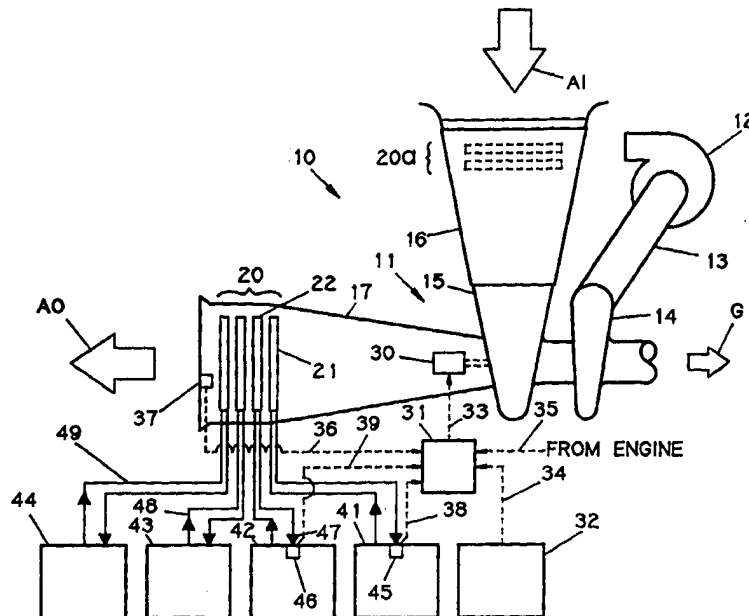




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<p>(21) International Application Number: PCT/US97/16666 (22) International Filing Date: 11 September 1997 (11.09.97) (30) Priority Data: 08/713,112 16 September 1996 (16.09.96) US (71) Applicant: TURBODYNE SYSTEMS, INC. [US/US]; 6155 Carpinteria Avenue, Carpinteria, CA 93010 (US). (72) Inventors: HALIMI, Edward, M.; 163 Hot Springs Road, Montecito, CA 93108 (US). WOOLLENWEBER, William, E.; 3169 Camino Del Arco, Carlsbad, CA 92009 (US). (74) Agents: BADGER, David, H. et al.; Brinks Hofer Gilson & Lione, Suite 2425, One Indiana Square, Indianapolis, IN 46204-2013 (US).</p>	<p>(81) Designated States: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> (88) Date of publication of the international search report: 28 May 1998 (28.05.98)</p>	

(54) Title: MOTOR-ASSISTED TURBO-COOLING SYSTEM FOR INTERNAL COMBUSTION ENGINES



(57) Abstract

An internal combustion engine cooling system (10) incorporating a motor-assisted turbofan is disclosed. The turbine-driven fan (11) is increased in rotational speed by energizing a motor (30) attached to the turbine fan shaft from an outside power source (32) to provide required cooling air flow. The cooling air system of the invention also includes a ducted fan (53) for supplying cooling air for one or more heat exchangers (20), and is controlled via inputs from an engine speed sensor (35) for providing a motor operating signal, a flow sensor (37) downstream of the heat exchangers for providing a motor operating signal, and temperature sensors located throughout the cooling circuits.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US97/16666

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :FOIP 5/08
US CL :60/597; 417/407

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 60/597, 599, 607, 608; 417/406, 407, 408, 409

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,121,605 A (ODA et al) 16 June 1992, see the entire document.	9
X	US 5,168,706 A (KAWAMURA) 08 December 1992, see the entire document.	9, 11
X	DE 3,539,782 A (BRUGGEMANN) 14 May 1987, see the entire document.	9, 11, 13
A	US 2,492,672 A (WOOD) 27 December 1949.	1-23
A	US 4,918,923 A (WOOLLENWEBER et al) 24 April 1990.	1-23
A	US 4,885,911 A (WOOLLENWEBER et al) 12 December 1989.	1-23

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Date of the actual completion of the international search 31 DECEMBER 1997	Date of mailing of the international search report 25 MAR 1998
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