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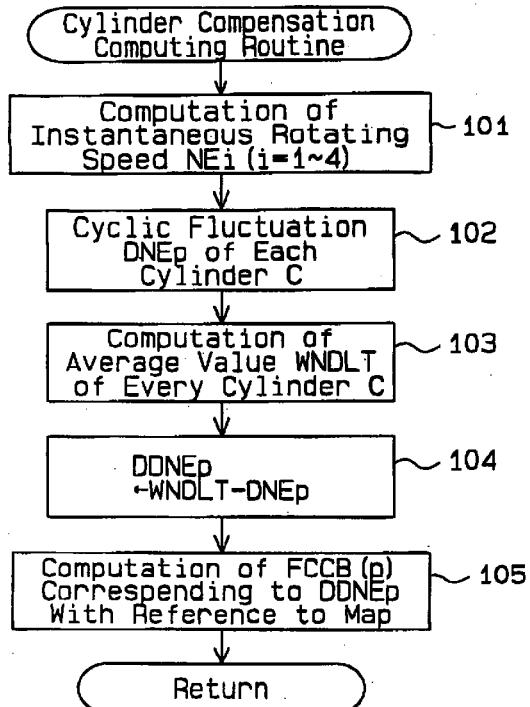
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(54) Apparatus for determining malfunctioning of fuel injection control system

(57) A system for detecting malfunctions in an apparatus for controlling a fuel injection mechanism of a diesel engine (2) provided with a plurality of cylinders (C) is disclosed. Each cylinder (C) accommodates a piston (42) for producing rotation of a crankshaft (40) and a nozzle (4) for performing fuel injection during each reciprocation cycle of the piston (42). Injection amount of the fuel is altered based on a compensation value computed for each cylinder (C) so as to minimize a value indicating cyclic rotating speed fluctuation of the crankshaft (40) produced by each cylinder (C). The system is characterized by memory means for storing an initial data indicative of the compensation value of each cylinder (C) computed during an initial injection stage of each nozzle (4), comparing means for comparing a malfunction judgement value with a magnitude obtained by computing the difference or ratio between an actual compensation value and the initial data, and determining means for determining the malfunctioning of the apparatus when the computed magnitude exceeds the predetermined range.

Fig. 3





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EUROPEAN SEARCH REPORT

Application Number

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Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim							
Y	EP 0 650 033 A (BOSCH GMBH ROBERT) 26 April 1995 * abstract * * column 4, line 1 - column 6, line 56 * * figures 1-3 * ---	1-4	F02D41/22 F02D41/14						
Y	US 4 688 535 A (KUETTNER THOMAS ET AL) 25 August 1987	1-4							
A	* abstract * * figures 1-3 * * claims 1-7 * ---	5,6							
A	PATENT ABSTRACTS OF JAPAN vol. 010, no. 176 (M-491), 20 June 1986 & JP 61 025947 A (NIPPON DENSO CO LTD), 5 February 1986 * abstract * ---	1,2							
A	US 5 213 081 A (FUJIMOTO TAKANORI) 25 May 1993 * abstract * * figures 1,3,4 * * column 1, line 25 - column 2, line 31 * * column 4, line 60 - column 6, line 68 * -----	1-4,6,7	TECHNICAL FIELDS SEARCHED (Int.Cl.6) F02D						
<p>The present search report has been drawn up for all claims</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;">Place of search</td> <td style="width: 33%;">Date of completion of the search</td> <td style="width: 34%;">Examiner</td> </tr> <tr> <td>THE HAGUE</td> <td>13 April 1999</td> <td>Trottereau, D</td> </tr> </table> <p>CATEGORY OF CITED DOCUMENTS</p> <p>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</p> <p>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</p>				Place of search	Date of completion of the search	Examiner	THE HAGUE	13 April 1999	Trottereau, D
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THE HAGUE	13 April 1999	Trottereau, D							

**ANNEX TO THE EUROPEAN SEARCH REPORT
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