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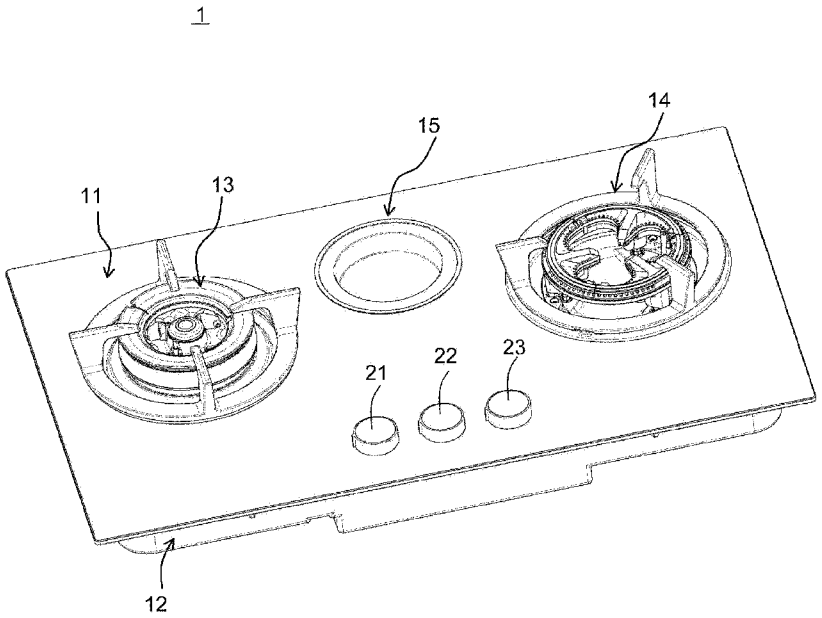


Fig. 1

(57) Abstract: The present application relates to a cooker (1,1'). The cooker includes: a housing including a bottom frame (12) and a top panel (11) attached to the bottom frame; at least one gas heating assembly (13,14) or electric heating assembly (13', 14') arranged on the top panel (11); at least one first control device (21, 23, 21', 23') configured to control the at least one gas heating assembly (13,14) or electric heating assembly (13', 14') to adjust the power of the at least one gas heating assembly (13,14) or electric heating assembly (13', 14'). The cooker further includes: a vapor generation assembly (15) arranged on the top panel (11) and including a container (151) and a heating device (152) configured to heat the container (151); and a second control device (22, 22') configured to control the vapor generation assembly (15) to adjust the power of the vapor generation assembly (15).

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COOKER WITH VAPOR GENERATOR

FIELD OF THE INVENTION

[0001] This application relates to a cooker.

BACKGROUND OF THE INVENTION

[0002] Currently, gas cookers and electric cookers have been widely used as household kitchen utensils, and brought great convenience for people's daily life.

[0003] With the continuous improvement of quality of people's life, daily meals are desired to include food of a variety of different flavors. For example, it is desired that the breakfast includes fried eggs, fried bacon, stir fried dishes, porridge, steamed breads, steamed eggs, etc., which requires using at least frying, stir frying, boiling, steaming and other different cooking methods to deal with different ingredients. However, commonly used household cookers typically include only one or two heating assemblies. For example, commonly used household gas stoves typically include only one or two gas burner assemblies, and commonly used household induction cookers typically include only one or two induction cooker hotplates. Therefore, when it requires to cook different foods by more than two different cooking methods, the commonly used household cookers sometimes cannot meet the demand. Especially in the pursuit of a healthy lifestyle, people need to cook food by "steaming" more and more. However, since "steaming" is to use heating power of water vapor to heat food, it often needs to occupy a gas burner assembly or an induction cooker hotplate for a long time, and "boiling" which also needs to take a long time will have to share the other gas burner assembly or induction cooker hotplate with cooking methods such as "frying", "stir frying", "deep frying", thus resulting in a prolonged cooking time. As the pace of people's life becomes faster and faster, in the case of short of time, the extension of cooking time will undoubtedly bring great trouble to users, and the users even have to give up the healthy nutrition steamed food which needs to take a long cooking time, and are forced to remain stagnant on the road of pursuing a healthy life.

[0004] In addition, cooking the food by steaming requires the preparation of additional pots,

which requires additional placement space. In the case of limited kitchen space, the storage of pots will also cause additional distress to the users. In addition, the hot steaming pot removed from the stove will possibly scald the user.

[0005] Therefore, there is a further room for improvement in the current commonly used household cookers in terms of their functionality.

SUMMARY OF THE INVENTION

[0006] For solving one or more of the problems described above, the present application is developed. The present application relates to a cooker. The cooker may include: a housing including a bottom frame and a top panel attached to the bottom frame; at least one heating assembly arranged on the top panel; at least one first control device configured to control the at least one heating assembly to adjust the power of the at least one heating assembly. The cooker may further include: a vapor generation assembly arranged on the top panel and configured to generate water vapor; and a second control device configured to control the vapor generation assembly to adjust the power of the vapor generation assembly.

[0007] In an embodiment according to the present application, the at least one heating assembly may include a gas heating assembly and/or an electric heating assembly.

[0008] In some embodiments, the at least one heating assembly may include two gas heating assemblies or two electric heating assemblies, and the vapor generation assembly may be arranged to be located between the two gas heating assemblies or between the two electric heating assemblies, and the vapor generation assembly may be arranged such that the center of the vapor generation assembly is offset from a line of centers of the two gas heating assemblies or a line of centers of the two electric heating assemblies in a front-rear direction of the cooker.

[0009] In some embodiments, the vapor generation assembly may be arranged such that a projection position of the center of the vapor generation assembly on the line of centers of the two gas heating assemblies is coincident with a midpoint position of the line of centers of the two gas heating assemblies or is offset from the midpoint position of the line of centers of the two gas heating assemblies in a left-right direction of the cooker; or the vapor generation assembly may be arranged such that a projection position of the center of the vapor generation assembly on the

line of centers of the two electric heating assemblies is coincident with a midpoint position of the line of centers of the two electric heating assemblies or is offset from the midpoint position of the line of centers of the two electric heating assemblies in the left-right direction of the cooker.

[0010] In some embodiments, the at least one heating assembly may include two gas heating assemblies or two electric heating assemblies. The vapor generation assembly may be arranged on the cooker at a left side or a right side of the cooker, to allow the center of one of the two gas heating assemblies to be offset from a line of centers of the vapor generation assembly and the other gas heating assembly of the two gas heating assemblies in the front-rear direction of the cooker, or to allow the center of one of the two electric heating assemblies to be offset from a line of centers of the vapor generation assembly and the other electric heating assembly of the two electric heating assemblies in the front-rear direction of the cooker.

[0011] In some embodiments, one of the two gas heating assemblies may be arranged such that a projection position of the center of the one gas heating assembly on the line of centers of the vapor generation assembly and the other one of the two gas heating assemblies is coincident with a midpoint position of the line of centers of the vapor generation assembly and the other gas heating assembly or is offset from the midpoint position of the line of centers of the vapor generation assembly and the other gas heating assembly in the left-right direction of the cooker; or one of the two electric heating assemblies may be arranged such that a projection position of the center of the one electric heating assembly on the line of centers of the vapor generation assembly and the other one of the two electric heating assemblies is coincident with a midpoint position of the line of centers of the vapor generation assembly and the other electric heating assembly or is offset from the midpoint position of the line of centers of the vapor generation assembly and the other electric heating assembly in the left-right direction of the cooker.

[0012] In some embodiments, the at least one heating assembly may include one gas heating assembly and one electric heating assembly, and the vapor generation assembly is arranged to be located between the one gas heating assembly and the one electric heating assembly, and the vapor generation assembly is arranged such that the center of the vapor generation assembly is offset from a line of centers of the one gas heating assembly and the one electric heating assembly in the front-rear direction of the cooker, and is closer to the one electric heating assembly in a left- right direction of the cooker.

[0013] In some embodiments, the at least one heating assembly may include two electric heating assemblies, and the vapor generation assembly is arranged to be located between the two electric heating assemblies, and the vapor generation assembly is arranged such that the center of the vapor generation assembly is offset from a line of centers of the two electric heating assemblies in the front-rear direction of the cooker, and is closer to one, having a smaller power, of the two electric heating assemblies in the left- right direction of the cooker.

[0014] In some embodiments, the vapor generation assembly may include a container and a heating device configured to heat the container, and the heating device is configured to heat the water contained in the container to generate water vapor.

[0015] In some embodiments, the heating device of the vapor generation assembly may be one of a resistive heating device, an inductive heating device and a far-infrared radiant heating device, and the heating device may be configured to be integrally formed with the container.

[0016] In some embodiments, the heating device of the vapor generation assembly may be one of a resistive heating device, an inductive heating device and a far-infrared radiant heating device, and the heating device is formed separately from the container, and the container of the vapor generation assembly is configured to be detachably attached to the cooker.

[0017] In some embodiments, the container of the vapor generation assembly may include a bottom wall, a peripheral wall extending angularly with respect to the bottom wall from a peripheral edge of the bottom wall in a height direction of the container, and a flange extending radially outwards from a peripheral edge, at an end opposite to the end where the bottom wall is located, of the peripheral wall.

[0018] In some embodiments, the flange of the container of the vapor generation assembly may be configured such that, in the height direction of the container, a distance of an outer edge of the flange from the bottom wall of the container is greater than a distance of an inner edge, in connection with the peripheral wall, of the flange from the bottom wall.

[0019] In some embodiments, the vapor generation assembly is attached to the top panel of the cooker by the flange of the container.

[0020] In some embodiments, a sealing member may be provided between the flange of the container of the vapor generation assembly and the top panel of the cooker.

[0021] In some embodiments, the sealing member arranged between the flange of the container and the top panel of the cooker is made of a heat-resistant material.

[0022] In some embodiments, the bottom wall, the peripheral wall and the flange of the container are each applied at an inner side thereof with a coating of a special material.

[0023] In some embodiments, the cooker may further include at least one steamer tray, and a lower end of the at least one steamer tray may be configured to be positively engaged with the flange of the container of the vapor generation assembly.

[0024] In some embodiments, the vapor generation assembly may further include an automatic power-off device.

[0025] In some embodiments, the vapor generation assembly may further include an automatic alarm device.

[0026] In some embodiments, the vapor generation assembly may further include a water level display device.

[0027] In some embodiments, the electric heating assembly of the cooker may include at least one of an inductive electric heating assembly, a far-infrared radiant electric heating assembly and a resistive electric heating assembly.

[0028] In some embodiments, the bottom wall of the container of the vapor generation assembly may be flat.

[0029] In some embodiments, the bottom wall of the container may be provided with a protrusion protruding towards an opening of the container, configured to accommodate the heating device, and a groove arranged to surround the protrusion.

[0030] According to the configurations described above, by providing a vapor generation assembly on the cooker, the steaming process taking a long time can be performed separately without affecting the conventional heating function of the cooker, thus, the functional extension of the cooker is achieved, and also the cooking time can be shortened significantly and the efficiency of the cooker can be improved. In addition, the cooker according to the present application dispenses with a dedicated steaming pot, therefore dispensing with the space required for placing the steaming pot, and can save the kitchen space, and can reduce the risk of scalding

possibly brought to the user due to the arrangement of too many heated pots.

BRIEF DESCRIPTION OF THE DRAWINGS

[0031] Features and advantages of exemplary embodiments and technical significance and industrial significance of the present application are described hereinafter with reference to the drawings in which the like reference numerals indicate the like elements and in the drawings:

[0032] Fig. 1 shows a schematic perspective view of a cooker according to an exemplary embodiment of the present application.

[0033] Fig. 2 shows a top view of the cooker shown in Fig. 1.

[0034] Fig. 3 shows a front view of the cooker shown in Fig. 1

[0035] Fig. 4 shows a cross-sectional view of the cooker taken along the cross section A-A in Fig. 2.

[0036] Fig. 5 is a partially enlarged view of the portion B shown in Fig. 4.

[0037] Fig. 6 shows a schematic view of sub-regions of the internal structure of the cooker according to the first exemplary embodiment of the present application.

[0038] Fig. 7 shows a top view of an exemplary embodiment of a vapor generation assembly according to the present application.

[0039] Fig. 8 shows a side view of the vapor generation assembly shown in Fig. 7.

[0040] Fig. 9 shows a sectional view of the vapor generation assembly taken along the cross-section C-C in Fig. 7.

[0041] Fig. 10 shows a schematic top view of a cooker according to another exemplary embodiment of the present application.

DETAILED DESCRIPTION

[0042] Exemplary embodiments of the present application are described hereinafter with reference to the drawings.

[0043] Fig. 1 shows a schematic perspective view of a cooker according to an exemplary

embodiment of the present application. Fig. 2 shows a top view of the cooker shown in Fig. 1. Fig. 3 shows a front view of the cooker shown in Fig. 1. Fig. 4 shows a cross-sectional view of the cooker taken along the cross section A-A in Fig. 2.

[0044] In the exemplary embodiment shown in Fig. 1, a cooker 1 includes a housing, and the housing includes a bottom frame 12 and a top panel 11 attached to the bottom frame 12.

[0045] The cooker 1 according to the present application may include one or more heating assemblies.

[0046] The heating assembly according to the present application may be a gas heating assembly or an electric heating assembly. In the present application, a "gas heating assembly" refers to a heating assembly that heats an object by converting chemical energy into heat energy through combustion of a combustible gas, and an "electric heating assembly" refers to a heating assembly that heats an object by converting electric energy into heat energy.

[0047] In the exemplary embodiment shown in Fig. 1, the cooker 1 includes two gas burner assemblies 13, 14 as examples of the gas heating assemblies. The illustrated exemplary gas burner assemblies 13, 14 have configurations known in the art and can be connected to a cooker in a manner known in the art. For example, referring to Fig. 3, the gas burner assemblies 13, 14 may include cooker brackets 131, 141 and gas burners 132, 142, and may be arranged on the top panel 11. It may be understood that the gas heating assembly according to the present application is not limited to the gas burner assemblies 13, 14 having the specific configuration as illustrated, but may be a gas burner assembly having any known configurations in the art and applied to a corresponding connection manner for connection with the cooker. The description of the specific structure of the gas burner assembly as an example of the gas heating assembly of the present application is omitted here.

[0048] The cooker 1 shown in Fig. 1 also includes a control device 21 configured to control the gas burner assembly 13 to adjust the power of the gas burner assembly 13 and a control device 23 configured to control the gas burner assembly 14 to adjust the power of the gas burner assembly 14.

[0049] The control device 21, 23 correspond to first control devices of the present application. In the exemplary embodiment shown in Fig. 1, the control devices 21, 23 are knob type controllers.

The control device 21 includes a control module 211, a manipulation shaft 212, and a manipulation knob 213. The control module 211 is attached to the bottom frame 12 and is located within the housing of the cooker 1 (see Fig. 6). The manipulation shaft 212 is coupled to the control module 211 and extends beyond the top panel 11. The manipulation knob 213 is arranged at a top end of the manipulation shaft 212 and is located above the top panel 11. The control device 23 includes a control module 231, a manipulation shaft 232, and a manipulation knob 233. The control module 231 is attached to the bottom frame 12 and is located within the housing of the cooker 1 (see Fig. 6). The manipulation shaft 232 is coupled to the control module 231 and extends beyond the top panel 11. The manipulation knob 233 is provided at a top end of the manipulation shaft 232 and is located above the top panel 11.

[0050] It may be understood that the first control device according to the present application is not limited to the control devices 21, 23 having the specific configurations as illustrated, but may be a control device of any configurations known in the art for controlling the corresponding gas burner assembly. For example, it may be a push button or contact-inductive control device. Therefore, the description of the specific structures of the control devices as the first control devices of the present application is omitted.

[0051] It should be noted that the locality terms “top”, “bottom”, “front”, “rear”, “left”, “right”, “up”, “down”, “front-rear direction” and “right-left direction” mentioned in the present application are defined with respect to the orientation adopted by the cooker 1 in normal use.

[0052] In the exemplary embodiment shown in Fig. 1, the cooker 1 further includes a vapor generation assembly 15. The vapor generation assembly 15 is attached to the top panel 11 of the cooker 1. The vapor generation assembly 15 is configured to generate water vapor to achieve the function of steaming food. The specific structure of the vapor generation assembly 15 is described in detail hereinafter.

[0053] The cooker 1 shown in Fig. 1 also includes a control device 22 configured to control the vapor generation assembly 15 to adjust the power of the vapor generation assembly 15. The control device 22 corresponds to a second control device of the present application.

[0054] In the exemplary embodiment shown in Fig. 1, the control device 22 is a knob type controller. As shown in Fig. 4, the control device 22 includes a control module 221, a

manipulation shaft 222 and a manipulation knob 223. The control module 221 is shown as being attached to the bottom frame 12. The manipulation shaft 222 is coupled to the control module 221 and extends beyond the top panel 11. The manipulation knob 223 is arranged at a top end of the manipulation shaft 222 and is located above the top panel 11. In use, the user controls the vapor generation assembly 15 by rotating the manipulation knob 223 to adjust the power of the vapor generation assembly 15. It may be understood that the second control device of the present application is not limited to the illustrated specific configuration of the control device 22, but may be a push button or contact-inductive control device.

[0055] In the exemplary embodiment shown in Fig. 1, the first control devices 21, 23 and the second control device 22 are provided separately. Thus, the first control devices and the second control device are capable of independently controlling the heating assemblies and the vapor generation assembly, thereby further enhancing the flexibility of use of the cooker.

[0056] In the exemplary embodiment shown in Fig. 1, the vapor generation assembly 15 is arranged between the two gas burner assemblies 13, 14 and, as shown in Fig. 2, the vapor generation assembly 15 is arranged such that a center O_{15} of the vapor generation assembly 15 is offset by a distance w from a line of centers O_{13}-O_{14} of the gas burner assembly 13 and the gas burner assembly 14 in the front-rear direction of the cooker 1. Preferably, the entire vapor generation assembly 15 is located on an upper side of the line of centers O_{13}-O_{14}, i.e., on a side opposite to the side where the control device 22 is located. It is further preferred that an outer profile of the vapor generation assembly 15 may be tangent to the line of centers O_{13}-O_{14} to make use of the space between the gas burner assemblies 13, 14 as much as possible to provide the vapor generation assembly 15 having a dimension as large as possible.

[0057] In this application, the term "center" refers to a geometric center of an outer contour, presented in the top view of the cooker 1, of the relevant assemblies seen from a position over the cooker 1. The term "line of centers" refers to a virtual line connecting the "centers" of the two assemblies.

[0058] According to the above-described exemplary configuration of the cooker 1 shown in Fig. 1, by making the center of the vapor generation assembly 15 be offset from the line of centers O_{13}-O_{14} of the gas burner assemblies 13, 14 by the distance w, the vapor generation assembly 15

is arranged between the gas burner assembly 13 and the gas burner assembly 14, but is not arranged side by side with the gas burner assembly 13 and the gas burner assembly 14. It will be understood that the embodiment illustrated is a preferred exemplary embodiment of the present application. The vapor generation assembly 15 may also be arranged side by side with the gas burner assembly 13 and the gas burner assembly 14.

[0059] Fig. 6 schematically shows sub-regions of an internal structure of the bottom frame 12 of the cooker 1 according to the exemplary embodiment of the present application. As shown in Fig. 6, the vapor generation assembly 15 is arranged within a sub-region 125 of the cooker 1 in which the gas burner assembly 13 and the gas burner assembly 14 are not arranged, without occupying a sub-region 122 for mounting the control devices, a sub-region 123 for mounting the gas burner assembly 13, and a sub-region 124 for mounting the gas burner assembly 14.

[0060] This arrangement of the vapor generation assembly 15 can make full use of the structural space of the cooker so as to realize the functional extension of the cooker without increasing the size of the cooker. In addition, various heat sources such as the gas burner assemblies 13, 14 and the vapor generation assembly 15 can be reasonably arranged to avoid mutual interference of the cooking utensils while contributing to the compactness of the entire cooker. Particularly, it is possible to add a vapor generation assembly without the need for an excessive modification of an existing cooker.

[0061] Fig. 10 shows a cooker 1' according to another exemplary embodiment of the present application. In this embodiment, the like components are indicated by the like reference numerals. The similar or corresponding components are indicated by the like reference numerals plus the right superscript "'".

[0062] In the exemplary embodiment shown in Fig. 10, a cooker 1' includes two electric heating assemblies 13', 14' and one vapor generation assembly 15.

[0063] According to embodiments of the present application, the electric heating assemblies 13', 14' may be respectively one of an inductive electric heating assembly (e.g., an induction cooktop), a far-infrared radiant electric heating assembly (e.g., a far-infrared radiant electric cooktop) and a resistive electric heating assembly. For example, the cooker 1' may include two inductive electric heating assemblies, or two far-infrared radiant electric heating assemblies, or one inductive

electric heating assembly and one far-infrared radiant electric heating assembly, or one inductive electric heating assembly and one resistive electric heating assembly, and so on. The inductive electric heating assembly, the far-infrared radiant electric heating assembly, and the resistive electric heating assembly each have a configuration known in the art and can be connected to the cooker in a manner known in the art, and therefore the description of the specific structures thereof is omitted here.

[0064] According to the above-described configuration, it is provided a technical solution in which a vapor generation assembly is used in combination with at least one of an inductive electric heating assembly, a far-infrared radiant electric heating assembly and a resistive electric heating assembly, to thereby providing a cooker with extended functionality and use flexibility.

[0065] The cooker 1' shown in Fig. 10 further includes a control device 21' and a control device 23' configured to respectively control the electric heating assemblies 13' and 14' to adjust the powers of the respective electric heating assemblies 13' and 14' and a control device 22' configured to control the vapor generation assembly 15 to adjust the power of the vapor generation assembly 15. The control devices 21' and 23' correspond to the first control devices of the present application. The control device 22' corresponds to the second control device of the present application.

[0066] In the exemplary embodiment shown in Fig. 10, the control devices 21', 22', 23' are contact-inductive controllers. It may be understood that the control devices 21', 23' as the first control devices of the present application and the control device 22' as the second control device of the present application may be control devices of any configurations known in the art for controlling the respective components so as to adjust the power thereof. For example, they may be knob type or push button type control devices. Therefore, the description of the specific structures of the control devices is omitted here.

[0067] Similar to the exemplary embodiment shown in Fig. 2, in an exemplary embodiment shown in Fig. 10, the vapor generation assembly 15 is arranged between the two electric heating assemblies 13' and 14', and the vapor generation assembly 15 is arranged such that the center O_{15} of the vapor generation assembly 15 is offset by a distance w' from a line of centers $O_{13'}$-$O_{14'}$ of the electric heating assembly 13' and the electric heating assembly 14'. In this manner, the vapor

generation assembly 15 is arranged between the electric heating assembly 13' and the electric heating assembly 14', but not side by side with the electric heating assembly 13' and the electric heating assembly 14'. Preferably, the entire vapor generation assembly 15 is located on an upper side of the line of centers $O_{13'}$-$O_{14'}$, that is, on a side opposite to the side where the control device 22' is located. It is further preferred that, similar to the example as shown in Fig. 2, the outer profile of the vapor generation assembly 15 may be tangent to the line of centers $O_{13'}$-$O_{14'}$ to make use of the space between the electric heating assembly 13' and the electric heating assembly 14' as much as possible to provide the vapor generation assembly 15 having a dimension as large as possible.

[0068] According to an exemplary embodiment of the present application, the vapor generation assembly 15 may also be arranged such that a projection position P of the center O_{15} of the vapor generation assembly 15 on the line of centers $O_{13'}$-$O_{14'}$ of the electric heating assembly 13' and the electric heating assembly 14' is coincident with a midpoint position M of the line of centers $O_{13'}$-$O_{14'}$, or the projection position P of the center O_{15} of the vapor generation assembly 15 on the line of centers $O_{13'}$-$O_{14'}$ of the electric heating assembly 13' and the electric heating assembly 14' is offset by a distance l from the midpoint position M of the line of centers $O_{13'}$-$O_{14'}$ as shown in Fig. 10.

[0069] It should be noted that "the projection position of the center O_{15} of the vapor generation assembly 15 on the line of centers $O_{13'}$-$O_{14'}$ of the electric heating assembly 13' and the electric heating assembly 14'" refers to an intersection point position between a perpendicular line extending from the center O_{15} of the vapor generation assembly 15 to the line of centers $O_{13'}$-$O_{14'}$ of the electric heating assembly 13' and the electric heating assembly 14' and the center line $O_{13'}$-$O_{14'}$ as observed in a top view of the cooker.

[0070] By setting the projection position P of the center O_{15} of the vapor generation assembly 15 on the line of centers $O_{13'}$-$O_{14'}$ of the electric heating assembly 13' and the electric heating assembly 14' to be coincident with the midpoint position M of the line of centers $O_{13'}$-$O_{14'}$, the vapor generation assembly 15 may be arranged to have a substantially equal distance from the two electric heating assemblies. By setting the projection position P of the center O_{15} of the vapor generation assembly 15 on the line of centers $O_{13'}$-$O_{14'}$ of the electric heating assembly 13' and the electric heating assembly 14' to be offset by a distance from the midpoint position M of the

line of centers $O_{13'}$-$O_{14'}$, the vapor generation assembly 15 may be arranged to have a distance from one of the electric heating assemblies greater than the distance from the other electric heating assembly. In the exemplary embodiment shown in Fig. 10, the vapor generation assembly 15 is arranged to have a distance from the electric heating assembly 13' greater than the distance from the electric heating assembly 14'. In other words, in the left- right direction of the cooker, the center O_{15} of the vapor generation assembly 15 may be arranged closer to the center $O_{13'}$ of the electric heating assembly 13' or to the center $O_{14'}$ of the electric heating assembly 14'. Particularly, in the case that the power of the electric heating assembly 13' is greater than the power of the electric heating assembly 14', the center O_{15} of the vapor generation assembly 15 may be arranged closer to the center $O_{14'}$ of the electric heating assembly 14' in a left-right direction of the cooker, to thereby further optimizing the space utilization of the cooker.

[0071] It may be understood that in the cooker 1 provided with two gas heating assemblies as shown in Fig. 2, the projection position of the center O_{15} of the vapor generation assembly 15 on the line of centers O_{13}-O_{14} of the two gas heating assemblies may also be coincident with the midpoint position of the line of centers O_{13}-O_{14}, or the projection position of the center O_{15} of the vapor generation assembly 15 on the line of centers O_{13}-O_{14} of the two gas heating assemblies may be offset from the midpoint position of the line of centers O_{13}-O_{14} to thereby arranging the vapor generation assembly 15 to have a distance from one of the gas heating assemblies greater than the distance from the other gas heating assembly.

[0072] According to the above-described exemplary configuration, the vapor generation assembly 15 can be arranged away from a heating assembly having a higher heating power including a gas heating assembly and an electric heating assembly, so as to avoid non-uniform heat effect caused by this heating assembly to the vapor generation assembly.

[0073] Although in the illustrated embodiment, the vapor generation assembly 15 is arranged to be located between the two heating assemblies (for example, the two gas burner assemblies 13 and 14, or the two heating assemblies 13' and 14'), however, it may be understood that, in an embodiment not illustrated, the vapor generation assembly 15 may be arranged on the cooker 1 at a left side or a right side of the cooker 1, to allow the center of one (for example, the gas heating assembly 13) of the two gas heating assemblies 13 and 14 to be offset from a line of centers of the vapor generation assembly 15 and the other gas heating assembly (for example, the gas

heating assembly 14) in the front-rear direction of the cooker 1, and/or to allow a projection position of the center of the one gas heating assembly (for example, the gas heating assembly 13) on the line of centers of the vapor generation assembly 15 and the other gas heating assembly (for example, the gas heating assembly 14) to be coincident with a midpoint position of the line of centers of the vapor generation assembly 15 and the other gas heating assembly (for example, the gas heating assembly 14) or be offset from the midpoint position of the line of centers of the vapor generation assembly 15 and the other gas heating assembly (for example, the gas heating assembly 14) in a left-right direction of the cooker 1. In addition, it may be understood that, in an embodiment not illustrated, the vapor generation assembly 15 may be arranged on the cooker 1' at a left side or a right side of the cooker 1', to allow the center of one (for example, the electric heating assembly 13') of the two electric heating assemblies 13' and 14' to be offset from a line of centers of the vapor generation assembly 15 and the other electric heating assembly (for example, the electric heating assembly 14') in the front-rear direction of the cooker 1', and/or to allow a projection position of the center of the one electric heating assembly (for example, the electric heating assembly 13') on the line of centers of the vapor generation assembly 15 and the other electric heating assembly (for example, the electric heating assembly 14') to be coincident with a midpoint position of the line of centers of the vapor generation assembly 15 and the other electric heating assembly (for example, the electric heating assembly 14') or be offset from the midpoint position of the line of centers of the vapor generation assembly 15 and the other electric heating assembly (for example, the electric heating assembly 14') in a left-right direction of the cooker 1'.

[0074] Although in the illustrated exemplary embodiments, the cookers 1, 1'; respectively include two gas heating assemblies and two electric heating assemblies, it may be understood that the cooker according to the present application may also be configured as including both a gas heating assembly and an electric heating assembly, and including control devices for controlling the respective gas heating assembly and the electric heating assembly to adjust their powers, respectively, which will not be described here. Particularly, the vapor generation assembly 15 is preferably provided (e.g., in the left-right direction and/or the front-rear direction) closer to the electric heating assembly in the case that the cooker includes both a gas heating assembly and an electric heating assembly.

[0075] Next, the structure of the vapor generation assembly is described with reference to Figs. 7 to 9. Fig. 7 shows a top view of an exemplary embodiment of the vapor generation assembly according to the present application. Fig. 8 shows a side view of the vapor generation assembly shown in Fig. 7. Fig. 9 shows a sectional view of the vapor generation assembly taken along the cross-section C-C in Fig. 7.

[0076] In the illustrated exemplary embodiment, the vapor generation assembly 15 includes a container 151 and a heating device 152 attached to the bottom of the container 151. The heating device 152 is configured to heat the water contained in the container 151 to generate water vapor.

[0077] According to an exemplary embodiment of the present application, the heating device 152 of the vapor generation assembly 15 may be a resistive heating device or an inductive heating device.

[0078] In the illustrated exemplary embodiment, the heating device 152 of the vapor generation assembly 15 is a heating disk having a flat upper surface. The container 151 of the vapor generation assembly 15 is a substantially cylindrical member. At the bottom of the container 151, a recess 1516 is formed which is recessed toward the inside of the container 151. The heating device 152 is accommodated in the recess 1516 at the bottom of the container 151, and a flat upper surface of the heating device 152 engages with a flat surface located at the bottom of the recess 1516 to heat the water contained in the container 151 by heat conduction when the heating device 152 generates heat to produce water vapor. Preferably, the container 151 of the vapor generation assembly 15 is made of a metal material having good thermal conductivity such as stainless steel.

[0079] According to an exemplary embodiment of the present application, the heating device 152 of the vapor generation assembly 15 may be molded together with the container 151 into an integral part, or the heating device 152 may be detachably attached to the bottom of the container 151 to be formed together with the container 151 into an integral part.

[0080] Modular management of the vapor generation assembly 15 can be realized by forming the heating device 152 and the container 151 of the vapor generation assembly 15 into the integral part. When the vapor generation assembly 15 needs to be removed from the cooker 1, 1' due to maintenance or replacement, the vapor generation assembly 15 can be removed by a single action

without requiring removal of multiple separate parts of the vapor generation assembly 15 from the cooker 1. Similarly, when the vapor generation assembly 15 is assembled to the cooker 1, 1', it can be placed and positioned by a single action. Thus, the installation and assembly of the vapor generation assembly 15 is made simple.

[0081] Referring to Figs. 7 and 9, in the illustrated exemplary embodiment, the container 151 of the vapor generation assembly 15 includes a bottom wall 1511, a peripheral wall 1512 extending angularly with respect to the bottom wall 1511 from a peripheral edge of the bottom wall 1511 in a height direction of the container 151, and a flange 1513 extending radially outwards from a peripheral edge, at an end opposite to the end where the bottom wall 1511 is located, of the peripheral wall 1512. The peripheral edge, at the end opposite to the end where the bottom wall 1511 is located, of the peripheral wall 1512 forms an inner edge 1515 of the flange 1513.

[0082] In the illustrated exemplary embodiment, the peripheral wall 1512 of the container 151 extends angularly with respect to the bottom wall 1511 from the peripheral edge of the bottom wall 1511 upwards and radially outwards so that the container 151 is formed into a flared shape gradually enlarged from its bottom to opening.

[0083] In this way, the size of the heating device 152 can be reduced while a larger vapor outlet is obtained, thereby achieving an efficient food steaming function while saving energy. In addition, the configuration, tapered toward the bottom, of the container 151 also facilitates cleaning and maintenance of the inside of the container.

[0084] In the embodiment according to the present application, the bottom wall 1511, the peripheral wall 1512 and the flange 1513 of the container 151 are each applied at an inner side thereof with a coating of a special material (for example, a polytetrafluoroethylene coating) to facilitate cleaning and maintenance of the inside of the container 151.

[0085] In the illustrated exemplary embodiment, the flange 1513 of the container 151 of the vapor generation assembly 15 is configured such that, in the height direction of the container 151, a distance h1 of an outer edge 1514 of the flange 1513 from the bottom wall 1511 of the container 151 is greater than a distance h2 of the inner edge 1515 of the flange 1513 from the bottom wall 1511 ($h1>h2$).

[0086] According to the above configuration, with respect to the bottom wall 1511, the outer

edge 1514 of the flange 1513 of the container 151 is higher than the inner edge 1515 of the flange 1513 in the height direction of the container 151. In this way, it is possible to prevent the water in the container 151 from escaping from the container 151 when being heated and boiling, to facilitate the natural return of the water flowing onto the flange 1513 of the container 151 into the container 151.

[0087] Referring to Figs. 4 and 5, in the illustrated exemplary embodiment, the vapor generation assembly 15 is attached to the top panel of the cooker 1 by the flange 1513 of the container 151.

[0088] According to an embodiment of the present application, a sealing member (not illustrated) may be provided between the flange 1513 of the container 151 of the vapor generation assembly 15 and the top panel 11 of the cooker 1. In the embodiment according to the present application, the sealing member provided between the flange 1513 of the container 151 and the top panel 11 of the cooker 1 is made of a heat-resistant material.

[0089] It may be understood that in the exemplary embodiment shown in Fig. 10, the vapor generation assembly 15 may be attached to the top panel 11' of the cooker 1' by the flange 1513 of the container 151 in a similar manner.

[0090] According to the above-described configuration, by providing the sealing member between the container flange 1513 of the vapor generation assembly 15 and the top panel 11, 11' of the cooker 1, 1', the water on the top panel 11, 11' of the cooker 1, 1', for example, the water spilled onto the top panel 11, 11' during injecting water into the container 151 of the vapor generation assembly 15, may be prevented from being leaked into the inside of the cooker 1, 1' and adversely affecting the normal operation of electronic elements arranged inside the cooker accordingly.

[0091] According to an embodiment of the present application, the cooker 1, 1' may further include at least one steamer tray (not illustrated). A lower end portion of the steamer tray is configured to be positively engaged with the flange 1513 of the container 151 of the vapor generation assembly 15.

[0092] According to an exemplary embodiment of the present application, a stepped portion 1517 is provided at a position, near the outer edge 1514, of the flange 1513 of the container 151 of the vapor generation assembly 15. As shown in Fig. 9, one end, adjacent to the outer edge 1514, of

the stepped portion 1517 is higher than one end, adjacent to the inner edge 1515, of the stepped portion 1517 in the height direction of the container 151.

[0093] In this way, the stepped portion 1517 may be formed with an engagement portion positively engaged with the lower end portion of the steamer tray. In addition, the stepped portion 1517 can also function as a stopper for restricting the movement of the steamer tray.

[0094] According to the above-described configuration, the function of the cooker 1, 1' is further extended by providing the at least one steamer tray for the cooker 1, 1'. It is possible to ensure the thermal efficiency of the vapor generation assembly and to ensure that the distilled water flowing from the side wall of the steamer tray naturally returns into the container by configuring the lower end portion of the steamer tray to be positively engaged with the flange 1513 of the container 151 of the vapor generation assembly 15.

[0095] In the above embodiment, the vapor generation assembly 15, in particular the container 151, is fixedly arranged in the cooker, but it can be envisaged by the person skilled in the art that the vapor generation assembly 15, in particular the container 151, may be easily detachably arranged in the cooker, to facilitate cleaning. For example, the heating device 152 of the vapor generation assembly 15 may be fixedly connected to the frame 12 or the panel 11 of the cooker, and the container 151 may be designed to be independent from the heating device 152 and to be easily removed from the cooker for cleaning.

[0096] It will be understood that, the vapor generation assembly 15 is not limited to the specific configuration illustrated, but may have various configurations. For example, though in the illustrated embodiment, the container 151 of the vapor generation assembly 15 has a substantially flat bottom wall, it may be understood that, the bottom wall of the container of the vapor generation assembly 15 may also be provided with a protrusion protruding towards the opening of the container and configured to accommodate of the heating device, and a groove for storing water arranged to surround the protrusion, so as to facilitate the generation of vapor.

[0097] According to an embodiment of the present application, the vapor generation assembly 15 may further include an automatic power-off device (not illustrated) configured to shut off the power supply of the heating device 152 when water shortage in the container 151 occurs in the case that the vapor generation assembly 15 is in a working state.

[0098] It may be understood that in the embodiments of the cooker 1, 1' according to the present application, the automatic power-off device of the vapor generation assembly 15 can be properly selected according to the specific type (the resistive heating device or the inductive heating device) of the heating device 152. The structure of such an automatic power-off device is known per se and is not described here.

[0099] In some embodiments according to the present application, the vapor generation assembly 15 may further be provided with an automatic alarm device used with the automatic power-off device or independently used and configured to alarm the user when water shortage in the container 151 occurs in the case that the vapor generation assembly 15 is in the working state. The structure of such an automatic alarm device is known per se and is not described here.

[00100] In some embodiments according to the present application, the vapor generation assembly 15 may further include a water level display device (not illustrated) configured to display the information of current water level in the container 151 of the vapor generation assembly 15 to assist the user in determining the water injection demand of the container 151.

[00101] By providing the automatic power-off device, the automatic alarm device and/or the water level display device for the vapor generation unit 15, it is possible to prevent the vapor generation module 15 from being overheated in the case of no water in the container 151, thus ensuring the use safety of the cooker 1, 1'.

[00102] According to the above-described configuration of the present application, by providing a freestanding vapor generation assembly independently of the conventional heating assemblies on the cooker, the cooker is enabled to have an independent function of steaming food, thus achieving functional extension of the cooker. Providing independent food steaming function for the cookers solves the contradiction between people's pursuit of healthy nutrition steamed food and short of time resulted from the faster and faster pace of life. Since the steaming process which takes a long time can be performed simultaneously with other conventional cooking methods, the cooker of the present application can be employed to cook more types of food with more cooking methods in substantially the same cooking time, and thus can meet the demand of people for improving the quality of daily life.

[00103] In addition, the cooker according to the present application dispenses with a dedicated steaming pot, thereby dispensing with the placement space for placing the steaming pot, saving the kitchen space, and reducing the risk of possible scalding caused to the user by arrangement of too many heated pots.

[00104] The present application has been described hereinbefore with reference to the drawings through the description of the embodiments, and the present application is not limited to the above-described embodiments. It may be understood by the person skilled in the art that modifications and variations may be made without departing from the technical idea of the present application, and all these modifications and variations are also intended to be included within the scope of the present application.

CLAIMS

1. A cooker, comprising:

a housing comprising a bottom frame and a top panel attached to the bottom frame;

at least one heating assembly arranged on the top panel;

at least one first control device configured to control the at least one heating assembly to adjust the power of the at least one heating assembly,

characterized in that, the cooker further comprises:

a vapor generation assembly arranged on the top panel and configured to generate water vapor; and

a second control device configured to control the vapor generation assembly to adjust the power of the vapor generation assembly.

2. The cooker according to claim 1, wherein the at least one heating assembly comprises a gas heating assembly and/or an electric heating assembly.

3. The cooker according to claim 1, wherein the at least one heating assembly comprises two gas heating assemblies or two electric heating assemblies, and the vapor generation assembly is arranged to be located between the two gas heating assemblies or between the two electric heating assemblies, and the vapor generation assembly is arranged such that the center of the vapor generation assembly is offset from a line of centers of the two gas heating assemblies or a line of centers of the two electric heating assemblies in a front-rear direction of the cooker.

4. The cooker according to claim 3, wherein the vapor generation assembly is arranged such that a projection position of the center of the vapor generation assembly on the line of centers of the two gas heating assemblies is coincident with a midpoint position of the line of centers of the two gas heating assemblies or is offset from the midpoint position of the line of centers of the two gas heating assemblies in a left-right direction of the cooker; or the vapor generation assembly is arranged such that a projection position of the center of the vapor

generation assembly on the line of centers of the two electric heating assemblies is coincident with a midpoint position of the line of centers of the two electric heating assemblies or offset from the midpoint position of the line of centers of the two electric heating assemblies in the left-right direction of the cooker.

5. The cooker according to claim 1, wherein the at least one heating assembly comprises two gas heating assemblies or two electric heating assemblies, the vapor generation assembly is arranged on the cooker at a left side or a right side of the cooker, to allow the center of one of the two gas heating assemblies to be offset from a line of centers of the vapor generation assembly and the other one of the two gas heating assemblies in the front-rear direction of the cooker, or to allow the center of one of the two electric heating assemblies to be offset from a line of centers of the vapor generation assembly and the other one of the two electric heating assemblies in the front-rear direction of the cooker.

6. The cooker according to claim 5, wherein the one gas heating assembly is arranged such that a projection position of the center of the one gas heating assembly on the line of centers of the vapor generation assembly and the other gas heating assembly is coincident with a midpoint position of the line of centers of the vapor generation assembly and the other gas heating assembly or is offset from the midpoint position of the line of centers of the vapor generation assembly and the other gas heating assembly in the left-right direction of the cooker; or the one electric heating assembly is arranged such that a projection position of the center of the one electric heating assembly on the line of centers of the vapor generation assembly and the other electric heating assembly is coincident with a midpoint position of the line of centers of the vapor generation assembly and the other electric heating assembly or is offset from the midpoint position of the line of centers of the vapor generation assembly and the other electric heating assembly in the left-right direction of the cooker.

7. The cooker according to claim 1, wherein the at least one heating assembly comprises one gas heating assembly and one electric heating assembly, and the vapor generation assembly is arranged to be located between the one gas heating assembly and the one electric heating

assembly, and the vapor generation assembly is arranged such that the center of the vapor generation assembly is offset from a line of centers of the one gas heating assembly and the one electric heating assembly in the front-rear direction of the cooker, and is closer to the one electric heating assembly in a left- right direction of the cooker; or

the at least one heating assembly comprises two electric heating assemblies, and the vapor generation assembly is arranged to be located between the two electric heating assemblies, and the vapor generation assembly is arranged such that the center of the vapor generation assembly is offset from a line of centers of the two electric heating assemblies in the front-rear direction of the cooker, and is closer to one, having a smaller power, of the two electric heating assemblies in the left- right direction of the cooker.

8. The cooker according to any one of claims 1 to 7, wherein the vapor generation assembly comprises a container and a heating device configured to heat the container.

9. The cooker according to claim 8, wherein the heating device is one of a resistive heating device, an inductive heating device and a far-infrared radiant heating device, and the heating device is configured to be formed with the container into an integral part.

10. The cooker according to claim 8, wherein the container comprises a bottom wall, a peripheral wall extending angularly with respect to the bottom wall from a peripheral edge of the bottom wall in a height direction of the container, and a flange extending radially outwards from a peripheral edge, at an end opposite to the end where the bottom wall is located, of the peripheral wall.

11. The cooker according to claim 10, wherein the flange is configured such that, in the height direction of the container, a distance of an outer edge of the flange from the bottom wall is greater than a distance of an inner edge, in connection with the peripheral wall, of the flange from the bottom wall.

12. The cooker according to claim 10, wherein the vapor generation assembly is attached

to the top panel by the flange of the container.

13. The cooker according to claim 12, wherein a sealing member is provided between the flange of the container and the top panel of the cooker.

14. The cooker according to claim 13, wherein the sealing member is made of a heat-resistant material.

15. The cooker according to claim 10, wherein the bottom wall, the peripheral wall and the flange of the container are each applied at an inner side thereof with a coating of a special material.

16. The cooker according to claim 10, wherein the cooker further comprises at least one steamer tray, and a lower end of the at least one steamer tray is configured to be positively engaged with the flange of the container.

17. The cooker according to any one of claims 1 to 7, wherein the vapor generation assembly further comprises at least one of an automatic power-off device, an automatic alarm device and a water level display device.

18. The cooker according to any one of claims 2 to 7, wherein the electric heating assembly comprises at least one of an inductive electric heating assembly, a far-infrared radiant electric heating assembly and a resistive electric heating assembly.

19. The cooker according to claim 8, wherein the heating device is one of a resistive heating device, an inductive heating device and a far-infrared radiant heating device, and the heating device is formed separately from the container, and the container is configured to be detachably attached to the cooker.

20. The cooker according to claim 10, wherein the bottom wall of the container is flat, or

the bottom wall of the container is provided with a protrusion protruding towards an opening of the container and configured to accommodate the heating device, and a groove arranged to surround the protrusion.

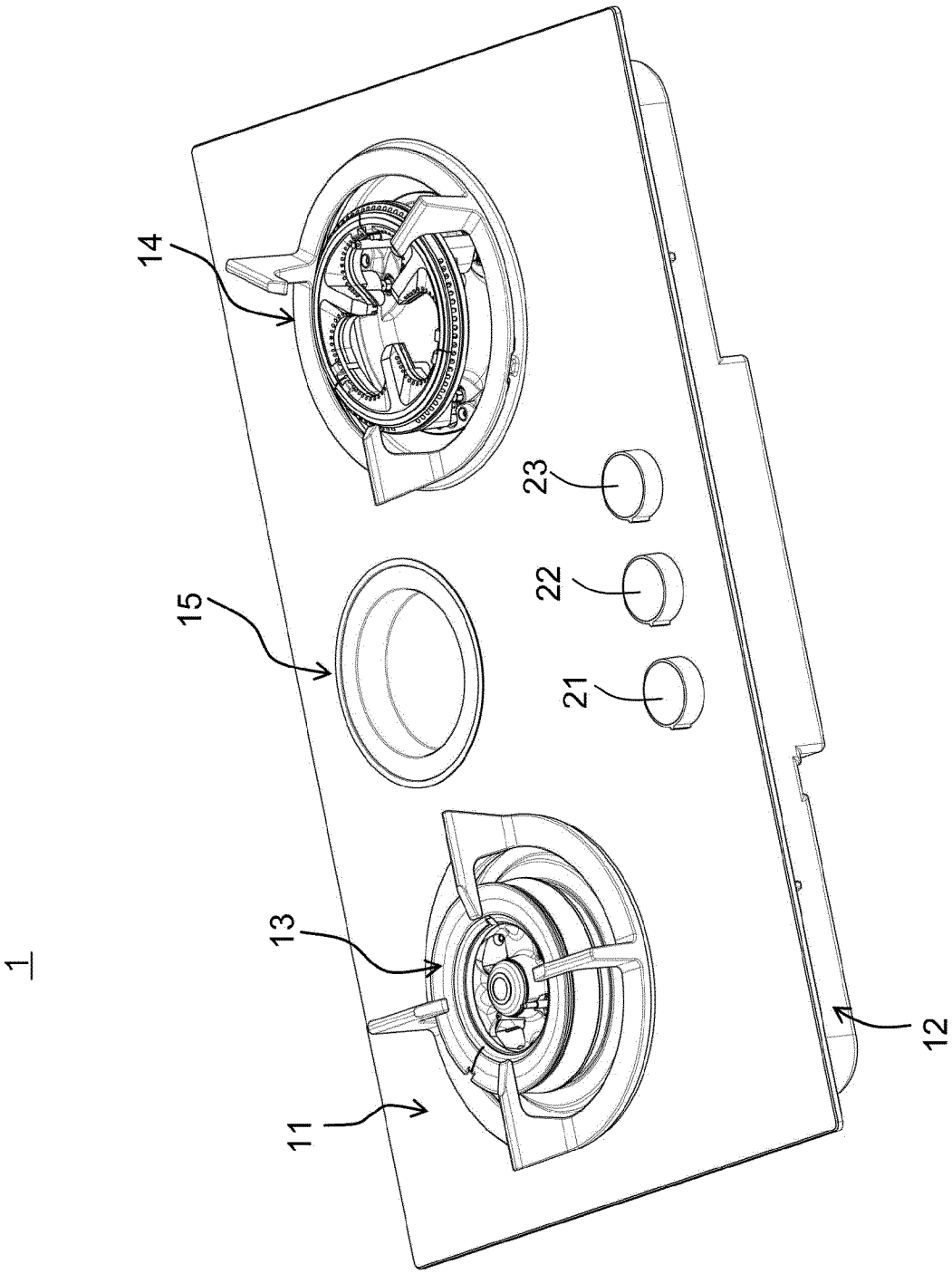


Fig. 1

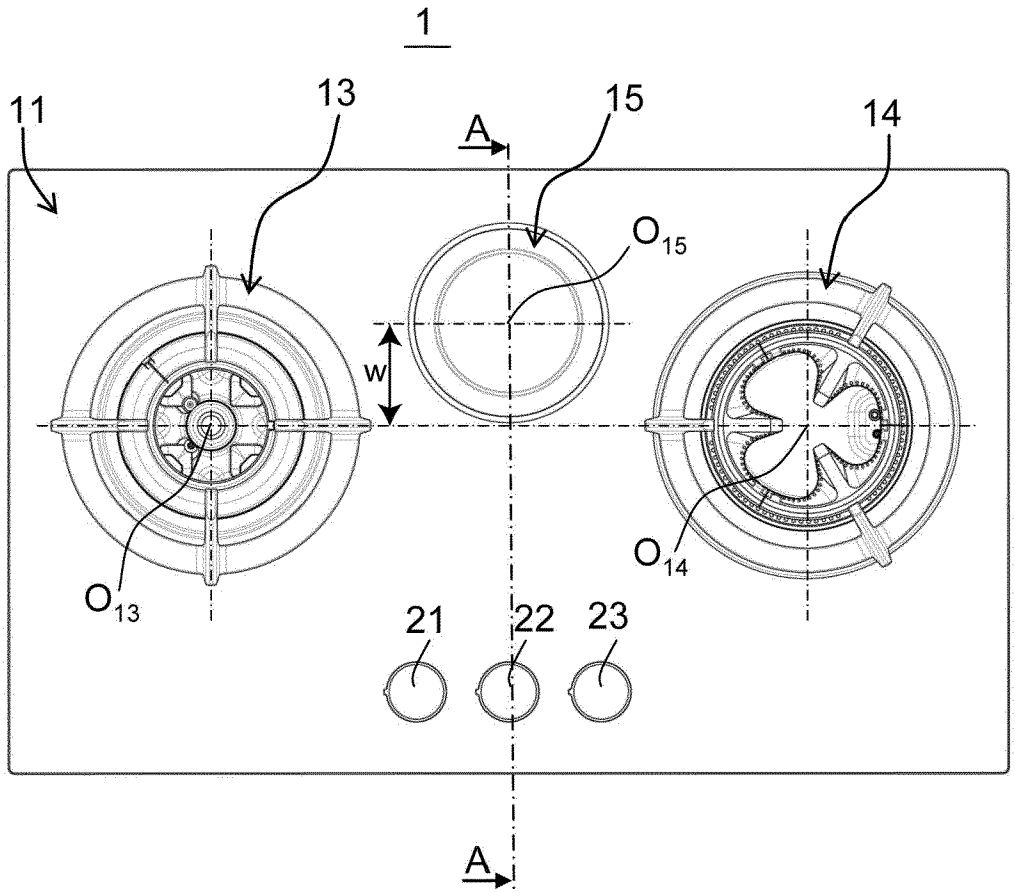

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Fig. 2

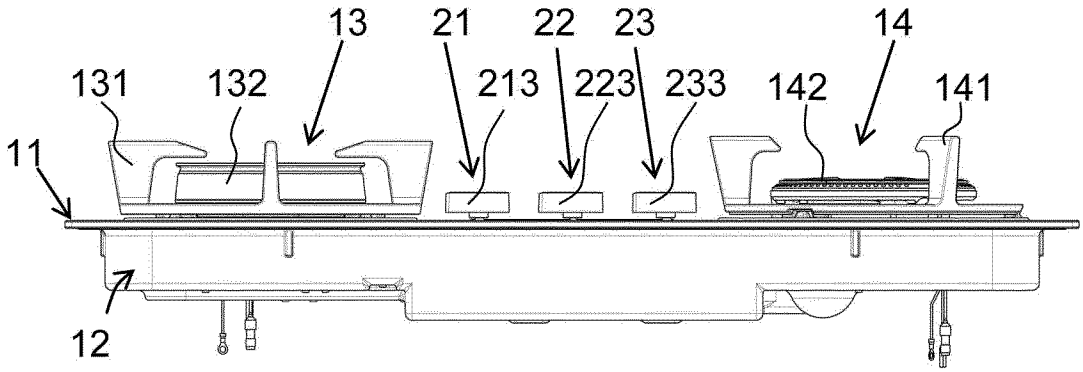

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Fig. 3

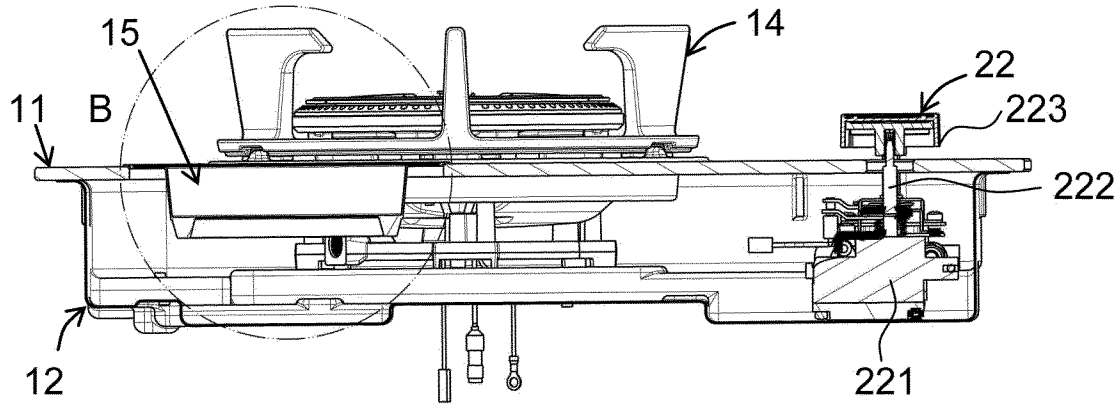


Fig. 4

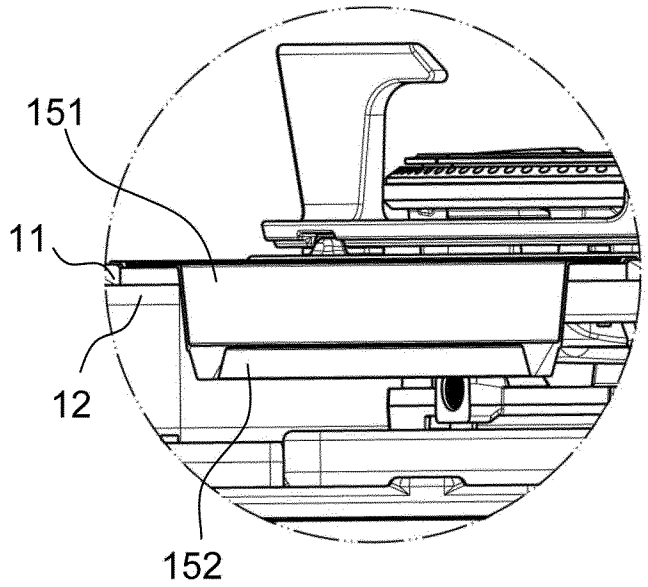


Fig. 5

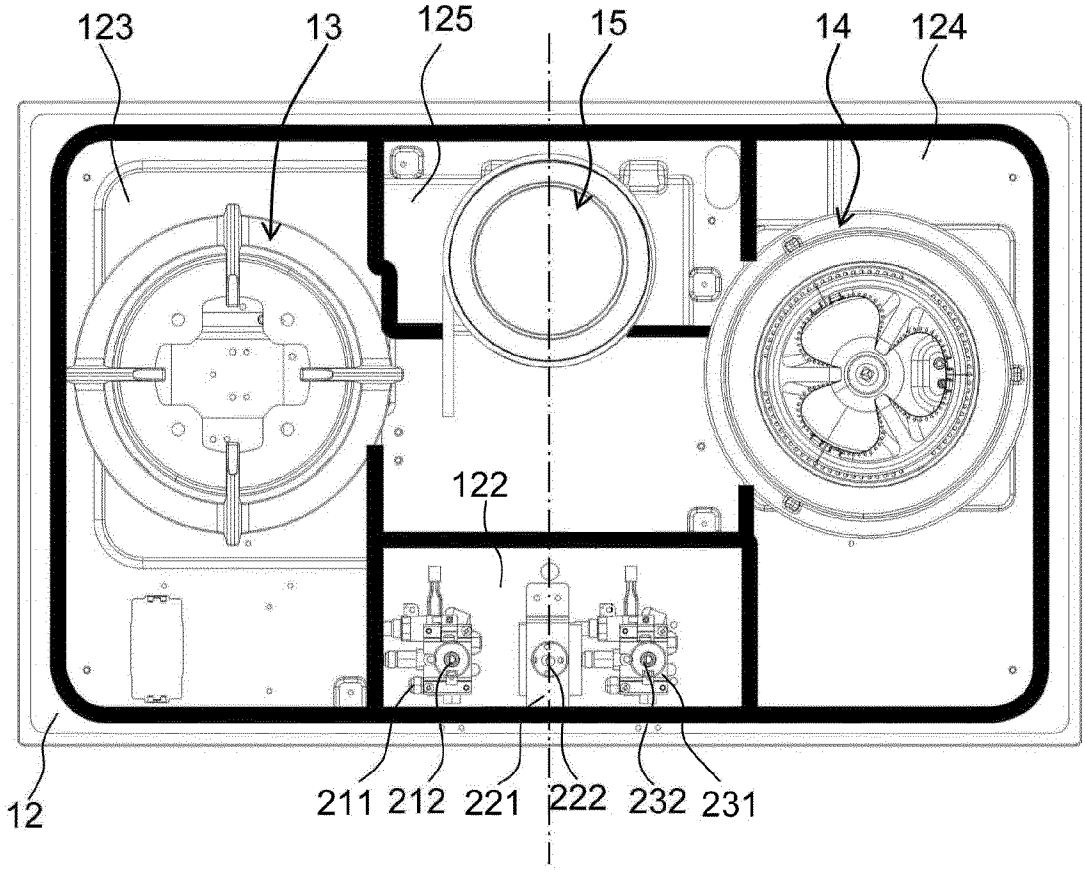


Fig. 6

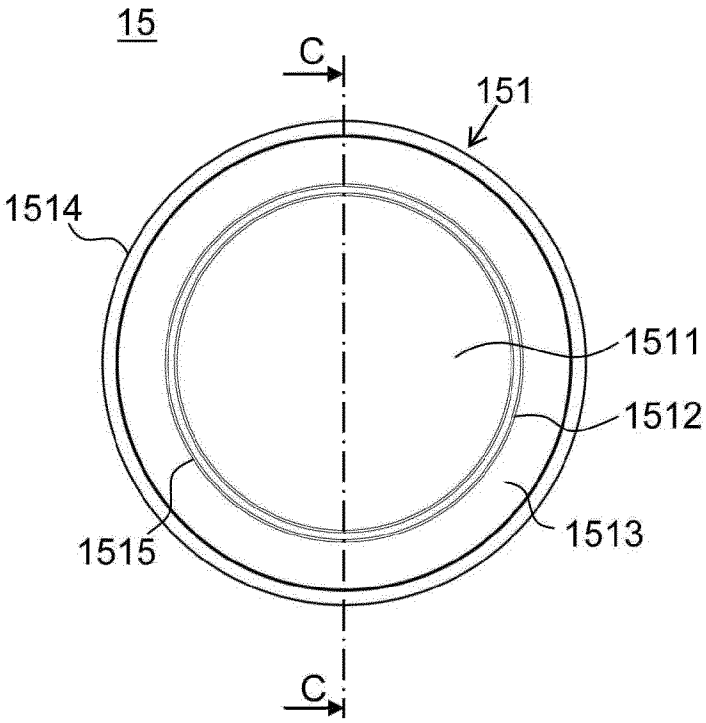


Fig. 7

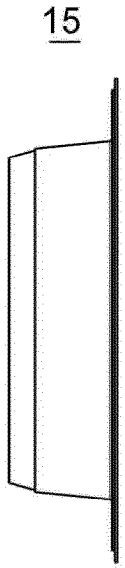


Fig. 8

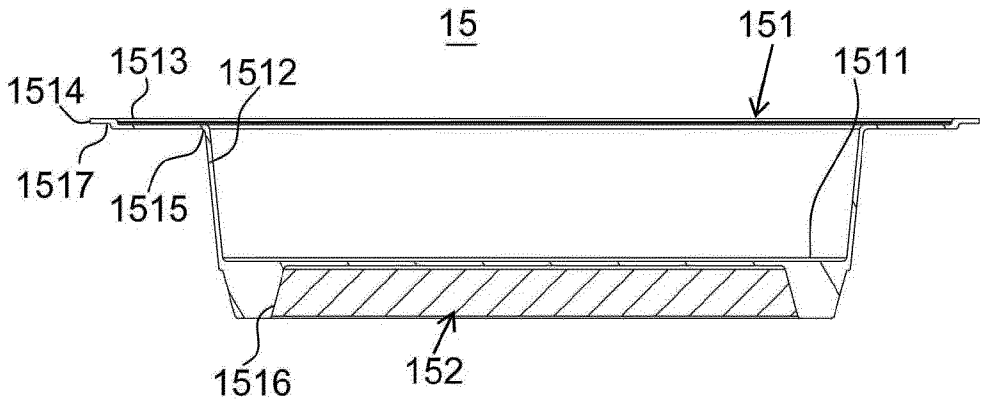


Fig. 9

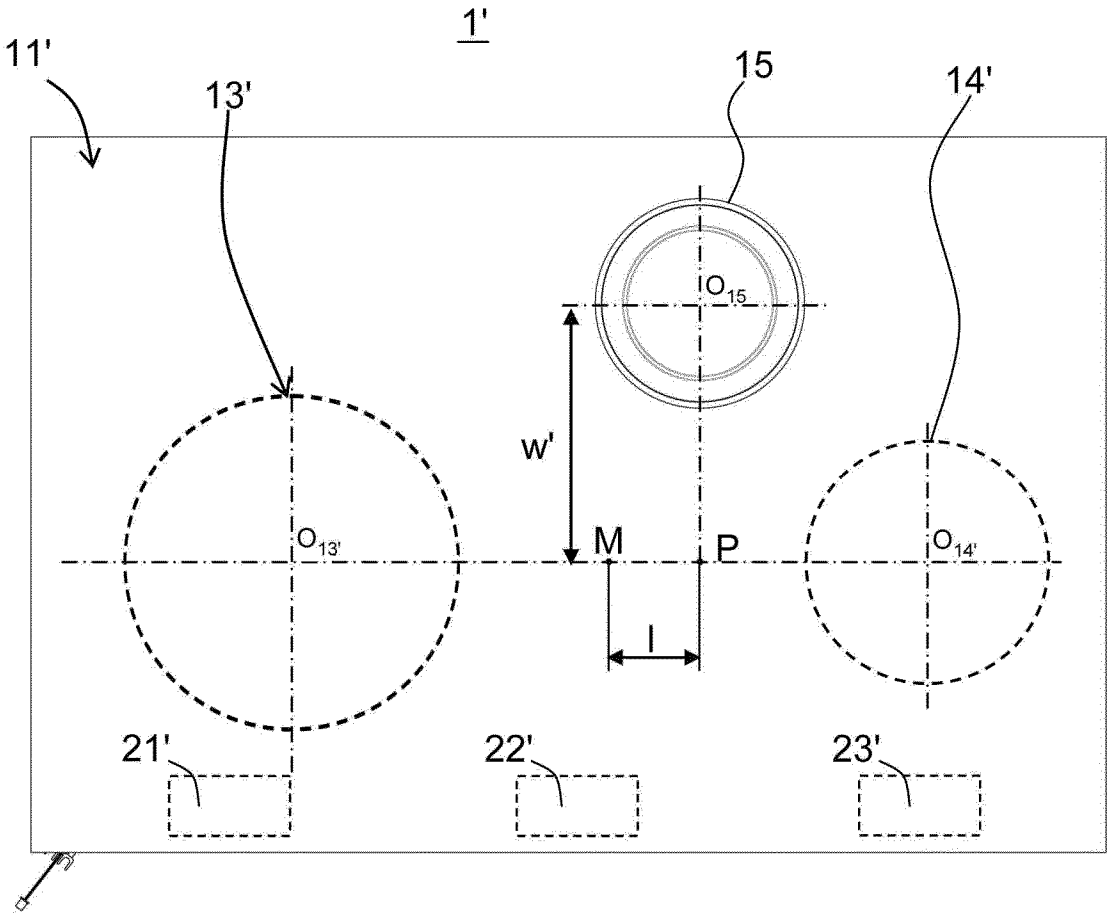


Fig. 10

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2018/063315

A. CLASSIFICATION OF SUBJECT MATTER
INV. F24C15/10 A47J27/04
ADD.

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
F24C A47J H05B A21B

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

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPO-Internal, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 658 798 A1 (WHIRLPOOL CO [US]) 24 May 2006 (2006-05-24) figure 2	1-11, 13-20
X	US 4 922 079 A (BOWEN ROBERT F [US] ET AL) 1 May 1990 (1990-05-01) figures 1,5,7	1-20
X	US 2016/146474 A1 (KIM WONTAE [KR] ET AL) 26 May 2016 (2016-05-26) figure 1	1
X,P	EP 3 176 509 A1 (ELECTROLUX APPLIANCES AB [SE]) 7 June 2017 (2017-06-07) figures 1-6	1

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[X] Further documents are listed in the continuation of Box C.

[X] See patent family annex.

* Special categories of cited documents :

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"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
16 July 2018	24/07/2018

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Adant, Vincent

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Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2018/063315

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2012/024164 A1 (PARK JAE-HYOUN [KR] ET AL) 2 February 2012 (2012-02-02) paragraphs [0031] - [0032]; figure 1 -----	1
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2

Form PCT/ISA/210 (continuation of second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
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