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(54) **Miniaturized multi-band antenna**

(57) A multi-band antenna (20, 40) includes a bent flat copper antenna forming a radiation surface (S2) to provide GSM-850/900/1800/1900 or GPS multi-band applications, and an auxiliary antenna (28, 48) coupled to the radiation surface (S2) provide WCDMA-2100 /

UMTS-2100 multi-band applications. The radiation surface (S2) and the auxiliary antenna (28, 48) are coupled to generate the required bandwidth for multiple radiation bands and to optimize the gain of radiation, so that the multi-band antenna (20, 40) can provide a broad range of services.

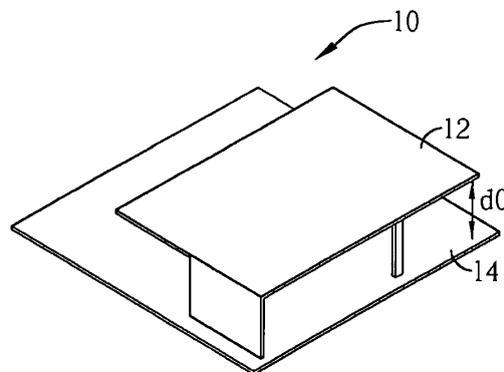


Fig. 1 Prior art

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DOCUMENTS CONSIDERED TO BE RELEVANT				
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)	
X	US 2004/080457 A1 (GUO YONGXIN [SG] ET AL) 29 April 2004 (2004-04-29)	1-5,10, 13	INV. H01Q1/24 H01Q1/36 H01Q9/42 H01Q5/00	
Y	* paragraphs [0042] - [0045] * * figures 4,6 *	6-9,12		
X	DE 103 41 310 A1 (HITACHI CABLE [JP]) 18 March 2004 (2004-03-18)	1-5,10, 11,13		
X	* paragraph [0024] - paragraph [0036] * * figure 5 *			
X	US 2004/090378 A1 (DAI HSIN KUO [TW] ET AL) 13 May 2004 (2004-05-13)	1-5,11, 13		
X	* paragraphs [0012] - [0019] * * figure 1 *			
X	EP 1 750 323 A (SONY ERICSSON MOBILE COMM AB [SE]) 7 February 2007 (2007-02-07)	1-3,5,10		
Y	* paragraphs [0059] - [0063] * * figures 9,11A,12A,12B *			
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Y	* paragraph [0019] * * figure 4a *			
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Y	* page 7, line 16 - page 8, line 13 * * figures 1a.1c,2a-2c *			
Y	EP 1 432 072 A (FILTRONIC LK OY [FI]) 23 June 2004 (2004-06-23)	12		
Y	* paragraph [0008] * * figure 1 *			
The present search report has been drawn up for all claims				
6	Place of search Munich	Date of completion of the search 12 August 2008	Examiner Kruck, Peter	
CATEGORY OF CITED DOCUMENTS		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		
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				

EPO FORM 1503 03.82 (P04C01)

**CLAIMS INCURRING FEES**

The present European patent application comprised at the time of filing claims for which payment was due.

- Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for those claims for which no payment was due 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 those claims for which no payment was due.

**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 present supplementary 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 (Rule 164 (1) EPC).



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: 1-5,10,11,13

multiband antenna comprising a coupling portion and first to  
third radiation portions

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2. claims: 6-9

mounting positions/means for coupling portion and first to  
third radiation portions

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3. claim: 12

shape of third radiation portion

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

EP 08 00 2385

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.

12-08-2008

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