

Title (en)  
Multi-frequency antenna

Title (de)  
Mehrfrequenzantenne

Title (fr)  
Antenne multifréquence

Publication  
**EP 1560287 B1 20130417 (EN)**

Application  
**EP 04002213 A 20040202**

Priority  
EP 04002213 A 20040202

Abstract (en)  
[origin: EP1560287A1] A multi-frequency antenna includes a antenna body, a patch antenna, and a ground plane. The antenna body has first and second radiation arms, a feed-in terminal, and a ground terminal disposed in one side of the antenna body for signal feeding, and grounding. The first and second radiation arms are arranged in a symmetrically inward spiral structure. Two current paths with different lengths are created, along with the two radiation arms from the feed-in terminal, and thereby the antenna is operable at two frequencies. An additional patch antenna can be disposed beside the antenna body to allow the antenna to have more operational frequencies. In practice, the length of the patch antenna can be designed according to the bandwidth of Bluetooth signals to meet the requirement of Bluetooth communication. The ground plane is disposed beneath the antenna body and the patch antenna for the purpose of grounding of the antenna's signals. In implementation, a section of the ground plane, which is above the endfire direction, can be hollowed to increase antenna's bandwidth. The hollowed section can also be used to dispose other components to increase the component density.

IPC 8 full level  
**H01Q 1/24** (2006.01); **H01Q 5/00** (2006.01); **H01Q 5/371** (2015.01); **H01Q 5/40** (2015.01); **H01Q 9/04** (2006.01); **H01Q 21/28** (2006.01)

CPC (source: EP)  
**H01Q 1/243** (2013.01); **H01Q 5/371** (2015.01); **H01Q 5/40** (2015.01); **H01Q 9/0421** (2013.01); **H01Q 21/28** (2013.01)

Citation (examination)  
• US 2003160728 A1 20030828 - FUKUSHIMA SUSUMU [JP], et al  
• WO 0117063 A1 20010308 - ERICSSON TELEFON AB L M [SE]  
• FU-REN HSIAO ET AL: "A dual-band planar inverted-F patch antenna with a branch-line slit", MICROWAVE AND OPTICAL TECHNOLOGY LETTERS, JOHN WILEY, NEW YORK, NY, US, vol. 32, no. 4, 20 February 2002 (2002-02-20), pages 310 - 312, XP002246573, ISSN: 0895-2477, DOI: 10.1002/MOP.10163

Cited by  
EP1858113A1

Designated contracting state (EPC)  
DE FR GB

DOCDB simple family (publication)  
**EP 1560287 A1 20050803; EP 1560287 B1 20130417**

DOCDB simple family (application)  
**EP 04002213 A 20040202**