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(71) Applicant (for all designated States except US): CERA-  
MATEC, INC. [US/US]; 2425 South 900 West, Salt Lake  
City, UT 84119 (US).

(72) Inventors: ELANGOVAN, Singaravelu; 11562 South  
Dry Creek Road, Sandy, UT 84094 (US). NAIR, Balakr-  
ishnan, G.; 11899 Bluff View Drive, Sandy, UT 84092  
(US). SMALL, Troy, A.; 7273 South 175 East, Midvale,  
UT 84047 (US).

(74) Agent: HULSE, Loren, R.; Ceramatec, Inc., 2425 South  
900 West, Salt Lake City, UT 84119 (US).

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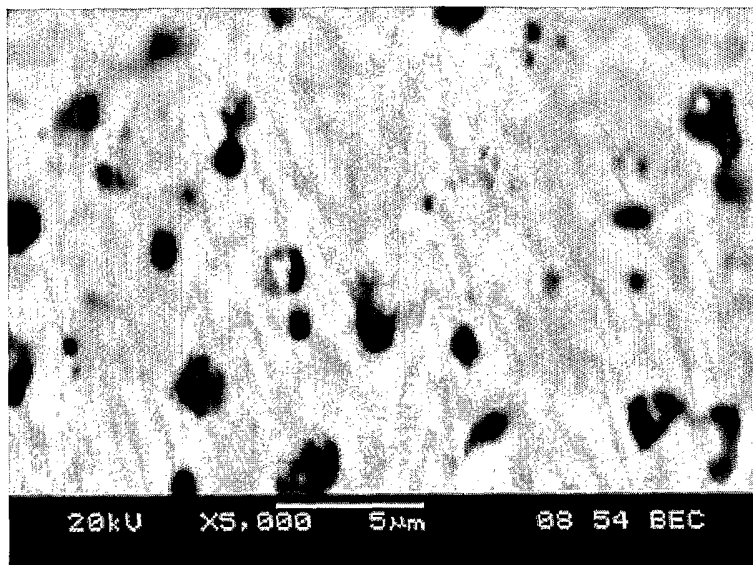
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ning of each regular issue of the PCT Gazette.

(54) Title: CERAMIC MIXED PROTONIC/ELECTRONIC CONDUCTING MEMBRANES FOR HYDROGEN SEPARATION



(57) Abstract: A multi-phase mixed protonic/electronic conducting material comprising a protonconducting ceramic phase and an electron conductive ceramic phase. Under the presence of a partial pressure gradient of hydrogen across the membrane, a membrane fabricated with this material selectively transports hydrogen ions through the protonically conductive ceramic phase and electrons through the electronically conducting ceramic phase, which results in ultrahigh purity hydrogen permeation through the membrane. The material has a high electronic conductivity and hydrogen gas transport is rate-limited by the protonic conductivity of the material

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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/07124

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC: <b>H01B 1/00( 2006.01),1/08( 2006.01);B01D 53/22( 2006.01),71/02( 2006.01)</b>  USPC: 252/518.1,521.1,520.5;423/593.1;95/55 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) U.S. : 252/518.1, 521.1, 520.5; 423/593.1; 95/55  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) CAS (search terms include: proton conduct?, electron? conduct?, ceramic, multiphase, ceria, perovskite)		
<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 -- A	US 5,670,270 A (WALLIN) 23 September 1997, see Abstract; Col 3, line 58 to Col 4, line 18; Col 4, lines 53-60; Col 5, lines 47-66.	1-15, 20, 27-29 ----- 16-19, 21-26
X -- A	Kuenstler et al "Physical-chemical investigations on Gd-, Eu- and In-doped BaCeO3 ceramics", High Temperature Electrochemistry: Ceramics and Metals, Proceedings of the Risoe International Symposium on Materials Science, 17th, Roskilde, Den., Sept. 2-6, 1996 (1996), 325-330. See abstract.	1-9, 11-15, 20, 27 ----- 10, 16-19, 21-26, 28, 29
X -- A	Balachandran et al "Development of mixed-conducting oxides for gas separation", Solid State Ionics 108 (1998) 363-370. See Abstract; page 366 (section 3.2).	1-15, 20, 27 ----- 16-19, 21-26, 28, 29
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents:		
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Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-3201	Authorized officer Mark Kopec <i>J. Whitefield</i> Telephone No. (571) 272-1300	

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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	Sharova et al "Electroconductivity and Ion Transport in Protonic Solid Electrolytes BaCe <sub>0.85</sub> R <sub>0.15</sub> O <sub>3</sub> -<SYM100>, where R is a Rare-Earth Element BaCe <sub>0.85</sub> R <sub>0.15</sub> O <sub>3</sub> -<SYM100> (R = La Pr Nd Sm Eu Gd Dy Ho Y Er Tm Yb Lu Sc La)" Russian Journal of Electrochemistry (Translation of Elektrokimiya) (2003), 39(5), 461-466. See Abstract.	1-28