(19) World Intellectual Property **Organization**

International Bureau





(43) International Publication Date 18 September 2003 (18.09.2003)

PCT

(10) International Publication Number WO 2003/077240 A3

(51) International Patent Classification7: G11B 7/005, 7/24

(21) International Application Number:

PCT/IL2003/000199

(22) International Filing Date: 11 March 2003 (11.03.2003)

English (25) Filing Language:

(26) Publication Language: English

(30) Priority Data:

60/363,041 11 March 2002 (11.03.2002) US 10/096,369 13 March 2002 (13.03.2002) US

(71) Applicant (for all designated States except US): MEM-PILE INC. [US/US]; 2711 Centreville Road, Suite 400, Wilmington, DE 19808 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): ALPERT, Ortal [IL/IL]; 16 Ha'arazim Street, 96182 Jerusalem (IL). WASSERMAN, Thierry [IL/IL]; 33/5 Weizmann Street, 64239 Tel Aviv (IL). SALOMON, Yair [IL/IL]; 21/25 Sderot Sharett, 96920 Jerusalem (IL). EYTAN, Ori [IL/IL]; 22 Hameshoreret Rachel Street, 96348 Jerusalem (IL).

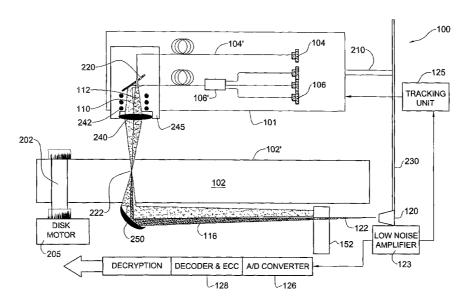
- (74) Agent: REINHOLD COHN AND PARTNERS; P. O. BOX 4060, 61040 Tel Aviv (IL).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

with international search report

[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR RETRIEVING INFORMATION FROM A 3D STORAGE MEDIUM



(57) Abstract: A method and apparatus for retrieving information from a three dimensional storage medium uses a three dimensional storage medium having an active medium capable of exhibiting first and second states, a data unit being represented by the ratio between the concentration of the first and second states in a given volume portion of the medium and a data sequence is represented by a sequence of data units. The active medium is irradiated with light as to concentrate light flux through a volume portion of the storage medium so as to generate in the volume portion a detectable non-linear optical response characteristic of the concentration ratio, which is detected and used for tracking.



WO 2003/077240 A3



 before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

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.

(88) Date of publication of the international search report:

15 January 2004

INTERNATIONAL SEARCH REPORT

Internal Application No PCT/IL 03/00199

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 G11B7/005 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, WPI Data C. DOCUMENTS CONSIDERED TO BE RELEVANT Category ° Citation of document, with indication, where appropriate, of the relevant passages Belevant to claim No. X US 6 009 065 A (GLUSHKO BORIS A ET AL) 1,11,12, 28 December 1999 (1999-12-28) 17,18, 20, 28-31, 33,34 the whole document Υ 2-9,15, 16,19 US 6 291 132 B1 (LEVICH EUGENE BORIS ET X 1,11,14, AL) 18 September 2001 (2001-09-18) 17,18, 20, 28-31, 33,34 the whole document -/--X Further documents are listed in the continuation of box C. Patent family members are listed in annex. ° Special categories of cited documents : "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 investors. "A" document defining the general state of the art which is not considered to be of particular relevance invention "E" earlier document but published on or after the international "X" document of particular relevance; the claimed invention filing date 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 "Y" document of particular relevance; the claimed invention citation or other special reason (as specified) 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 in the art. "P" document published prior to the international filing date but later than the priority date claimed "&" document member of the same patent family Date of the actual completion of the international search Date of mailing of the international search report 17/11/2003 7 November 2003 Authorized officer 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 Annibal, P

INTERNATIONAL SEARCH REPORT

Interna Application No
PCT/IL 03/00199

	ation) DOCUMENTS CONSIDERED TO BE RELEVANT	Delana da alaba Na
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Υ	WO 01 73779 A (ALPERT ORTAL) 4 October 2001 (2001-10-04) cited in the application the whole document	2-9
Υ	US 2001/002895 A1 (ISHII TSUTOMU ET AL) 7 June 2001 (2001-06-07) abstract paragraph '0090! - paragraph '0093! paragraph '0124!; figure 13	15,16,19
A	US 5 325 342 A (VO-DINH TUAN) 28 June 1994 (1994-06-28) the whole document	2,19
·		

INTERNATIONAL SEARCH REPORT

Intermation on patent family members

Internal Application No
PCT/IL 03/00199

Patent document cited in search report		Publication date		Patent family member(s)	Publication date
US 6009065	A	28-12-1999	AU EP JP WO	5516598 A 0943141 A1 2001505701 T 9825262 A1	29-06-1998 22-09-1999 24-04-2001 11-06-1998
US 6291132	B1	18-09-2001	US AU EP JP WO	6071671 A 5358398 A 0943144 A1 2001524245 T 9825268 A1	06-06-2000 29-06-1998 22-09-1999 27-11-2001 11-06-1998
WO 0173779	A	04-10-2001	AU CA EP WO JP	4678201 A 2404505 A1 1269469 A2 0173779 A2 2003529180 T	08-10-2001 04-10-2001 02-01-2003 04-10-2001 30-09-2003
US 2001002895	6 A1	07-06-2001	JP	10340479 A	22-12-1998
US 5325342	A	28-06-1994	AU CA EP IL JP JP WO	2934292 A 2131813 A1 0635157 A1 103357 A 2709651 B2 6503198 T 9321638 A1	18-11-1993 28-10-1993 25-01-1995 14-05-1996 04-02-1998 07-04-1994 28-10-1993