



US 20080238778A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0238778 A1**

(43) **Pub. Date: Oct. 2, 2008**

(54) **FOLDED ANTENNA**

(30) **Foreign Application Priority Data**

(75) Inventors: **JunXiang Ge**, Tokyo (JP);  
**Shozaburo Kameda**, Kanagawa (JP);  
**Hiroshi Ichikawa**, Ymaguchi (JP)

Mar. 22, 2004 (JP) ..... 2004-083314

**Publication Classification**

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

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

(57) **ABSTRACT**

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**RABIN & Berdo, PC**  
**1101 14TH STREET, NW, SUITE 500**  
**WASHINGTON, DC 20005 (US)**

An antenna element 1 is formed such that a plurality of turning parts 13, 15, 17 are formed by being turned back in zigzag in parallel to a ground conductor film 2 while extending perpendicularly thereto and the lengths of segments 12, 14, 16, 18 between the turning parts are shorter on a side of the ground conductor film 2 (a side of a feeding part 4) and increase gradually as the segments are away from the ground conductor film 2. The turning parts of the antenna element 1 are formed such that the antenna resonates at two or more frequency bands, and has a fractional bandwidth of 4% or more of its frequency in a first frequency band and a fractional bandwidth of 15% or more of its frequency in a second frequency band by adjusting the lengths  $L_1$ ,  $L_2$  and  $L_3$  of respective segments and the intervals  $d_1$ ,  $d_2$  and  $d_3$  between adjacent segments. Consequently, a wideband antenna is realized in two or more multi-frequency bands, for example 2.4 to 2.5 GHz and 5 to 6 GHz, by using a single folded antenna.

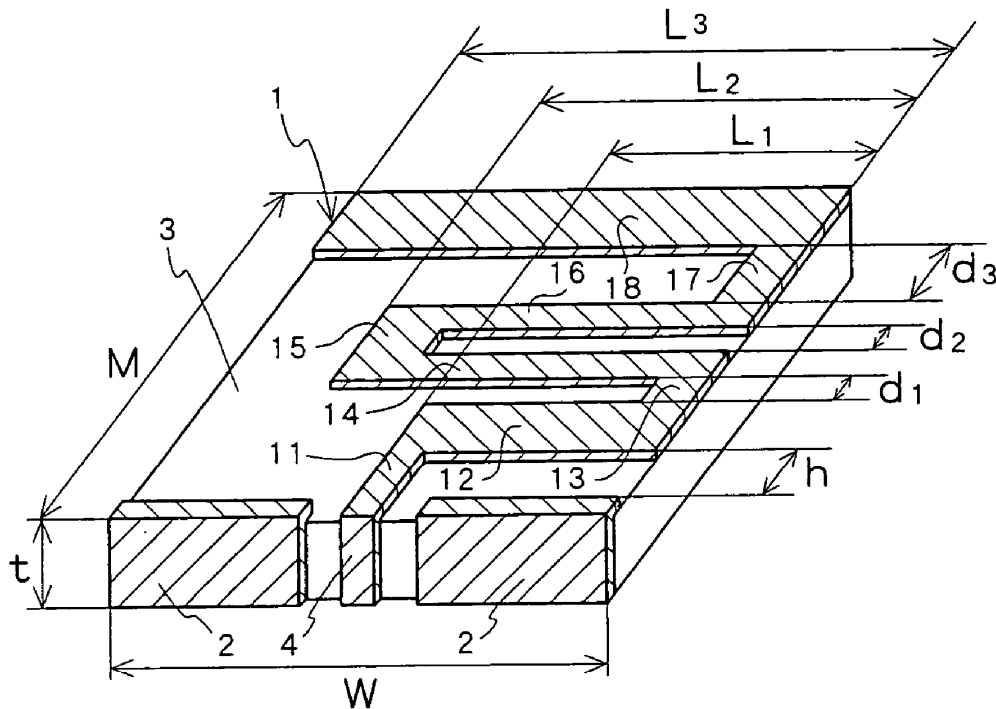
(73) Assignees: **Yokowo Co., Ltd.**, Kita-ku, Tokyo (JP);  
**Ube Industries, Ltd.**, Kita-ku, Tokyo (JP)

(21) Appl. No.: **10/593,714**

(22) PCT Filed: **Mar. 17, 2005**

(86) PCT No.: **PCT/JP05/04793**

§ 371 (c)(1),  
(2), (4) Date: **Sep. 21, 2006**





US 20080238780A1

(19) **United States**

(12) **Patent Application Publication**  
**PONCE DE LEON et al.**

(10) **Pub. No.: US 2008/0238780 A1**

(43) **Pub. Date: Oct. 2, 2008**

(54) **COUPLED SLOT PROBE ANTENNA**

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

(76) Inventors: **Lorenzo A. PONCE DE LEON**,  
Lake Worth, FL (US); **Naveed**  
**Mirza**, Boynton Beach, FL (US);  
**Paul Morningstar**, North  
Lauderdale, FL (US)

(57) **ABSTRACT**

A coupled slot probe antenna for use with antenna structures in mobile communication devices, such as cellular telephones and other wireless communication devices. The coupled slot probe antenna includes at least one first conductive element, and a second conductive element coupled between the first conductive element and the printed circuit board (PCB) ground plane of the mobile communication device. The first and second conductive elements define a tunable coupled slot area and the coupled slot probe antenna is coupled to the PCB ground plane in such a way that the coupled slot area is near a low-impedance point of the antenna structure, wherein coupling therebetween improves the bandwidth and the efficiency of the antenna structure. The coupled slot area can be tuned by changing the size of the coupled slot area and by changing the position of the coupled slot area relative to the low-impedance point of the antenna structure.

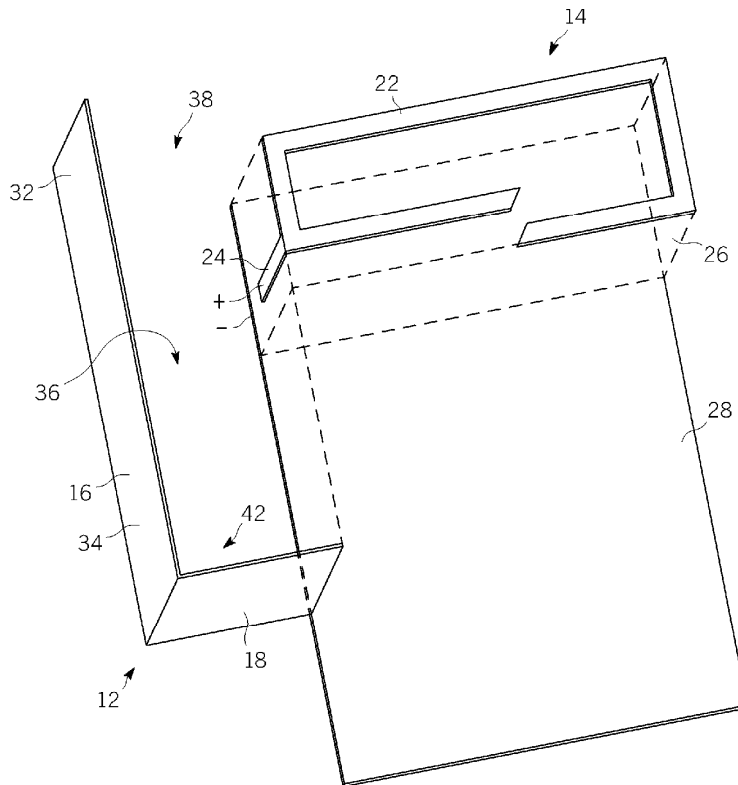
Correspondence Address:  
**SMITH FROHWEIN TEMPEL GREENLEE**  
**BLAHA LLC**  
**TWO RAVINIA DRIVE, SUITE 700**  
**ATLANTA, GA 30346 (US)**

(21) Appl. No.: **11/691,186**

(22) Filed: **Mar. 26, 2007**

**Publication Classification**

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





US 20080238781A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0238781 A1**

(43) **Pub. Date: Oct. 2, 2008**

(54) **PATCH ANTENNA WITH AN L-SHAPED CUT CORNER**

(30) **Foreign Application Priority Data**

Mar. 30, 2007 (TW) ..... 096111360

(75) Inventors: **CHIH-MING SU**, TAIPEI CITY (TW); **HUNG-YI LO**, KEELUNG CITY (TW)

**Publication Classification**

(51) **Int. Cl.**  
*H01Q 1/38* (2006.01)  
*H01Q 9/04* (2006.01)

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

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3458 ELLICOTT CENTER DRIVE-SUITE 101  
ELLICOTT CITY, MD 21043 (US)

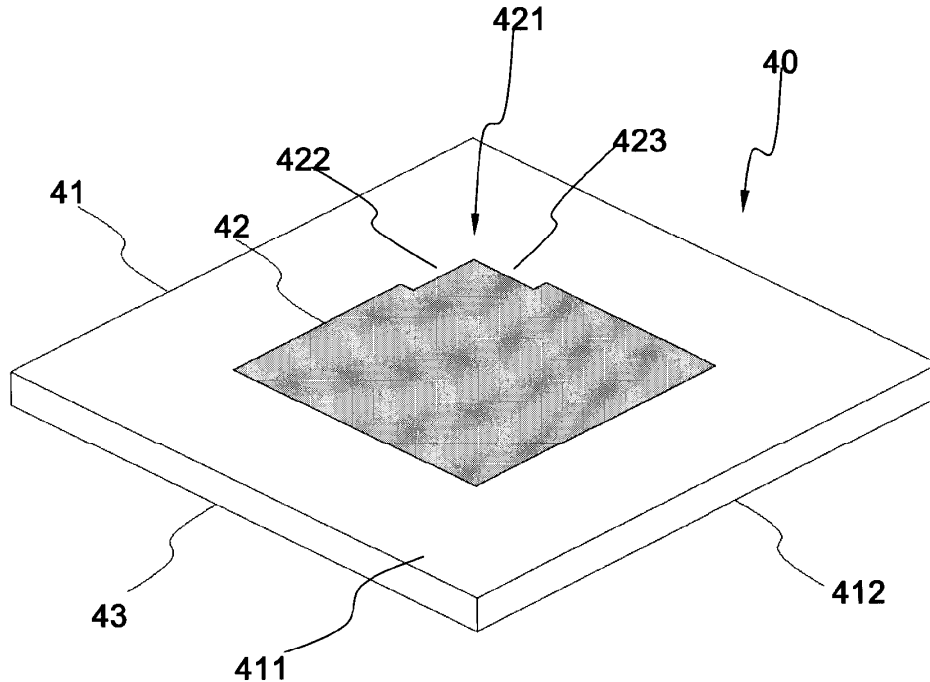
(57) **ABSTRACT**

The present invention discloses a patch antenna with an L-shaped cut corner. The patch antenna includes a substrate, a patch, a ground plate and a feed point. The substrate has corresponding first surface and second surface. The patch is installed on the first surface of the substrate. At least one corner of the patch forms the L-shaped cut corner, and two arms of the L-shaped cut corner are disposed at two edges of the patch. The second surface of the substrate includes a ground plate, and the patch includes a feed point for transmitting and receiving feed-in or feed-out wireless signals.

(73) Assignee: **SINBON ELECTRONICS CO., LTD.**, TAIPEI HSIEN (TW)

(21) Appl. No.: 11/753,923

(22) Filed: May 25, 2007





US 20080238782A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0238782 A1**

(43) **Pub. Date: Oct. 2, 2008**

(54) **HIGH-DIRECTIVITY MICROSTRIP ANTENNA**

**Publication Classification**

(75) Inventors: **Chieh-Sheng Hsu**, Taipei Hsien (TW); **Chang-Hsiu Huang**, Taipei Hsien (TW)

(51) **Int. Cl.**  
**H01Q 1/38** (2006.01)  
**H01Q 9/04** (2006.01)

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

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(57) **ABSTRACT**

A high-directivity microstrip antenna comprising a dielectric layer with a first surface and a second surface that respectively connects to a metal patch and a ground metal layer, wherein the dielectric layer has a through-hole with a metal element connecting to the first surface and the second surface, and the metal element is positioned at the interior of the through-hole, wherein the two ends of the metal element respectively electrically connects to the metal patch and the ground metal layer for having higher directivity when the antenna is designed in a fixed dimension; also, for saving cost by selecting a dielectric layer with various coefficients.

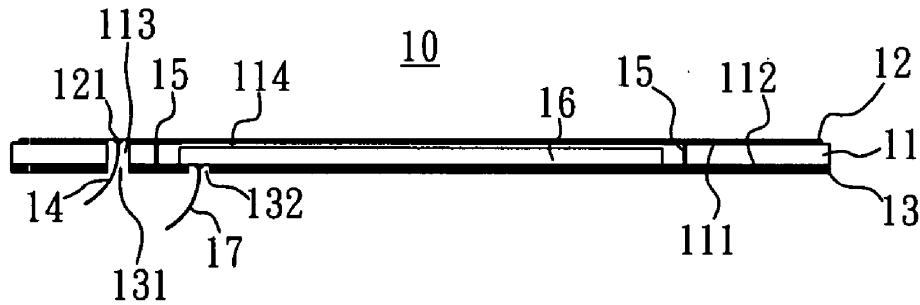
(73) Assignee: **WISTRON CORP.**

(21) Appl. No.: **11/812,973**

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

(30) **Foreign Application Priority Data**

Apr. 2, 2007 (TW) ..... 096205320





US 20080238783A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0238783 A1**

(43) **Pub. Date: Oct. 2, 2008**

(54) **ULTRA-WIDE BAND ANTENNA AND  
PLUG-AND-PLAY DEVICE USING THE SAME**

(30) **Foreign Application Priority Data**

Mar. 27, 2007 (TW) ..... 96110648

(75) Inventors: **Kin-Lu Wong**, Kaohsiung (TW);  
**Yu-Chan Yang**, Taipei (TW);  
**Wei-Yu Li**, Yilan (TW); **Saou-Wen  
Su**, Taipei (TW); **Jui-Hung Chou**,  
Taichung (TW)

**Publication Classification**

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

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

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**BACON & THOMAS, PLLC**  
**625 SLATERS LANE, FOURTH FLOOR**  
**ALEXANDRIA, VA 22314-1176 (US)**

(57) **ABSTRACT**

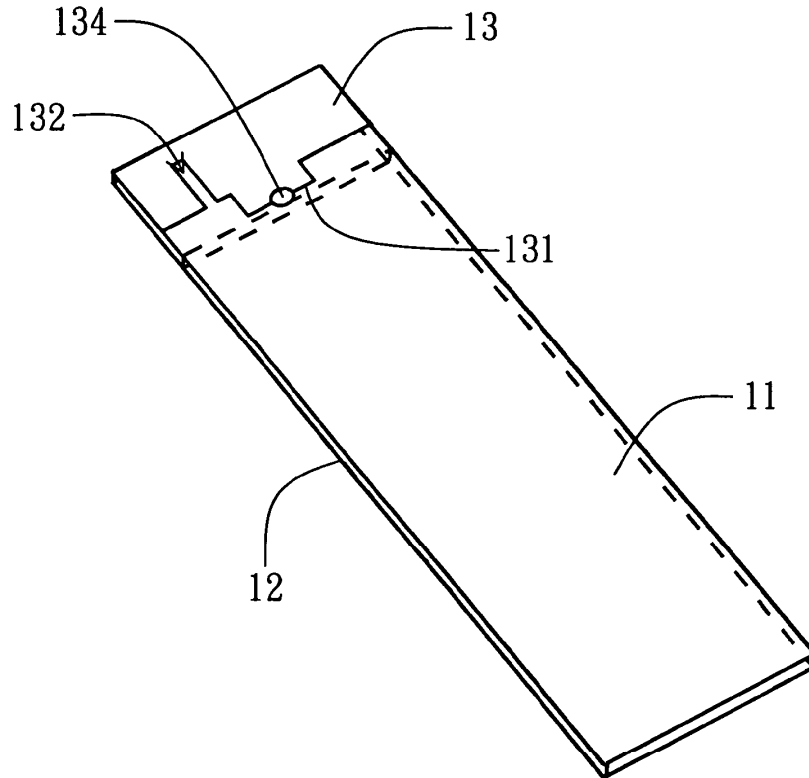
An ultra-wide band (UWB) antenna and a plug-and-play (PnP) device using the same are provided. A dielectric substrate of the PnP device has a ground plane. The UWB antenna includes a radiating metal plate and a feeding portion. The radiating metal plate is in a non-ground region of the dielectric substrate and has at least a slit cut. An opening of the slit cut is at the edge of the radiating metal plate facing the ground plane. The feeding portion is also at the edge of the radiating metal plate facing the ground plane for feeding a signal to the antenna.

(73) Assignee: **LITE-ON TECHNOLOGY  
CORPORATION**, Taipei (TW)

(21) Appl. No.: **11/878,963**

(22) Filed: **Jul. 30, 2007**

1





US 20080238784A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0238784 A1**

(43) **Pub. Date: Oct. 2, 2008**

(54) **PATTERN ANTENNA, TAG ANTENNA AND  
PATTERN TRANSMISSION PATH**

(30) **Foreign Application Priority Data**

Mar. 28, 2007 (JP) ..... 2007085339

(76) Inventors: **Tsuyoshi Ohashi**, Hashima-shi  
(JP); **Takeshi Asano**, Nagoya-shi  
(JP); **Yuji Shinkai**, Handa-shi (JP);  
**Katsuo Minakata**, Kasugai-shi (JP)

**Publication Classification**

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

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

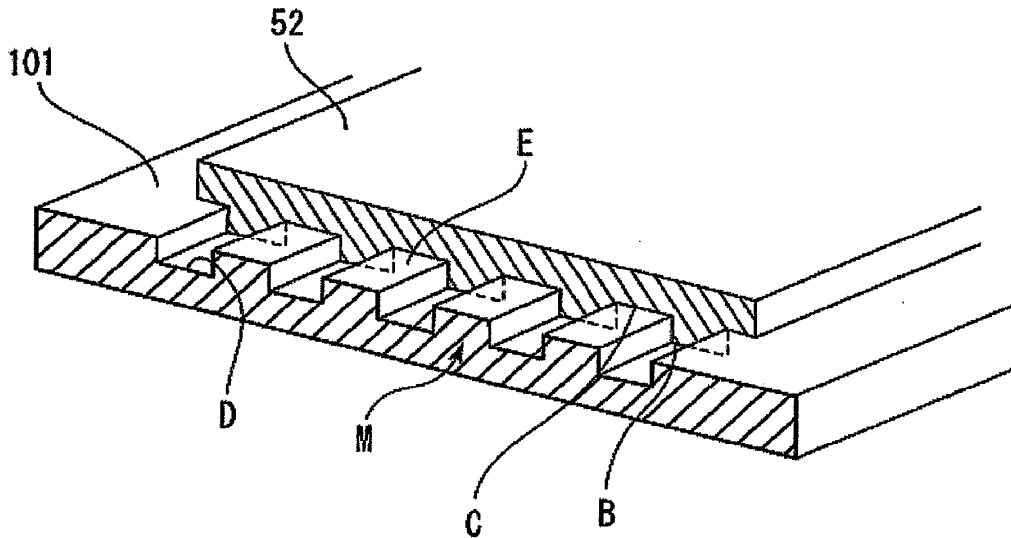
(57) **ABSTRACT**

Correspondence Address:  
**BAKER BOTTS LLP**  
**C/O INTELLECTUAL PROPERTY DEPART-  
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**THE WARNER, SUITE 1300, 1299 PENNSYLVANIA  
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**WASHINGTON, DC 20004-2400 (US)**

In an antenna formed by a substantially thin-plate state conductive member on a base material, a surface area expanding portion is provided at least substantially at a center part in a direction orthogonal to a direction in which an electric current flows. The surface area expanding portion is a projection portion provided in a projecting state with respect to a peripheral portion (or a concave portion arranged concaved than the peripheral portion). A width dimension of the projection portion (or the concave portion) in a cross-sectional face is twice or more of a skin depth of the electric current in the cross sectional face.

(21) Appl. No.: **12/049,503**

(22) Filed: **Mar. 17, 2008**





US 20080238792A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0238792 A1**

(43) **Pub. Date: Oct. 2, 2008**

(54) **MICROWAVE ANTENNA FOR FLIP-CHIP SEMICONDUCTOR MODULES**

**Publication Classification**

(76) Inventors: **Wolfgang Heinrich**, Berlin (DE);  
**Prodyut Talukder**, Berlin (DE)

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

(52) **U.S. Cl.** ..... **343/767**

Correspondence Address:  
**Pearl Cohen Zedek Latzer, LLP**  
**1500 Broadway, 12th Floor**  
**New York, NY 10036 (US)**

(57) **ABSTRACT**

The invention relates to a microwave antenna for flip-chip semiconductor modules, comprising two semiconductor substrates which are metallized on the surface thereof. Patch antennas, i.e. metallized flat areas which are insulated from the rest of the circuit on an outer surface of a module with a supply line to the circuit, are already known per se. They result in vertical radiation at a relatively large angle. According to the invention, a closed group of bumps are arranged in such a way that the distance of the bumps (2) to each other is less than the half wavelength ( $\lambda/2$ ) of the microsignal which is to be radiated or received and an open radiation slot arises in at least one pair of side walls (3,4) of the semiconductor substrates (a,b) and a bump, which is connected to the circuit of the semiconductor module, is arranged between the bumps (2) and the radiation slot, enabling the microwave antenna to be excited.

(21) Appl. No.: **10/593,337**

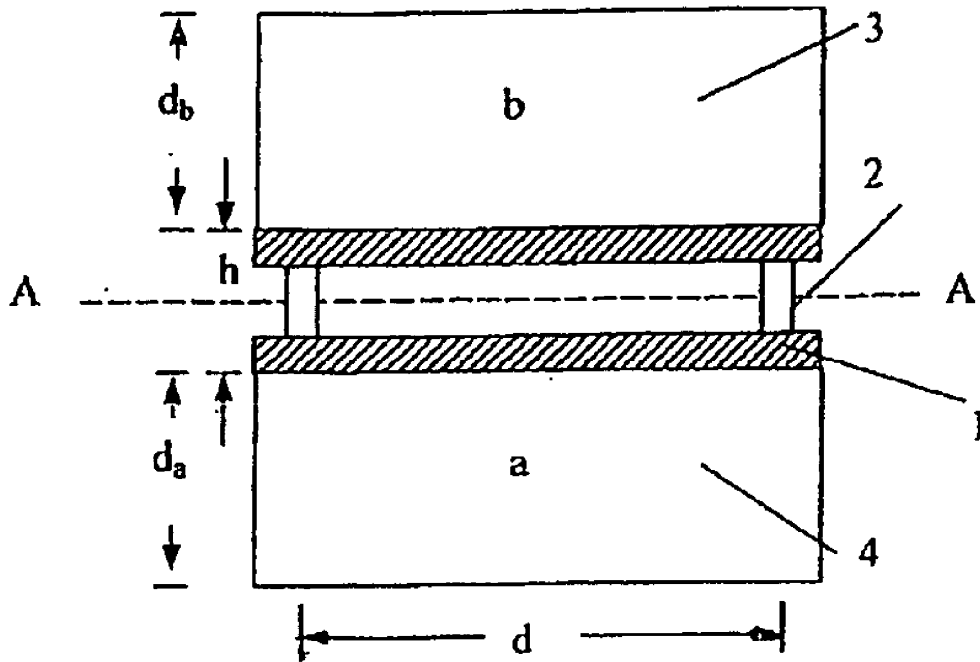
(22) PCT Filed: **Mar. 16, 2005**

(86) PCT No.: **PCT/EP2005/003303**

§ 371 (c)(1),  
(2), (4) Date: **Sep. 19, 2006**

(30) **Foreign Application Priority Data**

Mar. 19, 2004 (DE) ..... 10 2004 014 018.9





US 20080238794A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0238794 A1**

(43) **Pub. Date: Oct. 2, 2008**

(54) **CONFIGURABLE ANTENNA FOR MIXED WIRELESS NETWORKS**

(22) Filed: **Mar. 30, 2007**

**Publication Classification**

(76) Inventors: **Helen Kankan Pan**, Portland, OR (US); **James Tsai**, Beaverton, OR (US); **Stuart A. Golden**, Portland, OR (US)

(51) **Int. Cl.**  
**H01Q 5/00** (2006.01)

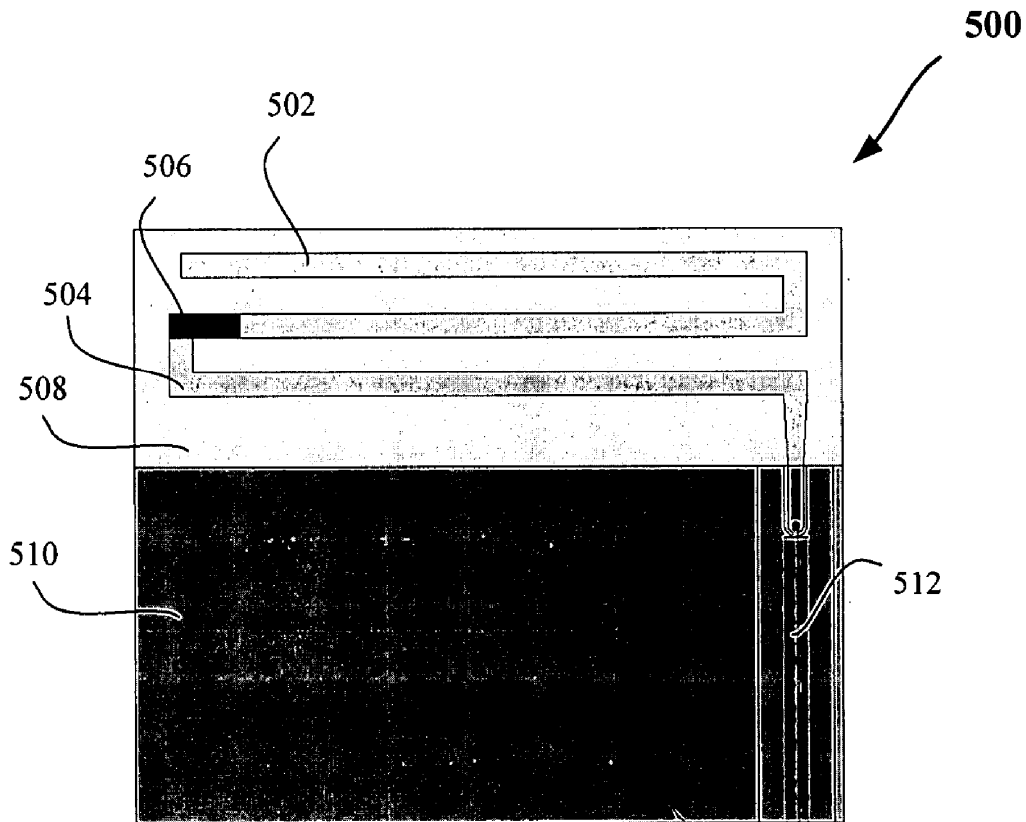
(52) **U.S. Cl.** ..... **343/767**

(57) **ABSTRACT**

Correspondence Address:  
**CAVEN & AGHEVLI**  
**c/o INTELLEVATE, LLC**  
**P.O. BOX 52050**  
**MINNEAPOLIS, MN 55402 (US)**

Methods and apparatus to reconfigure an antenna for use with mixed wireless networks are described. In one embodiment, a switch is coupled between a first portion and a second portion of an antenna to cause the antenna to tune to a plurality of radio frequency bands. Other embodiments are also described.

(21) Appl. No.: **11/731,646**







US 20080238797A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0238797 A1**

(43) **Pub. Date: Oct. 2, 2008**

(54) **HORN ANTENNA ARRAY SYSTEMS WITH LOG DIPOLE FEED SYSTEMS AND METHODS FOR USE THEREOF**

(22) Filed: **Mar. 29, 2007**

**Publication Classification**

(76) Inventors: **Corbett R. Rowell, Sha Tin (HK);  
Angus C.K. Mak, Sha Tin (HK)**

(51) **Int. Cl.**  
**H01Q 13/02** (2006.01)

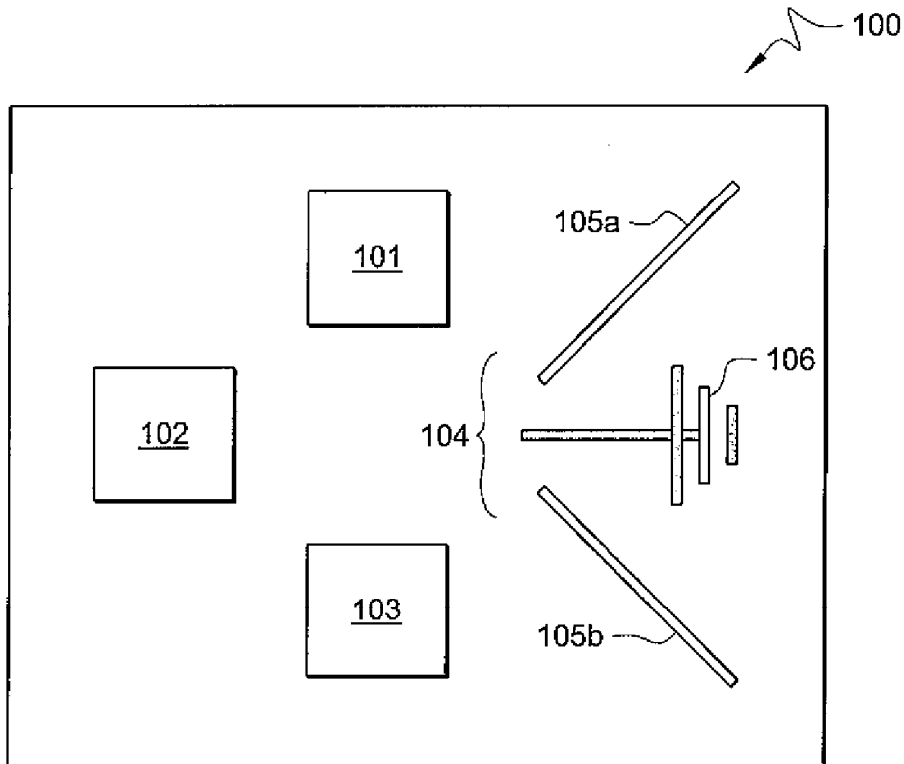
(52) **U.S. Cl.** ..... **343/776; 343/786**

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**2200 ROSS AVENUE, SUITE 2800**  
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(57) **ABSTRACT**

An antenna array comprises a plurality of elements, at least one of the elements including a log dipole isolated from others of the elements by a horn structure.

(21) Appl. No.: **11/693,474**





US 20080238800A1

(19) **United States**

(12) **Patent Application Publication**  
**Collins**

(10) **Pub. No.: US 2008/0238800 A1**

(43) **Pub. Date: Oct. 2, 2008**

(54) **BALANCED ANTENNA DEVICES**

(30) **Foreign Application Priority Data**

(76) Inventor: **Brian Collins, Cambridge (GB)**

Sep. 19, 2005 (GB) ..... 0518996.4

**Publication Classification**

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

(51) **Int. Cl.**  
**H01Q 9/28** (2006.01)

(52) **U.S. Cl.** ..... **343/795**

(57) **ABSTRACT**

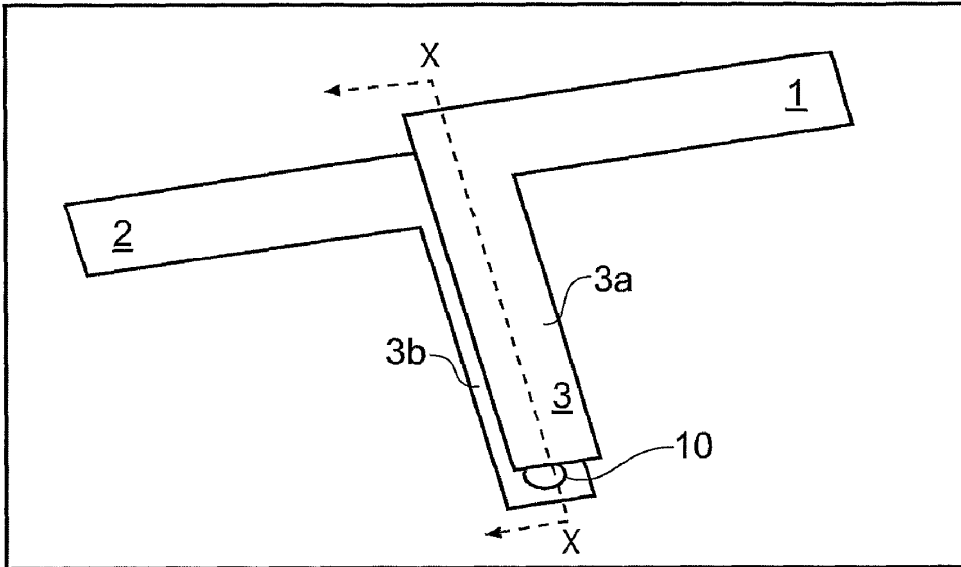
A balanced antenna comprising a dipole with first and second radiating arms, the radiating arms being provided with a balanced transmission line for connection to a feed, the balanced transmission line comprising first and second conductors connected to each other by a short-circuit conductor, and in which the antenna device is fed by applying a potential difference across the first and second conductors. The antenna device may be fed with an unbalanced feed, and is significantly smaller than a typical balanced dipole antenna device configured for operation at the same frequency.

(21) Appl. No.: **12/064,270**

(22) PCT Filed: **Sep. 18, 2006**

(86) PCT No.: **PCT/GB06/50292**

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





US 20080238802A1

(19) **United States**

(12) **Patent Application Publication**  
**Fukushima**

(10) **Pub. No.: US 2008/0238802 A1**

(43) **Pub. Date: Oct. 2, 2008**

(54) **ANTENNA DEVICE**

**Publication Classification**

(76) Inventor: **Susumu Fukushima, Osaka (JP)**

(51) **Int. Cl.**  
**H01Q 1/52** (2006.01)  
**H01Q 1/48** (2006.01)

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**P.O. BOX 980**  
**VALLEY FORGE, PA 19482 (US)**

(52) **U.S. Cl.** ..... **343/841; 343/846**

(21) Appl. No.: **10/586,069**

(57) **ABSTRACT**

(22) PCT Filed: **Nov. 24, 2005**

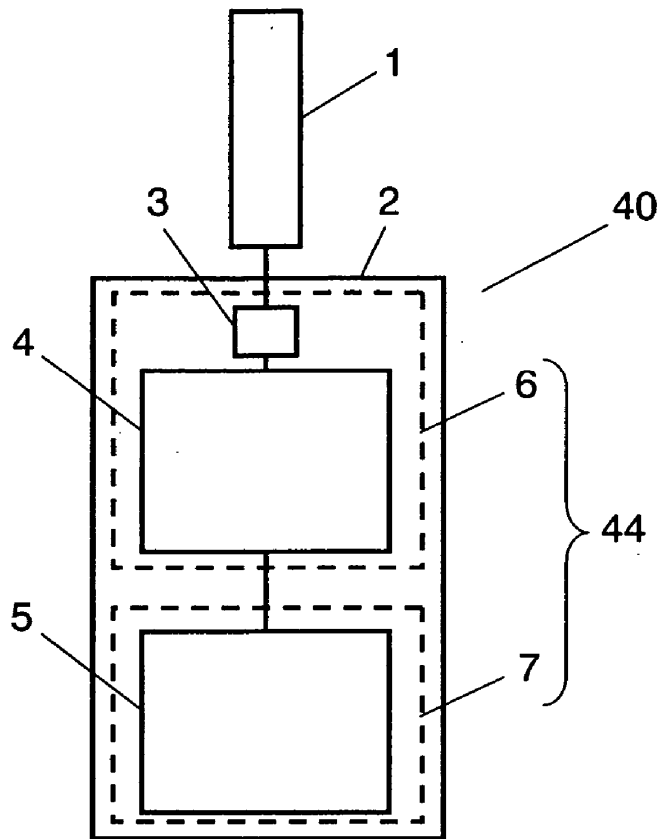
(86) PCT No.: **PCT/JP2005/021532**

§ 371 (c)(1),  
(2), (4) Date: **Jul. 14, 2006**

An antenna device includes an antenna element, a high-frequency circuit connected to the antenna element, a first ground section connected to the high-frequency circuit, a reactance circuit connected to the first ground section, and a second ground section connected to the reactance circuit. Employing the structure above allows the antenna device to have a compact body and to easily control antenna characteristics, such as radiation characteristics and input impedance characteristics.

(30) **Foreign Application Priority Data**

Nov. 29, 2004 (JP) ..... 2004-343490  
Oct. 21, 2005 (JP) ..... 2005-306908





US 20080238803A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0238803 A1**

(43) **Pub. Date: Oct. 2, 2008**

(54) **EXTREMELY MINIATURIZED FM  
FREQUENCY BAND ANTENNA**

(52) **U.S. CL. .... 343/848**

(76) Inventors: **Tsai-Yi Yang**, Kuntien Hsiang  
(TW); **Te-Yi Chu**, Kuntien Hsiang  
(TW)

(57) **ABSTRACT**

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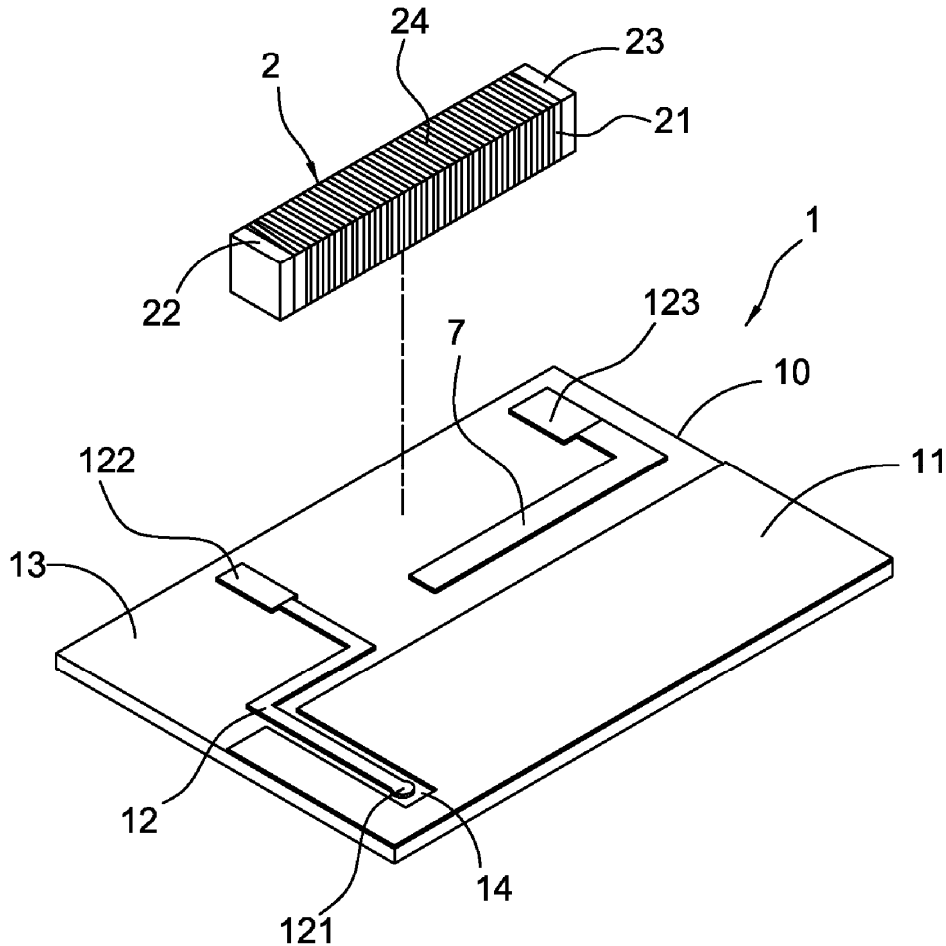
An extremely miniaturized FM frequency band antenna built in a mobile device includes a substrate and an antenna unit. The substrate is provided with a plate having a grounding metallic surface and a first clearance surface. A second clearance surface provided on the same side of the grounding metallic surface has a metallic micro strip line. One end of the metallic micro strip line extends to a bottom end of the second clearance surface and has a first contact. The other end of the micro strip line extends onto the first clearance surface and has a second contact. Further, a third contact is provided on the first clearance surface at a position corresponding to that of the second contact. Finally, the antenna unit is electrically connected on the second and third contacts to form a FM antenna for receiving FM signals.

(21) Appl. No.: **11/693,887**

(22) Filed: **Mar. 30, 2007**

**Publication Classification**

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





US 20080238804A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0238804 A1**

(43) **Pub. Date: Oct. 2, 2008**

(54) **MULTI-BAND HIGHLY ISOLATED PLANAR ANTENNAS INTEGRATED WITH FRONT-END MODULES FOR MOBILE APPLICATIONS**

(21) Appl. No.: 11/693,013

(22) Filed: Mar. 29, 2007

**Publication Classification**

(76) Inventors: **Seong-young Suh**, San Jose, CA (US); **Vijay K. Nair**, Mesa, AZ (US); **Debabani Choudhury**, Thousand Oaks, CA (US)

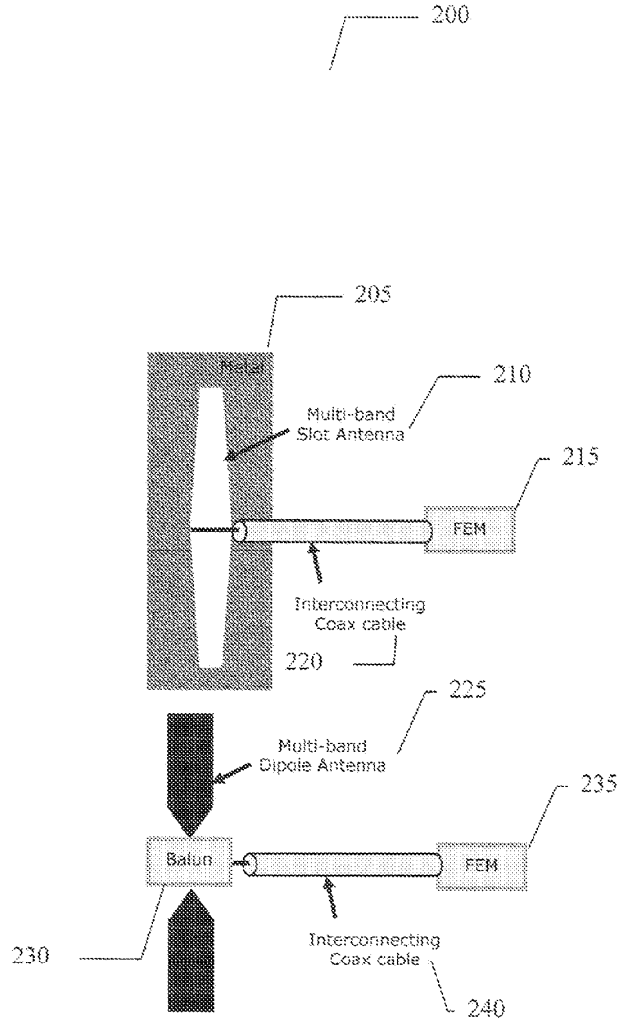
(51) **Int. Cl.**  
**H01Q 1/50** (2006.01)  
**H01Q 13/10** (2006.01)  
**H01Q 9/16** (2006.01)

(52) **U.S. Cl.** ..... **343/860; 343/767; 343/793**

(57) **ABSTRACT**

An embodiment of the present invention provides an apparatus, comprising a multi-band highly isolated planar antenna directly integrated with a front-end module (FEM).

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(19) **United States**

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

(10) **Pub. No.: US 2008/0238806 A1**

(43) **Pub. Date: Oct. 2, 2008**

(54) **ANTENNA STRUCTURE OF MOBILE PHONE**

(22) Filed: **Mar. 26, 2007**

(75) Inventors: **Chao-Hui Yu**, Taipei Hsien (TW);  
**Hung-Jen Chen**, Taipei Hsien (TW);  
**Jia-Hung Su**, Taipei Hsien (TW);  
**Kai Shih**, Taipei Hsien (TW);  
**Yu-Yuan Wu**, Taipei Hsien (TW)

**Publication Classification**

(51) **Int. Cl.**  
**H01Q 9/04** (2006.01)  
**H01Q 1/12** (2006.01)

(52) **U.S. Cl.** ..... **343/872; 343/700 MS**

(57) **ABSTRACT**

An antenna structure for mobile phone comprises a PCB (printed circuit board), an antenna portion and a second grounding portion position connected to the PCB. A face of the PCB is smeared with a stratum metal material and functioning as a first grounding portion. The antenna portion further has an antenna, a feeding point and a grounding point connected with the antenna. The second grounding portion connected to the PCB on another side of the PCB opposite to the antenna portion. Because the area of the grounding portion is increased, the electric field could be equality distributed within the whole grounding portion.

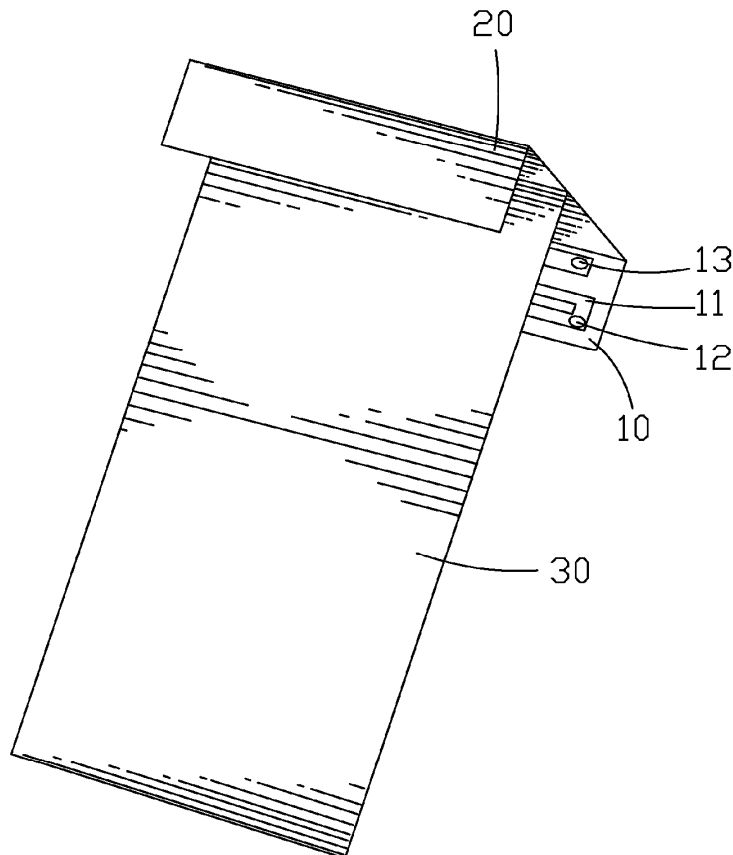
Correspondence Address:

**WPAT, PC**  
**INTELLECTUAL PROPERTY ATTORNEYS**  
**2030 MAIN STREET, SUITE 1300**  
**IRVINE, CA 92614 (US)**

(73) Assignee: **CHENG UEI PRECISION**  
**INDUSTRY CO., LTD.**, Taipei  
Hsien (TW)

(21) Appl. No.: **11/691,026**

100





US 20080246665A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0246665 A1**

(43) **Pub. Date: Oct. 9, 2008**

(54) **ANTENNA DEVICE**

(30) **Foreign Application Priority Data**

(75) Inventors: **Shigemi Kurashima**, Shinagawa (JP); **Masahiro Yanagi**, Shinagawa (JP); **Takashi Yuba**, Shinagawa (JP); **Satoshi Sakurai**, Shinagawa (JP); **Takashi Arita**, Shinagawa (JP)

Apr. 9, 2007 (JP) ..... 2007-101624

**Publication Classification**

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

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

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**WASHINGTON, DC 20005 (US)**

(57) **ABSTRACT**

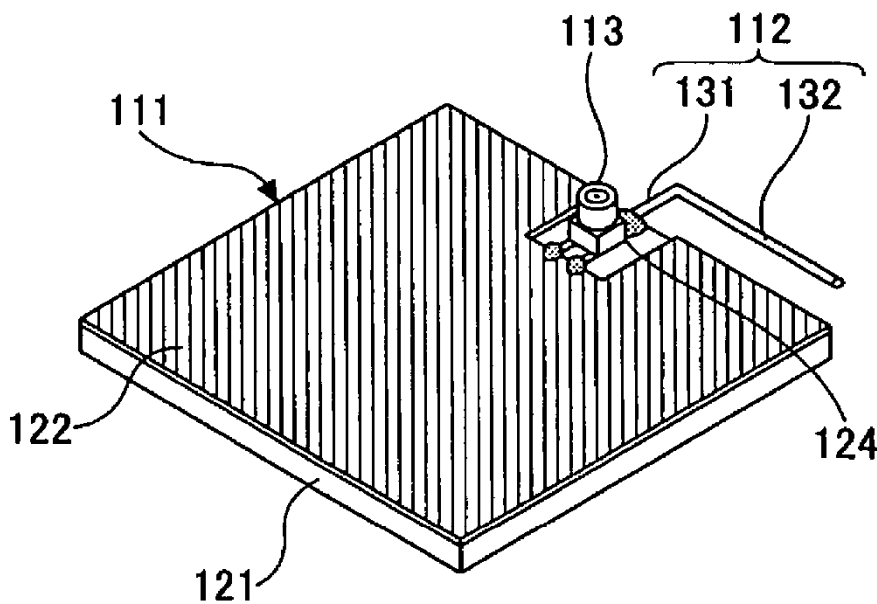
An antenna device is provided that includes a ground and an element including a first element component part and a second element component part. The first element component part has a first end facing a side of the ground and serving as a connection point, and extends from the first end in a direction, away from the ground. The second element component part is connected to a second end of the first element component part so as to extend substantially parallel to the side of the ground part.

(73) Assignee: **FUJITSU COMPONENT LIMITED**, Tokyo (JP)

(21) Appl. No.: **11/907,823**

(22) Filed: **Oct. 17, 2007**

**100**





(19) **United States**

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

(10) **Pub. No.: US 2008/0246678 A1**

(43) **Pub. Date: Oct. 9, 2008**

(54) **SLOT-STRIP ANTENNA APPARATUS FOR A RADIO DEVICE OPERABLE OVER MULTIPLE FREQUENCY BANDS**

(22) Filed: **Apr. 6, 2007**

**Publication Classification**

(75) Inventors: **QINJIANG RAO, WATERLOO (CA); GEYI WEN, WATERLOO (CA); MARK PECEN, WATERLOO (CA)**

(51) **Int. Cl.**  
**H01Q 13/10** (2006.01)  
**H01P 11/00** (2006.01)

(52) **U.S. Cl.** ..... **343/770; 29/600**

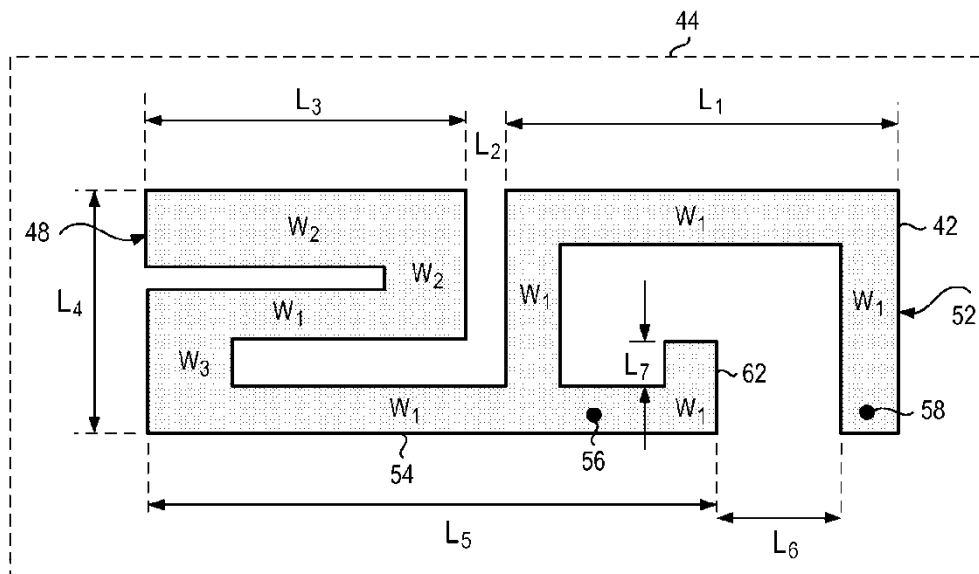
Correspondence Address:  
**RESEARCH IN MOTION  
ATTN: GLENDA WOLFE  
BUILDING 6, BRAZOS EAST, SUITE 100, 5000  
RIVERSIDE DRIVE  
IRVING, TX 75039 (US)**

(57) **ABSTRACT**

A hybrid slot-strip antenna apparatus, and an associated methodology, for a multi-mode mobile station or other radio device. The antenna is formed of a plurality of slot-strips disposed upon a printed circuit board, or other substrate. The antenna is defined by width and length design parameters, the selections of which are determinative of the antenna functionality. Through appropriate selection of the design parameters, the antenna is operable, that is, resonant, at each of the frequency bands of the multi-mode mobile station.

(73) Assignee: **RESEARCH IN MOTION LIMITED, WATERLOO (CA)**

(21) Appl. No.: **11/697,349**







US 20080246679A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0246679 A1**

(43) **Pub. Date: Oct. 9, 2008**

(54) **SMALL, NARROW PROFILE MULTIBAND ANTENNA**

(22) Filed: **Apr. 5, 2007**

**Publication Classification**

(76) Inventors: **Gary A. Martek**, Blythewood, SC (US); **Leon Fulmer**, Prosperity, SC (US); **John Maynard**, Columbia, SC (US); **Henry Jarman**, Newberry, SC (US)

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

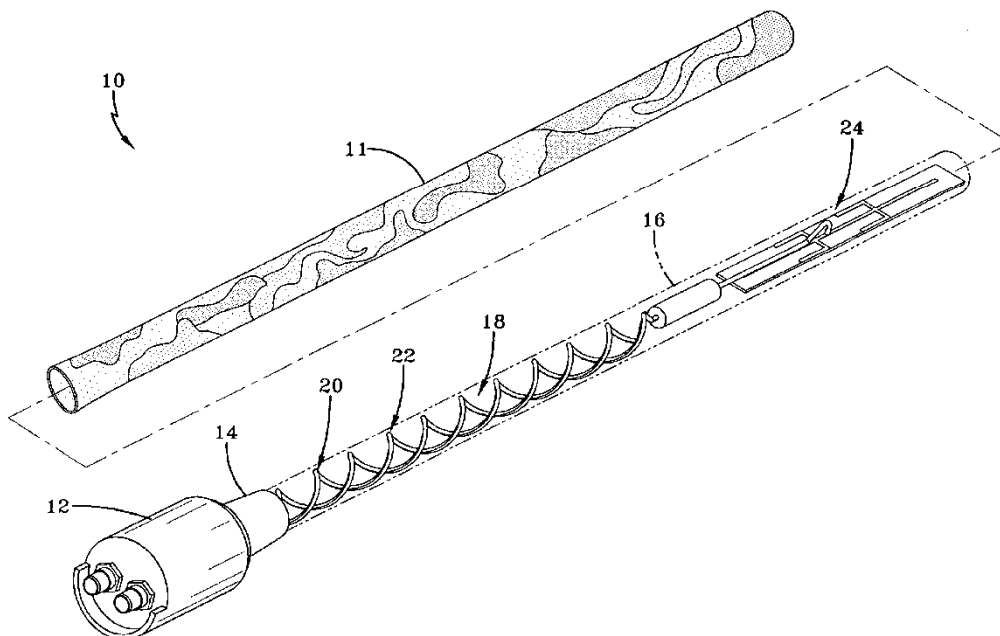
(52) **U.S. Cl.** ..... **343/793**

(57) **ABSTRACT**

Correspondence Address:  
**RENNER KENNER GREIVE BOBAK TAYLOR & WEBER**  
**FIRST NATIONAL TOWER FOURTH FLOOR,**  
**106 S. MAIN STREET**  
**AKRON, OH 44308 (US)**

A multiband antenna system includes a helical antenna having a first leg and a second leg wherein the first leg consists of a coaxial conductor. The multiband antenna also includes an antenna sub-system coupled to the helical antenna wherein the coaxial conductor feeds the antenna sub-system. A radome encloses components of the antenna system, and the radome may be covered by a radio-frequency transparent sock for concealment purposes.

(21) Appl. No.: **11/784,007**





US 20080246685A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0246685 A1**

(43) **Pub. Date: Oct. 9, 2008**

(54) **RADIO ANTENNA FOR A COMMUNICATION TERMINAL**

**Publication Classification**

(76) Inventors: **Zhinong Ying, I und (SE); Johan Andersson, Malmo (SE)**

(51) **Int. Cl.**  
*H01Q 1/36* (2006.01)  
*H01Q 1/12* (2006.01)  
*H01Q 21/00* (2006.01)

(52) **U.S. Cl.** ..... **343/878: 343/893**

(57) **ABSTRACT**

Correspondence Address:  
**WARREN A. SKLAR (SOER)**  
**RENNER, OTTO, BOISSELLE & SKLAR, LLP**  
**1621 EUCLID AVENUE, 19TH FLOOR**  
**CLEVELAND, OH 44115 (US)**

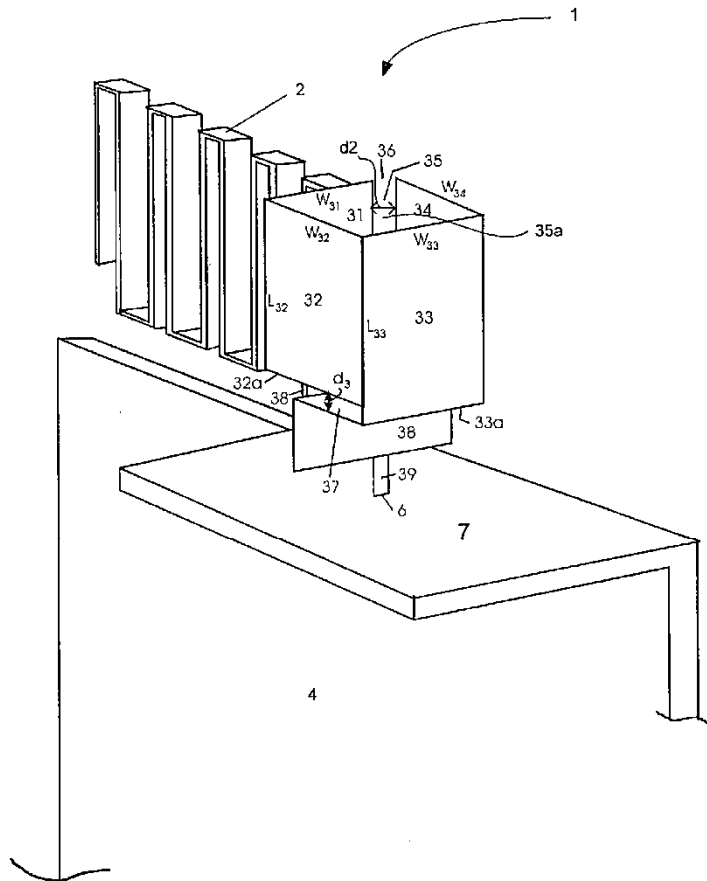
A radio antenna device for a radio communication terminal, e.g. a mobile phone, comprising a flat ground plane, a first monopole antenna element in the form of a meandered antenna element, and a second monopole antenna element having a folded three-dimensional box-like shape. The meandered antenna element has a first radio signal feeding point disposed at the ground plane. Furthermore, the meandered antenna element is located in the same plane as said ground plane in a direction of extension of the ground plane. The folded three-dimensional box-like shaped antenna element has a second radio signal feeding point disposed at a support member of the ground plane. Furthermore, the folded three-dimensional box-like shaped antenna element is located adjacent to said meandered antenna element. The meandered antenna element is operable in the first frequency band region and the folded three-dimensional box-like shaped antenna element is operable in the second frequency band region.

(21) Appl. No.: **11/740,312**

(22) Filed: **Apr. 26, 2007**

**Related U.S. Application Data**

(60) Provisional application No. 60/910,253, filed on Apr. 5, 2007.





US 20080246689A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0246689 A1**  
(43) **Pub. Date: Oct. 9, 2008**

(54) **MIMO ANTENNA**

**Publication Classification**

(75) Inventors: **XIANG-HONG QIN**, Shenzhen (CN); **JIA-LIN TENG**, Tu-Cheng (TW)

(51) **Int. Cl.**  
**H01Q 21/00** (2006.01)  
**H01Q 9/04** (2006.01)

Correspondence Address:  
**PCE INDUSTRY, INC.**  
**ATT. CHENG-JU CHIANG**  
**458 E. LAMBERT ROAD**  
**FULLERTON, CA 92835 (US)**

(52) **U.S. Cl.** ..... **343/893; 343/700 MS**

(57) **ABSTRACT**

A MIMO antenna is disposed on a substrate. The substrate includes a first surface and a second surface. The MIMO antenna includes a first antenna and a second antenna set as mirror image to the first antenna, each of the first and the second antennas includes a radiation body, a feeding portion, and a grounded portion. The radiation portion is disposed on the first surface for transceiving electromagnetic signals. The radiation body includes a first radiation portion and a second radiation portion electronically connected to the first radiation portion. The first radiation portion is serpentine-shaped and the second radiation portion is rectangular-shaped. The feeding portion is disposed on the first surface, and electronically connected to the second radiation portion for feeding electromagnetic signals to the radiation body. The grounded portion is disposed on the second surface.

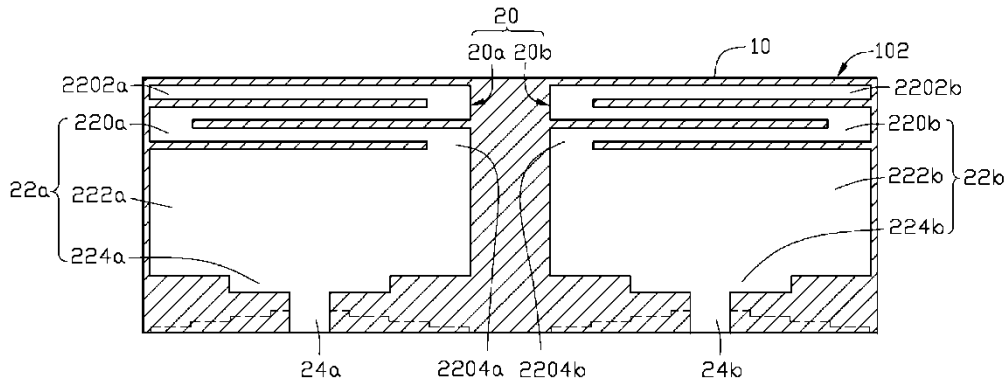
(73) Assignees: **HONG FU JIN PRECISION INDUSTRY (ShenZhen) CO., LTD.**, Shenzhen City (CN); **HON HAI PRECISION INDUSTRY CO., LTD.**, Tu-Cheng (TW)

(21) Appl. No.: **11/934,092**

(22) Filed: **Nov. 2, 2007**

(30) **Foreign Application Priority Data**

Apr. 6, 2007 (CN) ..... 200710200405.X





US 20080246690A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0246690 A1**  
(43) **Pub. Date: Oct. 9, 2008**

(54) **ANTENNA FOR A COMMUNICATION TERMINAL**

**Publication Classification**

(76) Inventors: **Zhinong Ying, Lund (SE); Johan Andersson, Malmo (SE)**

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

(52) **U.S. Cl.** ..... **343/900**

Correspondence Address:  
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**RENNER, OTTO, BOISSELLE & SKLAR, LLP**  
**1621 EUCLID AVENUE, 19TH FLOOR**  
**CLEVELAND, OH 44115 (US)**

(57) **ABSTRACT**

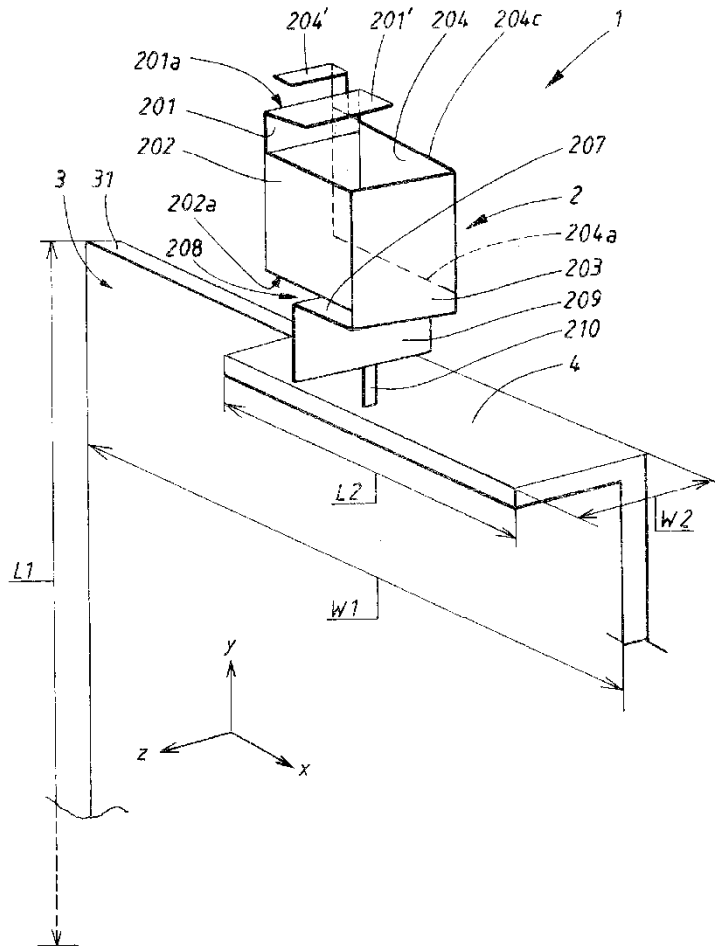
A radio antenna device for a radio communication terminal, e.g. a mobile telephone, comprising a flat ground plane and an antenna element having a radio signal feeding point disposed at the ground plane. The antenna element has a folded three dimensional box-like shape. The inventive antenna design provides for an antenna device with compact size, which at the same time is operable in UWB (Ultra Wideband) frequency regions. The antenna device may therefore advantageously be incorporated into a portable communication terminal such as a mobile telephone.

(21) Appl. No.: **11/740,310**

(22) Filed: **Apr. 26, 2007**

**Related U.S. Application Data**

(60) Provisional application No. 60/910,252, filed on Apr. 5, 2007.





US 20080252532A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0252532 A1**  
(43) **Pub. Date: Oct. 16, 2008**

(54) **MULTI-BAND ANTENNA**

(75) Inventors: **Sae-Won Oh**, Incheon (KR);  
**Seung-Yong Lee**, Pucheon-si (KR)

Correspondence Address:  
**DITTHAVONG MORI & STEINER, P.C.**  
**918 Prince St.**  
**Alexandria, VA 22314 (US)**

(73) Assignee: **Ace Antenna Corp.**, Incheon-shi (KR)

(21) Appl. No.: **12/090,045**

(22) PCT Filed: **Oct. 11, 2006**

(86) PCT No.: **PCT/KR2006/004083**

§ 371 (c)(1),  
(2), (4) Date: **Apr. 11, 2008**

(30) **Foreign Application Priority Data**

Oct. 11, 2005 (KR) ..... 10-2005-0095578  
Oct. 11, 2005 (KR) ..... 10-2005-0095583

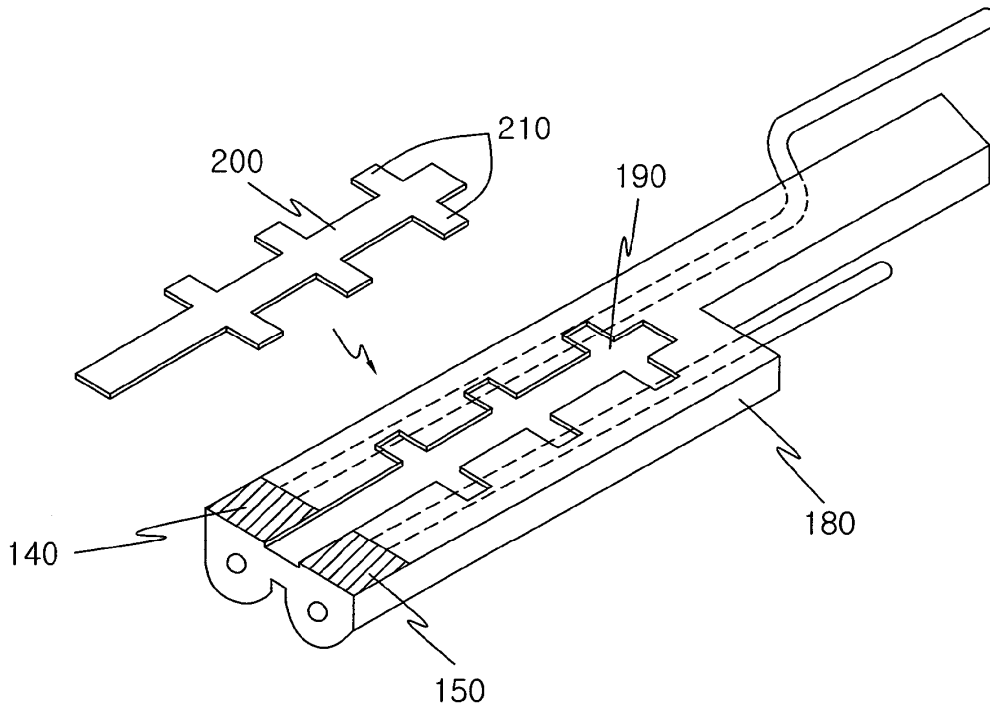
**Publication Classification**

(51) **Int. Cl.**  
**H01Q 5/00** (2006.01)

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

(57) **ABSTRACT**

The present invention relates to a multi-band antenna and, more particularly, to a sub multi-band antenna, in which a planer conducting part, which has a plurality of protruding portions, is inserted into a depression, which is formed on the surface of a body part formed through injection molding using a mold having a specific shape to surround first and second wire members, and the fitting depression of a fastening part, which is formed through the cutting or die casting of a metal material, and to a sub-band built-in chip antenna, in which sub radiation patterns having a predetermined length are formed on the interior surface of a body part, which is formed through injection molding using a dielectric material or is formed of a layered substrate a dielectric material





US 20080252533A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0252533 A1**

(43) **Pub. Date: Oct. 16, 2008**

(54) **COMPLEX ANTENNA**

(75) Inventors: **Chen-Ta Hung**, Tu-Cheng (TW);  
**Lung-Sheng Tai**, Tu-Cheng (TW);  
**Wen-Fong Su**, Tu-Cheng (TW)

(51) **Int. Cl.**  
**H01Q 1/38** (2006.01)  
**H01Q 9/04** (2006.01)

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

Correspondence Address:  
**WEI TE CHUNG**  
**FOXCONN INTERNATIONAL, INC.**  
**1650 MEMOREX DRIVE**  
**SANTA CLARA, CA 95050 (US)**

(57) **ABSTRACT**

A complex antenna comprising a grounding element having a first and second longitudinal sides; a first antenna, operating in a first wireless network, comprising a first radiating body spaced apart from the grounding element and a first connecting element connecting the first radiating body and the grounding element; a second antenna, operating in a second wireless network, comprising a second radiating body spaced apart from the grounding element and a second connecting element connecting the second radiating body and the grounding element; wherein the first antenna extending from the first side of the grounding element and working in a first lower frequency band and a first higher frequency band; the second antenna extends from the second side of the grounding element and working in a second lower frequency band and a second higher frequency band.

(73) Assignee: **Hon Hai Precision Ind. Co., Ltd.**

(21) Appl. No.: **12/148,029**

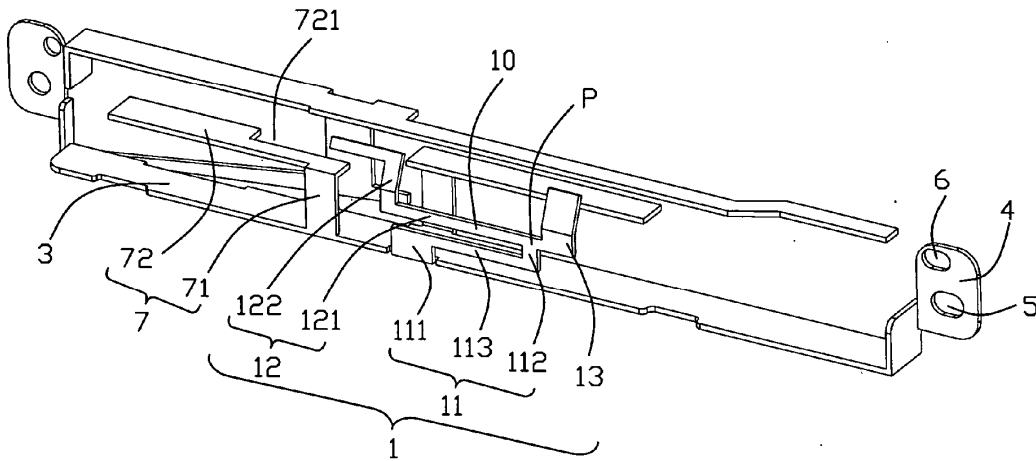
(22) Filed: **Apr. 16, 2008**

(30) **Foreign Application Priority Data**

Apr. 16, 2007 (TW) ..... 96113284

**Publication Classification**

100





US 20080252538A1

(19) **United States**

(12) **Patent Application Publication**  
**Ying**

(10) **Pub. No.: US 2008/0252538 A1**

(43) **Pub. Date: Oct. 16, 2008**

(54) **ANTENNA ARRANGEMENT**

**Related U.S. Application Data**

(76) Inventor: **Zhinong Ying, Lund (SE)**

(60) Provisional application No. 60/636,576, filed on Dec. 16, 2004.

(30) **Foreign Application Priority Data**

Dec. 7, 2004 (EP) ..... 04028916.7

Correspondence Address:

**WARREN A. SKLAR (SOER)**  
**RENNER, OTTO, BOISSELLE & SKLAR, LLP**  
1621 EUCLID AVENUE, 19TH FLOOR  
CLEVELAND, OH 44115 (US)

**Publication Classification**

(51) **Int. Cl.**  
*H01Q 1/38* (2006.01)  
*H01Q 13/10* (2006.01)

(52) **U.S. Cl.** ..... **343/767; 343/700 MS**

(57) **ABSTRACT**

An antenna arrangement comprising a multi-layer PCB (10) with a ground plane (20) in a first layer and a first antenna (11) in a second layer, and an extended ground plane (20) connected to the ground plane of the PCB. A second antenna (110, 120, 130, 140, 150) is formed integral with the extended ground plane (20). The extended ground plane is positioned opposite the first antenna.

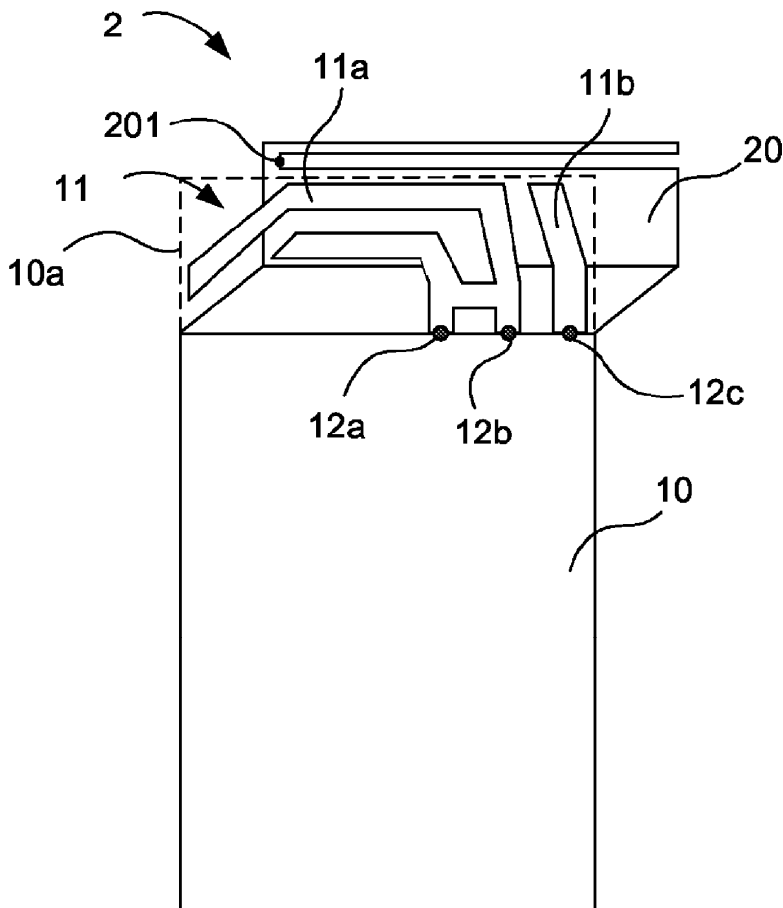
(21) Appl. No.: **11/720,634**

(22) PCT Filed: **Dec. 2, 2005**

(86) PCT No.: **PCT/EP2005/056425**

§ 371 (c)(1),

(2), (4) Date: **Nov. 14, 2007**





US 20080252548A1

(19) **United States**

(12) **Patent Application Publication**  
YU

(10) **Pub. No.: US 2008/0252548 A1**

(43) **Pub. Date: Oct. 16, 2008**

(54) **ANTENNA STRUCTURE FOR A NOTEBOOK**

**Publication Classification**

(76) Inventor: **Yao-Wen YU, Pa-Te City (TW)**

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

(52) **U.S. Cl.** ..... **343/861**

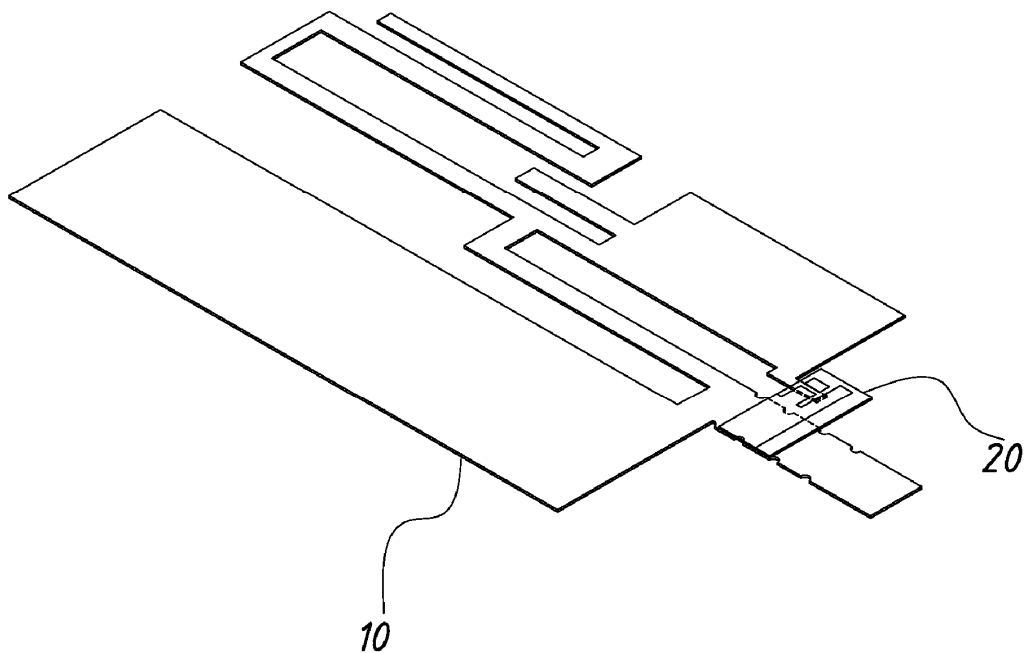
Correspondence Address:  
**SINORICA, LLC**  
**528 FALLSGROVE DRIVE**  
**ROCKVILLE, MD 20850 (US)**

(57) **ABSTRACT**

An antenna structure for a notebook comprising a main body of an antenna and a printed circuit board which is provided on the main body of the antenna and is electrically connected; and the printed circuit board is laid out thereon at least with a radio frequency matched line, the radio frequency matched line can be adjusted to get a desired bandwidth.

(21) Appl. No.: **11/735,461**

(22) Filed: **Apr. 14, 2007**







US 20080252554A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0252554 A1**

(43) **Pub. Date: Oct. 16, 2008**

(54) **ANTENNA STRUCTURE**

Apr. 16, 2007 (TW) ..... 096113315

(76) Inventors: **Ying-Chieh Chuang**, Taipei City (TW); **Ching-Chung Tang**, Taipei City (TW); **Shen-Yuan Lee**, Taipei City (TW)

**Publication Classification**

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

(52) **U.S. Cl.** ..... **343/906**

Correspondence Address:  
**NORTH AMERICA INTELLECTUAL PROP-  
ERTY CORPORATION**  
**P.O. BOX 506**  
**MERRIFIELD, VA 22116 (US)**

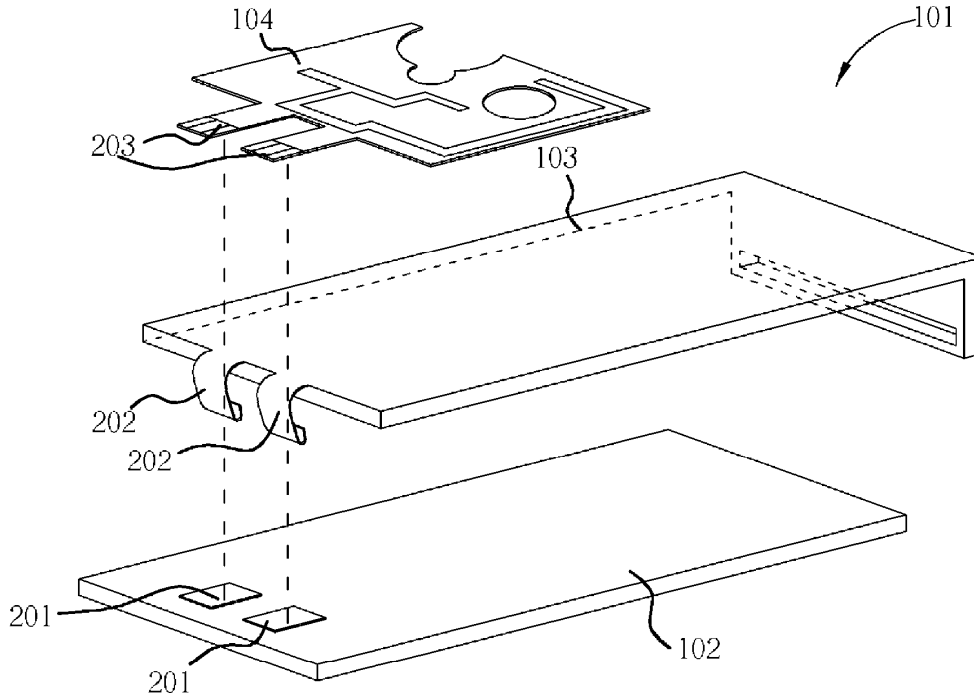
(57) **ABSTRACT**

The present invention provides an antenna structure. The antenna structure includes a main board, at least having a signal feeding portion; a bearing component, connected to the main board and at least having a protrusive portion; and an antenna, connected to the bearing component and at least having a pin portion, wherein the pin portion is disposed on the protrusive portion, and the signal feeding portion and the pin portion contact with each other.

(21) Appl. No.: **12/098,462**

(22) Filed: **Apr. 7, 2008**

(30) **Foreign Application Priority Data**





US 20080258977A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0258977 A1**  
(43) **Pub. Date: Oct. 23, 2008**

(54) **CONCURRENT MODE ANTENNA SYSTEM**

(21) Appl. No.: **11/785,789**

(75) Inventors: **Young-eil Kim**, Suwon-si (KR);  
**Chang-won Jung**, Hwaseong-si (KR);  
**Seunghwan Yoon**, Irvine, CA (US);  
**Franco De Flaviis**, Irvine, CA (US);  
**Hyoung-woon Park**, Seongnam-si (KR)

(22) Filed: **Apr. 20, 2007**

**Publication Classification**

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

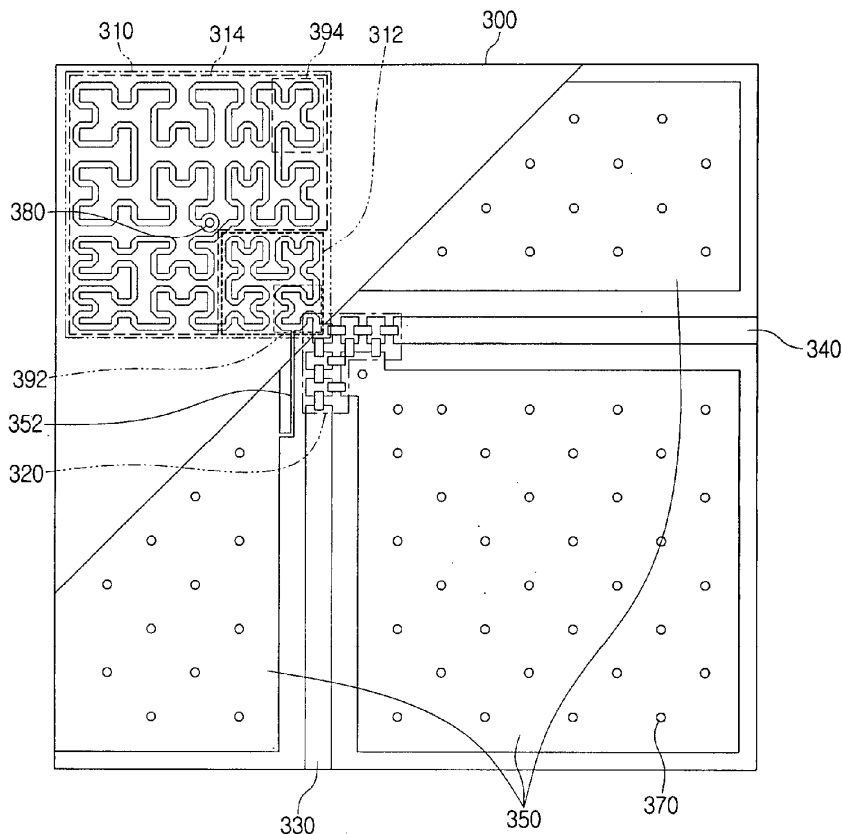
(52) **U.S. Cl.** ..... **343/700 MS**

Correspondence Address:  
**SUGHRUE MION, PLLC**  
**2100 PENNSYLVANIA AVENUE, N.W., SUITE 800**  
**WASHINGTON, DC 20037 (US)**

(57) **ABSTRACT**

A multiband antenna system is provided. The system includes a substrate; an antenna which is disposed on a first side and a second side of the substrate, and produces a resonance in a plurality of frequency bands; a plurality of feeders which are disposed on the first side of the substrate; and a filter which is disposed on the first side of the substrate, is coupled to an end of the antenna, and transfers signals of the plurality of frequency bands output from the antenna to respective feeders of the plurality of the feeders.

(73) Assignees: **SAMSUNG ELECTRONICS CO., LTD.**, Suwon-si (KR);  
**UNIVERSITY OF CALIFORNIA, IRVINE**, Irvine, CA (US)





US 20080258978A1

(19) **United States**

(12) **Patent Application Publication**  
**Stuart**

(10) **Pub. No.: US 2008/0258978 A1**

(43) **Pub. Date: Oct. 23, 2008**

(54) **STRIP-ARRAY ANTENNA**

**Publication Classification**

(75) Inventor: **Howard R. Stuart**, Glen Ridge, NJ  
(US)

(51) **Int. Cl.**  
*H01Q 1/38* (2006.01)  
*H01Q 9/04* (2006.01)

Correspondence Address:  
**MENDELSON & ASSOCIATES, P.C.**  
**1500 JOHN F. KENNEDY BLVD., SUITE 405**  
**PHILADELPHIA, PA 19102 (US)**

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

(57) **ABSTRACT**

(73) Assignee: **LUCENT TECHNOLOGIES**  
**INC.**, Murray Hill, NJ (US)

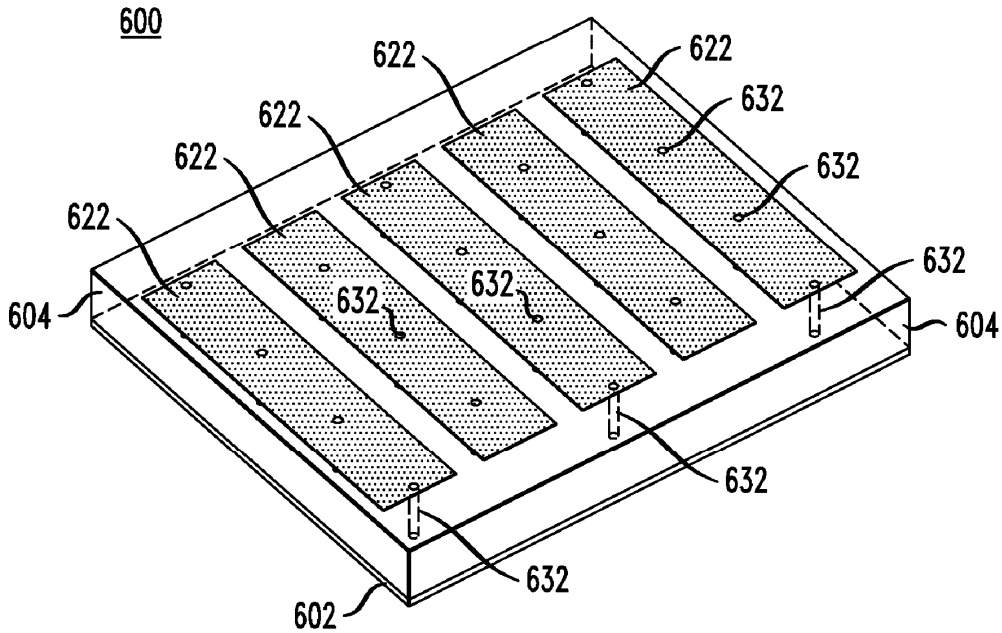
A representative embodiment of the invention provides an antenna having an electrically conducting ground plane and an array of electrically conducting strips located at an offset distance from the ground plane. Electrically conducting pathways, each attached to the middle portion of the corresponding strip, connect the strips to the ground plane. Electrically conducting lips, each attached to an edge of the corresponding conducting strip, extend about halfway toward the ground plane. The size of the array is smaller than the wavelength of the fundamental radiation mode supported by the antenna. Advantageously, the antenna has a bandwidth about three times larger than that of a comparably sized prior-art patch antenna.

(21) Appl. No.: **11/938,533**

(22) Filed: **Nov. 12, 2007**

**Related U.S. Application Data**

(60) Provisional application No. 60/925,813, filed on Apr. 23, 2007.





US 20080258979A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0258979 A1**

(43) **Pub. Date: Oct. 23, 2008**

(54) **ANTENNA**

**Publication Classification**

(75) Inventors: **Yi-Cheng Lin**, Taipei City (TW);  
**Chih-Hao Lin**, Taipei City (TW)

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

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

Correspondence Address:  
**QUINTERO LAW OFFICE, PC**  
**2210 MAIN STREET, SUITE 200**  
**SANTA MONICA, CA 90405 (US)**

(57) **ABSTRACT**

An antenna is provided comprising a transmission element, a ground element, a first parasitic element, a second parasitic element and a third parasitic element. The transmission element is located on a first plane, wherein the transmission element is T shaped, and comprises a first transmission portion and a second transmission portion and the second transmission portion is perpendicular to the first transmission portion and connected to an end thereof. The ground element is located on a second plane parallel to the first plane. The first parasitic element, the second parasitic element and the third parasitic element are connected to the ground element and located on the second plane.

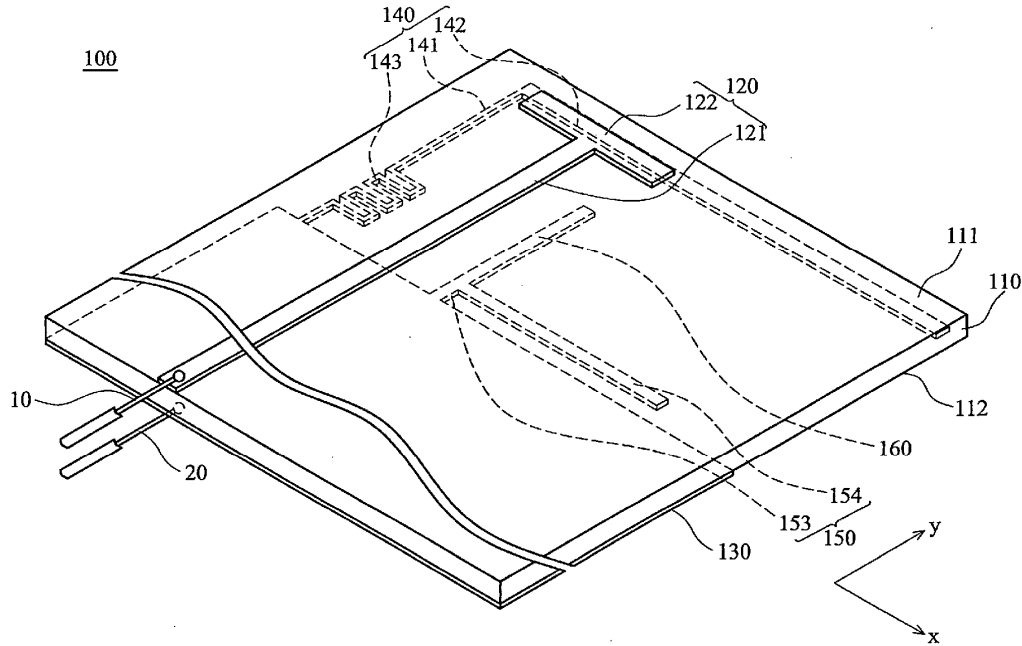
(73) Assignee: **NATIONAL TAIWAN UNIVERSITY, TAIPEI (TW)**

(21) Appl. No.: **11/948,944**

(22) Filed: **Nov. 30, 2007**

(30) **Foreign Application Priority Data**

Apr. 23, 2007 (TW) ..... 96114244





US 20080258980A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0258980 A1**

(43) **Pub. Date: Oct. 23, 2008**

(54) **BROADBAND ANTENNA**

(75) Inventors: **Wen-Shyang CHEN**, Hsin-Tien City (TW); **Yao-Yuan CHANG**, Hsin-Tien City (TW); **Chih-Ren HSIAO**, Hsin-Tien City (TW); **Tsung-Wen CHIU**, Hsin-Tien City (TW); **Fu-Ren HSIAO**, Hsin-Tien City (TW)

Correspondence Address:  
**PATENTM.US**  
**P. O. BOX 82788**  
**PORTLAND, OR 97282-0788 (US)**

(73) Assignee: **ADVANCED CONNECTEK INC.**, Hsin-Tien City (TW)

(21) Appl. No.: **12/101,549**

(22) Filed: **Apr. 11, 2008**

(30) **Foreign Application Priority Data**

Apr. 20, 2007 (TW) ..... 096113999

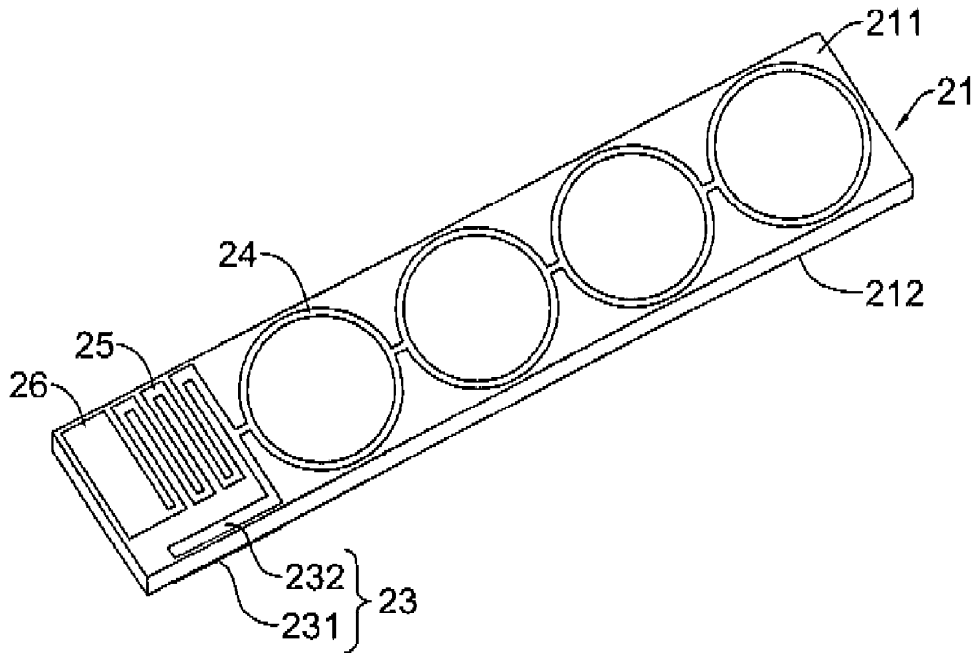
**Publication Classification**

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

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

(57) **ABSTRACT**

A broadband antenna has a substrate, a coupling conductor, a conductor string, a ground conductor and a ground plane. The coupling conductor has a first coupling member and a second coupling member being separated from each other. The conductor string and the ground conductor are connected to the second coupling member. The conductor string extends along a direction opposite to the second coupling member. The ground conductor is connected to the ground plane. The broadband antenna uses the coupling conductor and the ground conductor to adjust input impedance for impedance match. The conductor string functions as a multi level resonance circuit to increase impedance bandwidth.





US 20080258985A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0258985 A1**  
(43) **Pub. Date: Oct. 23, 2008**

(54) **INTERNAL ANTENNA FOR HANDSET AND DESIGN METHOD THEREOF**

(75) Inventors: **Byung-Hoon Ryou**, Seoul (KR);  
**Weon-Mo Sung**, Gyeonggi-do (KR)

Correspondence Address:  
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**P. O. BOX 82788**  
**PORTLAND, OR 97282-0788 (US)**

(73) Assignee: **E.M.W. ANTENNA CO., LTD.**,  
Seoul (KR)

(21) Appl. No.: **10/598,120**

(22) PCT Filed: **Feb. 18, 2005**

(86) PCT No.: **PCT/KR2005/000430**

§ 371 (c)(1),  
(2), (4) Date: **Jul. 10, 2008**

(30) **Foreign Application Priority Data**

Feb. 19, 2004 (KR) ..... 10-2004-0010972  
Feb. 17, 2005 (KR) ..... 10-2005-0013204

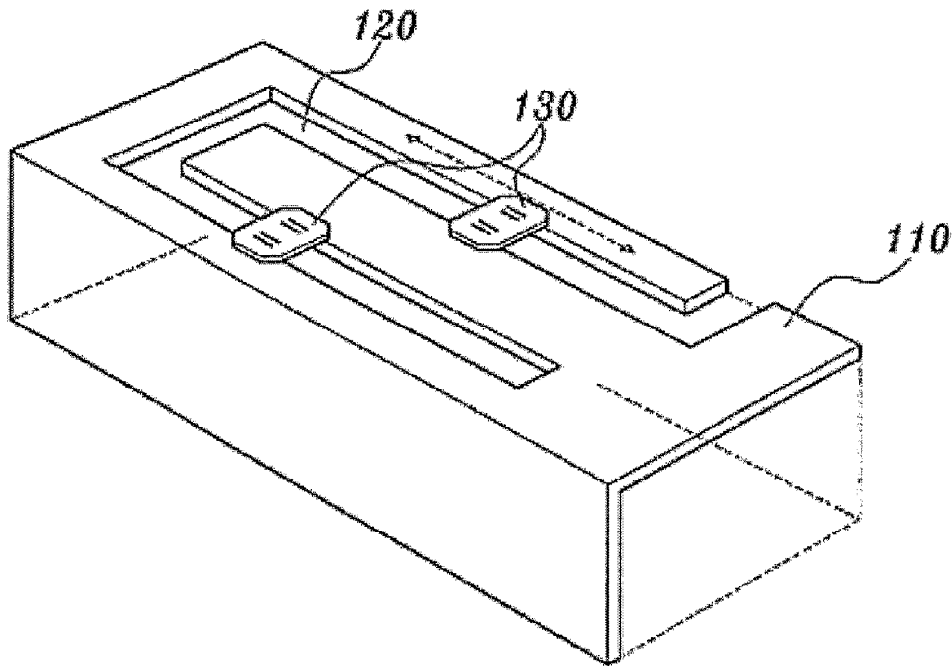
**Publication Classification**

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

(52) **U.S. Cl.** ..... **343/746**

(57) **ABSTRACT**

The present invention relates to an internal antenna for a handset and a design method thereof. The present invention provides an internal antenna for a handset and a design method thereof characterized in that a L/C element is attached to a slot line of an internal antenna, the attached L/C element is moved along the slot line, or the L/C element having a predetermined inductance/capacitance is attached and detached, thereby easily matching a resonant frequency.





US 20080258989A1

(19) **United States**

(12) **Patent Application Publication**

Rao et al.

(10) **Pub. No.: US 2008/0258989 A1**

(43) **Pub. Date: Oct. 23, 2008**

(54) **SLOT-LOADED MICROSTRIP ANTENNA AND RELATED METHODS**

**Publication Classification**

(75) Inventors: **Qinjiang Rao**, Waterloo (CA); **Geyi Wen**, Waterloo (CA); **Dong Wang**, Waterloo (CA); **Mark Pecen**, Waterloo (CA)

(51) **Int. Cl.**  
*H01Q 13/10* (2006.01)  
*H01P 11/00* (2006.01)

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

(57) **ABSTRACT**

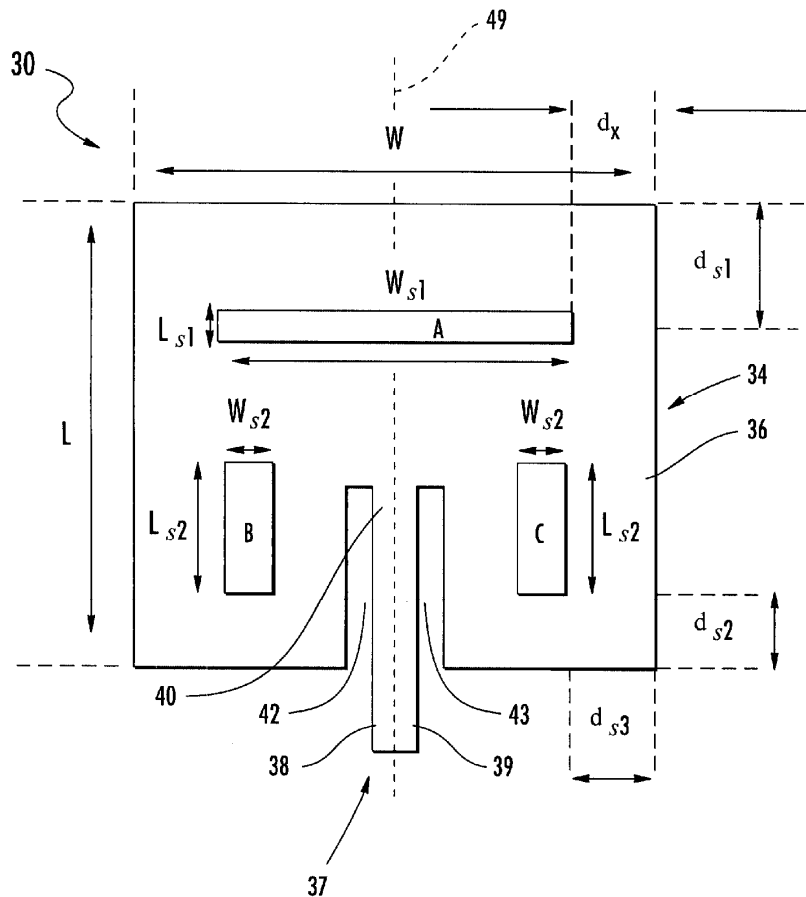
Correspondence Address:  
**ALLEN, DYER, DOPPELT, MILBRATH & GILCHRIST P.A.**  
1401 CITRUS CENTER 255 SOUTH ORANGE AVENUE, P.O. BOX 3791  
ORLANDO, FL 32802-3791 (US)

A microstrip antenna may include an electrically conductive ground plane layer, a dielectric layer adjacent the electrically conductive ground plane layer, and an electrically conductive patch layer adjacent the dielectric layer on a side thereof opposite the electrically conductive ground plane layer. The electrically conductive patch layer may be electrically floating with respect to the electrically conductive ground plane layer and may comprise a body portion and a feed strip extending outwardly from an interior medial portion of the body portion. The feed strip may have opposing first and second sides and an end electrically connected to the body portion. The body portion may have spaced apart first and second slots adjacent respective ones of the first and second opposite sides of the feed strip, and a third slot adjacent the end of the feed strip and spaced from the first and second slots.

(73) Assignee: **Research In Motion Limited**, Waterloo (CA)

(21) Appl. No.: **11/737,878**

(22) Filed: **Apr. 20, 2007**





US 20080258991A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0258991 A1**

(43) **Pub. Date: Oct. 23, 2008**

(54) **MULTIMODE ANTENNA STRUCTURE**

**Publication Classification**

(75) Inventors: **Mark T. Montgomery**, Melbourne Beach, FL (US); **Frank M. Caimi**, Vero Beach, FL (US); **Paul A. Tornatta**, Melbourne, FL (US); **Li Chen**, Melbourne, FL (US)

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

(52) **U.S. Cl.** ..... **343/844**

(57) **ABSTRACT**

A multimode antenna structure is provided for transmitting and receiving electromagnetic signals in a communications device. The communications device includes circuitry for processing signals communicated to and from the antenna structure. The antenna structure includes a plurality of antenna ports operatively coupled to the circuitry and a plurality of antenna elements, each operatively coupled to a different one of the antenna ports. The antenna structure also includes one or more connecting elements electrically connecting the antenna elements such that electrical currents on one antenna element flow to a connected neighboring antenna element and generally bypass the antenna port coupled to the neighboring antenna element, and the electrical currents flowing through the one antenna element and the neighboring antenna element are generally equal in magnitude, such that an antenna mode excited by one antenna port is generally electrically isolated from a mode excited by another antenna port at a given desired signal frequency range and the antenna elements generate diverse antenna patterns.

Correspondence Address:  
**BOSTON IP LAW GROUP**  
**TWO NEWTON PLACE, 255 WASHINGTON STREET, SUITE 200**  
**NEWTON, MA 02458 (US)**

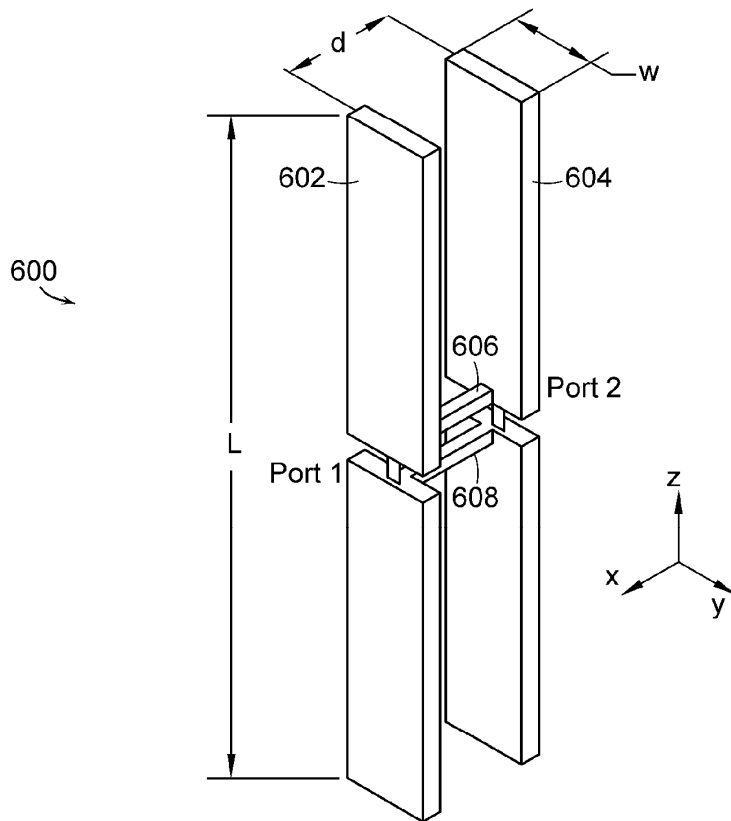
(73) Assignee: **SkyCross, Inc.**, Viera, FL (US)

(21) Appl. No.: **11/769,565**

(22) Filed: **Jun. 27, 2007**

**Related U.S. Application Data**

(60) Provisional application No. 60/925,394, filed on Apr. 20, 2007, provisional application No. 60/916,655, filed on May 8, 2007.







US 20080258992A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0258992 A1**

(43) **Pub. Date: Oct. 23, 2008**

(54) **ANTENNA UNIT WITH A PARASITIC COUPLER**

(30) **Foreign Application Priority Data**

Apr. 17, 2007 (TW) ..... 096113455

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

**Publication Classification**

(51) **Int. Cl.**  
**H01Q 1/50** (2006.01)  
**H01Q 21/00** (2006.01)

(52) **U.S. Cl.** ..... **343/853**

Correspondence Address:

**LADAS & PARRY**  
**5670 WILSHIRE BOULEVARD, SUITE 2100**  
**LOS ANGELES, CA 90036-5679 (US)**

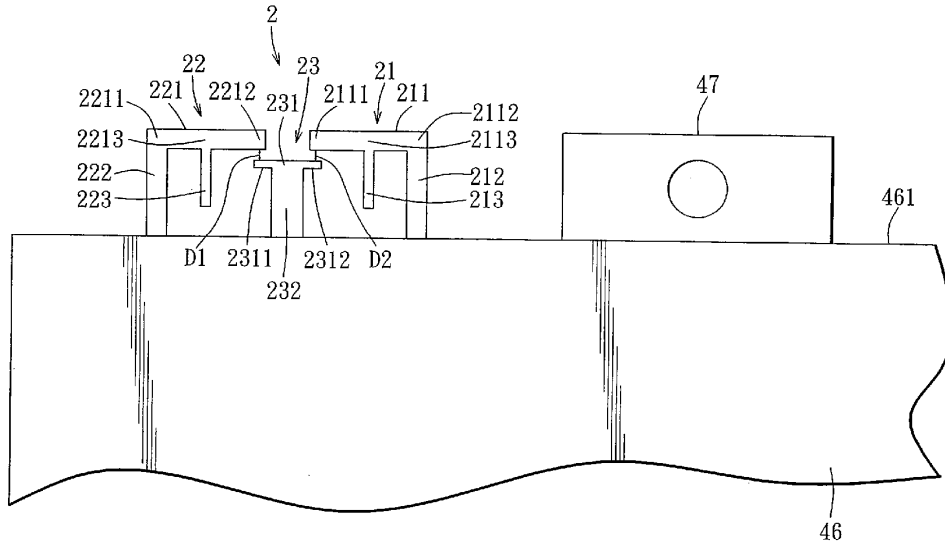
(57) **ABSTRACT**

An antenna unit includes left and right antennas that are spaced apart from each other and that are operable within a first frequency bandwidth, and a parasitic coupler that is spaced apart from and disposed between the left and right antennas, and that is electromagnetically coupled to the left and right antennas so as to be operable within a second frequency bandwidth.

(73) Assignee: **QUANTA COMPUTER INC.**, Tao Yuan Shien (TW)

(21) Appl. No.: **11/841,097**

(22) Filed: **Aug. 20, 2007**





US 20080265038A1

(19) **United States**

(12) **Patent Application Publication**  
**Mumbru Forn et al.**

(10) **Pub. No.: US 2008/0265038 A1**  
(43) **Pub. Date: Oct. 30, 2008**

(54) **ANTENNA IN PACKAGE WITH REDUCED ELECTROMAGNETIC INTERACTION WITH ON CHIP ELEMENTS**

(86) PCT No.: **PCT/EP05/08032**

§ 371 (c)(1),  
(2), (4) Date: **Jan. 19, 2007**

(75) Inventors: **Jose Mumbru Forn**, Barcelona (ES); **Carles Puente**, Sant Cugat del Valles (ES); **Jordi Soler Castany**, Barcelona (ES)

**Related U.S. Application Data**

(60) Provisional application No. 60/590,695, filed on Jul. 23, 2004.

**Publication Classification**

Correspondence Address:  
**KENYON & KENYON LLP**  
**1500 K STREET N.W., SUITE 700**  
**WASHINGTON, DC 20005 (US)**

(51) **Int. Cl.**  
**G06K 19/00** (2006.01)

(52) **U.S. Cl.** ..... **235/492; 257/659**

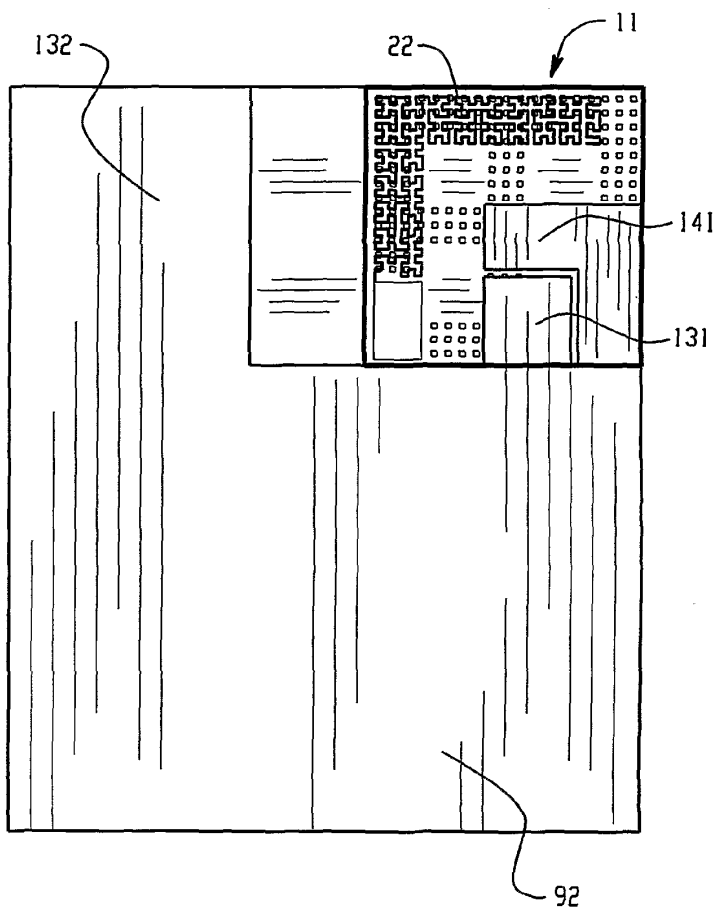
(57) **ABSTRACT**

A IC package for a wireless device includes an antenna that is attached to the chip. The electrically conductive elements of the antenna are spaced away from the antenna and particularly the endpoint of the antenna to prevent interference with the antenna. An element on the IC package may be shielded antenna. The antenna may have the shape of a space-filling curve, including a Hilbert, box-counting or grid dimension curve.

(73) Assignee: **FRACTUS, S.A.**, Sant Cugat del Valles (ES)

(21) Appl. No.: **11/572,380**

(22) PCT Filed: **Jul. 22, 2005**





US 20080266178A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0266178 A1**

(43) **Pub. Date: Oct. 30, 2008**

(54) **PLANAR ANTENNA FOR MOBILE  
SATELLITE APPLICATIONS**

**Publication Classification**

(75) Inventors: **Ferdinando Tiezzi**, Renens (CH);  
**Stefano Vaccaro**, Gland (CH)

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

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

(57) **ABSTRACT**

Correspondence Address:  
**GRIFFIN & SZIPL, PC**  
**SUITE PH-1, 2300 NINTH STREET, SOUTH**  
**ARLINGTON, VA 22204 (US)**

The invention relates to a microstrip patch antenna (1) for mobile satellite communications comprising a first electrically conducting ground plane (4) having at least one opening (7), at least one patch radiating element (2), at least one first dielectric layer (L2) disposed between the first electrically conducting ground plane and the patch radiating element and more particularly between the at least one opening and the patch radiating element, at least one feed line (6) for providing signal energy in a contactless manner to or from the patch radiating element through the opening and a second dielectric layer (L3) disposed between the feed line and the first electrically conducting ground plane wherein the antenna further comprises a second ground plane (8) and a third dielectric layer (L4) disposed between the second ground plane and the feed line.

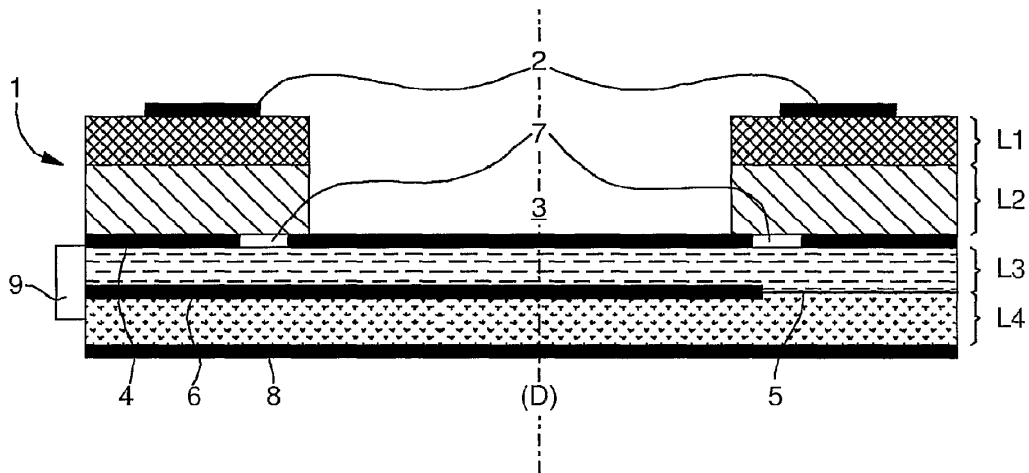
(73) Assignee: **Sàrl JAST**, Lausanne (CH)

(21) Appl. No.: **11/575,654**

(22) PCT Filed: **Sep. 24, 2004**

(86) PCT No.: **PCT/EP04/52312**

§ 371 (c)(1),  
(2), (4) Date: **Jul. 9, 2008**





US 20080266179A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0266179 A1**

(43) **Pub. Date: Oct. 30, 2008**

(54) **ELECTRICAL CONNECTION ELEMENTS PROVIDED IN THE AMC STRUCTURE OF AN ANTENNA ARRANGEMENT**

**Publication Classification**

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

(75) Inventors: **Omid SOTOUDEH**, Upplands Vasby (SE); **Soren KARLSSON**, Upplands Vasby (SE)

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

Correspondence Address:  
**HARRITY SNYDER, L.L.P.**  
**11350 RANDOM HILLS ROAD, SUITE 600**  
**FAIRFAX, VA 22030 (US)**

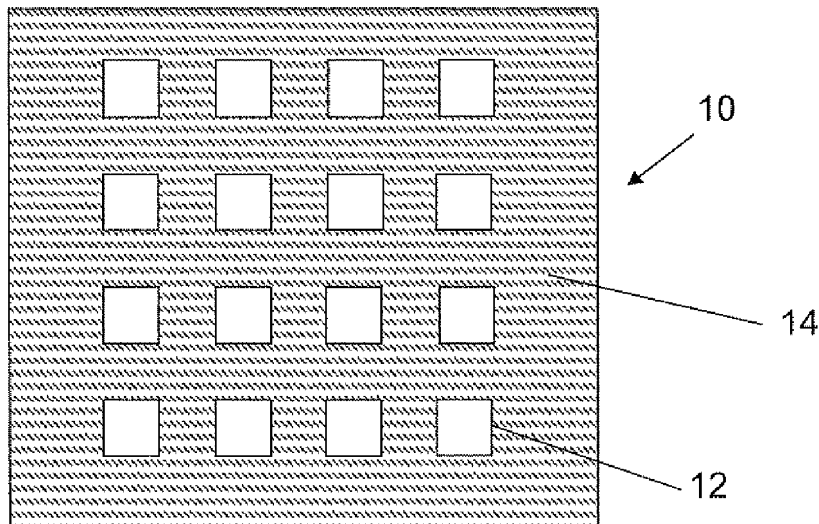
(57) **ABSTRACT**

A portable communication device comprises an antenna arrangement having a radiating antenna element and a grounding layer comprising an AMC material structure facing the radiating antenna element. The AMC material structure includes at least one layer of patches connected to a smooth conducting layer using conducting vias and electrical connection elements that selectively interconnect patches in a layer with other elements of the AMC structure. In this way a low profile antenna arrangement is provided that allows the coverage of a broad frequency band and/or directivity.

(73) Assignee: **SONY ERICSSON MOBILE COMMUNICATIONS AB**, Lund (SE)

(21) Appl. No.: **11/739,286**

(22) Filed: **Apr. 24, 2007**





US 20080266180A1

(19) **United States**

(12) **Patent Application Publication**  
**Wu**

(10) **Pub. No.: US 2008/0266180 A1**

(43) **Pub. Date: Oct. 30, 2008**

(54) **SYMMETRICAL UNI-PLATED ANTENNA  
AND WIRELESS NETWORK DEVICE  
HAVING THE SAME**

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

(75) **Inventor: Jung Tai Wu, Taipei City (TW)**

(57) **ABSTRACT**

Correspondence Address:  
**TROXELL LAW OFFICE PLLC  
SUITE 1404, 5205 LEESBURG PIKE  
FALLS CHURCH, VA 22041 (US)**

The present invention discloses an antenna adapted for use in a wireless network device. The antenna includes a base and two antenna portions. Each antenna portion includes a radiation section and a ground section. The ground sections of the two antenna portions are connected with the same base and substantially perpendicular to the base. The radiation section is connected with the ground section and substantially parallel to the base with a difference in height formed between the radiation section and the base. The antenna is a single component integrally formed by stamping an electrically conductive thin metal plate, which not only facilitates fabrication thereof, but also the assembly of the antenna to a substrate of the wireless network device, thereby increasing the gain of the wireless network device along a vertical direction.

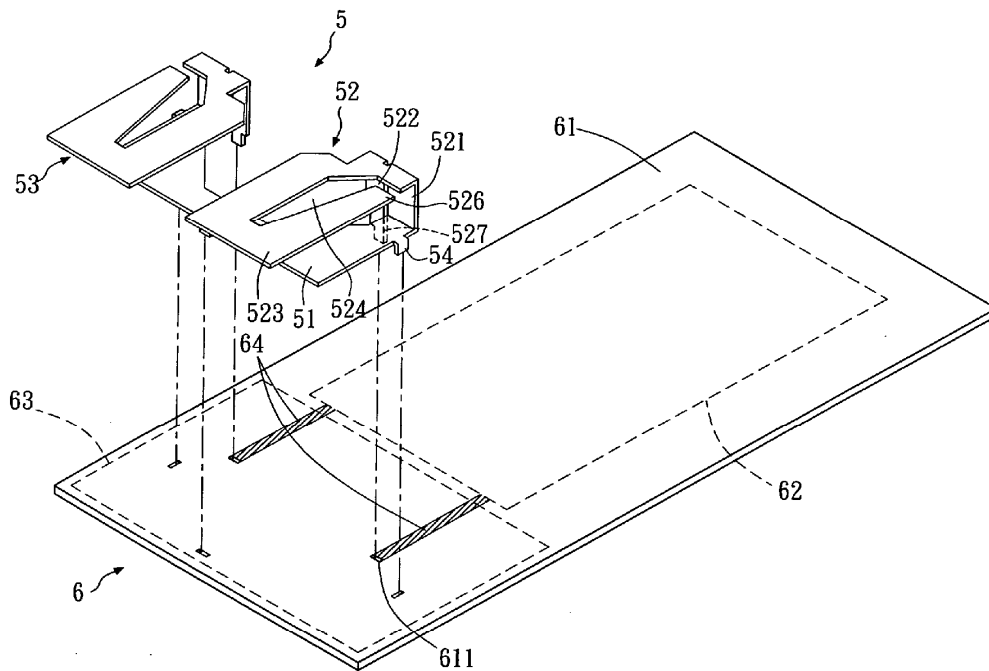
(73) **Assignee: Cameo Communications, Inc.**

(21) **Appl. No.: 11/790,303**

(22) **Filed: Apr. 24, 2007**

**Publication Classification**

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





US 20080266181A1

(19) **United States**

(12) **Patent Application Publication**  
**Ying**

(10) **Pub. No.: US 2008/0266181 A1**

(43) **Pub. Date: Oct. 30, 2008**

(54) **ANTENNA ARRANGEMENT**

(30) **Foreign Application Priority Data**

(76) Inventor: **Zhinong Ying, Lund (SE)**

Apr. 7, 2005 (EP) ..... 05102752.2

**Publication Classification**

Correspondence Address:

**WARREN A. SKLAR (SOER)**  
**RENNER, OTTO, BOISSELLE & SKLAR, LLP**  
**1621 EUCLID AVENUE, 19TH FLOOR**  
**CLEVELAND, OH 44115 (US)**

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

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

(57) **ABSTRACT**

(21) Appl. No.: **11/910,537**

An antenna arrangement (1, 30), comprising a first and a second antenna. The first antenna has a patch (10) of conductive material. The second antenna comprises a monopole antenna (21, 32). The monopole antenna extends through the patch and is arranged to be fed from a first side of the patch and to radiate at a second side of the patch. The antenna arrangement is a multiple-input, multiple-output (MIMO) system, wherein the patch (10) and the monopole antenna (21, 32) are isolated from each other and arranged to provide at least two channels for transmitting and receiving signals from the same or different frequency ranges. Thus, the antenna arrangement is efficient both in terms of utilization and achievable data rates.

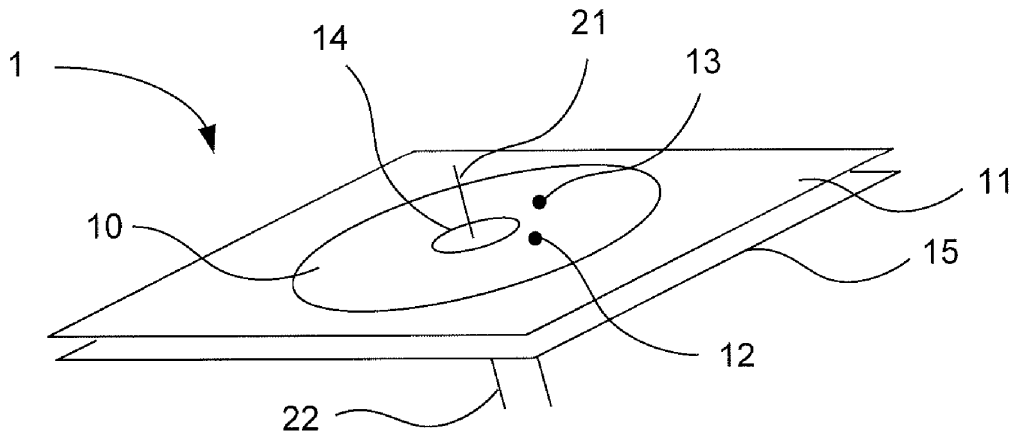
(22) PCT Filed: **Apr. 5, 2006**

(86) PCT No.: **PCT/EP2006/061316**

§ 371 (c)(1),  
(2), (4) Date: **Jun. 17, 2008**

**Related U.S. Application Data**

(60) Provisional application No. 60/671,270, filed on Apr. 14, 2005.





US 20080266182A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0266182 A1**

(43) **Pub. Date: Oct. 30, 2008**

(54) **ANTENNA DEVICE OPERABLE IN  
MULTIPLE FREQUENCY BANDS**

**Publication Classification**

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

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

(52) **U.S. Cl.** ..... **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 usable in a radio apparatus having a printed board includes a ground conductor provided in the printed board, a fed partial element, a first branch element and a second branch element. The fed partial element is shaped as an area including a feed portion near an end of a first side of the area facing a side of the ground conductor, and a first branch portion and a second branch portion each near a portion of a fringe of the area other than the first side. The fed partial element may be fed at the feed portion. The first branch element branches off from the first branch portion and is folded back in a direction approaching the feed portion. The second branch element branches off from the second branch portion and is shaped in a direction close to the direction of the first branch element.

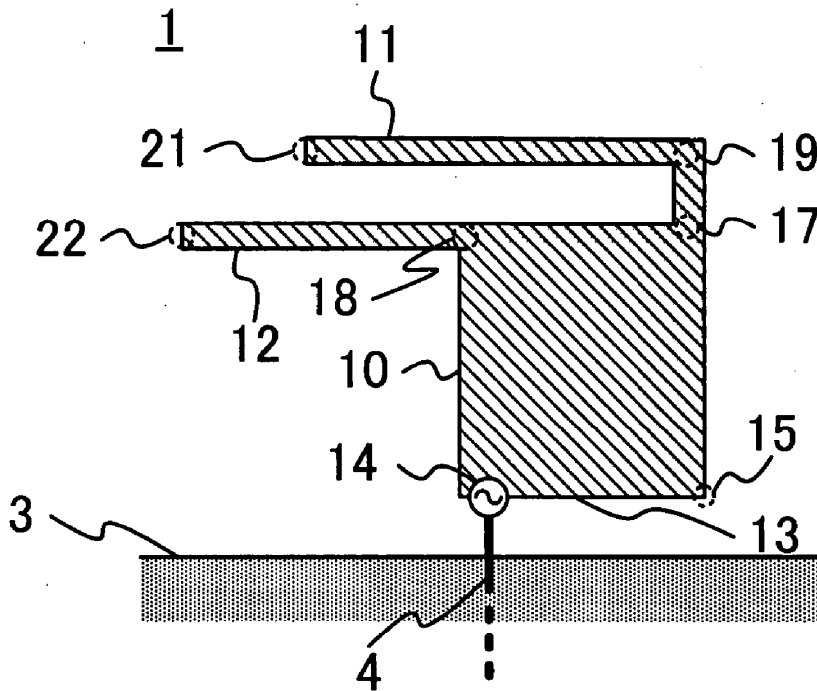
(73) Assignee: **KABUSHIKI KAISHA  
TOSHIBA, Tokyo (JP)**

(21) Appl. No.: **11/973,806**

(22) Filed: **Oct. 10, 2007**

(30) **Foreign Application Priority Data**

Apr. 25, 2007 (JP) ..... 2007-115235





US 20080266183A1

(19) **United States**

(12) **Patent Application Publication**  
**Takei**

(10) **Pub. No.: US 2008/0266183 A1**

(43) **Pub. Date: Oct. 30, 2008**

(54) **SKELETON EQUALIZING ANTENNA, RFID TAG AND RFID SYSTEM USING THE SAME**

**Publication Classification**

(75) Inventor: **Ken Takei, Kawasaki (JP)**

(51) **Int. Cl.**  
*H01Q 9/04* (2006.01)  
*G08B 13/14* (2006.01)

Correspondence Address:  
**Stanley P. Fisher**  
**Reed Smith LLP**  
**Suite 1400, 3110 Fairview Park Drive,**  
**Falls Church, VA 22042 (US)**

(52) **U.S. Cl.** ..... **343/700 MS; 340/572.7**

(57) **ABSTRACT**

The problems to be solved by the present invention are to provide an antenna which is applied to a wireless identification system wherein there is a long distance between a device to execute identification and a device attached to an object to be identified and which does not cause deterioration in aesthetic terms and covering of a meaningful symbol, and further to provide a wireless system using the antenna. According to the present invention, there are provided an antenna having a circularly polarizing function and a frequency equalizing function achieved by a grid structure having roughness and fineness around a feeding point and density which allows visible light to pass through, an RFID tag using the antenna, and an RFID system using the tag.

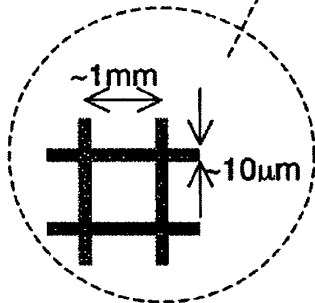
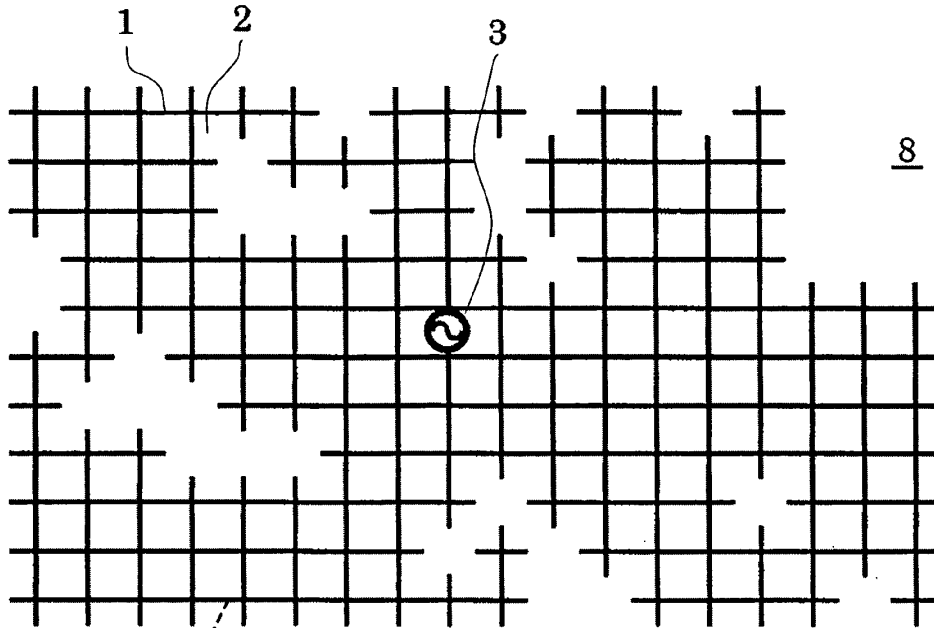
(73) Assignee: **Hitachi, Ltd**

(21) Appl. No.: **12/081,901**

(22) Filed: **Apr. 23, 2008**

(30) **Foreign Application Priority Data**

Apr. 27, 2007 (JP) ..... 2007-119413







US 20080266184A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0266184 A1**

(43) **Pub. Date: Oct. 30, 2008**

(54) **ANTENNA DEVICE**

**Publication Classification**

(76) Inventors: **Hisashi Takisawa**, Akita (JP);  
**Junichi Noro**, Akita (JP); **Kyuichi Sato**, Akita (JP); **Takao Kato**, Akita (JP); **Arata Togashi**, Akita (JP)

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

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

Correspondence Address:  
**WHITHAM, CURTIS & CHRISTOFFERSON & COOK, P.C.**  
**11491 SUNSET HILLS ROAD, SUITE 340**  
**RESTON, VA 20190 (US)**

(57) **ABSTRACT**

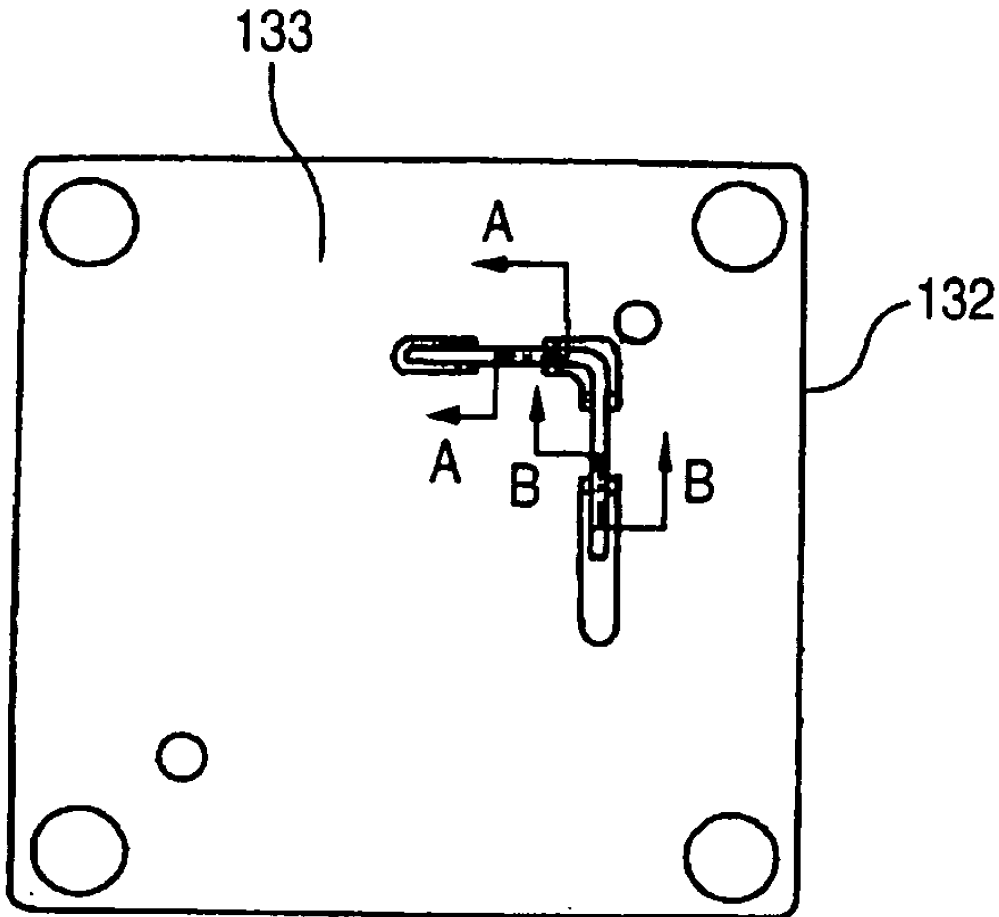
A hinge portion is formed on the base portion. An antenna portion is attached to the hinge portion so as to be pivotable thereabout. The hinge portion includes a hinge base having a first shaft formed on one end thereof, a second shaft formed on the other end thereof, and a first protrusion formed on an outer periphery of the second shaft, and a hinge bush rotatably mounted on the first shaft and engaged with the antenna portion. The antenna portion is formed with a hole surrounding the outer periphery of the second shaft. A projection is formed on an inner periphery of the hole. The first protrusion is brought into contact with the projection when the antenna portion is pivoted so as to define a predetermined angle with respect to the base portion.

(21) Appl. No.: **12/113,276**

(22) Filed: **May 1, 2008**

(30) **Foreign Application Priority Data**

Jan. 18, 2006 (JP) ..... P2006-009362  
Jan. 18, 2006 (JP) ..... P2006-009382  
Jan. 18, 2006 (JP) ..... P2006-009434





US 20080266185A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0266185 A1**

(43) **Pub. Date: Oct. 30, 2008**

(54) **COMPLEX ANTENNA**

(30) **Foreign Application Priority Data**

(75) Inventors: **Chen-Ta Hung**, Tu-cheng (TW);  
**Lung-Sheng Tai**, Tu-cheng (TW);  
**Wen-Fong Su**, Tu-cheng (TW)

Apr. 27, 2007 (CN) ..... 200710022050.X

**Publication Classification**

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

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

(57) **ABSTRACT**

A complex antenna includes a first antenna and a second antenna having a grounding element and an installing element sharing with the first antenna. The first antenna working in a WLAN (Wireless Local Area Network) comprises a first connecting element, a first radiating element and a second radiating element extending from the first connecting element in opposite direction. The second antenna working in a WWAN (Wireless Wide Area Network) comprises a second connecting element and at least three radiating elements extending from the second connecting element in different directions.

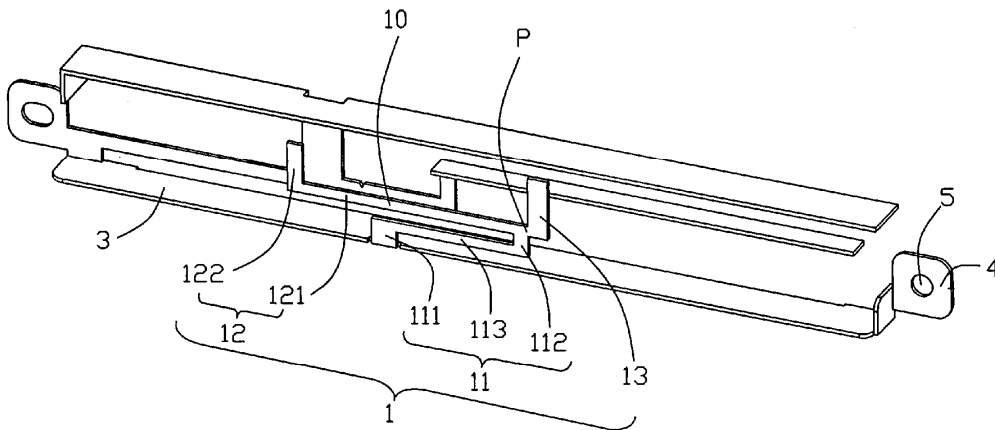
Correspondence Address:  
**WEI TE CHUNG**  
**FOXCONN INTERNATIONAL, INC.**  
**1650 MEMOREX DRIVE**  
**SANTA CLARA, CA 95050 (US)**

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

(21) Appl. No.: **12/150,382**

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

100







US 20080266187A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0266187 A1**

(43) **Pub. Date: Oct. 30, 2008**

(54) **ANTENNAS**

(30) **Foreign Application Priority Data**

(75) Inventors: **Yuan Li Chang**, Taipei (TW); **Chih Ming Wang**, Taipei (TW)

Oct. 28, 2004 (TW) ..... TW93132684

**Publication Classification**

Correspondence Address:  
**QUINTERO LAW OFFICE, PC**  
2210 MAIN STREET, SUITE 200  
SANTA MONICA, CA 90405 (US)

(51) **Int. Cl.**  
*H01Q 1/38* (2006.01)  
*H01Q 13/10* (2006.01)

(73) Assignee: **WISTRON NEWEB CORP.**,  
TAIPEI HSIEN (TW)

(52) **U.S. Cl.** ..... **343/700 MS; 343/767**

(21) Appl. No.: **12/168,008**

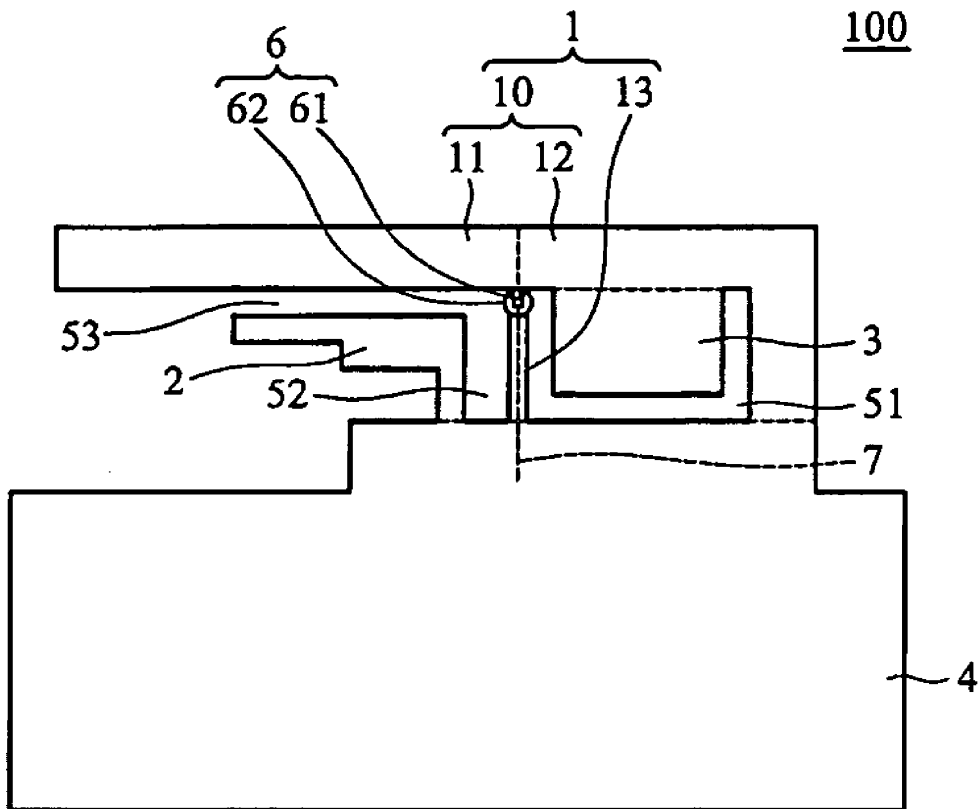
(57) **ABSTRACT**

(22) Filed: **Jul. 3, 2008**

An antenna comprises a first metal element, a second metal element, a third metal element, a ground element and a cable. The first metal element and the second metal element are connected to the ground element. The third metal element is disposed on the first metal element. The cable is coupled to the first metal element. The antenna has three different resonant frequencies (a first resonant frequency, a second resonant frequency and a third resonant frequency) for transmitting three signals in different frequency bands.

**Related U.S. Application Data**

(62) Division of application No. 11/564,226, filed on Nov. 28, 2006, which is a division of application No. 11/128,817, filed on May 12, 2005, now Pat. No. 7,170,450.





US 20080266188A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0266188 A1**

(43) **Pub. Date: Oct. 30, 2008**

(54) **RADIO MACHINE ANTENNA DEVICE AND PORTABLE RADIO MACHINE**

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(21) Appl. No.: **11/570,129**

(22) PCT Filed: **Sep. 28, 2005**

(86) PCT No.: **PCT/JP2005/017815**

§ 371 (c)(1),  
(2), (4) Date:

**Dec. 7, 2006**

(30) **Foreign Application Priority Data**

Sep. 28, 2004 (JP) ..... 2004-281586  
Apr. 13, 2005 (JP) ..... 2005-116049

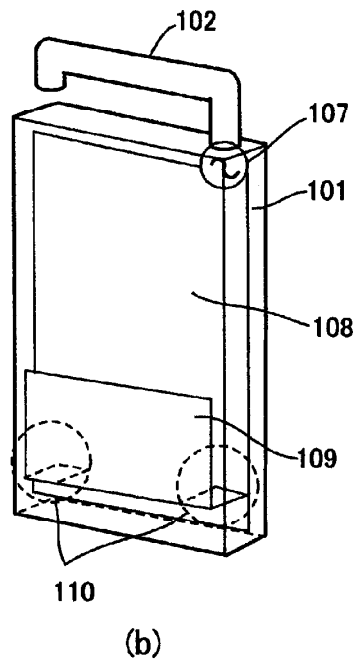
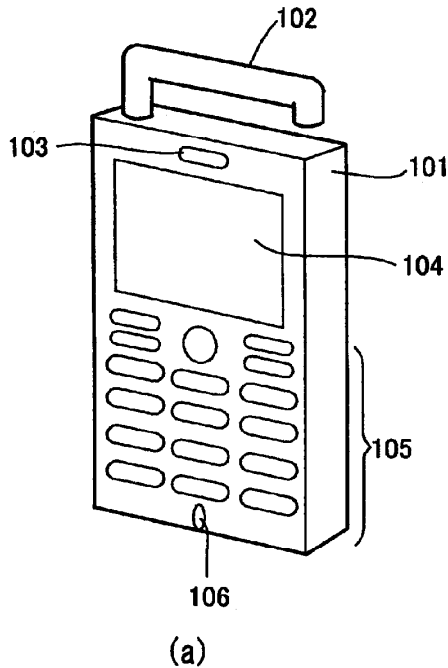
**Publication Classification**

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

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

(57) **ABSTRACT**

An object of the present invention is to provide an antenna device for a radio apparatus in which the amount of energy (SAR) absorbed by a head of a human body can be reduced without lowering the power of radio waves transmitted during a call. There is provided a board **108** serving as a base plate of an antenna element, an antenna element **102** disposed in a longitudinally end portion of the board **108** through a feeding portion **107**, a conductor plate **109** disposed substantially in parallel with a main surface of the board **108** and disposed on the opposite side to a surface having a sound hole of a receiver portion, and a plurality of short-circuit conductors **110** disposed on a lower end portion of the conductor plate **109**. The conductor plate **109** is short-circuited to a lower end portion of the board **108** through the short-circuit conductors **110**.





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(19) **United States**

(12) **Patent Application Publication**  
Wu

(10) **Pub. No.: US 2008/0266189 A1**

(43) **Pub. Date: Oct. 30, 2008**

(54) **SYMMETRICAL DUAL-BAND UNI-PLANAR ANTENNA AND WIRELESS NETWORK DEVICE HAVING THE SAME**

(75) Inventor: **Jung Tai Wu, Taipei City (TW)**

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(73) Assignee: **Cameo Communications, Inc.**

(21) Appl. No.: **11/790,302**

(22) Filed: **Apr. 24, 2007**

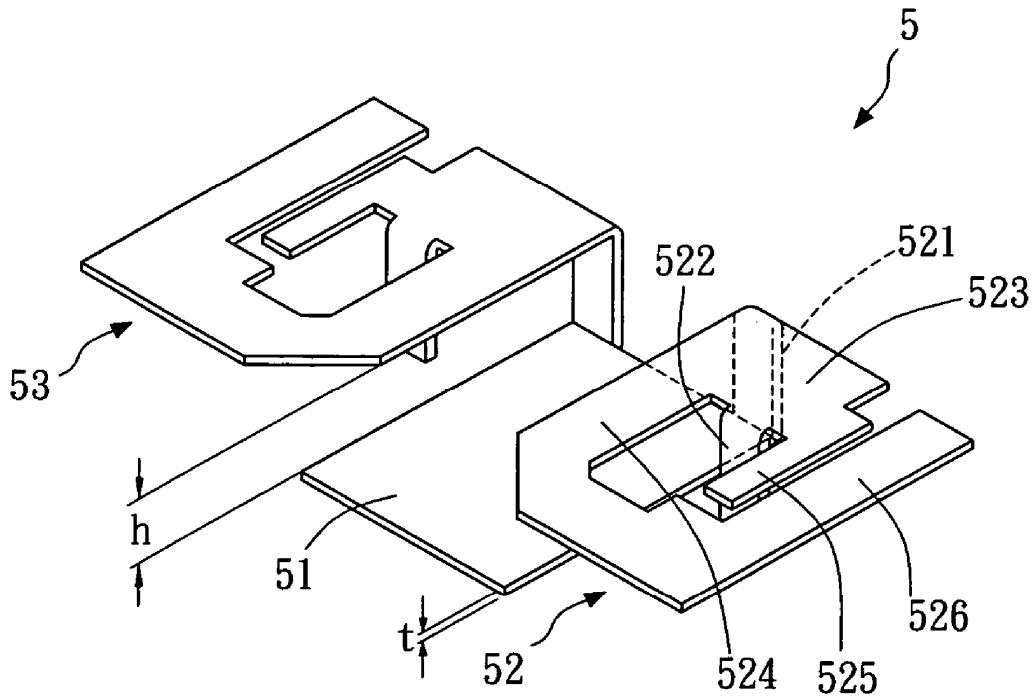
**Publication Classification**

(51) **Int. Cl.**  
**H01Q 9/04** (2006.01)  
**H01Q 1/22** (2006.01)

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

(57) **ABSTRACT**

The present invention discloses an antenna adapted for use in a wireless network device. The antenna includes a base and two antenna portions. Each antenna portion includes a ground section, a radiation portion and a signal section. The ground sections of the two antenna portions are connected with the same base. The radiation portion is connected with the ground section. The radiation portion has a first radiation section and a second radiation section wherein an external arm of the first radiation section is extending beyond and along the outer edge of the second radiation section and is separate from the second radiation section at a distance. The signal section is connected with the radiation portion in the manner that the first radiation section and the second radiation section are respectively positioned at two opposite side and a free end of the signal section is separate from the base. The antenna is a single component integrally formed by stamping an electrically conductive thin metal plate, which not only facilitates fabrication thereof, but also the assembly of the antenna to a substrate of the wireless network device, thereby increasing the gain of the wireless network device along a vertical direction.





US 20080266191A1

(19) **United States**

(12) **Patent Application Publication**  
**Hilgers**

(10) **Pub. No.: US 2008/0266191 A1**

(43) **Pub. Date: Oct. 30, 2008**

(54) **BROADBAND ANTENNA FOR A  
TRANSPONDER OF A RADIO FREQUENCY  
IDENTIFICATION SYSTEM**

(86) PCT No.: **PCT/IB06/54160**

§ 371 (c)(1),  
(2), (4) Date: **May 7, 2008**

(75) Inventor: **Achim Hilgers, Alsdorf (DE)**

(30) **Foreign Application Priority Data**

Nov. 10, 2005 (EP) ..... 05110618.5

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**M/S41-SJ, 1109 MCKAY DRIVE**  
**SAN JOSE, CA 95131 (US)**

**Publication Classification**

(51) **Int. Cl.**  
**H01Q 21/00** (2006.01)  
**H01Q 9/16** (2006.01)  
**H01Q 7/00** (2006.01)

(52) **U.S. Cl.** ..... **343/726**

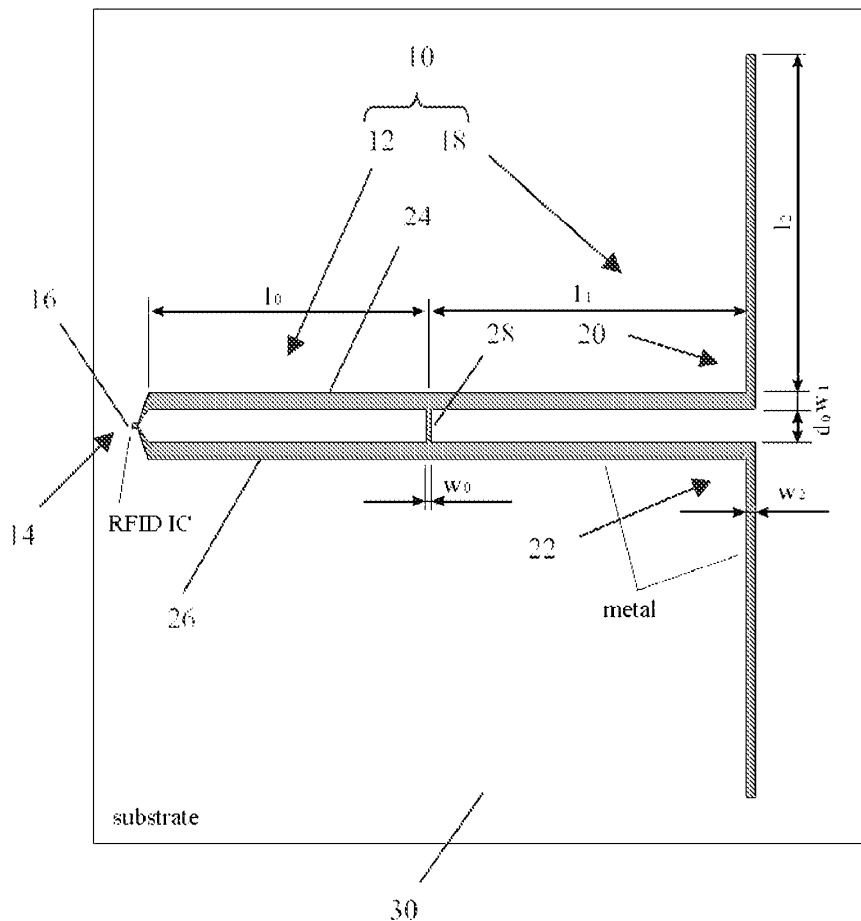
(73) Assignee: **NXP B.V., Eindhoven (NL)**

(57) **ABSTRACT**

(21) Appl. No.: **12/092,901**

A broadband antenna structure (10) for a transponder of a radio frequency identification system comprises —a loop resonator (12) with a feedpoint (14) for connecting with an electronic circuit (16), and —a dipole resonator (18) electrically connected to the loop resonator (12) and comprising two electrically isolated legs (20, 22).

(22) PCT Filed: **Nov. 8, 2006**





US 20080266193A1

(19) **United States**

(12) **Patent Application Publication**  
**Kim**

(10) **Pub. No.: US 2008/0266193 A1**

(43) **Pub. Date: Oct. 30, 2008**

(54) **ANTENNA**

**Publication Classification**

(75) Inventor: **Seung Kim**, Chapel Hill, NC (US)

(51) **Int. Cl.**  
**H01Q 3/02** (2006.01)  
**H01Q 9/16** (2006.01)

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(52) **U.S. Cl.** ..... **343/757**

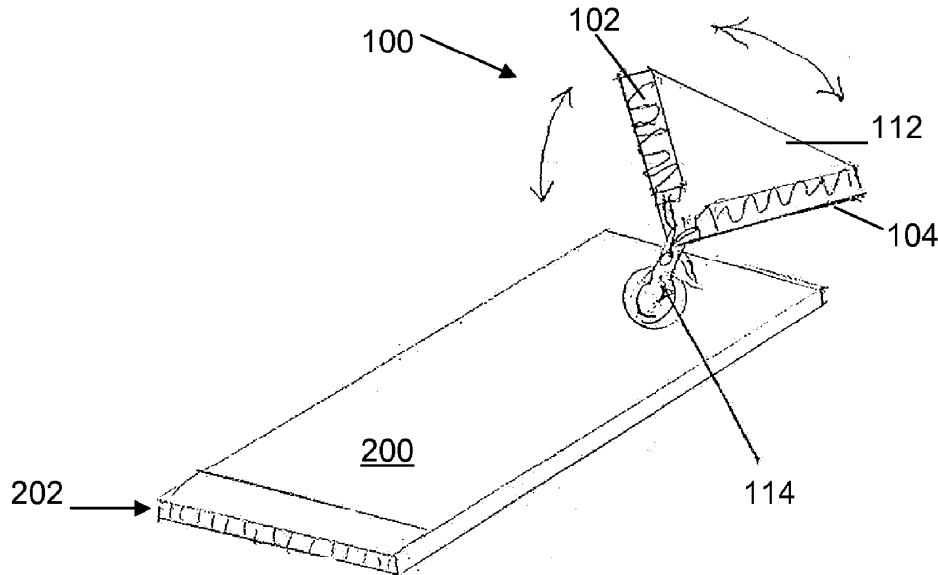
(57) **ABSTRACT**

(73) Assignee: **Telefonaktiebolaget L M Ericsson**  
**(publ)**, Stockholm (SE)

An antenna has a 90-degree polarization separation between at least two antenna elements regardless of how a user adjusts the antenna, and yet enables the user to adjust the antenna for the best signal reception. The antenna has a pivotally adjustable structure that is configured to maintain the antenna elements at substantially a right angle with respect to each other, including a universal joint that enables the antenna to be rotated in mutually orthogonal planes. The user in one step can adjust the antenna for the best reception and simultaneously maintain optimum polarization separation between the main and the diversity antenna elements.

(21) Appl. No.: **11/742,381**

(22) Filed: **Apr. 30, 2007**







US 20080266194A1

(19) **United States**

(12) **Patent Application Publication**  
**Huynh**

(10) **Pub. No.: US 2008/0266194 A1**

(43) **Pub. Date: Oct. 30, 2008**

(54) **SLOT ANTENNA WITH A SPIRAL FEED  
ELEMENT FOR WIRELESS  
COMMUNICATION DEVICES**

**Publication Classification**

(51) **Int. Cl.**  
*H01Q 13/10* (2006.01)  
*H01P 11/00* (2006.01)

(75) Inventor: **Minh-Chau T. Huynh**, Morrisville,  
NC (US)

(52) **U.S. Cl.** ..... **343/767; 29/600**

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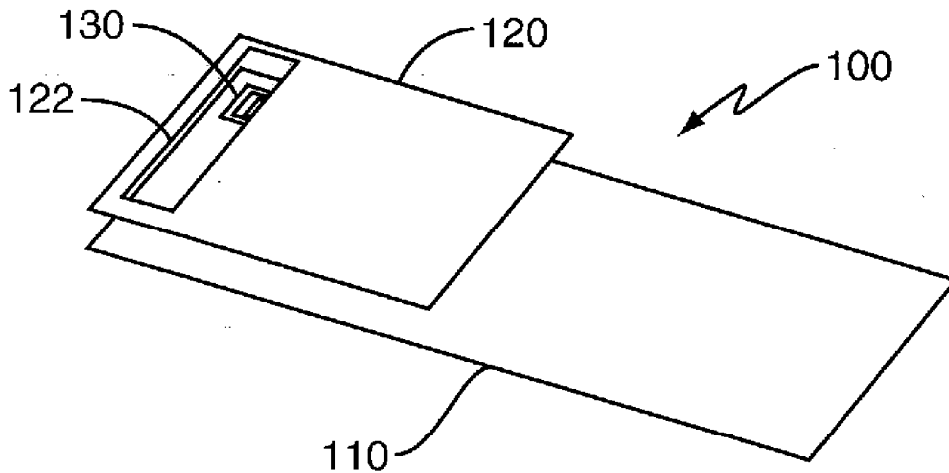
(57) **ABSTRACT**

A slot antenna for short-range communications between wireless communication devices is described herein. The antenna comprises a radiating plate spaced from a ground plate. A slot in the radiating plate defines the resonant frequency of the antenna. A spiral feed element disposed beneath the slot and between the ground plate and the radiating plate feeds transmission signals to the antenna. The slot antenna may be used in any portable wireless communication device configured to transmit short-range wireless signals, such as Bluetooth® signals.

(73) Assignee: **Sony Ericsson Mobile  
Communications AB**, Lund (SE)

(21) Appl. No.: **11/741,450**

(22) Filed: **Apr. 27, 2007**





US 20080266195A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0266195 A1**

(43) **Pub. Date: Oct. 30, 2008**

(54) **WAVEGUIDE SLOT ARRAY ANTENNA ASSEMBLY**

**Publication Classification**

(76) Inventors: **Satoshi Yamaguchi**, Tokyo (JP);  
**Kazushi Nishizawa**, Tokyo (JP);  
**Hiroaki Miyashita**, Tokyo (JP);  
**Shigeo Udagawa**, Tokyo (JP)

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

(52) **U.S. Cl.** ..... **343/771**

(57) **ABSTRACT**

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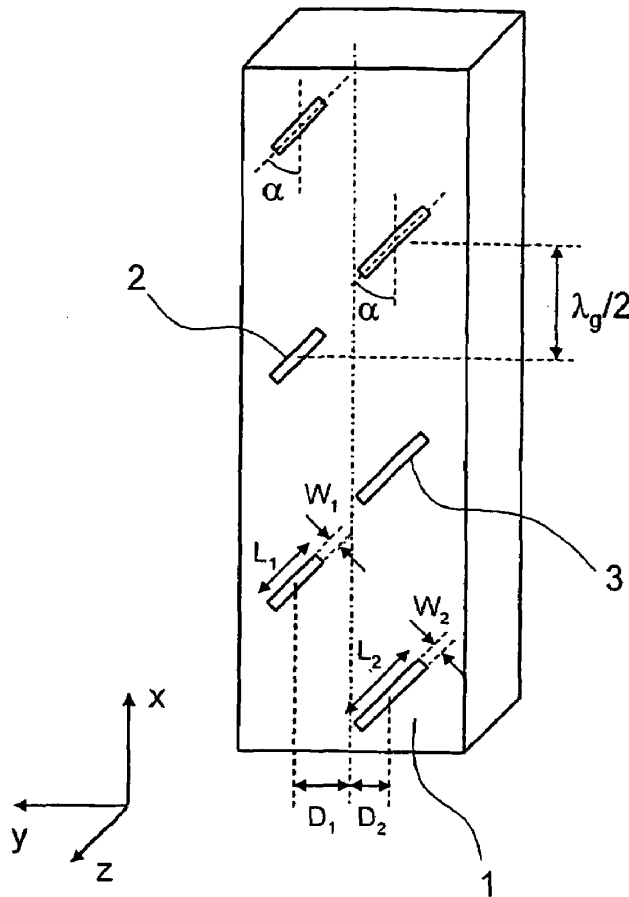
To suppress a standing wave ratio within a waveguide to a lower value, and suppresses a grating lobe, the present invention provides a waveguide slot array antenna device, including a plurality of rectangular slots (2, 3) that are inclined by a given angle with respect to an axis of a rectangular waveguide (1) and are arranged on a wide surface of the rectangular waveguide (1) alternately at opposite positions with respect to a center line that extends along the axial direction of the wide surface of the rectangular waveguide at intervals of  $\frac{1}{2}$  wavelength in the waveguide, respectively, in which the respective slots on the same side with respect to the center line are identical with each other in length, width, and distance from the center line, and the slots on opposite sides with respect to the center line are different from each other in at least any one of the length, the width, and the distance from the center line.

(21) Appl. No.: **11/884,132**

(22) PCT Filed: **Mar. 3, 2005**

(86) PCT No.: **PCT/JP2005/003603**

§ 371 (c)(1),  
(2), (4) Date: **Aug. 10, 2007**





US 20080266197A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0266197 A1**

(43) **Pub. Date: Oct. 30, 2008**

(54) **DOUBLE STRUCTURE BROADBAND LEAKY WAVE ANTENNA**

(75) Inventors: **Andrea Neto**, Voorburg (NL);  
**Raymond van Dijk**, Amsterdam (NL); **Filippo Marliani**, Oegstgeest (NL)

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(73) Assignee: **Nederlandse Organisatie voor toegepast-natuurwetenschappelijk Onderzoek TNO**, Delft (NL)

(21) Appl. No.: **11/572,480**

(22) PCT Filed: **Jul. 15, 2005**

(86) PCT No.: **PCT/NL05/00514**

§ 371 (c)(1),  
(2), (4) Date: **Apr. 30, 2008**

(30) **Foreign Application Priority Data**

Jul. 23, 2004 (EP) ..... 04077131.3

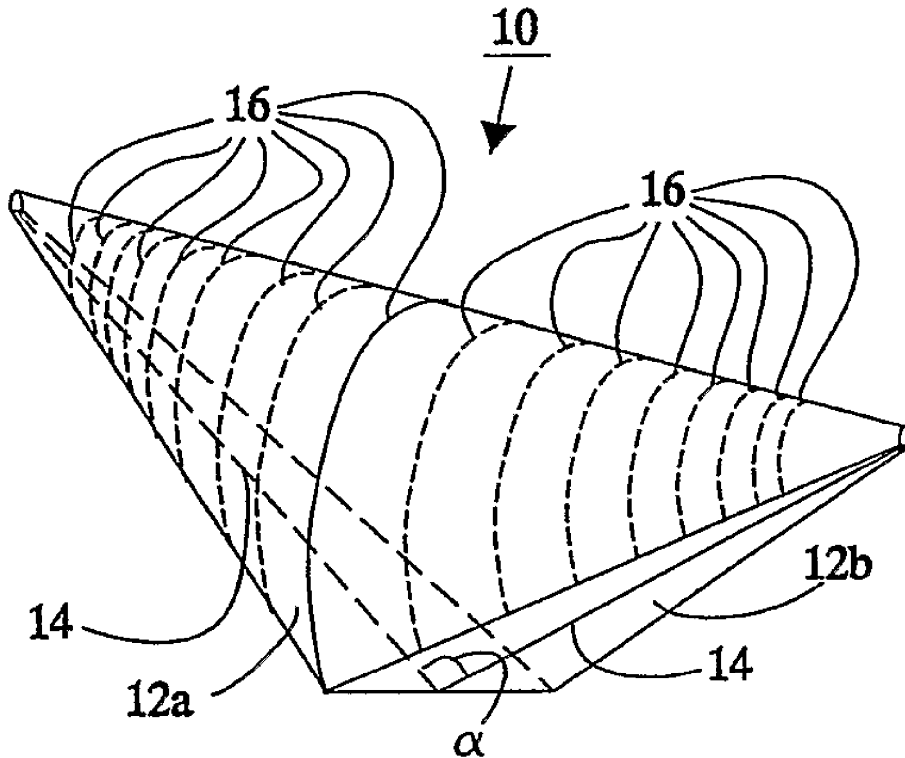
**Publication Classification**

(51) **Int. Cl.**  
**H01Q 13/28** (2006.01)

(52) **U.S. Cl.** ..... **343/785**

(57) **ABSTRACT**

A leaky wave antenna contains a first and a second leaky wave antenna structure back to back against each other. Each antenna structure comprises a dielectric body and an elongated wave carrying structure, such as a slot in a conductive ground plane. In each leaky wave antenna structure the body and wave carrying structure are mutually arranged to radiate a leaky wave from the wave carrying structure through the dielectric body, the leaky wave radiating at a respective angle to the wave carrying structure. The dielectric bodies of the first and second wave antenna structure adjoin each other in a common plane that is at said respective angles to the wave carrying structures of the first and second wave antenna structure respectively, so that the ground planes are at an angle with respect to each other. The respective wave carrying structures run over into each other at said common plane, the antenna comprising a feed arranged to excite waves in both the respective wave carrying structures together. In this way bandwidth limitations due to the feed structure are reduced.





US 20080266200A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0266200 A1**

(43) **Pub. Date: Oct. 30, 2008**

(54) **ANTENNA ASSEMBLY**

(30) **Foreign Application Priority Data**

(75) Inventors: **Jia-Jia Yang**, Kunshan (CN);  
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Apr. 27, 2007 (CN) ..... 200720037201.4

**Publication Classification**

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(51) **Int. Cl.**  
**H01Q 1/42** (2006.01)

(52) **U.S. Cl.** ..... **343/872**

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

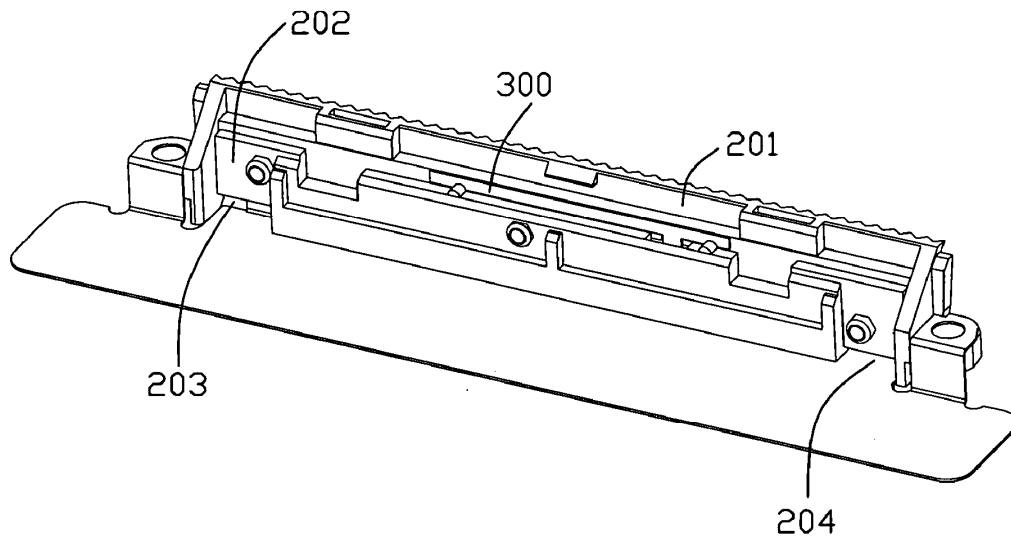
(57) **ABSTRACT**

(21) Appl. No.: **12/150,359**

An antenna assembly assembled in an electric device includes an inner antenna comprising a planar radiating element, a cover fixing the antenna on the electric device and comprising at least one protrusion to fix the radiating element.

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

1





US 20080266201A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0266201 A1**

(43) **Pub. Date: Oct. 30, 2008**

(54) **ANTENNA FOR AN ELECTRONIC DEVICE**

(21) Appl. No.: **11/796,367**

(76) Inventors: **Mark S. Tracy**, Tomball, TX (US);  
**Paul J. Doczy**, Cypress, TX (US);  
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(22) Filed: **Apr. 27, 2007**

**Publication Classification**

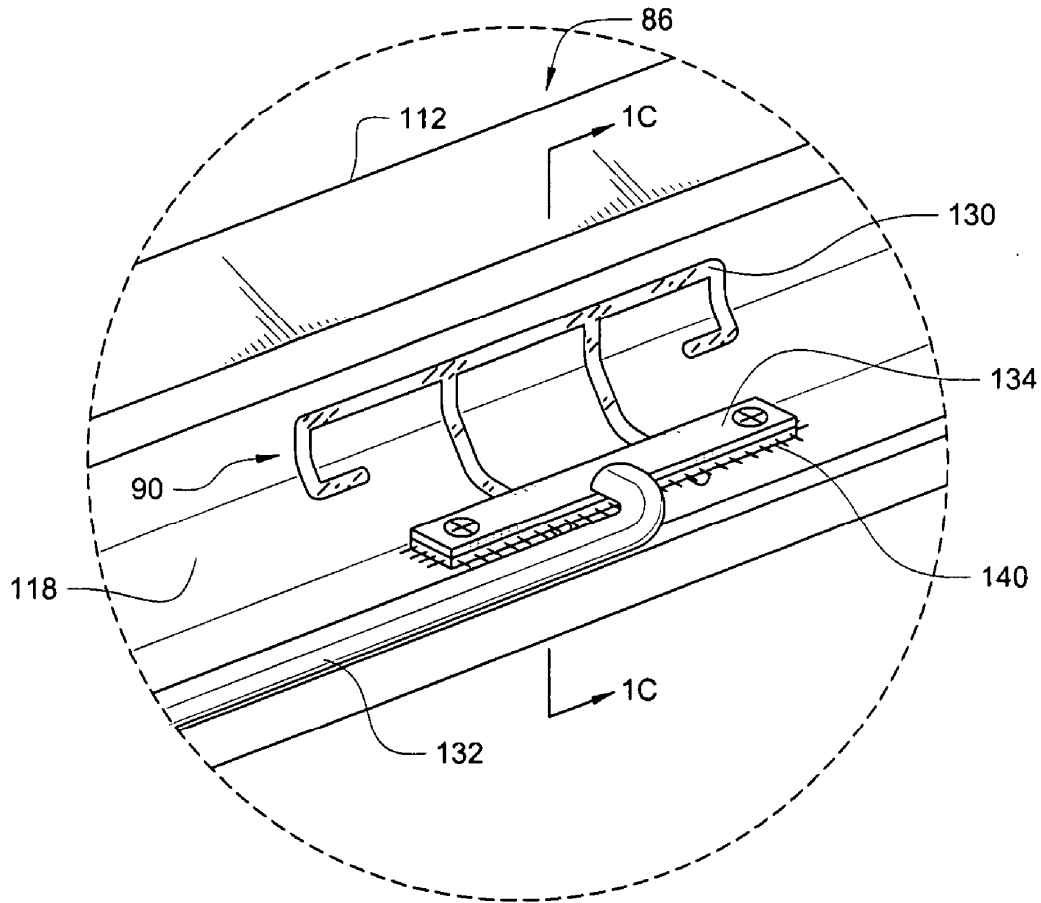
(51) **Int. Cl.**  
**H01Q 1/40** (2006.01)  
**H01P 11/00** (2006.01)

(52) **U.S. Cl.** ..... **343/873; 29/600; 29/601**

(57) **ABSTRACT**

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An electronic device comprises a housing having an antenna molded into the housing.





US 20080266202A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0266202 A1**

(43) **Pub. Date: Oct. 30, 2008**

(54) **ANTENNA UNIT**

(52) **U.S. CL.** ..... 343/893; 343/700 MS

(76) Inventors: **Ching-Chi Lin**, Tu-Cheng City (TW); **Jia-Hung Su**, Tu-Cheng City (TW); **Kai Shih**, Tu-Cheng City (TW); **Yu-Yuan Wu**, Tu-Cheng City (TW)

(57) **ABSTRACT**

An antenna unit has a first antenna operating at wireless telecommunication bands and a second antenna operating at wireless local area network bands. The first antenna has a first radiating conductor with a first feeding point defining opposite sides, a second, a third and a fourth radiating conductors extending from both sides of the first radiating conductor. A parasitic element defines opposite ends. One end of the parasitic element confronts the free end of the third radiating conductor. A trap circuit connects the fourth radiating conductor and the parasitic element. A second antenna has a third side, a fourth side and a stair-shape side. The connection of the sides of the second antenna forms a first protrusion with a second feeding point and a second protrusion confronting the first antenna. A slot is opened on the second antenna. A ground portion is spaced from the first radiating conductor and the first protrusion.

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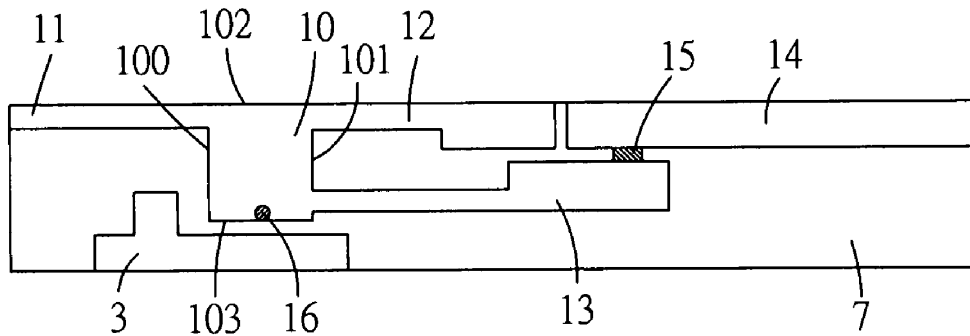
(21) Appl. No.: **11/790,706**

(22) Filed: **Apr. 27, 2007**

**Publication Classification**

(51) **Int. Cl.**  
**H01Q 1/38** (2006.01)  
**H01Q 21/00** (2006.01)

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US 20080266203A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0266203 A1**

(43) **Pub. Date: Oct. 30, 2008**

(54) **COOLED HELICAL ANTENNA FOR  
MICROWAVE ABLATION**

**Publication Classification**

(75) Inventors: **Francesca Rossetto**, Longmont,  
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(US)

(51) **Int. Cl.**  
**H01Q 1/36** (2006.01)  
**H01Q 1/12** (2006.01)

(52) **U.S. Cl.** ..... **343/895; 343/878**

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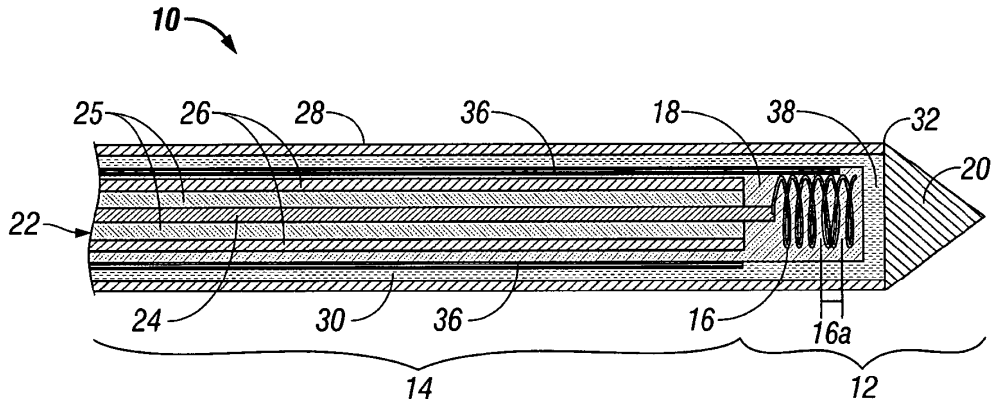
(57) **ABSTRACT**

A microwave antenna assembly including an elongated cooling jacket having proximal and distal ends and an inner lumen defined therebetween and a helical microwave antenna member disposed within at least a portion of the elongated cooling jacket and having an inner and outer conductor, the inner conductor disposed within the outer conductor, wherein at least a portion of the inner conductor extends distally from the outer conductor and forms at least one loop; and wherein the inner conductor is configured to deliver microwave energy.

(73) Assignee: **Vivant Medical, Inc.**

(21) Appl. No.: **11/789,521**

(22) Filed: **Apr. 25, 2007**





US 20080268908A1

(19) **United States**

(12) **Patent Application Publication**  
**Chen**

(10) **Pub. No.: US 2008/0268908 A1**

(43) **Pub. Date: Oct. 30, 2008**

(54) **ANTENNA AND WIRELESS NETWORK  
DEVICE HAVING THE SAME**

(52) **U.S. CL. .... 455/562.1**

(57) **ABSTRACT**

(75) **Inventor: Yu Ren Chen, Luodong Township  
(TW)**

An antenna applied to a wireless network device comprises a base, a pair of embedded portions, and an antenna portion. The base has two sides opposite to each other. Each of the embedded portions has a side wall portion and a locking wing portion. The side wall portion is substantially vertical to the base and connected to the sides of the base, while the locking wing portion is connected to the side wall portion, substantially parallel to the base, and spaced apart from the base with a first height. The antenna portion is provided with a ground member, a radiation member, and a signal member. The ground member is substantially vertical to the base, connected to one of the two sides of the base, and spaced apart from the embedded portion with an interval. The radiation member is connected to the ground member, substantially parallel to the base, and spaced apart from the base with a second height. The signal member is connected to the radiation member, substantially vertical to the base, and formed with a free end separated from the base. When the antenna is positioned in at least one slot formed on a substrate of the wireless network device, the radiation member is spaced apart from the substrate with a height difference between the second height and the first height.

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(73) **Assignee: Cameo Communications, Inc.**

(21) **Appl. No.: 11/790,467**

(22) **Filed: Apr. 25, 2007**

**Publication Classification**

(51) **Int. Cl.  
H04M 1/00 (2006.01)**

