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(54) **kitchen exhaust hood**

Küchenlüftungshaube

Hotte de ventilation pour cuisine

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- **PATENT ABSTRACTS OF JAPAN vol. 2002, no. 09, 4 September 2002 (2002-09-04) & JP 2002 130759 A (ROYAL ELECTRIC CO LTD), 9 May 2002 (2002-05-09)**

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Description

[0001] The present invention relates to a kitchen exhaust hood, and particularly, to a kitchen exhaust hood installed above a gas range for discharging contaminated gas such as heat, vapor, smell of food, or the like generated during cooking foods to the outside.

[0002] In a home kitchen or a commercial kitchen, contaminated gas such as smoke, smell of food, greasy vapor or the like as well as heat is generated during cooking foods, and the contaminated gas spreads over the kitchen or a whole room. In general, a kitchen exhaust hood is installed above a gas range, a cookware, for preventing the contaminated gas from spreading. Thereby, the contaminated gas is discharged to an outside by using a suction force of an exhaust fan installed in the kitchen exhaust hood.

[0003] Figure 1 is a perspective view showing a conventional kitchen exhaust hood and Figure 2 is a longitudinal sectional view showing this conventional kitchen exhaust hood.

[0004] As shown in Figures 1 and 2, the conventional kitchen exhaust hood 10 is comprised of: a vertical exhaust duct 11 fixed to a wall surface 11a of the kitchen and having an exhaust fan 11b installed therein; and a horizontal exhaust duct 12 having an inlet port 12a for sucking contaminated gas generated during cooking foods in the middle of a lower portion thereof.

[0005] Moreover, an grease filter 12b for filtering greasy vapor is installed at a lower portion of the horizontal exhaust duct 12, and a dust filter 11c for filtering fine dust from the sucked contaminated gas is installed in the vertical exhaust duct 11.

[0006] In this conventional kitchen exhaust hood 10, the exhaust fan 11b is operated to suck the contaminated gas generated during cooking foods through the inlet port 12a. The sucked contaminated gas is then discharged to the outside through the vertical exhaust duct 11. An unexplained reference numeral 30 indicates a gas range, the reference numeral 31 indicates a burner portion, the reference numeral 32 indicates a food container, and the reference numeral 11a indicates an inner wall of the kitchen.

[0007] However, in this conventional exhaust hood, if contaminated gas is generated over a capacity to be sucked by the exhaust fan during cooking foods, the contaminated gas cannot be rapidly discharged to the outside through the horizontal and the vertical exhaust ducts, rather spreading over the room. As a result of this, indoor air is contaminated.

[0008] Another conventional kitchen exhaust hood (Patent Abstracts of Japan, vol. 2002, No. 9 and JP 2002 130 759 A) comprising the features of the preamble of claim 1 has at each side of a horizontal exhaust hood a fan with an individual motor in a separate housing installed at the outer periphery of the horizontal duct to generate an air curtain around the burner portion of a range.

[0009] A further conventional kitchen exhaust hood (CH 682 51 2 A5) comprises a ventilation fan and a piping provided outside the hood.

[0010] Furthermore, it is known (DE 1 679 545 A1) to use in a kitchen range one fan for sucking off and for generating an air curtain around the cooking range. However, contaminated gas or air which is removed from the cooking range has to pass a filter to avoid that contaminated air or gas is used for shielding the cooking range against the room in which the cooking range is installed.

[0011] The object of the present invention is to provide a compact and simple kitchen exhaust hood which effectively presents that contaminated gas or air generated during cooking foods contaminates the indoor air of the room in which the cooking range is installed.

[0012] This object is achieved in accordance with the present invention by a kitchen exhaust hood comprising the features of claim 1.

[0013] Further features and improvements of this invention are subject matter of the claims dependent from claim 1.

[0014] The present invention provides a kitchen exhaust hood capable of preventing spread of contaminated gas by rapidly discharging the contaminated gas generated during cooking foods to an outside through a horizontal exhaust duct and a vertical exhaust duct after collecting the contaminated gas, by installing a single suction fan for sucking indoor air at an upper portion of the horizontal exhaust duct and emitting the indoor air sucked by the suction fan through nozzles formed at the outer periphery of a lower portion of the horizontal exhaust duct.

[0015] In accordance with the purpose of the present invention, as embodied and broadly described herein, there is provided a kitchen exhaust hood, comprising: a vertical exhaust duct having an exhaust fan therein; a horizontal exhaust hood having a contaminated gas inlet in the middle of a lower portion thereof and nozzles at an outer periphery of the lower portion thereof; and a single suction fan installed inside the horizontal exhaust duct, for blowing to the nozzles the air sucked through an indoor air inlet formed at the horizontal exhaust duct.

[0016] The indoor air inlet is formed at the horizontal exhaust duct, an indoor air passage is formed in the horizontal exhaust duct for guiding indoor air sucked through the indoor air inlet toward the nozzles. Also, a guider is installed at the indoor air passage.

[0017] A collection zone for collecting contaminated gas by the indoor air blown through the nozzles is formed at a lower portion of the horizontal exhaust duct, and the contaminated gas collected in the collection zone is discharged to the outside through the horizontal exhaust duct and the vertical exhaust duct.

[0018] The foregoing and other objects, features, aspects and advantages of the present invention will become more apparent from the following detailed description of the present invention when taken in conjunction with the accompanying drawings.

[0019] The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this specification, illustrate preferred embodiments of the invention and together with the description serve to explain the principles of the invention.

[0020] In the drawings:

Figure 1 is a perspective view showing a conventional kitchen exhaust hood;
Figure 2 is a longitudinal sectional view showing this conventional kitchen exhaust hood;
Figure 3 is a perspective view showing another kitchen exhaust hood;
Figure 4 is a bottom perspective view showing the kitchen exhaust hood of Figure 3;
Figure 5 is a front view showing the kitchen exhaust hood of Figures 3 and 4;
Figure 6 is a side view showing the kitchen exhaust hood of Figures 3 to 5;
Figure 7 is a cross sectional view showing the kitchen exhaust hood of Figures 3 to 6;
Figure 8 is a front view showing a kitchen exhaust hood in accordance with an embodiment of the present invention;
Figure 9 is a cross sectional view showing the kitchen exhaust hood in accordance with the embodiment of Figure 8; and
Figure 10 is a front view showing a kitchen exhaust hood in accordance with a further embodiment of the present invention.

[0021] As shown in Figures 3 to 7, the kitchen exhaust hood 100 includes; a vertical exhaust duct 110 having an exhaust fan 111 therein; a horizontal exhaust duct 120 having an inlet port 121 in the middle of a lower portion thereof and nozzles 123 at an outer periphery of the lower portion thereof; and a suction fan 130 installed in the horizontal exhaust duct 120, for blowing air sucked through the inlet port 121 formed at the horizontal exhaust duct 120 toward the nozzles 123.

[0022] An indoor air inlet 124 is formed at an upper surface of the horizontal exhaust duct 120, and a passage 125 is formed in the horizontal exhaust duct 120, for guiding the indoor air sucked through the indoor air inlet 124 toward the nozzles 123. The suction fan 130 is installed at one side of an inner portion of the passage 125 and a guider 127 is installed at the other side thereof.

[0023] The inlet port 121 has a grease filter 121a for filtering greasy vapor generated during cooking foods.

[0024] The indoor air inlet 124 is preferably positioned in the middle of an upper surface of the horizontal exhaust duct 120 in order to uniformly blow the indoor air sucked by the suction fan 130 through the nozzles 123.

[0025] As aforementioned, the indoor air is blown through the nozzles 123 formed at the outer periphery of the lower surface of the horizontal exhaust duct 120 with high pressure. The blown indoor air serves as an air curtain. At this time, a collection zone for collecting the contaminated gas is formed at a bottom of the horizontal exhaust duct 120. Thus, the contaminated gas collected at the collection zone 129 does not spread over the room but is rather rapidly discharged to the outside through the horizontal exhaust duct 120 and the vertical exhaust duct 110. Here, the collection zone 129 refers to an imaginary space of a square shape formed with the wall surface 11a and three sides of outer periphery of the horizontal exhaust duct 120 at which the nozzles 123 are formed. An unexplained reference numeral 30 indicates a gas range, 31 indicates a burner portion, 32 indicates a food container and 11a indicates an inner wall of the kitchen.

[0026] An operation of this kitchen exhaust hood will be explained as follows.

[0027] First, the suction fan 130 installed in the horizontal exhaust duct 120 is operated. The indoor air is thereby flowed in the passage 125 through the indoor air inlet 124, and the indoor air flowed in the passage 125 is led to each nozzle 123 by the guider 127.

[0028] The indoor air led to each nozzle 123 serves as an air curtain, being emitted with high pressure through the nozzles 123. At this time, the contaminated gas generated during cooking foods does not spread over the whole room but is collected in the collection zone 129 formed at the bottom of the horizontal exhaust duct 120.

[0029] At the same time to that, the exhaust fan 111 is operated to suck the contaminated gas through the inlet port 121. The sucked contaminated gas is discharged to the outside of the room through the vertical exhaust duct 110. The greasy filter 121a performs a function of filtering greasy vapor contained in the contaminated gas passing through the inlet port 121.

[0030] On the other hand, Figure 8 is a front view showing a kitchen exhaust hood in accordance with an embodiment of the present invention, and Figure 9 is a cross sectional view showing said kitchen exhaust hood in accordance with an embodiment of the present invention.

[0031] As shown in Figures 8 and 9, the kitchen exhaust hood in accordance with an embodiment of the present invention includes: a vertical exhaust duct 210 having an exhaust fan 211 therein; a horizontal exhaust duct 220 having a contaminated gas inlet port 221 in the middle of a lower portion thereof and nozzles 223 at an outer periphery of the lower portion thereof; and a sirroco fan 230 installed in the horizontal exhaust duct 220, for blowing air sucked through the inlet port 221 formed at the horizontal exhaust duct 220 toward the nozzles 223.

[0032] An indoor air inlet 224 is formed at an upper surface of the horizontal exhaust duct 220, and a passage is formed 223 in the horizontal exhaust duct 220 for leading the indoor air sucked through the indoor air inlet 224 toward the nozzles. The sirroco fan 230 is installed at one side of an inner portion of the passage 225 and a guider 227 is installed at the other side therein.

[0033] An operation of the kitchen exhaust hood 200 in accordance with an embodiment of the present inven-

tion is identical to that of the kitchen exhaust hood 100, so that an explanation thereof may be omitted.

[0034] On the other side, Figure 10 is a front view showing a kitchen exhaust hood.

[0035] As can be seen from Figure 10, said kitchen exhaust hood 300 includes: a vertical exhaust duct 310 having an exhaust fan 311 therein; a horizontal exhaust duct 320 having an inlet port 321 in the middle of a lower portion thereof and nozzles 323 at an outer periphery of the lower portion thereof; and a turbofan 330 installed in the horizontal exhaust duct 320, for blowing air sucked through the inlet port 321 formed at the horizontal exhaust duct 320 toward each nozzle 323.

[0036] An indoor air inlet 324 is formed at a lower surface of the horizontal exhaust duct 320, and a passage 325 is formed for leading the indoor air (sucked through the indoor air inlet 324) to each nozzle 323. Furthermore, the turbofan 330 is installed in the passage 325.

[0037] An operation of this kitchen exhaust hood will be now explained.

[0038] First, the turbofan 330 installed in the horizontal exhaust duct 320 is operated. The indoor air is thereby flowed into the passage 325 through the indoor air inlet 324, and then the indoor air flowed in the passage 325 is led toward each nozzle 323.

[0039] The indoor air led to each nozzle 323 serves as an air curtain, being emitted with high pressure through the nozzles 323. At this time, the contaminated gas generated during cooking foods does not spread over the whole inner room but is collected in the collection zone 329 formed at the bottom of the horizontal exhaust duct 320.

[0040] At the same time to that, the exhaust fan 311 is operated to suck the contaminated gas through the inlet port 321. The sucked contaminated gas is discharged to the outside of the room through the vertical exhaust duct 310.

[0041] As stated above, in the kitchen exhaust hood according to the present invention, the suction fan for sucking indoor air is installed at an upper portion of the horizontal exhaust duct and then the indoor air sucked through the suction fan is emitted with high pressure through each nozzle formed at an outer periphery of a lower portion of the horizontal exhaust duct. Thereafter, contaminated gas generated during cooking foods is collected and then rapidly discharged to the outside of the inner room through the horizontal exhaust duct and the vertical exhaust duct, thereby preventing the inner room from being contaminated due to spread of the contaminated gas.

[0042] As the present invention may be embodied in several forms without departing from the spirit or essential characteristics thereof, it should also be understood that the above-described embodiments are not limited by any of the details of the foregoing description, unless otherwise specified.

Claims

1. A kitchen exhaust hood, comprising:

   a vertical exhaust duct (110; 210; 310) having an exhaust fan (111; 211; 311) therein;
   a horizontal exhaust duct (120; 220; 320) having a contaminated gas inlet (121; 221; 321) In the middle of a lower portion thereof and nozzles (223; 323) at an outer periphery of the lower portion thereof, and
   a single suction fan (130; 230; 330) for blowing to the nozzles air sucked through an Indoor air Inlet (124; 224; 324) formed at an upper surface of the horizontal exhaust duct,
   characterized in that
   an indoor air passage (125; 225; 325) is formed in the horizontal exhaust duct for guiding indoor air sucked through the indoor air inlet (124; 224; 324) towards the nozzles formed at the outer periphery of the lower surface of the horizontal exhaust duct, whereby a collection zone (129) is formed at the bottom of the horizontal exhaust duct, said collection zone being formed with a wall surface (11a) and three sides of the outer periphery,
   said single suction fan is installed at one side of an inner portion of the passage formed In the horizontal exhaust duct, and
   a guider (127; 227) is installed at the other side of the Inner portion of the indoor air passage.

2. Kitchen exhaust hood of claim 1, **characterized in that** the indoor air inlet (124, 224) is positioned in the middle of the upper surface of the horizontal exhaust duct (120; 220).

3. Kitchen exhaust hood of claim 1, **characterized in that** a collection zone for collecting contaminated gas of the indoor air blown through the nozzles (123; 223; 323) is formed at a lower portion of the horizontal exhaust duct (120; 220; 320) and that the contaminated gas collected in the collection zone is discharged to the outside through the horizontal exhaust duct (120; 220; 320) and the vertical exhaust duct (110; 210; 310).

4. Kitchen exhaust hood of claim 1, **characterized in that** the suction fan (130; 230; 330) is a turbofan.

5. Kitchen exhaust hood of claim 1, **characterized in that** the suction fan (130; 230; 330) is a sirocco fan.

6. Kitchen exhaust hood of claim 1, **characterized in that** the indoor air inlet (324) is formed at a lower surface of the horizontal exhaust duct (320).

Patentansprüche

1. Küchenlüftungshaube, umfassend:

einen vertikalen Abluftkanal (110; 210; 310) mit einem Abluftventilator (111; 211; 311) darin;
einen horizontalen Abluftkanal (120, 220, 320) mit einem verunreinigten Gaseinlass (121, 221, 321) in der Mitte von einem unteren Abschnitt davon und Düsen (223, 323) an einem Außenumfang des unteren Abschnitts davon, und
einen einzelnen Sauglüfter (130; 230; 330) zum Blasen von Luft, die durch einen an der Oberseite des horizontalen Abluftkanals ausgebildeten Innenlufteinlass (124, 224, 324) angesaugt wird, zu den Düsen,
dadurch gekennzeichnet, dass
ein Innenluftdurchgang (125; 225, 325) in dem horizontalen Abluftkanal ausgebildet ist, um durch den Raumlufteinlass (124, 224, 324) angesaugte Innenluft den Düsen zuzuführen, die an der äußeren Peripherie der Unterseite des horizontalen Abluftkanals ausgebildet sind, wodurch eine Sammelzone (129) an der Unterseite des horizontalen Abluftkanals ausgebildet wird, wobei die Sammelzone von einer Wandfläche (11a) und drei Seiten des äußeren Umfangs gebildet wird,
der einzelne Sauglüfter an einer Seite eines inneren Abschnitts des in dem horizontalen Abluftkanal gebildeten Durchgangs angeordnet ist, und
ein Führung (127, 227) auf der anderen Seite des inneren Teils des Innenluftdurchgangs angeordnet ist.

2. Küchenlüftungshaube nach Anspruch 1, **dadurch gekennzeichnet, dass** der Innenlufteinlass (124, 224) in der Mitte der oberen Fläche des horizontalen Abluftkanals angeordnet ist (120, 220).

3. Küchenlüftungshaube nach Anspruch 1, **dadurch gekennzeichnet, dass** eine Sammelzone zum Sammeln von verunreinigtem Gas der durch die Düsen (123, 223, 323) geblasenen Raumluft an einem unteren Abschnitt des horizontalen Abluftkanals (120, 220, 320) ausgebildet ist, und dadurch dass das verunreinigte in der Sammelzone gesammelte Gas nach außen durch den horizontalen Abluftkanal (120, 220, 320) und den vertikalen Abluftkanal (110, 210, 310) abgeführt wird.

4. Küchenlüftungshaube nach Anspruch 1, **dadurch gekennzeichnet, dass** der Sauglüfter (130; 230; 330) ein Turbolüfter ist.

5. Küchenlüftungshaube nach Anspruch 1, **dadurch gekennzeichnet, dass** der Sauglüfter (130, 230, 330) ein Schirokkolüfter ist.

6. Küchenlüftungshaube nach Anspruch 1, **dadurch gekennzeichnet, dass** der Innenlufteinlass (324) an einer Unterseite des horizontalen Abluftkanals (320) ausgebildet ist.

Revendications

1. Hotte de ventilation pour cuisine, comprenant :

un conduit d'évacuation vertical (110; 210; 310) ayant un ventilateur d'évacuation (111; 211; 311) à l'intérieur ;
un conduit d'évacuation horizontal (120; 220; 320) ayant une entrée de gaz contaminé (121; 221; 321) au milieu d'une partie inférieure de celui-ci et des buses (223; 323) sur une périphérie externe de la partie inférieure de celui-ci, et
un ventilateur d'aspiration unique (130; 230; 330) pour souffler l'air aspiré à travers les buses d'une entrée d'air intérieur (124, 224, 324) formée au niveau d'une surface supérieure du conduit d'évacuation horizontal,
caractérisée par le fait que,
un passage de l'air intérieur (125; 225; 325) est formé dans le conduit d'évacuation horizontal pour guider l'air aspiré à travers l'entrée de l'air intérieur (124; 224; 324) en direction des buses ménagées à la périphérie externe de la surface inférieure du conduit d'évacuation horizontal, en formant de ce fait une zone de collection (291) au bas du conduit d'évacuation horizontal, ladite zone étant formée avec une surface de paroi (11a) et trois côtés de la périphérie extérieure,
ledit ventilateur d'aspiration unique est installé sur un côté d'une partie intérieure du passage formé dans le conduit d'évacuation horizontal, et
un guide (127, 227) est installé de l'autre côté de la partie intérieur du passage de l'air intérieur.

2. Hotte de ventilation pour cuisine selon la revendication 1, **caractérisée par le fait que** l'orifice d'entrée de l'air intérieur (124, 224) est positionné au milieu de la surface supérieure du conduit d'évacuation horizontal (120; 220).

3. Hotte de ventilation pour cuisine selon la revendication 1, **caractérisée par le fait qu'**une zone de collection de gaz contaminé de l'air soufflé à travers les buses (123; 223; 323) est formé dans une partie inférieure du conduit d'évacuation horizontal (120; 220; 320) et que le gaz contaminé collecté dans la zone de collection est évacué à l'extérieur par le conduit d'évacuation horizontal (120; 220; 320) et le conduit d'évacuation vertical (110, 210, 310).

4. Hotte de ventilation pour cuisine selon la revendication 1, **caractérisée par le fait que** le ventilateur d'aspiration (130; 230; 330) est un turboventilateur.

5. Hotte de ventilation pour cuisine selon la revendication 1, **caractérisée par le fait que** le ventilateur d'aspiration (130; 230; 330) est un ventilateur sirocco.

6. Hotte de ventilation pour cuisine selon la revendication 1, **caractérisée par le fait que** l'entrée de l'air intérieur (324) est formée à une surface inférieure du conduit d'évacuation horizontal (320).

FIG. 1

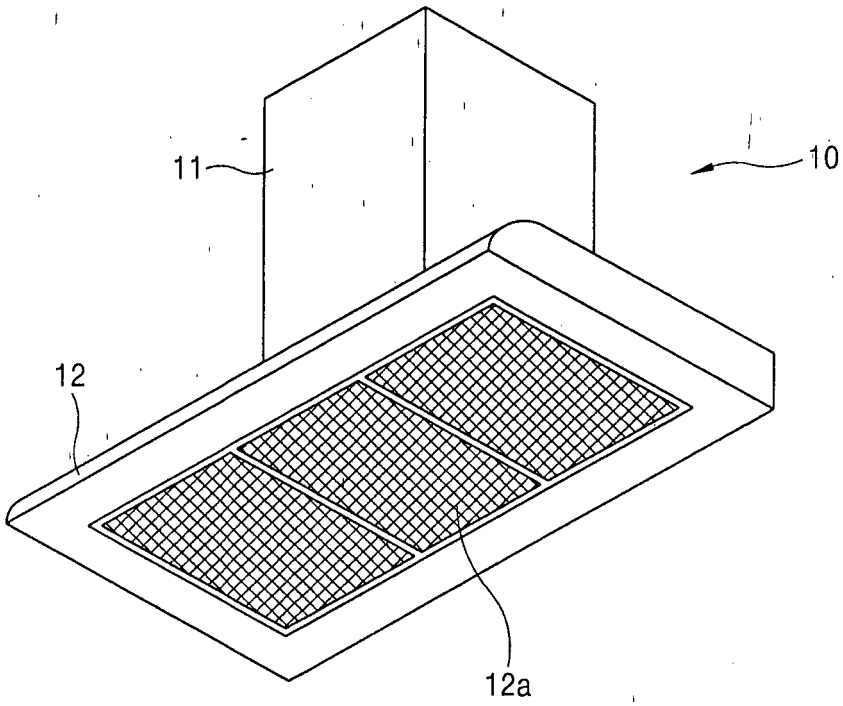


FIG. 2

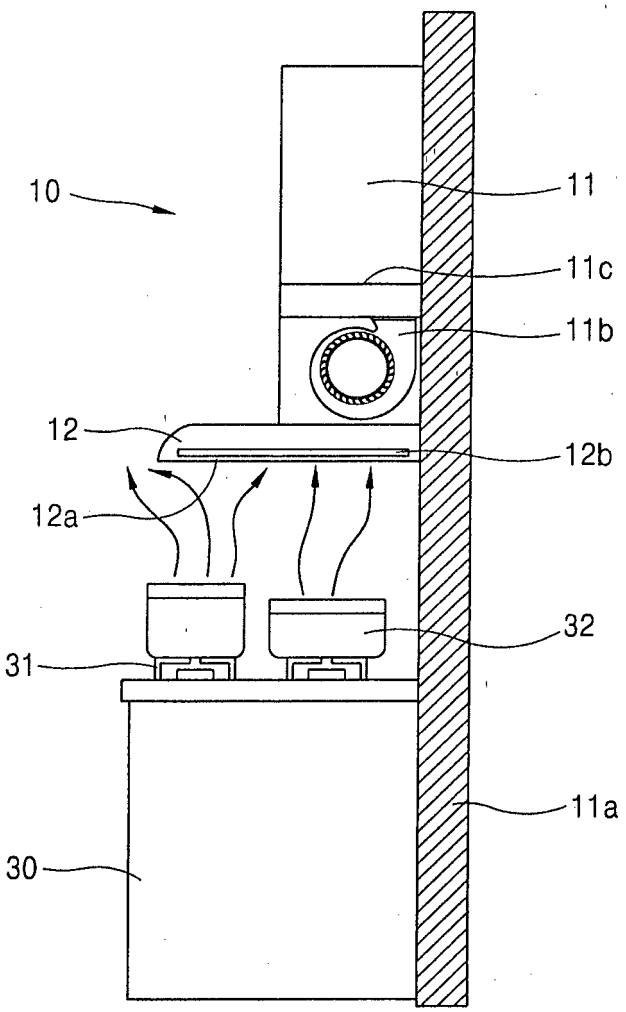


FIG. 3

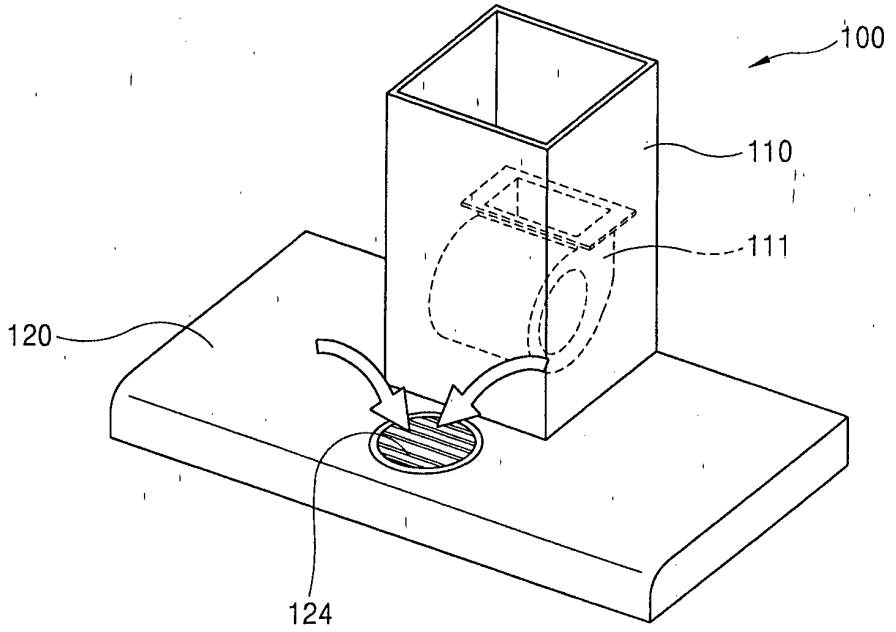


FIG. 4

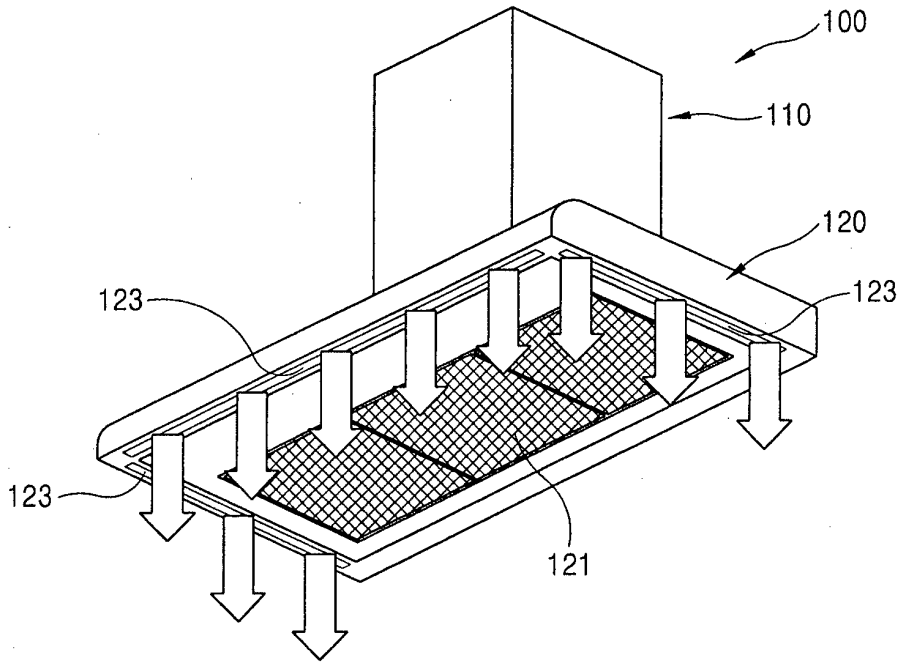


FIG. 5

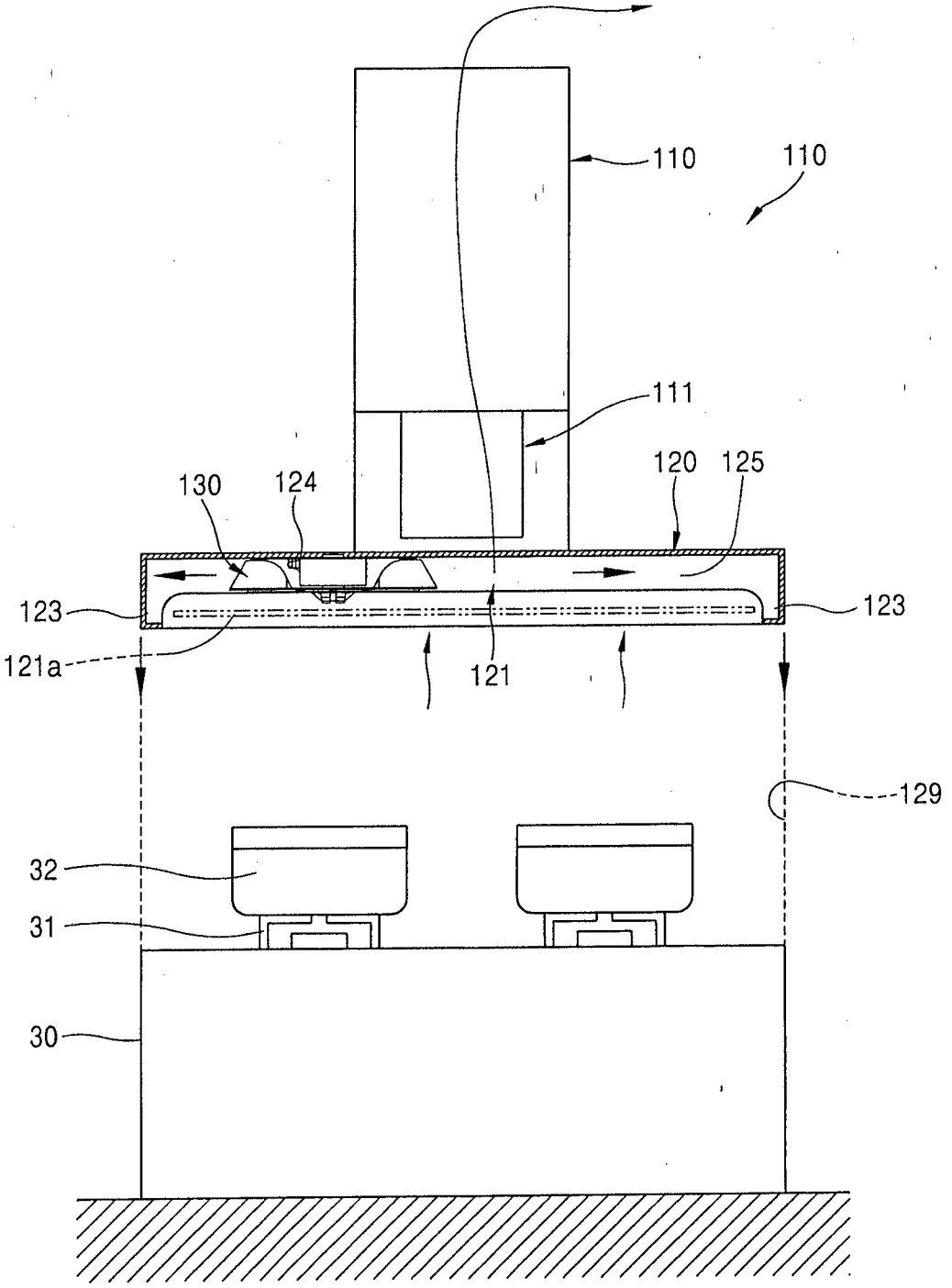


FIG. 6

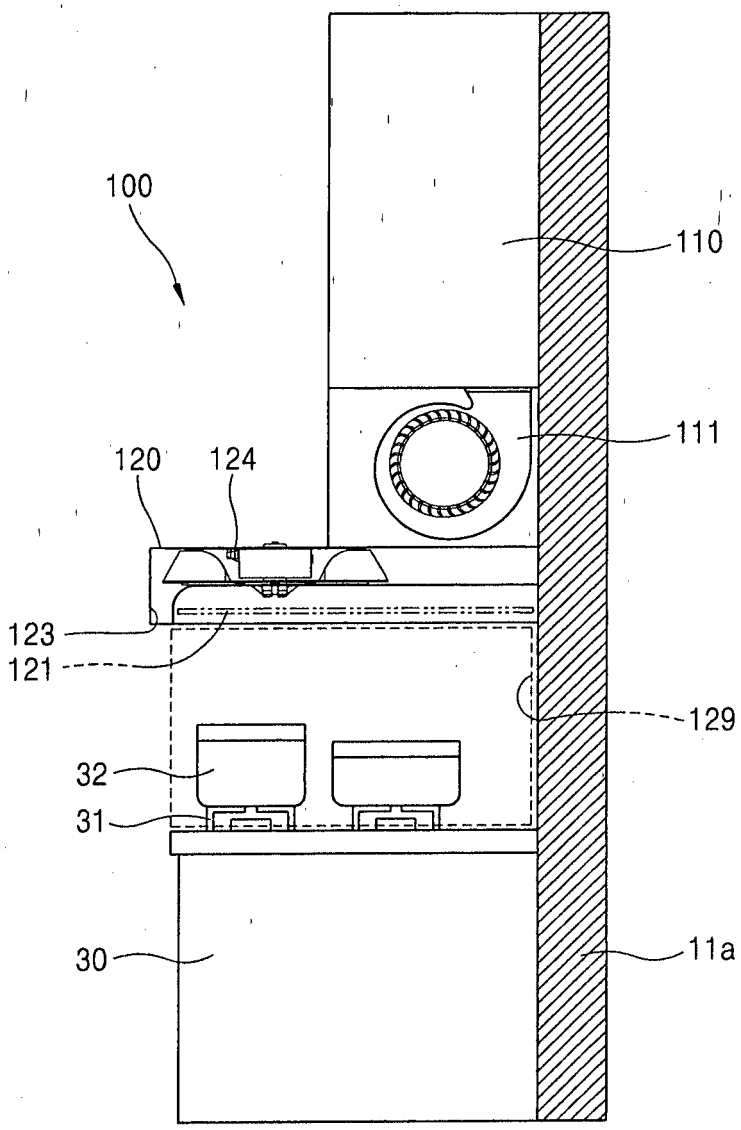


FIG. 7

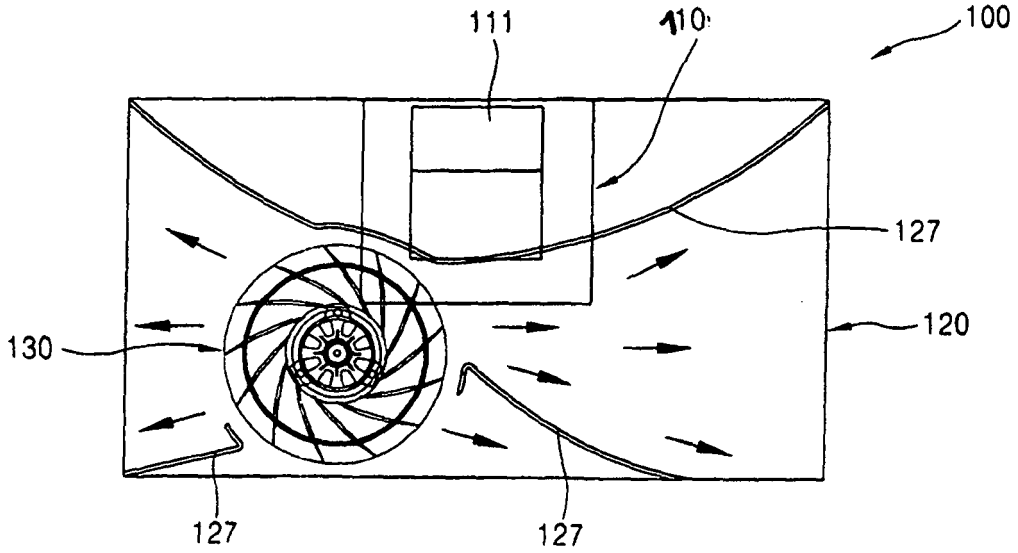

111
110
100
127
120
130
127
127

FIG. 8

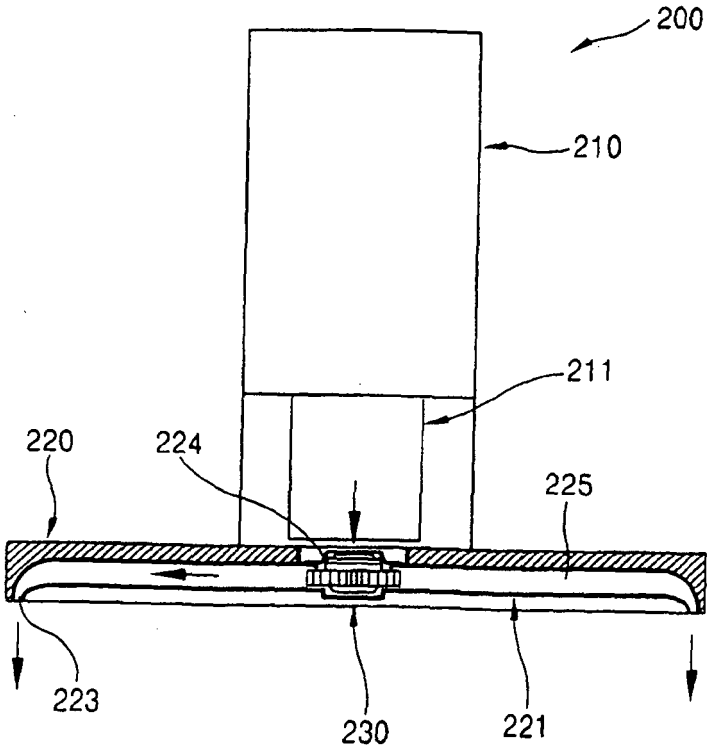

200
210
211
220
224
225
223
230
221

FIG. 9

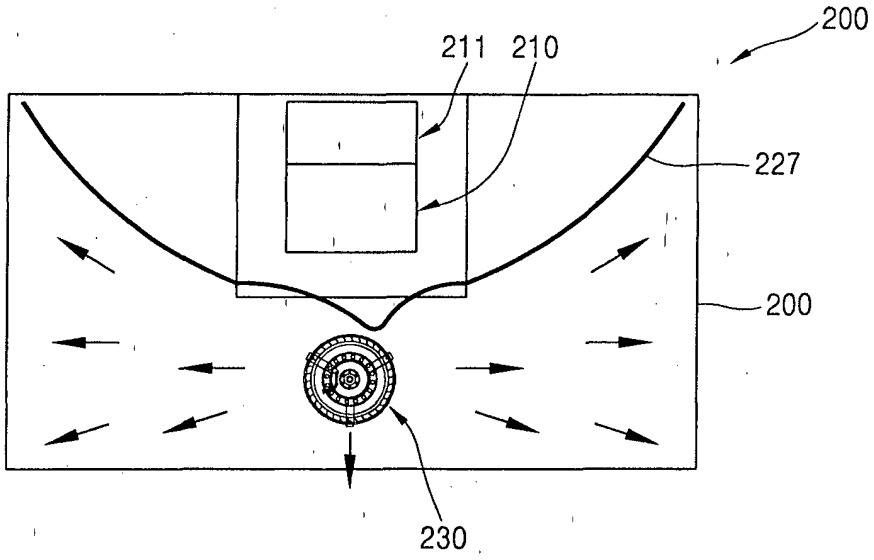
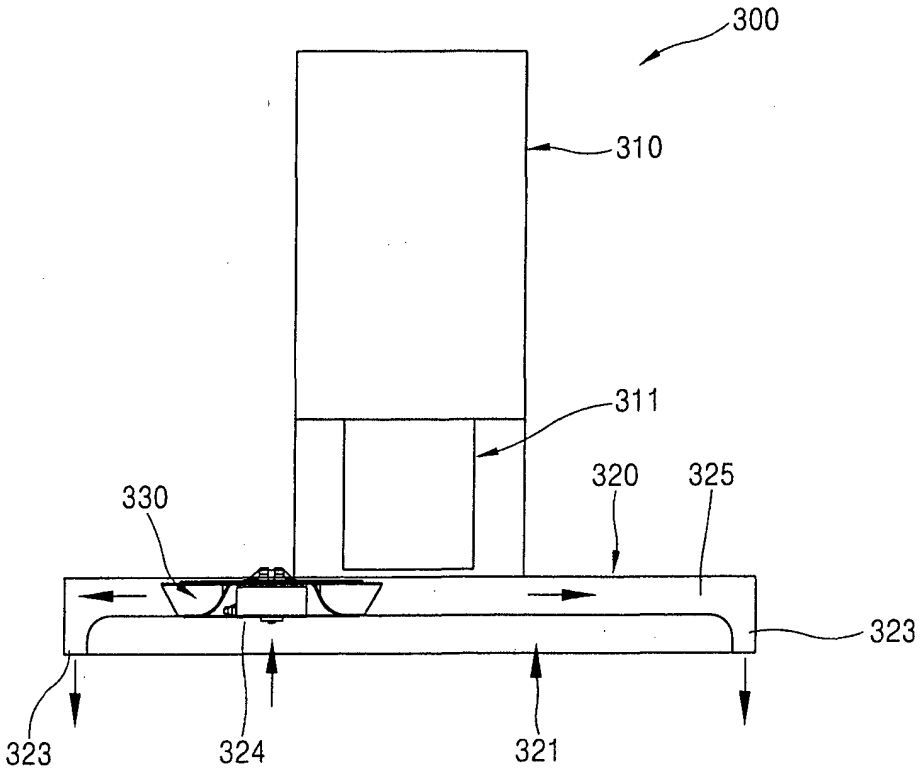


FIG. 10



REFERENCES CITED IN THE DESCRIPTION

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