

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
8 April 2004 (08.04.2004)

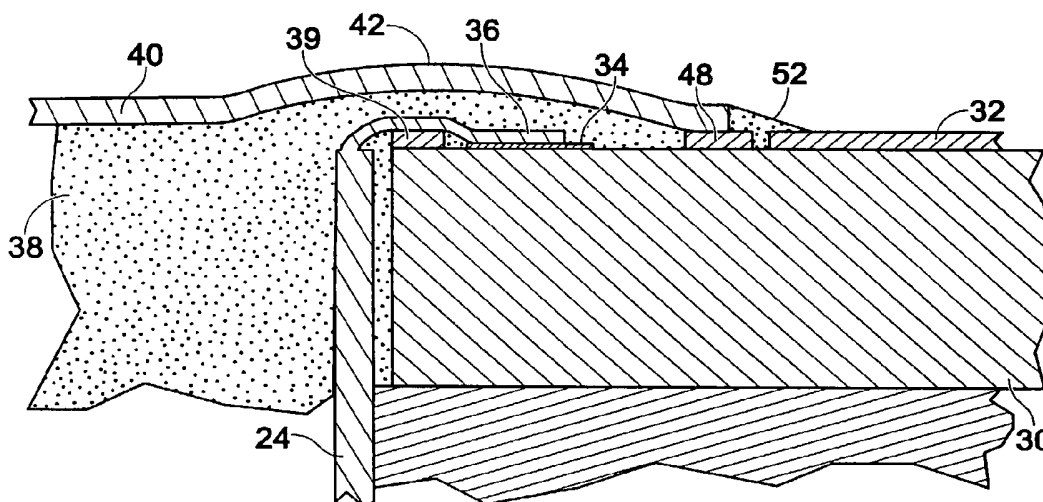
PCT

(10) International Publication Number
WO 2004/028811 A3

- (51) International Patent Classification⁷: **B41J 2/04**, 2/14, 2/05
- (21) International Application Number: PCT/US2003/028872
- (22) International Filing Date: 12 September 2003 (12.09.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data: 10/262,406 30 September 2002 (30.09.2002) US
- (71) Applicant: **HEWLETT-PACKARD DEVELOPMENT COMPANY, L.P.** [US/US]; 20555 S.H. 249, Houston, TX 77070 (US).
- (72) Inventors: **ASHOFF, Chris**; 6248 SW Trellis Drive, Corvallis, OR 97333 (US). **BOUCHER, William, R.**; 2040 NE Conifer Boulevard, Corvallis, OR 97330 (US). **REBOA, Paul, F.**; 2215 NW 29th Street, Corvallis, OR 97330 (US). **SMITH, Gilbert, G.**; 7345 NW Madrone Way, Corvallis, OR 97330 (US). **ALTENDORE, John, M.**; 2375 Chinook Dr, Corvallis, OR 97330 (US).
- (74) Agents: **SISMILICH, Robert, C.** et al.; Hewlett-Packard Company, Intellectual Property Administration, P.O. Box 272400, Mail Stop 35, Fort Collins, CO 80527-2400 (US).
- (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, 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, 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, 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, RO, 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
 - 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: FLUID EJECTION DEVICE AND METHOD OF MANUFACTURING A FLUID EJECTION DEVICE



(57) Abstract: A mold (40) configured to be coupled to a fluid ejection head die (30) to allow a protective material (38) to be molded around a plurality of contact pads (34) on the die (30) is disclosed. The mold (40) includes a molding surface (43) configured to cover the contact pads (34), wherein the molding surface (43) is configured to support and shape the protective material (38) during molding, and at least one side (45) extending away from the molding surface (43), wherein the side (45) is configured to contain the protective material (38) during molding.



(88) Date of publication of the international search report:
23 September 2004

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

International Application No

PCT/US 03/28872

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 B41J2/04 B41J2/14 B41J2/05

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 B41J H01L

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002/030720 A1 (WONG MARVIN G ET AL) 14 March 2002 (2002-03-14) paragraphs '0036! - '0038!; figures 7,8 -----	1-10
X	US 6 322 200 B1 (EMAMJOMEH ALI ET AL) 27 November 2001 (2001-11-27)	1,4-7,9, 10
Y	column 5, line 21 - column 6, line 44; figures 4,9 -----	2,3,8
X	US 6 454 955 B1 (SURIADI ARIEF BUDIMAN ET AL) 24 September 2002 (2002-09-24) column 3, line 20 - column 3, line 43; figures 1,2a -----	1,4-7,9, 10
X	US 2002/051036 A1 (EMAMJOMEH ALI ET AL) 2 May 2002 (2002-05-02) paragraphs '0057!, '0058!, '0072! - '0082!; figures 5,6,9-11 -----	1,4-7,9, 10
	----- -/--	



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.

G document member of the same patent family

Date of the actual completion of the international search

22 July 2004

Date of mailing of the international search report

04/08/2004

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

Vorwerg, N

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 03/28872

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6 331 737 B1 (LIM TIANG HOCK ET AL) 18 December 2001 (2001-12-18) the whole document -----	2,3,8

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 03/28872

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2002030720 A1	14-03-2002	US 6188414 B1	13-02-2001
		US 2004046824 A1	11-03-2004
		CN 1297815 A	06-06-2001
		DE 60003767 D1	14-08-2003
		DE 60003767 T2	03-06-2004
		EP 1095773 A1	02-05-2001
		TW 501979 B	11-09-2002
		JP 2001130012 A	15-05-2001
		TW 503181 B	21-09-2002
		US 2002122097 A1	05-09-2002
		US 6454955 B1	24-09-2002
US 6322200 B1	27-11-2001	NONE	
US 6454955 B1	24-09-2002	US 6188414 B1	13-02-2001
		JP 2001130012 A	15-05-2001
		TW 503181 B	21-09-2002
		US 2002122097 A1	05-09-2002
		CN 1297815 A	06-06-2001
		DE 60003767 D1	14-08-2003
		DE 60003767 T2	03-06-2004
		EP 1095773 A1	02-05-2001
		TW 501979 B	11-09-2002
		US 2004046824 A1	11-03-2004
		US 2002030720 A1	14-03-2002
US 2002051036 A1	02-05-2002	US 6341845 B1	29-01-2002
		US 2003007034 A1	09-01-2003
		US 2003048330 A1	13-03-2003
		US 2004100522 A1	27-05-2004
US 6331737 B1	18-12-2001	SG 74651 A1	22-08-2000
		SG 74652 A1	22-08-2000
		JP 2000208540 A	28-07-2000
		KR 2000017471 A	25-03-2000