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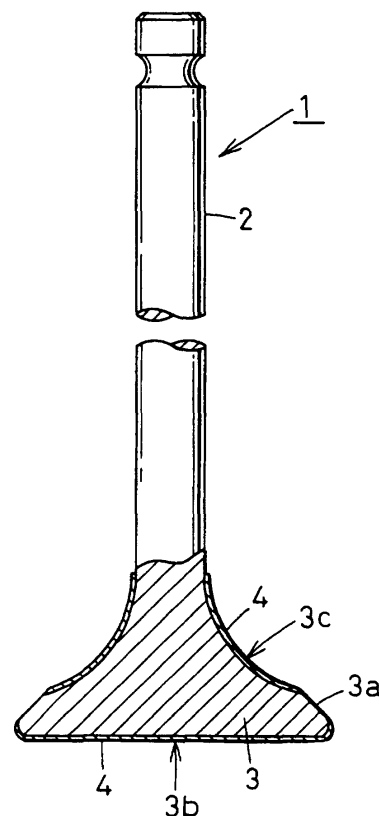
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(54) **Poppet valve**

(57) A poppet valve that comprises a valve head and a valve stem is used in an internal combustion engine. The valve head is covered with a heat-insulating film except a valve face. The film is made of ceramics. Furthermore, a heat-shielding plate is fixed over a front face of the valve head to form a heat-insulating space between the plate and the front face thereby decreasing operational temperature of the valve.

FIG.1



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EUROPEAN SEARCH REPORT

Application Number
EP 03 00 7678

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	US 5 543 029 A (KENMOKU TAKEJI ET AL) 6 August 1996 (1996-08-06)	1,4	F01L3/04
Y	* column 1, lines 8,9 * * column 2, lines 52-57 * * column 3, lines 20-33 * * column 3, lines 48-63 * * figure 1 *	5,6	
X	CH 658 101 A (I K TECHNOLOGY A S) 15 October 1986 (1986-10-15)	1,2	
A	* column 1, lines 2-14 * * page 3, column 1, lines 56-61 * * page 3, column 2, lines 27-33 * * figure 2 *	5,6	TECHNICAL FIELDS SEARCHED (Int.Cl.7) F01L
Y	US 4 530 322 A (MIZUSHINA MASAOKI ET AL) 23 July 1985 (1985-07-23) * figures 3A,3B * * column 1, paragraph 47-50 * * column 3, lines 1-30 * * column 3, lines 47-55 * * column 3, lines 66-68 *	5,6	
X	DE 31 50 708 A (SCHNEIDER GESENKSCHMIEDE) 7 July 1983 (1983-07-07)	1	
A	* page 3, paragraph 1 * * page 4, paragraph 4 - page 5, paragraph 1 * * page 6, paragraphs 2,3 * * figures 1,2 *	3	F01L
A	GB 618 607 A (HAROLD ERNEST GRESHAM;MARCUS ALAN WHEELER; WILLIAM THOMAS DAVIES) 24 February 1949 (1949-02-24) * page 2, line 94 - page 3, line 8 * * page 3, lines 59-70 *	1	

-The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
The Hague		6 October 2003	Paquay, 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 03/92 (P04/G01)



CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):

No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1-6



The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1-6

A valve with a valve head covered with a heat-resistant and a heat-insulating material

2. claims: 7-16

A valve head that contains a head-shielding plate, made of a heat-resistant and a heat-insulating material

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

EP 03 00 7678

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
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06-10-2003

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5543029	A	06-08-1996	NONE	
CH 658101	A	15-10-1986	CH 658101 A5	15-10-1986
			NO 831216 A	31-10-1983
			SE 8301855 A	08-10-1983
US 4530322	A	23-07-1985	JP 58052469 A	28-03-1983
			JP 57076214 A	13-05-1982
			DE 3175312 D1	16-10-1986
			EP 0051300 A1	12-05-1982
			US 4554897 A	26-11-1985
			US 4554898 A	26-11-1985
			US 4556022 A	03-12-1985
			US 4661371 A	28-04-1987
DE 3150708	A	07-07-1983	DE 3150708 A1	07-07-1983
GB 618607	A	24-02-1949	NONE	

EPO FORM P0459

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