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(54) **Casing and range hood comprising the casing**

(57) A case and a range hood provided with the case are described. The range hood includes a case and a volute (2). An air outlet (3) is disposed on an upper wall of the case. The volute (2) is mounted in the case, and includes a front baffle (4), a rear baffle, and an enclosing board (5). The front baffle (4) and the rear baffle are oppositely disposed on two sides of the enclosing board (5). An air inlet (3) is disposed on the front baffle (4). A recessed portion (7) is disposed on at least one side wall (6) of the case opposite to the enclosing board (5), and the recessed portion (7) is recessed away from the enclosing board (5). The recessed portion (7) is used for accommodating a corresponding protruding portion of the volute (2), and the protruding portion of the volute (2) refers to a portion of the volute (2) that protrudes from a plane where a region of the side wall (6) other than the recessed portion (7) is located. In this way, since the recessed portion (7) is disposed, it is possible to enlarge a fan system without significantly increasing the volume of the case.

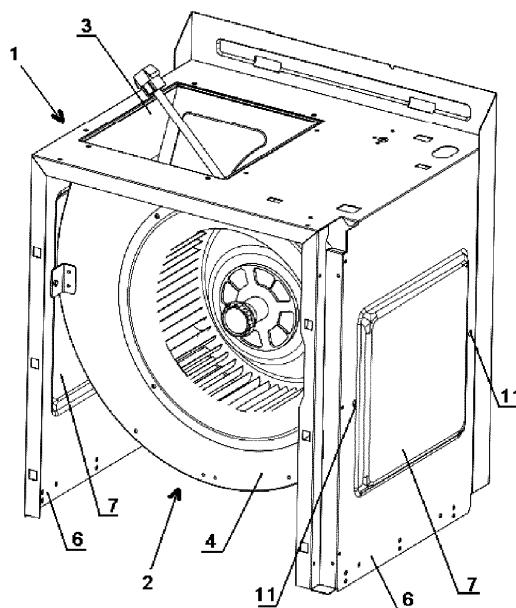


FIG. 4

Description

BACKGROUND

Technical Field

[0001] The present invention relates to the field of a range hood and components thereof, and more particularly to a case for accommodating a volute.

Related Art

[0002] A range hood is a kitchen appliance for cleaning kitchen environment. The range hood is mounted above a cooker in the kitchen, is capable of quickly exhausting burning wastes of the cooker and oil fume harmful to the human body produced in cooking to the outdoors, reducing indoor pollution, and purifying indoor air, and has the safety guarantee function of gas proof and explosion proof. A volute is an important component of the range hood, and generally consists of three parts: a front baffle, an enclosing board, and a rear baffle. In the existing volute, an air inlet is disposed on the front baffle, for taking in air. In the existing range hood, air is taken in mainly from the air inlet on the front baffle. Although the rear baffle generally also has an air inlet disposed thereon, since a connecting device connected to a case is usually disposed on one side of the rear baffle, and the connecting device is usually disposed between the rear baffle and a side wall of the case that the rear baffle faces, a poor air intake effect of the air inlet on the rear baffle is caused and noise is easily produced. Therefore, how to change the existing fixing mode of the volute to improve the effect of taking in air from both sides of the volute has always been a technical problem demanding prompt solution in this field.

[0003] In addition, to achieve better noise reduction effect and increase the power of the range hood, the trend of enlarging a fan system appears in this field. However, a problem arises from the trend: to carry the fan system with increased volume, the volume of the case has to be increased accordingly, so that the manufacturing cost is increased and the appearance is impaired. In fact, in view of the assembly process, in existing European-style range hoods, a certain distance is generally kept between the enclosing board of the volute and the side wall of the case opposite thereto, resulting in a large volume of the case. Therefore, how to reduce the volume of the case has always been an important issue in this field for a long time.

[0004] Unless supported by sufficient evidences, the prior art described herein does not mean that it is known to those of ordinary skill in the art before the filing date of this application.

SUMMARY

[0005] In order to solve the above technical problems,

the present invention is directed to a case and a range hood provided with the case.

[0006] The present invention provides a range hood, which includes a case and a volute. The volute may also be referred to as a fan casing or housing, in particular a casing or housing of a radial fan. Preferably, the volute is a spiral casing or a coiled casing. An air outlet is disposed on an upper wall of the case. The volute is mounted in the case, and includes a front baffle, a rear baffle, and an enclosing board. The front baffle may also be referred to as front plate. The rear baffle may also be referred to as a back plate or rear plate and the enclosing board may also be referred to as enclosing plate. The front baffle and the rear baffle are oppositely disposed on two sides of the enclosing board. An air inlet is disposed on the front baffle. To be disposed on, according to the present invention may include providing an inlet, a portion or an opening in or on the respective element. A recessed portion is disposed on at least one side wall of the case opposite to the enclosing board, and the recessed portion is recessed away from the enclosing board. The side wall, which according to the present invention is opposite to the enclosing board, may also be referred to as the side wall facing or being adjacent to the enclosing board. The recessed portion is used for accommodating a corresponding protruding portion of the volute, and the protruding portion of the volute refers to a portion of the volute that protrudes from a plane where a region of the side wall other than the recessed portion is located. In this way, since the recessed portion is disposed, it is possible to enlarge a fan system without significantly increasing the volume of the case.

[0007] Optionally, a recessed cavity of the recessed portion is of a cuboidal structure or a cubic structure or a cylindrical structure or a circular truncated conical structure or a columnar structure having a bow-shaped base.

[0008] Optionally, a recessed cavity of the recessed portion fits a structure of the protruding portion of the volute accommodated therein. In this way, the material consumption of the recessed portion can be reduced and it is easier to fix the volute.

[0009] Optionally, the side wall provided with the recessed portion and the volute are connected and fixed to each other through at least one connecting device. The connecting device includes a first connecting portion and a second connecting portion. The first connecting portion is connected to the front baffle or the rear baffle, and the second connecting portion is connected to the region of the side wall other than the recessed portion. In this way, a brand-new fixing mode for the volute and the case is provided, which can avoid the influence of the fixing device between the volute and the case on the air intake effect of the air inlet and reduce noise.

[0010] Optionally, the connecting device is an L-shaped fixing sheet generally of an L-shaped structure, the first connecting portion and the second connecting portion are both of a sheet structure, and an angle between the first connecting portion and the second con-

necting portion is a right angle. The first connecting portion is attached to the front baffle or the rear baffle, and the second connecting portion is attached to the region of the side wall other than the recessed portion. In this way, the influence of the fixing device between the volute and the case on the air intake effect of the air inlet can further be avoided and noise can be reduced.

[0011] Optionally, the first connecting portion is completely attached to the front baffle or the rear baffle. In this way, a better fixing effect can be achieved.

[0012] Optionally, the first connecting portion is fixed to the volute by screw connection or riveting or welding or integral formation. Especially when the first connecting portion and the volute are integrally formed, the production and manufacturing efficiency can be greatly improved.

[0013] Optionally, the second connecting portion is fixed to the side wall by screw connection or riveting or welding.

[0014] Optionally, the side wall provided with the recessed portion and the volute are connected and fixed to each other through at least one V-shaped fixing sheet. The V-shaped fixing sheet includes two fixing sheet bodies, and an angle between the two fixing sheet bodies is an acute angle. Ends of the V-shaped fixing sheet in an opening direction are connected to the front baffle or the rear baffle. One fixing sheet body of the V-shaped fixing sheet is attached to the region of the side wall other than the recessed portion. A better fixing effect can be achieved by using the V-shaped fixing sheet for fixing.

[0015] Optionally, the case includes a U-shaped cover, and the air outlet and the recessed portion are both disposed on the U-shaped cover. With the U-shaped cover structure, the recessed portion can be manufactured conveniently, so as to improve the production efficiency.

[0016] Optionally, the recessed portions are respectively symmetrically disposed on two side walls of the case opposite to the enclosing board. In this case, the two side walls are preferably opposite side walls of the case. In this way, the overall structure of the case is more aesthetic.

[0017] Optionally, an air inlet is also disposed on the rear baffle. With the technical solution of the present invention, the mode of taking in air from both sides of the volute has made a qualitative breakthrough, thereby greatly improving the air intake efficiency.

[0018] Optionally, the recessed portion and the corresponding side wall are integrally formed. Thereby, the manufacturing efficiency can be improved.

[0019] The present invention provides a case. An air outlet is disposed on an upper wall of the case, and the case is used for mounting and fixing a volute. The volute includes a front baffle, a rear baffle, and an enclosing board. The front baffle and the rear baffle are oppositely disposed on two sides of the enclosing board. An air inlet is disposed on the front baffle. A recessed portion is disposed on at least one side wall of the case opposite to the enclosing board, and the recessed portion is re-

cessed away from the enclosing board. The recessed portion is used for accommodating a corresponding protruding portion of the volute, and the protruding portion of the volute refers to a portion of the volute that protrudes from a plane where a region of the side wall other than the recessed portion is located. In this way, since the recessed portion is disposed, it is possible to enlarge a fan system without significantly increasing the volume of the case.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] The accompanying drawings below are merely intended to provide an illustrative description and explanation of the present invention and are not to limit the scope of the present invention. In the drawings,

FIG. 1 is a schematic structural view of an embodiment of a case in the present invention;

FIG. 2 is another schematic structural view of an embodiment of a case in the present invention;

FIG. 3 is a schematic view illustrating an assembly relation between a case and a volute in an embodiment of a range hood in the present invention;

FIG. 4 is another schematic view illustrating an assembly relation between a case and a volute in an embodiment of a range hood in the present invention; and

FIG. 5 is a schematic structural view of a volute in an embodiment of a range hood in the present invention.

[0021] The symbols in the drawings include:

1-U-shaped cover, 2-volute, 3-air outlet, 4-front baffle, 5-enclosing board, 6-side wall, 7-recessed portion, 8-first connecting portion, 9-second connecting portion, 10-V-shaped fixing sheet, and 11-fixing hole.

DETAILED DESCRIPTION

[0022] To make the objectives, solutions, and beneficial effects of the present invention more comprehensible, the present invention is further described below with reference to the accompanying drawings and preferred embodiments.

Embodiment 1

[0023] As shown in FIGS. 1 and 2, the present invention provides an embodiment of a case. The case is used for mounting and fixing a volute 2. An air outlet 3 is disposed on an upper wall of the case, and the air outlet 3

is used for connecting an exhaust port of the volute 2. In addition to the upper wall, the case further includes four side walls 6 respectively connected to four edges of the upper wall. In order to show the interior structure of the case, FIGS. 1 and 2 only show three side walls 6. An opening is provided on the other end of the case opposite to the upper wall, for absorbing oil fume. The volute 2 accommodated in the case is shown in FIG. 5. The volute 2 includes a front baffle 4, a rear baffle, and an enclosing board 5. The front baffle 4 and the rear baffle are symmetrically disposed on two sides of the enclosing board 5, and air inlets are disposed on both the front baffle 4 and the rear baffle, so as to take in air from both sides.

[0024] Two of the four side walls 6 of the case are opposite to the enclosing board 5. A recessed portion 7 is disposed respectively on the two side walls 6 opposite to the enclosing board 5, the two recessed portions 7 are symmetrically disposed, and the two recessed portions 7 are both recessed away from the enclosing board 5. As shown in FIGS. 1 and 2, in visual effect, the recessed portion 7 protrudes out from the corresponding side wall 6. The recessed portion 7 is used for accommodating a corresponding protruding portion of the volute 2. The protruding portion of the volute 2 refers to the portion of the volute 2 that protrudes from the plane where the region of the side wall 6 other than the recessed portion 7 is located. That is to say, without the recessed portions 7, the volute 2 cannot be placed into the case, and with the recessed portions 7 provided in this embodiment, the portions of the volute 2 that exceed the distance between the above two side walls 6 opposite to the enclosing board 5 can be placed into the corresponding recessed portions 7. A recessed cavity of the recessed portion 7 is of a cuboidal structure. The recessed cavity should be understood as the space enclosed between the inner surface of the recessed portion 7 and the plane where the region of the corresponding side wall 6 other than the recessed portion 7 is located.

[0025] As shown in FIGS. 1 and 2, for the specific structure, the case includes a U-shaped cover 1, a front board, and a rear board. The U-shaped cover 1 includes one upper wall and two side walls 6, the two side walls 6 are opposite to the enclosing board 5 of the volute 2 in the use state, the front board and the rear board are disposed on two sides of the U-shaped cover 1, and the front board is not shown in the figures. Specifically, the air outlet 3 and the recessed portions 7 are both disposed on the U-shaped cover 1. The air outlet 3 is disposed on the upper wall of the U-shaped cover 1, and the two recessed portions 7 are symmetrically disposed on the two side walls 6 of the U-shaped cover 1, so as to facilitate manufacturing and assembly.

[0026] The recessed portion 7 and the corresponding side wall 6 are integrally formed. Specifically, the recessed portion 7 is formed on the side wall 6 by a stamping process.

[0027] The above is merely a preferred embodiment of the present invention, and other embodiments can be

obtained by modifying and replacing some technical features. In an example, the recessed portion is disposed on only one side wall. In another example, the recessed cavity of the recessed portion is of a cubic structure or a cylindrical structure or a circular truncated conical structure or a columnar structure having a bow-shaped base. In still another example, the recessed cavity of the recessed portion fits the structure of the protruding portion of the volute accommodated therein.

Embodiment 2

[0028] The present invention further provides an embodiment of a range hood, which is formed by assembling the volute 2 shown in FIG. 5 and other components based on the embodiment of the case provided in Embodiment 1.

[0029] As shown in FIGS. 3 and 4, the protruding portions of the volute 2 enter the recessed cavities of the corresponding recessed portions 7, and air is taken in from both sides of the volute 2. The side walls 6 provided with the recessed portions 7 and the volute 2 are connected and fixed to each other through two L-shaped fixing sheets and two V-shaped fixing sheets 10.

[0030] The L-shaped fixing sheet is generally of an L-shaped structure. The L-shaped fixing sheet includes a first connecting portion 8 and a second connecting portion 9. The first connecting portion 8 and the second connecting portion 9 are both of a sheet structure, and an angle between the first connecting portion 8 and the second connecting portion 9 is a right angle. The first connecting portion 8 is connected to the front baffle 4 of the volute 2, and the second connecting portion 9 is connected to the region of the side wall 6 other than the recessed portion 7. The "region of the side wall 6 other than the recessed portion 7" should be understood as the region of the side wall 6 provided with the recessed portion 7 other than the recessed portion 7 thereof. Specifically, the first connecting portion 8 is completely attached to the front baffle 4, and the second connecting portion 9 is attached to the region of the side wall 6 other than the recessed portion 7. The first connecting portion 8 is fixed to the front baffle 4 of the volute 2 by screw connection. A flanged hole with threads is disposed on the second connecting portion 9, a corresponding fixing hole 11 is disposed on the corresponding side wall 6, and the second connecting portion 9 is fixed to the corresponding side wall 6 by screw connection. As shown in FIGS. 3 and 4, due to the existence of the recessed portion 7, the above fixing manner of using the L-shaped fixing sheet becomes possible.

[0031] The V-shaped fixing sheet 10 includes two fixing sheet bodies, and an angle between the two fixing sheet bodies is an acute angle. Ends of the V-shaped fixing sheet 10 in the opening direction are connected to the rear baffle of the volute 2. One fixing sheet body of the V-shaped fixing sheet 10 is attached to the region of the side wall 6 other than the recessed portion 7, a flanged

hole with threads is disposed on the fixing sheet body, a corresponding fixing hole 11 is disposed on the corresponding side wall 6, and the V-shaped fixing sheet 10 is fixed to the corresponding side wall 6 by screw connection. As shown in FIGS. 3 and 4, due to the existence of the recessed portion 7, the above fixing manner of using the V-shaped fixing sheet 10 becomes possible.

[0032] The above is merely a preferred embodiment of the present invention, and other embodiments can be obtained by modifying and replacing some technical features. In an example, the first connecting portion is fixed to the volute by riveting, welding, or integral formation. In another example, the second connecting portion is fixed to the side wall by riveting or welding.

[0033] It should be noted that, the present invention is not limited to the above embodiments, but covers all the possible implementations determined according to the claims and the disclosure of the specification. Therefore, any simple modification, equivalent replacement, or improvement made without departing from the spirit and principle of the present invention shall fall within the protection scope of the present invention.

Claims

1. A range hood, comprising a case and a volute (2), wherein an air outlet (3) is disposed on an upper wall of the case, the volute (2) is mounted in the case, the volute (2) comprises a front baffle (4), a rear baffle, and an enclosing board (5), the front baffle (4) and the rear baffle are oppositely disposed on two sides of the enclosing board (5), and an air inlet is disposed on the front baffle (4), **characterized in that:**

a recessed portion (7) is disposed on at least one side wall (6) of the case opposite to the enclosing board (5), and the recessed portion (7) is recessed away from the enclosing board (5); and
the recessed portion (7) is used for accommodating a corresponding protruding portion of the volute (2), and the protruding portion of the volute (2) refers to a portion of the volute (2) that protrudes from a plane where a region of the side wall (6) other than the recessed portion (7) is located.

2. The range hood according to claim 1, **characterized in that:**

a recessed cavity of the recessed portion (7) is of a cuboidal structure or a cubic structure or a cylindrical structure or a circular truncated conical structure or a columnar structure having a bow-shaped base.

3. The range hood according to claim 1 or 2, **characterized in that:**

a recessed cavity of the recessed portion (7) fits a structure of the protruding portion of the volute (2) accommodated therein.

4. The range hood according to anyone of claims 1 to 3, **characterized in that:**

the side wall (6) provided with the recessed portion (7) and the volute (2) are connected and fixed to each other through at least one connecting device (8, 9);

the connecting device comprises a first connecting portion (8) and a second connecting portion (9); and

the first connecting portion (8) is connected to the front baffle (4) or the rear baffle, and the second connecting portion (9) is connected to the region of the side wall (6) other than the recessed portion (7).

5. The range hood according to claim 4, **characterized in that:**

the connecting device is an L-shaped fixing sheet generally of an L-shaped structure, the first connecting portion (8) and the second connecting portion (9) are both of a sheet structure, and an angle between the first connecting portion (8) and the second connecting portion (9) is a right angle; and
the first connecting portion (8) is attached to the front baffle (4) or the rear baffle, and the second connecting portion (9) is attached to the region of the side wall (6) other than the recessed portion (7).

6. The range hood according to anyone of claims 4 or 5, **characterized in that:**

the first connecting portion (8) is completely attached to the front baffle (4) or the rear baffle.

7. The range hood according to anyone of claims 4 to 6, **characterized in that:**

the first connecting portion (8) is fixed to the volute (2) by screw connection or riveting or welding or integral formation.

8. The range hood according to anyone of claims 4 to 7, **characterized in that:**

the second connecting portion (9) is fixed to the side wall (6) by screw connection or riveting or welding.

9. The range hood according to anyone of claims 1 to 8, **characterized in that:**

the side wall (6) provided with the recessed portion (7) and the volute (2) are connected and fixed to each other through at least one V-shaped fixing sheet (10);
the V-shaped fixing sheet (10) comprises two fixing sheet bodies, and an angle between the two fixing sheet bodies is an acute angle;
ends of the V-shaped fixing sheet (10) in an opening direction are connected to the front baffle (4) or the rear baffle; and
one fixing sheet body of the V-shaped fixing sheet (10) is attached to the region of the side wall (6) other than the recessed portion (7).

volute (2), and the protruding portion of the volute (2) refers to a portion of the volute (2) that protrudes from a plane where a region of the side wall (6) other than the recessed portion (7) is located.

10. The range hood according to anyone of claims 1 to 9, **characterized in that:**

the case comprises a U-shaped cover (1), and the air outlet (3) and the recessed portion (7) are both disposed on the U-shaped cover (1).

11. The range hood according to anyone of claims 1 to 10, **characterized in that:**

the recessed portions (7) are respectively symmetrically disposed on two side walls (6) of the case opposite to the enclosing board (5).

12. The range hood according to anyone of claims 1 to 11, **characterized in that:**

an air inlet is also disposed on the rear baffle.

13. The range hood according to anyone of claims 1 to 12, **characterized in that:**

the recessed portion (7) and the corresponding side wall (6) are integrally formed.

14. A case, wherein an air outlet (3) is disposed on an upper wall of the case, the case is used for mounting and fixing a volute (2), the volute (2) comprises a front baffle (4), a rear baffle, and an enclosing board (5), the front baffle (4) and the rear baffle are oppositely disposed on two sides of the enclosing board (5), and an air inlet is disposed on the front baffle (4), **characterized in that:**

a recessed portion (7) is disposed on at least one side wall (6) of the case opposite to the enclosing board (5), and the recessed portion (7) is recessed away from the enclosing board (5);
and
the recessed portion (7) is used for accommodating a corresponding protruding portion of the

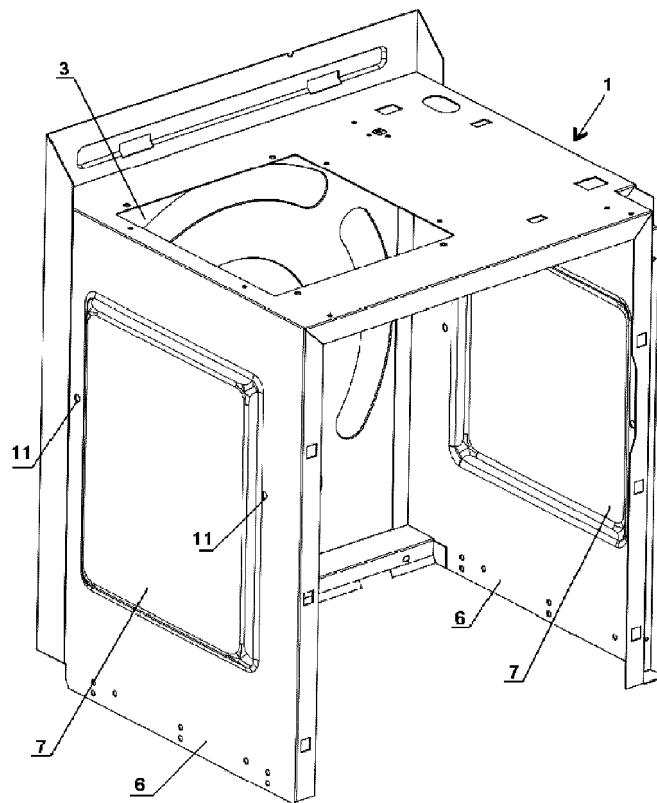


FIG. 1

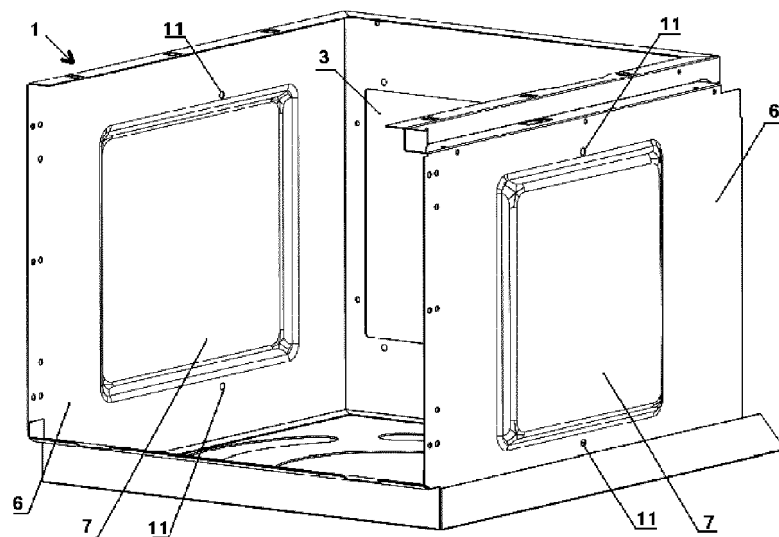


FIG. 2

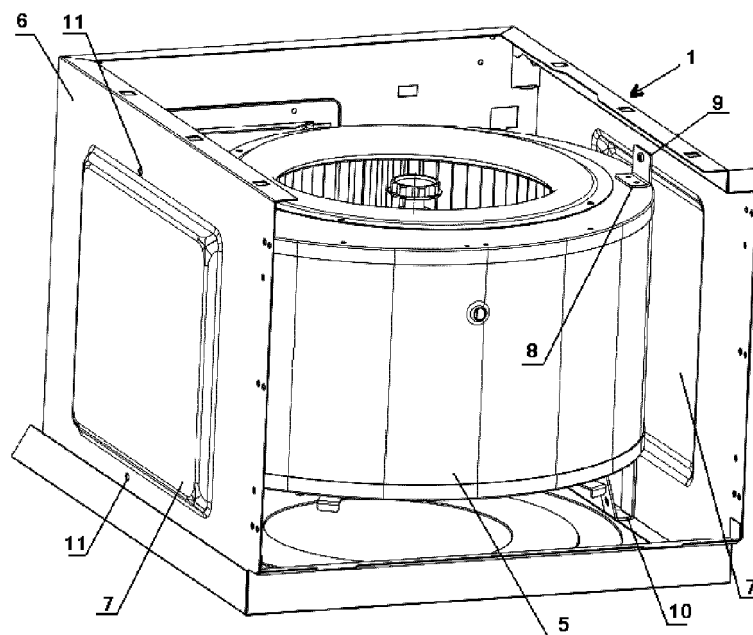


FIG. 3

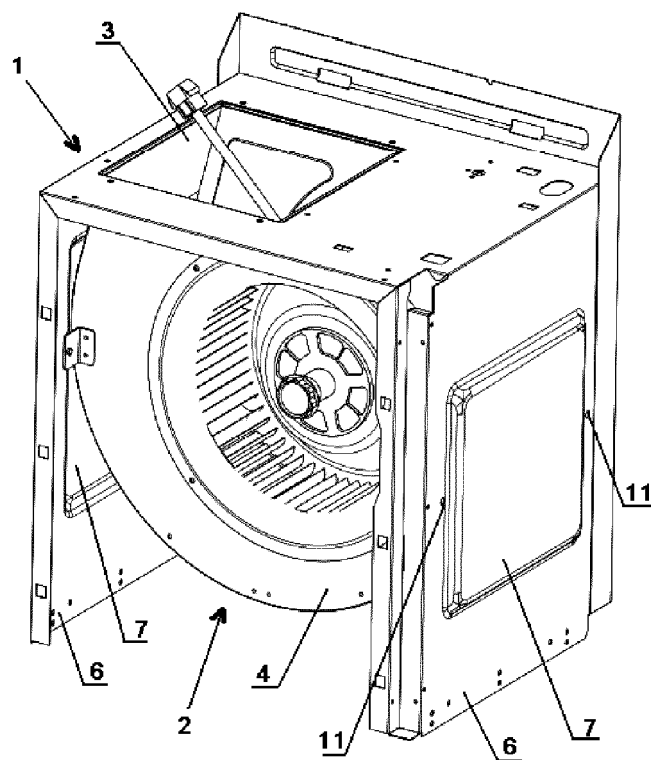


FIG. 4

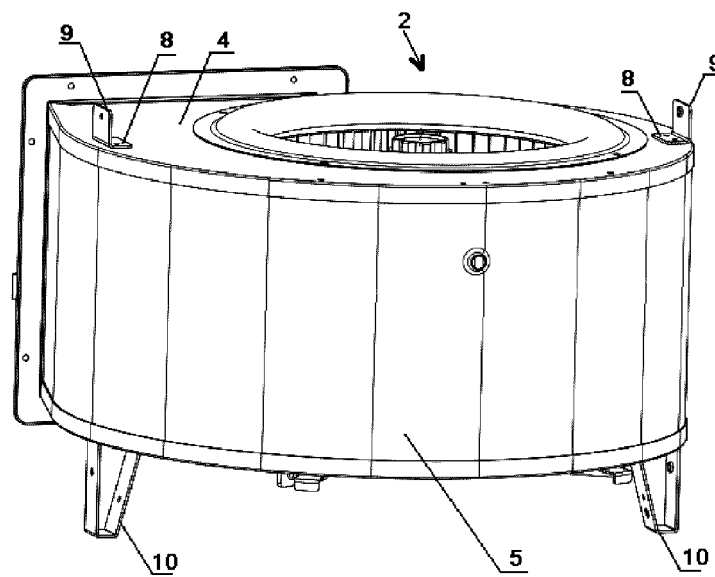


FIG. 5



EUROPEAN SEARCH REPORT

Application Number
EP 12 15 6175

DOCUMENTS CONSIDERED TO BE RELEVANT			
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			TECHNICAL FIELDS SEARCHED (IPC)
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The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 13 July 2012	Examiner Adant, Vincent
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 12 15 6175

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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