(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 403 007 A1**

(12) EUROPEAN PATENT APPLICATION

(21) Application number: **90201492.7**

(51) Int. Cl.5: **F04D 29/42, F04D 29/62**

(22) Date of filing: **09.06.90**

(30) Priority: **13.06.89 IT 2122989 U**

(43) Date of publication of application:
19.12.90 Bulletin 90/51

(84) Designated Contracting States:
AT BE CH DE DK ES FR GB GR IT LI LU NL SE

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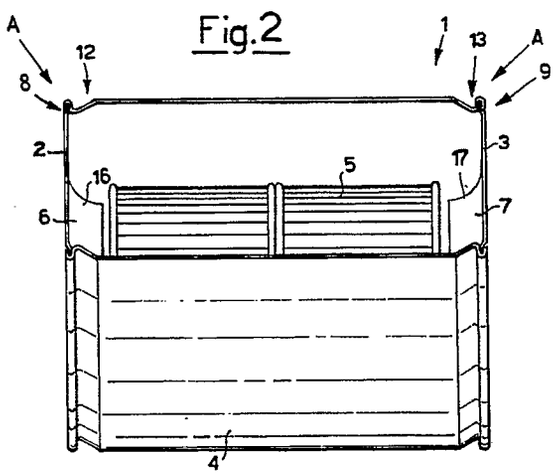
(54) Volute for motor-driven fans.

(57) The present invention relates to a volute (1) for motor-driven fans, which volute comprises a first side panel (2) and a second side panel (3), a curved band (4) interposed between said side panels and an impeller (5). The side panels (2, 3) are specularly identical to each other and are united with the curved band (4) by means of a respective forced joint; said side panels are provided with openings (6, 7), whose diameter is shorter than the outer diameter of the impeller (5).

Fig.2



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VOLUTE FOR MOTOR-DRIVEN FANS

The present invention relates to a volute for motor-driven fans.

The volutes for motor-driven fans known from the prior art, and in particular the industrial type of such volutes, comprise a first side panel and a second side panel and a curved band interposed between said side panels, and an impeller.

The first side panel and the second side panel are respectively provided with a first opening and with a second opening acting as the inlet ways for the air which is laterally intaken and is subsequently frontally expelled from the volute.

The first side panel and the second side panel are respctively provided with a first perimetrical step and with a second perimetrical step, and the curved band is provided with a first side edge and a second side edge, respectively provided with a first peripheral groove and with a second peripheral groove.

The first step and the second step are coupled by means of a respective forced fit inside the interior of said first peripheral groove and said second peripheral groove in order to generate the volute. The first opening and the second opening have various shapes and sizes.

In fact, the second opening has a larger diameter, so as to make it possible the impeller to be mounted inside the volute.

For the purposes of a correctly respecting the laws which govern air motion, and for the purpose of constraining the impeller, the second opening is then partially closed by means of a mouth piece, so that when said mouth piece is mounted the first opening and the second opening have eventually a same diameter.

The mouth piece is fastened onto the second side panel by means of some screws arranged alongside the larger-size circumferential edge of said mouth piece.

Such a traditional structure, although is at all satisfactory from a functional view point, is however constituted by a plurality of pieces which increase the end cost thereof.

Furthermore, to the mouth piece care and attention have to be paid both during the step of production thereof by punching, and during its assembling step in order to prevent any noises generated by the vibrations it undergoes during volute operation.

Unfortunately, the past experience demonstrated that such vibrations cannot anyway be prevented any longer after the volute has been operating for a certain number of hours, owing to phenomena of wear which unbalance the revolving masses.

The purpose of the instant finding is of providing a volute which is capable of obviating the above drawbacks, and more precisely:

(a) of reducing the manufacturing costs of the whole unit constituted by the volute and the impeller;

(b) of providing a more functional and reliable structure, with the noises due to the vibrations of the mouth piece being eliminated.

Such purposes are achieved by a volute for motor-driven fans, which volute comprises a first side panel and a second side panel, a curved band interposed between said side panels and an impeller, with said first side panel and said second side panel being respectively provided with a first opening and a second opening acting as the intake ways for air sucked by the volute, and with a first peripheral edge and a second peripheral edge respectively provided with a first step and a second step, with said curved band having a first side edge and a second side edge respectively provided with a first peripheral groove and a second peripheral groove, with said first step and said second step being respectively connected by means of a forced fit inside the interior of said first peripheral groove and of said second peripheral groove in order to generate the volute, which volute is characterized in that said first side panel and said second side panel are specularly identical to each other and that the respective openings acting as the inlet ways for the intaken air have a diameter smaller than the outer diameter of the impeller, with said impeller being assembled inside the interior of the volute before said first step and said second step are connected by means of respective forced fits inside the interior of said first peripheral groove and of said second peripheral groove.

By making the first side panel and the second side panel specularly identical to each other to each other, a drastic decrease in production costs is attained, in that:

- one single die can be easily adapted so as to be able to produce both of said side panels;
- neither the mouth piece, nor the threaded bores for fastening it have to be produced any longer;
- when the volute is assembled, the step of fastening of the mouth piece by means of screws is no longer necessary.

Anyway, the manufacturer has to remember that the impeller has to be introduced into the interior of the volute before the forced joints which constrain the edges of the side panels inside the grooves of the curved band are produced.

The present invention is illustrated for merely exemplifying, non-limitative purposes, in the hereto

attached drawing tables, wherein:

Figure 1 shows a perspective view of a volute according to the present invention, without the impeller, for a better understanding.

Figure 2 shows a view of the volute complete with the impeller, according to the arrow "F" of Figure 1;

Figure 3 shows a side view of the first side panel;

Figure 4 shows a sectional view according to path IV-IV of Figure 3;

Figure 5 shows a side view of the curved band; and

Figure 6 shows a magnified view of the details indicated by the characters "A" in Figure 2.

Referring to the above mentioned figures, the volute according to the present invention, generally indicated by the reference numeral 1, comprises a first side panel 2 and a second side panel 3, a curved band 4 interposed between said side panels and an impeller 5. Said first side panel 2 and said second side panel 3 are respectively provided with a first opening 6 and a second opening 7 acting as the intake ways for air sucked by the volute 1, and with a first peripheral edge 8 and a second peripheral edge 9 respectively provided with a first step and a second step 11.

The curved band has a first side edge 12 and a second side edge 13 respectively provided with a first peripheral groove 14 and a second peripheral groove 15.

Said first side panel 2 and said second side panel 3 are specularly identical to each other and the respective openings 6 and 7 acting as the inlet ways for the intaken air have a diameter smaller than the outer diameter of the impeller 5; they are furthermore provided with a first annular invitation 16 and a second annular invitation 17, suitable for improving the characteristics of respect of the laws which govern air motion of the same openings 6 and 7.

For the assemblage of the volute 1, it is enough to just respectively couple by means of a forced fit the first step 10 and the second step 11 into the interior of said first peripheral groove 14 and of second peripheral groove 15 after previously inserting the impeller 5 into the interior of the structure which is being assembled.

Claims

1. Volute (1) for motor-driven fans, which volute comprises a first side panel (2) and a second side panel (3), a curved band (4) interposed between said side panels and an impeller (5), with said first side panel (2) and said second side panel (3) being respectively provided with a first opening (6) and a second opening (7) acting as the intake ways for the air sucked by the volute (1), and with a first peripheral edge (8) and a second peripheral edge (9) respectively provided with a first step (10) and a second step (11), with said curved band (4) having a first side edge (12) and a second side edge (13) respectively provided with a first peripheral groove (14) and a second peripheral groove (15), with said first step (10) and said second step (11) being respectively coupled by means of a forced fit inside the interior of said first peripheral groove (14) and of said second peripheral groove (15) in order to generate the volute (1), which volute is characterized in that said first side panel (2) and said second side panel (3) are specularly identical to each other and that the respective openings (6-7) acting as the inlet ways for the intaken air have a diameter smaller than the outer diameter of the impeller (5), with said impeller (5) being assembled inside the interior of the volute (1) before said first step (10) and said second step (11) are respectively coupled by means of forced fits inside the interior of said first peripheral groove (14) and of said second peripheral groove (15).

Fig.1

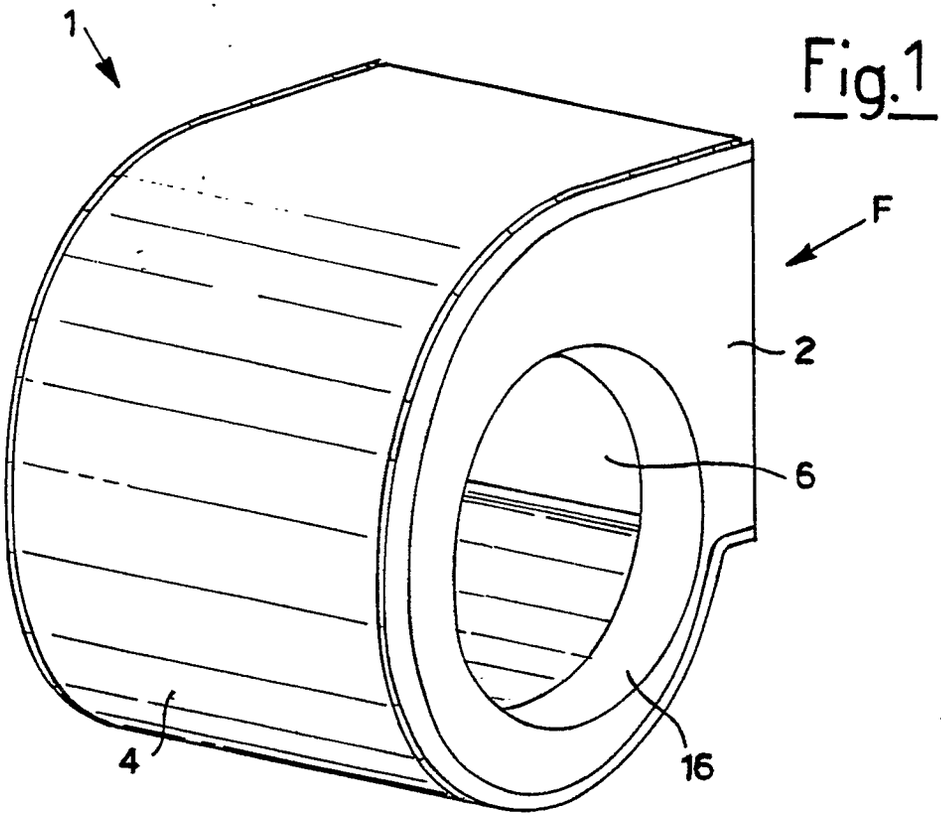


Fig.2

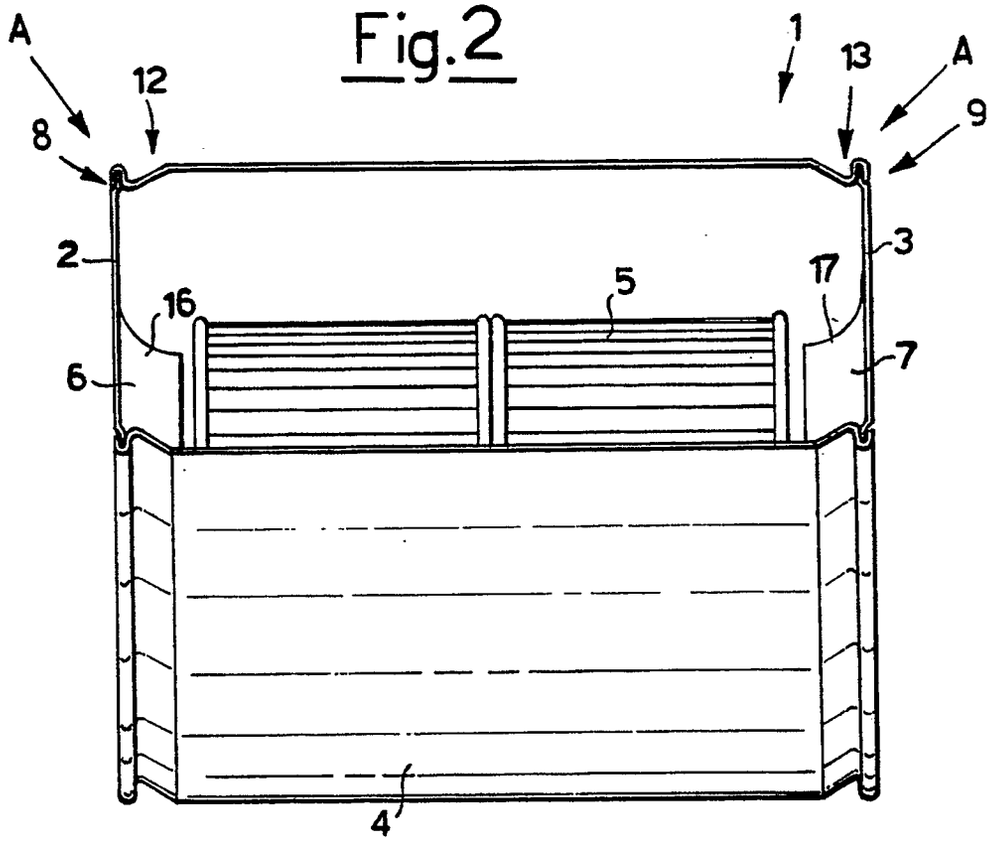


Fig.3

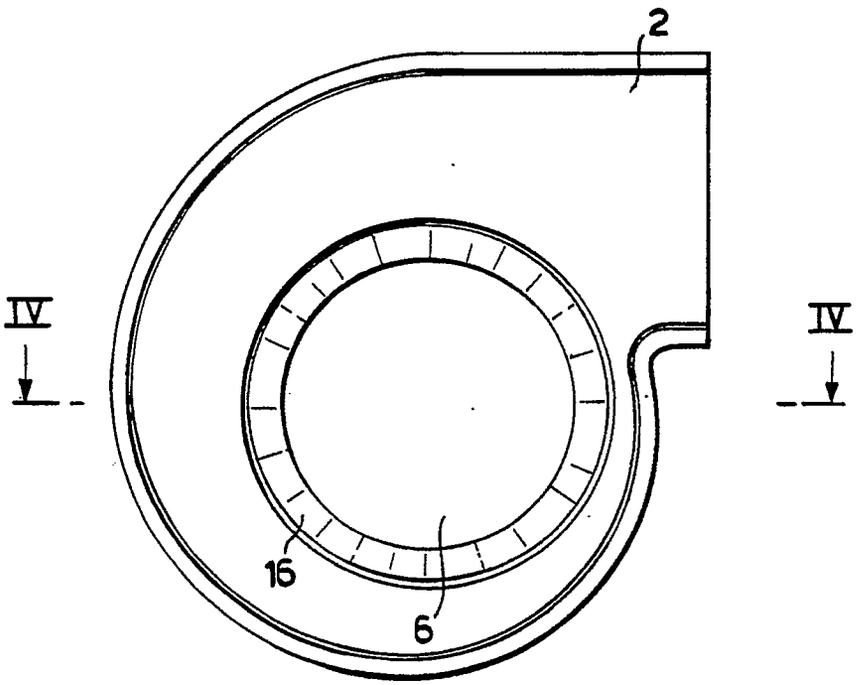


Fig.4

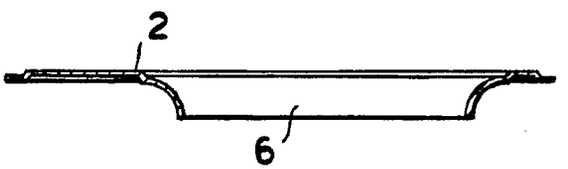


Fig.5

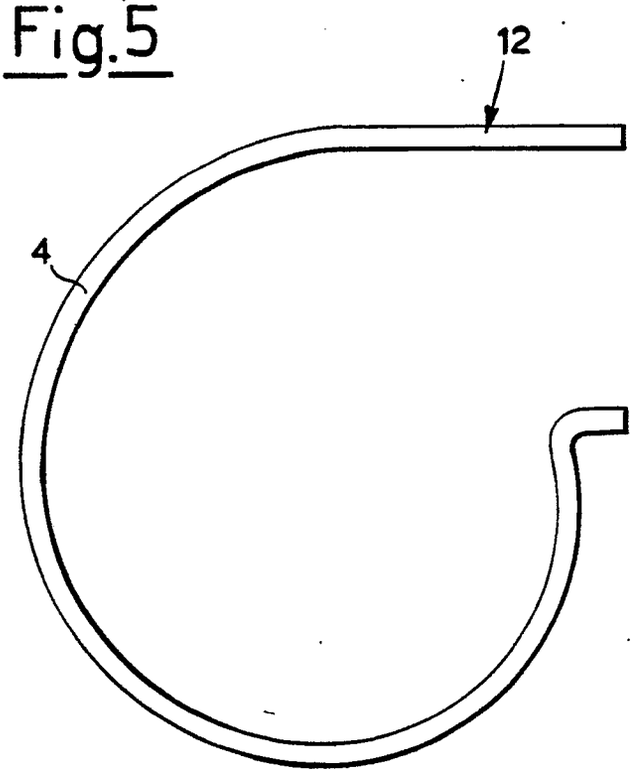
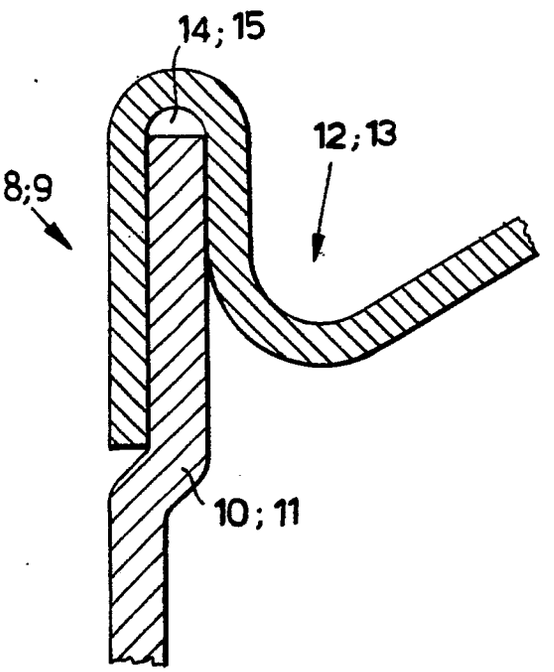


Fig.6



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EUROPEAN SEARCH REPORT

Application Number

EP 90 20 1492

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
A	EP-A-0289735 (FISCHBACH) * page 1, column 2, line 32 - page 3, column 4, line 16; figures 1-3 *	1	F04D29/42 F04D29/62
A	US-A-1609545 (HANF) * the whole document *	1	
A	US-A-3653116 (LOV) * column 1, line 47 - column 2, line 5; figures 1-5a *	1	
A	FR-A-2105109 (TORIN) * page 4, line 18 - page 10, line 7; figures 1-6 *	1	
A	US-A-3743439 (CANN) * the whole document *	1	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

F04D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	06 SEPTEMBER 1990	TEERLING J.H.

CATEGORY OF CITED DOCUMENTS

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