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(71) Applicant: GUARDIAN INDUSTRIES CORPORA-  
TION [US/US]; 2300 Harmon Road, Auburn Hills, MI  
48326-1714 (US).

(72) Inventor: VEERASAMY, Vijayen, S.; 22575 Maywood  
Court, Farmington Hills, MI 48335 (US).

(74) Agent: RHOA, Joseph, A.; Nixon & Vanderhye P.C.,  
1100 North Glebe Road, Suite 800, Arlington, VA 22201-  
4714 (US).

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(54) Title: HYDROPHOBIC COATING INCLUDING DLC ON SUBSTRATE

(57) Abstract: A substrate is coated with a hydrophobic coating that includes highly tetrahedral amorphous carbon that is a form of diamond-like carbon (DLC). In certain embodiments, the coating is deposited on the substrate in a manner to increase its hydrophobicity (e.g. so that the coating has an initial contact angle  $\theta$  of at least about 100 degrees; and/or a surface energy of no more than about 20.2 mN/m). In certain embodiments, the coating is deposited in a manner such that it has an average hardness of at least about 10 GPa, more preferably from about 20-80 GPa.

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 00/31161

**A. CLASSIFICATION OF SUBJECT MATTER**  
 IPC 7 C03C17/22 C03C17/34

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)

IPC 7 C03C

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

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 97 45834 A (WEILER MANFRED ;AKASHIC MEMORIES CORP (US); VEERASAMY VIJAYEN (US)) 4 December 1997 (1997-12-04)  abstract page 5, line 18 - line 34 page 6, line 14 - line 27 page 7, line 17 - line 22 page 8, line 12 - line 38 page 11, line 17 - line 20 page 13, line 33 -page 14, line 3 page 32, line 19 - line 22	1-6,8, 11-13, 16-27, 29,30, 37-42
A	--- -/-- claims	7,9,10, 14,15, 28, 31-36, 43-48

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

° 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.
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Date of the actual completion of the international search

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26.06.2001

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

Grenette, S

INTERNATIONAL SEARCH REPORT

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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	EP 0 499 287 A (TOYOTA MOTOR CO LTD) 19 August 1992 (1992-08-19)	1-7,9, 11,12, 14,15, 18-29, 37,38, 40-44
A	abstract column 4, line 10 - line 37 column 4, line 48 - line 52 examples 8-10 claims	8,10,13, 16,17, 30-36, 39,45-48
P,X	--- WO 00 66506 A (GUARDIAN INDUSTRIES) 9 November 2000 (2000-11-09) abstract page 7, line 3 - line 16 page 8, line 20 -page 9, line 11 page 23, line 7 -page 25, line 12 table 1 claims	1-30, 37-44,47
A	--- US 4 210 431 A (BACHMAN DAVID L ET AL) 1 July 1980 (1980-07-01) abstract column 2, line 36 - line 38 column 3, line 14 - line 32	1-48
A	--- US 5 665 424 A (SHERMAN DAN) 9 September 1997 (1997-09-09) abstract column 2, line 1 - line 6 column 6, line 55 - line 62 example 14; table -----	1-48

# INTERNATIONAL SEARCH REPORT

...ternational application No.  
PCT/US 00/31161

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 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 II Observations where unity of invention is lacking (Continuation of item 2 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.:

1-48

### 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: 1-48

Claims 1 to 48 relate to a substrate coated with a layer including Diamond Like Carbon and its manufacture.

2. Claim : 49

Claim 49 is a method of cleaning a glass substrate using a linear ion beam source.

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No PCT/US 00/31161
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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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