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(54) Connector with integrated PCB assembly

(57) Shielded pair or twinax connectors constructed from printed circuit board modules (30) are disclosed. The printed circuit boards (31) include mirror-image pairs of terminal conductors (32), with appropriate electrical shielding (33,36,38). The connectors can be

board-mounted or cable mounted. The cable connectors can be constructed from a PCB assembly having a cover (100) with a retention structure (102) for a cable or other flexible conductor.

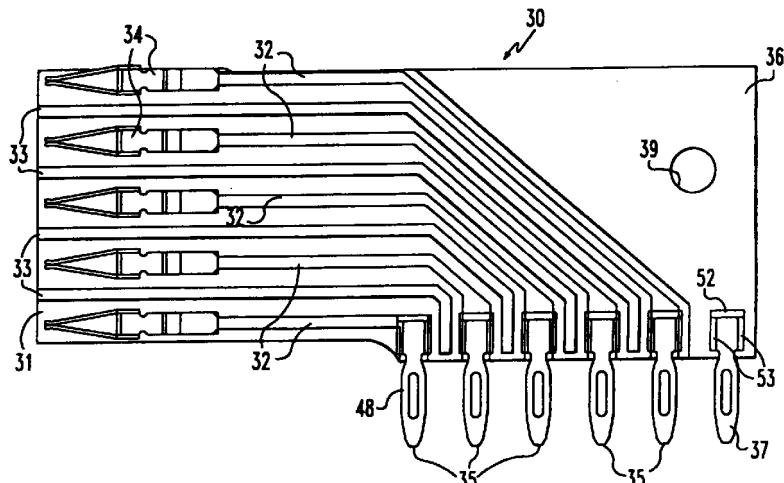


FIG.2



DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
D, P, Y	WO 97 02627 A (BERG TECH INC ;PAAGMAN BERNARDUS L (NL)) 23 January 1997 (1997-01-23) * the whole document *	1-4,6-8, 10-15	H01R23/68 H01R13/658 H05K1/02
X	---	18	
D, P, Y	EP 0 752 739 A (BERG ELECTRONICS MFG) 8 January 1997 (1997-01-08) * the whole document *	1-4,6-8, 10-15	
X	---	18	
Y	US 4 705 332 A (SADIGH-BEHZADI AMIR-AKBAR) 10 November 1987 (1987-11-10) * column 5, line 33 - column 6, line 42 * * column 7, line 59-65; figures 1-17,22 *	1-4,6-8, 10-15	
A	---		
A	KATZIER H ET AL: "FIELD-BASED DESIGN OF A NEW HIGH PINCOUNT BOARD CONNECTOR FOR HIGH FIELD-BESED DESIGN OF E NEW HIGH PINCOUNT BOARD CONNECTOR FOR HIGH DATA RATE TRANSMISSION" 1996 PROCEEDINGS OF THE 46TH. ELECTRONIC COMPONENTS AND TECHNOLOGY CONFERENCE, ORLANDO, MAY 28 - 31, 1996, no. CONF. 46, 28 May 1996 (1996-05-28), pages 456-459, XP000684919 INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS	1,11,15	
A	---		
Y	EP 0 442 643 A (GORE W L & ASS UK) 21 August 1991 (1991-08-21) * column 1, line 27 - column 2, line 18 * * column 2, line 54 - column 4, line 22; figures 1-6 *	1,11,15 18	
A	---		
A	US 4 338 717 A (DAMON NEIL F) 13 July 1982 (1982-07-13) * column 2, line 53 - column 4, line 19; figures 1-3 *	1,11,15	

	-/-		
The present search report has been drawn up for all claims			
Place of search	Date of completion of the search	Examiner	
THE HAGUE	31 August 1999	Schaap, E	
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone	T : theory or principle underlying the invention		
Y : particularly relevant if combined with another document of the same category	E : earlier patent document, but published on, or after the filing date		
A : technological background	D : document cited in the application		
O : non-written disclosure	L : document cited for other reasons		
P : intermediate document	& : member of the same patent family, corresponding document		



European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 97 12 2940

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
Y	US 5 122 065 A (DUDEK THOMAS J ET AL) 16 June 1992 (1992-06-16)	18	TECHNICAL FIELDS SEARCHED (Int.Cl.6)
A	* the whole document *	16,17	
A	---		
A	JP 08 167457 A (KEL CORP) 25 June 1996 (1996-06-25)	1,11,15,	
	& US 5 679 008 A (TAKAHASHI HISAFUMI ET AL) 21 October 1997 (1997-10-21)	18	
	* column 3, line 37 - column 6, line 18; figures 1-7B *		
Y	US 5 122 077 A (SAMEJIMA MASAKUNI ET AL) 16 June 1992 (1992-06-16)	18	
	* column 3, line 54 - column 7, line 49; figures 3-18 *		

The present search report has been drawn up for all claims			
Place of search	Date of completion of the search		Examiner
THE HAGUE	31 August 1999		Schaap, E
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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

EP 97 12 2940

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

31-08-1999

Patent document cited in search report		Publication date		Patent family member(s)		Publication date
WO 9702627	A	23-01-1997		EP 0752739 A		08-01-1997
				EP 0836756 A		22-04-1998
EP 0752739	A	08-01-1997		EP 0836756 A		22-04-1998
				WO 9702627 A		23-01-1997
US 4705332	A	10-11-1987		CA 1244531 A		08-11-1988
				EP 0212764 A		04-03-1987
				JP 62035472 A		16-02-1987
EP 0442643	A	21-08-1991		DE 69112658 D		12-10-1995
				DE 69112658 T		21-03-1996
				JP 5135824 A		01-06-1993
US 4338717	A	13-07-1982		CA 1165460 A		10-04-1984
				DE 3134381 A		19-08-1982
				FR 2489611 A		05-03-1982
				GB 2083289 A,B		17-03-1982
				JP 1307088 C		13-03-1986
				JP 57078787 A		17-05-1982
				JP 60034237 B		07-08-1985
US 5122065	A	16-06-1992		JP 2505956 B		12-06-1996
				JP 5205818 A		13-08-1993
JP 08167457	A	25-06-1996		JP 2728372 B		18-03-1998
				US 5679008 A		21-10-1997
US 5122077	A	16-06-1992		JP 1670446 C		12-06-1992
				JP 2223171 A		05-09-1990
				JP 3038708 B		11-06-1991
				JP 1734767 C		17-02-1993
				JP 2148583 A		07-06-1990
				JP 4024835 B		28-04-1992
				DE 3938964 A		31-05-1990

**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing more than ten claims.

Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):

No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:



The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. Claims: 1-17

a connector having a circuit module with a longitudinal plane and a pair of signal conductors, each of said pair being the mirror-image of the other about the longitudinal plane; or the module for the connector.

2. Claim : 18

a connector having a plurality of circuit board modules, each module including traces and a cover with an integrally formed retaining structure for retaining flexible conductors.