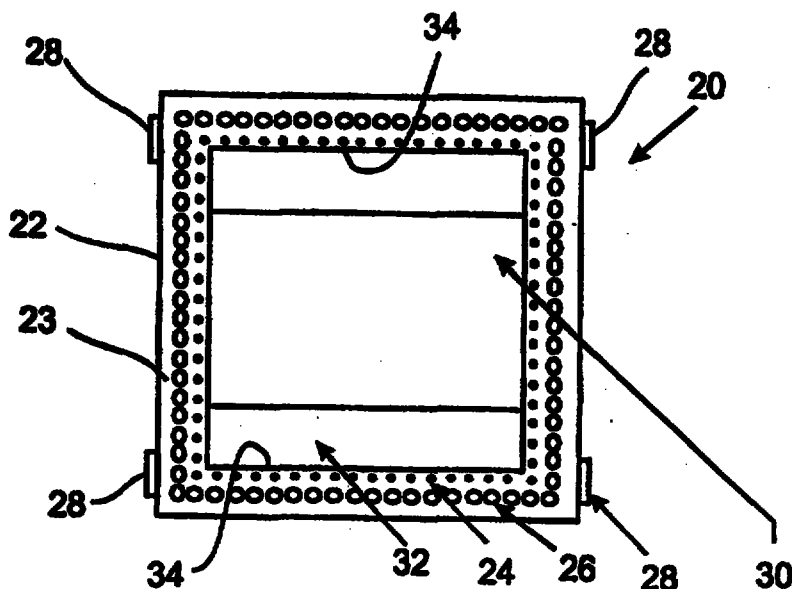




INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification ⁶ : H05K 3/34, B23K 37/04	A1	(11) International Publication Number: WO 98/56218 (43) International Publication Date: 10 December 1998 (10.12.98)
(21) International Application Number: PCT/US98/10926 (22) International Filing Date: 4 June 1998 (04.06.98) (30) Priority Data: 08/869,357 5 June 1997 (05.06.97) US (71) Applicant: COOPER INDUSTRIES, INC. [US/US]; Suite 5800, 600 Travis, Houston, TX 77002 (US). (72) Inventors: URBAN, Paul, Louis; 209 Funderburd Drive, Cheraw, SC 29520 (US). BENSUSSAN, Bernard, L.; 500 B. Golden Horseshoe Circle, Morrisville, NC 27560 (US). GORDON, Thomas, A.; 12044 Rue des Amis, San Diego, CA 92131 (US). (74) Agents: FARRELL, Martin et al.; Burns, Doane, Swecker & Mathis, L.L.P., P.O. Box 1404, Alexandria, VA 22313-1404 (US).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, GW, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>

(54) Title: FINE PITCH COMPONENT PLACEMENT METHOD AND APPARATUS



(57) Abstract

An apparatus and method for aligning fine pitch electrical components (14) and for solder paste stenciling includes a template (20, 40) for aligning an electrical component (14) and for aligning a solder stencil (60, 70). The template (20, 45) has a window (30, 50) with shelves on opposite sides. Tape is adhered to the shelves across the window (30, 50) and is used to secure the template (20, 40) to the desired location on the printed circuit board (10). The template (20, 40) also includes upright tabs that engage notches (66, 76) in the edges of the stencil for aligning the stencil (60, 70). A two-headed vacuum lifting device (120) is used to lift an aligned component (14) and an aligned stencil (60, 70) from the template. With the template (20, 40) removed from the printed circuit board (10), the stencil (60, 70) is replaced in the aligned position for solder application. The stencil (60, 70) is removed and the electrical component (14) is placed for soldering.