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**Declarations under Rule 4.17:**

- as to the identity of the inventor (Rule 4.17(i))
- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

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31 August 2006

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) **Title:** PATTERNED CERAMIC FILMS AND METHOD FOR PRODUCING THE SAME

(57) **Abstract:** A patterned ceramic film (10) is useful as ion-conducting ceramics, electrodes, hard ceramic coatings, transparent conducting oxides, transparent semiconducting oxides, ferroelectric oxides, and dielectric oxides. The ceramic film (10) may be produced from a liquid precursor solution.

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# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/US2004/035770

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> INV. G03F7/004 H01M8/12 H01M4/04		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) G03F H01M		
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 practical, search terms used) EPO-Internal, WPI Data, PAJ		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US 2002/083863 A1 (S. MITAMURA) 4 July 2002 (2002-07-04) page 2, paragraph 22 - paragraph 25 page 4, paragraph 46 - paragraph 49 claims 15,16	1,3-11, 15,17-20 2
X	US 5 942 376 A (H. UCHIDA ET AL.) 24 August 1999 (1999-08-24)  figures 1,4,5 column 7, line 63 - line 67 claims 1,10	1,3,4, 6-11, 18-20
Y	US 2003/157250 A1 (S. P. MUKHERJEE ET AL.) 21 August 2003 (2003-08-21) page 1, paragraph 2 page 3, paragraph 34 claim 13	2
-/--		
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <span style="margin-left: 200px;"><input checked="" type="checkbox"/> Patent family members are listed in annex.</span>		
° Special categories of cited documents :		
"A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier document but published on or after the international filing date "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) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "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. "&" document member of the same patent family	
Date of the actual completion of the international search	Date of mailing of the international search report	
27 April 2006	22/06/2006	
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer  Dupart, J.-M.	

## INTERNATIONAL SEARCH REPORT

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.
X	<p>US 6 399 233 B1 (C. E. MILLIKEN ET AL.) 4 June 2002 (2002-06-04) figures 1,3,4 column 3, line 37 - line 43 column 7, line 39 - line 47 column 10, line 55 - line 67 column 11, line 1 - line 4</p>	12-14, 16,17
X	<p>US 6 361 892 B1 (R.C. RUHL ET AL.) 26 March 2002 (2002-03-26) figures 1,3 column 1, line 13 - line 15 column 8, line 27 - line 28 column 8, line 43 - line 50</p>	12-14
A	<p>EP 0 296 719 A (HEWLETT-PACKARD COMPANY) 28 December 1988 (1988-12-28) column 3, line 36 - line 52 column 4, line 20 - line 21 column 5, line 22 - line 24 column 6, line 22 - line 31</p>	1-11, 18-20
A	<p>US 4 952 556 A (J.V. MANTESE ET AL.) 28 August 1990 (1990-08-28) column 8 - column 10</p>	1-11, 18-20

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2004/035770

## Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.  Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2.  Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
  
3.  Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1.  As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2.  As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3.  As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4.  No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

### Remark on Protest

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-11, 18-20

a method of making a patterned ceramic film  
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2. claims: 12,13

a fuel cell  
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3. claim: 14

an electronic device  
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4. claim: 15

a method of using a patterned ceramic film  
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5. claim: 16

a method of using a fuel cell  
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6. claim: 17

a ceramic film  
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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No  
PCT/US2004/035770

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2002083863	A1	04-07-2002	NONE
US 5942376	A	24-08-1999	JP 11160874 A 18-06-1999
US 2003157250	A1	21-08-2003	NONE
US 6399233	B1	04-06-2002	AU 6749800 A 19-02-2001 CA 2380268 A1 08-02-2001 EP 1222706 A1 17-07-2002 WO 0109970 A1 08-02-2001
US 6361892	B1	26-03-2002	AU 1920701 A 12-06-2001 CA 2394896 A1 07-06-2001 EP 1249048 A1 16-10-2002 WO 0141239 A1 07-06-2001 US 2002132156 A1 19-09-2002
EP 0296719	A	28-12-1988	JP 1019783 A 23-01-1989 US 5041420 A 20-08-1991
US 4952556	A	28-08-1990	NONE