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

(11) EP 1 193 388 A3

(12) EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
04.06.2003 Bulletin 2003/23

(43) Date of publication A2:
03.04.2002 Bulletin 2002/14

(21) Application number: **01123579.3**

(22) Date of filing: **01.10.2001**

(51) Int Cl.[7]: **F02M 25/07**, F02B 37/00

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

(30) Priority: **02.10.2000 JP 2000302759**

(71) Applicant: **TOYOTA JIDOSHA KABUSHIKI KAISHA**
Aichi-ken 471-8571 (JP)

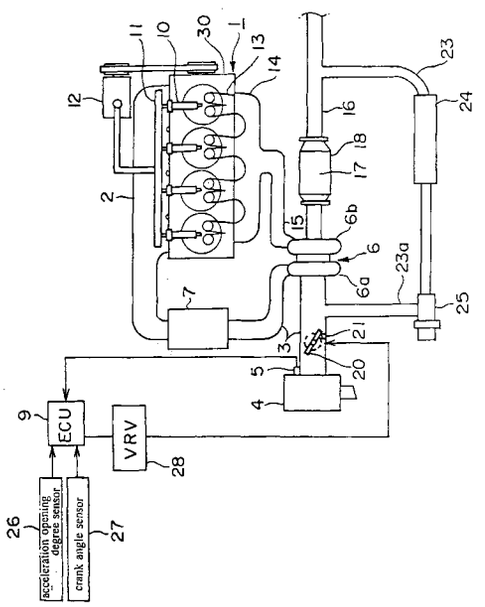
(72) Inventors:
- **Murata, Hiroki,**
  c/oToyota Jidosha Kabushiki Kaisha
  Toyota-shi, Aichi-ken, 471-8571 (JP)
- **Sasaki, Shizuo,**
  c/oToyota Jidosha Kabushiki Kaisha
  Toyota-shi, Aichi-ken, 471-8571 (JP)
- **Igarashi, Kohei, c/oToyota Jidosha K. K.**
  Toyota-shi, Aichi-ken, 471-8571 (JP)

(74) Representative:
Leson, Thomas Johannes Alois, Dipl.-Ing.
Tiedtke-Bühling-Kinne & Partner GbR,
TBK-Patent,
Bavariaring 4
80336 München (DE)

(54) Exhaust gas purifying apparatus for an internal combustion engine with a supercharger

(57) An exhaust gas purifying apparatus for an internal combustion engine with a turbocharger is provided with an introduction port for EGR gas disposed upstream of a compressor and a throttle valve disposed upstream of the introduction port, and comprised of a fail safe means that the portion on the upstream side of the compressor does not have any excessive negative pressure even if a malfunction occurs in the throttle valve. The exhaust gas purifying apparatus for an internal combustion engine with a turbocharger is provided with a supercharger (6) having a turbine (6b) disposed in an exhaust passage (16) and a compressor (6a) disposed in an intake passage (3) and having an exhaust gas recirculation system (23,24 and 25) for connecting the exhaust passage (16) downstream of the turbine (6b) and the intake passage (3) with each other and for recirculating a part of exhaust gas back to an intake system of the internal combustion engine, wherein an introduction port for recirculating the part of the exhaust gas and a throttle valve (20) for opening/closing the intake passage (3) as desired are arranged in this order. A fail safe unit (21) for allowing a predetermined flow rate of intake air to flow to the compressor (6a) and giving a load, when the throttle valve (20) is fully closed, is provided in the intake passage (3) upstream of the compressor (6a).

FIG.1



EP 1 193 388 A3

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 01 12 3579

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.7)
Y	EP 0 987 419 A (TOYOTA MOTOR CO LTD) 22 March 2000 (2000-03-22) * column 5, line 1 - column 6, line 37; figure 1 *	1-3	F02M25/07 F02B37/00
Y	DE 199 25 202 A (TOYOTA MOTOR CO LTD ;AISAN IND (JP)) 16 December 1999 (1999-12-16) * column 4, line 39 - column 7, line 62; figures 1-4 *	1-3	
Y	WO 00 28203 A (STT HOLDING AB ;BLOMQVIST MICAEL (SE); ERIKSSON INGEMAR (SE)) 18 May 2000 (2000-05-18) * page 4, line 18 - page 7, line 23; figures 1-4 *	1	
Y	US 5 003 957 A (TAKEDA TOSHIO) 2 April 1991 (1991-04-02) * column 3, line 23 - column 4, line 19; figures 2,3 *	1	
A	US 4 246 752 A (TRYON DEAN G) 27 January 1981 (1981-01-27) * column 2, line 17 - column 2, line 56; figure *	2,3	TECHNICAL FIELDS SEARCHED (Int.Cl.7) F02D F02M F02B
A	GB 2 043 771 A (ROTOR MASTER INC) 8 October 1980 (1980-10-08) * page 2, line 74 - page 3, line 113; figure 1 *	2,3	
A	US 5 458 855 A (GILLBRAND PER) 17 October 1995 (1995-10-17) * column 4, line 20 - column 7, line 6; figure 1 *	1,9,10	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
MUNICH	25 March 2003	Marsano, F

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 01 12 3579

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.

25-03-2003

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0987419 A	22-03-2000	JP 2000097072 A	04-04-2000
		JP 2000097078 A	04-04-2000
		JP 2000145547 A	26-05-2000
		JP 2000145512 A	26-05-2000
		EP 0987419 A2	22-03-2000
		US 6240721 B1	05-06-2001
DE 19925202 A	16-12-1999	JP 11350981 A	21-12-1999
		DE 19925202 A1	16-12-1999
		US 6164623 A	26-12-2000
WO 0028203 A	18-05-2000	AU 754789 B2	28-11-2002
		AU 1591700 A	29-05-2000
		BR 9915167 A	14-08-2001
		CA 2347874 A1	18-05-2000
		CN 1332828 T	23-01-2002
		EP 1129281 A1	05-09-2001
		JP 2002529653 T	10-09-2002
		PL 347572 A1	08-04-2002
		SE 9803827 A	10-05-2000
		SE 9804240 A	10-05-2000
		WO 0028203 A1	18-05-2000
		TR 200101301 T2	21-11-2001
US 5003957 A	02-04-1991	JP 1216022 A	30-08-1989
US 4246752 A	27-01-1981	NONE	
GB 2043771 A	08-10-1980	BR 7903891 A	16-12-1980
		DE 2918916 A1	04-09-1980
		FR 2449837 A1	19-09-1980
		JP 55114843 A	04-09-1980
US 5458855 A	17-10-1995	SE 468524 B	01-02-1993
		DE 69204839 D1	19-10-1995
		DE 69204839 T2	15-05-1996
		EP 0593622 A1	27-04-1994
		JP 7500159 T	05-01-1995
		SE 9102132 A	09-01-1993
		WO 9301400 A1	21-01-1993

EPO FORM P0459

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