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(54) Title: METAL-INFILTRATED CERAMIC SEAL

(57) Abstract: A metal-infiltrated ceramic for use in tribological applications, such as in mechanical face seals, bearings and other sliding or rubbing components, which provides excellent durability and wear characteristics. The metal-infiltrated ceramic is useful in both the "harder" and "softer" one of two relatively sliding members which is in, or may come into, contact with each other during the motion of one of the members relative to the other. The material is a porous ceramic which has been infiltrated with a metal.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US00/31226

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : C04B 35/01, 10, 462, 48, 64, 653, 565; B22F 3/11, 3/26; 7/00
 US CL : 428/614, 539.5; 501/127, 96.3, 88; 277/650, 651; 384/912, 913, 907.1

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. : 428/614, 539.5; 501/127, 96.3, 88; 277/650, 651; 384/912, 913, 907.1

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)
 WEST computer database: metal or ceramic matrix composite, infiltrate, capillary, spontaneous, sinter, interconnected, skeleton

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,580,834 A (PFAFF) 03 December 1996 (03.12.1996), column 2, lines 53-68, column 3, lines 17-27, column 6, lines 21-63.	17-23
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Y		13
X	US 5,118,647 A (NEWKIRK et al.) 02 June 1992 (02.6.1992), column 1, lines 30-41, column 1, line 56 - column 2, line 7, col. 3, lines 13-19, column 10, lines 43-52, column 11, lines 1-30.	1-3, 5-9, 14-16
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Y		17-18, 20-23
X	US 5,073,527 A (NEWKIRK et al.) 17 December 1991 (17.12.1991), column 1, lines 28-38, column 1, lines 49-68, column 2, lines 39-41, column 8, lines 27-45, column 12, lines 29-62.	1-3, 5-9, 14-16
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Y		4, 17-23
Y	US 5,224,533 A (KANTNER et al.) 06 July 1993 (06.7.1993), column 6, lines 56-68, col. 11, lines 65-68, col. 13, lines 3-17, column 16, lines 10-17, Table 1, Table 2	1-6, 10-11, 17-21
Y	US 5,163,498 A (KANTNER et al.) 17 November 1992 (17.11.1992), column 7, lines 26-38, column 12, lines 47-49, column 13, lines 51-65, column 16, lines 59-66, column 28, lines 33-34, column 29, lines 32-55.	1-6, 10-11, 17-22
Y	US 5,007,475 A (KENNEDY et al.) 16 April 1991 (16.4.1991), column 12, lines 43-53, column 19, lines 11-17.	1-3, 5-6
A	US 5,188,164 A (KANTNER et al.) 23 February 1993 (23.2.1993), All.	1-6, 10-11, 17-21
A	US 5,165,463 A (AGHAJANIAN et al.) 24 November 1992 (24.11.1992), all.	1-3, 5-6
A	US 5,161,728 A (LI) 10 November 1992 (10.11.1992), all.	1-3, 5-6

☒ Further documents are listed in the continuation of Box C.☐ See patent family annex.

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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

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International application No.

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C (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,000,249 A (BURKE) 19 March 1991 (19.3.1991), all.	1-3, 5-6
A	US 4,988,645 A (HOLT et al.) 29 January 1991 (29.1.1991), all.	1-3, 5-6, 7-9
A	US 4,824,622 A (KENNEDY et al.) 25 April 1989 (25.4.1989), all.	1-3, 5-6, 7-9