

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
12 February 2004 (12.02.2004)

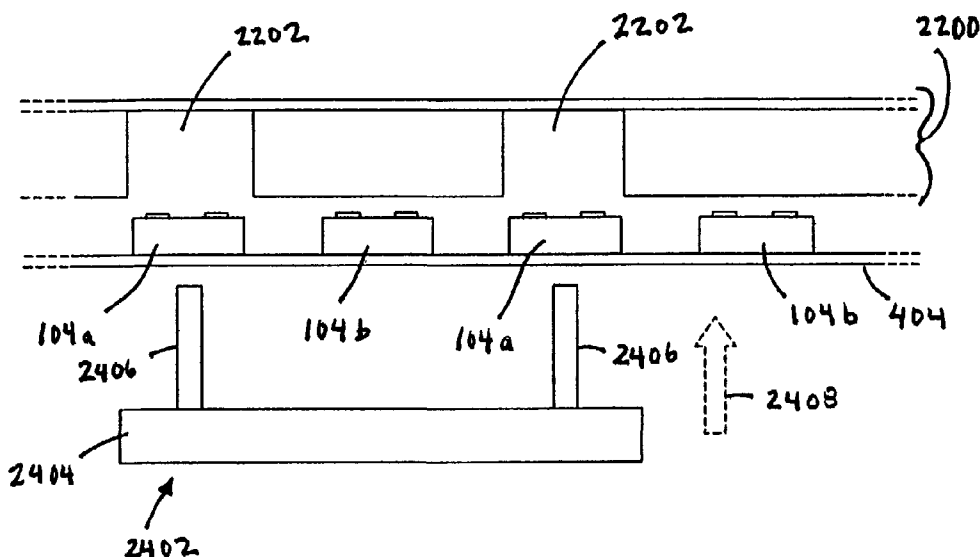
PCT

(10) International Publication Number
WO 2004/012896 A1

- (51) International Patent Classification⁷: **B23P 19/00**, H05K 3/30
- (21) International Application Number: PCT/US2003/023792
- (22) International Filing Date: 30 July 2003 (30.07.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
- | | | |
|------------|-------------------------------|----|
| 60/400,101 | 2 August 2002 (02.08.2002) | US |
| 10/322,467 | 19 December 2002 (19.12.2002) | US |
| 10/322,718 | 19 December 2002 (19.12.2002) | US |
| 10/322,701 | 19 December 2002 (19.12.2002) | US |
| 10/322,702 | 19 December 2002 (19.12.2002) | US |
| 10/429,803 | 6 May 2003 (06.05.2003) | US |
- (71) Applicant: **MATRICES, INC.** [US/US]; Columbia Corporate Park 1, 8850 Stanford Boulevard, Suite 3000, Columbia, MD 21045 (US).
- (72) Inventors: **ARNESON, Michael, R.**; 1500 Conrose Drive, Westminster, MD 21157 (US). **BANDY, William, R.**; 2406 Bell Branch Road, Gambrills, MD 21054 (US).
- (74) Agents: **SOKOHL, Robert** et al.; Sterne, Kessler, Goldstein & Fox, P.L.L.C., 1100 New York Avenue, N.W., Washington, DC 20005 (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, 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).

[Continued on next page]

(54) Title: METHOD AND APPARTUS FOR HIGH VOLUME ASSEMBLY OF RADIO FREQUENCY IDENTIFICATION TAGS



(57) Abstract: A plurality of electrical devices, such as RFID tags, that each include a die having one or more connecting pads, are produced. Dies are transferred from a wafer directly to substrates, or from the wafer to one or more intermediate surfaces before being transferred to the substrates. Dies can be transferred between surfaces using an adhesive surface mechanism and process. Dies can be alternatively transferred between surfaces using a punching mechanism and process. Dies can be alternatively transferred between surfaces using a multi-barrel die collet mechanism and process. Alternatively, a die frame is formed. Furthermore, dies are transferred using the die frame.



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

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.