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(54) Title: METHOD FOR FORMING HIGH RESOLUTION ELECTRONIC CIRCUITS

(57) Abstract: A method of forming high resolution electronic circuits (10) on a substrate (12) is provided. The method includes the steps of laminating a dielectric layer (14) on a substrate (12), laser drilling channels (16 and 18) in the dielectric film (14) and the substrate (12), and filling channels (16 and 18) with a filler material (20). Further, a release layer (22) is applied to dielectric film layer (14) and filler material (20), the release layer (22) having an adhesive thereon. Release layer (22) is peeled or otherwise removed from substrate (12), leaving filler material (20) formed and shaped on substrate (12), thus producing a high resolution electronic circuit on substrate (12).





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.

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US CL: 156/248; 438/759 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) U.S.: 156/248, 257, 268, 344; 427/63, 96.1, 101, 102, 118, 271, 272, 282, 289, 290; 438/759, 780, 951; 29/25.01-25.03; 83/875			
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 practicable, search terms used)			
C. DOCUMENTS CONSIDERED TO BE RELEVANT			
Category *	Citation of document, with indication, where ap		Relevant to claim No.
Y	US 3,956,052 A (KOSTE et al) 11 May 1976 (11.5.)		1-20
Y	lines 44-56, Column 5, lines 17-22, Column 5, lines 39-50 US 5,466,325 A (MIZUNO et al) 14 November 1995 (14.11.1995), Column 2, lines 60-63, Column 2, line 65 to Column 3, line 5, Column 3, lines 32-38, and Column 5, lines 51-57		1-20
Y	US 6,245,663 B1 (ZHAO et al) 12 June 2001 (12.6.2 Column 5, lines 23-31	3,4,13, and 14	
Y	US 6,378,424 A (HAYAMA et al) 30 April 2002 (30.4.2002), column 7, lines 26-32 and column 8, lines 28-39		5, 6, 11, 12, 16, 17, and 20
Y	US 5,233,157 A (SCHREIBER et al) 03 August 1993 (3.8.1993), column 3, lines 20-35 and column 5, lines 8-17		8, 9, 18, and 19
Y	US 3,923,697 A (ELLIS) 02 December 1975 (2.12.1975), Col 16, lines 52-64		15
Further	documents are listed in the continuation of Box C.	See patent family annex.	
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