



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11) **EP 0 846 868 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
03.02.1999 Bulletin 1999/05

(51) Int. Cl.⁶: **F04D 29/42**, F04D 29/28

(43) Date of publication A2:
10.06.1998 Bulletin 1998/24

(21) Application number: **97203477.1**

(22) Date of filing: **10.11.1997**

(84) Designated Contracting States:
**AT BE CH DE DK ES FI FR GB GR IE IT LI LU MC
NL PT SE**
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **05.12.1996 US 760771**

(71) Applicant:
**GENERAL MOTORS CORPORATION
Detroit Michigan 48202 (US)**

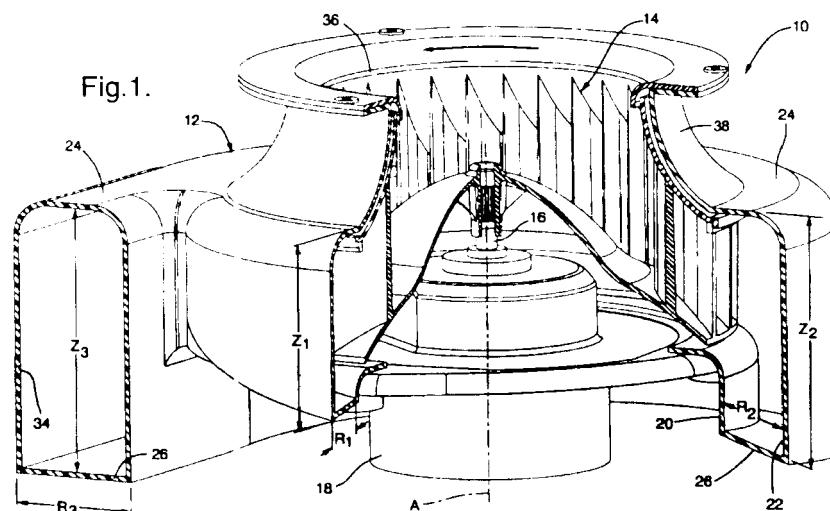
(72) Inventors:
• **Parisi, Mark Joseph**
East Amherst, New York 14051 (US)
• **Vetter, Stephan Michael**
Lockport, New York 14094 (US)

(74) Representative:
Denton, Michael John et al
Delphi Automotive Systems
Centre Technique Paris
117 avenue des Nations
B.P. 60059
95972 Roissy Charles de Gaulle Cedex (FR)

(54) **Centrifugal blower assembly**

(57) A centrifugal blower assembly (10) includes a volute housing (12) of the axially asymmetrically expanding type, with an upper end wall (24) flattened off for ease of installation and a spiraling lower end wall (26) and tangential outlet (34) that are consequently both downwardly axially displaced relative to the flat end wall (24) and the cylindrical air inlet (28) into the housing (12). To counteract the flow inefficiency that normally results from the axial displacement of inlet (28) relative to outlet (34), the blower (12) is formed with a curved tip

ring (44) and correspondingly curved, axially opposed base rim (42) that shift axially downwardly from an air entrance (36) that is shifted axially above the flat end wall (24) and cylindrical inlet (28). Air drawn in through the entrance (36) by the blower (14) is thereby given a significant axially downward velocity component, which causes it to approach and better conform to the axially displaced end wall (26).



EP 0 846 868 A3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 97 20 3477

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.6)
A	US 4 890 598 A (KINSWORTHY) 2 January 1990 * column 2, line 46 - line 68; figures 2,4,5 *	1	F04D29/42 F04D29/28
A	DE 91 16 263 U (KOHL) 23 July 1992 * figures 1,2 *	1	
A	EP 0 444 551 A (ADAM OPEL) 4 September 1991 * page 2, column 2, line 25 - line 58; figures 1-4 *	1	
A	US 3 584 968 A (KEITH) 15 June 1971 * column 2, line 29 - line 40; figure 2 *	1,2	
A	US 3 829 250 A (SAMSON) 13 August 1974 * column 1, line 35 - column 3, line 17; figure 1 *	1-3	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			F04D
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		11 December 1998	Teerling, J
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			

EPO FORM 1503 03.82 (P04C01)

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

EP 97 20 3477

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
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

11-12-1998

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 4890598	A	02-01-1990	NONE	
DE 9116263	U	23-07-1992	DE 4141590 A	24-06-1993
EP 444551	A	04-09-1991	DE 4006373 A	05-09-1991
			DE 9007696 U	05-05-1994
US 3584968	A	15-06-1971	NONE	
US 3829250	A	13-08-1974	DE 2229328 A	05-04-1973
			FR 2154134 A	04-05-1973
			GB 1383420 A	12-02-1974
			JP 48049006 A	11-07-1973
			SE 383389 B	08-03-1976