

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
17 February 2005 (17.02.2005)

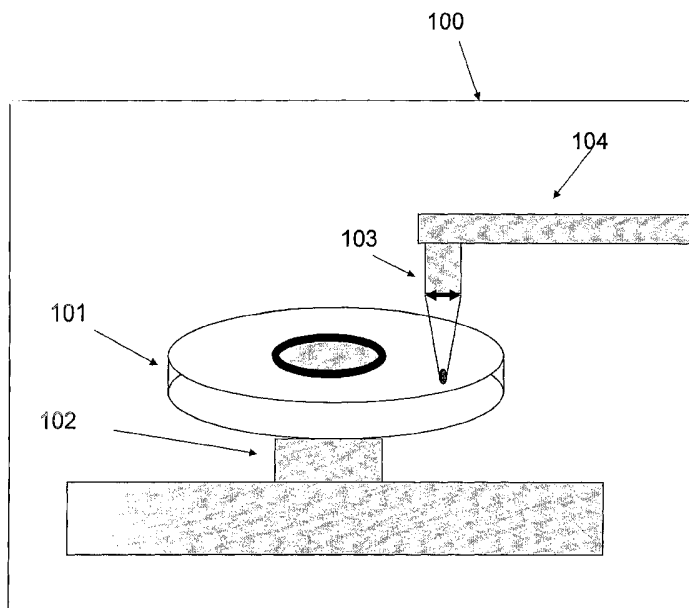
PCT

(10) International Publication Number  
WO 2005/015552 A3

- (51) International Patent Classification<sup>7</sup>: G11B 7/007, 7/09, 7/14, 7/24, 7/135
- (21) International Application Number: PCT/IL2004/000730
- (22) International Filing Date: 5 August 2004 (05.08.2004)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: 60/492,742 6 August 2003 (06.08.2003) US
- (71) Applicant (for all designated States except US): MEM-PILE INC. [US/US]; 1013 Centre Road, Suite 400, Wilmington, DE 19808 (US).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): ALPERT, Ortal [IL/IL]; 16 Ha'arazim Street, 96182 Jerusalem (IL).
- (74) Agent: REINHOLD COHN AND PARTNERS; P.O.B. 4060, 61040 Tel Aviv (IL).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, 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, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:  
— with international search report  
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

[Continued on next page]

(54) Title: METHODS AND APPARATUS FOR FORMATTING AND TRACKING INFORMATION IN A THREE-DIMENSIONAL STORAGE MEDIUM



(57) Abstract: A formatter (100) for inscription of marks on to a 3D translucent optical medium (101) to enable recording and retrieval of information from the medium, includes a clamping mechanism to hold the media, and at least one optical unit (103) calibrated to focus at least one diffraction limited spot within the medium at a respective depth therein. At least one light source is optimized for the inscription of marks, and at least one actuator (104) moves the spot relative to the medium.

WO 2005/015552 A3



---

**(88) Date of publication of the international search report:**  
14 April 2005

*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.*

# INTERNATIONAL SEARCH REPORT

Inter	Application No
PCT/IL2004/000730	

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC 7    G11B7/007    G11B7/09    G11B7/14    G11B7/24    G11B7/135		
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) 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, INSPEC		
<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	US 6 574 174 B1 (NISHIMURA SHUNICHI ET AL) 3 June 2003 (2003-06-03)	1,3,5, 7-24,26, 28-36
Y	column 9, line 28 - column 18, line 54; figures 1-6 column 31, line 16 - column 35, line 10; figures 14A-23B	2,6,25, 27
X	WO 97/23872 A (THOMSON CSF ; LE CARVENNEC FRANCOIS (FR); HUIGNARD JEAN PIERRE (FR); P) 3 July 1997 (1997-07-03) the whole document	1,3,7-9, 11-13,17
X	EP 0 461 956 A (THOMSON CSF) 18 December 1991 (1991-12-18)  column 3, line 36 - column 9, line 23; figures 2-5	1,3,4,7, 19-24, 28-36
----- -/--		
<input checked="" type="checkbox"/> Further documents are listed in the continuation of box C. <input checked="" type="checkbox"/> 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. *&* document member of the same patent family	
Date of the actual completion of the international search	Date of mailing of the international search report	
8 December 2004	03.03.2005	
Name and mailing address of the ISA	Authorized officer	
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	Hermann, R	

## INTERNATIONAL SEARCH REPORT

 Intern Application No  
 PCT/IL2004/000730

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98/25268 A (GLUSHKO BORIS ALEXEY ; OPTICAL MEMORY DEVICES LTD (IL); LEVICH EUGENE) 11 June 1998 (1998-06-11)  page 11, line 9 - page 14, line 13 page 22, line 25 - page 31, line 9; figures 9-18  -----	1,3,5,7, 11,12, 15,17, 19,26, 28-36
Y	US 6 122 133 A (NAZARIAN ARA W ET AL) 19 September 2000 (2000-09-19) cited in the application column 3, line 11 - column 10, line 59  -----	25,27
Y	US 6 147 942 A (ABE HIROYUKI ET AL) 14 November 2000 (2000-11-14) abstract  -----	2
Y	PATENT ABSTRACTS OF JAPAN vol. 2000, no. 05, 14 September 2000 (2000-09-14) -& JP 2000 057612 A (NEC CORP), 25 February 2000 (2000-02-25) abstract; figure 1  -----	6

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/IL2004/000730

## Box II Observations where certain claims were found unsearchable (Continuation of item 2 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 III Observations where unity of invention is lacking (Continuation of item 3 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.:

1-36

### 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: 1-36

A formatted 3D translucent optical medium with oblong servo marks that are angularly tilted relative to the axis of the data track.

---

2. claims: 37-39

A method for correcting spherical aberration in an optical system employing a correction element which is common to a number of focusing elements and has a major dimension larger than a respective major dimension of any of the focusing elements.

---

## INTERNATIONAL SEARCH REPORT

Information on patent family members \*

International Application No  
PCT/IL2004/000730

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6574174	B1	03-06-2003	AU 5699101 A	23-10-2001
			EP 1281175 A2	05-02-2003
			WO 0178068 A2	18-10-2001
			WO 0180229 A2	25-10-2001
			US 2002041564 A1	11-04-2002
WO 9723872	A	03-07-1997	FR 2742911 A1	27-06-1997
			DE 69630590 D1	11-12-2003
			DE 69630590 T2	30-09-2004
			EP 0811227 A1	10-12-1997
			WO 9723872 A1	03-07-1997
			JP 11501143 T	26-01-1999
			US 6091697 A	18-07-2000
EP 0461956	A	18-12-1991	FR 2663146 A1	13-12-1991
			DE 69121020 D1	29-08-1996
			DE 69121020 T2	19-12-1996
			EP 0461956 A1	18-12-1991
			JP 4229417 A	18-08-1992
WO 9825268	A	11-06-1998	US 6071671 A	06-06-2000
			AU 5358398 A	29-06-1998
			EP 0943144 A1	22-09-1999
			JP 2001524245 T	27-11-2001
			WO 9825268 A1	11-06-1998
			US 6291132 B1	18-09-2001
US 6122133	A	19-09-2000	NONE	
US 6147942	A	14-11-2000	JP 11039664 A	12-02-1999
JP 2000057612	A	25-02-2000	NONE	