simmer plate.

[8] The burner may include a simmer burner slowly heating the food container, and the simmer plate may be arranged between the grate and the simmer burner.

[9] The support may include a supporting portion for supporting the simmer plate, and the simmer plate may be detachably supported by the support.

[10] The support may be detachably fixed onto the counter.

[11] The counter may include a protruding portion arranged to protrude upwards from the counter to fix the support.

[12] The support may include a prop detachably fixed to the protruding portion, and a plurality of connectors connecting the prop to the supporting portion.

[13] The support may be provided in the plural and coupled onto the counter.

[14] The counter may include a plurality of coupling holes to which the plurality of supports are inserted and coupled.

[15] The plurality of supports may each include a coupling projection inserted and coupled to one of the plurality of coupling holes, a supporting portion supporting the simmer plate, and a connector connecting the supporting portion to the coupling projection.

[16] The cooking appliance may further include a ring-shaped heater arranged on top of the simmer burner to heat the food container when heated by flames generated from the simmer burner.

[17] The simmer plate may have the form of a circle with a diameter larger than the heater.

[18] The food container may be heated by convection heat resulting from flames generated from the simmer burner reaching the simmer plate and losing energy and radiation heat from the simmer plate heated by the flames generated from the simmer burner.

[19] The flames generated from the simmer burner may be transferred to the food container by radiation heat from the simmer plate having a diameter larger than the heater, so that transfer of the heat to the food container may be retarded.

[20] The simmer plate may be formed of a transparent glass material, allowing flames generated from the simmer burner to be checked from above the simmer plate.

[21] According to another embodiment of the disclosure, a cooking appliance includes a counter; a burner arranged to protrude upwards from the counter to heat a food container, and including a simmer burner slowly heating the food container; a grate arranged on top of the counter to support the food container; a simmer plate arranged between the grate and the simmer burner to retard transfer of heat produced from the simmer burner to the food container; and a support detachably fixed on the counter to

support the simmer plate.

[22] The simmer plate may be formed of a transparent glass material, allowing flames generated from the simmer burner to be checked from above the simmer plate.

[23] The simmer plate may be formed of a stone material.

[24] The counter may include a protruding portion arranged to protrude upwards from the counter to fix the support.

[25] The support may include a supporting portion supporting the simmer plate, a prop detachably fixed to the protruding portion, and a plurality of connectors connecting the prop to the supporting portion.

[26] According to another embodiment of the disclosure, a cooking appliance includes a counter; a burner arranged to protrude upwards from the counter to heat a food container, and including a simmer burner slowly heating the food container; a ring-shaped heater arranged on top of the simmer burner to heat the food container when heated by flames generated from the simmer burner; a grate arranged on top of the counter to support the food container; a simmer plate arranged between the grate and the simmer burner, and having the form of a circle with a diameter larger than the heater to retard transfer of radiation heat from the flames generated from the simmer burner to the food container; and a support arranged on top of the counter to support the simmer plate.

### **Advantageous Effects of Invention**

[27] According to embodiments of the disclosure, personal liability (PL) accidents may be avoided by preventing flames of a simmer burner from going out.

[28] Cooking performance with a simmer burner may also be enhanced by retarding transfer of heat generated from the simmer burner to a food container.

[29] Furthermore, the simmer burner has a structure to look large on the exterior to overcome design constraints that the simmer burner needs to remain small in size.

### **Brief Description of Drawings**

[30] FIG. 1 is a perspective view of a cooking appliance, according to an embodiment of the disclosure;

[31] FIG. 2 is a plan view of a cooking appliance with a counter removed therefrom, according to an embodiment of the disclosure;

[32] FIG. 3 is a perspective view of a simmer burner with a simmer plate arranged thereon, according to an embodiment of the disclosure;

[33] FIG. 4 shows the simmer burner shown in FIG. 3 with the simmer plate separated from a support;

[34] FIG. 5 shows the simmer burner shown in FIG. 3 with the simmer plate and the support separated therefrom;

- [35] FIG. 6 is a side view of a simmer plate and a support, which are arranged on a counter, according to an embodiment of the disclosure;
- [36] FIG. 7 is a perspective view of a simmer burner with a simmer plate arranged thereon, according to another embodiment of the disclosure;
- [37] FIG. 8 shows the simmer burner shown in FIG. 7 with the simmer plate separated from a support;
- [38] FIG. 9 shows a support being coupled onto the top of a counter, according to an embodiment of the disclosure; and
- [39] FIG. 10 is a side view of a simmer plate and a support, which are arranged on a counter, according to another embodiment of the disclosure.

### **Mode for the Invention**

- [40] Embodiments and features as described and illustrated in the disclosure are merely examples, and there may be various modifications replacing the embodiments and drawings at the time of filing this application.
- [41] Throughout the drawings, like reference numerals refer to like parts or components.
- [42] The terminology used herein is for the purpose of describing particular embodiments only and is not intended to limit the disclosure. It is to be understood that the singular forms "a," "an," and "the" include plural references unless the context clearly dictates otherwise. It will be further understood that the terms "comprises" and/or "comprising," when used in this specification, specify the presence of stated features, integers, steps, operations, elements, and/or components, but do not preclude the presence or addition of one or more other features, integers, steps, operations, elements, components, and/or groups thereof.
- [43] The terms including ordinal numbers like "first" and "second" may be used to explain various components, but the components are not limited by the terms. The terms are only for the purpose of distinguishing a component from another. Thus, a first element, component, region, layer or chamber discussed below could be termed a second element, component, region, layer or section without departing from the teachings of the disclosure. Descriptions shall be understood as to include any and all combinations of one or more of the associated listed items when the items are described by using the conjunctive term "~ and/or ~," or the like.
- [44] The terms "front", "rear", "upper", "lower", "top", and "bottom" as herein used are defined with respect to the drawings, but the terms may not restrict the shape and position of the respective components.
- [45] Embodiments of the present disclosure will now be described in detail with reference to accompanying drawings.
- [46] FIG. 1 is a perspective view of a cooking appliance, according to an embodiment of

the disclosure. FIG. 2 is a plan view of a cooking appliance with a cooktop removed therefrom, according to an embodiment of the disclosure.

- [47] Although a cooking appliance is shown as an oven range with a combination of an oven 10 and a cooktop 20 in the drawings, it is not limited thereto. For example, the cooking appliance may be a gas range.
- [48] Referring to FIGS. 1 and 2, the cooking appliance may include the oven 10 and the cooktop 20. The cooktop 20 may be placed on top of the oven 10. A cavity (not shown) may be formed inside the oven 10 to contain and cook foods.
- [49] The oven 10 may include a door 11 to open or close the front of the cavity. The door 11 may include a window 13 that allows the cooking progress of a food contained in the cavity to be seen with a naked eye.
- [50] A knob 30 may be provided on a top front side of the cooking appliance. The knob 30 may be provided in the plural. Although there are five knobs 30 shown in FIG. 1 to correspond to the numbers of burners 24 and heaters 26, which will be described below, the number of the knobs 30 is not limited thereto. For example, more or less than five knobs 30 may be arranged to correspond to the number of the burners 24 or the heaters 26.
- [51] The cooktop 20 may include a counter 21, the burner 24 arranged to protrude upwards from the counter 21 for generating flames to heat a food container (not shown), and the heater 26 arranged on top of the burner 24 and heated by the flames generated by the burner 24 to heat the food container.
- [52] A grate 27 may be arranged on top of the counter 21 to support the food container. A food may be contained in the food container.
- [53] The burner 24 may be arranged to protrude upwards from the counter 21, and may receive a gas and generate flames. The flames generated from the burner 24 may heat the heater 26 located above the burner 24. The burner 24 may include five burners 24a, 24b, 24c, 24d, and 40. Although five burners 24 are shown in FIG. 2, embodiments of the disclosure are not limited thereto. For example, there may be less or more than five burners 24. The burners 24a, 24b, 24c, 24d, and 40 may be connected to five knobs 30a, 30b, 30c, 30d, and 30e, respectively. The knobs 30 may each be connected to a valve (not shown) arranged to control at least one of opening/closing of gas or an amount of gas. Accordingly, an amount of the gas supplied to the burner 24 and whether to open or close the gas may be determined by controlling the knob 30. Operations of the heaters 26a, 26b, 26c, 26d, and 26e may be controlled by controlling the knobs 30a, 30b, 30c, 30d, and 30e, respectively.
- [54] The burner 24 may include a simmer burner 40 that slowly heats the food container. The cooktop 20 has a simmer function to slowly heat the food container by keeping flames at a minimum. Hence, the simmer burner 40 and the heater 26e located on top

of the simmer burner 40 may have a relatively small size. As the simmer burner needs to keep the flames at a minimum, the flames may go out when wind blows from the outside or a user suddenly turns the associated knob 30, and the unburned gas may leak out, causing the risk of fire and personal liability (PL) accidents. To prevent this, a simmer plate 50 may be arranged on top of the simmer burner 40. The simmer plate 50 may allow the minimum flames generated from the simmer burner 40 to grow larger than without the simmer plate 50. This will be described later in connection with FIG. 3.

[55] Each of the burners 24a, 24b, 24c, 24d, and 40 may receive gas through a connecting pipe 28. There may be five connecting pipes 28. The five connecting pipes 28a, 28b, 28c, 28d, and 28e may be connected to the burners 24a, 24b, 24c, 24d, and 40, respectively.

[56] The heater 26 may be arranged on top of the burner 24 and may be heated by the flames generated from the burner 24. The heater 26 may use the gas as a source of energy. There may be five heaters 26. The five heaters 26a, 26b, 26c, 26d, and 26e may be connected to the five knobs 30a, 30b, 30c, 30d, and 30e, respectively. The heater 26 may be shaped like a circle.

[57] FIG. 3 is a perspective view of a simmer burner with a simmer plate arranged thereon, according to an embodiment of the disclosure. FIG. 4 shows the simmer burner shown in FIG. 3 with the simmer plate separated from a support. FIG. 5 shows the simmer burner shown in FIG. 3 with the simmer plate and the support separated therefrom. FIG. 6 is a side view of a simmer plate and a support, which are arranged on a counter, according to an embodiment of the disclosure.

[58] Referring to FIGS. 3 to 6, the simmer plate 50 may be arranged on top of the simmer burner 40. The simmer plate 50 may be arranged between the grate 27 and the simmer burner 40 (see FIG. 1). The simmer plate 50 may retard transfer of heat produced from the simmer burner 40 to the food container.

[59] The simmer plate 50 may be formed of a transparent glass material. In this case, the user may check the flames generated from the simmer burner 40 from above the counter 21. Accordingly, the user may check from above the counter 21 whether the flames generated from the simmer burner 40 is maintained or goes out. The simmer plate 50 is not limited to being formed of the glass material. For example, the simmer plate 50 may be formed of another material such as a stone.

[60] The simmer plate 50 may be shaped like a circle. The simmer plate 50 may have a larger diameter than the heater 26e arranged on top of the simmer burner 40. As the simmer plate 50 has a larger diameter than the heater 26e, it may be slowly heated by the flames generated from the simmer burner 40.

[61] The simmer plate 50 may be heated by the flames generated from the simmer burner

40. The heated simmer plate 50 may heat the food container. The flames generated from the simmer burner 40 first heat the simmer plate 50 and the heated simmer plate 50 then heats the food container, so the heat applied to the food container from the simmer burner 40 may be retarded.

[62] In other words, without the simmer plate 50, the flames generated from the simmer burner 40 may be transferred to the food container through convection heat and radiation heat. On the contrary, with the simmer plate 50, a portion of the flames generated from the simmer burner 40 reaches the simmer plate 50 and lose energy, and may then be transferred to the food container by convection heat. Furthermore, the rest of the flames generated from the simmer burner 40 may heat the simmer plate 50 and radiation heat from the heated simmer plate 50 may be transferred to the food container. Accordingly, the heat applied to the food container from the simmer burner 40 may be retarded by the simmer plate 50. Accordingly, the simmer plate 50 may allow the simmer burner 40 to generate relatively large flames as compared with a case that the simmer plate 50 is not provided. Allowing the simmer burner 40 to generate relatively large flames may increase a minimum amount of gas required by the simmer burner 40 to generate the flames. As such, the simmer plate 50 may allow the simmer burner 40 to generate relatively large flames as well as slowly heat the food container, thereby avoiding the risk of fire and PL accidents. Furthermore, this may enhance cooking performance in a case of cooking a food in need of the simmer function. In addition, design constraints that the simmer burner 40 needs to be small in size may be overcome by using the simmer plate 50 of a relatively large size.

[63] The simmer plate 50 may be supported by the support 60. The support 60 may be arranged on top of the counter 21 to support the simmer plate 50. The simmer plate 50 may be detachably supported by the support 60. The support 60 may be detachably fixed to the counter 21.

[64] The support 60 may include a prop 61 detachably fixed onto the top of the counter 21, a supporting portion 63 detachably supporting the simmer plate 50, and a connector 65 connecting between the prop 61 and the supporting portion 63.

[65] The counter 21 may include a protruding portion 22 arranged to protrude upwards from the counter 21 in order to detachably fix the prop 61 of the support 60. The protruding portion 22 may be shaped like a circle as a whole. The prop 61 may have the shape of a ring that may be put in and fixed to the protruding portion 22. As the support 60 is detachably fixed to the counter 21, the top surface of the counter 21 may be easily cleaned by separating the support 60 and the simmer plate 50 from the counter 21.

[66] The supporting portion 63 may be shaped like a circle. The supporting portion 63 may be formed to have a portion sunken downwards for the simmer plate 50 to be



settled therein and supported.

[67] The connector 65 may be provided to connect the prop 61 to the supporting portion 63, and may be provided in the plural. Although three connectors 65 are shown in the drawings, embodiments of the disclosure are not limited thereto. For example, there may be more or less than three connectors 65.

[68] FIG. 7 is a perspective view of a simmer burner with a simmer plate arranged thereon, according to another embodiment of the disclosure. FIG. 8 shows the simmer burner shown in FIG. 7 with the simmer plate separated from a support. FIG. 9 shows a support being coupled onto the top of a counter, according to another embodiment of the disclosure. FIG. 10 is a side view of a simmer plate and a support, which are arranged on a counter, according to another embodiment of the disclosure.

[69] Referring to FIGS. 7 to 10, the simmer plate 50 may be arranged on top of the simmer burner 40. The simmer plate 50 may be arranged between the grate 27 and the simmer burner 40 (see FIG. 1). The simmer plate 50 may retard transfer of heat produced from the simmer burner 40 to the food container. The simmer plate 50 in the embodiment of the disclosure is the same as the simmer plate 50 described above in connection with FIGS. 3 to 6, so the description thereof will not be repeated.

[70] The simmer plate 50 may be supported by a support 70. The support 70 may be arranged on top of the counter 21 to support the simmer plate 50. The simmer plate 50 may be detachably supported by the support 70. The support 70 may be coupled to the counter 21. The support 70 may be provided in the plural. Although three supports 70 are shown in the drawings, embodiments of the disclosure are not limited thereto. For example, there may be more or less than three supports 70.

[71] The supports 70 may each include a coupling projection 71 coupled onto the top of the counter 21, a supporting portion 73 detachably supporting the simmer plate 50, and a connector 75 connecting between the coupling projection 71 and the supporting portion 73.

[72] There may be a plurality of coupling holes 23 at the counter 21 to have the supports 70 coupled onto the top of the counter 21. There may be as many coupling holes 23 as the number of the supports 70. Although three coupling holes 23 are shown in the drawings, embodiments of the disclosure are not limited thereto. For example, there may be more or less than three coupling holes 23 depending on the number of the supports 70.

[73] The supporting portion 73 may be formed at the top of the support 70. The supporting portion 73 may be formed to have a portion sunken downwards for the simmer plate 50 to be settled therein and supported.

[74] The connector 75 may be provided to connect the coupling projection 71 to the supporting portion 73.

[75] Several embodiments of the disclosure have been described above, but a person of ordinary skill in the art will understand and appreciate that various modifications can be made without departing the scope of the disclosure. Thus, it will be apparent to those ordinary skilled in the art that the true scope of technical protection is only defined by the following claims.

## Claims

- [Claim 1] A cooking appliance comprising:  
a counter;  
a burner arranged to protrude upwards from the counter and produce heat to heat a food container;  
a grate arranged on a top of the counter to support the food container over the burner to allow the food container to be heated by the heat produced from the burner;  
a simmer plate formed of a glass material and arranged between the grate and the burner to retard transfer of the heat produced from the burner to the food container; and  
a support arranged on the top of the counter to support the simmer plate.
- [Claim 2] The cooking appliance of claim 1, wherein the burner comprises a simmer burner to slowly heat the food container, and the simmer plate is arranged between the grate and the simmer burner.
- [Claim 3] The cooking appliance of claim 2, wherein the support comprises a supporting portion supporting the simmer plate, and the simmer plate is detachable from the support.
- [Claim 4] The cooking appliance of claim 3, wherein the support arranged on the top of the counter is detachable from the counter.
- [Claim 5] The cooking appliance of claim 4, wherein the counter comprises a protruding portion arranged to protrude upwards from the counter and the support is arranged on the protruding portion of the counter.
- [Claim 6] The cooking appliance of claim 5, wherein the support comprises:  
a prop attachable to and detachable from the protruding portion, and a plurality of connectors connecting the prop to the supporting portion.
- [Claim 7] The cooking appliance of claim 2, wherein the support is among a plurality of supports which are coupleable to the counter.
- [Claim 8] The cooking appliance of claim 7, wherein the counter comprises a plurality of coupling holes to which the plurality of supports are inserted and coupled.
- [Claim 9] The cooking appliance of claim 8, wherein the plurality of supports each comprise:  
a coupling projection insertable and coupleable to one of the plurality of coupling holes,  
a supporting portion to support the simmer plate, and

a connector to connect the supporting portion to the coupling projection.

[Claim 10]

The cooking appliance of claim 2, further comprising:  
a ring-shaped heater arranged on a top of the simmer burner to heat the food container when heated by flames generated from the simmer burner.

[Claim 11]

The cooking appliance of claim 10, wherein the simmer plate is circular with a diameter larger than a diameter of the heater.

[Claim 12]

The cooking appliance of claim 11, wherein the food container is heated by convection heat resulting from flames generated from the simmer burner reaching the simmer plate and losing energy and radiation heat from the simmer plate heated by the flames generated from the simmer burner.

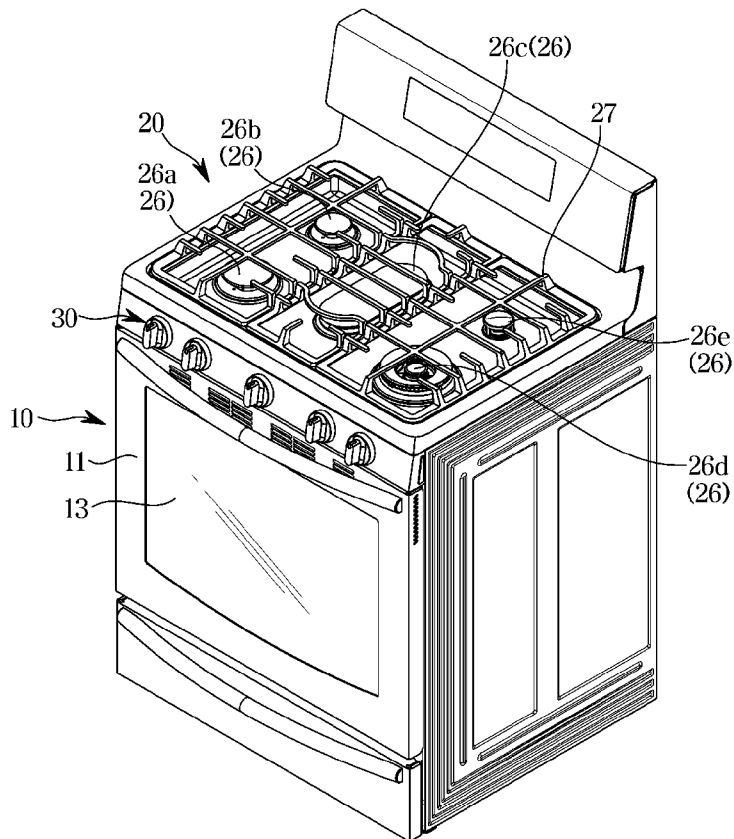
[Claim 13]

The cooking appliance of claim 12, wherein the flames generated from the simmer burner are transferred to the food container by the radiation heat from the simmer plate having the diameter larger than the diameter of the heater, so that transfer of the heat to the food container is retarded.

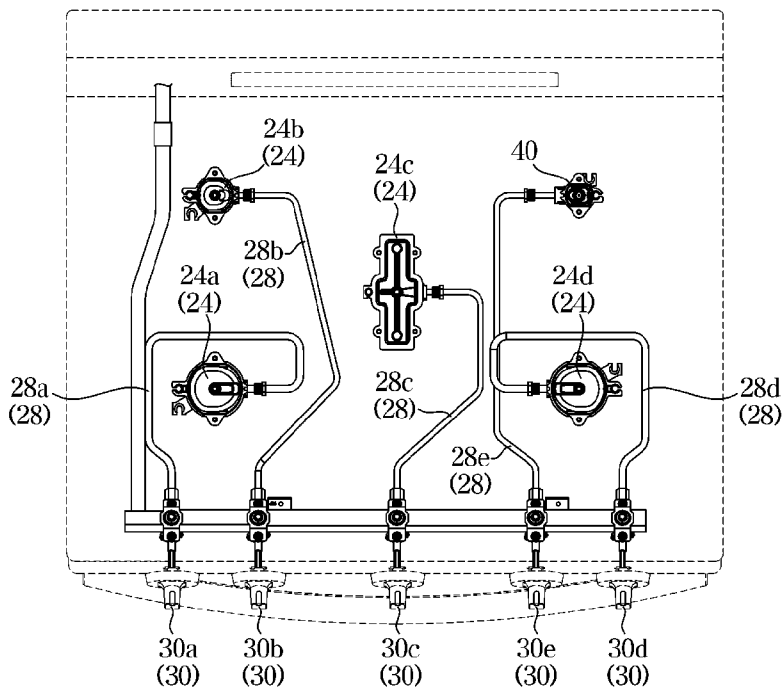
[Claim 14]

The cooking appliance of claim 2, wherein the glass material from which the simmer plate is formed is transparent, thereby allowing flames generated from the simmer burner to be checked from above the simmer plate.

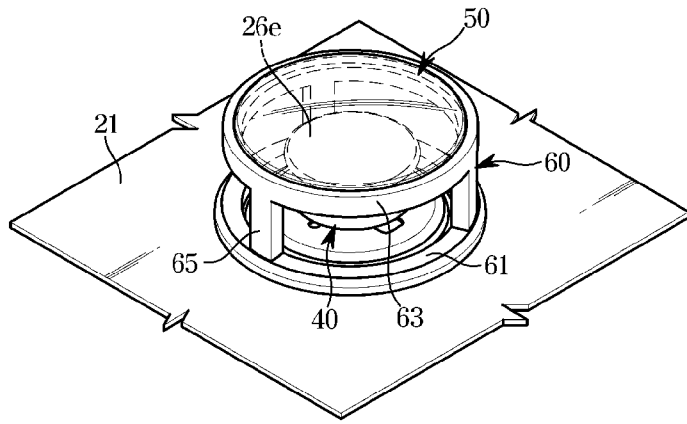
[Fig. 1]



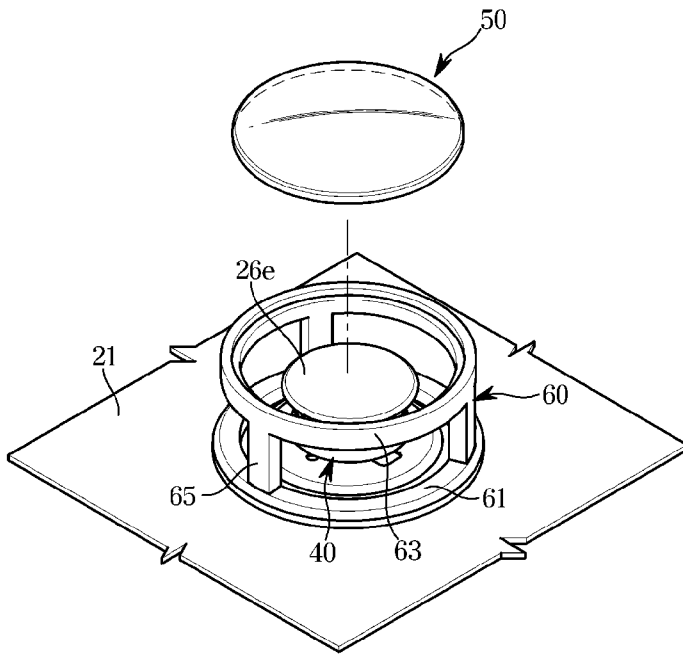
[Fig. 2]



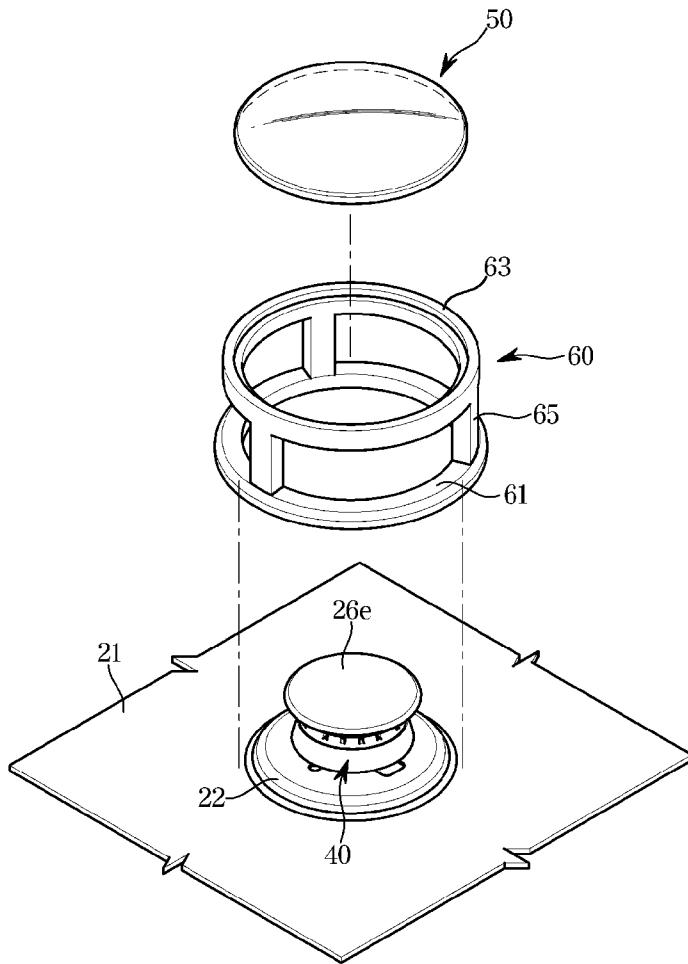
[Fig. 3]



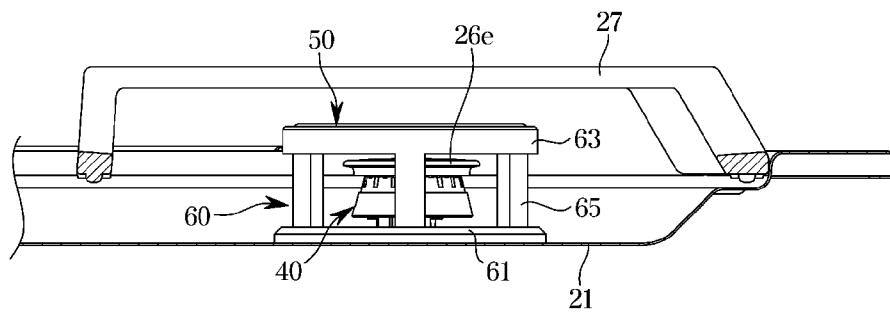
[Fig. 4]



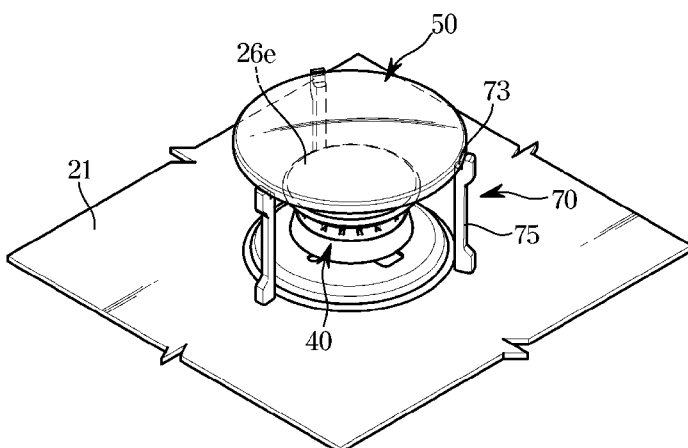
[Fig. 5]



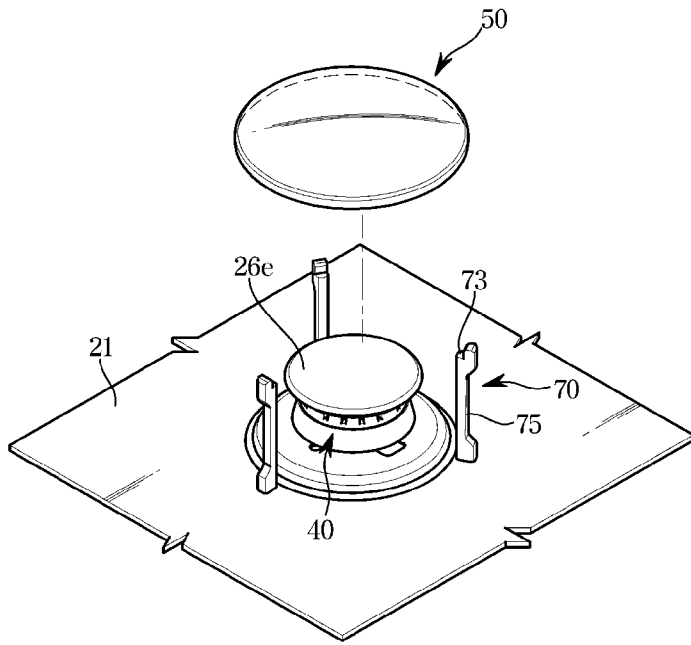
[Fig. 6]



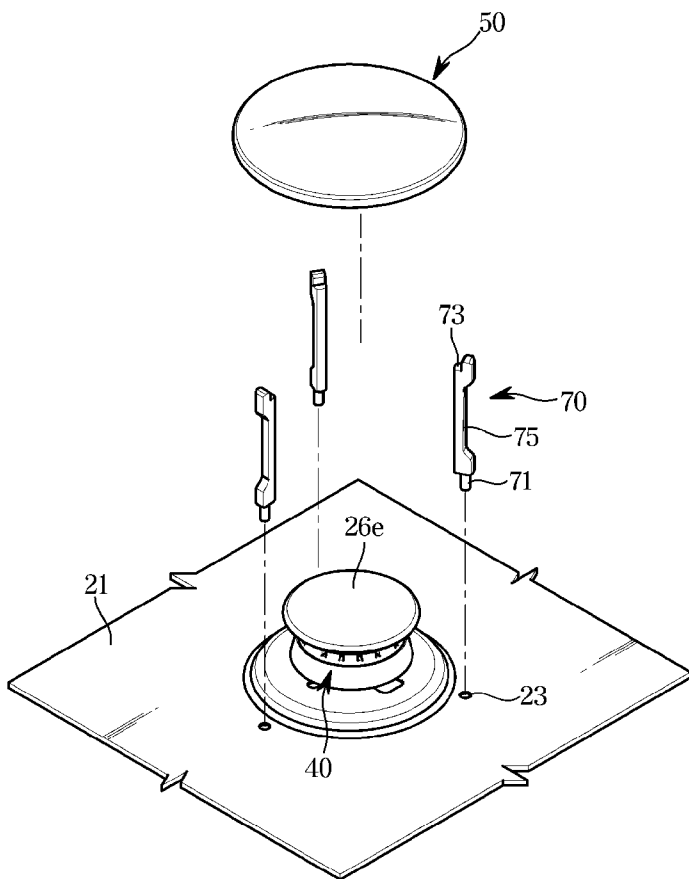
[Fig. 7]



[Fig. 8]

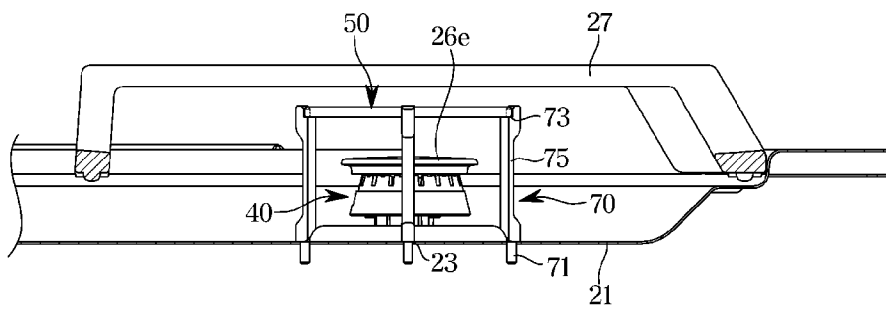


[Fig. 9]





[Fig. 10]



## INTERNATIONAL SEARCH REPORT

International application No.

**PCT/KR2021/001300**

<b>A. CLASSIFICATION OF SUBJECT MATTER</b>		
F24C 3/02(2006.01); F24C 15/10(2006.01); F23D 14/76(2006.01);		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols) F24C 3/02(2006.01); F24C 15/10(2006.01); F24C 3/00(2006.01); F24C 3/04(2006.01); F24C 3/08(2006.01)		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Korean utility models and applications for utility models Japanese utility models and applications for utility models		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) eKOMPASS(KIPO internal) & keywords: cook, burner, grate, simmer plate, support		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2006-0207588 A1 (STAEBLER et al.) 21 September 2006 (2006-09-21) paragraphs [0021], [0025], [0033] and figures 1-4	1-14
Y	US 2011-0290231 A1 (PADGETT, MICHAEL) 01 December 2011 (2011-12-01) paragraphs [0016], [0019]-[0021] and figures 1-4	1-14
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Date of the actual completion of the international search <b>18 May 2021</b>		Date of mailing of the international search report <b>18 May 2021</b>
Name and mailing address of the ISA/KR <b>Korean Intellectual Property Office 189 Cheongsa-ro, Seo-gu, Daejeon 35208, Republic of Korea</b> Facsimile No. +82-42-481-8578		Authorized officer <b>LEE, Hun Gil</b> Telephone No. +82-42-481-8525

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