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(54) Title: OPTICAL DISK, CARD OR MEDIA AND METHOD FOR COATING OF SAID OPTICAL DISK, CARD OR MEDIA

(57) Abstract: Disclosed is an optical disk, card or media which comprises: a) a plurality of data structures that are readable by the interrogating beam of light; and b) a composition on or in the optical disk, card or media disposed so that when the optical disk, card or media is used in the optical read-out system, the interrogating beam of light passes through the composition before or after contacting some or all of the data structures. The composition comprises a polymeric matrix with an organometallic complex dissolved therein or with metal, transition metal, metal oxide or transition metal oxide nanoparticles uniformly dispersed therein. The composition is substantially transparent to the interrogating beam and/or is substantially colorless. Alternatively, the composition comprises a solid polymeric matrix with an olefinic compound dissolved or uniformly dispersed therein wherein double bond in the olefinic compound undergoes oxidative cleavage promoted by a transition metal catalyst and a thiophenol or a catalytic amount of a thiyl radical and wherein the composition is substantially transparent to the interrogating beam and/or is substantially colorless.

INTERNATIONAL SEARCH REPORT

International Application No

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A. CLASSIFICATION OF SUBJECT MATTER
 IPC 7 G11B7/24

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 G11B

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, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 815 484 A (LACKRITZ HILARY S ET AL) 29 September 1998 (1998-09-29) abstract figures 2,3A,3B,5A,5B column 2, line 66 -column 3, line 9 ---	1-17, 21-26, 39-54, 56,57
A	US 6 011 772 A (EHNHOLT DANIEL J ET AL) 4 January 2000 (2000-01-04) abstract figure 17 column 3, line 10 - line 32 column 7, line 55 -column 9, line 2 --- -/--	1-17, 21-26, 39-54, 56,57

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	"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
"E" earlier document but published on or after the international filing date	"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
"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	

Date of the actual completion of the international search 26 February 2003	Date of mailing of the international search report 30. 07. 2003
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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 Vogt, C
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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.
A	WO 01 29828 A (SPECTRADISC CORP) 26 April 2001 (2001-04-26) claims 1,4-7 ---	1-17, 21-36, 39-54, 56,57
A	WO 00 56529 A (BRYNJOLFSSON ERIK ;FLEXPLAY TECHNOLOGIES INC (US); HELLER ADAM (US) 28 September 2000 (2000-09-28) abstract ---	1,21,39, 56
X	US 4 496 957 A (SMITH THOMAS W ET AL) 29 January 1985 (1985-01-29) column 3, line 21 - line 55 claim 1 ---	1,2, 4-12,39
X	US 4 328 303 A (BRANCH HARVEY C ET AL) 4 May 1982 (1982-05-04) column 1, line 5 -column 2, line 30 -----	1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 02/35712

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.: 20,37(partially),38 (partially),55(partially)
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:
see FURTHER INFORMATION sheet PCT/ISA/210

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.:
1-17, 21-36, 39-54, 56, 57

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

Continuation of Box I.2

Claims Nos.: 20,37(partially),38 (partially),55(partially)

Present independent claims 20, 37, 38 and 55 relate to an extremely large number of possible coating methods, namely a method for coating a surface of any device with a layer containing a specific layer composition.

Support within the meaning of Article 6 PCT and/or disclosure within the meaning of Article 5 PCT is to be found, however, for only a very small proportion of the coating methods claimed, i.e. the method for coating a surface of an optical disk, optical card or optical medium.

In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible.

Consequently, the search has been carried out for those parts of the claims which appear to be supported and disclosed, namely those parts relating to the methods for coating an optical disk, card or medium comprising the steps of:

1) dispensing onto the surface a film of a solution comprising at least one monomer or at least one oligomer, wherein the solution additionally comprises an organometallic complex, metal, transition metal, metal oxide or transition metal oxide nanoparticles dissolved therein or uniformly dispersed therein;

b) polymerizing the monomer(s) or oligomer(s) to form a polymer; or

2) dispensing onto the surface a film of a solution comprising at least one polymer, wherein the solution additionally comprises an organometallic complex, metal, transition metal, metal oxide or transition metal oxide nanoparticles dissolved therein or uniformly dispersed therein; and b) removing the solvent from coating; or

3) dispensing onto the surface a film of a solution comprising : i) at least one monomer or at least one oligomer with an olefinic compound dissolved or dispersed therein, and ii) a transition metal catalyst and a thiophenol (the term "thiyl-radical" has no chemical meaning) and b) polymerizing the monomer; or

4) dispensing onto the surface a film of a solution comprising : i) at least one polymer with an olefinic compound dissolved or dispersed therein, and ii) a transition metal catalyst and a thiophenol (the term "thiyl-radical" has no chemical meaning) and b) removing the solvent from coating.

(The subject-matter of method-claims 37 and 55, item 3 and 4 has not been searched, reasoning see Non-Unity)

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

receipt of the search report or during any Chapter II procedure.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. Claims: 1-17,21-36,39-54,56,57

Claims 1 to 17:

An optical disk, card or medium comprising: i) a plurality of data structures that are readable by the interrogating beam of light; ii) a composition on or in the optical disk, card or medium disposed comprising a polymer matrix with an organometallic complex dissolved therein or with metal, transition metal, metal oxide or transition metal oxide nanoparticles dissolved therein or uniformly dispersed therein; and iii) the composition is substantially transparent and/or colourless.

Claims 21 to 36:

A method for coating an optical disk, optical card or optical medium comprising: i) dispensing onto the surface a film of a solution comprising at least one monomer or at least one oligomer, wherein the solution additionally comprises an organometallic complex, metal, transition metal, metal oxide or transition metal oxide nanoparticles dissolved therein or uniformly dispersed therein; and ii) polymerizing the monomer(s) or oligomer(s) to form a polymer.

Claims 39 to 54:

A further method for coating an optical disk, optical card or optical medium comprising: i) dispensing onto the surface a film of a solution comprising at least one polymer, wherein the solution additionally comprises an organometallic complex, metal, transition metal, metal oxide or transition metal oxide nanoparticles dissolved therein or uniformly dispersed therein; and ii) removing the solvent from coating.

Claims 56 and 57:

A method or limiting access to data stored on an optical disk, card that makes use of the optical disk, card as defined in present claim 1.

2. Claims: 18,19,37,55,58,59

Claims 18 -19:

An optical disk, card or medium comprising:
i) a plurality of data structures that are readable by the interrogating beam of light; ii) a composition on or in the optical disk, card or recording medium disposed comprising a polymer matrix with an olefinic compound dissolved or uniformly dispersed therein; and ii) a transition metal catalyst and a thiophenol; and iii) the composition is substantially transparent and/or colourless.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Claim 37 (in part, see reasoning Incomplete Search):
A method for coating an optical disk, optical card or optical recording medium comprising: i) dispensing onto the surface a film of a solution comprising at least one monomer or at least one oligomer with an olefinic compound and a transition metal catalyst and a thiophenol; and ii) polymerizing the monomer.

Claim 55 (in part, see reasoning Incomplete Search):
A further method for coating an optical disk, optical card or optical recording medium comprising: i) dispensing onto the surface a film of a solution comprising at least one polymer with an olefinic compound and a transition metal catalyst and a thiophenol; and ii) removing the solvent from coating.

Claims 58 and 59:
A method of limiting access to data stored on an optical disk or card that makes use of the optical disk, card as defined in present claim 18.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 02/35712

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5815484	A	29-09-1998	NONE
US 6011772	A	04-01-2000	AU 4347697 A 02-04-1998 CA 2265744 C 06-03-2001 CN 1246195 A 01-03-2000 EP 0925581 A1 30-06-1999 JP 2002516014 T 28-05-2002 KR 2000036132 A 26-06-2000 WO 9811539 A1 19-03-1998 US 6343063 B1 29-01-2002 US 2001046204 A1 29-11-2001
WO 0129828	A	26-04-2001	US 6531262 B1 11-03-2003 AU 1968401 A 30-04-2001 BR 0014918 A 12-11-2002 CA 2388800 A1 26-04-2001 CN 1411596 T 16-04-2003 EP 1230638 A1 14-08-2002 NO 20021486 A 18-06-2002 WO 0129828 A1 26-04-2001 US 2003003394 A1 02-01-2003
WO 0056529	A	28-09-2000	US 6537635 B1 25-03-2003 AU 4029700 A 09-10-2000 BR 0009217 A 09-04-2002 CA 2367924 A1 28-09-2000 EP 1171281 A1 16-01-2002 WO 0056529 A1 28-09-2000 US 2003099186 A1 29-05-2003
US 4496957	A	29-01-1985	CA 1143836 A1 29-03-1983 DE 3071208 D1 05-12-1985 EP 0023102 A1 28-01-1981 JP 56010491 A 02-02-1981
US 4328303	A	04-05-1982	NONE