Abstract: A fuel cell (40) includes first and second catalysts (12'), (14') secured to opposed surfaces of an electrolyte (16); a first flow field (26') secured in fluid communication with the first catalyst (12') defining a plurality of flow channels (30A', 30B', 30C', 30D') between a plurality of ribs (32A', 32B', 32C', 32D', 32E') of the first flow field (26'); and a backing layer (42) secured between the first flow field (26') and the first catalyst (12'). The backing layer (42) includes a carbon black, a hydrophobic polymer, and randomly-dispersed carbon fibers (44). The carbon fibers (44) are at least twice as long as a width (46) of the flow channels (30A', 30B', 30C', 30D') defined in the adjacent first flow field (26'). The backing layer (42) replaces a known substrate (22) and diffusion layer (18).
# INTERNATIONAL SEARCH REPORT

**INTERNATIONAL APPLICATION NO.**

PCT/US04/43243

## A. CLASSIFICATION OF SUBJECT MATTER

<table>
<thead>
<tr>
<th>IPC(7)</th>
<th>US CL</th>
<th>According to International Patent Classification (IPC) or to both national classification and IPC</th>
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<td>H01M 4/86, 88, 90, 96</td>
<td>429/12, 40, 41, 44; 502/101</td>
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## B. FIELDS SEARCHED

**Minimum documentation searched (classification system followed by classification symbols)**

| U.S. | 429/12, 40, 41, 44, 502/101 |

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).

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
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<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<td>Y</td>
<td>US 5,635,039 A (CISAR et al) 3 June 1997 (03.06.1997), column 7, lines 27-29; column 10, line 46 - column 11, line 33; column 16, lines 8-10; claims 10,11.</td>
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<td>Y</td>
<td>US 5,863,673 A (CAMPBELL et al) 26 January 1999 (26.01.1999), column 2, line 58 - column 3, line 3; column 3, lines 14-19, 36-45; column 4, lines 13-20; column 6, lines 51-55; column 8, lines 1-11.</td>
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<td>Y</td>
<td>US 6,127,059 A (KATO) 3 October 2000 (03.10.2000), column 4, lines 39-49.</td>
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</table>

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