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(71) Applicant: **Fime - S.p.A.**
60022 Castelfidardo (AN) (IT)

(72) Inventor: **Casoli, Francesco**
60044 Fabriano
(Ancona) (IT)

(74) Representative: **Crippa, Paolo Ernesto et al**
Jacobacci & Partners S.p.A.
Via Senato 8
20121 Milano (IT)

(54) HOUSING FOR A RADIAL BLOWER

(57) A housing (1) for a radial blower comprises at least two half-shells (2, 3) being connected to each other by means of connecting means and means for tightly sealing housing (1) along a connecting line (4) of the two half-shells (2, 3), wherein the two half-shells (2, 3) are made of plastic material and the connecting means comprise a welding (5) which extends along said connecting line (4) such as to connect and seal the two half-shells (2, 3) along connecting line (4).

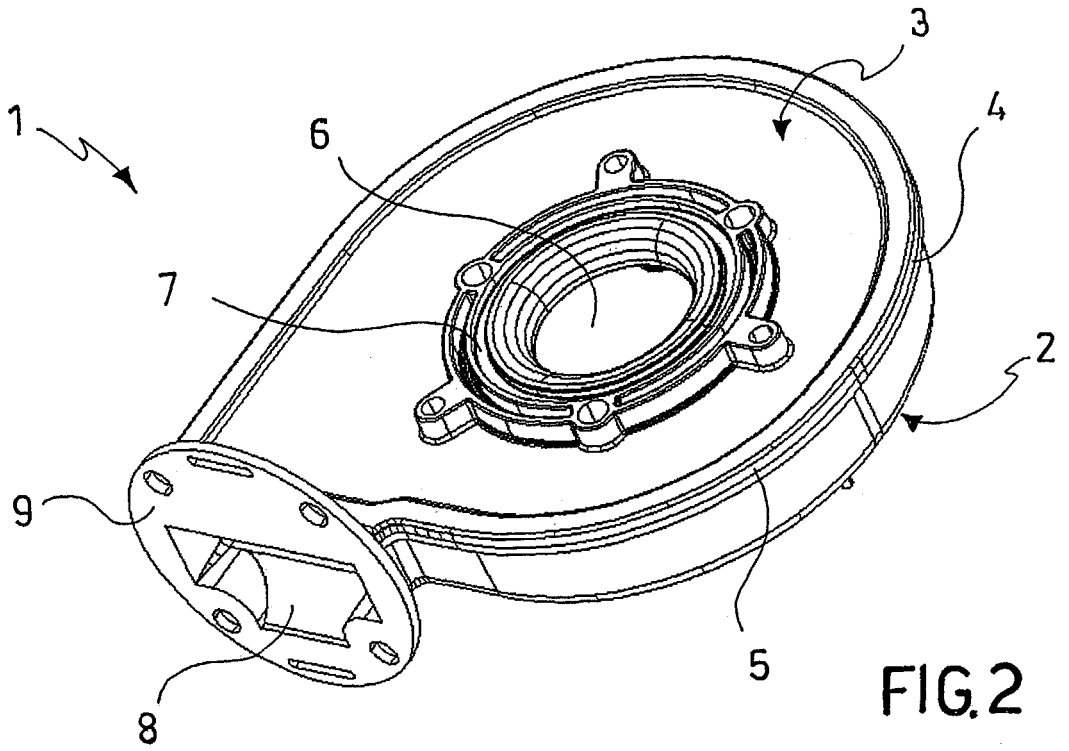

FIG.2

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Description

[0001] The present invention relates to a housing for a radial blower.

[0002] Among other things, radial blowers are employed for conveying and drawing in the air, gas and flue gas to boilers and heating and air-conditioning systems.

[0003] Radial blowers mainly comprise an impeller or fan being rotatably arranged within a suitably shaped housing, also said volute or scroll of the blower. Typically, the housing has a substantially toroidal shape with two sidewalls and one peripheral wall. In one of the two sidewalls there is provided an inlet aperture in a radially inner position but not necessarily in the centre of the housing. A substantial portion tangential to an outlet aperture is provided in the peripheral wall.

[0004] The impeller may rotate due to an electric motor being associated to the opposite sidewall of the inlet aperture, in which either the motor rotor or a propeller shaft extends through a suitable hole located in the sidewall from outside the housing to the inside thereof, where it is connected to the impeller in a rotatably integral manner.

[0005] The prior art volutes are manufactured as two separate pieces or half-shells in metallic material, for example aluminium, which are then screw assembled by interposing either an elastic or elastomeric gasket in order to provide a hermetic seal housing around the impeller.

[0006] This known solution requires a forming with close tolerance of the two half-shells as well as a very accurate assembling in order to avoid any misplacements of the gasket. In fact, if the elastic gasket is not properly positioned inside the housing thereof and the two half-shells are not exactly complementary to each other some leakage of the gas conveyed may occur.

[0007] Given that the conveyed gas and gas mixtures are often harmful or explosive, a leakage thereof might cause serious damages to the people and surrounding systems.

[0008] Furthermore, the rotation of the motor rotor and the impeller gives rise to vibrations which in turn may cause the loosening of the screws connecting the two half-shells of the housing, thus compromising the seal thereof.

[0009] Therefore, the object of the present invention is to provide a housing for radial blowers, having such characteristics as to overcome the mentioned problems with reference to the prior art.

[0010] This object is achieved by means of a housing for a radial blower, comprising at least two half-shells being connected to each other by means of connecting means and means for tightly sealing the housing along a connecting line of the two half-shells,

[0011] wherein the two half-shells are made of plastic material and the connecting means comprise a welding (5) which extends along said connecting line such as to connect and seal the two half-shells along the connecting line.

[0012] In order to better understand the invention and appreciate the advantages thereof, some exemplary nonlimiting embodiments thereof are described herein below, with reference to the annexed drawings, in which:

[0013] figure 1 is a perspective view of one embodiment of the housing according to the invention;

[0014] figure 2 is a further perspective view of the housing from figure 1;

[0015] figure 3 is a perspective view of an outer side of a half-shell of the housing from figures 1 and 2;

[0016] figure 4 is a perspective view of an inner side of the half-shell of the housing from figures 1 and 2;

[0017] figure 5 is a perspective view of an inner side of a second half-shell of the housing from figures 1 and 2.

[0018] With reference to the figures, a housing 1 for a radial blower has been generally indicated with reference 1.

[0019] The housing 1 comprises at least two half-shells 2, 3 being connected to each other by means of connecting means and means for tightly sealing the housing 1 along a connecting line 4 of the two half-shells 2, 3.

[0020] The two half-shells 2, 3 of housing 1 are manufactured, for example by means of injection moulding, in weldable plastic material, preferably heat sealable, and are connected to each other by means of a welding 5 which extends along said connecting line 4. Welding 5 has the double function of connecting and sealing the two half-shells 2, 3 along connecting line 4.

[0021] Thanks to the plastic material of the half-shells and their connection by means of welding, the interposition of a gasket between the half-shells can be wholly overcome. In fact, the base material of the two half-shells 2, 3 being made of plastic is locally melted while welding along connecting line 4, thus providing a close connection of the two half-shells with continuity of material. In this manner, possible dimensional and form tolerance of the two half-shells may be also easy to compensate.

[0022] In accordance with an embodiment, welding 5 is a ultrasonic welding. After the impeller has been inserted (not shown in figures), the two half-shells 2, 3 are approached to one another along connecting line 4 and a ultrasonic generator is guided along this connecting line. Due to the ultrasonic power, the plastic material of the two half-shells is heated and locally melted at the connecting line 4, and said welding 5 is then achieved.

[0023] In accordance with a further embodiment, welding 5 is a vibration welding, particularly a linear vibration welding. After the impeller has been inserted (not shown in figures), the two half-shells 2, 3 are approached to one another along connecting line 4 and caused to vibrate relative to each other. The vibration kinetic energy is then converted, by means of friction along connecting line 4, into heat which locally melts the plastic material of half-shells 2, 3 at the connecting line 4, and welding 5 is then achieved.

[0024] Advantageously, the plastic material of half-shells 2, 3 is a polymer being provided with an electroconductive additive, such as a coal dust charge, such as

to make the housing electrostatically dissipative. This is particularly significant in order to avoid the accumulation of electrostatic charge which may discharge by means of sparks.

[0025] The lack of sparks qualifies a blower having a housing 1 for example for conveying inflammable or explosive gases as well as for applications near sensitive electrical or electronic devices.

[0026] Advantageously, the half-shell material is further reinforced by means of fibres, such as fibreglass or other filler. This allows a polymer being less break-resistant and deformationresistant but with excellent seal characteristics to be used, without affecting the weight and thickness of the walls of housing 1.

[0027] In accordance with an embodiment, an inlet aperture 6 being formed in one of the two half-shells 2, 3 is provided with a housing 7 in order to accommodate either an elastic or elastomeric gasket (not shown in figures). Advantageously, the gasket and the corresponding half-shell 3 thereof are joined together by means of over-moulding or comoulding.

[0028] This overcomes the drawback of having to assemble a large number of single pieces while mounting the radial blower for example in a boiler.

[0029] According to a further embodiment, an outlet aperture 8 being formed in one of the two half-shells is also provided with a housing 9 in order to accommodate either an elastic or elastomeric gasket (not shown in figures). Advantageously, this second gasket and the corresponding half-shell 2 thereof are also joined together by means of over-moulding or comoulding.

[0030] One of the two half-shells 2, 3 comprises a plurality of fastening posts 10, preferably three posts being provided by means of injection moulding as one piece with said half-shell 2. Each fastening post 10 is provided with a base portion 11, and an end 12 protruding therefrom has a diameter lower than the diameter of the base portion 11. The end 12 is plastically deformable, for example by means of ultrasonic striking such as to form a rivet head suitable to connect a motor (not shown in figures) to housing 1. The motor comprises for example either a motor cap or a motor housing having three slotted connecting holes which can be inserted from over the ends 12 of the fastening posts 10 and then laid on the base portions 11 thereof. Then, ends 12 may be deformed by means of ultrasonic striking in order to obtain the above mentioned rivet heads which make the connection substantially irreversible between the housing and the motor.

[0031] Advantageously, in a blower provided with the housing described until now, the impeller is also made of plastic material and, preferably, reinforced by means of fibres or other filler.

[0032] The housing and the blower according to the present invention have several advantages. They enable a reduction in the number of single pieces to be assembled and have a better seal and a lower weight under the same resistance. Furthermore, the need to accurately interpose a separate gasket between the two half-shells before they are connected to one another being overcome, the invention allows the manufacture of the radial blower to be automated.

Claims

1. A housing (1) for a radial blower, comprising at least two half-shells (2, 3) being connected to each other by means of connecting means and means for tightly sealing the housing (1) along a connecting line (4) of the two half-shells (2, 3),
characterized in that the two half-shells (2, 3) are made of plastic material and the connecting means comprise a welding (5) which extends along said connecting line (4) such as to connect and seal the two half-shells (2, 3) along the connecting line (4).

2. The housing (1) according to claim 1, wherein said welding (5) is a ultrasonic welding.

3. The housing (1) according to claim 1, wherein said welding (5) is a vibration welding.

4. The housing (1) according to any preceding claim, wherein said housing (1) is made of a polymeric material being provided with an electro-conductive additive, such as to make the housing (1) electrostatically dissipative.

5. The housing (1) according to the preceding claim, wherein said electro-conductive additive is coal dust being mixed in the polymer blend of half-shells (2, 3).

6. The housing (1) according to any preceding claim, wherein the plastic material of half-shells (2, 3) is reinforced by means of fibres.

7. The housing (1) according to the preceding claim, wherein said fibres are fibreglass.

8. The housing (1) according to any preceding claim, comprising an inlet aperture (6) being formed in one (3) of the two half-shells (2, 3) and provided with either an elastic or elastomeric gasket, wherein said gasket and said half-shell (3) are joined together by means of comoulding.

9. The housing (1) according to any preceding claim, comprising an outlet aperture (8) being formed in one (2) of the two half-shells (2, 3) and provided with either an elastic or elastomeric gasket, wherein said gasket and said half-shell (2) are joined together by means of comoulding.

10. The housing (1) according to any preceding claim, wherein one (2) of half-shells (2, 3) comprises a plu-

rality of fastening posts (10) being provided by means of injection moulding as one piece with said half-shell (2), said fastening posts (10) having a plastically deformable end (12) in order to allow a motor to be connected to housing (1).

11. A radial blower comprising:

- the housing (1) according to any preceding claim;
- an impeller being rotatably accommodated within housing (1);
- a motor being connected to housing (1) and the impeller such as to be able to cause the impeller to rotate relative to housing (1).

12. The radial blower according to the preceding claim, wherein the motor is fastened to one (2) of the two half-shells (2, 3) by means of ultrasonic striking of fastening posts (10) being provided as one piece with said half-shell (2).

13. The blower according to one of claims 11 or 12, wherein said impeller is made of plastic material being reinforced by means of fibres.

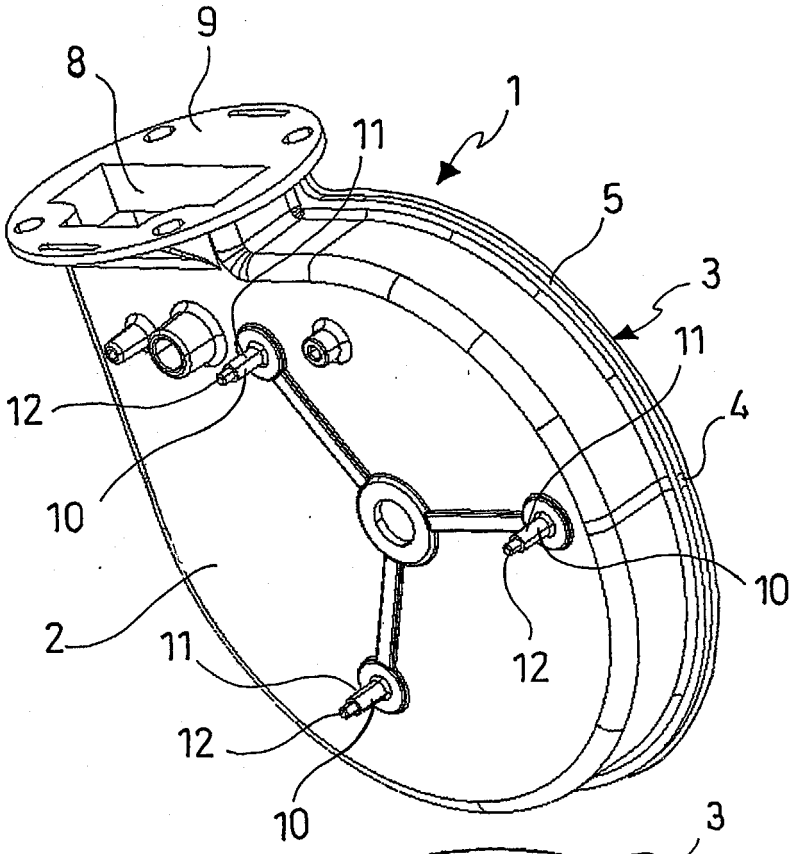

FIG.1

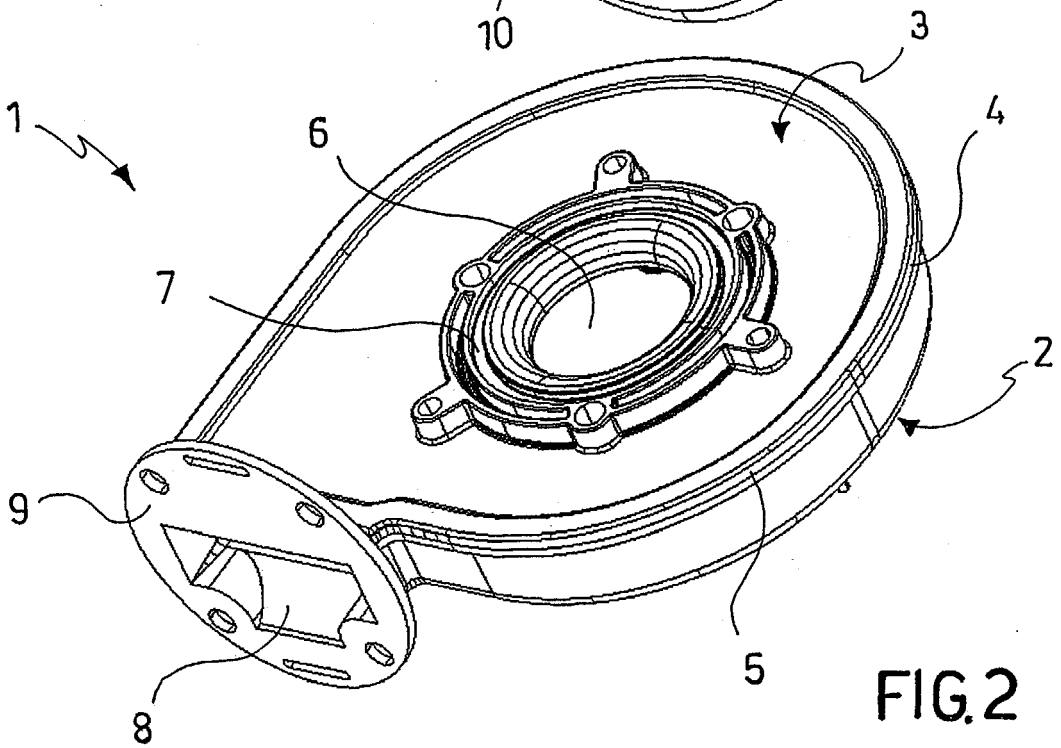

FIG.2

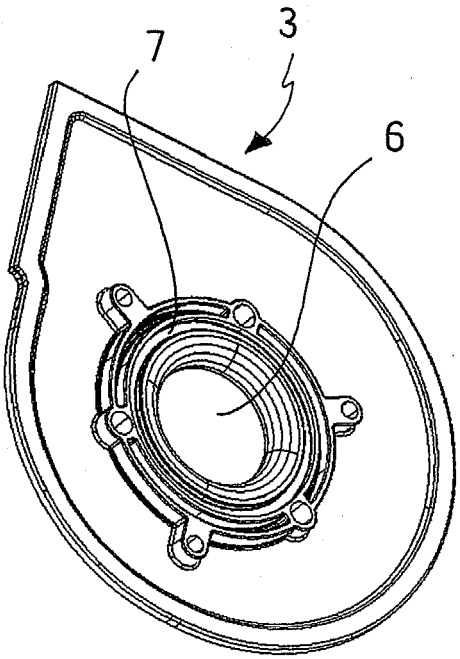

FIG. 3

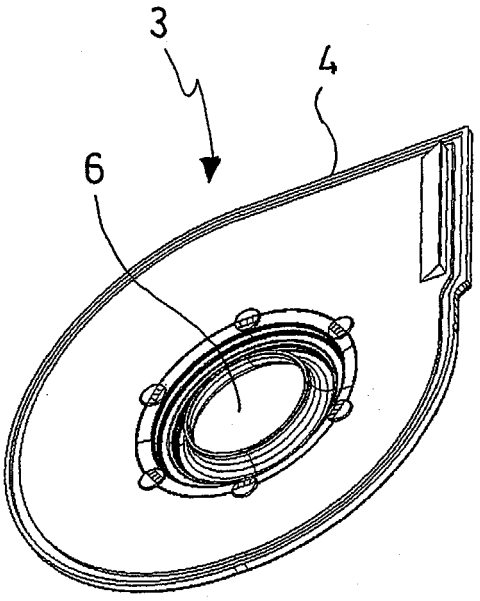

FIG. 4

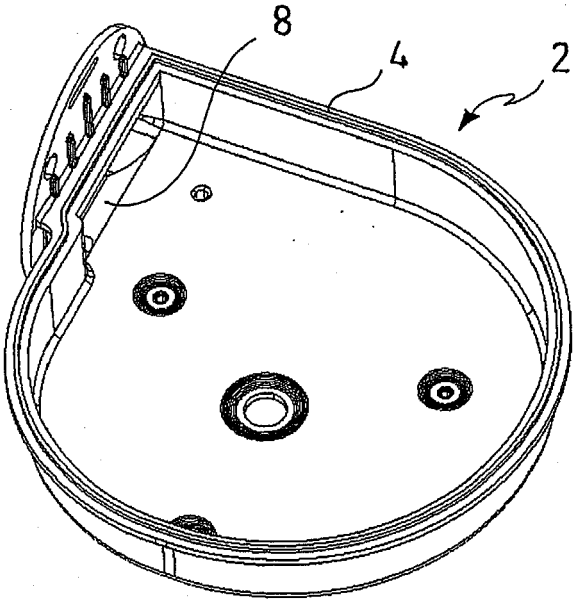

FIG. 5

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EUROPEAN SEARCH REPORT

Application Number
EP 05 42 5061

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TECHNICAL FIELDS SEARCHED (Int.Cl.7)

F04D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	12 July 2005	Teerling, J

CATEGORY OF CITED DOCUMENTS

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82