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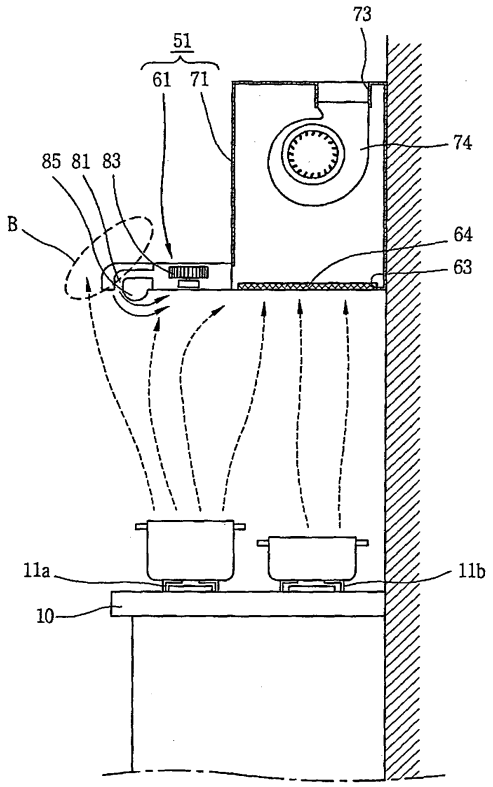
(54) Exhaust hood

(57) An exhaust hood comprising: a hood main body (110) provided with a canopy (111) having a suction portion (115) disposed at a lower portion thereof for sucking air and disposed to be upwardly inclined in a forward direction, and an exhaustion portion (121) perpendicularly formed for discharging the sucked air to the exterior; an air supply fan (135) disposed in the hood main body (110) for blowing air; and a nozzle unit (141) formed at a front end region of the hood main body (110) for spreading the air blown by the air supply fan (135) toward the suction portion (115) by being inclined by a particular angle, whereby contaminated air which flows toward the exhaust hood without being sucked therein can effectively be induced and collected into an inlet, thereby enabling the creation of more comfortable cooling environment and experimental circumstance.

FIG. 2



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Description

[0001] The present invention relates to an exhaust hood, and particularly, to an exhaust hood having an improved efficiency for collecting contaminated air.

[0002] In general, an exhaust hood refers to a device which is installed above cookware by heating such as gas-ranges or laboratory benches from which contaminated air such as smoke, smell and oily vapor is generated, to suck the contaminated air to discharge to the exterior.

[0003] Fig. 1 is a lateral sectional view illustrating an example of a related art exhaust hood. As illustrated in Fig. 1, a related art exhaust hood includes a canopy 21 installed above a cookware 10 with a particular distance therebetween and having a plurality of burners 11 a and 11 b, and an exhaustion portion 31 connected to the canopy 21 and protruding upwardly from an upper side of the canopy 21 by a particular height.

[0004] An inlet 23 for sucking contaminated air including contaminated materials such as smoke, smell, oily vapor, or the like which are generated from the cookware 10 is formed at a bottom surface of the canopy 21. A grease filter 24 for collecting the contaminated materials is mounted in the inlet 23.

[0005] An exhaustion passage 33 for discharging the contaminated air flowed inwardly through the inlet 23 is formed in the exhaustion portion 31. An exhaustion fan 34 for forcibly sucking air is installed at a lower side of the exhaustion passage 33.

[0006] As the contaminated air including the smoke, smell, oily vapor, or the like generated from the cookware 10 by a heating using the burners 11 a and 11 b rises with a buoyancy jet form, the width thereof is increased.

[0007] Accordingly, the contaminated air is only partially discharged (blown) to the outside via the inlet 23, the grease filter 24 and the exhaustion passage 33 in turn, while most of the contaminated air moves and deviates toward the outside along a bottom surface of the canopy 21, thereby contaminating a peripheral environment, which may occur more seriously upon cooking using the burners 11 a and 11 b disposed at a front side of the cookware 10.

[0008] In order to prevent the occurrence of the problem, a rotation speed of the exhaustion fan 34 is increased to improve a suction force. However, although the rotation speed of the exhaustion fan 34 is increased to improve the suction force, it is difficult to induce the contaminated air which moves and deviates toward the outside of the canopy 21 along the bottom surface thereof to the inlet 23 just using the suction force of the exhaustion fan 34.

[0009] As a result, the related art exhaust hood could not prevent the contaminated air from being deviated from the canopy 21 to thus contaminate a front upper region A of the canopy 21 and from spreading indoors to thus contaminate the peripheral environment.

[0010] In order to solve such problems, on the other side, an exhaust hood as illustrated in Fig. 2 has been invented.

[0011] Fig. 2 is a lateral sectional view illustrating another embodiment of an exhaust hood according to the related art. As illustrated in Fig. 2, an exhaust hood according to another embodiment of the related art may include a hood main body 51 arranged above the cookware 10 with a particular distance therebetween, and a nozzle 81 disposed at a front portion of the hood main body 51 for discharging air (indicated with solid lines) downwardly.

[0012] The hood main body 51 may include a canopy 61 disposed at an upper side of the cookware 10 having a plurality of burners 11a and 11b with a particular distance therebetween, and an exhaustion portion 71 connected to the canopy 61 and protruding upwardly from an upper side of the canopy 61 by a particular height.

[0013] The nozzle 81 is formed at a front portion of a bottom surface of the canopy 61, so as to discharge (blow) air downwardly. An air supply fan 83 for blowing air is disposed in the canopy 61 so that air can be injected through the nozzle 81.

[0014] A curved shape portion 85 having a convex arc-shaped section is formed downwardly at a front lower portion of the canopy 61 so as to allow the air discharged (blown) through the nozzle 81 to partially move toward an inlet 63 according to a so-called coanda effect. The curved shape portion 85 prevents the contaminated air from flowing away from the canopy 61 (without being sucked inside thereof) and induces the air to the inlet 63.

[0015] In the exhaust hood 81 as illustrated in Fig. 2, on the other side, the nozzle 81 is formed at a position spaced from the front end of the canopy 61 inwardly by a particular distance, and accordingly contaminated air risen toward an inner side of the canopy 61 may be induced to the inlet 63 by the air discharged (blown) through the nozzle 81. However, the contaminated air risen toward the front end of the canopy 61 is deviated outwardly from the front end of the canopy 61 to thus still problematically contaminate an upper region B.

[0016] Therefore, an object of the present invention is to provide an exhaust hood having an improved efficiency for collecting contaminated air.

[0017] To achieve these and other advantages and in accordance with the purpose of the present invention, as embodied and broadly described herein, there is provided an exhaust hood comprising: a hood main body 110 provided with a canopy 111 having a suction portion 115 at a lower portion thereof for sucking air and disposed to be upwardly inclined in a forward direction, and an exhaustion portion 121 perpendicularly formed to discharge the sucked air to the exterior; an air supply fan 135 disposed in the hood main body 110 for blowing air; and a nozzle unit 141 formed at a front end portion of the hood main body 110 to spread the air blown by the air supply fan 135 toward the suction portion 115 by being inclined by a particular angle.

[0018] The foregoing and other objects, features, as-

pects 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 embodiments of the invention and together with the description serve to explain the principles of the invention.

[0020] In the drawings:

Fig. 1 is a lateral sectional view illustrating an embodiment of the related art exhaust hood;

Fig. 2 is a lateral sectional view illustrating another embodiment of the related art exhaust hood;

Fig. 3 is a perspective view illustrating an exhaust hood in accordance with a first embodiment of the present invention;

Fig. 4 is a sectional view taken along a line IV-IV of Fig. 3;

Fig. 5 is a perspective view illustrating an exhaust hood in accordance with a second embodiment of the present invention;

Fig. 6 is a sectional view taken along a line VI-VI of Fig. 5;

Fig. 7 is a lateral sectional view illustrating an exhaust hood in accordance with a third embodiment of the present invention;

Fig: 8 is a lateral sectional view illustrating an exhaust hood in accordance with a fourth embodiment of the present invention;

Fig. 9 is a perspective view illustrating an exhaust hood in accordance with a fifth embodiment of the present invention;

Fig. 10 is a sectional view taken along a line X-X of Fig. 9;

Fig. 11 is a perspective view illustrating an exhaust hood in accordance with a sixth embodiment of the present invention;

Fig. 12 is a sectional view taken along a line XII-XII of Fig. 11; and

Fig. 13 is a perspective view illustrating an exhaust hood in accordance with a seventh embodiment of the present invention.

[0021] Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings.

[0022] Fig. 3 is a perspective view illustrating an exhaust hood in accordance with a first embodiment of the present invention, and Fig. 4 is a sectional view taken along a line IV-IV of Fig. 3. As illustrated in the drawings, an exhaust hood according to the present invention comprises: a hood main body 110 provided with a canopy 111 having a suction portion 115 at a lower portion thereof for sucking air and disposed to be upwardly inclined in a forward direction, and an exhaustion portion 121 perpendicularly formed to discharge the sucked air to the exterior; an air supply fan 135 disposed in the hood main body 110 for blowing air; and a nozzle unit 141 formed at a front end portion of the hood main body 110 to spread the air blown by the air supply fan 135 toward the suction portion 115 by being inclined by a particular angle.

[0023] The suction portion 115 includes an inlet 117 formed through a lower surface of the canopy 111 and a grease filter 118 disposed to block the inlet 117 to thus collect foreign materials contained in the air.

[0024] The exhaustion portion 121 is provided with an exhaustion passage 123 perpendicularly formed at the canopy 111 to be connected thereto for discharging air sucked through the suction portion 115, and an exhaustion fan 124 for providing a suction force to the exhaustion passage 123.

[0025] A partition wall 131 is formed in the canopy 111 so as to divide the inner space of the canopy 111 and the exhaustion passage 123. A suction hole 133 is formed through the partition wall 131 to thus suck air. An air supply fan 135 is disposed in the space partitioned by the partition wall 131 therein. An air supply passage 137 for blowing air to the nozzle unit 141 is formed at a downstream side of the air supply fan 135.

[0026] The nozzle unit 141 is formed to be inclined downwardly toward the suction portion 115 along a front-to-rear direction of the canopy 111, such that a central direction of the air blown out of the nozzle unit 141 heads for the suction portion 115 in order to allow the contaminated air being risen to flow toward the suction portion 115. Here, the inclined angle may preferably be 15° through 60° with respect to a perpendicular line (Lv, refer to Fig. 6).

[0027] According to such construction, when the exhaustion fan 124 is rotated, smoke, smell, steam and/or oily vapor generated and risen while cooking are/is sucked through the suction portion 115 to be then blown outwardly. Here, the suction portion 115 is inclined downwardly, and thus the suction portion 115 may be more adjacent to the contaminated air generation source such as the cookware, thereby improving a suction efficiency of the exhaust hood.

[0028] When the air supply fan 135 is rotated, on the other hand, the air sucked through the suction portion 115 is partially sucked through the suction hole 133. The partially sucked air flows toward the nozzle unit 141 along the air supply passage 137. The air discharged in the inclined direction from the nozzle unit 141 to the suction portion 115 easily flows the contaminated air such as smell, smoke, vapor, or the like toward the suction portion 115, so as to improve the suction efficiency of the exhaust hood.

[0029] Fig. 5 is a perspective view illustrating an exhaust hood in accordance with a second embodiment of the present invention, Fig. 6 is a sectional view taken along a line VI-VI of Fig. 5, Fig. 7 is a lateral sectional view illustrating an exhaust hood in accordance with a third embodiment of the present invention, and Fig. 8 is

a lateral sectional view illustrating an exhaust hood in accordance with a fourth embodiment of the present invention. Hereinafter, the same reference numerals are provided for the same parts and components as those in the aforementioned and illustrated construction, and the explanation therefor will thus be omitted.

[0030] An exhaust hood in accordance with a second embodiment shown in Figs. 5 and 6 may include: a hood main body 110 provided with a canopy 111 formed in a squarish plate type body, and having a suction portion 115 for sucking air at a lower portion thereof, the canopy 111 being disposed to be upwardly inclined in a forward direction, and an exhaustion portion 121 perpendicularly formed for discharging the sucked air to the exterior; an air supply fan 135 disposed in the hood main body 110 for blowing air; and a front collecting unit 151 provided with a nozzle unit 155 for discharging the air blown by the air supply fan 135 outwardly from an upper side of the canopy 111, and a curved wall member 153 having a sectional shape which is convex outwardly, and disposed at one side of the nozzle unit 155, to thus allow the air discharged by the nozzle unit 155 to partially flow along the convex outer surface thereof, the front collecting unit 151 collecting the contaminated air of the front end region of the canopy 111 and flowing the collected contaminated air toward the suction portion 115.

[0031] The front collecting unit 151 includes the curved wall member 153 formed in a cylindrical bar or cylindrical pipe shape so as to allow air to flow along its convex outer surface depending on a so-called Coanda effect, and the nozzle unit 155 spaced from the curved wall member 153 so as to form a particular angle θ between a virtually perpendicular line Lv passing through the center O of the curved wall member 153 and a virtual line L1 which connects the end of the nozzle unit 155 and the center O of the curved wall member 153 at an opposite side of the air discharge direction.

[0032] According to such construction, when the air supply fan 135 is rotated, the air sucked through the suction portion 115 is partially sucked through the suction hole 133 and flows along the air supply passage 137, thereby being discharged through the nozzle unit 155. The air discharged through the nozzle unit 155 partially flows downwardly along the outer surface of the curved wall member 153 according to the coanda effect, and thereafter flows toward the suction portion 115. Here, the contaminated air around the curved wall member 153 is mixed with air-stream downwardly flowing along the outer surface of the curved wall member 153 to then flow toward the suction portion 115. The air is then sucked through the suction portion 115 to be discharged to the exterior.

[0033] Here, as illustrated in Fig. 7, the front collecting unit 161 may be constructed to include: a curved wall member 163 formed in the cylindrical bar or pipe shape and disposed at the front end region; and a nozzle unit 165 one end of which is positioned on the virtually perpendicular line Lv passing through the center O of the curved wall member 163 (i.e., θ=0°).

[0034] Also, as illustrated in Fig. 8, the front collecting unit 171 may be constructed to include a first nozzle unit 172 for partially discharging upwardly the air blown by the air supply fan 135 along the thickness direction of the canopy 111; a first curved wall member 174 disposed at one side of the first nozzle unit 172 so as to allow the air blown by the first nozzle unit 172 to partially flow along the convex outer surface thereof according to the coanda effect and also to allow the air blown by the air supply fan 135 to partially flow along an inner surface thereof; a second nozzle unit 176 formed at a downstream end region of the first curved wall member 174, through which air is discharged, for discharging the air flowed along the inner surface of the first curved wall member 174; and a second curved wall member 178 disposed inside of the first curved wall member 174 to form an air passage together with the first curved wall member 174 and to allow the air discharged through the second nozzle unit 176 to partially flow toward the suction portion 115 according to the coanda effect.

[0035] Fig. 9 is a perspective view illustrating an exhaust hood in accordance with a fifth embodiment of the present invention, and Fig. 10 is a sectional view taken along a line X-X of Fig. 9. As illustrated in Figs. 9 and 10, an exhaust hood according to a fifth embodiment of the present invention may include: a hood main body 110 provided with a canopy 111 formed in a squarish plate type body, and having a suction portion 115 at a lower portion thereof for sucking air, the canopy 111 being disposed to be upwardly inclined in a forward direction, and an exhaustion portion 121 perpendicularly formed to discharge sucked air to the exterior; an air supply fan 135 (refer to fig. 4) disposed in the hood main body 110 for blowing air; a front collecting unit 151 provided with a nozzle unit 155 for discharging the air blown by the air supply fan 135(refer to fig. 4), and a curved wall member 153 having a sectional shape which is convex outwardly, and disposed at one side of the nozzle unit 155, to thus allow the air discharged by the nozzle unit 155 to partially flow along the convex outer surface thereof, the front collecting unit 151 collecting the contaminated air of the front end region of the canopy 111 and flowing the contaminated air toward the suction portion 115; a lateral collecting unit 181 provided with a lateral nozzle unit 185 for discharging the air blown by the air supply fan 135 (refer to fig. 4), and a lateral curved wall member 183 having a sectional shape which is outwardly convex, and disposed at one side of the lateral nozzle unit 185 for partially flowing the air discharged through the lateral nozzle unit 185 along an outer surface thereof, the lateral collecting unit collecting the air of a lateral region of the hood main body 110 to flow the collected air toward the suction portion 115.

[0036] The lateral collecting unit 181 may include the lateral curved wall member 183 formed in a cylindrical bar or pipe shape for flowing air along the convex outer surface thereof, and the lateral nozzle unit 185 formed

at both sides of the lateral curved wall member 183, respectively, for flowing the air along the outer surface of the lateral curved wall member 183 according to the coanda effect. Here, the lateral collecting unit 181 may be formed at one side of the canopy 111. The lateral collecting unit 181 may be constructed as same as the front collecting unit 151, or one of the constructions of the front collecting units 161 and 171 shown in Figs. 7 and 8 can be applied thereto.

[0037] In such construction, when the air supply fan 135(refer to fig. 4) starts to be rotated, the air sucked into the canopy 111 by the exhaustion fan 124(refer to fig. 4) is partially sucked through the suction hole 133(refer to fig. 4) to then flow the front collecting unit 151 and the lateral collecting unit 181, respectively, along the air supply passage 137(refer to fig. 4). The air flowed to the front collecting unit 151 is discharged through the nozzle unit 155. The air discharged through the nozzle unit 155 partially flows along the outer surface of the curved wall member 153 according to the coanda effect. The air flowed to the lateral collecting unit 181 is discharged through the lateral nozzle unit 185. The air discharged through the lateral nozzle unit 185 partially flows along the lateral curved wall member 183 according to the coanda effect. At this time, the contaminated air of the front end and lateral regions is mixed with the air-stream flowing along the curved wall member 153 and the lateral curved wall member 183. The mixed air is then sucked into the canopy 111 through the suction portion 115 and thereafter discharged to the exterior through the exhaustion passage 123.

[0038] Fig. 11 is a perspective view illustrating an exhaust hood in accordance with a sixth embodiment of the present invention, Fig. 12 is a sectional view taken along a line XII-XII of Fig. 11, Fig. 13 is a perspective view illustrating an exhaust hood in accordance with a seventh embodiment of the present invention. As illustrated in Figs. 11 and 12, an exhaust hood according to a sixth embodiment of the present invention may include: a hood main body 210 provided with a canopy 211 including an inclined section portion 212a disposed to be upwardly inclined in a forward direction and having a suction portion 215 at its lower portion and a horizontal section portion 212b curved and horizontally extending at a front end portion of the inclined section portion 212a, and an exhaustion portion 221 perpendicularly formed for discharging air sucked in the canopy 211; an air supply fan 235 for blowing air into the hood main body 211; and a nozzle unit 241 disposed at the front end portion of the canopy 211 for discharging air blown by the air supply fan 235.

[0039] The canopy 211 may include: an inclined section portion 212a having a particular thickness and disposed to be upwardly inclined at a forward direction; and a horizontal section portion 212b curved from the front end portion of the inclined section portion 212a to be horizontally disposed thereat. The inclined section portion 212a is disposed to be upwardly inclined and thus placed adjacent to the cookware. Accordingly, the contaminated air can rapidly be sucked and discharged.

[0040] A partition wall 231 for partitioning an inner space of the canopy 211 is disposed in the horizontal section portion 212b of the canopy 211. A suction hole 233 for passing air through is formed through the partition wall 231. An air supply fan 235 is disposed at one side of the partition wall 231. An air supply passage 237 for moving the air toward the nozzle unit 241 is formed at one side of the air supply fan 235.

[0041] The nozzle unit 241 is formed to be downwardly inclined toward the suction portion 215 so that the discharged air can be toward the inside thereof, whereby the contaminated air such as smoke, smell, vapor, and the like can easily flow toward the suction portion 215 to be sucked therein.

[0042] Here, as can be seen in the exhaust hood in accordance with a seventh embodiment of the present invention shown in Fig. 13, a lateral nozzle unit 251 for discharging air toward the suction portion 215 of the canopy 211 is disposed at both lateral surfaces or one lateral surface of the canopy so as to prevent the contaminated air from flowing toward the lateral direction of the canopy 211 without being sucked therein.

[0043] According to such construction, when the air supply fan 235(refer to Fig. 12) starts to be rotated, air is sucked through the suction hole 233(refer to Fig. 12). The sucked air flows toward the nozzle unit 241 and/or the lateral nozzle unit 251 along the air supply passage 237(refer to Fig. 12) to be discharged therethrough. The air discharged through the nozzle unit 241 and/or the lateral nozzle unit 251 can prevent the contaminated air such as smoke, smell, vapor and the like from being deviated outwardly from the canopy 211 and also allow the contaminated air to easily flow toward the suction portion 215, thereby improving a suction efficiency of the exhaust hood.

[0044] As described above, the exhaust hood according to the embodiments of the present invention can comprise: a hood main body provided with a canopy disposed to be upwardly inclined in a forward direction and having a suction portion disposed at a lower portion thereof for sucking air, and an exhaustion portion perpendicularly formed to be connected with the canopy for discharging air sucked in the canopy; an air supply fan for blowing air into the hood main body; a first nozzle unit disposed at a front end portion of the hood main body for spreading the air blown by the air supply fan toward the suction portion by being inclined by a particular angle; a first curved wall member having a sectional shape which is convex outwardly and disposed at one side of the first nozzle unit, to thus allow the air discharged by the first nozzle unit to partially flow along the convex outer surface thereof, whereby the contaminated air can rapidly be exhausted and a collecting region of the contaminated air can be expanded, and thus the contaminated air can effectively be prevented from being deviated and dispersed.

[0045] 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, but rather should be construed broadly within its spirit and scope as defined in the appended claims, and therefore all changes and modifications that fall within the metes and bounds of the claims, or equivalence of such metes and bounds are therefore intended to be embraced by the appended claims.

Claims

1. An exhaust hood comprising:

a hood main body (110) provided with a canopy (111) having a suction portion (115) disposed at a lower portion thereof for sucking air and disposed to be upwardly inclined in a forward direction, and an exhaustion portion (121) perpendicularly formed for discharging the sucked air to the exterior;
an air supply fan (135) disposed in the hood main body (110) for blowing air; and
a nozzle unit (141) formed at a front end region of the hood main body (110) for spreading the air blown by the air supply fan (135) toward the suction portion (115) by being inclined by a particular angle.

2. The exhaust hood of claim 1, wherein the inclined angle of the nozzle unit (141) is 15° through 60°.

3. An exhaust hood comprising:

a hood main body (110) provided with a canopy (111) having a suction portion (115) disposed at a lower portion thereof for sucking air and disposed to be upwardly inclined in a forward direction, and an exhaustion portion (121) perpendicularly formed for discharging the sucked air to the exterior;
an air supply fan (135) disposed in the hood main body (110) for blowing air; and
a front collecting unit (151) provided with a nozzle unit (155) for discharging the air blown by the air supply fan (135) outwardly from an upper side of the canopy (111), and a curved wall member (153) having a sectional shape which is convex outwardly, and disposed at one side of the nozzle unit (155), to thus allow the air discharged by the nozzle unit (155) to partially flow along the convex outer surface thereof, the front collecting unit (151) collecting the contaminated air of the front end region of the canopy (111) and flowing the contaminated air toward the suction portion (115).

4. The exhaust hood of claim 3, wherein the nozzle unit (155) is positioned on a virtually perpendicular line Lv passing through the center O of the curved wall member (153) (i.e., θ=0°).

5. An exhaust hood comprising:

a hood main body (110) provided with a canopy (111) having a suction portion (115) disposed at a lower portion thereof for sucking air and disposed to be upwardly inclined in a forward direction, and an exhaustion portion (121) perpendicularly formed for discharging the sucked air to the exterior;
an air supply fan (135) disposed in the hood main body (110) for blowing air; and
a front collecting unit (171) provided with a first nozzle unit (172) for partially discharging upwardly the air blown by the air supply fan (135) along the thickness direction of the canopy (111); a first curved wall member (174) disposed at one side of the first nozzle unit (172) so as to allow the air blown by the first nozzle unit (172) to partially flow along the convex outer surface thereof according to a Coanda effect and also to allow the air blown by the air supply fan (135) to partially flow along an inner surface thereof; a second nozzle unit (176) formed at a downward end region of the first curved wall member (174), through which air is discharged, for discharging the air flowed along the inner surface of the first curved wall member (174) therethrough; and a second curved wall member (178) disposed inside of the first curved wall member (174) to form an air passage together with the first curved wall member (174) and to allow the air discharged through the second nozzle unit (176) to partially flow toward the suction portion (115) according to the coanda effect.

6. The exhaust hood of any of claims 3 through 5, further comprising:

a lateral collecting unit (181) provided with a lateral nozzle unit (185) for discharging the air blown by the air supply fan (135), and a lateral curved wall member (183) having a sectional shape which is outwardly convex and disposed at one side of the lateral nozzle unit (185) for partially flowing the air discharged through the lateral nozzle unit (183) along an outer surface thereof.

7. An exhaust hood comprising:

a hood main body (211) provided with a canopy

(211) including an inclined section portion (212a) disposed to be upwardly inclined in a forward direction, and having a suction portion (215) at a lower portion thereof and a horizontal section portion (212b) curved and horizontally extending at a front end portion of the inclined section portion (212a), and an exhaustion portion (221) perpendicularly formed to discharge air sucked in the canopy (211);
an air supply fan (235) for blowing air into the hood main body (211); and
a nozzle unit (241) disposed at the front end portion of the canopy (211) for discharging air blown by the air supply fan (235).

8. The exhaust hood of claim 7, further comprising:

a lateral collecting unit (181) provided with a lateral nozzle unit (185) for discharging the air blown by the air supply fan (235), and a lateral curved wall member (183) having a sectional shape which is outwardly convex, and disposed at one side of the lateral nozzle unit (185) for partially flowing the air discharged through the lateral nozzle unit (183) along an outer surface thereof.

FIG. 1

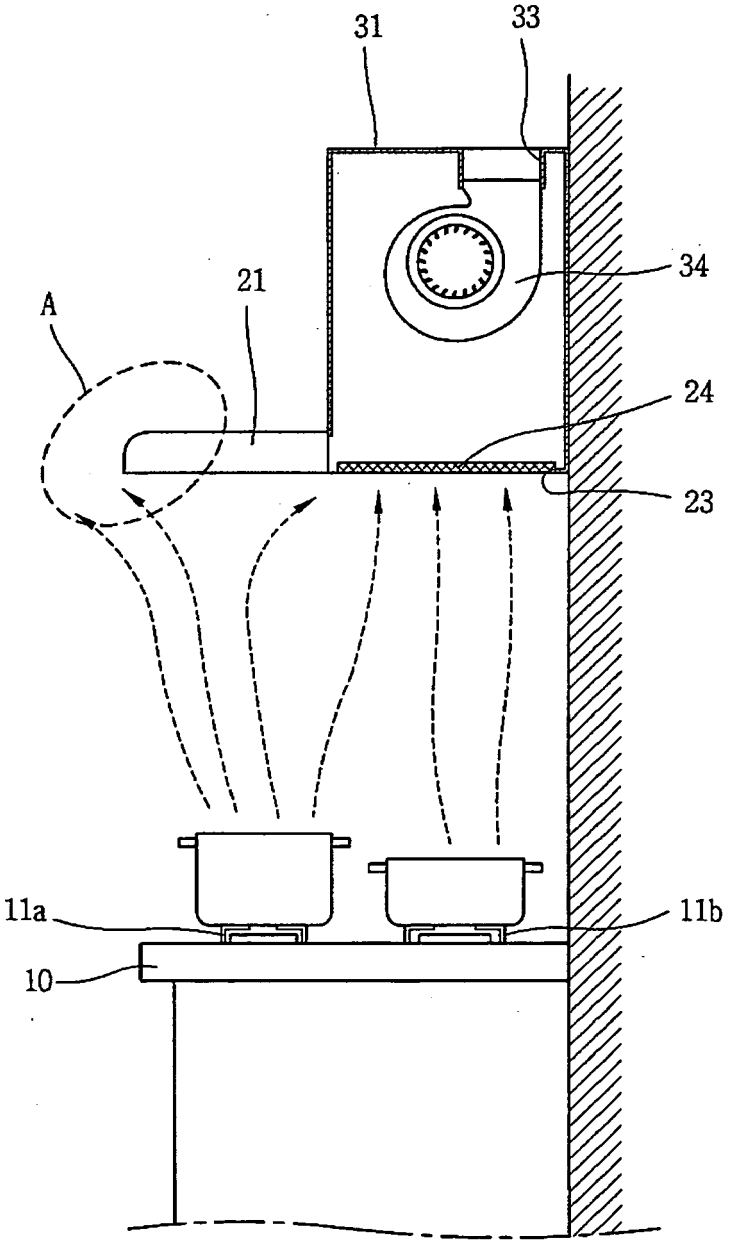

FIG. 2

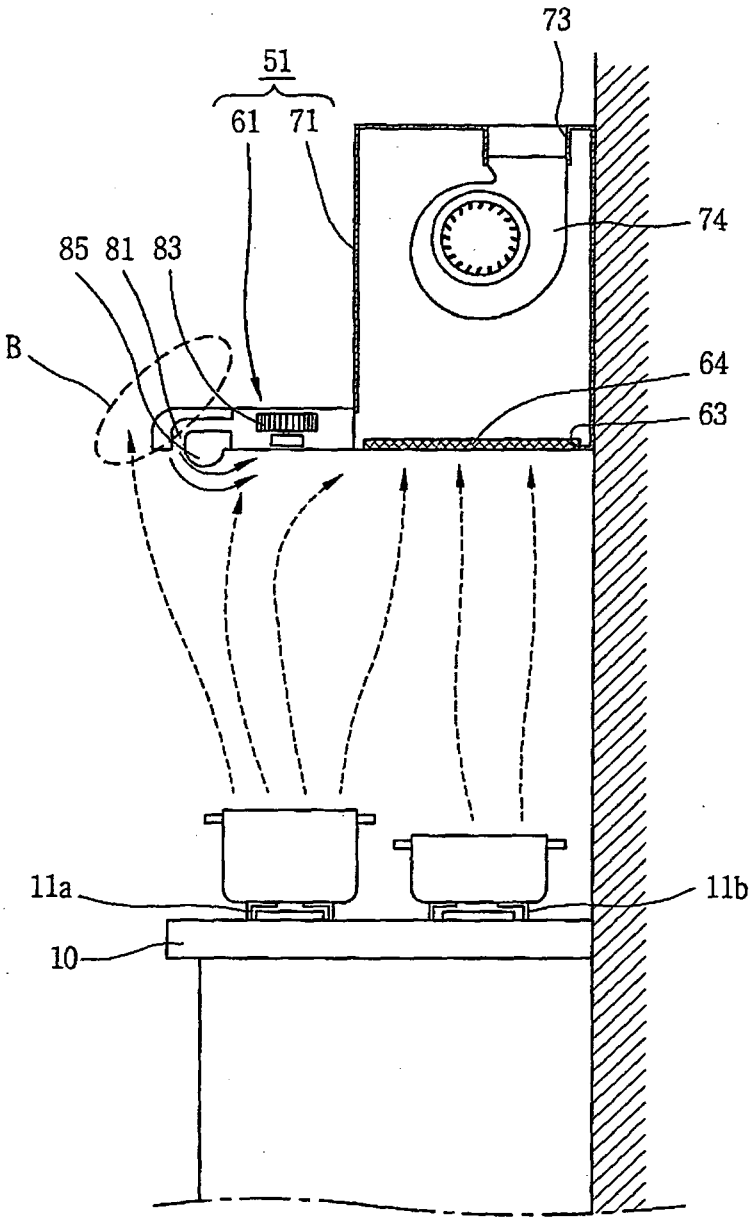

FIG. 3

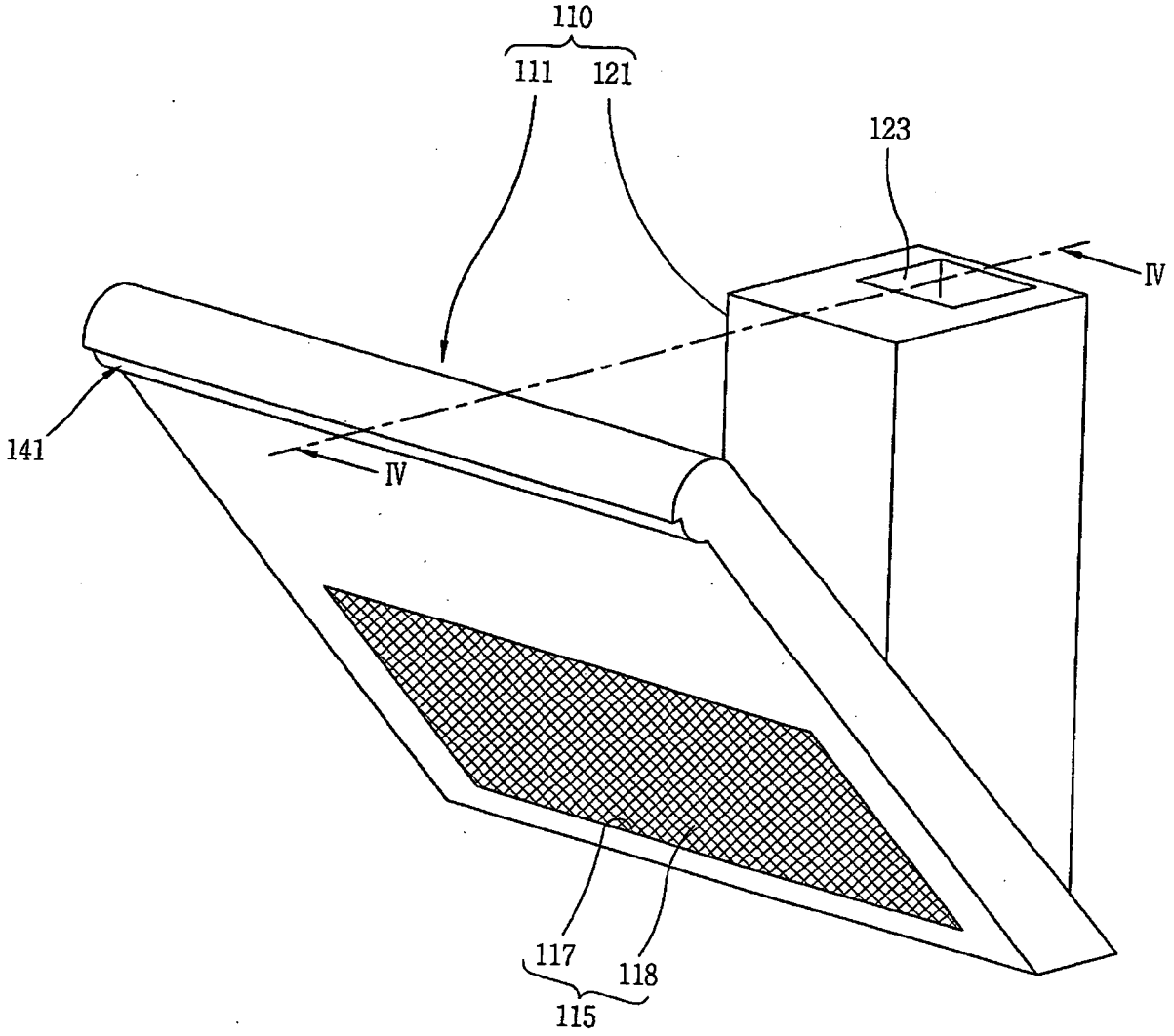

FIG. 4

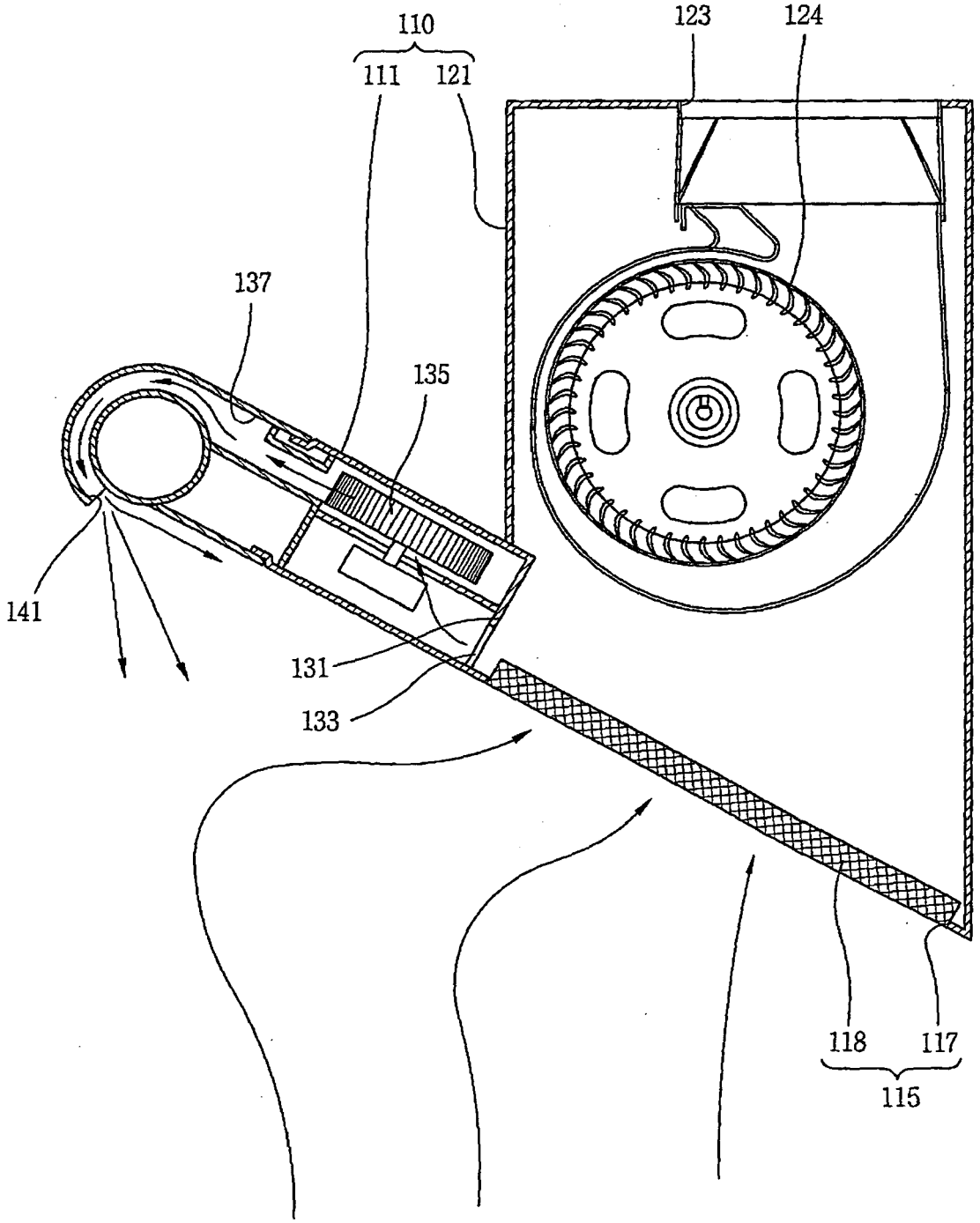

FIG. 5

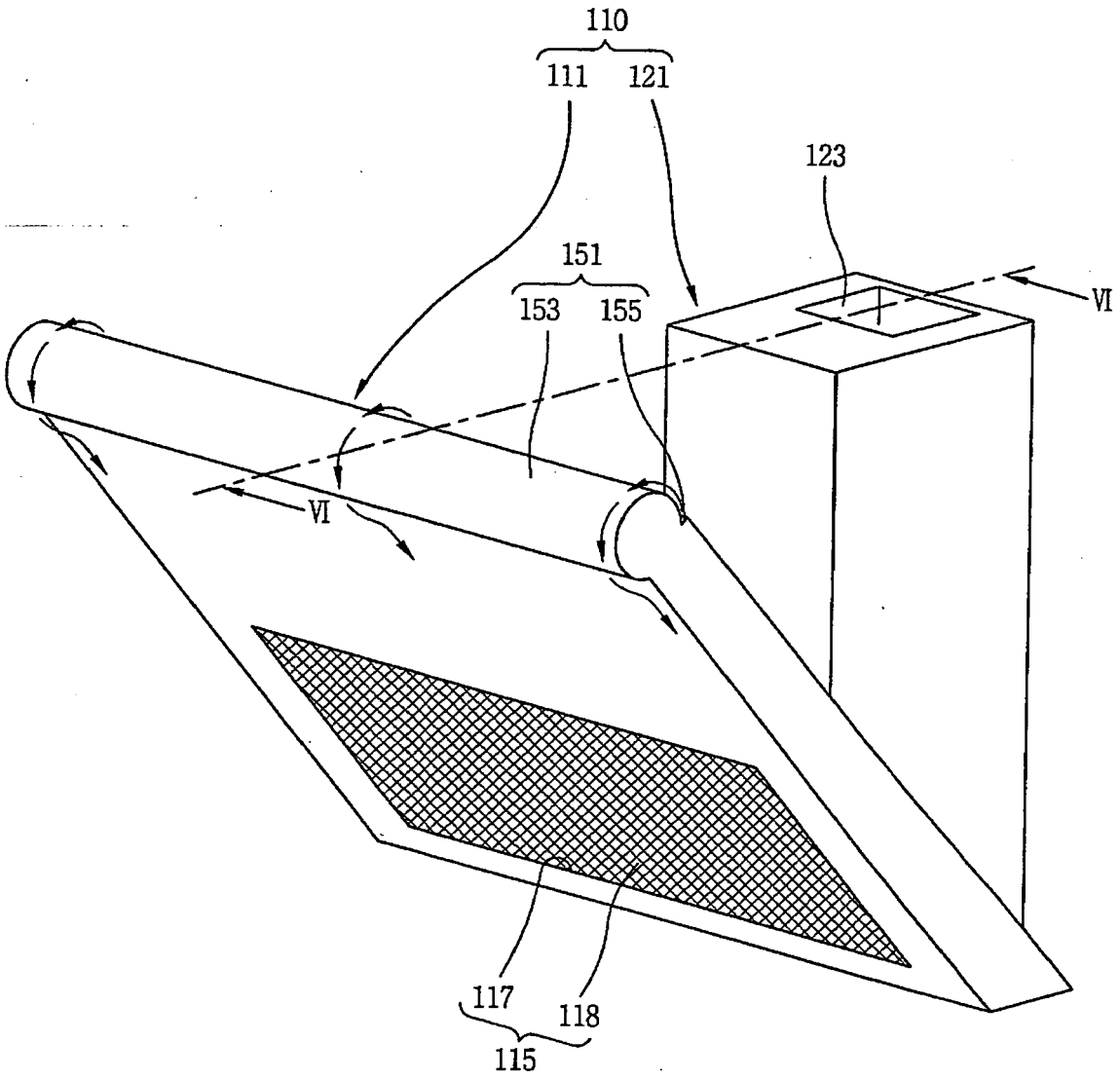

FIG. 6

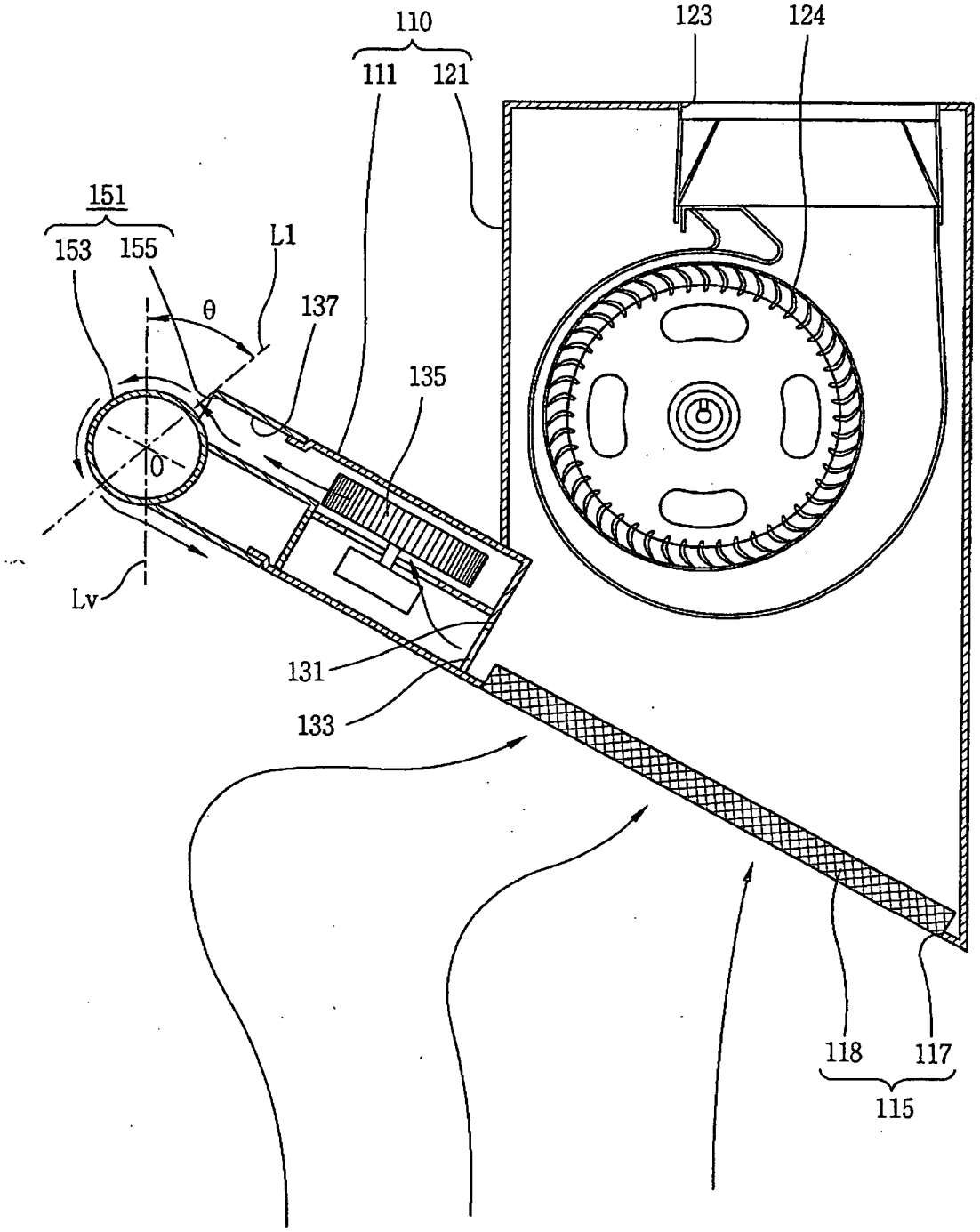
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FIG. 7

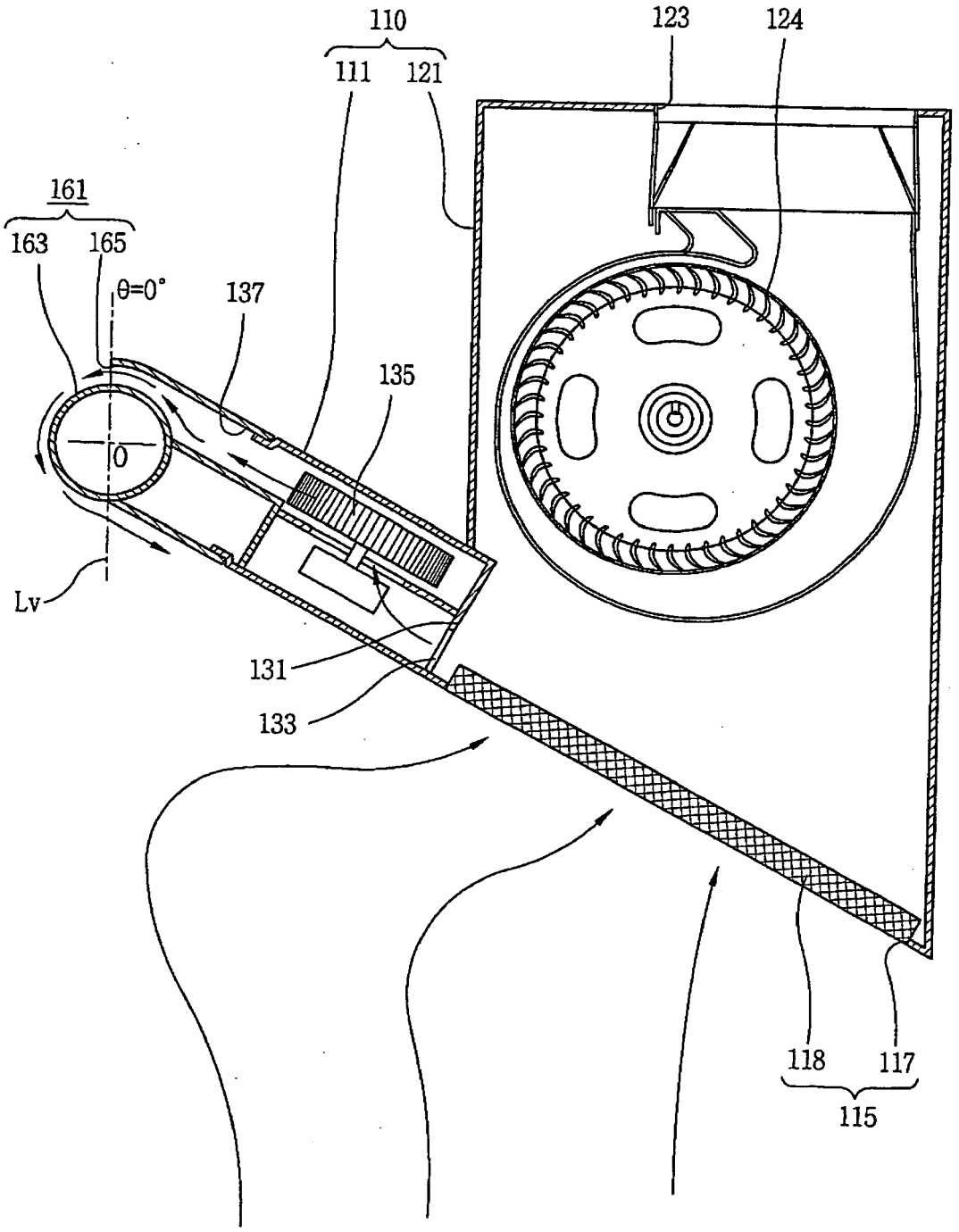
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FIG. 8

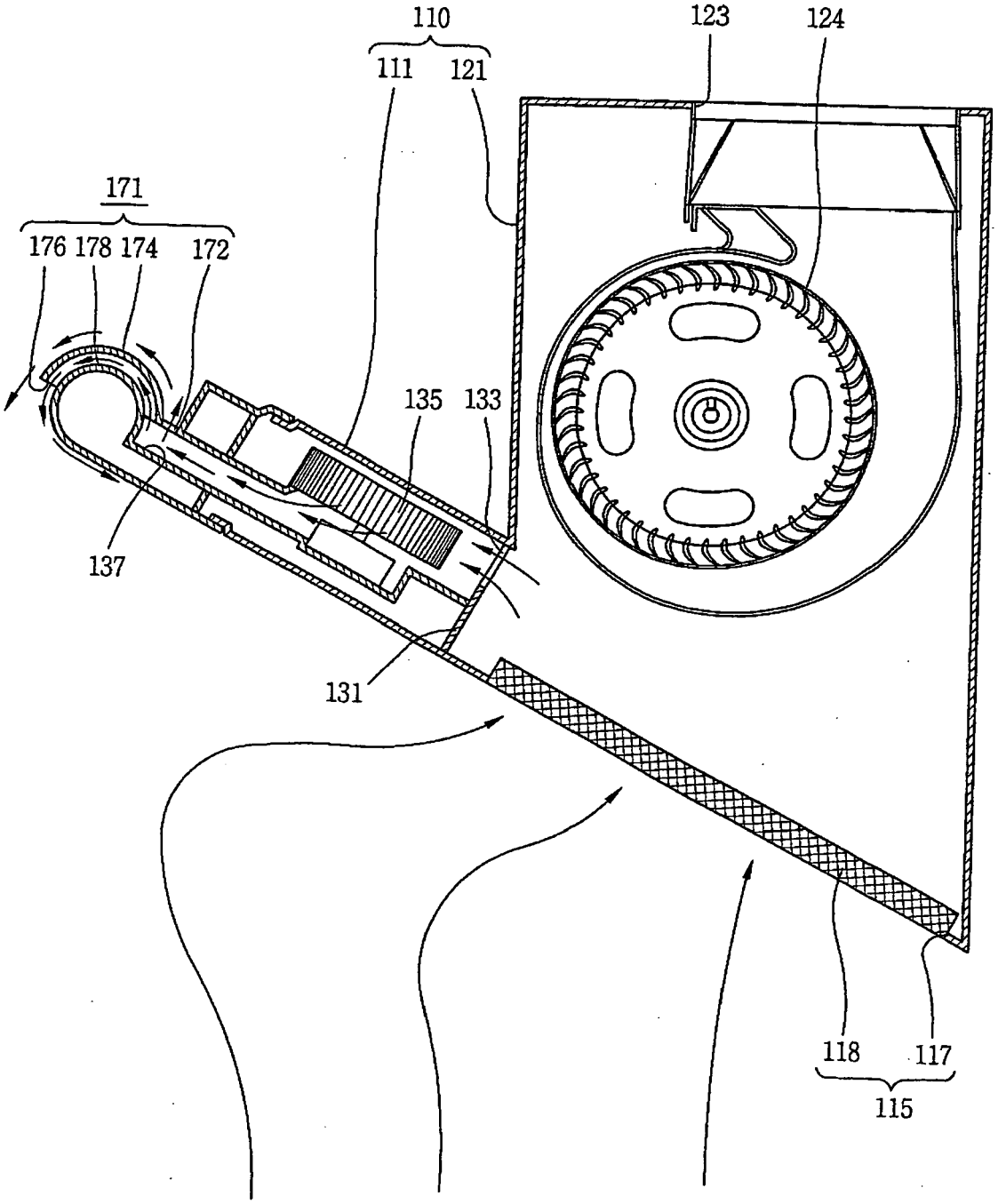
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FIG. 9

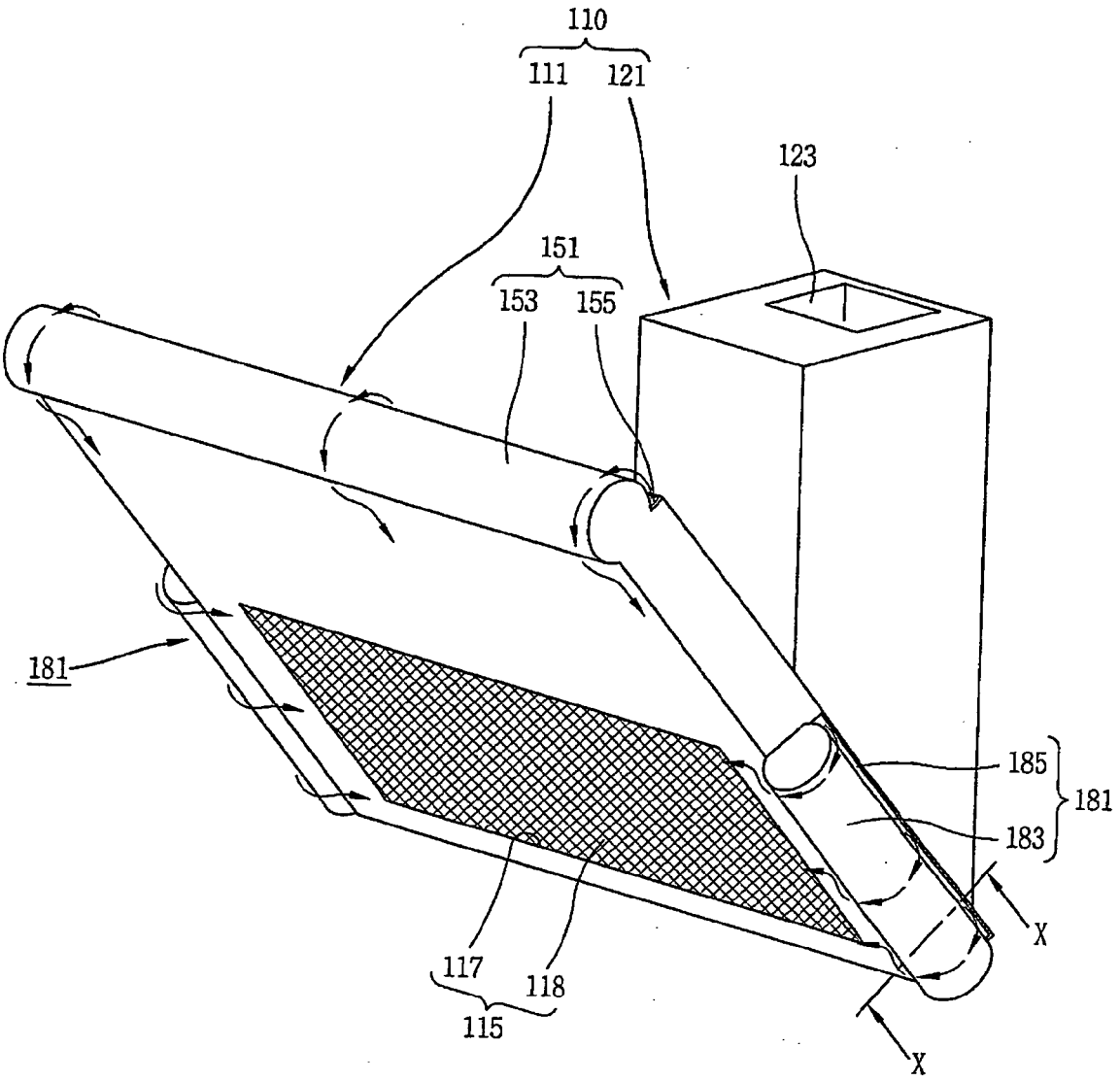

FIG. 10

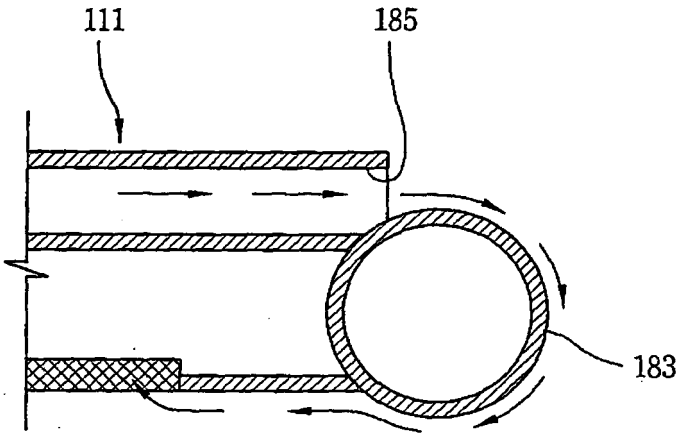

FIG. 11

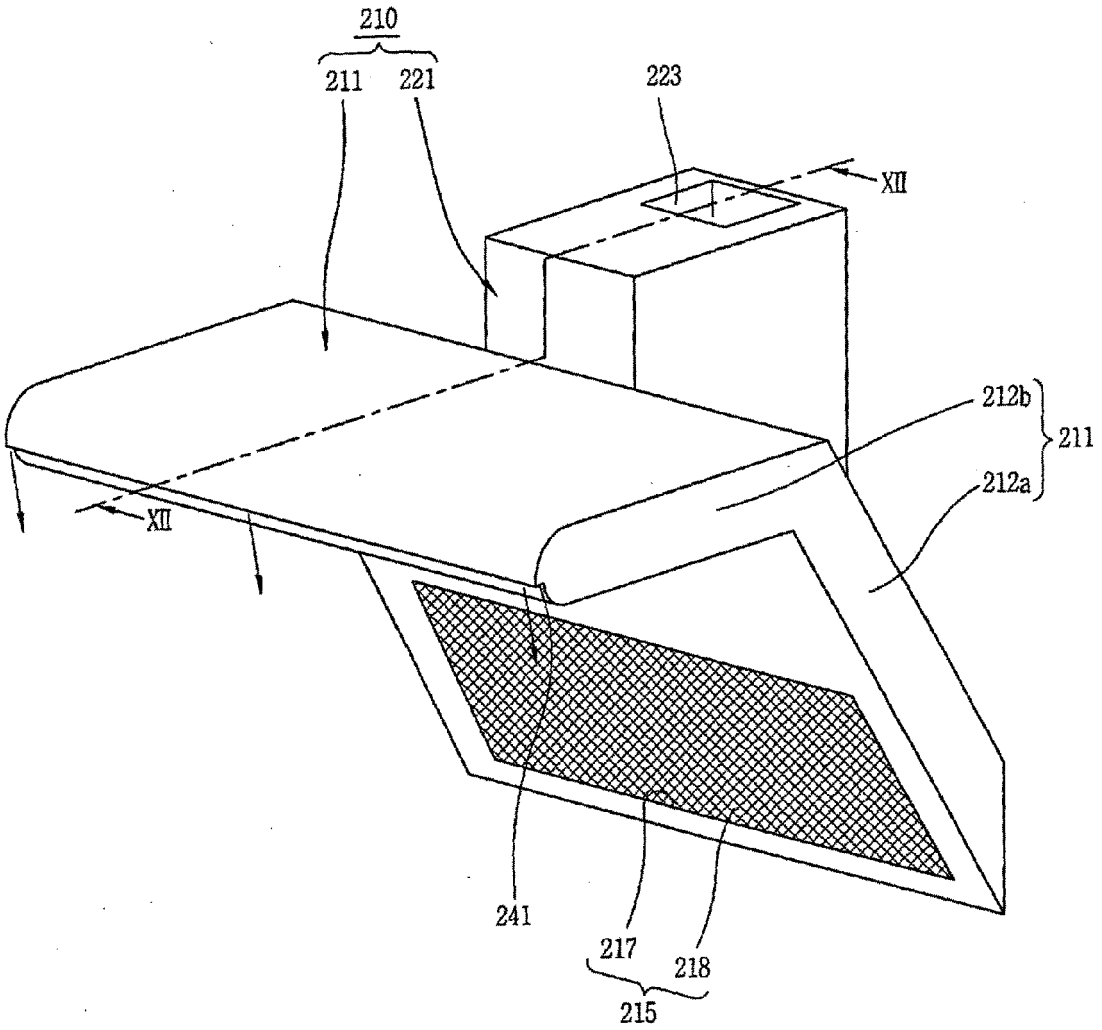

FIG. 12

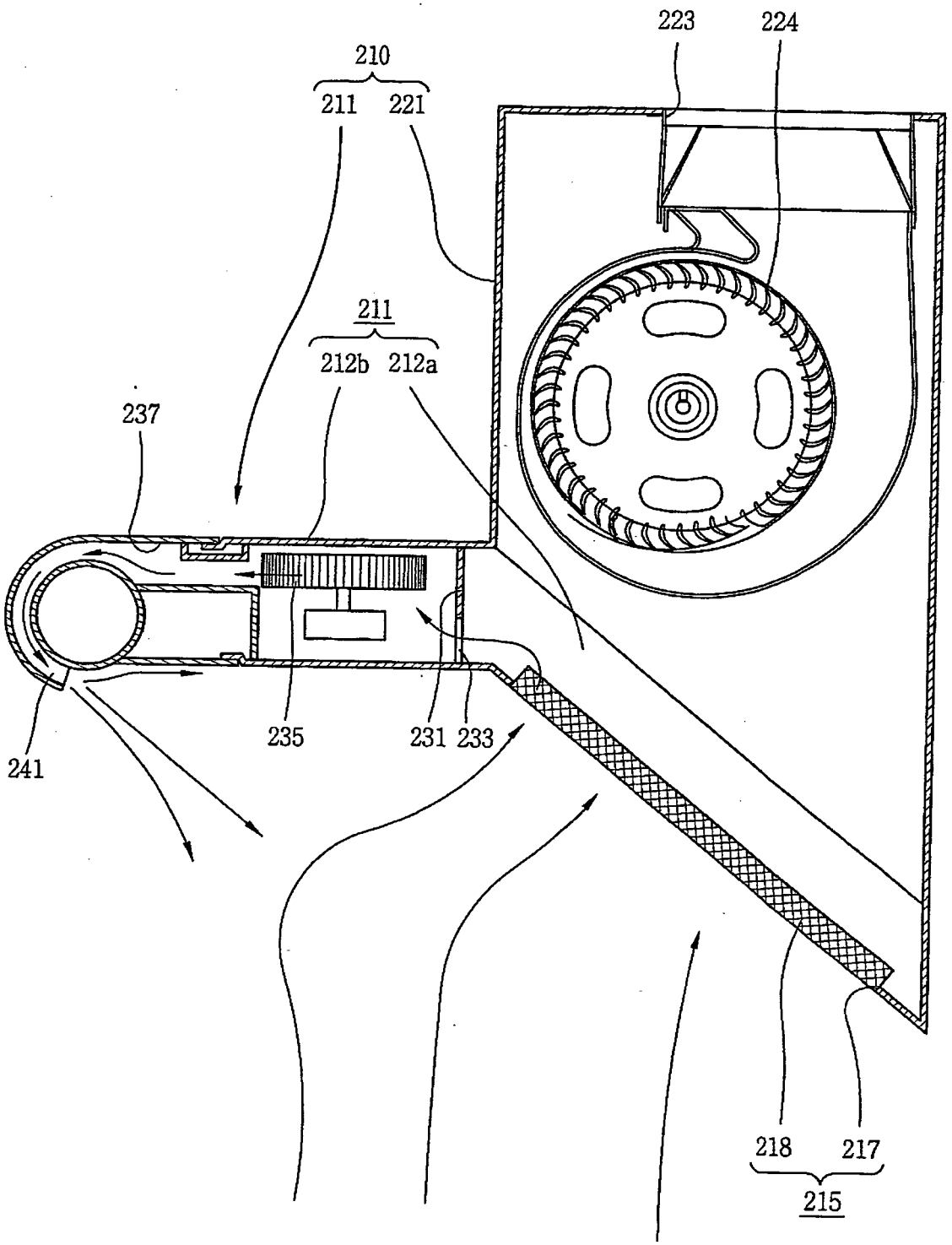
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FIG. 13