



(11)

EP 2 259 379 A3

(12)

EUROPEAN PATENT APPLICATION

(88) Date of publication A3:
02.03.2011 Bulletin 2011/09

(51) Int Cl.:
H01Q 3/32 (2006.01) H01P 1/18 (2006.01)
H01Q 1/24 (2006.01)

(43) Date of publication A2:
08.12.2010 Bulletin 2010/49

(21) Application number: 10163719.7

(22) Date of filing: 24.05.2010

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO
PL PT RO SE SI SK SM TR
Designated Extension States:
BA ME RS

(30) Priority: 22.05.2009 IE 20090401

(71) Applicant: Alpha Wireless Limited
Ireland (IR)

(72) Inventors:
• Lawlor, Fergal
County Laoise (IE)
• Trejtnar, Zdenek
Northampton, Northamptonshire (GB)

(74) Representative: Schütte, Gearoid et al
Cruickshank & Company
8A Sandyford Business Centre
Sandyford
Dublin 18 (IE)

(54) A phase shifter

(57) The present invention is directed to a phase shifter comprising a primary printed circuit board (PCB) having at least an arcuate co-centric unconnected double track printed thereon, and, a secondary PCB having printed thereon at least an arcuate co-centric double track connected by a radially extending link track located at neighbouring ends of the double track; whereby, the secondary PCB is rotatably mounted on the primary PCB such that the arcuate co-centric double tracks on both PCBs partially overlap one another so as to be in electrical communication with one another. The advantage of providing arcuate co-centric tracks on the secondary PCB and the primary PCB is that rotation of the secondary PCB may be used to increase the length of the completed track circuit rather than a translational movement of the secondary PCB. Therefore, no additional area on the primary PCB has to be reserved to accommodate the movement of the secondary PCB. A variable phase shifter and a differential phase shifter may also be constructed in analogous manners.

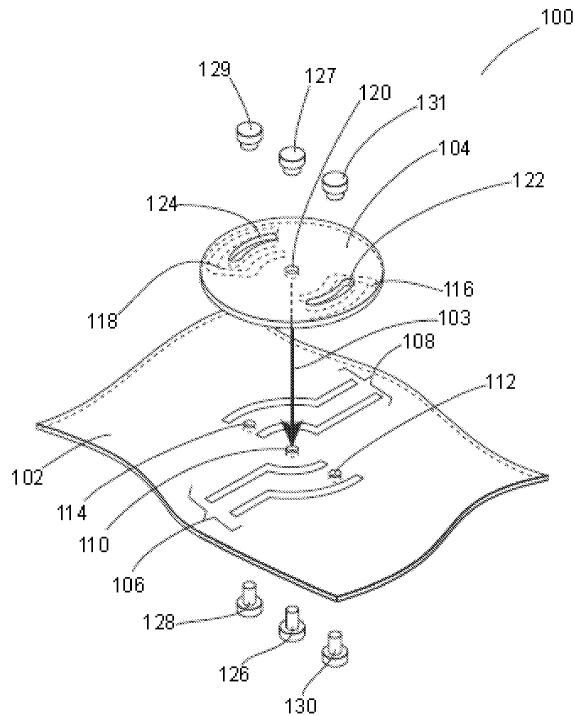


Fig. 1



EUROPEAN SEARCH REPORT

Application Number
EP 10 16 3719

DOCUMENTS CONSIDERED TO BE RELEVANT			CLASSIFICATION OF THE APPLICATION (IPC)
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	
X	JP 58 075901 A (NIPPON ELECTRIC CO) 7 May 1983 (1983-05-07) * the whole document * -----	1-3,9	INV. H01Q3/32
Y	-----	6-8	H01P1/18
X	JP 5 014004 A (FUJITSU LTD) 22 January 1993 (1993-01-22) * the whole document * -----	1-3,9	H01Q1/24
Y	-----	6-8	
X	WO 03/036759 A1 (QINETIQ LTD [GB]; THOMAS LOUIS DAVID [GB]) 1 May 2003 (2003-05-01) * pages 20-29; figures 6-16 * -----	1-5,9-14	
Y	-----	6-8	
X	WO 03/036756 A2 (QINETIQ LTD [GB]; THOMAS LOUIS DAVID [GB]) 1 May 2003 (2003-05-01) * the whole document * -----	1-5,9-11	
Y	-----		
Y	US 2005/219133 A1 (ELLIOT ROBERT D [US]) 6 October 2005 (2005-10-06) * paragraph [0050]; figures 5,6 * -----	6	
Y	-----		
Y	US 2005/046514 A1 (JANOSCHKA DARIN M [US]) 3 March 2005 (2005-03-03) * paragraph [0006]; figure 1 * -----	7,8	TECHNICAL FIELDS SEARCHED (IPC)
			H01Q H01P
The present search report has been drawn up for all claims			
1	Place of search Munich	Date of completion of the search 21 January 2011	Examiner Ribbe, Jonas
CATEGORY OF CITED DOCUMENTS <p>EPO FORM 1503 03.82 (P04C01)</p> <p>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</p> <p>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</p>			

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

EP 10 16 3719

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.

21-01-2011

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
JP 58075901	A	07-05-1983	NONE		
JP 5014004	A	22-01-1993	NONE		
WO 03036759	A1	01-05-2003	CA 2461967 A1	01-05-2003	
			CN 1572044 A	26-01-2005	
			EP 1438765 A1	21-07-2004	
			JP 2005506789 T	03-03-2005	
			MX PA04002701 A	05-07-2004	
			US 2004246175 A1	09-12-2004	
WO 03036756	A2	01-05-2003	AT 331313 T	15-07-2006	
			AU 2002321653 B2	28-09-2006	
			CA 2461480 A1	01-05-2003	
			CN 1575530 A	02-02-2005	
			CN 101436711 A	20-05-2009	
			CN 101593868 A	02-12-2009	
			DE 60212682 T2	28-06-2007	
			EP 1442501 A2	04-08-2004	
			ES 2263804 T3	16-12-2006	
			HK 1074534 A1	12-03-2010	
			JP 2005506788 T	03-03-2005	
			JP 2009050029 A	05-03-2009	
			MX PA04003126 A	27-07-2004	
			RU 2277740 C2	10-06-2006	
			US 2004209572 A1	21-10-2004	
US 2005219133	A1	06-10-2005	NONE		
US 2005046514	A1	03-03-2005	AU 2004269748 A1	10-03-2005	
			BR PI0413398 A	17-10-2006	
			CA 2537265 A1	10-03-2005	
			CN 1864302 A	15-11-2006	
			EP 1665338 A2	07-06-2006	
			JP 2007508723 T	05-04-2007	
			MX PA06002149 A	22-05-2006	
			WO 2005022601 A2	10-03-2005	