



US 20090195458A1

(19) **United States**

(12) **Patent Application Publication**  
**Chiang**

(10) **Pub. No.: US 2009/0195458 A1**

(43) **Pub. Date: Aug. 6, 2009**

(54) **ANTENNA**

**Publication Classification**

(75) Inventor: **Yuh-Yuh Chiang**, Taipei (TW)

(51) **Int. Cl.**  
**H01Q 9/04** (2006.01)

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(52) **U.S. Cl.** ..... **343/700 MS**

(57) **ABSTRACT**

(73) Assignee: **WISTRON NEWEB CORP.**,  
Taipei Hsien (TW)

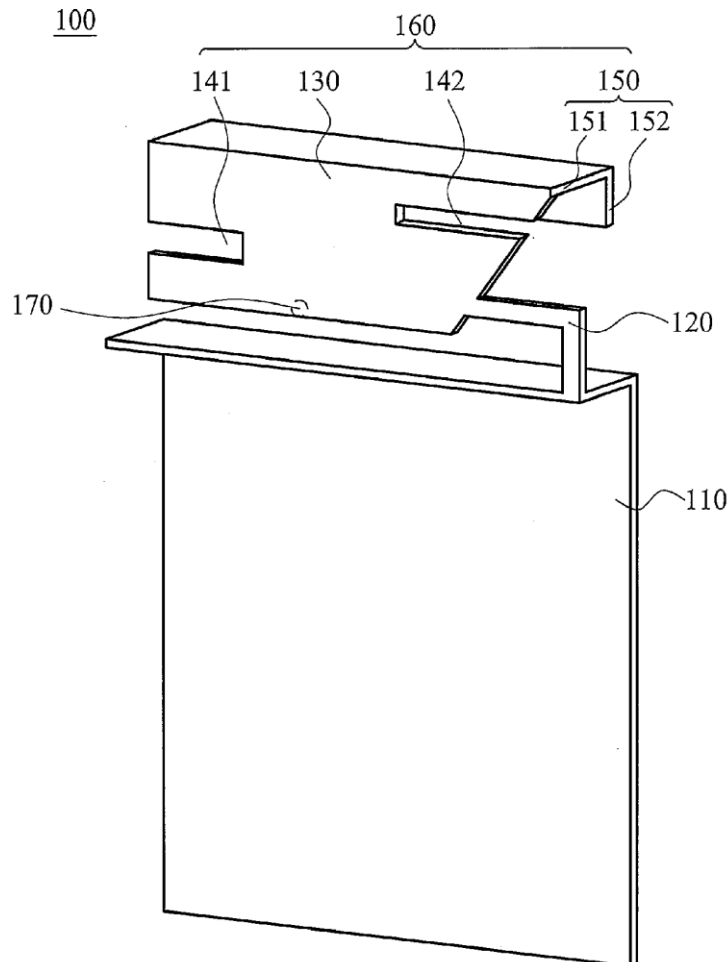
An antenna is provided. The antenna has a ground element, a radiator and a conductive element. The radiator has a body, wherein the body has a first edge, a second edge, a third edge and a fourth edge, and the first edge is parallel to the third edge, a length of the first edge is shorter than a length of the third edge, the first edge is close to the ground element, the second edge connects the first edge and the third edge, a fourth edge connects the first edge and the third edge, and a first slot is formed on the radiator. The second edge and the fourth edge extend separately from the first edge to the third edge. The conductive element connects the ground element and the radiator.

(21) Appl. No.: **12/172,879**

(22) Filed: **Jul. 14, 2008**

(30) **Foreign Application Priority Data**

Jan. 31, 2008 (TW) ..... TW97202097





US 20090195459A1

(19) **United States**

(12) **Patent Application Publication**  
**Chua**

(10) **Pub. No.: US 2009/0195459 A1**

(43) **Pub. Date: Aug. 6, 2009**

(54) **ULTRA WIDEBAND ANTENNA**

**Publication Classification**

(75) Inventor: **Lye-Whatt Chua, Surrey (GB)**

(51) **Int. Cl.**  
**H01Q 9/04** (2006.01)

Correspondence Address:  
**LOWE HAUPTMAN & BERNER, LLP**  
**1700 DIAGONAL ROAD, SUITE 300**  
**ALEXANDRIA, VA 22314 (US)**

(52) **U.S. Cl.** ..... **343/700 MS; 29/600**

(57) **ABSTRACT**

(73) Assignee: **Thales Holdings UK PLC,**  
**Addlestone, Surrey (GB)**

An antenna printed on a dielectric substrate having a radiating element and a transmission line printed on a front surface of the dielectric substrate and a ground element printed on a back surface of the dielectric substrate. The radiating element has a tapered shape with a narrow end connected to a first end of the transmission line, and two opposing edges of the radiating element contiguous to the transmission line. The radiating element further has a v-shaped notch distal from the first end of the transmission line wherein a broader end of the v-shaped notch having two opposing ends contiguous to the opposing edges of the radiating element thereby forming a two symmetrical lobes which diverge with increasing distance from the first end of the transmission line. The opposing edges of the radiating element further having a plurality of serrations along its length thereby forming a slow wave structure for signal propagating along the edges.

(21) Appl. No.: **12/301,684**

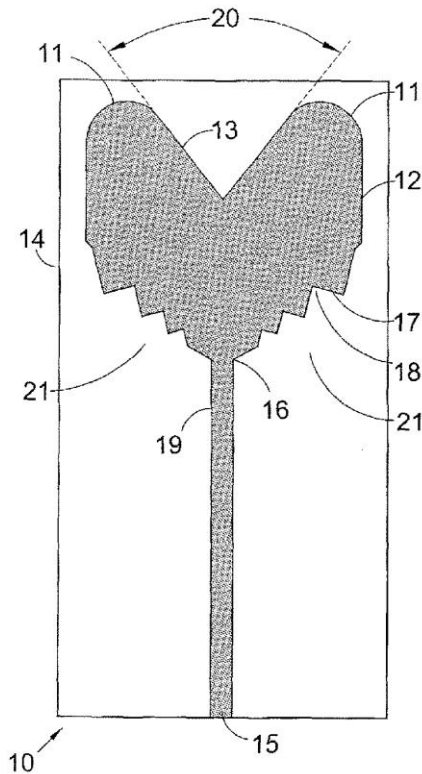
(22) PCT Filed: **Jun. 13, 2007**

(86) PCT No.: **PCT/EP07/55842**

§ 371 (c)(1),  
(2), (4) Date: **Nov. 20, 2008**

(30) **Foreign Application Priority Data**

Jun. 13, 2006 (GB) ..... 0611673.5





US 20090195462A1

(19) **United States**

(12) **Patent Application Publication**

**Lai et al.**

(10) **Pub. No.: US 2009/0195462 A1**

(43) **Pub. Date: Aug. 6, 2009**

(54) **ANTENNA AND COMMUNICATION DEVICE**

(30) **Foreign Application Priority Data**

(75) Inventors: **Ming-Iu Lai**, Taipei (TW);  
**Chun-Hsiung Wang**, Taipei (TW)

Feb. 4, 2008 (TW) ..... 97104266

**Publication Classification**

Correspondence Address:  
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OFFICE  
7 FLOOR-1, NO. 100, ROOSEVELT ROAD, SEC-  
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TAIPEI 100 (TW)**

(51) **Int. Cl.**  
**H01Q 1/38** (2006.01)  
**H01Q 1/24** (2006.01)

(52) **U.S. Cl.** ..... **343/702; 343/700 MS**

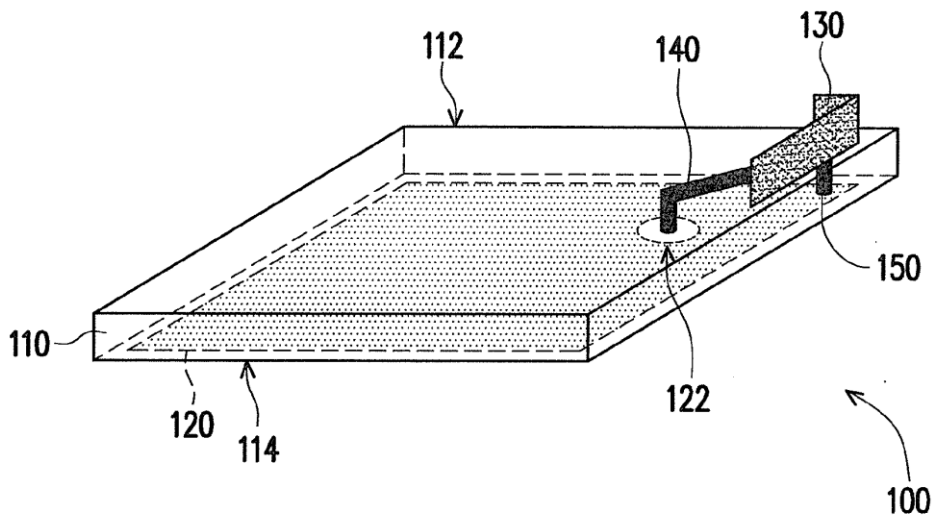
(57) **ABSTRACT**

An antenna including a substrate, a ground layer, a conductive sheet and a feeding microstrip line is provided. The substrate has an upper surface and a lower surface. The ground layer is disposed at the lower surface. The conductive sheet is disposed at the substrate, substantially perpendicular to the ground layer and electrically connected to the ground layer. The feeding microstrip line is electrically connected to the conductive sheet. The antenna may be used in a communication device.

(73) Assignee: **ASUSTeK COMPUTER INC.**,  
Taipei (TW)

(21) Appl. No.: **12/266,538**

(22) Filed: **Nov. 6, 2008**





US 20090195463A1

(19) **United States**

(12) **Patent Application Publication**  
**Kim et al.**

(10) **Pub. No.: US 2009/0195463 A1**

(43) **Pub. Date: Aug. 6, 2009**

(54) **ANTENNA AND PORTABLE TERMINAL HAVING THE SAME**

(30) **Foreign Application Priority Data**

Apr. 21, 2006 (KR) ..... 10-2006-0036433

(76) Inventors: **Mun-Gyu Kim**, Bucheon (KR);  
**Jong-Hyun Park**, Seoul (KR)

**Publication Classification**

Correspondence Address:  
**LEE, HONG, DEGERMAN, KANG & WAIMEY**  
660 S. FIGUEROA STREET, Suite 2300  
LOS ANGELES, CA 90017 (US)

(51) **Int. Cl.**  
**H01Q 1/24** (2006.01)  
**H01Q 1/10** (2006.01)

(52) **U.S. Cl.** ..... **343/702; 343/901**

(21) Appl. No.: **12/398,776**

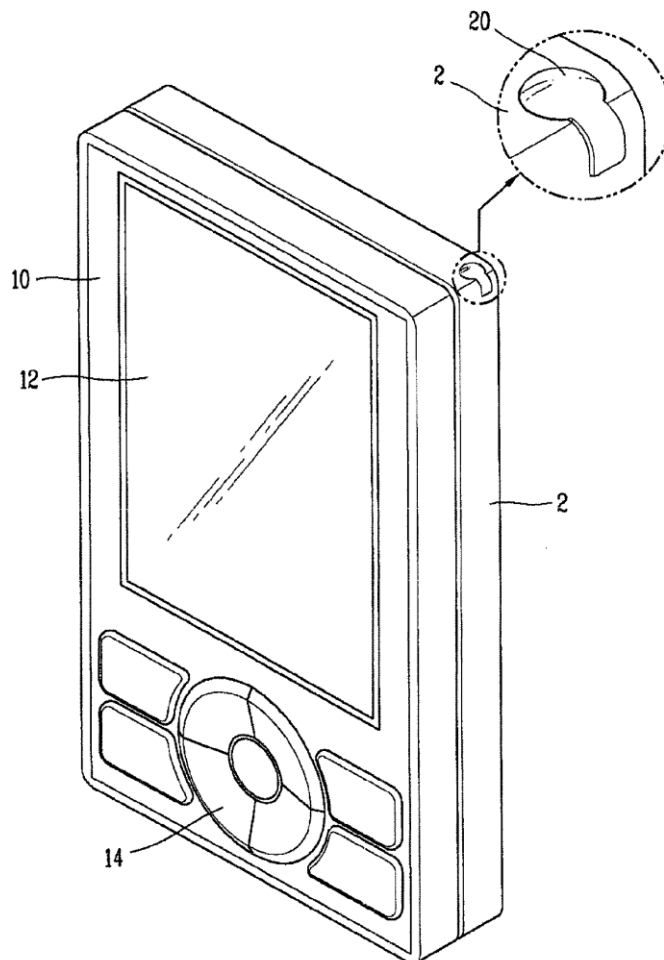
(57) **ABSTRACT**

(22) Filed: **Mar. 5, 2009**

The present invention relates to a portable terminal including a terminal body and a retractable antenna operatively connected to the terminal body and capable of being retractably housed into and withdrawn out of the terminal body. The retractable antenna includes a base rotatably supported at the terminal body, an antenna rod connected with the base and including at least one telescoping member for extending a length of the antenna rod, and a pivot connection unit connecting the base to the antenna rod and allowing the antenna rod to pivot with respect to the base.

**Related U.S. Application Data**

(63) Continuation of application No. 11/737,645, filed on Apr. 19, 2007, now Pat. No. 7,545,332.





US 20090195466A1

(19) **United States**

(12) **Patent Application Publication**  
**Tsai et al.**

(10) **Pub. No.: US 2009/0195466 A1**

(43) **Pub. Date: Aug. 6, 2009**

(54) **ANTENNA FOR A WIRELESS PERSONAL AREA NETWORK**

(30) **Foreign Application Priority Data**

Feb. 4, 2008 (TW) ..... 097104200

(75) Inventors: **Tiao-Hsing Tsai**, Yungho City (TW); **Chao-Hsu Wu**, Lu Chu Hsiang (TW); **Chi-Yin Fang**, Pingtung City (TW)

**Publication Classification**

(51) **Int. Cl.**  
**H01Q 11/12** (2006.01)

(52) **U.S. Cl.** ..... **343/741**

Correspondence Address:  
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**BOSTON, MA 02110-1618 (US)**

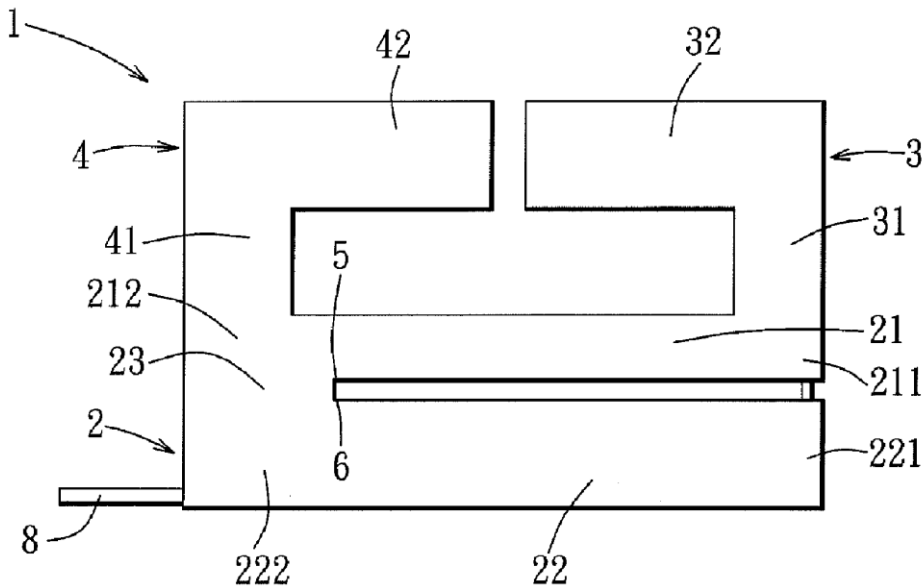
(57) **ABSTRACT**

An antenna includes a loop radiating element, and first and second radiating arms. The loop radiating element includes first and second segments, each of which has opposite first and second ends, and an intermediate segment that interconnects the second ends of the first and second segments thereof. The first and second radiating arms extend outwardly and respectively from the first and second ends of the first segment of the loop radiating element.

(73) Assignee: **QUANTA COMPUTER INC.**,  
Kuei Shan Hsiang (TW)

(21) Appl. No.: **12/169,362**

(22) Filed: **Jul. 8, 2008**





US 20090195469A1

(19) **United States**

(12) **Patent Application Publication**  
**LIM et al.**

(10) **Pub. No.: US 2009/0195469 A1**

(43) **Pub. Date: Aug. 6, 2009**

(54) **ANTENNA SYSTEM AND ANTENNA THEREOF**

**Publication Classification**

(76) Inventors: **Chan-Ping LIM**, San Diego, CA (US); **Tsung-Ying TSAI**, Yanchao Town (TW)

(51) **Int. Cl.**  
**H01Q 13/10** (2006.01)

(52) **U.S. Cl.** ..... **343/770**

(57) **ABSTRACT**

Correspondence Address:  
**HOLLAND & KNIGHT LLP**  
**10 ST. JAMES AVENUE**  
**BOSTON, MA 02116-3889 (US)**

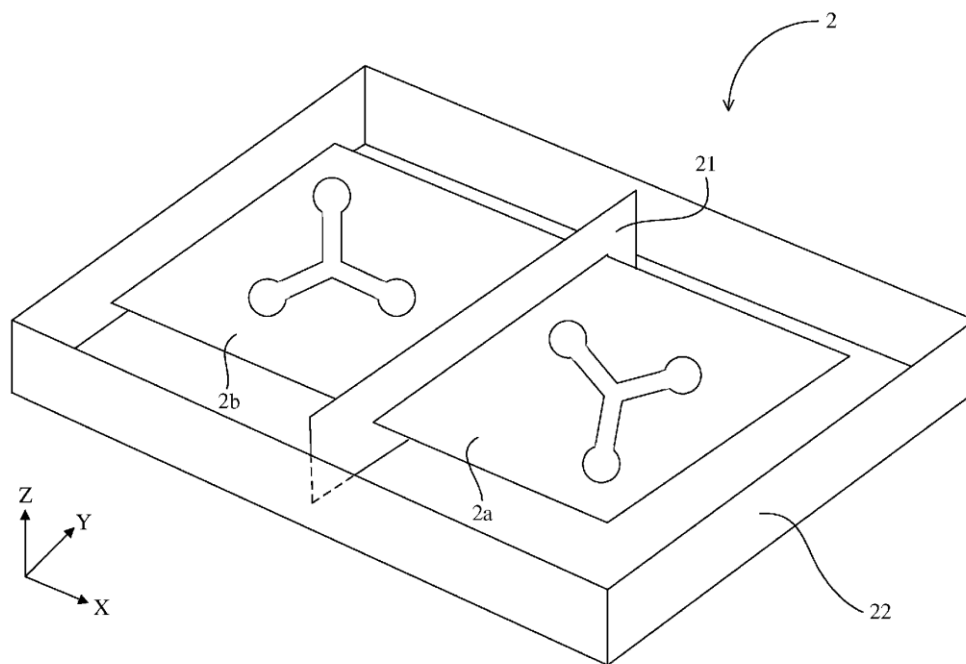
An antenna system and an antenna thereof are provided. The antenna system comprises an antenna array including a plurality of antennas and at least one plate. The at least one plate is used for isolating two neighbor ones of the antennas. Each of the antennas comprises a first surface and a second surface. The first surface has a metal area and a slot area. The metal area is coated by a metal material, while the slot area consists of three slots. Each of the slots comprises a first area and a second area. The first areas are connected to each other, and each of the second areas extends to different directions individually. The second surface is coated by a metal line as a signal feed end. The metal line terminates at an opposite position of a signal feed slot, which is one of the three slots.

(21) Appl. No.: **12/057,848**

(22) Filed: **Mar. 28, 2008**

(30) **Foreign Application Priority Data**

Jan. 31, 2008 (TW) ..... 097103700





US 20090195471A1

(19) **United States**

(12) **Patent Application Publication**  
**Semonov**

(10) **Pub. No.: US 2009/0195471 A1**

(43) **Pub. Date: Aug. 6, 2009**

(54) **MULTI-ELEMENT BROADBAND  
OMNI-DIRECTIONAL ANTENNA ARRAY**

**Publication Classification**

(51) **Int. Cl.**  
**H01Q 21/00** (2006.01)  
**H01Q 9/16** (2006.01)

(76) **Inventor: Kostyantyn Semonov, Irvine, CA  
(US)**

(52) **U.S. CL. .... 343/810**

(57) **ABSTRACT**

Correspondence Address:  
**Myers Andras Sherman LLP**  
**19900 MacArthur Blvd., Suite 1150**  
**Irvine, CA 92612 (US)**

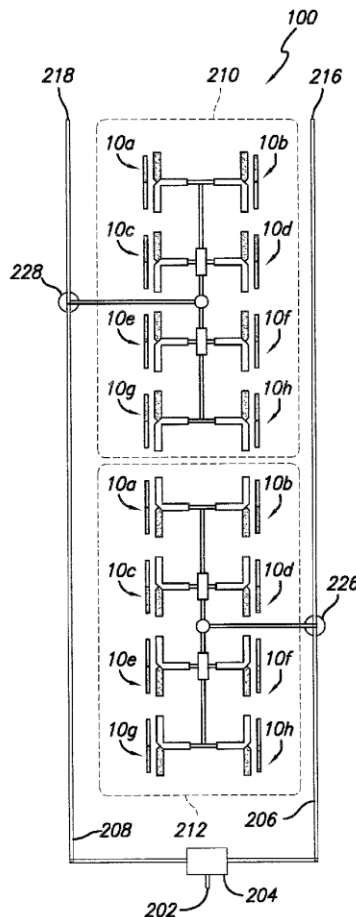
A broad beam width antenna array, preferably having 360 degrees of azimuth coverage, which also has broad frequency bandwidth, for use in a wireless network system is disclosed. In a preferred embodiment the antenna array comprises a planar dielectric substrate, micro strip elements on both sides of the dielectric substrate, and a corporate feed structure employing parasitic conductive beam width enhancing tubes as feed line conduits. The antenna array comprises dipole radiating elements formed on both sides of the dielectric substrate and a balanced feed network feeding each dipole arm. The shape of the dipole is symmetric and the overall structure, including feed network, preferably has a  $\Gamma$ -shape when viewed from either side of the dielectric substrate. Disposed proximate to each dipole arm are bandwidth enhancement coplanar micro strips which are parallel to each dipole arm and at least partially overlapping each other.

(21) **Appl. No.: 12/365,767**

(22) **Filed: Feb. 4, 2009**

**Related U.S. Application Data**

(60) **Provisional application No. 61/026,675, filed on Feb. 6, 2008.**





US 20090195472A1

(19) **United States**

(12) **Patent Application Publication**  
**Rambeau et al.**

(10) **Pub. No.: US 2009/0195472 A1**

(43) **Pub. Date: Aug. 6, 2009**

(54) **DIVERSITY ANTENNA ASSEMBLY FOR WIRELESS COMMUNICATION EQUIPMENT**

(86) PCT No.: **PCT/IB2006/051527**

§ 371 (c)(1),  
(2), (4) Date: **Apr. 8, 2009**

(75) Inventors: **Vincent Rambeau**, Cormelles Le Royal (FR); **Jan Van Sinderen**, Liempde (NL); **Johannes H. A. Brekelmans**, Nederweert (NL); **Marc G. M. Notten**, Elsloo (NL)

(30) **Foreign Application Priority Data**

May 30, 2005 (EP) ..... 05300431.3

**Publication Classification**

(51) **Int. Cl.**  
**H01Q 9/42** (2006.01)  
**H01Q 7/00** (2006.01)

(52) **U.S. Cl.** ..... **343/829; 343/866**

(57) **ABSTRACT**

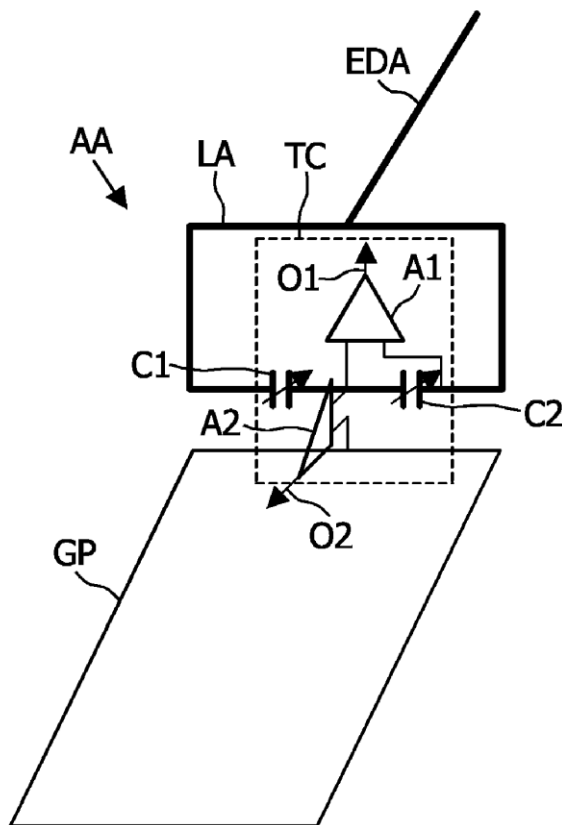
An antenna assembly (AA), for wireless communication equipment, comprises i) an antenna structure comprising at least a loop type antenna (LA) arranged to deliver a first current when it is used in a balanced mode and/or a second current when it is used in an unbalanced mode with respect to a ground plane (GP) from received radio signals, and E) current extraction means (A1) coupled to the antenna structure (LA) and arranged to be placed in at least a first state in which they deliver the first or second current and a second state in which they simultaneously deliver the first and second currents either separately or mixed together.

Correspondence Address:  
**NXP, B.V.**  
**NXP INTELLECTUAL PROPERTY & LICENSING**  
**M/S41-SJ, 1109 MCKAY DRIVE**  
**SAN JOSE, CA 95131 (US)**

(73) Assignee: **NXP B.V.**, Eindhoven (NL)

(21) Appl. No.: **11/915,812**

(22) PCT Filed: **May 16, 2006**







US 20090195473A1

(19) **United States**

(12) **Patent Application Publication**  
**Ke et al.**

(10) **Pub. No.: US 2009/0195473 A1**

(43) **Pub. Date: Aug. 6, 2009**

(54) **MULTI-BAND ANTENNA**

(30) **Foreign Application Priority Data**

(75) Inventors: **Yun-Lung Ke**, Tu-cheng (TW);  
**Po-Kang Ku**, Tu-cheng (TW);  
**Chen-Ta Hung**, Tu-cheng (TW)

Feb. 4, 2008 (TW) ..... 97104105

**Publication Classification**

(51) **Int. Cl.**  
*H01Q 1/48* (2006.01)  
*H01Q 1/36* (2006.01)  
*H01Q 5/00* (2006.01)  
(52) **U.S. Cl.** ..... 343/846; 343/848; 343/700 MS

Correspondence Address:  
**WEI TE CHUNG**  
**FOXCONN INTERNATIONAL, INC.**  
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(57) **ABSTRACT**

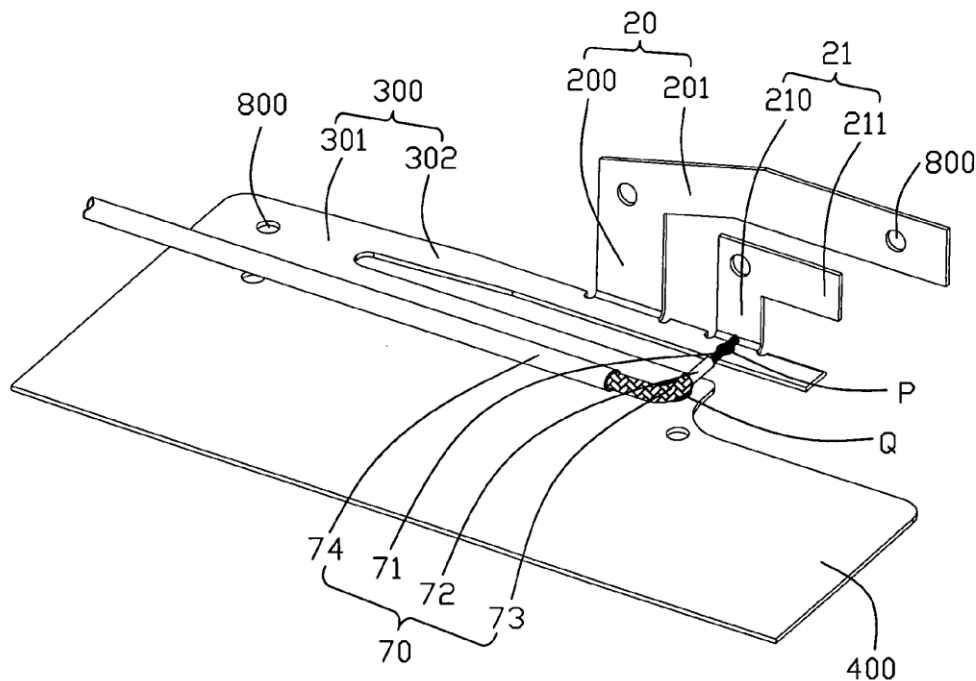
A multi-band antenna includes a grounding element located on a first planar, a connecting element, a first radiating portion, and a second radiating portion. The connecting element is substantially of L-shape configuration and located on the first planar. The first radiating portion, with a free end, extends from connecting element. The second radiating portion, with a free end, extends from the connecting element and is separated from the first radiating element. The free end of the first radiating portion and the free end of the second radiating portion extend in the same direction.

(73) Assignee: **HON HAI PRECISION IND. CO., LTD.**

(21) Appl. No.: **12/322,535**

(22) Filed: **Feb. 3, 2009**

100





US 20090195474A1

(19) **United States**

(12) **Patent Application Publication**  
**CHIEN et al.**

(10) **Pub. No.: US 2009/0195474 A1**

(43) **Pub. Date: Aug. 6, 2009**

(54) **DUAL-FEED PLANAR ANTENNA**

**Publication Classification**

(75) Inventors: **Shao-Lun CHIEN**, Taipei (TW);  
**Chun-Chih CHEN**, Taipei (TW);  
**Chien-Yi WU**, Taipei (TW)

(51) **Int. Cl.**  
**H01Q 1/36** (2006.01)  
**H01Q 1/48** (2006.01)  
(52) **U.S. Cl.** ..... **343/846; 343/700 MS**

Correspondence Address:  
**MORRIS MANNING MARTIN LLP**  
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**FINANCIAL CENTER**  
**ATLANTA, GA 30326 (US)**

(57) **ABSTRACT**

The invention provides a dual-feed planar antenna including a first resonant portion, a second resonant portion, and a grounding portion. The first resonant portion provides a first radiation path and includes a first feed-in portion and a grounding end receiving a grounding level. The first feed-in portion receives a first antenna signal to transmit the first antenna signal to the first radiation path. The second resonant portion provides a second radiation path and a third radiation path and includes a second feed-in portion respectively receiving a second antenna signal and a third antenna signal to correspondingly transmit the second antenna signal and the third antenna signal to the second radiation path and the third radiation path. The grounding portion receives the grounding level and is disposed between the first and second resonant portions. The dual-feed planar antenna covers the communication bands for GSM850, GSM900, GPS, DCS, PCS, and UMTS.

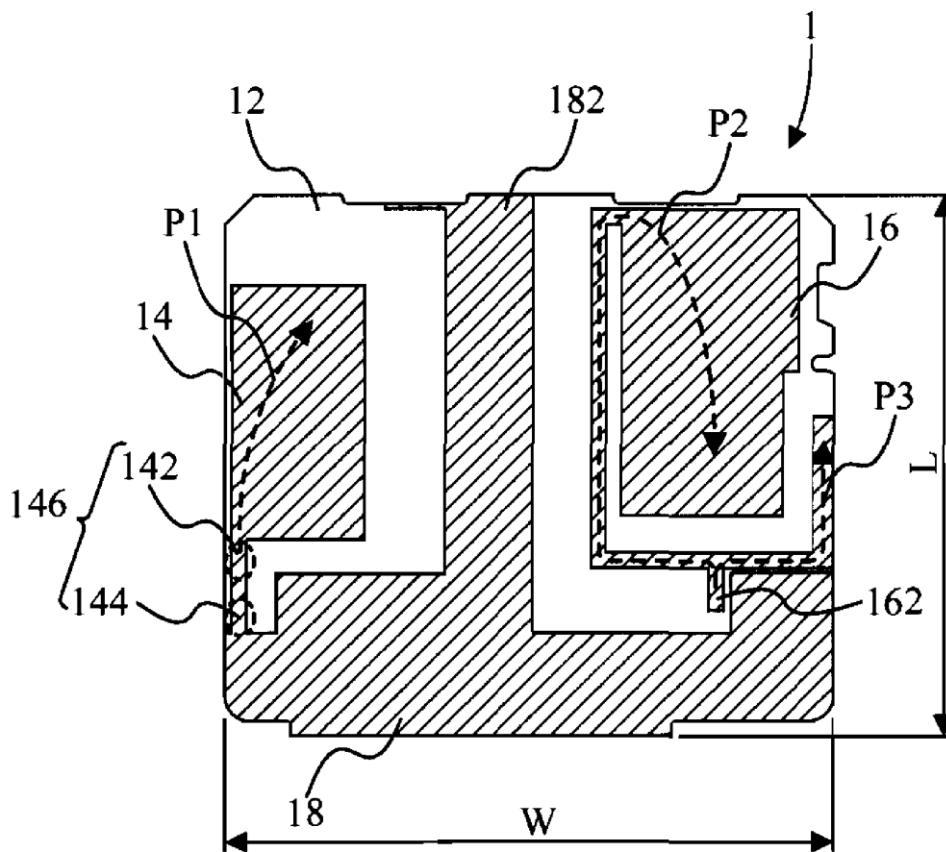
(73) Assignee: **PEGATRON CORPORATION**,  
Taipei (TW)

(21) Appl. No.: **12/357,604**

(22) Filed: **Jan. 22, 2009**

(30) **Foreign Application Priority Data**

Feb. 4, 2008 (TW) ..... 097104168





US 20090195478A1

(19) **United States**

(12) **Patent Application Publication**  
**Tsai et al.**

(10) **Pub. No.: US 2009/0195478 A1**

(43) **Pub. Date: Aug. 6, 2009**

(54) **LOW-PROFILE ANTENNA**

(30) **Foreign Application Priority Data**

(75) Inventors: **Tiao-Hsing Tsai**, Yungho City (TW); **Chieh-Ping Chiu**, Er Lun Hsiang (TW); **Chih-Wei Liao**, Su-ao Township (TW); **Peng-Jen Weng**, Kuei Shan Hsiang (TW)

Feb. 4, 2008 (TW) ..... 097104199

**Publication Classification**

(51) **Int. Cl.**  
*H01Q 1/36* (2006.01)  
*H01Q 9/04* (2006.01)  
(52) **U.S. Cl.** ..... **343/895; 343/700 MS**

Correspondence Address:  
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**125 SUMMER STREET**  
**BOSTON, MA 02110-1618 (US)**

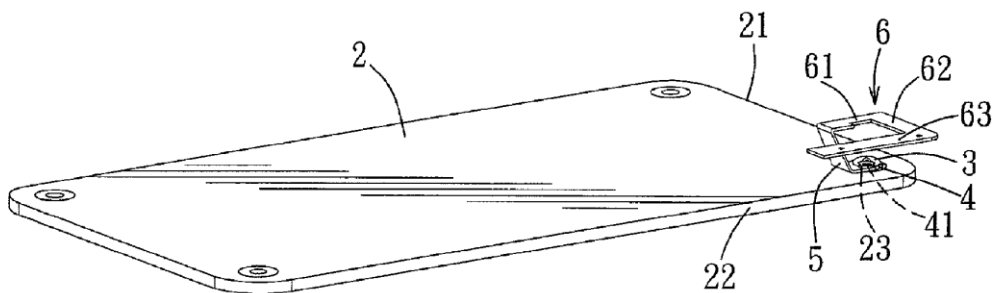
(57) **ABSTRACT**

An antenna includes a dielectric substrate, feeding and grounding elements, a base element, a radiating element, and an interconnecting element. The feeding and grounding elements are formed on the dielectric substrate. The base element is mounted on the dielectric substrate such that the base element is in electrical contact with the feeding and grounding elements. The radiating element is spaced apart from the dielectric substrate. The interconnecting element interconnects the base element and the radiating element.

(73) Assignee: **Quanta Computer Inc.**, Kuei Shan Hsiang (TW)

(21) Appl. No.: **12/173,880**

(22) Filed: **Jul. 16, 2008**





US 20090201209A1

(19) **United States**

(12) **Patent Application Publication**  
Boyle

(10) **Pub. No.: US 2009/0201209 A1**

(43) **Pub. Date: Aug. 13, 2009**

(54) **RADIO DEVICE HAVING ANTENNA ARRANGEMENT SUITED FOR OPERATING OVER A PLURALITY OF BANDS**

(30) **Foreign Application Priority Data**

Apr. 27, 2005 (EP) ..... 05300328.1

**Publication Classification**

(51) **Int. Cl.**  
*H01Q 1/24* (2006.01)  
*H01Q 9/04* (2006.01)

(52) **U.S. Cl.** ..... 343/702; 343/700 MS

(57) **ABSTRACT**

This radio device operating over a plurality of bands comprises a casing having a front cover and a back cover, an antenna arrangement, a radio frequency circuit set and a matching unit for connecting the antenna arrangement to the radio frequency circuit set. The following measures are proposed: —the antenna arrangement is formed by at least two antenna parts, each of which being related to a set of bands, —the antenna parts are placed close together, —the arrangement comprises a part that is normal to the front cover and another one that is near the back cover and feeding points, —the matching unit comprises control switching means for tuning the arrangement to each band. Thanks to these measures, the coverage of the band is obtained with satisfactory performance.

(75) **Inventor: Kevin Boyle, Horsham (GB)**

Correspondence Address:  
**NXP, B.V.**  
**NXP INTELLECTUAL PROPERTY & LICENSING**  
**M/S41-SJ, 1109 MCKAY DRIVE**  
**SAN JOSE, CA 95131 (US)**

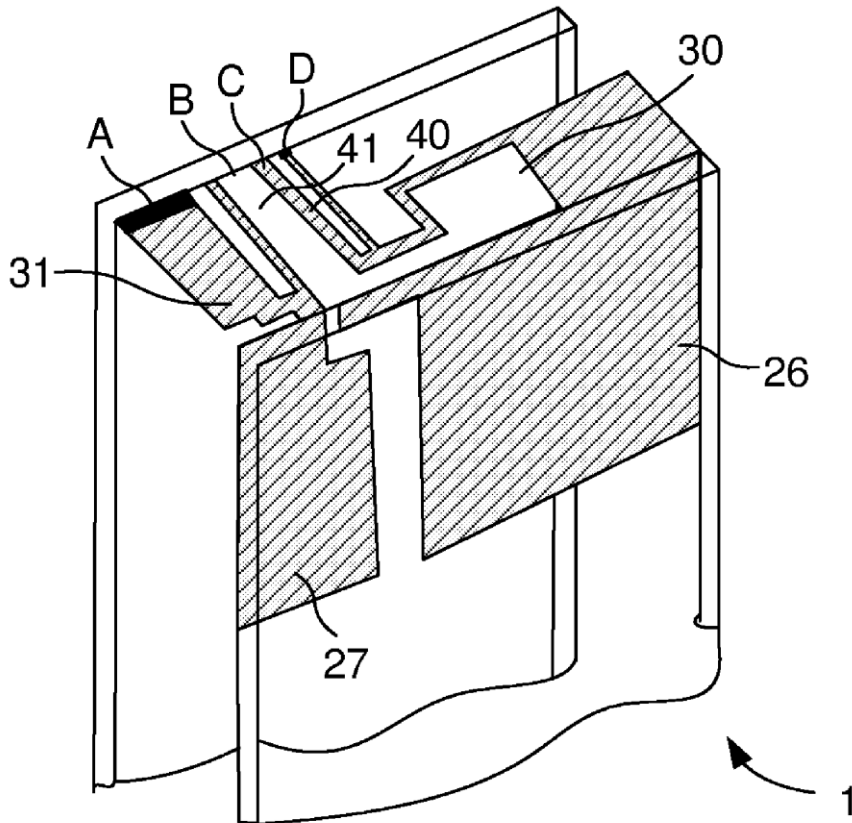
(73) **Assignee: NXP B.V., Eindhoven (NL)**

(21) **Appl. No.: 11/912,837**

(22) **PCT Filed: Apr. 26, 2006**

(86) **PCT No.: PCT/IB06/51302**

§ 371 (c)(1),  
(2), (4) **Date: Jul. 22, 2008**





US 20090201210A1

(19) **United States**

(12) **Patent Application Publication**  
**TESHIMA et al.**

(10) **Pub. No.: US 2009/0201210 A1**

(43) **Pub. Date: Aug. 13, 2009**

(54) **ANTENNA DEVICE HAVING MULTIPLE  
RESONANT FREQUENCIES AND RADIO  
APPARATUS**

**Publication Classification**

(51) **Int. Cl.**  
*H01Q 1/38* (2006.01)  
*H01Q 1/24* (2006.01)

(75) Inventors: **Masao TESHIMA**, Tokyo (JP);  
**Hiroshi Shimasaki**, Tokyo (JP)

(52) **U.S. Cl.** ..... **343/702; 343/700 MS**

(57) **ABSTRACT**

Correspondence Address:  
**FRISHAUF, HOLTZ, GOODMAN & CHICK, PC**  
**220 Fifth Avenue, 16TH Floor**  
**NEW YORK, NY 10001-7708 (US)**

An antenna device included in a radio apparatus having a printed board includes a ground conductor provided in the printed board, a first sub-element, a second sub-element and a short circuit element. The first sub-element is formed as an area having a first side and a second side crossing each other. The first side faces a side of the ground conductor. The first sub-element has a feed portion around a crossing of the first side and the second side. The second sub-element is formed to branch off from the first sub-element around an end of the second side being farther from the crossing, to be open-ended and to be directed at least partially in a direction opposite a direction from the crossing to an end of the first side opposite the crossing. The short circuit element short-circuits one of the first sub-element and the second sub-element with the ground conductor.

(73) Assignee: **KABUSHIKI KAISHA  
TOSHIBA**, Tokyo (JP)

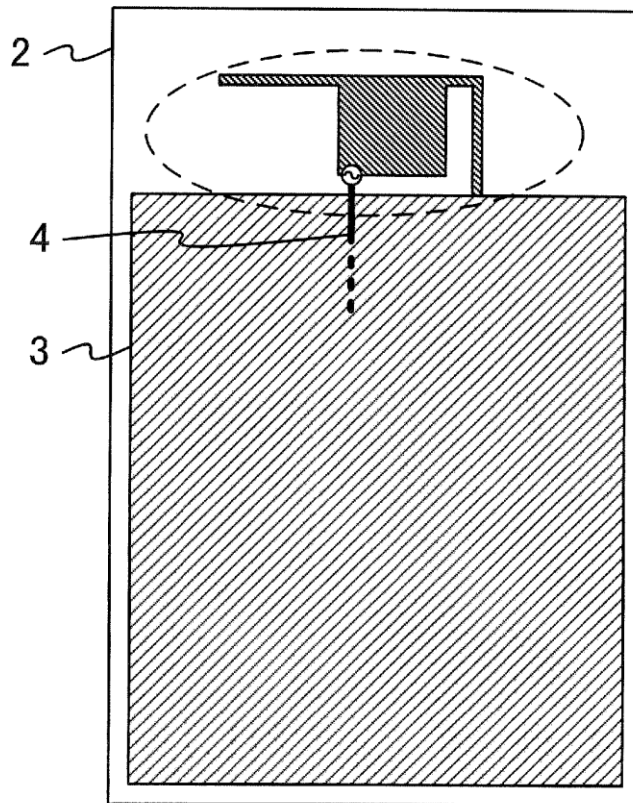
(21) Appl. No.: **12/265,797**

(22) Filed: **Nov. 6, 2008**

(30) **Foreign Application Priority Data**

Feb. 12, 2008 (JP) ..... 2008-30961

1





US 20090201220A1

(19) **United States**

(12) **Patent Application Publication**  
**Kim et al.**

(10) **Pub. No.: US 2009/0201220 A1**

(43) **Pub. Date: Aug. 13, 2009**

(54) **HIGH IMPEDANCE SURFACE STRUCTURE USING ARTIFICIAL MAGNETIC CONDUCTOR, AND ANTENNA AND ELECTROMAGNETIC DEVICE USING THE SAME STRUCTURE**

(30) **Foreign Application Priority Data**

Apr. 4, 2006 (KR) ..... 10-2006-0030510

**Publication Classification**

(76) Inventors: **Dong-Ho Kim**, Daejeon-city (KR);  
**Jae-Ick Choi**, Daejeon-city (KR);  
**Dong-Uk Sim**,  
Chungcheongbuk-do (KR);  
**Jong-Hwa Kwon**, Daejeon-city (KR)

(51) **Int. Cl.**  
**H01Q 1/00** (2006.01)  
**H01Q 1/38** (2006.01)

(52) **U.S. Cl.** ..... **343/907; 343/700 MS**

Correspondence Address:  
**LADAS & PARRY LLP**  
**224 SOUTH MICHIGAN AVENUE, SUITE 1600**  
**CHICAGO, IL 60604 (US)**

(57) **ABSTRACT**

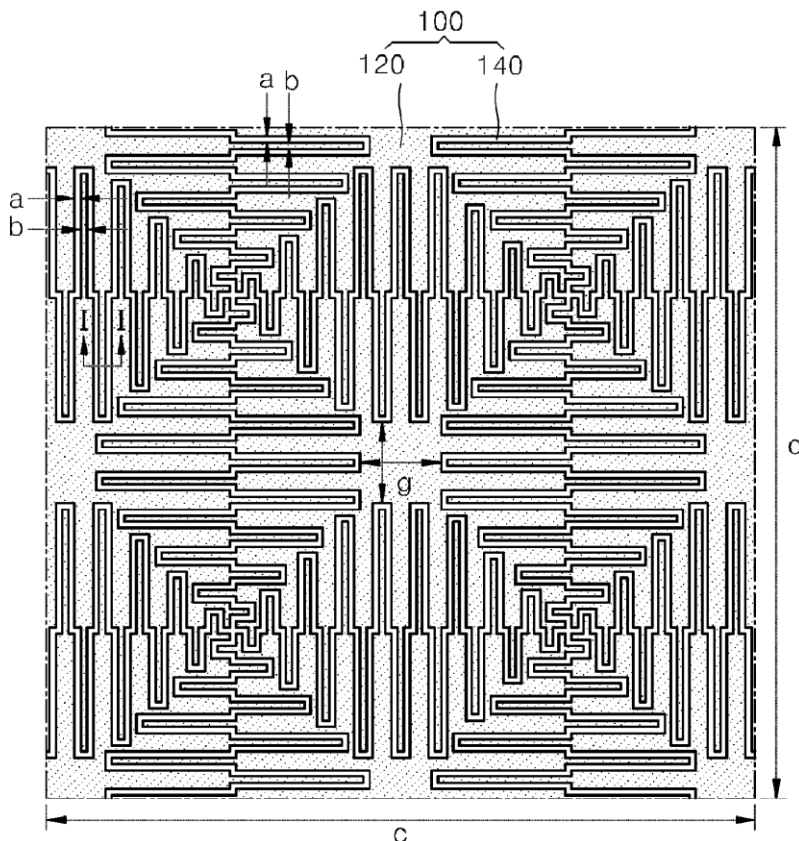
Provided are a high impedance surface structure using an AMC (artificial magnetic conductor) and an antenna and an electromagnetic device using the high impedance surface structure. The high impedance surface structure includes: a ground layer formed of a first conductor layer; a first dielectric layer formed on the ground layer; and an HIS (high impedance surface) layer formed of second conductor layers and a second dielectric layer on the first dielectric layer, wherein the second conductor layers are interdigitated with one another and vias connecting the second conductor layers to the ground layer are not formed.

(21) Appl. No.: **12/295,910**

(22) PCT Filed: **Dec. 4, 2006**

(86) PCT No.: **PCT/KR06/05184**

§ 371 (c)(1),  
(2), (4) Date: **Oct. 3, 2008**





US 20090207084A1

(19) **United States**

(12) **Patent Application Publication**  
**IKEDA et al.**

(10) **Pub. No.: US 2009/0207084 A1**

(43) **Pub. Date: Aug. 20, 2009**

(54) **ANTENNA APPARATUS**

(30) **Foreign Application Priority Data**

(75) Inventors: **Masakazu IKEDA, WARABI-SHI**  
**(JP); Yusuke TAINAKA,**  
**WARABI-SHI (JP)**

Nov. 22, 2006 (JP) ..... 2006-315297

**Publication Classification**

Correspondence Address:  
**KIRK HAHN**  
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(51) **Int. Cl.**  
**H01Q 1/32** (2006.01)  
**H01Q 9/00** (2006.01)

(52) **U.S. Cl.** ..... **343/713; 343/749**

(57) **ABSTRACT**

(73) Assignee: **NIPPON ANTENA KABUSHIKI**  
**KAISHA, Tokyo (JP)**

Even though an antenna apparatus is low profile to have a height of not more than 70 mm, sensitivity is maximally suppressed from being deteriorated.

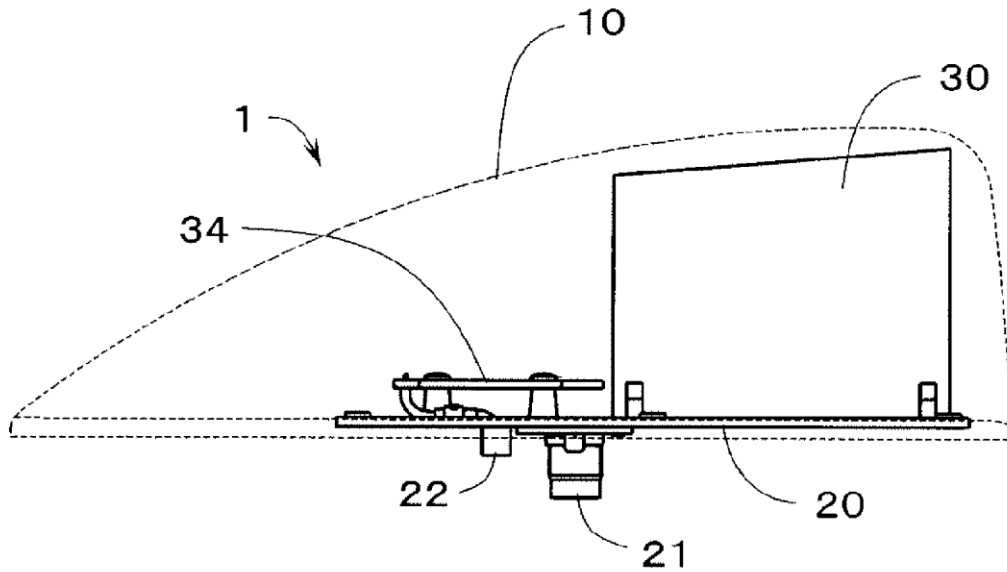
(21) Appl. No.: **12/179,568**

In an antenna case **10** projecting from a vehicle in a height of not more than 70 mm, an antenna circuit board **30** on which an antenna pattern is formed is uprightly arranged and an amplifier circuit board **34** which amplifies a received signal output from the antenna circuit board **30** are housed. In the antenna circuit board **30**, an antenna coil to resonate the antenna pattern in an FM waveband is inserted between the antenna pattern and a feeding point. Therefore, a low-profile antenna pattern having a length which is about 1/20 a wavelength of an FM broadcast resonates the FM band.

(22) Filed: **Jul. 24, 2008**

**Related U.S. Application Data**

(63) Continuation-in-part of application No. 11/852,319, filed on Sep. 9, 2007.





US 20090207086A1

(19) **United States**

(12) **Patent Application Publication**  
**Shinkawa et al.**

(10) **Pub. No.: US 2009/0207086 A1**

(43) **Pub. Date: Aug. 20, 2009**

(54) **ANTENNA APPARATUS**

**Publication Classification**

(76) Inventors: **Tomohiro Shinkawa**, Tokyo (JP);  
**Masaaki Miyata**, Tokyo (JP);  
**Hisamatsu Nakano**, Tokyo (JP)

(51) **Int. Cl.**  
**H01Q 9/16** (2006.01)  
**H01Q 1/36** (2006.01)  
**H01Q 1/50** (2006.01)

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RESTON, VA 20190 (US)

(52) **U.S. Cl.** ..... **343/793; 343/895; 343/850**

(57) **ABSTRACT**

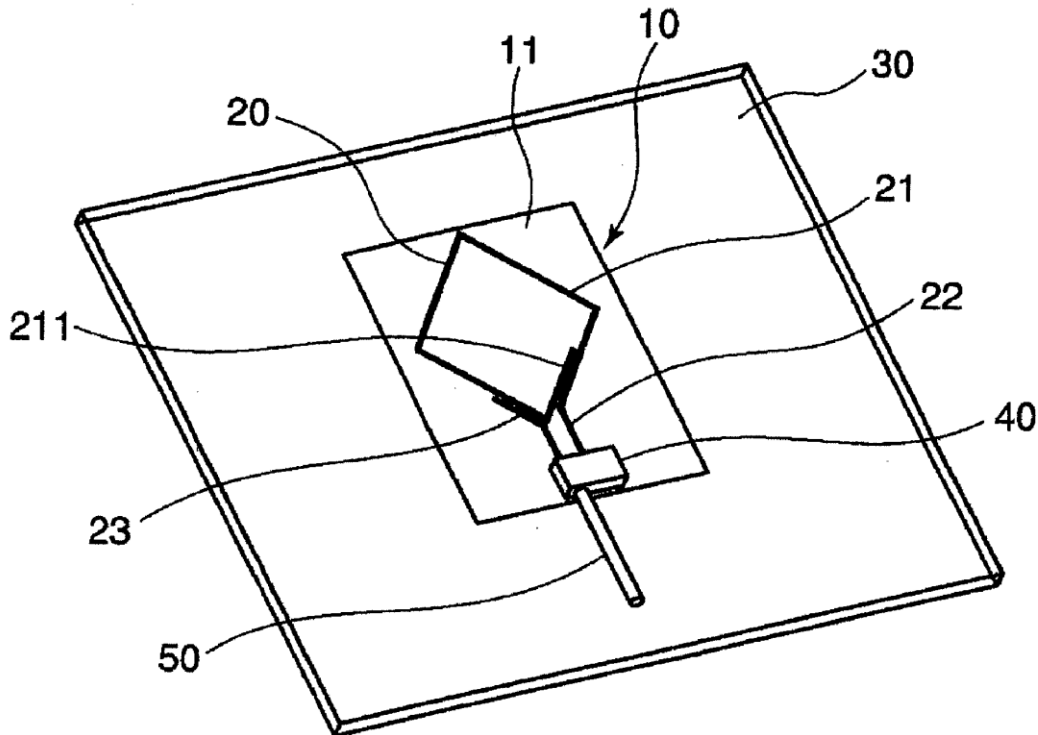
In an antenna apparatus, a radiation element includes a perturbation element. A first power feeding line has a first end connected to the radiation element and is configured to feed power to the radiation element. A second power feeding line has a first end configured to feed power to the radiation element through electromagnetic coupling. The radiation element, the first power feeding line and the second power feeding line are arranged on a same plane to constitute a balance type antenna.

(21) Appl. No.: **12/372,222**

(22) Filed: **Feb. 17, 2009**

(30) **Foreign Application Priority Data**

Feb. 18, 2008 (JP) ..... P2008-036551  
Dec. 18, 2008 (JP) ..... P2008-321757







US 20090207087A1

(19) **United States**

(12) **Patent Application Publication**  
**FANG et al.**

(10) **Pub. No.: US 2009/0207087 A1**

(43) **Pub. Date: Aug. 20, 2009**

(54) **FRactal DIPOLE ANTENNA**

(21) Appl. No.: **12/033,403**

(75) Inventors: **Chiou-Yung FANG**, Taipei County (TW); **Hua-Ming CHEN**, Taipei County (TW); **Yang-Kai WANG**, Taipei County (TW); **Chia-Ming LIANG**, Taipei County (TW); **Ching-Shun WANG**, Taipei County (TW)

(22) Filed: **Feb. 19, 2008**

**Publication Classification**

(51) **Int. Cl.**  
**H01Q 9/16** (2006.01)  
**H01Q 9/04** (2006.01)

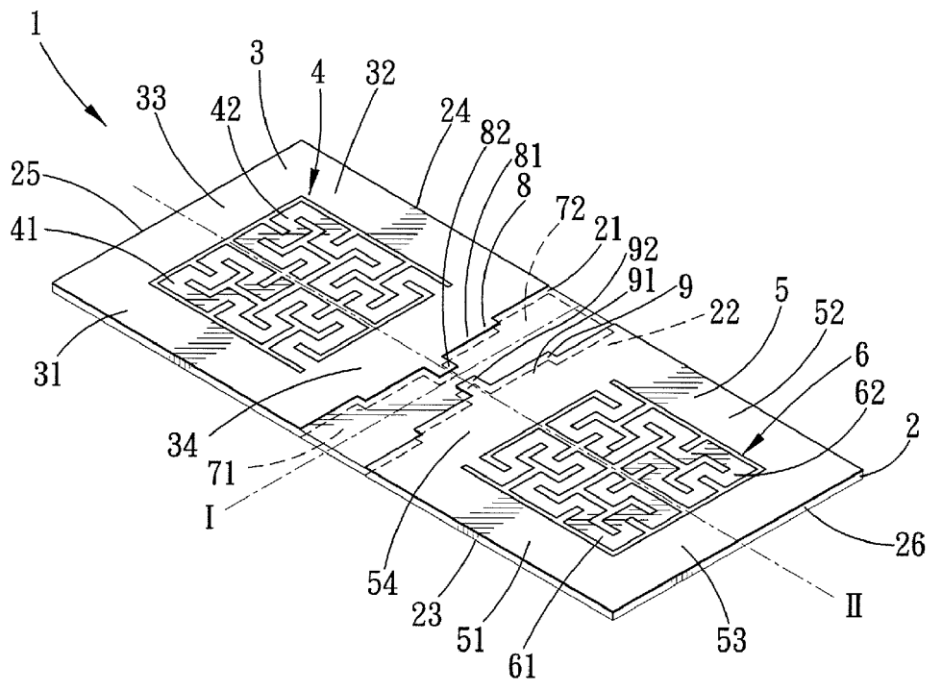
(52) **U.S. Cl.** ..... **343/795; 343/700 MS**

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(57) **ABSTRACT**

A fractal dipole antenna includes a dielectric substrate, first and second closed-loop radiating elements, each of which is formed on the dielectric substrate, and first and second fractal radiating elements, each of which is formed on the dielectric substrate and is surrounded by and connected to a respective one of the first and second closed-loop radiating elements.

(73) Assignee: **ADVANCED CONNECTION TECHNOLOGY INC.**, Taipei County (TW)





US 20090207088A1

(19) **United States**

(12) **Patent Application Publication**  
**SATO et al.**

(10) **Pub. No.: US 2009/0207088 A1**

(43) **Pub. Date: Aug. 20, 2009**

(54) **ANTENNA APPARATUS**

**Publication Classification**

(75) Inventors: **Sho SATO**, Tokyo (JP); **Hisamatsu Nakano**, Tokyo (JP)

(51) **Int. Cl.**  
**H01Q 19/13** (2006.01)

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(52) **U.S. Cl.** ..... **343/818**

(73) Assignee: **Mitsumi Electric Co., Ltd.**, Tokyo (JP)

(57) **ABSTRACT**

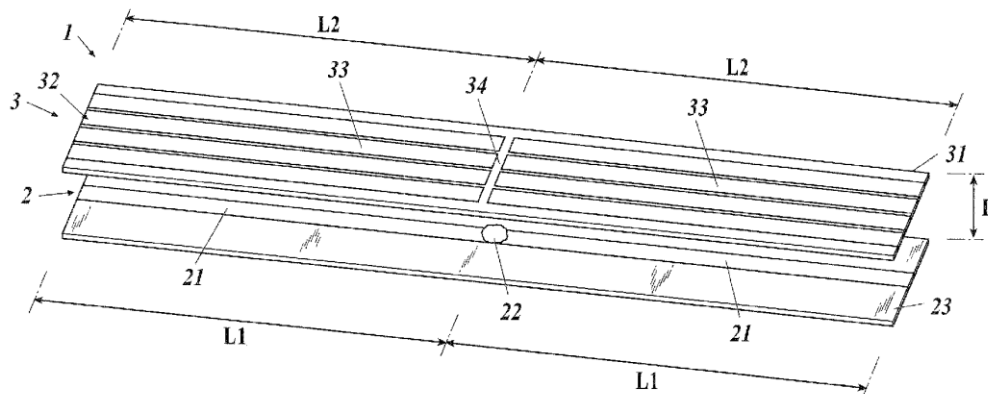
(21) Appl. No.: **12/370,799**

An antenna apparatus, including: an antenna device including a feeding point and a pair of antenna elements placed symmetrically with respect to the feeding point; and a parasitic device placed parallel to each of the antenna elements of the antenna device and including one or a plurality of elements placed at a position separated from each of the antenna elements, wherein the element of the parasitic device includes a gap at a center of the element in an extending direction and includes a pair of sub-elements structured symmetrically with respect to the gap as a boundary.

(22) Filed: **Feb. 13, 2009**

(30) **Foreign Application Priority Data**

Feb. 18, 2008 (JP) ..... 2008-036210





US 20090207089A1

(19) **United States**

(12) **Patent Application Publication**  
**Yoshioka**

(10) **Pub. No.: US 2009/0207089 A1**

(43) **Pub. Date: Aug. 20, 2009**

(54) **ANTENNA ELEMENT**

**Publication Classification**

(76) Inventor: **Hiroki Yoshioka, Tokyo (JP)**

(51) **Int. Cl.**  
**H01Q 1/36** (2006.01)  
**H01Q 1/48** (2006.01)

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**WHITHAM, CURTIS & CHRISTOFFERSON &  
COOK, P.C.**  
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(52) **U.S. Cl. .... 343/846**

(21) Appl. No.: **12/372,249**

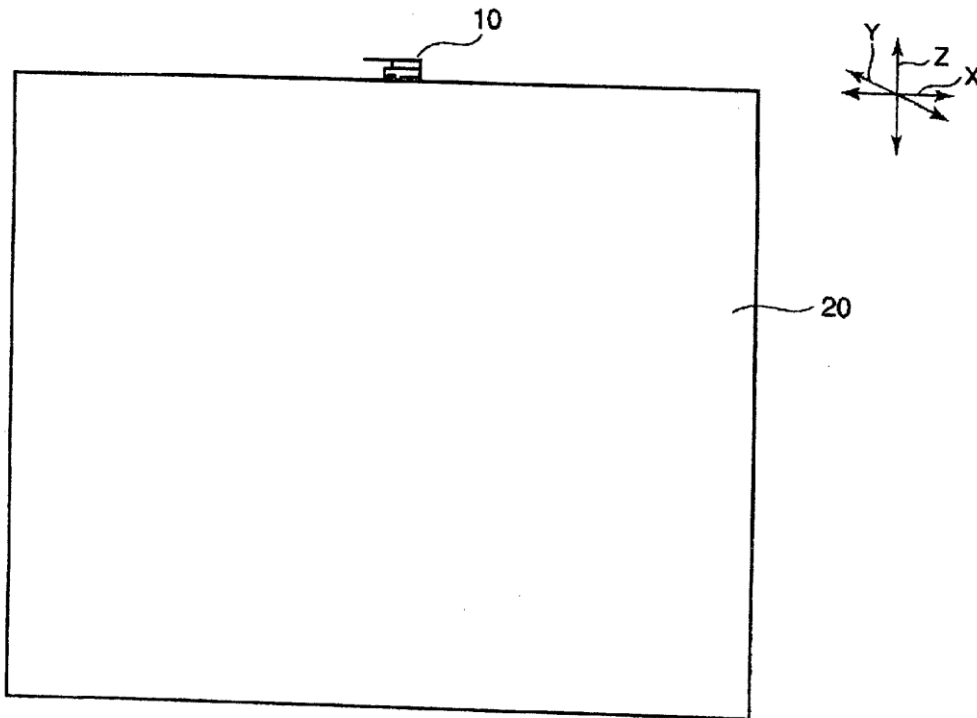
(57) **ABSTRACT**

(22) Filed: **Feb. 17, 2009**

An antenna element is disclosed. A conductive plate is adapted to be electrically connected to an electric ground, and has a first edge. A second edge opposes the first edge and is formed with a first slit elongated in a first direction. A third edge intersects the first edge. A recessed part intersects the first edge and the third edge. A conductive member elongates from the second edge in the first direction.

(30) **Foreign Application Priority Data**

Feb. 18, 2008 (JP) ..... P2008-35559





US 20090213011A1

(19) **United States**

(12) **Patent Application Publication**  
**Tsai et al.**

(10) **Pub. No.: US 2009/0213011 A1**

(43) **Pub. Date: Aug. 27, 2009**

(54) **DUAL-BAND DUAL-FEED ANTENNA**

(30) **Foreign Application Priority Data**

(75) Inventors: **Tiao-Hsing Tsai**, Tao Yuan Shien (TW); **Chieh-Ping Chiu**, Tao Yuan Shien (TW); **Chih-Wei Liao**, Tao Yuan Shien (TW); **Peng-Jen Weng**, Tao Yuan Shien (TW)

Feb. 25, 2008 (TW) ..... 097106426

**Publication Classification**

(51) **Int. Cl.**  
**H01Q 1/38** (2006.01)

(52) **U.S. Cl.** ..... **343/700 MS**

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**TWO EMBARCADERO CENTER, EIGHTH FLOOR**  
**SAN FRANCISCO, CA 94111-3834 (US)**

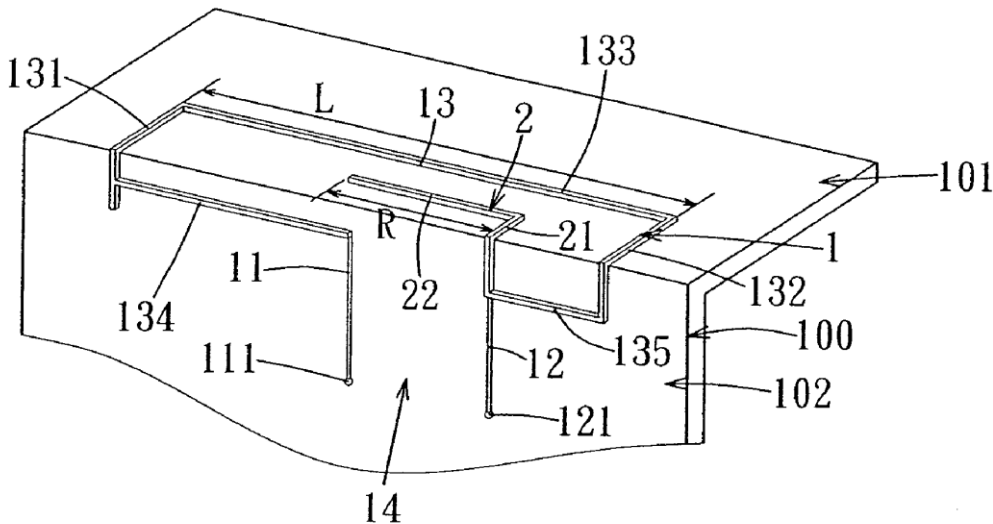
(57) **ABSTRACT**

An antenna includes an open loop conductor, a pair of feeding points, and a conductive arm. The open loop conductor includes a loop element that has opposite first and second ends, and first and second feeding elements, each of which is connected to a respective one of first and second ends of the loop element. Each of the feeding points is provided on a respective one of the first and second feeding elements. The conductive arm extends from the open loop conductor.

(73) Assignee: **Quanta Computer Inc.**, Kuei Shan Hsiang (TW)

(21) Appl. No.: **12/231,711**

(22) Filed: **Sep. 4, 2008**





US 20090213014A1

(19) **United States**

(12) **Patent Application Publication**  
**IELLICI et al.**

(10) **Pub. No.: US 2009/0213014 A1**

(43) **Pub. Date: Aug. 27, 2009**

(54) **HYBRID ANTENNA USING PARASITIC  
EXCITATION OF CONDUCTING ANTENNAS  
BY DIELECTRIC ANTENNAS**

(30) **Foreign Application Priority Data**

Jun. 16, 2003 (GB) ..... 0313890.6

(76) Inventors: **Devis IELLICI**, Cambridge (GB);  
**Simon Philip Kingsley**, Cambridge  
(GB); **James William Kingsley**,  
Cambridge (GB); **Steven Gregory**  
**O'Keefe**, Chambers Flat (AU)

**Publication Classification**

(51) **Int. Cl.**  
**H01Q 1/38** (2006.01)

Correspondence Address:  
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**1500 Broadway, 12th Floor**  
**New York, NY 10036 (US)**

(52) **U.S. Cl.** ..... **343/700 MS**

(21) Appl. No.: **12/419,628**

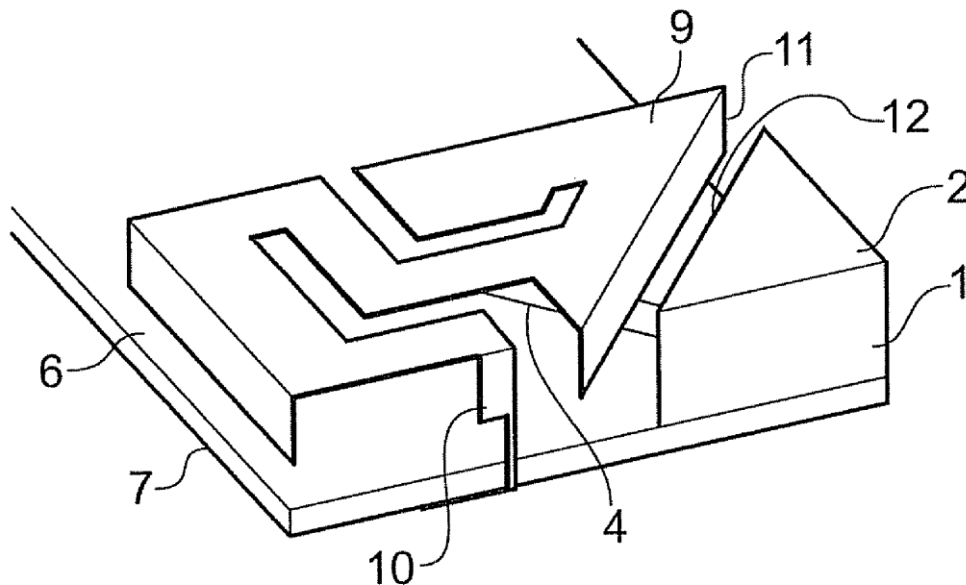
(22) Filed: **Apr. 7, 2009**

**Related U.S. Application Data**

(63) Continuation of application No. 10/560,739, filed on  
Dec. 15, 2005, now Pat. No. 7,545,327, filed as appli-  
cation No. PCT/GB2004/002497 on Jun. 16, 2004.

(57) **ABSTRACT**

An integrated antenna device comprising a first, dielectric  
antenna component and a second, electrically-conductive  
antenna component, wherein the first and second components  
are not electrically connected to each other but are mutually  
arranged such that the second component is parasitically  
driven by the first component when the first component is fed  
with a predetermined signal.





US 20090213016A1

(19) **United States**

(12) **Patent Application Publication**  
**Teshima**

(10) **Pub. No.: US 2009/0213016 A1**

(43) **Pub. Date: Aug. 27, 2009**

(54) **ANTENNA DEVICE AND RADIO APPARATUS HAVING A BROADBAND CHARACTERISTIC**

**Publication Classification**

(75) Inventor: **Masao Teshima, Tokyo (JP)**

(51) **Int. Cl.**  
**H01Q 9/04** (2006.01)  
**H01Q 1/24** (2006.01)

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**220 Fifth Avenue, 16TH Floor**  
**NEW YORK, NY 10001-7708 (US)**

(52) **U.S. Cl.** ..... **343/702; 343/700 MS**

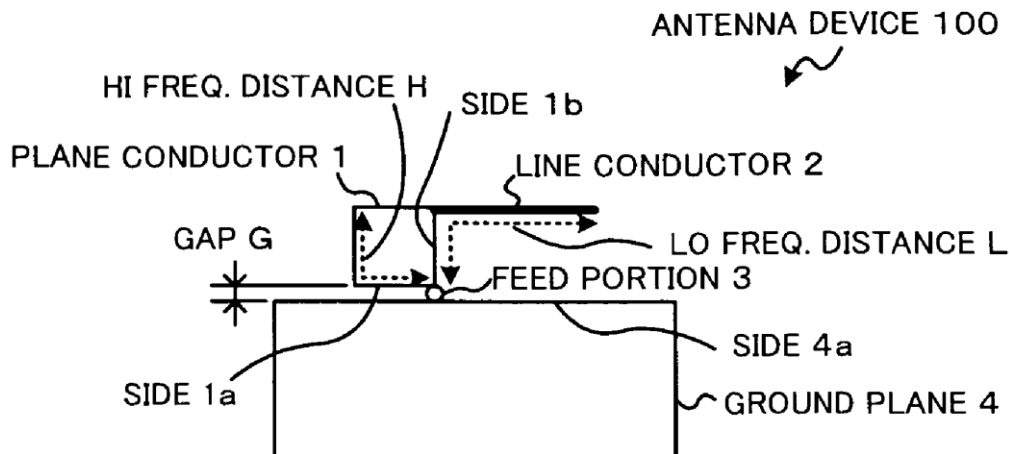
(57) **ABSTRACT**

An antenna device including a ground plane, a plane conductor and a line conductor is provided. The plane conductor is shaped like a polygon having a first side, a second side and an angle between the first side and the second side. The plane conductor is arranged almost on a same plane as the ground plane. The plane conductor has a feed portion around the angle. The first side faces a side of the ground plane. The line conductor is arranged almost on the same plane as the ground plane. The line conductor has a first end and a second end. The first end is connected to an end of the second side being opposite the feed portion.

(73) Assignee: **KABUSHIKI KAISHA TOSHIBA, Tokyo (JP)**

(21) Appl. No.: **12/072,345**

(22) Filed: **Feb. 26, 2008**





US 20090213025A1

(19) **United States**

(12) **Patent Application Publication**  
**Coupez et al.**

(10) **Pub. No.: US 2009/0213025 A1**

(43) **Pub. Date: Aug. 27, 2009**

(54) **ULTRA-WIDEBAND ANTENNA WITH EXCELLENT DESIGN FLEXIBILITY**

(75) Inventors: **Jean-Philippe Coupez**, Le Relecq Kerhuon (FR); **Sergel Pinel**, Brest (FR); **Sylvain Inisan**, Plouzane (FR)

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(73) Assignee: **Groupe des Ecoles des Telecommunications (GET)**, Evry (FR)

(21) Appl. No.: **11/887,020**

(22) PCT Filed: **Mar. 24, 2006**

(86) PCT No.: **PCT/EP2006/061035**

§ 371 (c)(1),  
(2), (4) Date: **Dec. 15, 2008**

(30) **Foreign Application Priority Data**

Mar. 24, 2005 (FR) ..... 0502922

**Publication Classification**

(51) **Int. Cl.**  
**H01Q 9/28** (2006.01)  
**H01Q 1/50** (2006.01)  
**H01P 11/00** (2006.01)

(52) **U.S. Cl.** ..... **343/807; 343/860; 29/600**

(57) **ABSTRACT**

An ultra-wideband antenna includes a zone, an excitation means, and an adapting means. The zone is defined between first and second shaped surfaces such as to form a radiating element. The first and second shaped surfaces are also rotationally symmetrical in relation to a longitudinal axis of the antenna, and are disposed opposite one another in respect of a plane that is orthogonal to the longitudinal axis and that contains a horizontal axis. The first and second shaped surfaces are configured to control the characteristics of an electromagnetic field in the zone such that the antenna has an essentially-constant gain in the frequency band along an azimuth plane. The excitation means is configured to supply a signal in a localised manner in a central region of the zone. The adapting means is configured to promote a localised coupling between the excitation means and the zone.

