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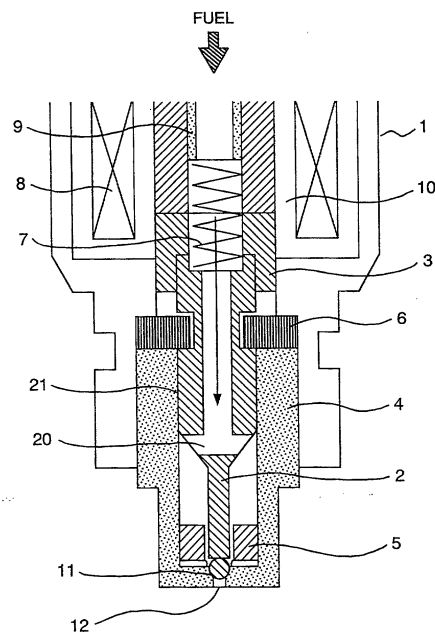
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(54) **Fuel injection valve**

(57) A damper is formed between the nozzle and the plunger (2) of the fuel injection valve (1). This suppresses the bouncing of the plunger (2) and consequently suppresses secondary injections. Further, this can suppress depositions of chemicals on the fuel injection valve (1), generation of soot at improper combustion of fuel, and combustion control errors.

FIG. 1





European Patent Office

PARTIAL EUROPEAN SEARCH REPORT

Application Number

which under Rule 45 of the European Patent Convention shall be considered, for the purposes of subsequent proceedings, as the European search report

EP 00 11 3005

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)
X	WO 89 10478 A (SIEMENS BENDIX AUTOMOTIVE ELEC) 2 November 1989 (1989-11-02) * the whole document *	2	F02M51/06 F02M61/16
X	US 5 288 025 A (CERNY MARK S) 22 February 1994 (1994-02-22) * the whole document *	2	
X	US 5 271 565 A (CERNY MARK S) 21 December 1993 (1993-12-21) * the whole document *	2	
X	US 5 012 981 A (HOLZGREFE VOLKER ET AL) 7 May 1991 (1991-05-07) * the whole document *	3	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			F02M
INCOMPLETE SEARCH			
<p>The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC to such an extent that a meaningful search into the state of the art cannot be carried out, or can only be carried out partially, for these claims.</p> <p>Claims searched completely :</p> <p>Claims searched incompletely :</p> <p>Claims not searched :</p> <p>Reason for the limitation of the search: see sheet C</p>			
Place of search		Date of completion of the search	Examiner
MUNICH		14 May 2003	Wagner, A
CATEGORY OF CITED DOCUMENTS		<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>	
<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>			

EPO FORM 1503 03/82 (P04/C07)



Claim(s) searched completely:

2, 3

Claim(s) not searched:

1, 4

Reason for the limitation of the search:

The application does not meet the requirements of Article 84 EPC, because claims 1 and 4 are not clear. An attempt is made to define an apparatus by reference to a result to be achieved.

The solution to the problem of the invention given in the last three lines of claim 1 attempts to define the invention by the result to be achieved, i.e. the underlying technical problem.

Claim 1 does not define any technical features which lead unambiguously to the technical effect "so that no fuel may come out through said fuel injection hole after said movable plunger presses against the seat surface".

The solution to the problem of the invention given in the last two lines of claim 4 attempts to define the invention by the result to be achieved, i.e. the underlying technical problem.

Claim 4 does not define any technical features which lead unambiguously to the technical effect "wherein the resisting force made when said movable plunger having a valve hits said seat surface is a function of the moving speed of the movable plunger".

The independent claim fail define the invention by all its essential technical features, in order to meet the requirements of Article 84 EPC in the sense of the Guidelines C-III 4.7.

This lack of clarity in the present case is such as to render a meaningful search over the whole of the claimed scope impossible. Consequently, the search has been carried out for those parts of the claims which appear to be clear, supported and disclosed, namely those parts relating to claims 2 and 3.

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

EP 00 11 3005

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.

14-05-2003

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