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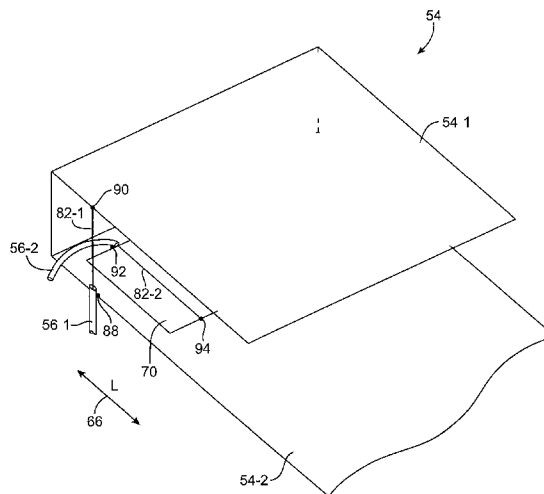
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[Continued on next page]

(54) Title: ANTENNAS FOR HANDHELD ELECTRONIC DEVICES



(57) Abstract: Handheld electronic devices are provided that contain wireless communications circuitry having at least one antenna. The antenna may have a planar ground element and a planar resonating element. The planar ground element may have a rectangular shape that matches a rectangular housing shape for a handheld electronic device. A dielectric-filled slot may be formed in one end of the planar ground element. The planar resonating element may be located above the slot. The antenna may be a hybrid antenna that contains both a slot antenna structure formed from the slot and a planar inverted-F structure formed from the planar resonating element and the planar ground element. The antenna may be fed using a single transmission line or two transmission lines. With two transmission lines, one transmission line may be associated with the slot antenna structure and one transmission line may be associated with the planar inverted-F antenna structure.



WO 2008/086100 A3



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**A. CLASSIFICATION OF SUBJECT MATTER**

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**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)  
**HOIQ**

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 practical, search terms used)

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**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	EP 1 401 050 A (FILTRONIC LK OY [FI] PULSE FINLAND OY [FI]) 24 March 2004 (2004-03-24) the whole document	1-30
X	US 2004/017318 A1 (ANNABI AYOUB [FR] ET AL) 29 January 2004 (2004-01-29) the whole document	1-30
X	WO 2004/001894 A (FRACTUS SA [ES]; GALA GALA DAVID [ES]; PUENTE BALIARDA CARLES [ES]; SO) 31 December 2003 (2003-12-31) the whole document	1-30
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- 'X1' document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- 'Y1' 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.
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## C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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