



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification<sup>5</sup> :</b>  <b>H05K 3/46</b>	<b>A3</b>	<b>(11) International Publication Number:</b> <b>WO 90/07858</b>  <b>(43) International Publication Date:</b> 12 July 1990 (12.07.90)
<b>(21) International Application Number:</b> PCT/GB89/01536 <b>(22) International Filing Date:</b> 22 December 1989 (22.12.89)  <b>(30) Priority data:</b> 8830251.8                      24 December 1988 (24.12.88) GB 8928563.9                      18 December 1989 (18.12.89) GB  <b>(71) Applicant (for all designated States except US):</b> TECHNOLOGY APPLICATIONS COMPANY LIMITED [GB/GB]; 24 Ridgeway Street, Douglas, Isle of Man (GB).  <b>(72) Inventors; and</b> <b>(75) Inventors/Applicants (for US only) :</b> LOWE, John, Michael [GB/GB]; 7 The Heights, Market Harborough, Leicester LE16 8BQ (GB). DÉVONPORT, Joseph [GB/GB]; 16 Churchill Way, Upper Bruntingthorpe, Leicestershire LE17 5QX (GB).		<b>(74) Agent:</b> GILDING, Martin; Eric Potter & Clarkson, 14 Oxford Street, Nottingham NG1 5BP (GB).  <b>(81) Designated States:</b> AT (European patent), AU, BE (European patent), BR, CH (European patent), DE (European patent), DK, ES (European patent), FI, FR (European patent), GB (European patent), IT (European patent), JP, KR, LU (European patent), NL (European patent), SE (European patent), SU, US.  <b>Published</b> <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>  <b>(88) Date of publication of the international search report:</b> 9 August 1990 (09.08.90)
<b>(54) Title:</b> IMPROVED METHOD FOR MAKING PRINTED CIRCUITS		
<b>(57) Abstract</b>  Printed circuits are produced by screen printing or the like to deposit conductors, resistors, capacitors and insulators. Cross-over connections are made by covering the conducting portions to be crossed with an insulating material that serves as a base for a printed crossing conductor. The equivalent of multilayer boards can be achieved by printing repeated layers of conductors, components and insulators on the same side of the board, or by printing on two sides of a board. Interconnection between adjacent layers can be made as a part of the printing process. A method of making a printed circuit board comprises applying a first and second coating in a desired pattern to a substrate, the substrate (12) being disposed in a different relationship to coating apparatus used in applying a second coating from the relationship in which it is disposed in applying the first coating. Preferably a number of identical boards are printed on a substrate (12) from which they are subsequently separated. The individual boards are positioned such that the same pattern may be applied when the substrate (12) is presented to coating means in any of a number of orientations each separated from the next by a fixed angle of rotation about an axis (A) at right angles to the substrate (12), the first coating being applied in one such orientation and the second after the screen and substrate respectively have been rotated in opposite directions, (S, B) each through 90°.		

# INTERNATIONAL SEARCH REPORT

International Application No PCT/GB 89/01536

<b>I. CLASSIFICATION OF SUBJECT MATTER</b> (if several classification symbols apply, indicate all) <sup>6</sup>		
According to International Patent Classification (IPC) or to both National Classification and IPC		
IPC <sup>5</sup> : H 05 K 3/46		
<b>II. FIELDS SEARCHED</b>		
Minimum Documentation Searched <sup>7</sup>		
Classification System <sup>1</sup>	Classification Symbols	
IPC <sup>5</sup>	H 05 K 3/46	
Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched <sup>8</sup>		
<b>III. DOCUMENTS CONSIDERED TO BE RELEVANT <sup>9</sup></b>		
Category <sup>9</sup>	Citation of Document, <sup>11</sup> with indication, where appropriate, of the relevant passages <sup>12</sup>	Relevant to Claim No. <sup>13</sup>
X	GB, A, 2078448 (STANDARD TELEPHONES & CABLES LTD) 6 January 1982 see page 1, line 40 - page 2, line 72; figures	1-4,7,14-15, 21-26
	--	
X	GB, A, 2181303 (ASAHI CHEMICAL RESEARCH LABORATORY CO. LTD) 15 April 1987 see page 3, lines 1-92	1-4,7,14-15, 24
	--	
A	US, A, 3981761 (NIPPON TOKI K.K.) 21 September 1976 see claim 1	5,8,12
	--	
A	EP, A, 0164921 (MURRAY, JOHN) 18 December 1985 see page 4, line 27 - page 5, line 14; ./.	5-6,8-13,16
<p><sup>9</sup> Special categories of cited documents: <sup>10</sup></p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> <p>"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</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"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.</p> <p>"&amp;" document member of the same patent family</p>		
<b>IV. CERTIFICATION</b>		
Date of the Actual Completion of the International Search	Date of Mailing of this International Search Report	
26th June 1989	16 JUL 1990	
International Searching Authority	Signature of Authorized Officer	
EUROPEAN PATENT OFFICE	MISS T. TAZELAAR	

III. DOCUMENTS CONSIDERED TO BE RELEVANT (CONTINUED FROM THE SECOND SHEET)		
Category *	Citation of Document, ** with indication, where appropriate, of the relevant passages	Relevant to Claim No.
	page 6, lines 1-5; page 6, line 11 - page 7, line 11 --	
X	EP, A, 0100144 (TEXAS INSTRUMENTS INC.) 8 February 1984 see page 26, paragraph 3 - page 29, paragraph 2 --	18-19
X	EP, A, 0078935 (PREH ELEKTROFEINMECHANISCHE WERKE JAKOB PREH. NACHF. GmbH) 18 May 1983 see claims 17,22,24 --	20,27,29
X	DE, A, 1791233 (IBM) 9 March 1972 see claim 3; column 6, lines 51-21; figure 7 --	27-28
X	GB, A, 2078448 (STANDARD TELEPHONES & CABLES LTD) 6 January 1982 see page 2, lines 65-71	30,32,37
A		33
	-----	

**ANNEX TO THE INTERNATIONAL SEARCH REPORT  
ON INTERNATIONAL PATENT APPLICATION NO.**

GB 8901536  
SA 33515

This annex lists the patent family members relating to the patent documents cited in the above-mentioned international search report. The members are as contained in the European Patent Office EDP file on 09/07/90. The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
GB-A- 2078448	06-01-82	None	
GB-A- 2181303	15-04-87	JP-A- 62076600 DE-A- 3631632 FR-A- 2588146 NL-A- 8602455 US-A- 4734156	08-04-87 02-04-87 03-04-87 16-04-87 29-03-88
US-A- 3981761	21-09-76	None	
EP-A- 0164921	18-12-85	None	
EP-A- 0100144	08-02-84	JP-A- 59033565 US-A- 4635354 US-A- 4736190	23-02-84 13-01-87 05-04-88
EP-A- 0078935	18-05-83	DE-A- 3143995 JP-A- 58180013 US-A- 4555745	19-05-83 21-10-83 26-11-85
DE-A- 1791233	09-03-72	BE-A- 651581 DE-A- 1465736 FR-E- 89790 FR-A- 1414836 US-A- 3456158 US-A- 3547604	01-12-64 06-03-69  15-07-69 15-12-70
GB-A- 2078448	06-01-82	None	