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(54) HEATING COOKER

HEIZUNGSHERD

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Description

TECHNICAL FIELD

[0001] The present disclosure relates to a heating cooker that heats food in a heating chamber.

BACKGROUND ART

[0002] Conventionally, a heating cooker having a configuration in which a cooling air flow path is provided in a door on which an operation unit is disposed and the operation unit is not affected by hot air of a heating chamber that becomes high in temperature has been disclosed (for example, see PTL 1).

[0003] In the heating cooker described in PTL 1, a fan is disposed in a flow path of a door through which cooling air flows, thereby improving the cooling capacity. The fan includes an air intake port and an exhaust port that are disposed to be substantially vertical in the height direction of the door. The fan draws air from below through the air intake port and discharges air upward from the exhaust port.

[0004] However, since the fan is disposed in the height direction of the door, it is necessary to secure a space in the height direction of the door by the thickness of the fan. Therefore, since the height of the door cannot be shortened, it is difficult to reduce the size of the heating cooker.

Citation List

Patent Literature

[0005]

PTL 1: Japanese Patent No. 5899452

Document WO 2015/129449 A1 discloses a cooker provided with a casing, a heating chamber, a microwave generator for supplying microwaves to the heating chamber, and a door for opening and closing an opening portion. The heating chamber is provided in the casing and has the opening portion on the front side. The door has light-emitting portions for emitting light into the heating chamber, a transparent or semi-transparent window member, and a microwave-shielding portion. The window member is arranged on a light path between the light-emitting portions and the heating chamber. The microwave-shielding portion is arranged between the light-emitting portions and the window member, and shields off microwaves from the heating chamber.

Document JP 2017 026233 A discloses a heating cooker comprising: a body casing; a heating chamber disposed in the body casing and having an opening at a front side; and a door for opening and closing the heating chamber. The door has: an operation part which is disposed on the front side so as to overlap with the opening when the heating chamber is closed; an air passage which is provided in the door and used to supply and discharge external air to the back side of the operation part; and a blower fan arranged in an intermediate portion of the air passage

SUMMARY OF THE INVENTION

[0006] The present disclosure provides a heating cooker that can be reduced in size.

[0007] Aheating cooker according to one aspect of the present disclosure is defined by claim 1.

[0008] Thereby, a heating cooker that can be reduced in size can be provided.

BRIEF DESCRIPTION OF DRAWINGS

[0009]

FIG. 1 is a front view of a heating cooker according to an exemplary embodiment.

FIG. 2 is a front perspective view of the heating cooker.

FIG. 3 is an exploded perspective view of a door of the heating cooker.

FIG. 4 is a rear perspective view with the inner frame of the door of the heating cooker removed.

FIG. 5 is a rear perspective view with a radio wave leakage prevention plate removed from the door illustrated in FIG. 4.

FIG. 6 is a rear perspective view with a second metal plate removed from the door illustrated in FIG. 5.

FIG. 7 is a rear perspective view with a first metal plate removed from the door illustrated in FIG. 6.

FIG. 8 is a rear view with the first metal plate removed from the door illustrated in FIG. 6.

FIG. 9 is a rear perspective view with a fan case removed from the door illustrated in FIG. 7.

FIG. 10 is a rear view with the fan case removed from the door illustrated in FIG. 7.

FIG. 11 is an enlarged view around the fan illustrated in FIG. 10.

FIG. 12 is a diagram illustrating a positional relationship between a radio wave leakage prevention plate of the door and the fan of the heating cooker.

FIG. 13 is a view of the inside of the door of the heating cooker as viewed from a longitudinal section around the fan.

FIG. 14 is a front perspective view of the fan, the fan case, and a board of the heating cooker.

FIG. 15 is a diagram illustrating air passages of the heating cooker.

DESCRIPTION OF EMBODIMENT

[0010] Hereinafter, an exemplary embodiment according to the present disclosure will be described in details with reference to the drawings. Note that the present disclosure is not limited by the exemplary embodiment.

(Exemplary embodiment)

[0011] Hereinafter, a heating cooker according to the exemplary embodiment of the present disclosure will be described with reference to FIGS. 1 and 2.

[0012] FIG. 1 is a front view of heating cooker 1 according to the exemplary embodiment. FIG. 2 is a front perspective view of heating cooker 1 with door 7 opened. Note that in the following, the X direction is described as the longitudinal direction (width direction or left and right direction) of heating cooker 1, the Y direction is described as the front-rear direction thereof, and the Z direction is described as the height direction thereof. In addition, in the following description, the height refers to a distance from the mounting surface of heating cooker 1.

[0013] As illustrated in FIGS. 1 and 2, heating cooker 1 according to the present exemplary embodiment includes housing 3, heating chamber 5 disposed in housing 3, and door 7 and the like. Door 7 includes outer frame 13 that openably covers opening 3b opened in front frame 3a serving as a front surface of housing 3.

[0014] Heating chamber 5 is configured by a space formed by being surrounded by upper wall 5a disposed at the upper portion, side walls 5b and 5c disposed at both sides, a rear wall (not shown) disposed at the rear portion, and bottom wall 5e disposed at the lower portion. Heating chamber 5 includes a microwave radiation port (not shown) for radiating microwaves. Heating cooker 1 is configured to dielectrically heat the object to be heated (food) placed in heating chamber 5 by the microwave radiated from the microwave radiation port.

[0015] In addition, heating chamber 5 includes a steam outlet (not shown) in the upper portion. Thereby, the steam generated by a steam generator (not shown) is supplied into heating chamber 5.

[0016] Door 7 includes a rotation center in the horizontal direction on the lower side of opening 3b. Thereby, door 7 is openably attached to housing 3 with the rotation center as the rotation axis. Door 7 includes handle 7a mounted on the upper portion of outer frame 13. When the user pulls handle 7a forward and downward, door 7 is rotated so as to be in a horizontal state, and heating chamber 5 is opened. In addition, heating chamber 5 is closed by the user rotating door 7 so as to be in the vertical state.

[0017] Outer frame 13 of door 7 includes display unit 9, operation unit 11, and the like disposed near the other side (right side) in the longitudinal direction (X direction) in a front view. Display unit 9 is configured by, for example, a liquid crystal screen, and displays a menu screen and the like. Operation unit 11 includes functions such as a push button, a dial, and the like. The user can set various cooking instructions and the like in heating cooker 1 using operation unit 11. Note that, hereinafter, one side in the longitudinal direction will be described as a left side, and the other side will be described as a right side in the front view of heating cooker 1.

[0018] Next, the configuration of door 7 will be described with reference to FIG. 3.

[0019] FIG. 3 is an exploded perspective view of door 7. Note that in the following, when the positional relationship of the components of door 7 is described, the positional relationship with door 7 disposed upright in the Z direction will be described.

[0020] As illustrated in FIG. 3, outer frame 13, display unit 9, board 15, fan 17, fan case 19, first metal plate 21 and second metal plate 23 included in metal plates, radio wave leakage prevention plate 25, inner frame 27, and the like are disposed in stated order from a front side (-Y direction) in door 7. That is, door 7 includes at least the above components.

[0021] Electronic components for controlling display unit 9, operation unit 11, and the like are disposed on board 15. Furthermore, a heating element (not shown) that generates heat during operation is disposed on board 15. The heating element is, for example, a microcomputer.

[0022] Fan 17 functions to draw outside air (external air) into door 7 and send it out of door 7. Thereby, board 15 that is heated by the heat from heating chamber 5 is cooled. Fan 17 is disposed forward (-Y direction) from radio wave leakage prevention plate 25.

[0023] Fan case 19 covers the rear of board 15 and fan 17 and forms an air passage through which cooling air generated by fan 17 flows.

[0024] First metal plate 21 is disposed behind board 15 with fan case 19 interposed therebetween. First metal plate 21 functions to block heat transmitted from heating chamber 5 to board 15.

[0025] Second metal plate 23 is disposed so as to cover the rear surface of first metal plate 21. Similarly to first metal plate 21, second metal plate 23 also functions to block heat transmitted from heating chamber 5 to board 15.

[0026] Radio wave leakage prevention plate 25 is configured by a metal plate such as a hot-dip galvanized steel plate or an aluminum-plated steel plate, and is attached to the rear side of outer frame 13. Radio wave leakage prevention plate 25 prevents radio waves (microwaves)

from leaking out of the interior of heating chamber 5 to the outside through door 7.

[0027] Inner frame 27 is attached to the rear side of radio wave leakage prevention plate 25. At this time, inner frame 27 is disposed so as to sandwich radio wave leakage prevention plate 25 between inner frame 27 and outer frame 13.

[0028] Next, the configuration of door 7 will be further described with reference to FIGS. 4 to 6.

[0029] FIG. 4 is a rear perspective view of door 7 with inner frame 27 removed. FIG. 5 is a rear perspective view with radio wave leakage prevention plate 25 removed from door 7 illustrated in FIG. 4. FIG. 6 is a rear perspective view with second metal plate 23 removed from door 7 illustrated in FIG. 5.

[0030] Radio wave leakage prevention plate 25 is disposed inside outer frame 13 along the outer edge of outer frame 13 as illustrated in FIG. 4.

[0031] Second metal plate 23 is disposed on the other side (right side) in the longitudinal direction (X direction) of outer frame 13 as illustrated in FIG. 5. Second metal plate 23 is located behind board 15 and is disposed between heating chamber 5 and first metal plate 21 in the front-rear direction (Y direction).

[0032] First metal plate 21 is located behind board 15 and is disposed between second metal plate 23 and fan case 19 in the front-rear direction (Y direction) as illustrated in FIG. 6.

[0033] Next, the configuration of door 7 will be described with reference to FIGS. 7 and 8.

[0034] FIG. 7 is a rear perspective view with first metal plate 21 removed from door 7 illustrated in FIG. 6. FIG. 8 is a rear view with first metal plate 21 removed from door 7 illustrated in FIG. 6.

[0035] As illustrated in FIG. 7, fan case 19 is located behind board 15 and is disposed between board 15 and second metal plate 23 in the front-rear direction (Y direction).

[0036] Fan case 19 includes hole 19a, which is a through-hole, near the inner side (left side) on the upper side. Hole 19a is formed, for example, as a long hole extending in the vertical direction (Z direction). Two holes 19a are formed in fan case 19 side by side in the vertical direction. Behind the hole 19a, for example, L-shaped cover 19c that opens to the front side and the outside (right side) in the longitudinal direction of door 7 is attached to fan case 19. Cover 19c functions to change the direction of the cooling air flowing backward from board 15 so as to flow outward on the rear surface of fan case 19.

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[0037] In addition, fan case 19 has a plurality of upper holes 19b formed in the vicinity of the upper portion along the longitudinal direction of door 7. Thereby, the cooling air flowing from the lower end to the upper end of board 15 flows into the rear surface of fan case 19 through upper holes 19b.

[0038] In addition, wall 19d protruding rearward (in Y direction) is provided near the outside (right side) of the lower side of fan case 19 on the other side (right side) in the longitudinal direction (X direction) of door 7. Thereby, the cooling air flowing outward from cover 19c can be reflected by wall 19d and turned inward.

[0039] Next, the configuration of door 7 will be further described with reference to FIGS. 9 and 10.

[0040] FIG. 9 is a rear perspective view with fan case 19 removed from door 7 illustrated in FIG. 7. FIG. 10 is a rear view with fan case 19 removed from door 7 illustrated in FIG. 7.

[0041] As illustrated in FIGS. 9 and 10, outer frame 13 of door 7 has air intake port 13a formed at a lower portion on the other side (right side) in the longitudinal direction (X direction) to take in external air. Furthermore, board 15 is attached to outer frame 13 together with display unit 9. In addition, fan 17 is provided near the lower portion of outer frame 13 on the other side in the longitudinal direction and above air intake port 13a.

[0042] Next, the configuration around fan 17 will be described with reference to FIG. 11. FIG. 11 is an enlarged view around fan 17 illustrated in FIG. 10.

[0043] As illustrated in FIG. 11, fan 17 has air intake port 17a and exhaust port 17b. The opening of air intake port 17a is provided in the front-rear direction (Y direction) of door 7. On the other hand, the opening of exhaust port 17b of fan 17 is provided toward the upper direction (Z direction) of door 7.

[0044] Thereby, air intake port 17a of fan 17 that takes in external air is disposed such that the intake direction is the front-rear direction (Y direction) of door 7 in the upright state, that is, the direction intersecting air intake port 13a of outer frame 13 (see FIG. 13). Note that the direction in which fan 17 takes in and the direction in which air intake port 13a intersects may be a right angle. On the other hand, exhaust port 17b of fan 17 is disposed such that the discharge direction is a direction intersecting the intake direction of air intake port 17a. Note that a direction intersecting between the intake direction of air intake port 17a of fan 17 and the discharge direction of exhaust port 17b of fan 17 may be a right angle. Therefore, the axis of rotation of the blade of fan 17 is disposed along the front-rear direction (Y direction). Note that, for example, a sirocco fan is exemplified as fan 17.

[0045] In addition, outer frame 13 includes first partition wall 13c and second partition wall 13d extending rearward (Y direction) from the rear surface of outer frame 13. Groove 13b is formed by first partition wall 13c, second partition wall 13d, and rear wall 13e that is a part of the rear surface of outer frame 13. Groove 13b extends upward from exhaust port 17b of fan 17.

[0046] Next, the positional relationship between radio wave leakage prevention plate 25 and fan 17 will be described with reference to FIG. 12.

[0047] FIG. 12 is a diagram illustrating the positional relationship between radio wave leakage prevention

plate 25 and fan 17 of door 7 of heating cooker 1.

[0048] As illustrated in FIG. 12, at least a part of fan 17 is disposed inside radio wave leakage prevention plate 25 in a rear view and is covered with radio wave leakage prevention plate 25. Specifically, fan 17 is disposed such that, for example, the upper portion including exhaust port 17b and the vicinity of the central part are crawled inside radio wave leakage prevention plate 25. The lower portion of fan 17 is disposed so as to protrude downward from lower edge 25a of radio wave leakage prevention plate 25. With this disposition, it is not necessary to dispose the air intake port and the exhaust port in the vertical direction unlike the conventional fan configuration, so that the length (dimension) of door 7 in the height direction can be reduced.

[0049] Next, air passages of the cooling air flowing from fan 17 will be described with reference to FIGS. 13 to 15.

[0050] FIG. 13 is a view inside door 7 as viewed from a longitudinal cross section around fan 17. FIG. 14 is a front perspective view of fan 17, fan case 19, and board 15. FIG. 15 is a diagram illustrating air passages. Note that in FIG. 15, fan case 19 is illustrated by a broken line, and is illustrated with the inside seen through.

[0051] As illustrated in FIG. 14, fan case 19 further includes outer wall 19e, partition wall 19g, hole 19h, and front wall 19k. Outer wall 19e extends forward (-Y direction) from the inner (left side) end of the front surface of fan case 19. Partition wall 19g extends outside (to the right of) outer wall 19e and forward (-Y direction) parallel to outer wall 19e. Hole 19h is opened in partition wall 19g at a position corresponding to a branch point between first air passage 29 and second air passage 31 configuring air passages described later. Front wall 19k is configured by a part of the front surface of fan case 19. Groove 19m is formed by outer wall 19e, partition wall 19g, and front wall 19k described above. Specifically, groove 19m extends upward from exhaust port 17b of fan 17.

[0052] Groove 13b of outer frame 13 and groove 19m of fan case 19 described above are fitted in the front-rear direction (Y direction). Thereby, air passages in which the external air exhausted from exhaust port 17b of fan 17 flows upward (in Z direction) inside fan case 19 are formed. At this time, hole 19h formed in partition wall 19g of fan case 19 described above serves as a branch point between first air passage 29 and second air passage 31. Thereby, a part of the cooling air flows onto board 15 through hole 19h. On the other hand, the cooling air flowing upward of fan case 19 without passing through hole 19h passes through second air passage 31.

[0053] Hereinafter, the air passages formed in door 7 will be described in details.

[0054] First, the external air indicated by arrow AA, which is taken in from air intake port 13a of outer frame 13 (see FIG. 13), is taken in from air intake port 17a of fan 17 through air intake port 19f of fan case 19 (see FIGS. 11 and 13) disposed so as to face air intake port 13a in the front-rear direction. At this time, the external air taken in from below fan 17 goes around to the rear of fan 17 as illustrated by arrow BB, is taken in from an air intake port 17a, and is discharged from exhaust port 17b as illustrated by arrow CC.

[0055] The cooling air discharged from exhaust port 17b at the upper portion of fan 17 flows upward along groove 13b configuring the air passages. At this time, as illustrated in FIG. 14, first air passage 29 in which the cooling air is branched toward board 15 by hole 19h formed in partition wall 19g is formed in the middle of the air passage flowing upward along groove 13b of outer frame 13. Therefore, the cooling air flowing on board 15 along first air passage 29 flows toward upper hole 19b of fan case 19 as illustrated by arrow DD in FIG. 15. The cooling air passing through upper hole 19b flows on the rear surface side of fan case 19 along third air passage 33 illustrated in FIGS. 8 and 15. Third air passage 33 is connected to fourth air passage 35 flowing between fan case 19 and first metal plate 21 as illustrated in FIG. 8.

[0056] On the other hand, the cooling air branched from first air passage 29 and further flowing along groove 13b of outer frame 13 flows on the rear side of fan case 19 along second air passage 31 passing through hole 19a of fan case 19 (see FIGS. 7 and 15). It is then connected to fourth air passage 35 (see FIG. 8) flowing between fan case 19 and first metal plate 21.

[0057] As described above, air passages configured by, for example, first air passage 29 to fourth air passage 35 are formed inside door 7. And, the external air taken in through fan 17 flows inside fan case 19 along the air passages, and cools board 15 and the like.

[0058] As described above, heating cooker 1 of the present disclosure includes heating chamber 5 having opening 3b, and door 7 that openably covers opening 3b of heating chamber 5. Door 7 includes outer frame 13, radio wave leakage prevention plate 25 attached to the rear side of outer frame 13, inner frame 27 that sandwiches radio wave leakage prevention plate 25 between inner frame 27 and outer frame 13, and air intake port 13a that is provided at a lower portion of outer frame 13 and takes in external air. Furthermore, door 7 includes board 15 attached to outer frame 13, fan 17 attached to outer frame 13, and first air passage 29 extending from fan 17 to board 15. Fan 17 is disposed forward of radio wave leakage prevention plate 25. At least a portion of fan 17 is disposed inside radio wave leakage prevention plate 25 in a rear view. Air intake port 17a of fan 17 is disposed in a direction in which the intake direction is intersects with air intake port 13a of outer frame 13 in the front-rear direction of door 7 in the upright state. Furthermore, exhaust port 17b of fan 17 is disposed in a direction in which the discharge direction intersects the intake direction of the fan.

[0059] From the configuration of heating cooker 1 described above, the following effects can be obtained.

[0060] First, heating cooker 1 of the present disclosure is arranged such that the intake direction of air intake port

17a of fan 17 and the discharge direction of exhaust port 17b are different. Thereby, the direction of the external air taken in is changed, for example, into an orthogonal direction, so that the external air can be taken in slowly. As a result, it is possible to suppress the intake of steam from another cooker such as a rice cooker and the like or a water heater disposed below heating cooker 1 into heating cooker 1. In addition, a part of fan 17 is disposed inside radio wave leakage prevention plate 25. Thereby, the height dimension of door 7 can be shortened. As a result, heating cooker 1 can be reduced in size.

[0061] In addition, heating cooker 1 of the present disclosure includes fan case 19 that covers fan 17 and board 15, and outer frame 13 has groove 13b formed with first partition wall 13c and second partition wall 13d configuring partition walls thereinside. First air passage 29 is formed by groove 13b of outer frame 13 and fan case 19. That is, first air passage 29 configuring an air passage extending from fan 17 to board 15 is formed by fan case 19 and groove 13b of outer frame 13. Therefore, the external air taken in from air intake port 13a of outer frame 13 is appropriately blown to board 15. Thereby, board 15 can be effectively cooled by the external air.

[0062] In addition, fan case 19 of heating cooker 1 of the present disclosure has hole 19a that is formed behind groove 13b of outer frame 13 and configures a through-hole, and second air passage 31 extending from fan 17 to the rear surface of fan case 19 through hole 19a is formed by groove 13b of outer frame 13 and fan case 19. That is, hole 19a configuring the through-hole is formed in fan case 19. Thereby, second air passage 31 configuring an air passage from fan 17 to the rear surface of fan case 19 through hole 19a is formed. As a result, the rear surface of fan case 19 can be effectively cooled.

[0063] In addition, fan case 19 of heating cooker 1 of the present disclosure includes upper hole 19b formed upward of board 15, and third air passage 33 extending from board 15 to the rear surface of fan case 19 through upper hole 19b. That is, third air passage 33 configuring an air passage in which the cooling air that has cooled board 15 passes through upper hole 19b of fan case 19 and reaches the rear surface of fan case 19 is formed. Thereby, the rear surface of fan case 19 can be effectively cooled.

[0064] In addition, door 7 of heating cooker 1 of the present disclosure includes first metal plate 21 configuring metal plates that cover at least a part of the rear side of fan case 19, and fourth air passage 35 between the rear surface of fan case 19 and the front surface of first metal plate 21. That is, the cooling air that has passed through third air passage 33 reaching the rear surface of fan case 19 passes through fourth air passage 35 configuring an air passage between the rear surface of fan case 19 and first metal plate 21. Thereby, first metal plate 21 is cooled. As a result, the heat shielding effect of first metal plate 21 on board 15 is furthermore improved. In addition, an air curtain is formed between fan case 19 and first metal plate 21 by fourth air passage 35. Thereby, the heat transferred to first metal plate 21 can be absorbed by the cooling air. As a result, the function of first metal plate 21 as a heat shield plate is further improved, and the heat transfer to fan case 19 can be efficiently reduced.

[0065] In addition, a heating element that generates heat during operation is mounted on board 15 of heating cooker 1 of the present disclosure, and the heating element is disposed on first air passage 29. Thereby, the heating element can be efficiently cooled by the cooling air flowing on first air passage 29.

[0066] Note that by appropriately combining any of the above-described various exemplary embodiments and modified examples, the effects of the respective exemplary embodiments can be achieved.

[0067] As described above, according to the heating cooker of one aspect of the present disclosure, the heating cooker includes a heating chamber having the opening and a door that openably covers the opening of the heating chamber. The door includes an outer frame, a radio wave leakage prevention plate attached to the rear side of the outer frame, an inner frame that sandwiches the radio wave leakage prevention plate between the inner frame and the outer frame, and an air intake port provided at a lower portion of the outer frame to take in external air. Furthermore, the door includes a board attached to the outer frame, a fan attached to the outer frame, and a first air passage extending from the fan to the board. The fan is disposed forward of the radio wave leakage prevention plate. At least a part of the fan is disposed inside the radio wave leakage prevention plate in a rear view. An air intake port of the fan is disposed in a direction in which the intake direction intersects with the air intake port of the outer frame in a front-rear direction of the door in an upright state. Furthermore, the exhaust port of the fan is disposed in a direction in which the discharge direction intersects the intake direction of the fan.

[0068] In addition, a fan case that covers the fan and the board is provided, and the outer frame has a groove formed by a partition wall thereinside. The first air passage is formed by the groove of the outer frame and the fan case.

[0069] In addition, the fan case may have a through-hole formed behind the groove of the outer frame, and a second air passage extending from the fan to the rear surface of the fan case through the through-hole may be formed by the groove of the outer frame and the fan case.

[0070] In addition, the fan case may include an upper hole formed upward of the board, and the door may include a third air passage extending from the board through the upper hole to a rear surface of the fan case.

[0071] In addition, the door may include a metal plate that covers at least a part of the rear side of the fan case, and a fourth air passage between the rear surface of the fan case and the front surface of the metal plate.

[0072] In addition, the board may be provided with a heating element that generates heat during operation, and the heating element may be disposed on the first air

passage.

INDUSTRIAL APPLICABILITY

[0073] The present disclosure is useful as a heating cooker such as a high-frequency heating cooker, a high-frequency heating cooker with a steam generator, a high-frequency heating cooker with a heater, and the like.

REFERENCE MARKS IN THE DRAWINGS

[0074]

1: heating cooker
3: housing
3a: front frame
3b: opening
5: heating chamber
5a: upper wall
5b, 5c: side wall
5e: bottom wall
7: door
9: display unit
11: operation unit
13: outer frame
13a, 17a, 19f: air intake port
13b, 19m: groove
13c: first partition wall (partition wall)
13d: second partition wall (partition wall)
13e: rear wall
15: board
17: fan
17b: exhaust port
19: fan case
19a: hole (through-hole)
19b: upper hole
19c: cover
19d: wall
19e: outer wall
19g: partition wall
19h: hole
19k: front wall
21: first metal plate (metal plate)
23: second metal plate (metal plate)
25: radio wave leakage prevention plate
25a: lower edge
27: inner frame
29: first air passage (air passage)
31: second air passage (air passage)
33: third air passage (air passage)
35: fourth air passage (air passage)

Claims

1. A heating cooker (1) comprising:

a heating chamber (5) having an opening; and

a door (7) that openably covers the opening of the heating chamber (5) and has a front side and a rear side, the rear side being opposite to the front side in a front-rear direction of the door (7), wherein
the door (7) includes:

an outer frame (13);
a radio wave leakage prevention plate (25) attached to a rear side of the outer frame;
an inner frame (27) that sandwiches the radio wave leakage prevention plate (25) between the inner frame (27) and the outer frame (13);
an air intake port (13a) provided at a lower portion of the outer frame (13) to take in external air;
a board (15) attached to the outer frame (13);
a fan (17) attached to the outer frame (13); and
a first air passage (29) extending from the fan (17) to the board (15),

the fan (17) is arranged, in a direction from the rear side of the door (7) to the front side of the door (7), forward of the radio wave leakage prevention plate (25),
wherein at least a part of the fan (17) is disposed inside the radio wave leakage prevention plate (25) in a view from the rear side to the front side of the door (7), **characterized in that**
an air intake port (17a) of the fan (17) is disposed in a direction such that the intake direction of the air intake port (17a) intersects with the intake direction of the air intake port (13a) of the outer frame (13),
an exhaust port (17b) of the fan (17) is disposed in a direction in which a discharge direction intersects the intake direction of the fan (17), and the heating cooker (1) further comprises a fan case (19) covering the fan (17) and the board (15), wherein
the outer frame (13) has a groove (13b) formed by a first partition wall (13c), a second partition wall (13d) and a rear wall (13c) of the outer frame (13), and
the first air passage (29) is formed by the groove (13b) of the outer frame (13) and the fan case (19).

2. The heating cooker (1) according to claim 1, wherein

the fan case (19) has a through-hole (19h) formed behind the groove (13b) of the outer frame (13), and
a second air passage (31) extending from the fan (17) through the through-hole (19h) to a rear

surface of the fan case (19) is formed by the groove (13b) of the outer frame (13) and the fan case (19).

3. The heating cooker (1) according to claim 1 or 2, wherein

the fan case (19) includes an upper hole (19b) formed above the board (15), and
the door (7) includes a third air passage (33) extending from the board (15) through the upper hole (19b) to a rear surface of the fan case (19).

4. The heating cooker (1) according to claim 2 or 3, wherein
the door (7) includes:

a metal plate (21) covering at least a part of the rear side of the fan case (19); and
a fourth air passage (35) between a rear surface of the fan case (19) and a front surface of the metal plate (21).

5. The heating cooker (1) according to any one of claims 1 to 4, wherein

the board (15) is provided with a heating element that generates heat during operation, and
the heating element is disposed on the first air passage (29).

Patentansprüche

1. Ein Heizkocher (1), umfassend:

eine Heizkammer (5) mit einer Öffnung; und
eine Tür (7), die die Öffnung der Heizkammer (5) verschließbar abdeckt und eine Vorderseite sowie eine Rückseite aufweist, wobei die Rückseite der Vorderseite in einer Vorne-Hinten-Richtung der Tür (7) gegenüberliegt, wobei die Tür (7) umfasst:

einen Außenrahmen (13);
eine Funkwellenaustrittsverhinderungsplatte (25), die an einer Rückseite des Außenrahmens angebracht ist;
einen Innenrahmen (27), der die Funkwellenaustrittsverhinderungsplatte (25) zwischen dem Innenrahmen (27) und dem Außenrahmen (13) einschließt;
eine Lufteinlassöffnung (13a), die an einem unteren Abschnitt des Außenrahmens (13) vorgesehen ist, um Außenluft anzusaugen;
eine Platte (15), die am Außenrahmen (13) befestigt ist;
einen am Außenrahmen (13) befestigten Lüfter (17); und
einen ersten Luftkanal (29), der sich vom Lüfter (17) zur Platine (15) erstreckt,

wobei der Lüfter (17) in einer Richtung von der Rückseite der Tür (7) zur Vorderseite der Tür (7) vor der Funkwellenaustrittsverhinderungsplatte (25) angeordnet ist,
wobei zumindest ein Teil des Lüfters (17) in einer Ansicht von der Rückseite zur Vorderseite der Tür (7) zumindest ein Teil des Lüfters (17) innerhalb der Funkwellenaustrittsverhinderungsplatte (25) angeordnet ist, **dadurch gekennzeichnet, dass**
eine Lufteinlassöffnung (17a) des Lüfters (17) so ausgerichtet ist, dass die Einlassrichtung der Lufteinlassöffnung (17a) die Einlassrichtung der Lufteinlassöffnung (13a) des Außenrahmens (13) schneidet,
eine Auslassöffnung (17b) des Lüfters (17) in einer Richtung angeordnet ist, in der sich die Auslassrichtung mit der Ansaugrichtung des Lüfters (17) schneidet, und der Heizkocher (1) ferner ein Lüftergehäuse (19) umfasst, das den Lüfter (17) und die Platte (15) abdeckt, wobei der Außenrahmen (13) eine Nut (13b) aufweist, die durch eine erste Trennwand (13c), eine zweite Trennwand (13d) und eine Rückwand (13c) des Außenrahmens (13) gebildet wird, und der erste Luftkanal (29) durch die Nut (13b) des Außenrahmens (13) und das Lüftergehäuse (19) gebildet wird.

2. Der Heizkocher (1) nach Anspruch 1, wobei

das Lüftergehäuse (19) eine Durchgangsöffnung (19h) aufweist, die hinter der Nut (13b) des Außenrahmens (13) ausgebildet ist, und
ein zweiter Luftkanal (31), der sich vom Lüfter (17) durch die Durchgangsöffnung (19h) zu einer Rückseite des Lüftergehäuses (19) erstreckt, durch die Nut (13b) des Außenrahmens (13) und das Lüftergehäuse (19) gebildet wird.

3. Der Heizkocher (1) nach Anspruch 1 oder 2, wobei

das Lüftergehäuse (19) eine oberhalb der Platte (15) ausgebildete obere Öffnung (19b) aufweist und
die Tür (7) einen dritten Luftkanal (33) aufweist, der sich von der Platte (15) durch die obere Öffnung (19b) zu einer Rückseite des Lüftergehäuses (19) erstreckt.

4. Der Heizkocher (1) nach Anspruch 2 oder 3, wobei die Tür (7) umfasst:

eine Metallplatte (21), die zumindest einen Teil

der Rückseite des Lüftergehäuses (19) abdeckt; und
einen vierten Luftkanal (35) zwischen einer Rückseite des Lüftergehäuses (19) und einer Vorderseite der Metallplatte (21).

5. Der Heizkocher (1) nach einem der Ansprüche 1 bis 4, wobei

die Platte (15) mit einem Heizelement versehen ist, das im Betrieb Wärme erzeugt, und
das Heizelement am ersten Luftkanal (29) angeordnet ist.

Revendications

1. Appareil de cuisson chauffant (1) comprenant :

une chambre de chauffage (5) présentant une ouverture, et
une porte (7) qui recouvre de manière ouvrable l'ouverture de la chambre de chauffage (5) et qui comprend une face avant et une face arrière, la face arrière étant opposée à la face avant dans une direction avant-arrière de la porte (7) ;
ladite porte (7) comprenant :

un cadre extérieur (13),
une plaque de prévention de fuite d'ondes radio (25) fixée à la face arrière du cadre extérieur,
un cadre intérieur (27) qui prend en sandwich la plaque de prévention de fuite d'ondes radio (25) entre le cadre intérieur (27) et le cadre extérieur (13),
une entrée d'air (13a) prévue dans la portion inférieure du cadre extérieur (13) pour faire entrer de l'air extérieur,
une carte (15) fixée au cadre extérieur (13),
un ventilateur (17) fixé au cadre extérieur (13), et
un premier passage d'air (29) s'étendant du ventilateur (17) à la carte (15) ;

le ventilateur (17) étant agencé, dans le sens allant de la face arrière de la porte (7) vers la face avant de la porte (7), en avant de la plaque de prévention de fuite d'ondes radio (25),
au moins une partie du ventilateur (17) étant disposée à l'intérieur de la plaque de prévention de fuite d'ondes radio (25), vue de la face arrière vers la face avant de la porte (7) ; **caractérisé en ce que**
une entrée d'air (17a) du ventilateur (17) est disposée de façon que la direction d'entrée de l'entrée d'air (17a) croise la direction d'entrée de l'entrée d'air (13a) du cadre extérieur (13),
une sortie d'air (17b) du ventilateur (17) est disposée de façon que la direction de sortie croise la direction d'entrée du ventilateur (17), et l'appareil de cuisson (1) comprend en outre un boîtier de ventilateur (19) recouvrant le ventilateur (17) et la carte (15) ;
le cadre extérieur (13) présentant une rainure (13b) formée par une première paroi de séparation (13c), une deuxième paroi de séparation (13d) et une paroi arrière (13c) du cadre extérieur (13), et
le premier passage d'air (29) étant formé par la rainure (13b) du cadre extérieur (13) et le boîtier de ventilateur (19).

2. Appareil de cuisson chauffant (1) selon la revendication 1, dans lequel

le boîtier de ventilateur (19) présente un trou traversant (19h) formé derrière la rainure (13b) du cadre extérieur (13), et
un deuxième passage d'air (31) s'étendant depuis le ventilateur (17) jusqu'à la surface arrière du boîtier de ventilateur (19) en passant par le trou traversant (19h) est formé par la rainure (13b) du cadre extérieur (13) et le boîtier de ventilateur (19).

3. Appareil de cuisson chauffant (1) selon la revendication 1 ou 2, dans lequel

le boîtier de ventilateur (19) présente un trou supérieur (19b) formé au-dessus de la carte (15), et
la porte (7) présente un troisième passage d'air (33) s'étendant depuis la carte (15) jusqu'à la surface arrière du boîtier de ventilateur (19) en passant par le trou supérieur (19b).

4. Appareil de cuisson chauffant (1) selon la revendication 2 ou 3, dans lequel la porte (7) comprend :

une plaque métallique (21) recouvrant au moins une partie de la face arrière du boîtier de ventilateur (19), et
un quatrième passage d'air (35) entre une surface arrière du boîtier de ventilateur (19) et une surface avant de la plaque métallique (21).

5. Appareil de cuisson chauffant (1) selon l'une quelconque des revendications 1 à 4, dans lequel

la carte (15) est pourvue d'un élément chauffant qui génère de la chaleur à l'usage, et
l'élément chauffant est disposé sur le premier passage d'air (29).

FIG. 1

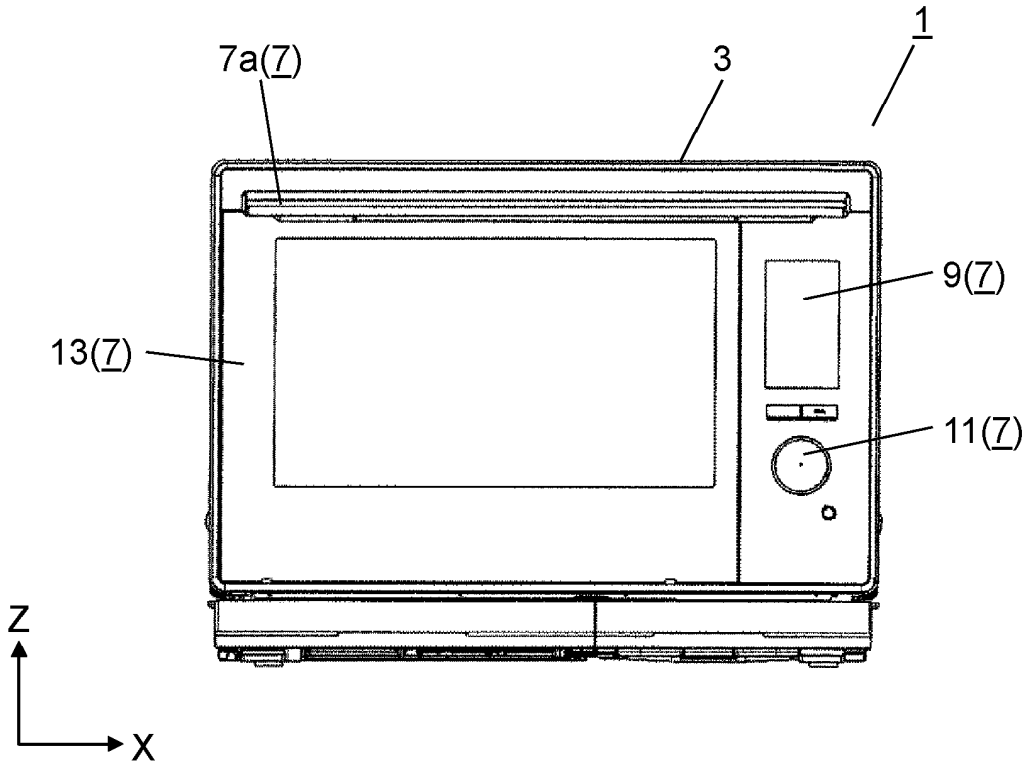


FIG. 2

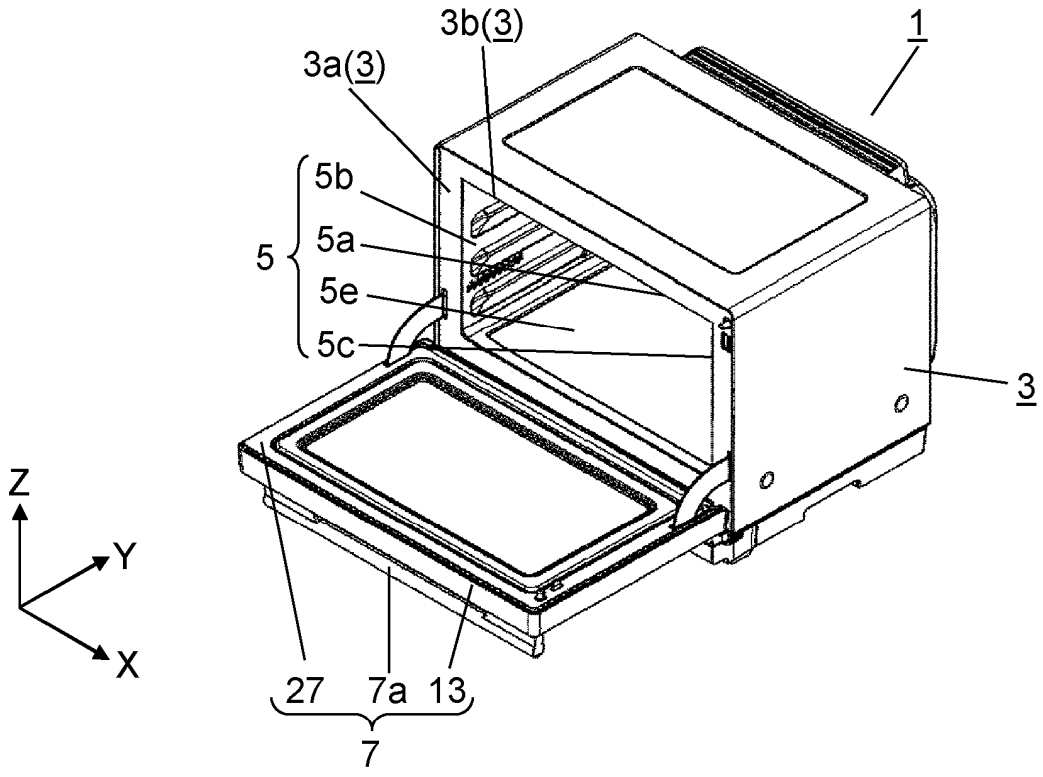


FIG. 3

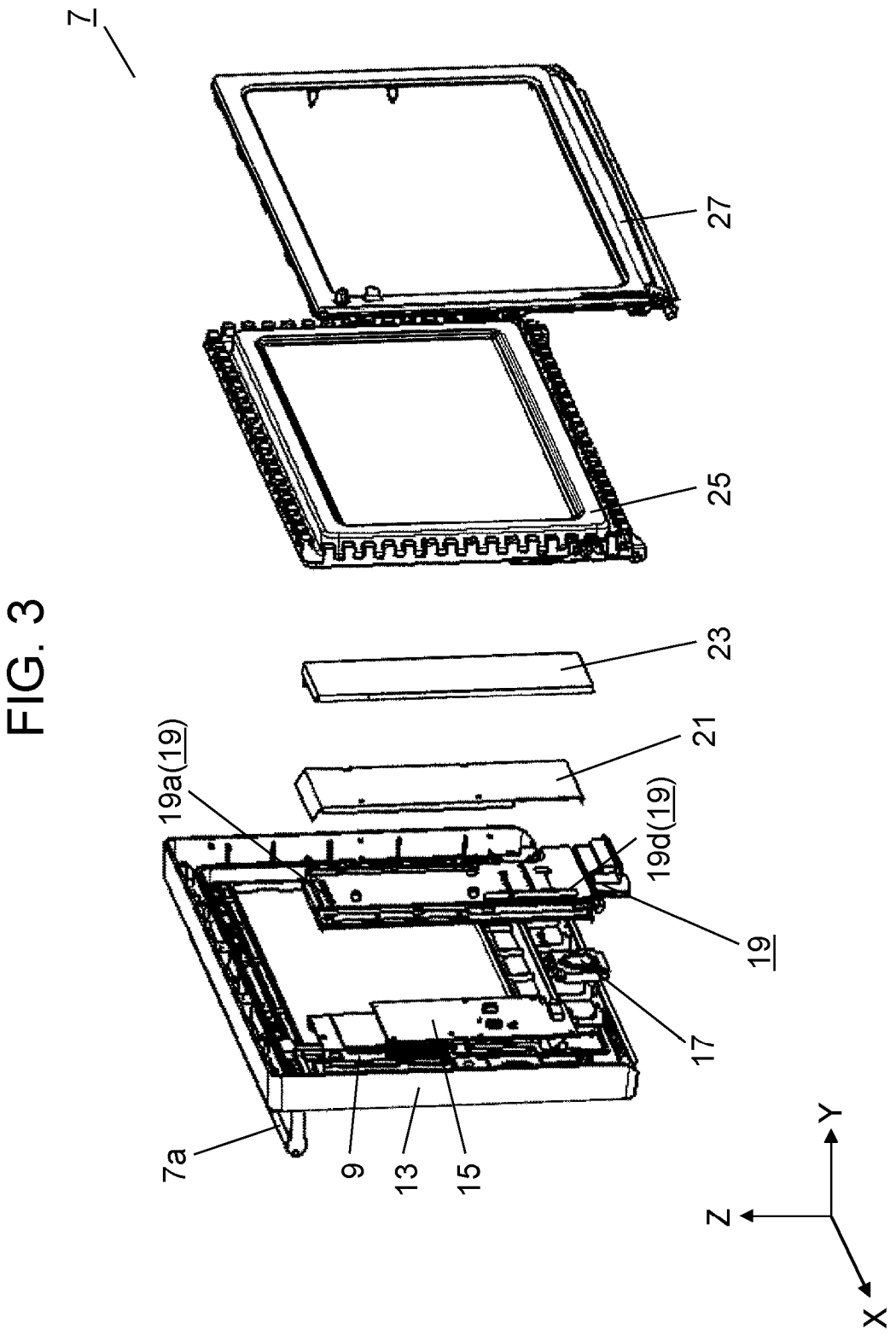


FIG. 4

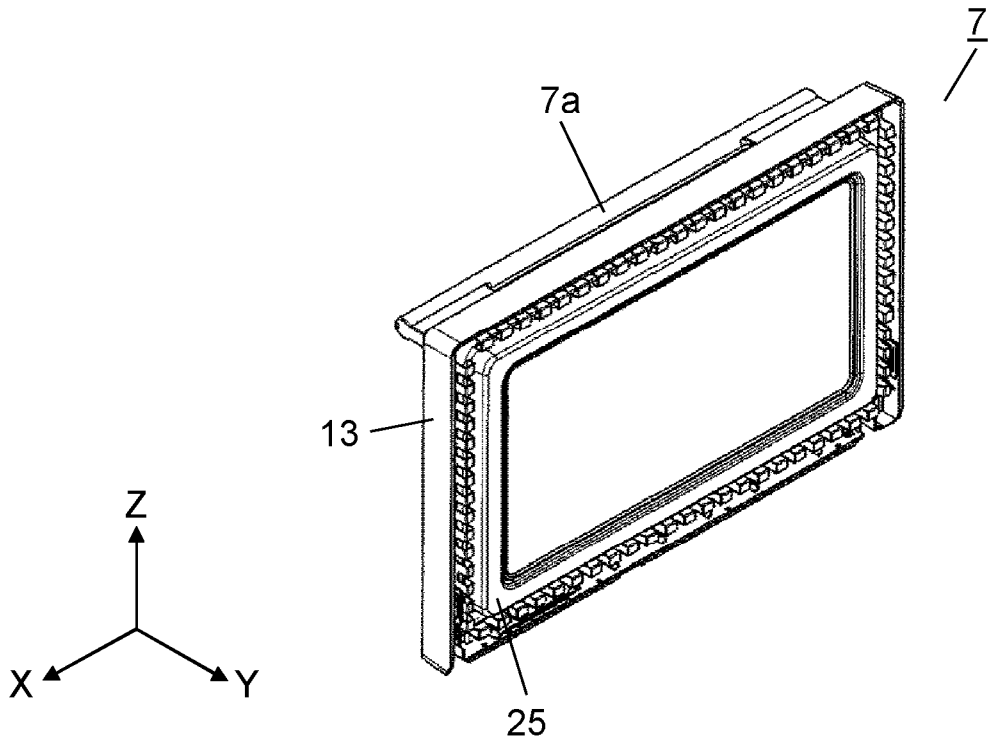


FIG. 5

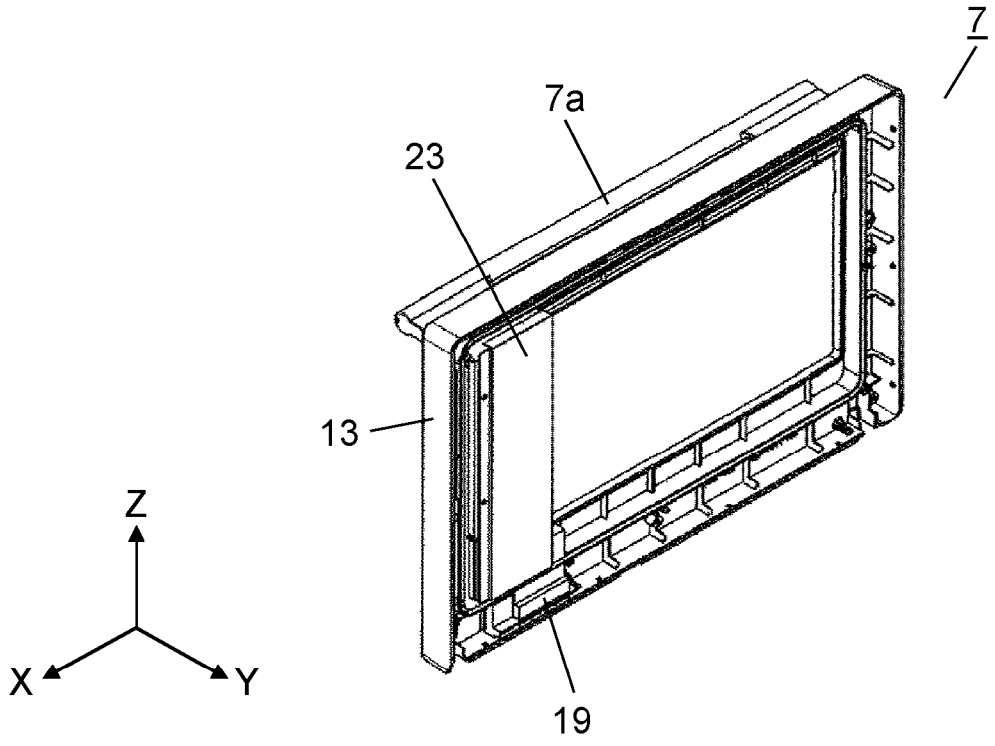


FIG. 6

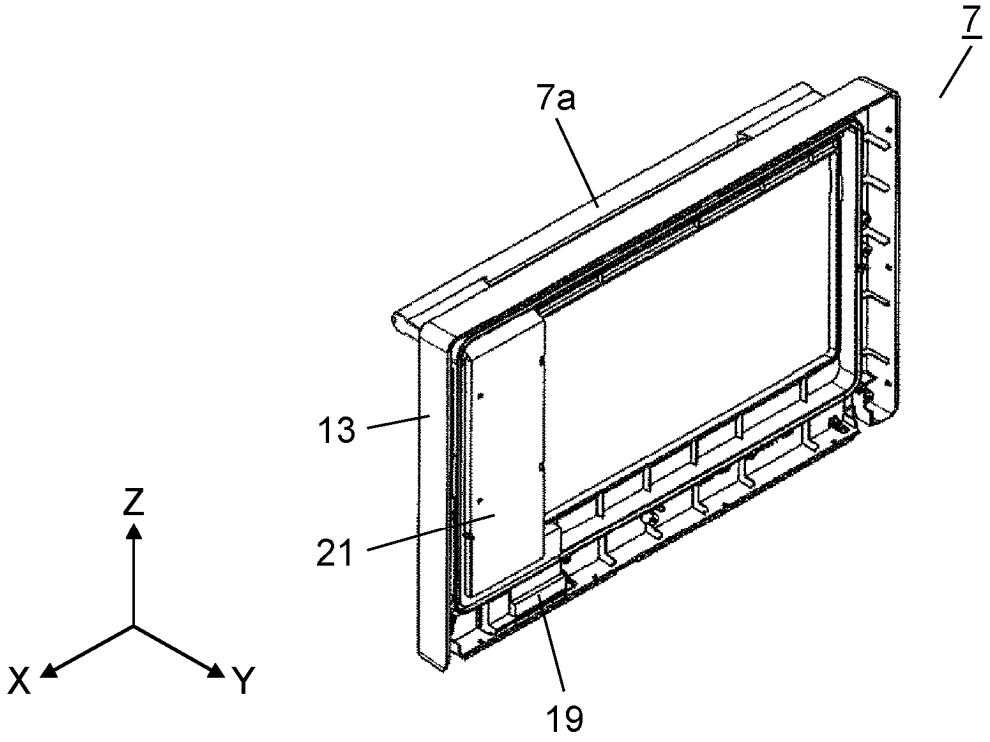


FIG. 7

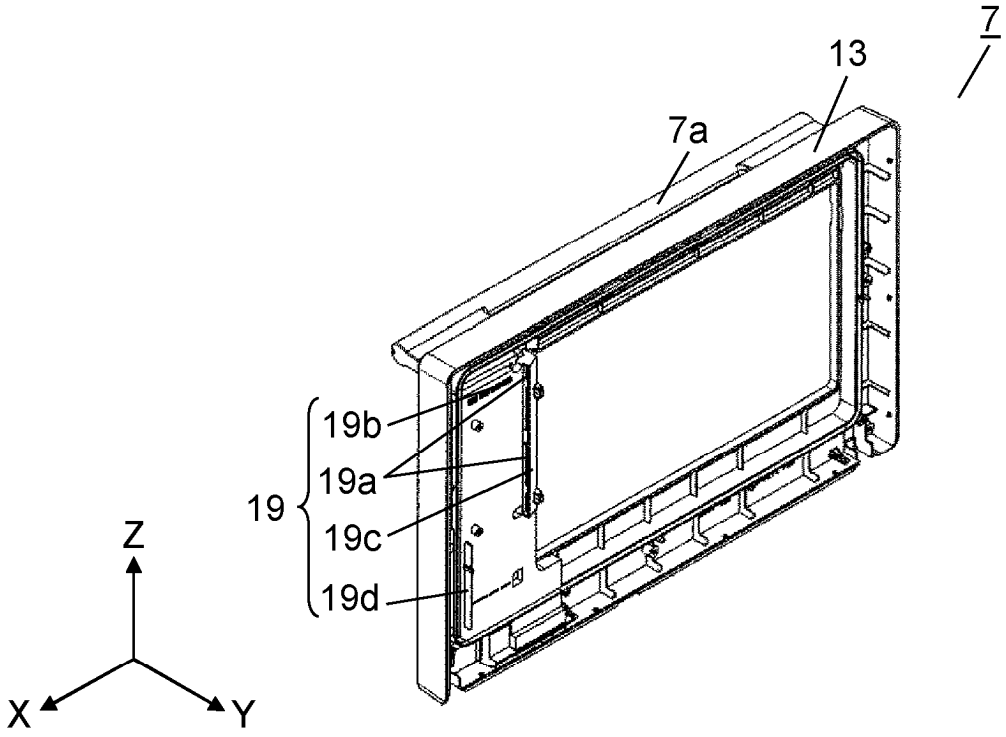


FIG. 8

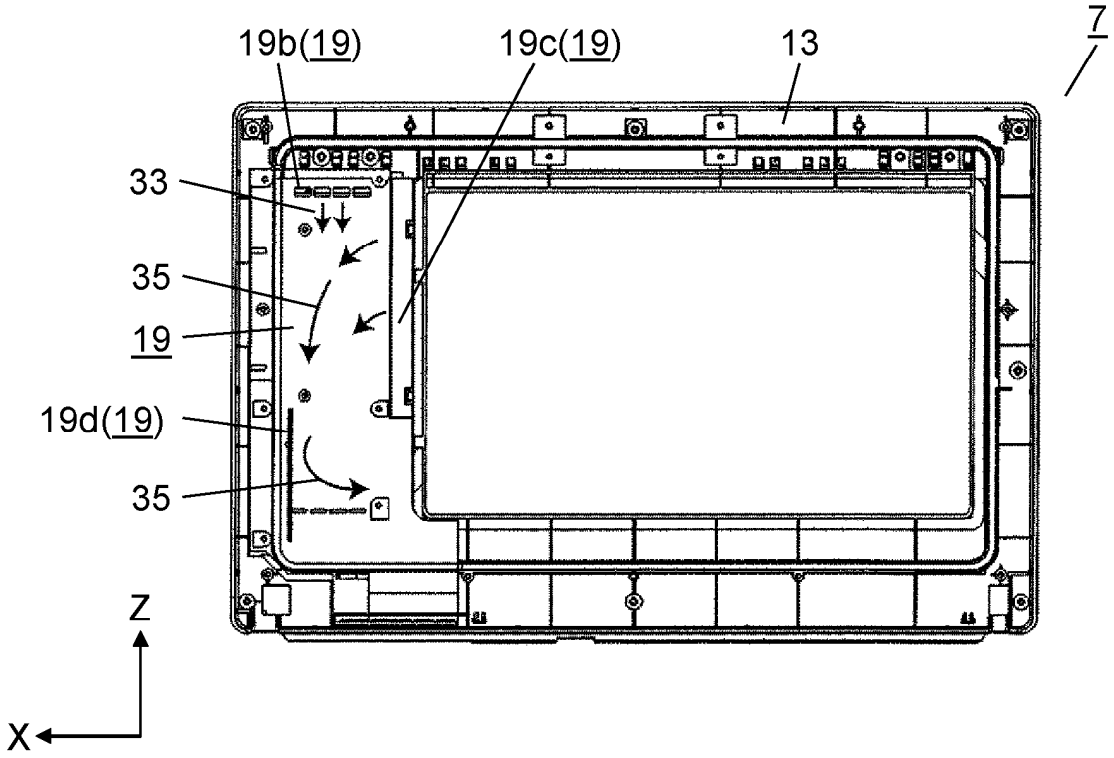


FIG. 9

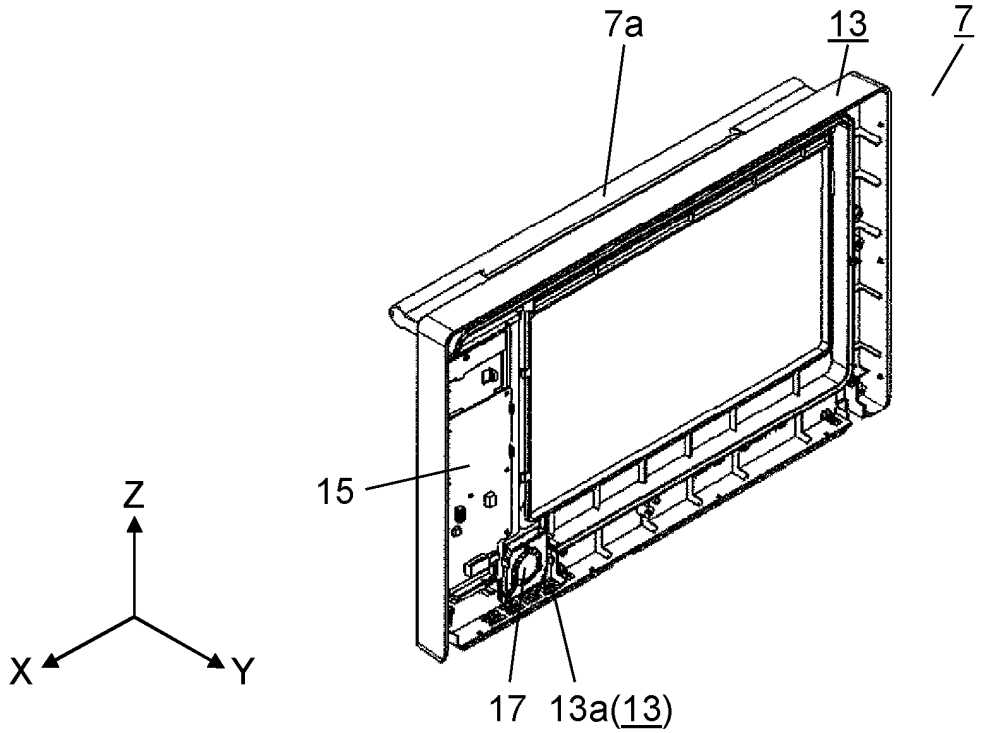


FIG. 10

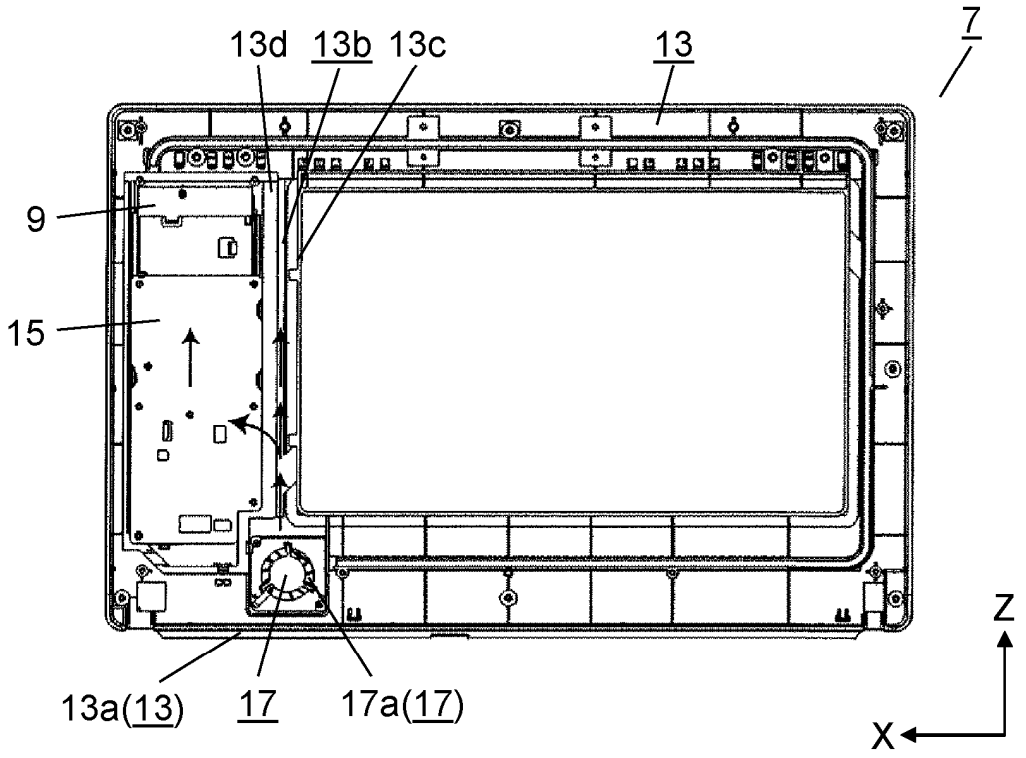

13d
13b
13c
13
7
9
15
13a(13)
17
17a(17)
Z
X

FIG. 11

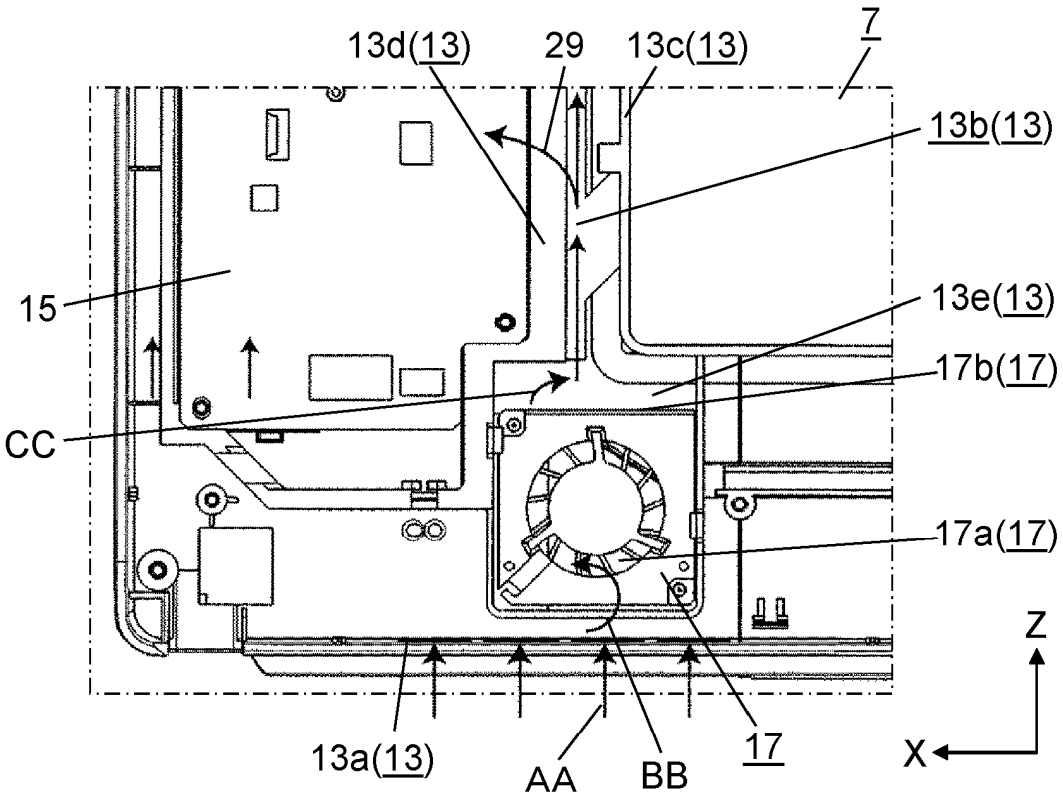

13d(13)
29
13c(13)
7
13b(13)
15
13e(13)
17b(17)
CC
17a(17)
Z
X
13a(13)
AA
BB
17

FIG. 12

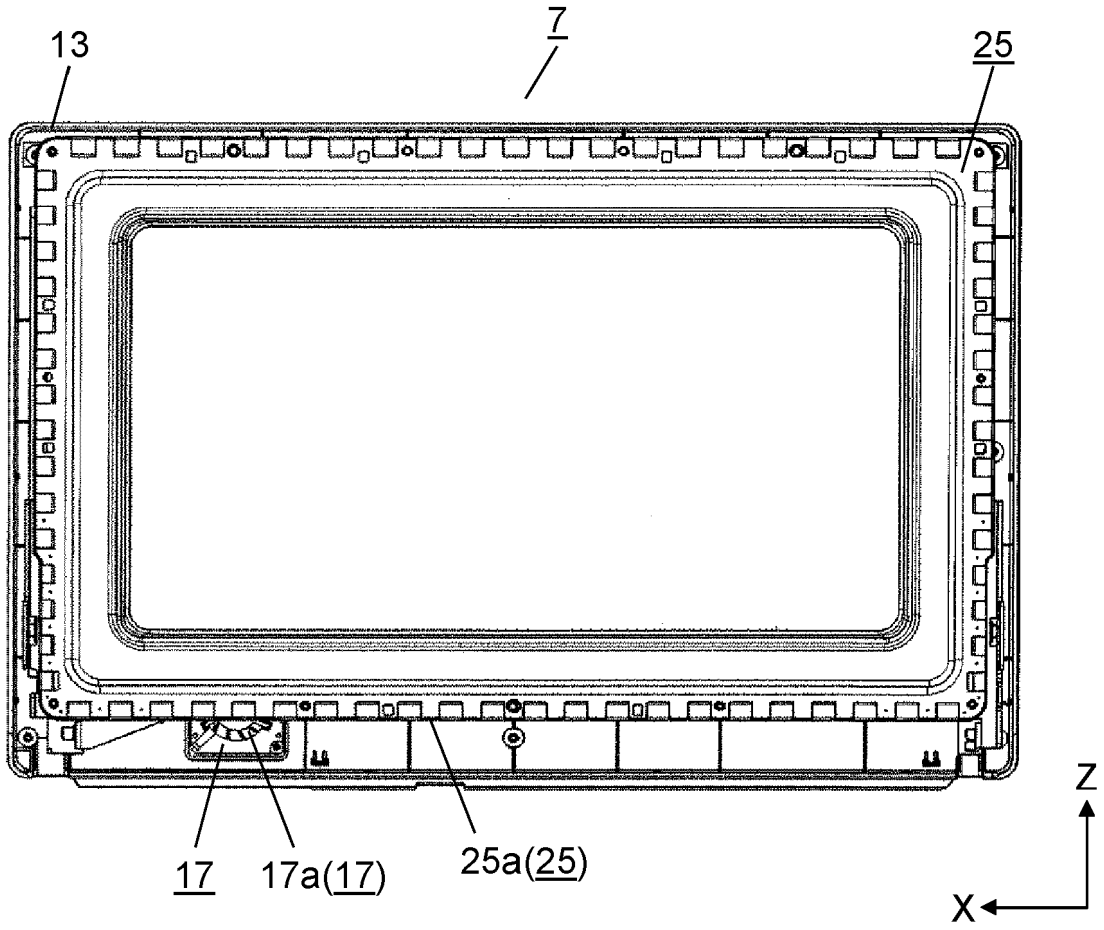


FIG. 13

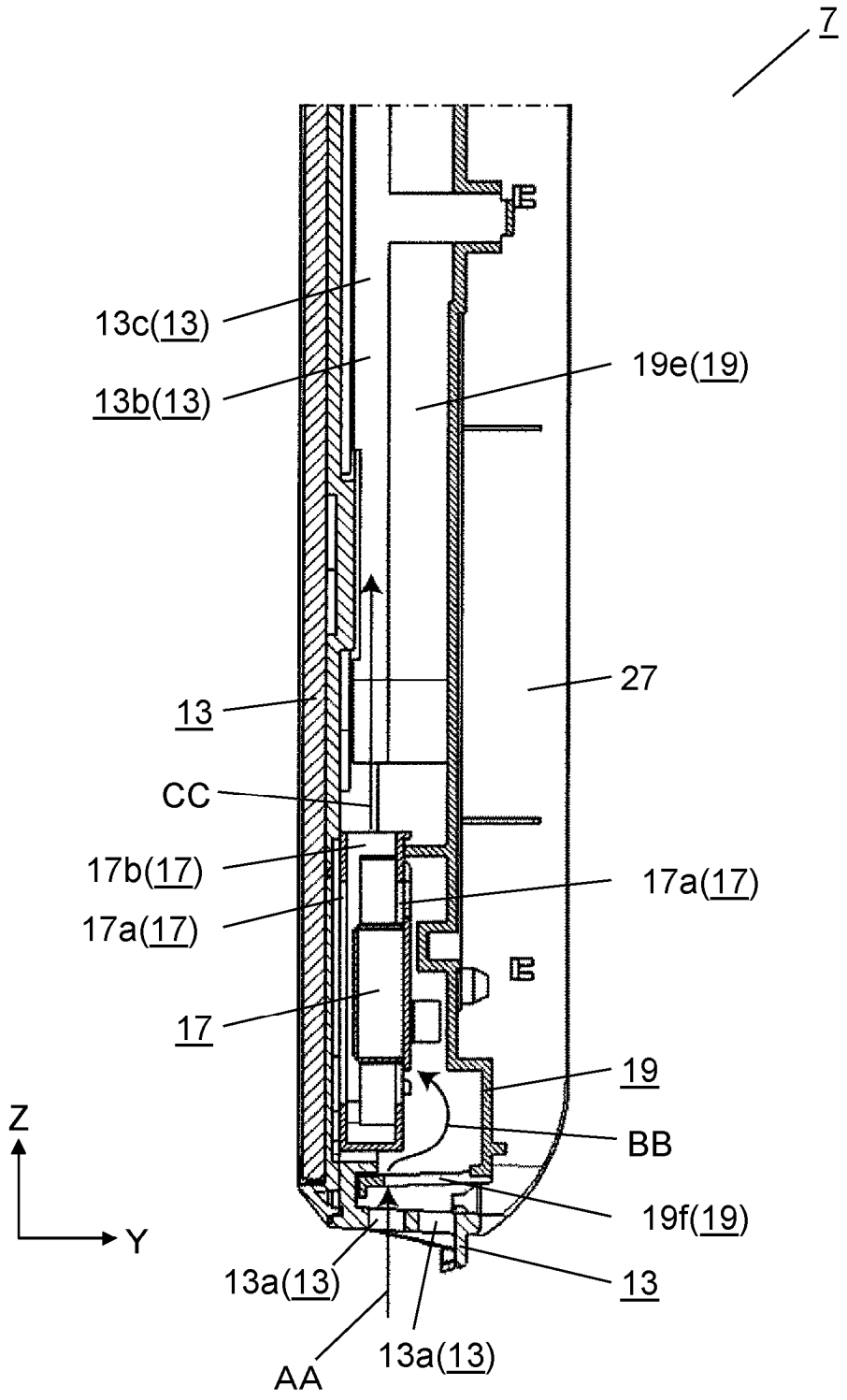

7
13c(13)
13b(13)
19e(19)
27
13
CC
17b(17)
17a(17)
17a(17)
17
19
BB
19f(19)
13
13a(13)
13a(13)
AA
Z
Y

FIG. 14

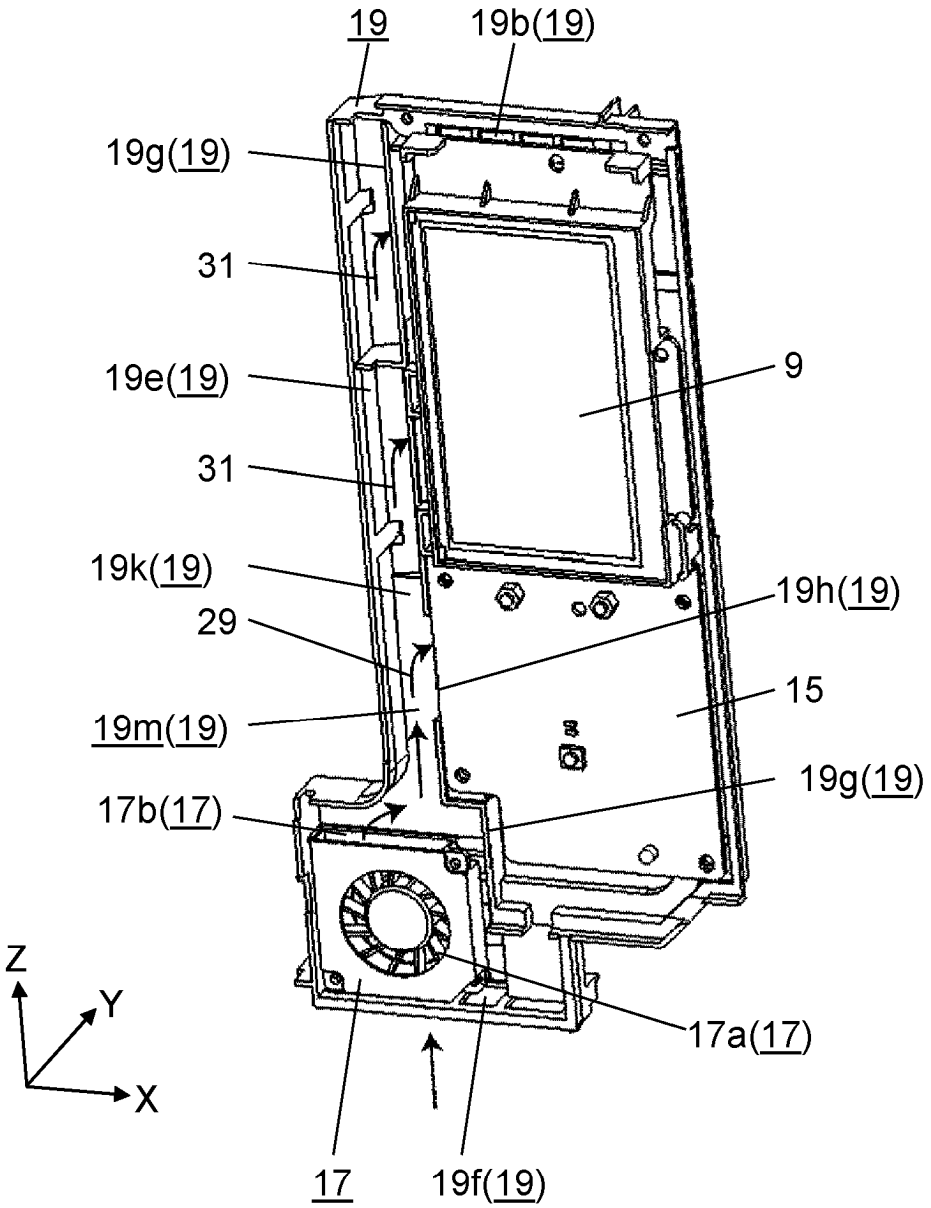
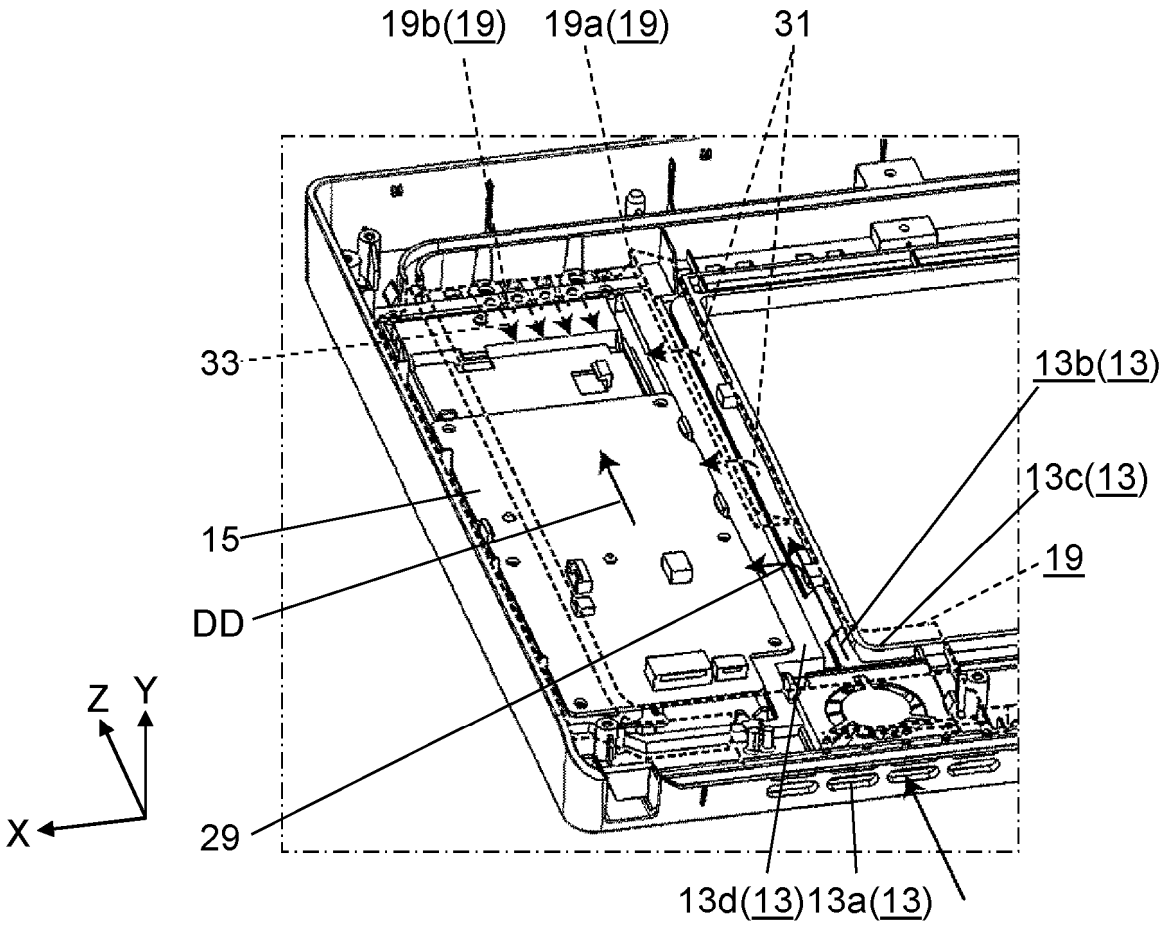

19
19b(19)
19g(19)
31
19e(19)
9
31
19k(19)
19h(19)
29
15
19m(19)
19g(19)
17b(17)
Z
Y
X
17a(17)
17
19f(19)

FIG. 15



REFERENCES CITED IN THE DESCRIPTION

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