US 20100220014A1

(19) **United States**

(12) **Patent Application Publication**

Chang et al.

(10) **Pub. No.: US 2010/0220014 A1**

(43) **Pub. Date: Sep. 2, 2010**

(54) **ANTENNA STRUCTURE**

(76) Inventors: **Cheng-Wei Chang**, Taipei Hsien (TW); **Shen-Pin Wei**, Taipei Hsien (TW)

Correspondence Address:
NORTH AMERICA INTELLECTUAL PROPERTY CORPORATION
P.O. BOX 506
MERRIFIELD, VA 22116 (US)

(21) Appl. No.: **12/464,889**

(22) Filed: **May 13, 2009**

(30) **Foreign Application Priority Data**

Feb. 27, 2009 (TW) 098203007

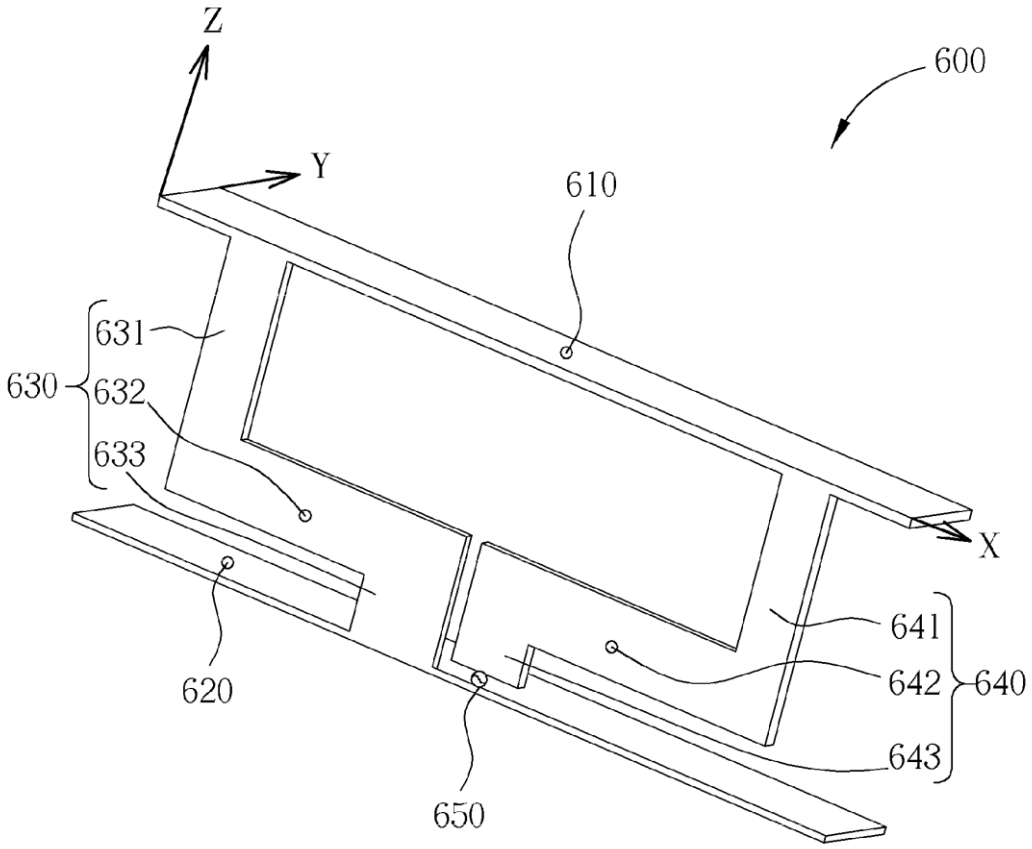
Publication Classification

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

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

(57) **ABSTRACT**

An antenna structure consists of a radiation element, a grounding element, a short element, a connection element, and a signal feeding element. The short element is coupled between the radiation element and the grounding element. The connection element is disposed between the radiation element and the grounding element. The connection element has at least a first segment and a second segment, wherein the first segment and the second segment form a bend. The signal feeding element is coupled between the connection element and the grounding element. The first segment of the connection element is substantially parallel to the grounding element and is at a designated distance from the grounding element.



US 20100220023A1

(19) **United States**

(12) **Patent Application Publication**

(10) **Pub. No.: US 2010/0220023 A1**

(43) **Pub. Date: Sep. 2, 2010**

Ge et al.

(54) **BROAD BAND ANTENNA**

(76) Inventors: **JunXiang Ge**, Tokyo (JP); **Wasuke Yanagisawa**, Tokyo (JP); **Ryo Horie**, Tokyo (JP)

Correspondence Address:
PAUL, HASTINGS, JANOFSKY & WALKER LLP
875 15th Street, NW
Washington, DC 20005 (US)

(21) Appl. No.: **11/997,696**

(22) PCT Filed: **Aug. 3, 2006**

(86) PCT No.: **PCT/JP2006/315788**

§ 371 (c)(1),
(2), (4) Date: **May 7, 2010**

(30) **Foreign Application Priority Data**

Aug. 4, 2005 (JP) 2005-227154

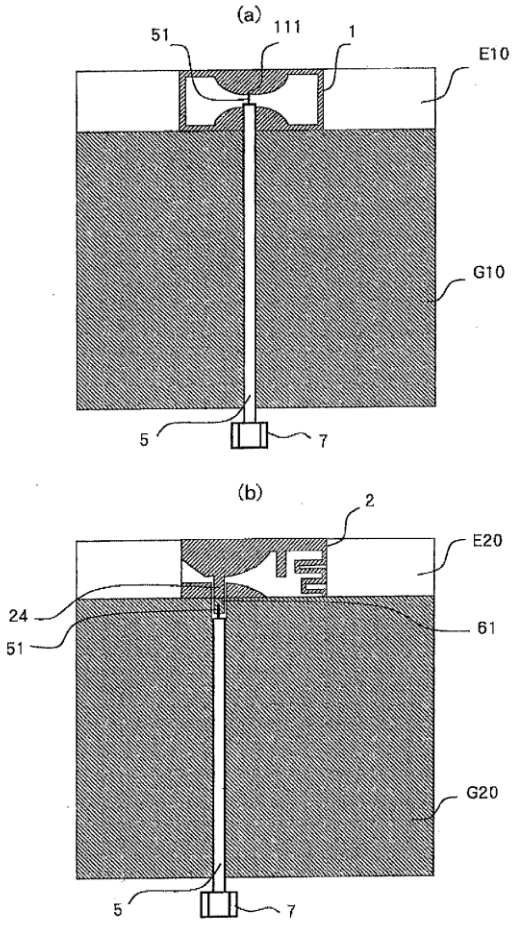
Publication Classification

(51) **Int. Cl.**
H01Q 9/04 (2006.01)
H01Q 13/00 (2006.01)

(52) **U.S. Cl.** ..... **343/772**; 343/700 MS

(57) **ABSTRACT**

Provided is a wide band antenna having ultra-wide band and high performance at a low cost. An antenna element constituting a part of an opening cross section structure of a double cylinder ridge waveguide is spread on a plane. The antenna element has a ridge element portion (**21**) for adjusting antenna characteristic corresponding to a ridge portion and a radiation element portion (**22**) for electromagnetic wave radiation. Substantially at a leading end portion of the ridge element portion (**21**), a feeder terminal (**24**) is formed. Ground portions (**23***a* and **23***b*) are maintained at a ground potential and the feeder terminal (**24**) is guided to an outside as a coplanar waveguide.



US 20100220027A1

(19) **United States**

(12) **Patent Application Publication**

Mori

(10) **Pub. No.: US 2010/0220027 A1**

(43) **Pub. Date: Sep. 2, 2010**

(54) **ANTENNA**

(75) Inventor: **Nobuyuki Mori**, Tokyo (JP)

Correspondence Address:
LERNER, DAVID, LITTENBERG, KRUMHOLZ & MENTLIK
600 SOUTH AVENUE WEST
WESTFIELD, NJ 07090 (US)

(73) Assignee: **Sony Corporation**, Tokyo (JP)

(21) Appl. No.: **12/658,888**

(22) Filed: **Feb. 17, 2010**

(30) **Foreign Application Priority Data**

Feb. 27, 2009 (JP) P2009-045194

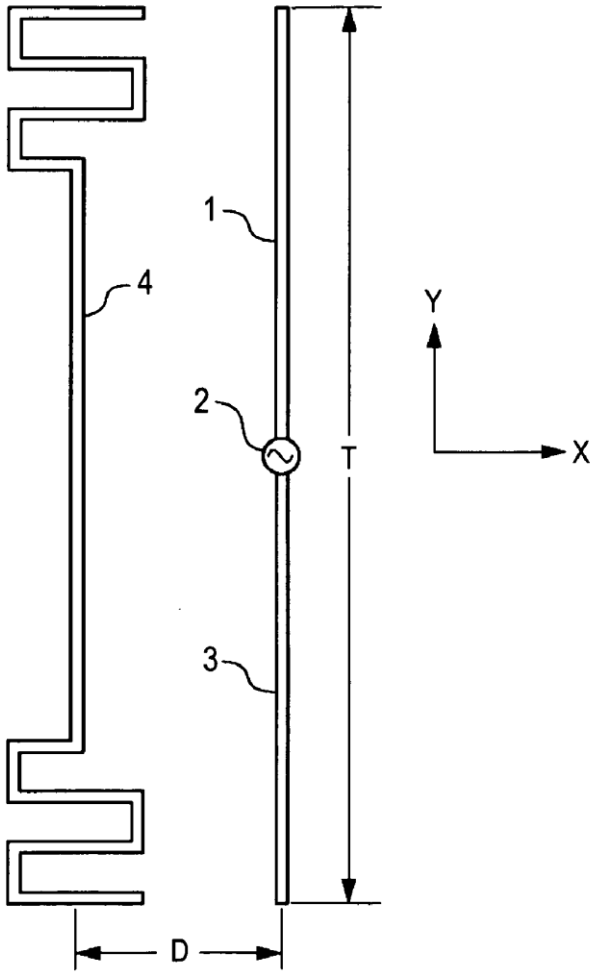
Publication Classification

(51) **Int. Cl.**
H01Q 9/16 (2006.01)
H01Q 19/10 (2006.01)

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

(57) **ABSTRACT**

An antenna includes: a dipole antenna; and a parasitic element arranged in parallel to the dipole antenna and having a linear structure and a meander structure, wherein a directivity and a return loss of the dipole antenna are controlled by setting a distance between the dipole antenna and the parasitic element and a shape and size of the meander structure.



US 20100220030A1

(19) **United States**

(12) **Patent Application Publication**

SHIMODA et al.

(10) **Pub. No.: US 2010/0220030 A1**

(43) **Pub. Date: Sep. 2, 2010**

(54) **ANTENNA DEVICE**

(75) Inventors: **Hideaki SHIMODA**, Tokyo (JP); **Tetsuya Shibata**, Tokyo (JP); **Kei Suzuki**, Tokyo (JP)

Correspondence Address:
MCDERMOTT WILL & EMERY LLP
600 13TH STREET, N.W.
WASHINGTON, DC 20005-3096 (US)

(73) Assignee: **TDK CORPORATION**

(21) Appl. No.: **12/712,503**

(22) Filed: **Feb. 25, 2010**

(30) **Foreign Application Priority Data**

Feb. 27, 2009 (JP) 2009-047386

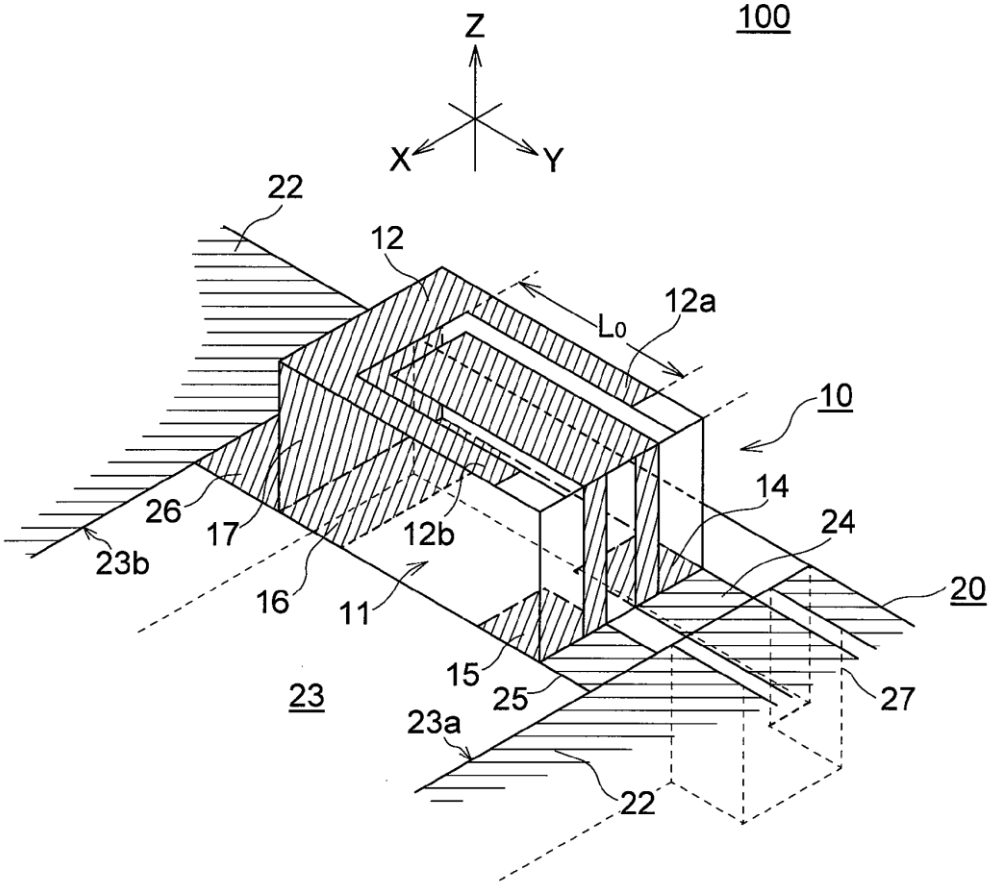
Publication Classification

(51) **Int. Cl.**
H01Q 1/38 (2006.01)
H01Q 1/50 (2006.01)

(52) **U.S. Cl.** ..... **343/860**; 343/700 MS

(57) **ABSTRACT**

An antenna device is provided with an antenna element including a base, an inductance adjustment pattern that is formed on the upper surface and a side surface of the base and has a substantially U-shape, a capacitance adjustment pattern that is formed on the upper surface of the base and is placed to face the inductance adjustment pattern, and first to third terminal electrodes provided on the bottom surface of the base. The antenna element is installed between the first side and the second side of the ground pattern that form the two facing sides of the antenna mounting region. One end of the inductance adjustment pattern is connected to the feed line, the other end of the inductance adjustment pattern is connected to the first side of the ground pattern, and the third terminal electrode is connected to the second side of the ground pattern.



US 20100222105A1

(19) **United States**

(12) **Patent Application Publication**

Nghiem et al.

(10) **Pub. No.: US 2010/0222105 A1**

(43) **Pub. Date: Sep. 2, 2010**

(54) **WIRELESS DATA COMMUNICATION CARD WITH COMPACT ANTENNA**

(75) Inventors: **David Nghiem**, Shoreview, MN (US); **Paul T. Simonette**, Maple Lake, MN (US); **Randy Sazenski**, Robbinsdale, MN (US); **Matthew G. Jaenke**, Fridley, MN (US); **David H. Tran**, Plymouth, MN (US)

Correspondence Address:
MEDTRONIC, INC.
710 MEDTRONIC PARKWAY NE
MINNEAPOLIS, MN 55432-9924 (US)

(73) Assignee: **Medtronic, Inc.**

(21) Appl. No.: **12/779,082**

(22) Filed: **May 13, 2010**

Related U.S. Application Data

(63) Continuation of application No. 11/113,460, filed on Apr. 25, 2005, now Pat. No. 7,742,787.

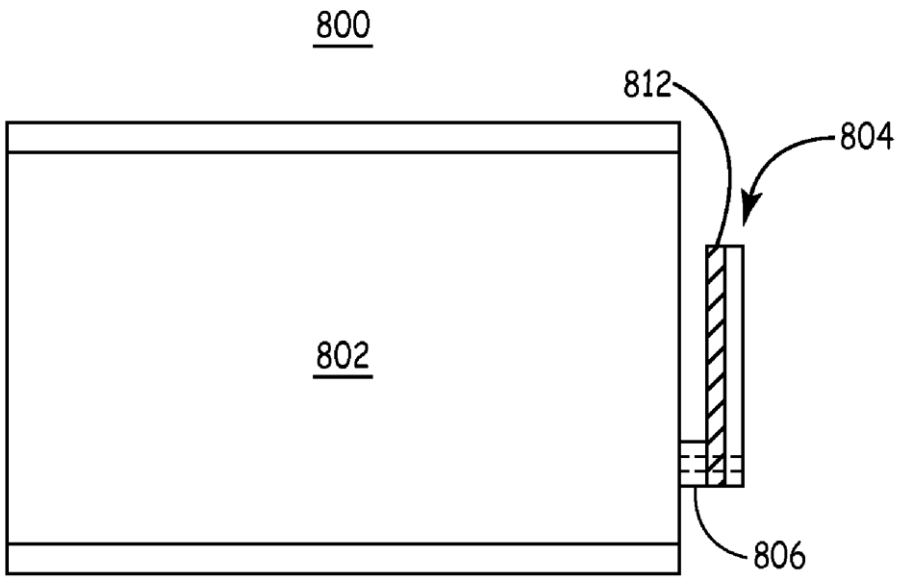
Publication Classification

(51) **Int. Cl.**
H04B 1/38 (2006.01)

(52) **U.S. Cl.** **455/558**

(57) **ABSTRACT**

A wireless data communication card configured in accordance with an example embodiment of the invention includes a low profile antenna arrangement that does not protrude from the housing of the computing device when the wireless data communication card is inserted into the housing. The low profile design is achieved without compromising the radio frequency ("RF") characteristics and performance of the wireless data communication card by tuning the antenna arrangement to account for conductive ground structure located within the housing of the computing device. In accordance with one practical embodiment of the invention, the wireless data communication card is compliant with IEEE Standard 802.11(b) and compliant with PCMCIA specifications.



US 20100224685A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2010/0224685 A1

(43) Pub. Date: Sep. 9, 2010

AOKI

(54) **IC CARD CAPABLE OF COMMUNICATING WITH EXTERNAL DEVICE BY UTILIZING ELECTROMAGNETIC INDUCTION**

(75) Inventor: **Yutaka AOKI**, Ome-shi (JP)

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

(73) Assignee: **Casio Computer Co., Ltd.**, Tokyo (JP)

(21) Appl. No.: **12/715,607**

(22) Filed: **Mar. 2, 2010**

(30) **Foreign Application Priority Data**

Mar. 3, 2009 (JP) 2009-048731

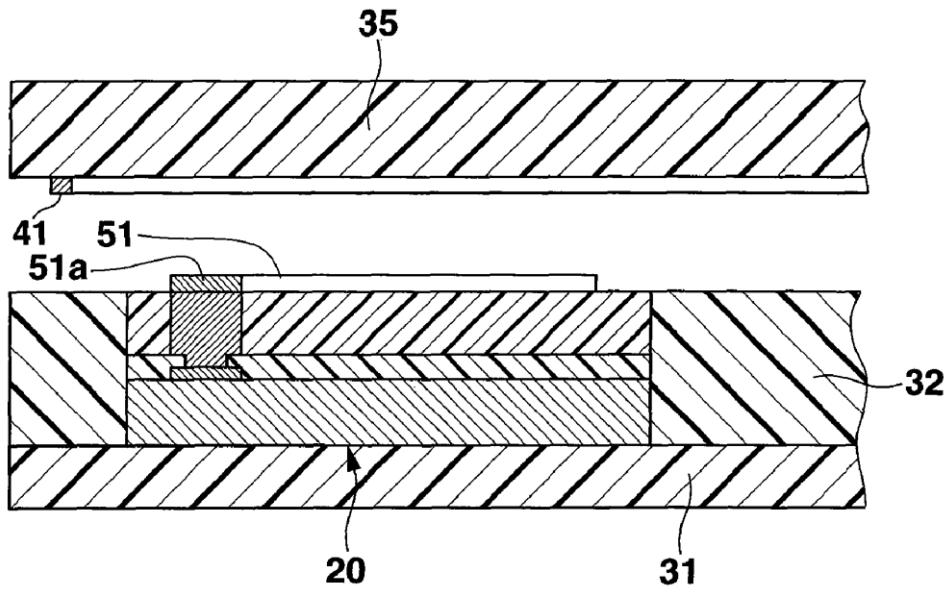
Publication Classification

(51) **Int. Cl.**
G06K 19/077 (2006.01)

(52) **U.S. Cl.** **235/488**; 235/492

(57) **ABSTRACT**

An IC card includes a card main body, a first antenna which is provided on an upper surface of the card main body along an outer peripheral side surface of the card main body, a semiconductor chip which is arranged on an inner side of the first antenna, and a second antenna which is provided on the inner side of the first antenna. The semiconductor chip has transmission and reception circuits and external connection electrodes connected with the transmission and reception circuits. The second antenna is connected with the external connection electrodes of the semiconductor chip.



US 20100225542A1

(19) **United States**

(12) **Patent Application Publication**

SUZUKI et al.

(10) **Pub. No.: US 2010/0225542 A1**

(43) **Pub. Date: Sep. 9, 2010**

(54) **ANTENNA DEVICE AND ANTENNA ELEMENT USED THEREFOR**

(75) Inventors: **Kei SUZUKI**, Tokyo (JP); **Masaki Matsushima**, Tokyo (JP); **Naoaki Utagawa**, Tokyo (JP); **Tetsuya Shibata**, Tokyo (JP)

Correspondence Address:
MCDERMOTT WILL & EMERY LLP
600 13TH STREET, N.W.
WASHINGTON, DC 20005-3096 (US)

(73) Assignee: **TDK CORPORATION**

(21) Appl. No.: **12/715,887**

(22) Filed: **Mar. 2, 2010**

(30) **Foreign Application Priority Data**

Mar. 3, 2009 (JP) 2009-049971

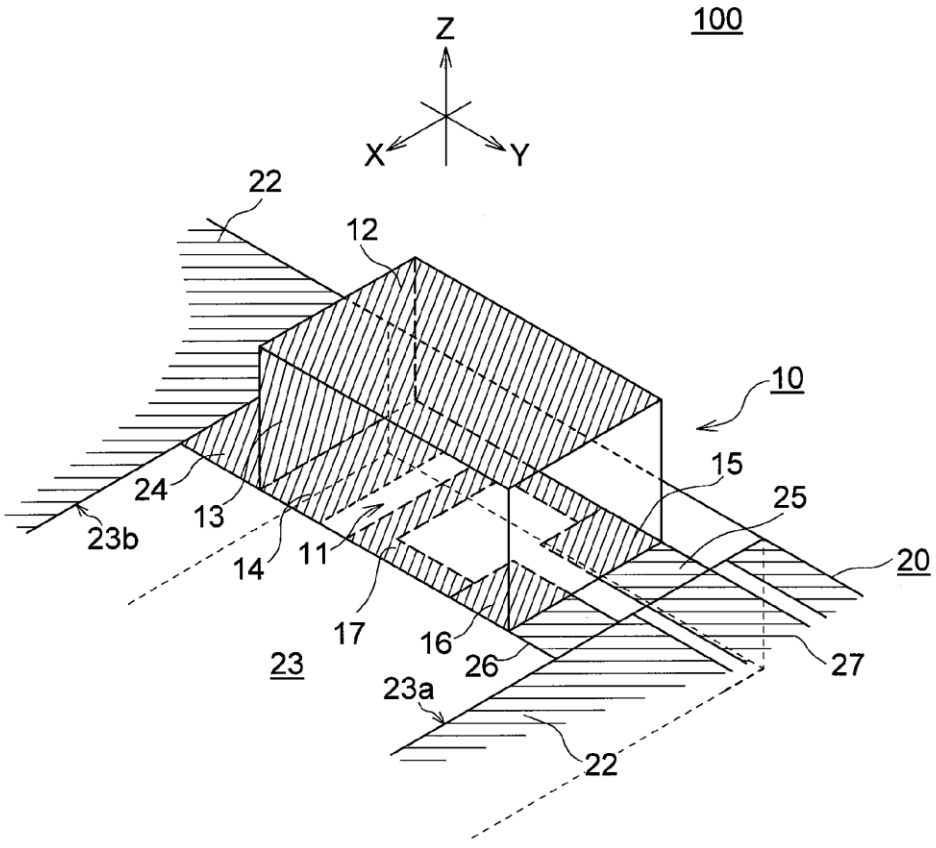
Publication Classification

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

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

(57) **ABSTRACT**

An antenna device includes an antenna element and a printed circuit board on which the antenna element is mounted. The antenna element includes a base, a radiation conductor formed on an upper surface of the substrate and one end of the radiation conductor being an open end, a plurality of terminal electrodes formed on a bottom surface of the substrate, and a loop conductor of a substantially U-shape. The loop conductor is arranged to face one of the terminal electrodes via a gap having a predetermined width. An antenna mounting region is provided on a upper surface of the printed circuit board to be adjacent to an edge of a long side of the printed circuit board. A feed line is led in the antenna mounting region along the edge. One and the other end of the loop conductor are connected to the feed line and a ground pattern, respectively.



US 20100225544A1

(19) **United States**

(12) **Patent Application Publication**

Taura

(10) **Pub. No.: US 2010/0225544 A1**

(43) **Pub. Date: Sep. 9, 2010**

(54) **SLOT ANTENNA AND PORTABLE WIRELESS TERMINAL**

(76) Inventor: **Toru Taura**, Tokyo (JP)

Correspondence Address:
Mr. Jackson Chen
6535 N. STATE HWY 161
IRVING, TX 75039 (US)

(21) Appl. No.: **12/600,214**

(22) PCT Filed: **May 15, 2008**

(86) PCT No.: **PCT/JP2008/058906**

§ 371 (c)(1),
(2), (4) Date: **Nov. 13, 2009**

(30) **Foreign Application Priority Data**

May 16, 2007 (JP) 2007-130848

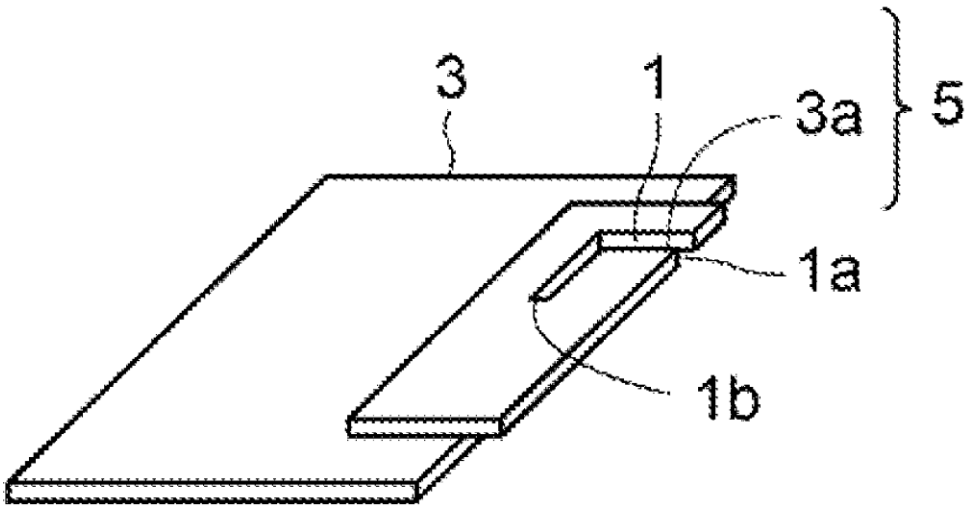
Publication Classification

(51) **Int. Cl.**
H01Q 13/10 (2006.01)
H01Q 1/24 (2006.01)

(52) **U.S. Cl.** **343/702**; 343/767

(57) **ABSTRACT**

To provide a portable wireless terminal having a reduced thickness and fine antenna performance. A slot antenna is provided with an antenna element having an aperture silt shaped slot; a reflection plate disposed by being opposed to the antenna element; and a power feeding device which is electrically and physically connected to the antenna element and the reflection plate. The slot antenna has a structure wherein an opening end of the slot and an end of the reflection plate are shifted from each other. Since only the antenna element and the reflection plate opposing to each other are disposed in the thickness direction (vertical direction) of the antenna, the size in the thickness direction of the antenna can be reduced. Further, through controlling the reactance component of the antenna, the characteristic of a transmitting/receiving antenna can be improved.



US 20100225545A1

(19) **United States**

(12) **Patent Application Publication**

TAMURA et al.

(10) **Pub. No.: US 2010/0225545 A1**

(43) **Pub. Date: Sep. 9, 2010**

(54) **CAPACITIVE-FEED ANTENNA AND WIRELESS COMMUNICATION APPARATUS HAVING THE SAME**

(75) Inventors: **Masamichi TAMURA**, Ishikawa-ken (JP); **Satoru HIRANO**, Ishikawa-ken (JP); **Yuichi KUSHIHI**, Ishikawa-ken (JP)

Correspondence Address:
Studebaker & Brackett PC
One Fountain Square, 11911 Freedom Drive, Suite 750
Reston, VA 20190 (US)

(73) Assignee: **MURATA MANUFACTURING CO., LTD.**, Kyoto-fu (JP)

(21) Appl. No.: **12/779,118**

(22) Filed: **May 13, 2010**

Related U.S. Application Data

(63) Continuation of application No. PCT/JP2008/067306, filed on Sep. 25, 2008.

(30) **Foreign Application Priority Data**

Nov. 13, 2007 (JP) 2007-294562

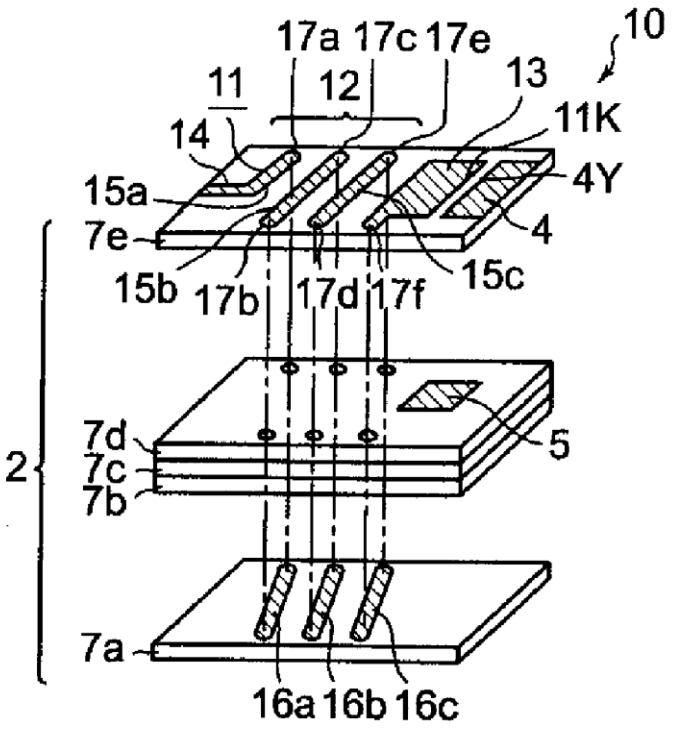
Publication Classification

(51) **Int. Cl.**
H01Q 9/04 (2006.01)
H01Q 1/24 (2006.01)
H01Q 1/38 (2006.01)

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

(57) **ABSTRACT**

A dielectric substrate having a radiation electrode **3** and a feed electrode **4** formed thereon is formed such that a plurality of insulator layers **7***a* to **7***e* are stacked and combined. An open end **3**K of the radiation electrode **3** and a capacitive coupling end **4**Y of the feed electrode **4** are formed on a surface of the same insulator layer of the dielectric substrate **2**. A floating electrode **5** is formed on a surface of an insulator layer on which the open end **3**K of the radiation electrode **3** and the capacitive coupling end **4**Y of the feed electrode **4** are not formed. The floating electrode **5** is arranged to commonly face both the open end **3**K of the radiation electrode **3** and the capacitive coupling end **4**Y of the feed electrode **4** in the stacking direction of the insulator layers **7***a* to **7***e*.



US 20100225548A1

(19) **United States**

(12) **Patent Application Publication**

PFLETSCHINGER et al.

(10) **Pub. No.: US 2010/0225548 A1**

(43) **Pub. Date: Sep. 9, 2010**

(54) **FLAT ANTENNA WITH AT LEAST TWO EMITTER SECTIONS FOR SENDING AND RECEIVING HIGH FREQUENCY SIGNALS**

(76) Inventors: **Markus PFLETSCHINGER**, Eningen (DE); **Bernd SCHWARZ**, Walddorf-Haeslach (DE)

Correspondence Address:
KF ROSS PC
5683 RIVERDALE AVENUE, SUITE 203 BOX 900
BRONX, NY 10471-0900 (US)

(21) Appl. No.: **12/628,389**

(22) Filed: **Dec. 1, 2009**

(30) **Foreign Application Priority Data**

Mar. 6, 2009 (DE) 102009011494.7

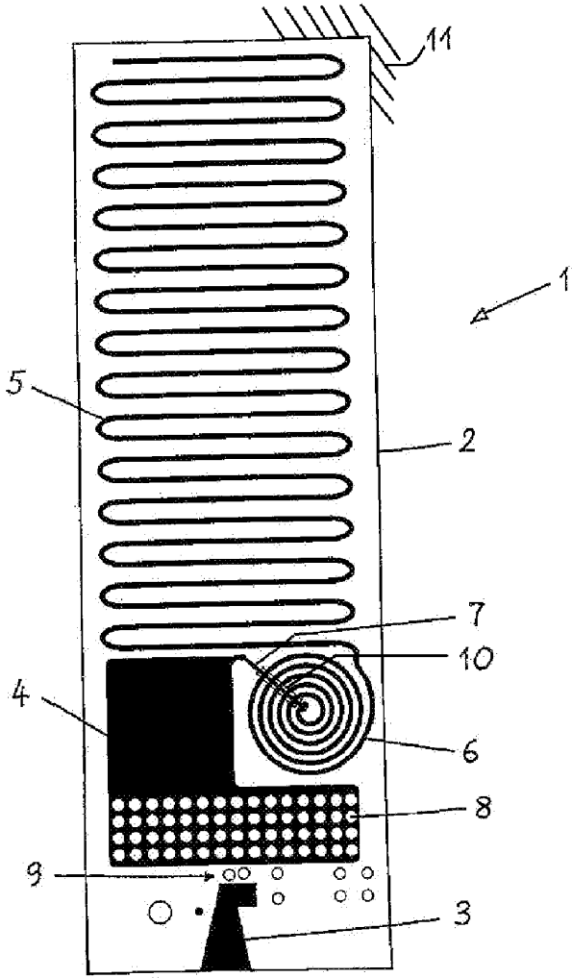
Publication Classification

(51) **Int. Cl.**
H01Q 1/32 (2006.01)
H01Q 1/48 (2006.01)
H01Q 1/36 (2006.01)

(52) **U.S. Cl.** **343/713**; 343/846; 343/893

(57) **ABSTRACT**

An antenna has a flat support and two separate and flat emitter sections for transmitting or receiving high-frequency signals flatly fixed to the support. One of the emitter sections is flat and areal and the other of the emitter sections is a meander. A coil is fixed flatly on the support and connected to both of the emitter sections, and a ground terminal is also fixed flatly on the support.



US 20100225550A1

(19) **United States**

(12) **Patent Application Publication**

Laubner et al.

(10) **Pub. No.: US 2010/0225550 A1**

(43) **Pub. Date: Sep. 9, 2010**

(54) **MULTIBAND ANTENNAS AND DEVICES**

(76) Inventors: **Thomas S. Laubner**, Merrimac, MA (US); **Robert Schilling**, Londonderry, NH (US)

Correspondence Address:
CHRISTOPHER P. MAIORANA, P.C.
24840 HARPER SUITE 100
ST. CLAIR SHORES, MI 48080 (US)

(21) Appl. No.: **12/728,422**

(22) Filed: **Mar. 22, 2010**

Related U.S. Application Data

(63) Continuation of application No. 11/532,942, filed on Sep. 19, 2006, now Pat. No. 7,683,843.

(60) Provisional application No. 60/734,403, filed on Nov. 8, 2005.

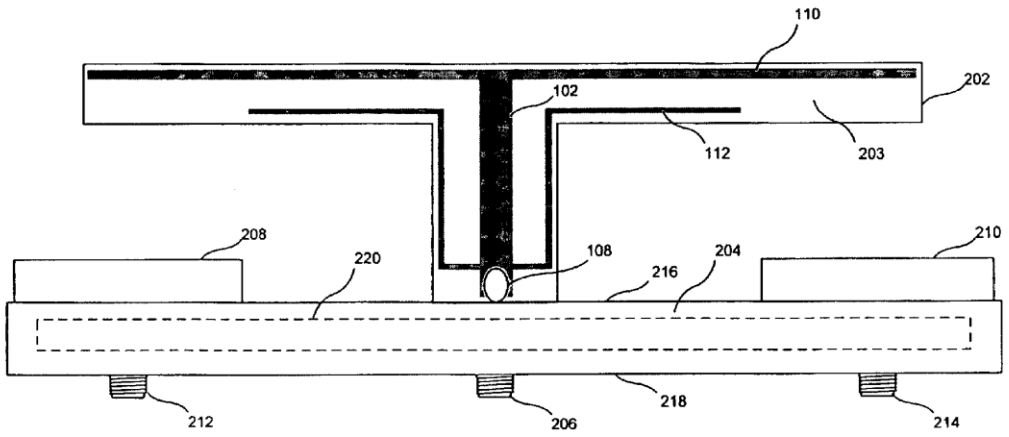
Publication Classification

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

(52) **U.S. Cl.** **343/722**

(57) **ABSTRACT**

An apparatus includes an antenna (e.g., a monopole), a first load, and a second load. The antenna, which extends substantially along an axis, has a first end and a second end. The first load is coupled to the antenna at the first end, while the second load is coupled to the antenna between the first end and the second end. Both the first and second loads are symmetrical with reference to the axis. The apparatus is arranged to operate in at least two frequency bands, such as the AMPS band from about 824 MHz to 894 MHz and the PCS band from about 1850 MHz to 1990 MHz.



US 20100225551A1

(19) **United States**

(12) **Patent Application Publication**

Yang et al.

(10) **Pub. No.: US 2010/0225551 A1**

(43) **Pub. Date: Sep. 9, 2010**

(54) **MULTI-BAND ANTENNA**

(75) Inventors: **Wen-Chieh Yang**, Taipei Hsien (TW); **Kai Shih**, Taipei Hsien (TW); **Yu-Yuan Wu**, Taipei Hsien (TW)

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.: **12/398,371**

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

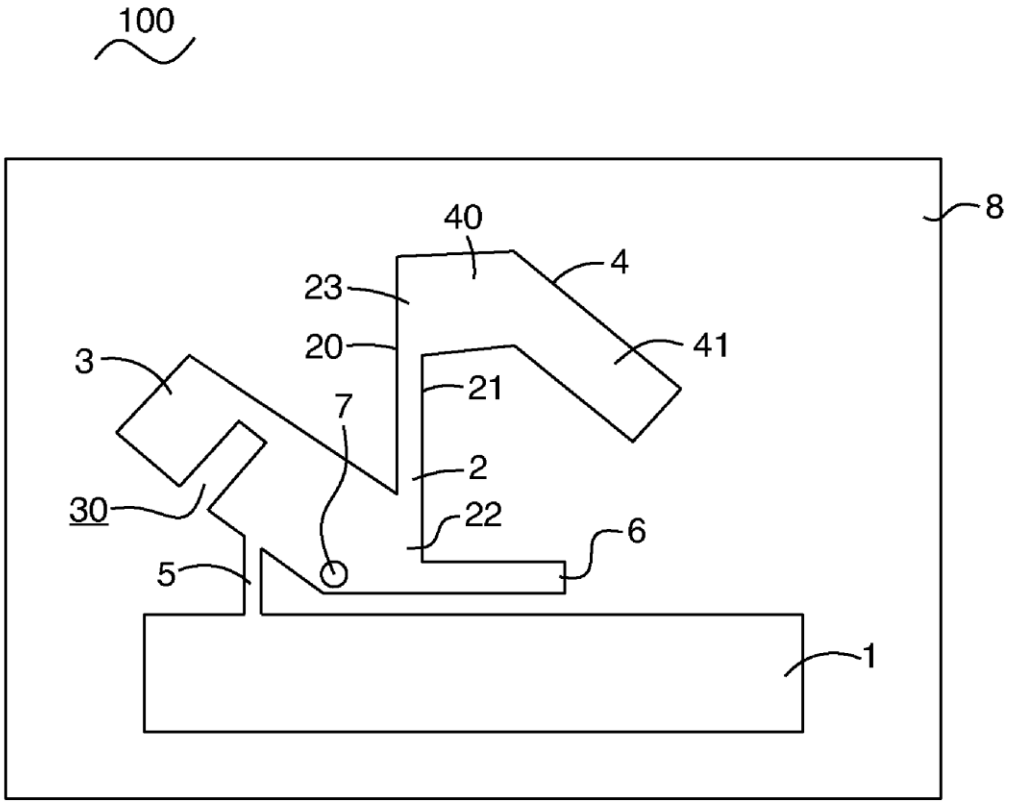
Publication Classification

(51) **Int. Cl.**
H01Q 1/38 (2006.01)
H01Q 9/00 (2006.01)

(52) **U.S. Cl.** ..... **343/749**; 343/700 MS

(57) **ABSTRACT**

A multi-band antenna includes a ground portion, a radiating element spaced from the ground portion, a tuning conductor extending from the radiating element and parallel to the ground portion to form a gap therebetween, a short-circuit conductor interconnecting the ground portion and the radiating element, and a feed point disposed at the radiating element and adjacent to the short-circuit conductor. The radiating element, the short-circuit conductor and the feed point function as a first inverted-F antenna obtaining a first high frequency band, and a second inverted-F antenna obtaining a low frequency band and a second high frequency band higher than the first high frequency band. The ground portion and the tuning conductor cause a capacitance effect to shift the second high frequency band to be close to the first high frequency band. It can cover various wireless communication frequency bands.



US 20100225555A1

(19) **United States**

(12) **Patent Application Publication**

Gunnels

(10) **Pub. No.: US 2010/0225555 A1**

(43) **Pub. Date: Sep. 9, 2010**

(54) **CIRCUIT BOARD FOLDED DIPOLE WITH INTEGRAL BALUN AND TRANSFORMER**

(75) Inventor: **Robert Charles Gunnels**, Homer Glen, IL (US)

Correspondence Address:
Husch Blackwell Sanders, LLP
Husch Blackwell Sanders LLP Welsh & Katz
120 S RIVERSIDE PLAZA, 22ND FLOOR
CHICAGO, IL 60606 (US)

(73) Assignee: **PC-TEL, Inc.**, Bloomington, IL (US)

(21) Appl. No.: **12/397,722**

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

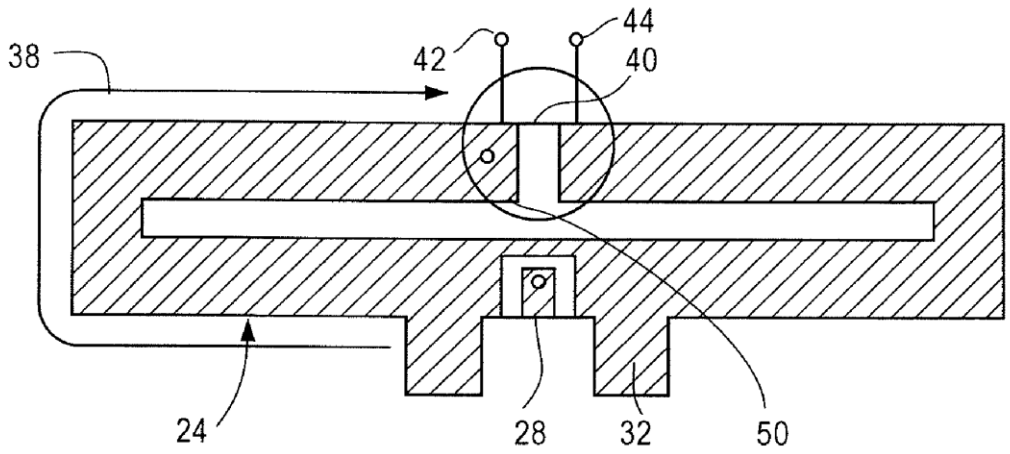
Publication Classification

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

(52) **U.S. Cl.** **343/859**

(57) **ABSTRACT**

An antenna is described having an RF connection and a second connection. The antenna includes a dielectric panel having a first longitudinal edge and second, opposing longitudinal edge and a first transverse edge and second, opposing transverse edge, a first antenna element disposed on a first predominant surface of the panel, said first antenna element extending along a periphery of the dielectric panel and only along the periphery of the first surface with a second connection located midway along the first longitudinal edge of the board and a gap in the first antenna element located midway along the opposing second longitudinal edge and a second antenna element disposed on a second predominant surface of the panel, said second antenna element extending along the periphery and only along the periphery, said second antenna element electrically connecting with the RF connection located midway along the first longitudinal edge adjacent the second connection and extending along the first longitudinal edge, across the transverse edge and along the second, opposing longitudinal edge to terminate adjacent the gap on a distal end.



US 20100225558A1

(19) **United States**

(12) **Patent Application Publication**

Jonsson et al.

(10) **Pub. No.: US 2010/0225558 A1**

(43) **Pub. Date: Sep. 9, 2010**

(54) **ANTENNA ARRANGEMENT**

(75) Inventors: **Stefan Jonsson**, Stocksund (SE); **Dan Karlsson**, Solna (SE)

Correspondence Address:
THE JANSSON FIRM
3616 Far West Blvd, Ste 117-314
AUSTIN, TX 78731 (US)

(73) Assignee: **CELLMAX TECHNOLOGIES AB**, Täby (SE)

(21) Appl. No.: **12/679,550**

(22) PCT Filed: **Sep. 19, 2008**

(86) PCT No.: **PCT/SE08/51054**

§ 371 (c)(1),
(2), (4) Date: **Mar. 23, 2010**

(30) **Foreign Application Priority Data**

Sep. 24, 2007 (SE) 0702121-5

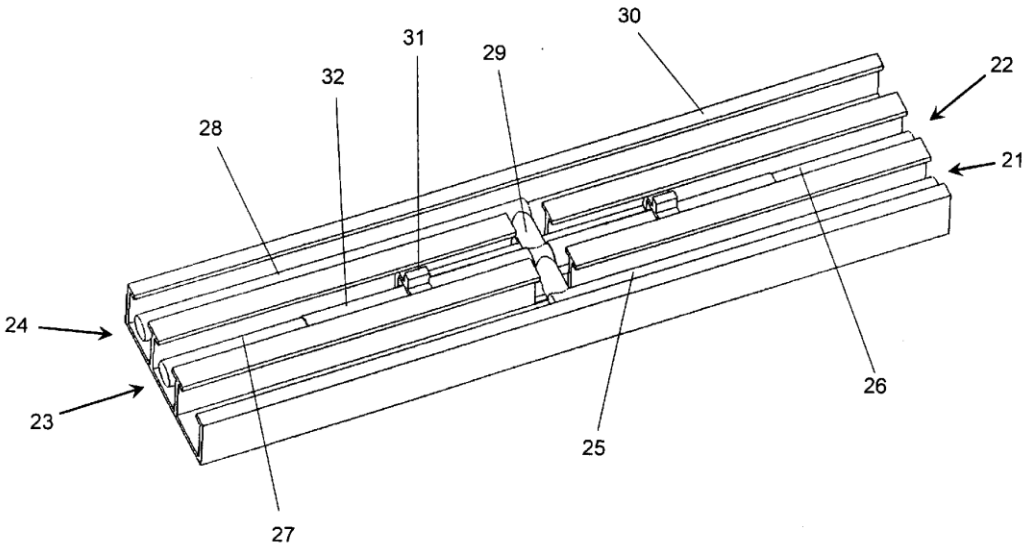
Publication Classification

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

(52) **U.S. Cl.** **343/860**; 343/905

(57) **ABSTRACT**

Antenna arrangement for a multi-radiator base station antenna, the antenna having a feeding network based on air filled coaxial lines (**1**, **2**, **3**), wherein each coaxial line comprises an outer conductor (**8**) and an inner conductor (**4**, **5**, **6**), wherein an adjustable differential phase shifter including a dielectric part (**9**) is arranged in the antenna and said dielectric part being movable longitudinally in relation to at least one coaxial line (**1**, **2**, **3**).



US 20100225560A1

(19) **United States**

(12) **Patent Application Publication**

ENDOU

(10) **Pub. No.: US 2010/0225560 A1**

(43) **Pub. Date: Sep. 9, 2010**

(54) **ANTENNA DEVICE**

(75) Inventor: **Kenji ENDOU**, Tokyo (JP)

Correspondence Address:
MCDERMOTT WILL & EMERY LLP
600 13TH STREET, N.W.
WASHINGTON, DC 20005-3096 (US)

(73) Assignee: **TDK CORPORATION**

(21) Appl. No.: **12/714,902**

(22) Filed: **Mar. 1, 2010**

(30) **Foreign Application Priority Data**

Mar. 6, 2009 (JP) 2009-052771

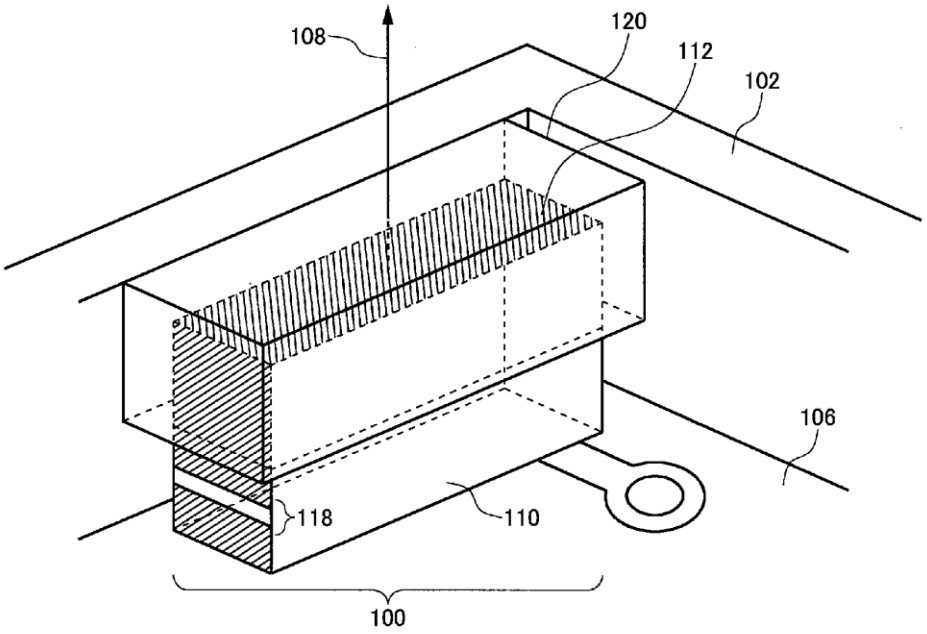
Publication Classification

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

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

(57) **ABSTRACT**

An antenna element is formed by providing a radiation electrode on a base member made of a dielectric material. To protect the antenna element from external impact, a void is formed between a housing and the antenna element. This void is filled with a solid member. The relative permittivity of the solid member is equal to or higher than the relative permittivity of the housing, and equal to or lower than the relative permittivity of the base member. The solid member is formed as an elastic member.



US 20100231456A1

(19) **United States**

(12) **Patent Application Publication**

Wong et al.

(10) **Pub. No.: US 2010/0231456 A1**

(43) **Pub. Date: Sep. 16, 2010**

(54) **MOBILE COMMUNICATION ANTENNA WITH REDUCED GROUNDPLANE EFFECTS**

(75) Inventors: **Kin-Lu Wong**, Taipei Hsien (TW); **Cheng-Tse Lee**, Taipei Hsien (TW)

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

(73) Assignee: **ACER INCORPORATED**, Taipei Hsien (TW)

(21) Appl. No.: **12/536,532**

(22) Filed: **Aug. 6, 2009**

(30) **Foreign Application Priority Data**

Mar. 11, 2009 (TW) 098107838

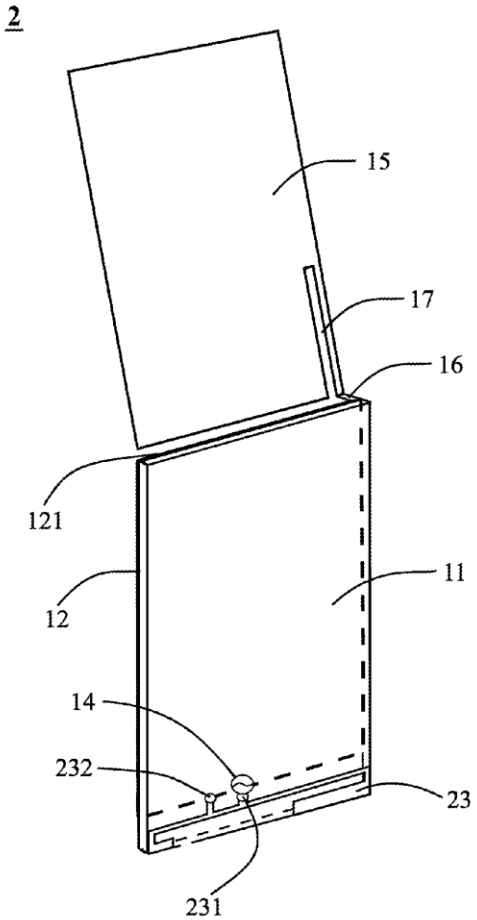
Publication Classification

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

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

(57) **ABSTRACT**

The present invention is related to a mobile communication antenna with reduced ground plane effects. The antenna comprises a dielectric substrate, a first ground plane, a radiating element, a second ground plane, and a slit. The first ground plane is disposed on the dielectric substrate. The radiating element is disposed on the dielectric substrate or nearby the dielectric substrate and is connected to a signal source disposed on the dielectric substrate. The second ground plane is disposed nearby one edge of the first ground plane and is connected to the first ground plane through a metal strip. The slit is disposed on the second ground plane and is nearby the metal strip.



US 20100231457A1

(19) **United States**

(12) **Patent Application Publication**

Chen et al.

(10) **Pub. No.: US 2010/0231457 A1**

(43) **Pub. Date: Sep. 16, 2010**

(54) **STRETCHABLE ANTENNA ASSEMBLY AND NOTEBOOK COMPUTER WITH THE ANTENNA ASSEMBLY THEREOF**

(76) Inventors: **Hen-An Chen**, Taipei Hsien (TW); **San-Yi Kuo**, Taipei Hsien (TW); **Bing-Chun Chung**, Taipei Hsien (TW)

Correspondence Address:
G. LINK CO., LTD
3550 BELL ROAD
MINOOKA, IL 60447 (US)

(21) Appl. No.: **12/007,146**

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

(30) **Foreign Application Priority Data**

Aug. 20, 2007 (TW) 096130746

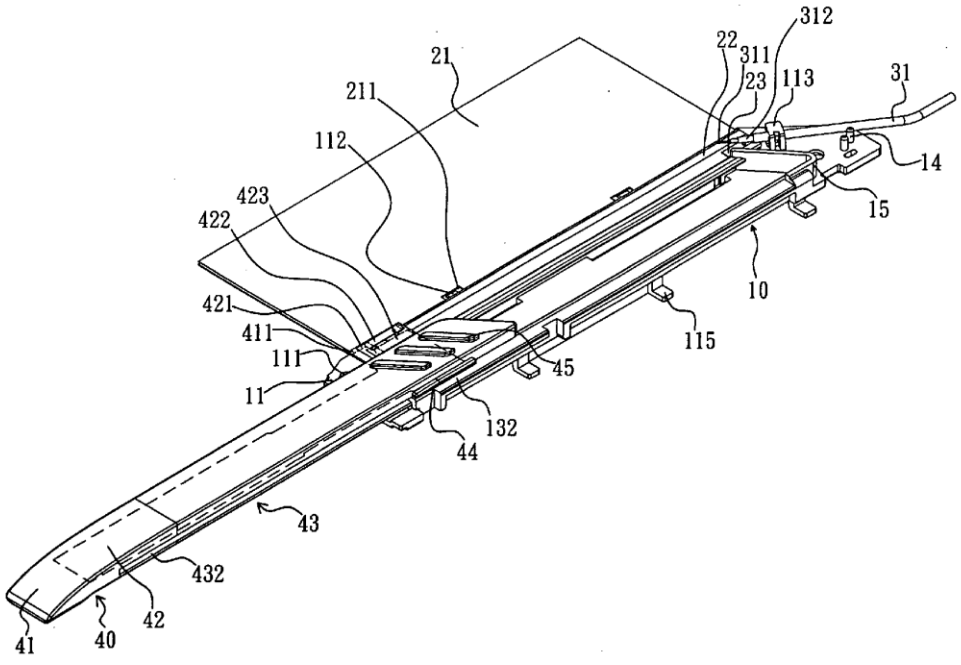
Publication Classification

(51) **Int. Cl.**
H01Q 1/08 (2006.01)
H01Q 1/24 (2006.01)

(52) **U.S. Cl.** **343/702**; 343/880

(57) **ABSTRACT**

A stretchable antenna assembly and a notebook computer with the antenna assembly thereof, comprising an antenna module and a holder which respectively has a guiding unit corresponding to the antenna module and the holder, and further the antenna module couples to a signal transmission element for activating with a first conductive element disposed at one side of the holder, resulting in preventing the antenna signal transmission from being interrupted whenever the antenna module is open or closed, and in further ensuring the precise locating function, and strengthening the receipt of signal.



US 20100231460A1

(19) **United States**

(12) **Patent Application Publication**

Chiang et al.

(10) **Pub. No.: US 2010/0231460 A1**

(43) **Pub. Date: Sep. 16, 2010**

(54) **INVERTED-F ANTENNA WITH BANDWIDTH ENHANCEMENT FOR ELECTRONIC DEVICES**

(76) Inventors: **Bing Chiang**, Cupertino, CA (US); **Enrique Ayala Vazquez**, Watsonville, CA (US)

Correspondence Address:
Treyz Law Group
870 Market Street, Suite 984
SAN FRANCISCO, CA 94102 (US)

(21) Appl. No.: **12/401,594**

(22) Filed: **Mar. 10, 2009**

Publication Classification

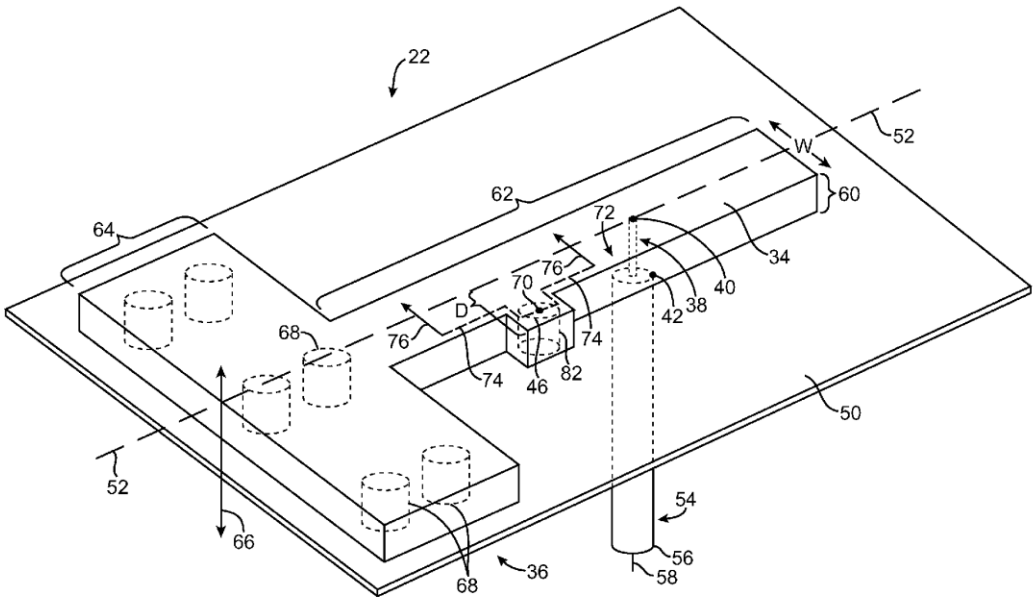
(51) **Int. Cl.**

H01Q 9/04	(2006.01)
H01Q 1/00	(2006.01)
H01Q 1/24	(2006.01)

(52) **U.S. Cl.** ..... **343/702**; 343/700 MS; 343/722

(57) **ABSTRACT**

An inverted-F antenna is provided that has a resonating element arm and a ground element. A shorting branch of the resonating element arm shorts the resonating element arm to the ground element. An antenna feed that receives a transmission line is coupled to the resonating element arm and the ground element. One or more impedance discontinuity structures are formed along the resonating element arm at locations that are between the shorting branch and the antenna feed. The impedance discontinuity structures may include shorting structures and capacitance discontinuity structures. The impedance discontinuity structures may be formed by off-axis vertical conductors such as vias that pass through a dielectric layer separating the antenna resonating element arm from the ground element. Capacitance discontinuity structures may be formed from hollowed portions of the dielectric or other dielectric portions with a dielectric constant that differs from that of the dielectric layer.



US 20100231462A1

(19) **United States**

(12) **Patent Application Publication**

Tran

(10) **Pub. No.: US 2010/0231462 A1**

(43) **Pub. Date: Sep. 16, 2010**

(54) **MULTI-BAND SERIALLY CONNECTED ANTENNA ELEMENT FOR MULTI-BAND WIRELESS COMMUNICATION DEVICES**

(75) Inventor: **Allen Minh-Triet Tran**, San Diego, CA (US)

Correspondence Address:
QUALCOMM INCORPORATED
5775 MOREHOUSE DR.
SAN DIEGO, CA 92121 (US)

(73) Assignee: **QUALCOMM INCORPORATED**, San Diego, CA (US)

(21) Appl. No.: **12/404,191**

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

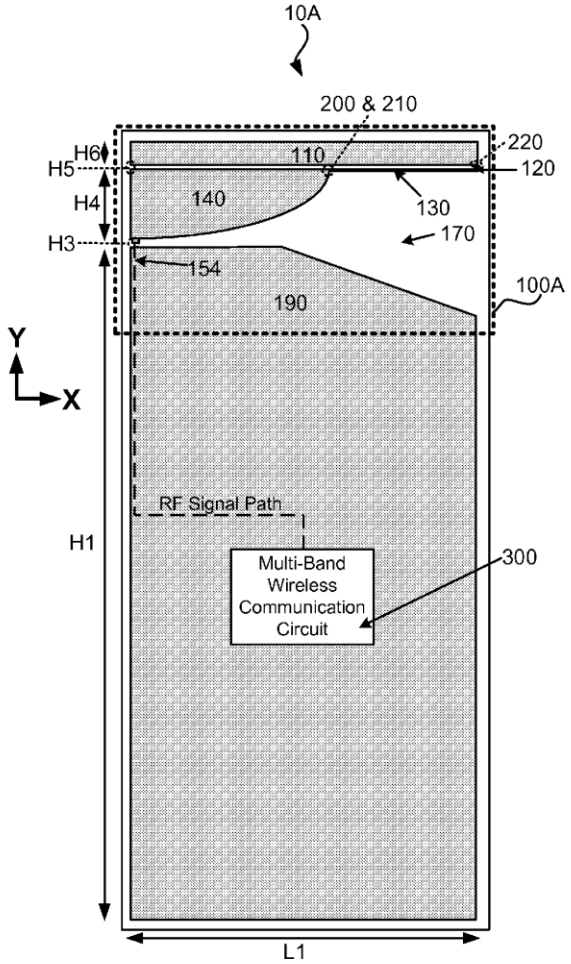
Publication Classification

(51) **Int. Cl.**
H01Q 1/24 (2006.01)
H01Q 1/38 (2006.01)
H01Q 21/30 (2006.01)

(52) **U.S. Cl.** ..... **343/702**; 343/700 MS; 343/893

(57) **ABSTRACT**

A multi-band antenna including a high-band antenna and a low-band antenna coupled in serial cascade fashion, where the low-band antenna is coupled at a position relative to the high-band antenna characterized by low coupling between the low-band antenna and the high-band antenna in corresponding operating frequency bands. In one exemplary embodiment, the high-band antenna is a high-band modified monopole antenna. In another, the high-band modified monopole antenna is a high-band quarter ellipse monopole antenna element and the low-band antenna is a low-band modified monopole antenna.



US 20100231463A1

(19) **United States**

(12) **Patent Application Publication**

(10) **Pub. No.: US 2010/0231463 A1**

(43) **Pub. Date: Sep. 16, 2010**

LIU

(54) **UWB ANTENNA AND PORTABLE WIRELESS COMMUNICATION DEVICE USING THE SAME**

(75) Inventor: **CHANG-MING LIU**, Tu-Cheng (TW)

Correspondence Address:
Altis Law Group, Inc.
ATTN: Steven Reiss
288 SOUTH MAYO AVENUE
CITY OF INDUSTRY, CA 91789 (US)

(73) Assignee: **CHI MEI COMMUNICATION SYSTEMS, INC.**, Tu-Cheng City (TW)

(21) Appl. No.: **12/493,340**

(22) Filed: **Jun. 29, 2009**

(30) **Foreign Application Priority Data**

Mar. 13, 2009 (CN) 200910300864.4

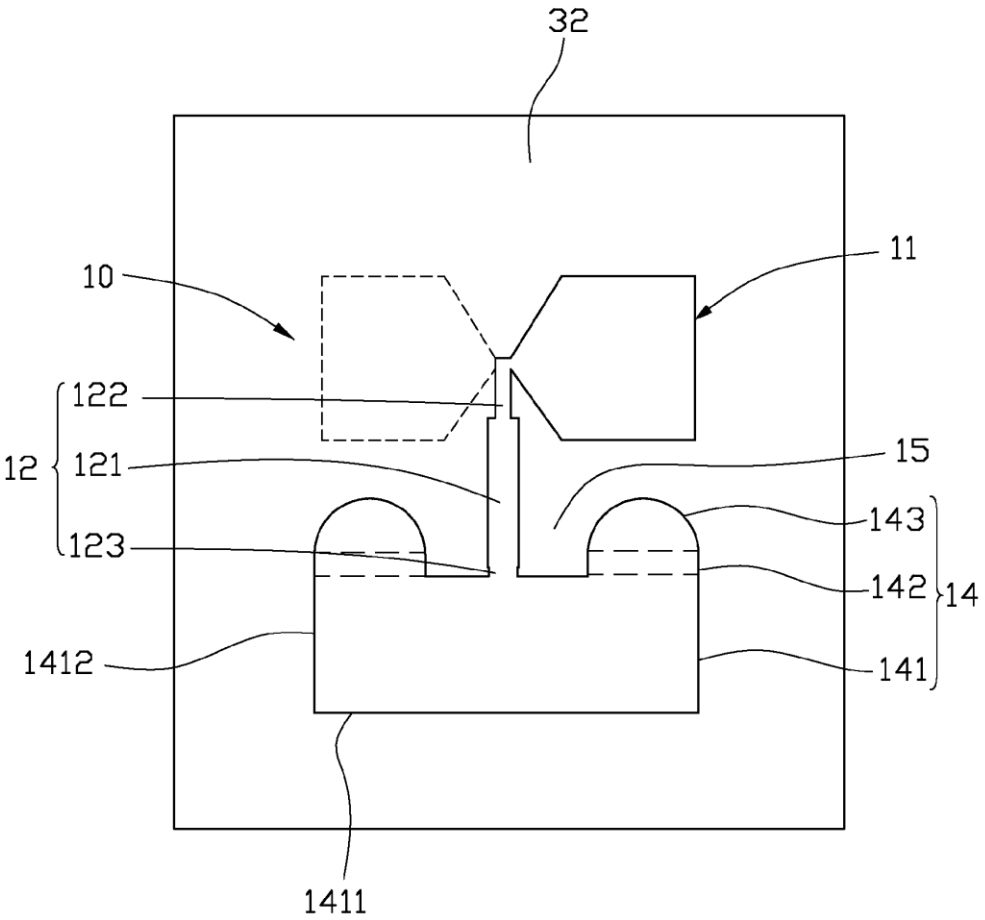
Publication Classification

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

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

(57) **ABSTRACT**

A UWB antenna mounted on a baseboard includes a first surface and a second surface opposite to the first surface, and a radiating unit, two connecting portions, a mircostrip line, and a grounding unit. The radiating unit includes two radiating bodies positioned on the first surface and the second surface separately. The mircostrip line and the grounding unit are positioned on the first surface and the second surface separately, and connected to the two radiating bodies via the two connecting portions. Projections of the two radiating bodies on the baseboard are symmetrical, and take the connecting portion as an axis.



US 20100231464A1

(19) **United States**

(12) **Patent Application Publication**

Huang et al.

(10) **Pub. No.: US 2010/0231464 A1**

(43) **Pub. Date: Sep. 16, 2010**

(54) **HIGH GAIN METAMATERIAL ANTENNA DEVICE**

(75) Inventors: **Wei Huang**, San Diego, CA (US); **Gregory Poilasne**, El Cajon, CA (US); **Vaneet Pathak**, San Diego, CA (US)

Correspondence Address:
Rayspan Corporation
11975 El Camino Real, Suite 301
San Diego, CA 92130 (US)

(73) Assignee: **RAYSPAN CORPORATION**, San Diego, CA (US)

(21) Appl. No.: **12/722,481**

(22) Filed: **Mar. 11, 2010**

Related U.S. Application Data

(60) Provisional application No. 61/159,320, filed on Mar. 11, 2009.

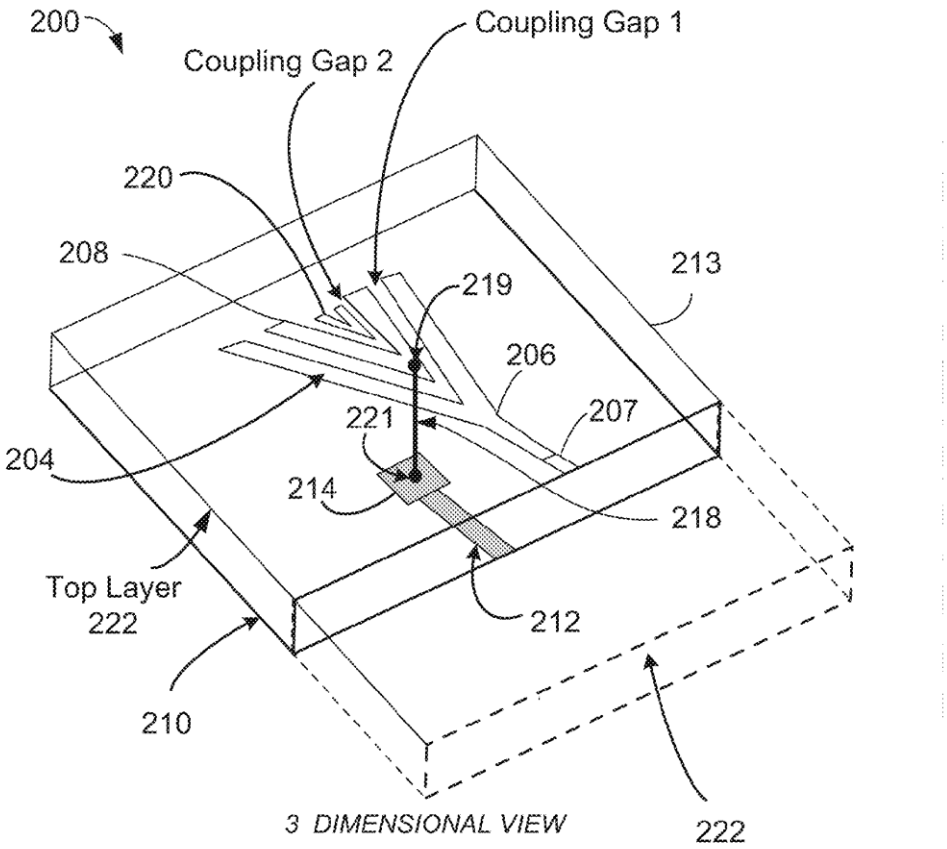
Publication Classification

(51) **Int. Cl.**
H01Q 1/38 (2006.01)
H01Q 1/24 (2006.01)
B05D 5/12 (2006.01)

(52) **U.S. Cl.** ..... **343/702**; 343/700 MS; 427/126.1

(57) **ABSTRACT**

An antenna is presented having a flared structure wherein charge is induced from one portion of the structure to another. The flared structure may be a V-shaped or other shaped element. The antenna includes at least one parasitic element to increase the gain of the antenna and extend the radiation pattern generated by the antenna in a given direction.



US 20100231470A1

(19) **United States**

(12) **Patent Application Publication**

Lee et al.

(10) **Pub. No.: US 2010/0231470 A1**

(43) **Pub. Date: Sep. 16, 2010**

(54) **MULTIBAND COMPOSITE RIGHT AND LEFT HANDED (CRLH) SLOT ANTENNA**

(75) Inventors: **Cheng-Jung Lee**, San Diego, CA (US); **Ajay Gummalla**, San Diego, CA (US); **Maha Achour**, Encinitas, CA (US)

Correspondence Address:
Rayspan Corporation
11975 El Camino Real, Suite 301
San Diego, CA 92130 (US)

(73) Assignee: **RAYSPAN CORPORATION**, San Diego, CA (US)

(21) Appl. No.: **12/723,540**

(22) Filed: **Mar. 12, 2010**

Related U.S. Application Data

(60) Provisional application No. 61/159,694, filed on Mar. 12, 2009.

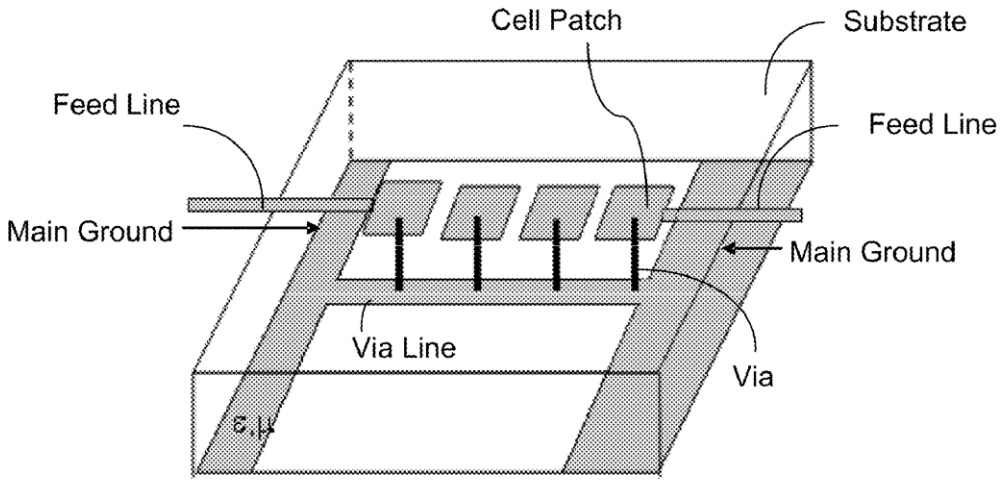
Publication Classification

(51) **Int. Cl.**
H01Q 13/10 (2006.01)
H01Q 1/00 (2006.01)
B44C 1/22 (2006.01)

(52) **U.S. Cl.** **343/722**; 343/767; 343/746; 216/13

(57) **ABSTRACT**

This application relates to slot antenna devices based on Composite Right and Left Handed (CRLH) metamaterial (MTM) structures.



US 20100238012A1

(19) **United States**

(12) **Patent Application Publication**

Duzdar et al.

(10) **Pub. No.: US 2010/0238012 A1**

(43) **Pub. Date: Sep. 23, 2010**

(54) **ANTENNA ASSEMBLIES FOR REMOTE APPLICATIONS**

(75) Inventors: **Ayman Duzdar**, Holly, MI (US); **Haiyang Wang**, Grand Blanc, MI (US); **Huzefa Abdulkader Bharmal**, Rochester Hills, MI (US); **Joseph M. Combi**, Grand Blanc, MI (US)

Correspondence Address:
HARNESS, DICKEY, & PIERCE, P.L.C
7700 Bonhomme, Suite 400
ST. LOUIS, MO 63105 (US)

(73) Assignee: **Laird Technologies, Inc.**, Chesterfield, MO (US)

(21) Appl. No.: **12/421,422**

(22) Filed: **Apr. 9, 2009**

Related U.S. Application Data

(60) Provisional application No. 61/162,116, filed on Mar. 20, 2009.

Publication Classification

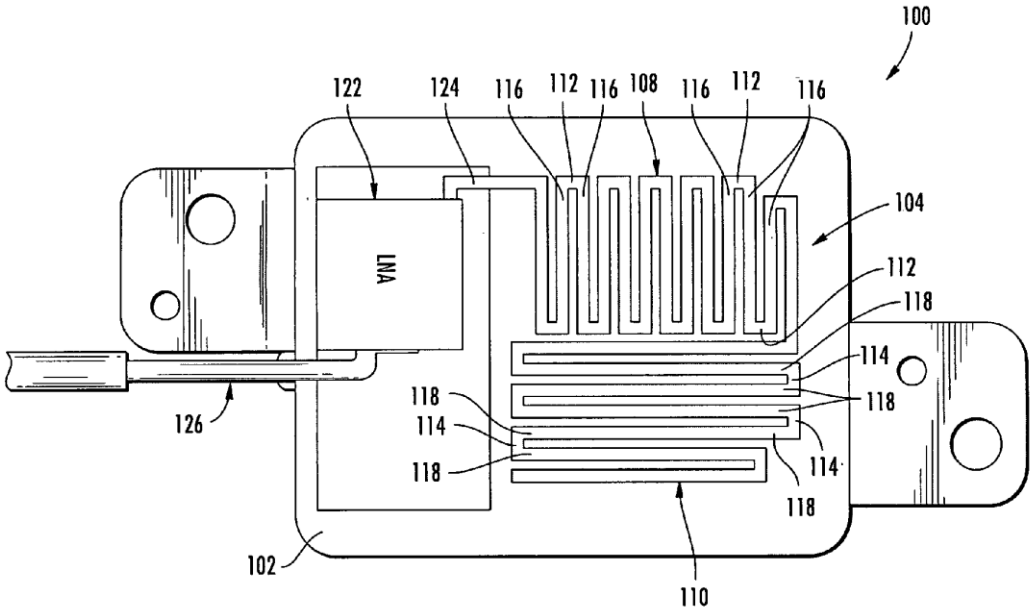
(51) **Int. Cl.**

B60C 23/00	(2006.01)
H01Q 1/38	(2006.01)
G08B 29/00	(2006.01)
H01P 11/00	(2006.01)
H01Q 9/26	(2006.01)

(52) **U.S. Cl.** ..... **340/447**; 343/700 MS; 340/5.64; 29/601; 343/803

(57) **ABSTRACT**

An antenna assembly is provided suitable for use with a remote communications module such as, for example, a keyless entry module, a tire pressure monitoring module, etc. The antenna assembly generally includes a support, a folded metallic antenna element mounted on the support, an amplifier coupled to the folded antenna element, and a transmission line coupled to the amplifier.



US 20100238079A1

(19) **United States**

(12) **Patent Application Publication**

(10) **Pub. No.: US 2010/0238079 A1**

(43) **Pub. Date: Sep. 23, 2010**

Ayatollahi et al.

(54) **HIGH ISOLATION MULTIPLE PORT ANTENNA ARRAY HANDHELD MOBILE COMMUNICATION DEVICES**

(76) Inventors: **Mina Ayatollahi**, Waterloo (CA); **Qinjiang Rao**, Waterloo (CA)

Correspondence Address:
QUARLES & BRADY LLP
411 E. WISCONSIN AVENUE, SUITE 2040
MILWAUKEE, WI 53202-4497 (US)

(21) Appl. No.: **12/776,678**

(22) Filed: **May 10, 2010**

Related U.S. Application Data

(63) Continuation-in-part of application No. 12/405,955, filed on Mar. 17, 2009.

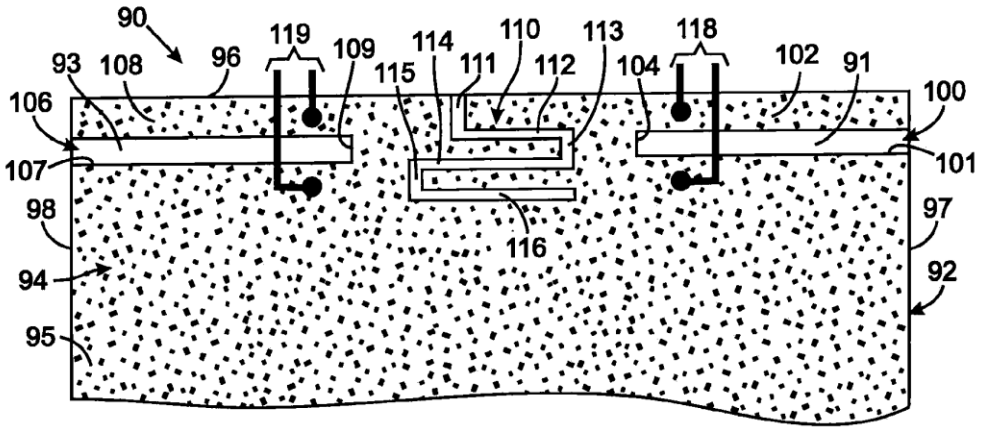
Publication Classification

(51) **Int. Cl.**
H01Q 13/10 (2006.01)
H01Q 1/00 (2006.01)

(52) **U.S. Cl.** **343/729**; 343/770

(57) **ABSTRACT**

A multiple input-multiple output antenna assembly with high isolation between the antennas is disclosed. The antenna assembly includes a substrate with a ground layer at its surface. Two antennas are disposed opposing each other on the substrate. A meandering slot is interposed between the first and second antennas on the ground plane. A first signal port is provided for applying a first signal to excite the first antenna and a second signal port is provided for applying a second signal to excite the second antenna. The meandering slot provides isolation that inhibits electromagnetic propagation between the first and second antennas. A third signal port is provided for applying a third signal to excite the meandering slot to act as another antenna for multiple input, multiple output operation.



US 20100245176A1

(19) **United States**

(12) **Patent Application Publication**

WONG et al.

(10) **Pub. No.: US 2010/0245176 A1**

(43) **Pub. Date: Sep. 30, 2010**

(54) **MONOPOLE SLOT ANTENNA**

(75) Inventors: **KIN-LU WONG**, Taipei Hsien (TW); **FANG-HSIEN CHU**, Taipei Hsien (TW)

Correspondence Address:
Wang Law Firm, Inc.
4989 Peachtree Parkway,, Suite 200
Norcross, GA 30092 (US)

(73) Assignee: **ACER INCORPORATED**, Taipei Hsien (TW)

(21) Appl. No.: **12/536,584**

(22) Filed: **Aug. 6, 2009**

(30) **Foreign Application Priority Data**

Mar. 27, 2009 (TW) 098110256

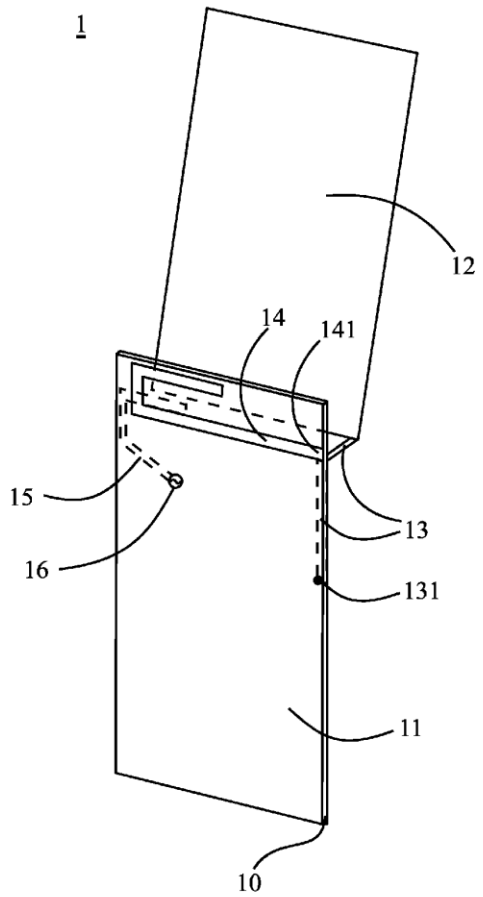
Publication Classification

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

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

(57) **ABSTRACT**

A monopole slot antenna applicable to a mobile communication device includes a dielectric substrate, a first ground plane, a second ground plane, a monopole slot, and a microstrip feedline. The first ground plane is disposed on the dielectric substrate. The second ground plane is in the vicinity of the first ground plane and electrically connected to the first ground plane via a metal wire. A section of the metal wire is disposed on one surface of the dielectric substrate. The monopole slot is disposed on the first ground plane and has an open end disposed near the metal wire that connects the first and the second ground planes. The microstrip feedline is disposed on a surface of the dielectric substrate opposite to the first ground plane with one end of the microstrip feedline extended across the monopole slot and the other end connected to a signal source.



US 20100245177A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2010/0245177 A1

(43) Pub. Date: Sep. 30, 2010

Jagielski et al.

(54) **MOBILE TERMINAL WITH A MONOPOLE LIKE ANTENNA**

(76) Inventors: **Ole Jagielski**, Frederikshavn (DK); **Simon Svendsen**, Aalborg Ost (DK)

Correspondence Address:
KACVINSKY DAISAK PLLC
4500 BROOKTREE ROAD, SUITE 302
WEXFORD, PA 15090 (US)

(21) Appl. No.: **12/296,335**

(22) PCT Filed: **Apr. 11, 2007**

(86) PCT No.: **PCT/EP07/53506**

§ 371 (c)(1),
(2), (4) Date: **Jun. 16, 2010**

(30) **Foreign Application Priority Data**

Apr. 18, 2006 (EP) 06112695.9

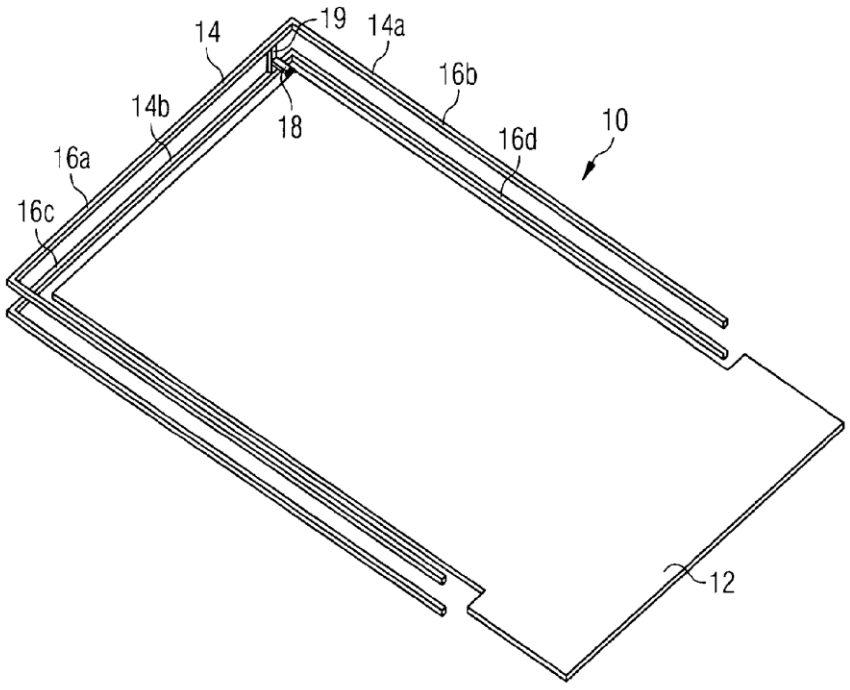
Publication Classification

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

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

(57) **ABSTRACT**

A mobile terminal comprising: a casing with at least one body which has electronic means; an antenna arrangement having at least one antenna element (**14**) provided on or within said body or on or within at least one of several bodies of said casing in a defined spatial relation to a conducting chassis part (**12**) of the body or the respective bodies allowing a high frequency interaction between the antenna arrangement and the conducting chassis part, said conducting chassis part being limited by a periphery of the conducting chassis part. Said antenna element has at least one arm (**16***a*, **16***b*) which extends outwardly of said periphery along at least one chassis part edge for promoting said high frequency interaction or/and that said antenna arrangement has at least two arms (**16***a*, **16***b*) of different length which are provided by the same or at least two different antenna elements and which extend in different or opposed directions along at least one chassis part edge, wherein a shorter arm (**16***b*) has an effective electrical length shorter than a quarter wavelength at a resonance frequency within the or a particular predetermined frequency band and a longer arm (**16***a*) has an effective electrical length longer than a quarter wavelength at said resonance frequency, to improve the band width of said frequency band.



US 20100245180A1

(19) **United States**

(12) **Patent Application Publication**

Wang

(10) **Pub. No.: US 2010/0245180 A1**

(43) **Pub. Date: Sep. 30, 2010**

(54) **MOBILE APPARATUS**

(75) Inventor: **Ching-Sung Wang**, Taoyuan County (TW)

Correspondence Address:
JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE
7 FLOOR-1, NO. 100, ROOSEVELT ROAD, SECTION 2
TAIPEI 100 (TW)

(73) Assignee: **HTC CORPORATION**, Taoyuan County (TW)

(21) Appl. No.: **12/619,657**

(22) Filed: **Nov. 16, 2009**

(30) **Foreign Application Priority Data**

Mar. 26, 2009 (TW) 98109994

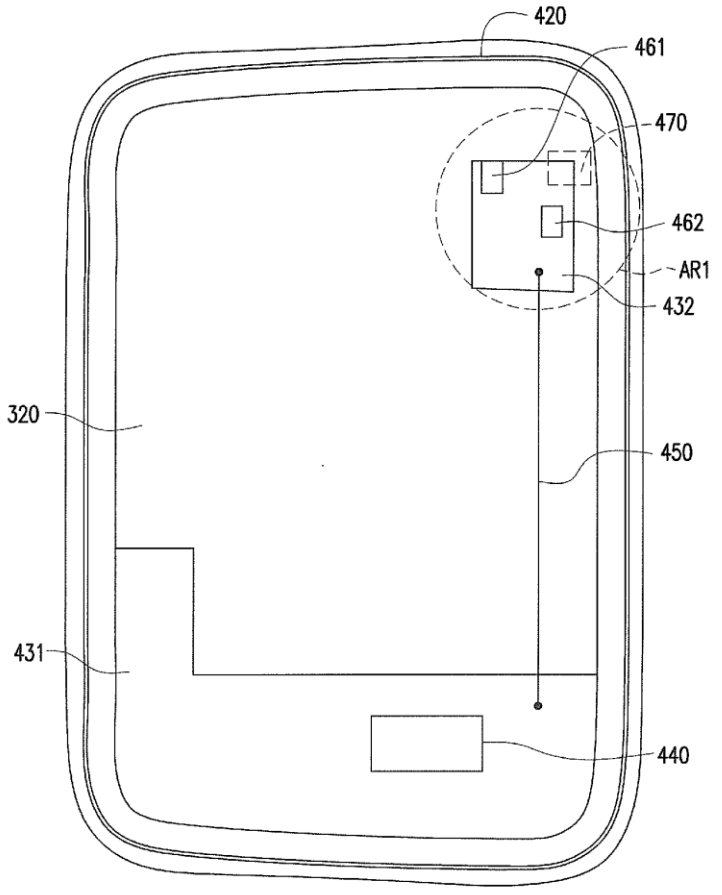
Publication Classification

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

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

(57) **ABSTRACT**

A mobile apparatus is provided. The mobile apparatus includes an antenna and a ground plane. The antenna is used to receive or transmit a radio frequency signal and includes a grounding part having a first ground terminal and a second ground terminal. Wherein, a distance between the first ground terminal and the second ground terminal is associated with a wavelength of the radio frequency signal. The ground plane is electrically connected to the grounding part of the antenna through the first ground terminal and the second ground terminal. The present invention effectively reduces a specific absorption ratio and a required height for setting the antenna such that a bandwidth of the antenna is increased.



US 20100245181A1

(19) **United States**

(12) **Patent Application Publication**

Christian et al.

(10) **Pub. No.: US 2010/0245181 A1**

(43) **Pub. Date: Sep. 30, 2010**

(54) **MULTI-BAND PRINTED CIRCUIT BOARD ANTENNA AND METHOD OF MANUFACTURING THE SAME**

(76) Inventors: **Rene Christian**, Arden Hills, MN (US); **Bernard Sandler**, Brookfield, WI (US)

Correspondence Address:
PATRICK W. RASCHE (22697)
ARMSTRONG TEASDALE LLP
7700 Forsyth Boulevard, Suite 1800
St. Louis, MO 63105 (US)

(21) Appl. No.: **12/645,246**

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

Related U.S. Application Data

(60) Provisional application No. 61/163,022, filed on Mar. 24, 2009.

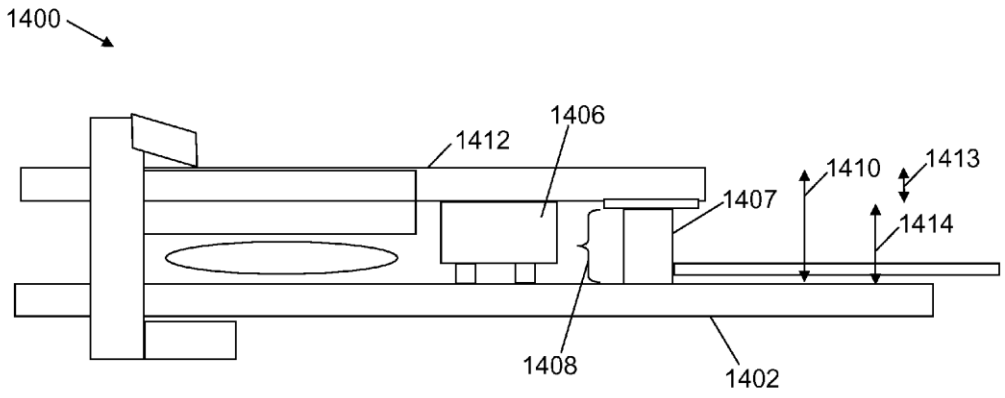
Publication Classification

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

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

(57) **ABSTRACT**

A multi-band antenna for a printed circuit board (PCB). The PCB multi-band antenna comprises a first trace coupled to a first surface of the PCB extending along at least a portion of a length of a first side of the PCB and along at least a portion of a length of a second side of the PCB that intersects the first side, wherein the first trace is positioned proximate a perimeter of the PCB that is partially defined by the first side and the second side.



US 20100245183A1

(19) **United States**

(12) **Patent Application Publication**

Hyvönen et al.

(10) **Pub. No.: US 2010/0245183 A1**

(43) **Pub. Date: Sep. 30, 2010**

(54) **ANTENNA ARRANGEMENT**

(76) Inventors: **Lassi Pentti Olavi Hyvönen**, Helsinki (FI); **Jussi Olavi Rahola**, Espoo (FI)

Correspondence Address:
ALSTON & BIRD LLP
BANK OF AMERICA PLAZA, 101 SOUTH TRYON STREET, SUITE 4000
CHARLOTTE, NC 28280-4000 (US)

(21) Appl. No.: **12/669,329**

(22) PCT Filed: **Jul. 18, 2007**

(86) PCT No.: **PCT/IB07/02961**

§ 371 (c)(1),
(2), (4) Date: **Jun. 14, 2010**

Publication Classification

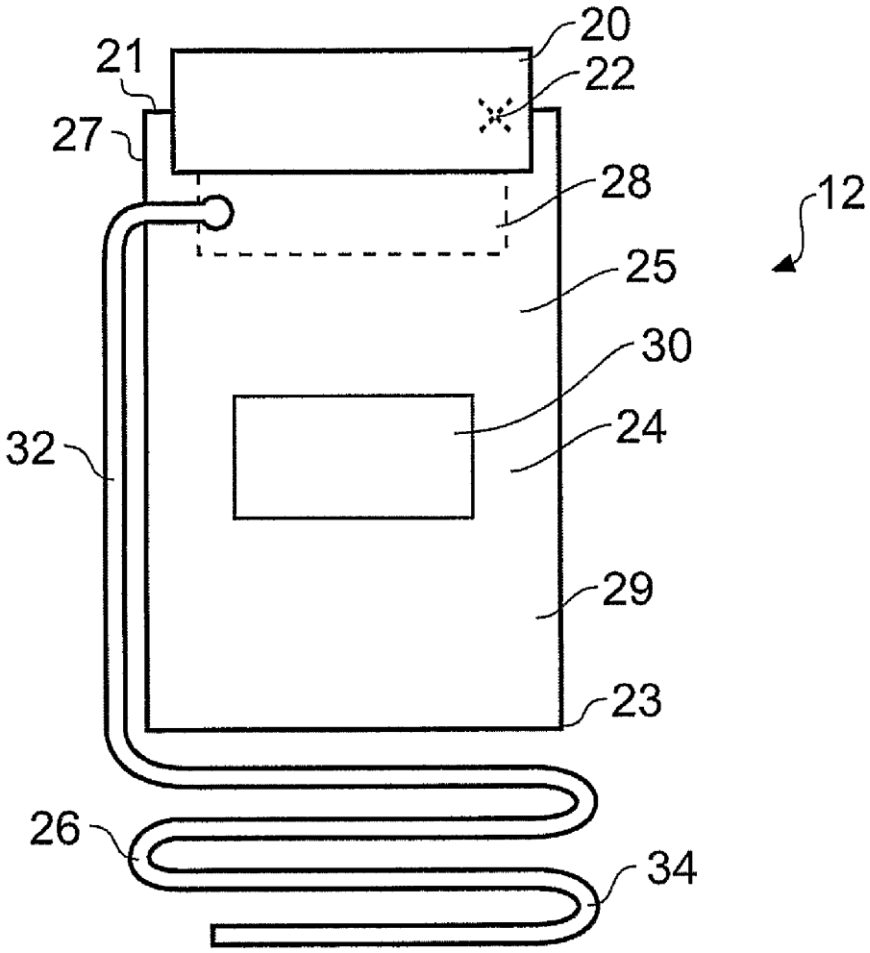
(51) **Int. Cl.**

H01Q 1/38	(2006.01)
H01Q 9/00	(2006.01)
H01Q 1/24	(2006.01)

(52) **U.S. Cl.** ..... **343/702**; 343/700 MS; 343/749

(57) **ABSTRACT**

An antenna arrangement operable at a first resonant frequency f having a corresponding resonant wavelength λ the antenna arrangement comprising: an antenna comprising a feed; a ground plane coupled to the antenna comprising a first region and a second region; and a grounded conductive structure coupled to the first region of the ground plane, wherein the second region of the ground plane is configured such that, at the first resonant frequency f the current flows predominantly in the grounded conductive structure compared to the second region of the ground plane.



US 20100245184A1

(19) **United States**

(12) **Patent Application Publication**

Talty et al.

(10) **Pub. No.: US 2010/0245184 A1**

(43) **Pub. Date: Sep. 30, 2010**

(54) **CONTROL MODULE CHASSIS-INTEGRATED SLOT ANTENNA**

(75) Inventors: **Timothy J. Talty**, Beverly Hills, MI (US); **Rod Niner**, Royal Oak, MI (US); **Fred W. Huntzicker**, Ann Arbor, MI (US)

Correspondence Address:
CICHOSZ & CICHOSZ, PLLC
129 E. COMMERCE
MILFORD, MI 48381 (US)

(73) Assignee: **GM GLOBAL TECHNOLOGY OPERATIONS, INC.**, Detroit, MI (US)

(21) Appl. No.: **12/727,298**

(22) Filed: **Mar. 19, 2010**

Related U.S. Application Data

(60) Provisional application No. 61/163,385, filed on Mar. 25, 2009.

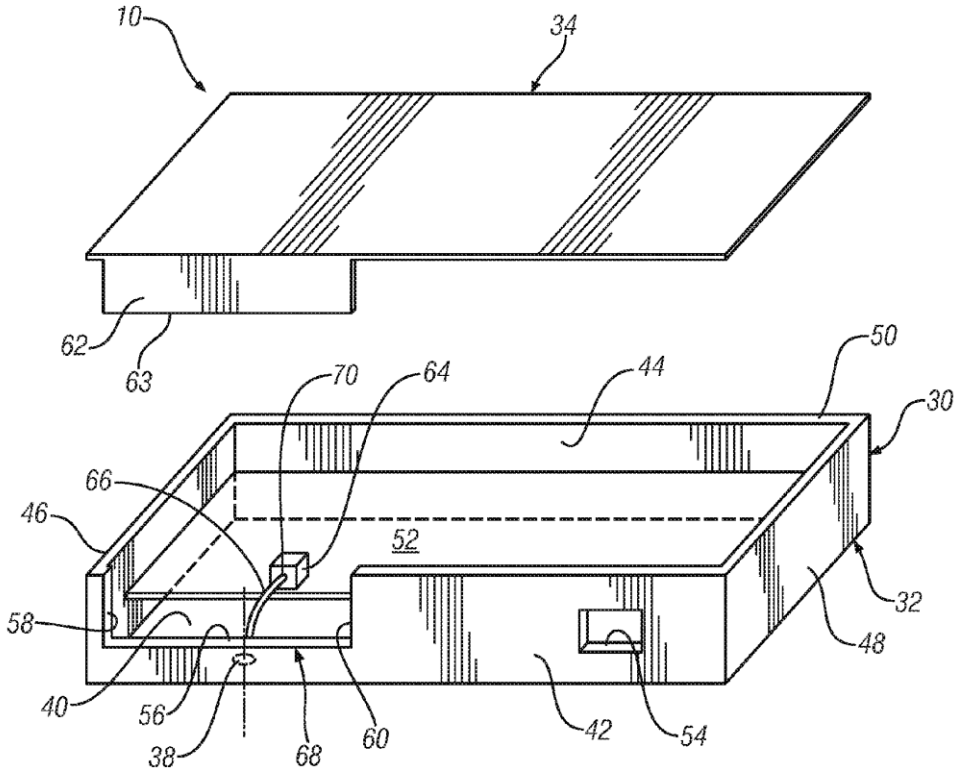
Publication Classification

(51) **Int. Cl.**
H01Q 13/10 (2006.01)
H01Q 1/24 (2006.01)

(52) **U.S. Cl.** **343/702**; 343/767

(57) **ABSTRACT**

A control module has a conductive metal chassis with a chassis body and a chassis lid. A non-conductive opening is formed within the chassis body and a tab extends from the chassis lid engaging edges of the non-conductive opening to create a rectangularly-shaped non-conductive aperture with a longitudinal axis having a predetermined length for forming a slot antenna structure. The predetermined length is designed to communicate with a specific communications frequency. The slot antenna structure is signally interconnected to a transceiver housed within the chassis.



US 20100245186A1

(19) **United States**

(12) **Patent Application Publication**

Kojima

(10) **Pub. No.: US 2010/0245186 A1**

(43) **Pub. Date: Sep. 30, 2010**

(54) **FOLDED-TYPE MOBILE TERMINAL**

(76) Inventor: **Takuya Kojima**, Tokyo (JP)

Correspondence Address:
Mr. Jackson Chen
6535 N. STATE HWY 161
IRVING, TX 75039 (US)

(21) Appl. No.: **12/738,869**

(22) PCT Filed: **Nov. 27, 2008**

(86) PCT No.: **PCT/JP2008/071587**

§ 371 (c)(1),
(2), (4) Date: **Apr. 20, 2010**

(30) **Foreign Application Priority Data**

Dec. 12, 2007 (JP) 2007-320792

Publication Classification

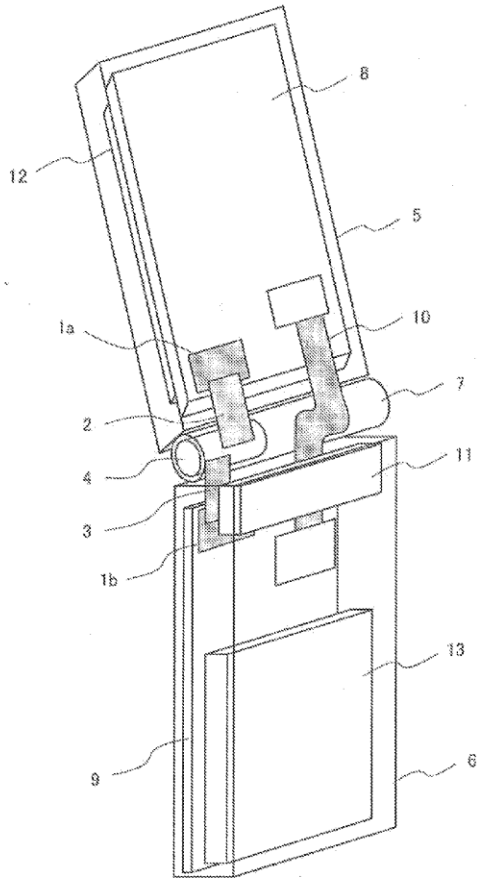
(51) **Int. Cl.**
H01Q 1/24 (2006.01)
H01Q 9/16 (2006.01)

(52) **U.S. Cl.** **343/702**; 343/793

(57) **ABSTRACT**

A folded-type mobile terminal is to provide a composition which is capable of securing antenna characteristics both of an antenna used at a first frequency band and a housing dipole antenna used at a second frequency band with an easy structure.

The folded-type mobile terminal includes an upper housing which has built-in upper printed wiring board, a lower housing which connects with the upper housing by a hinge part and accommodates lower printed wiring board, a first antenna used at the first frequency band, a second antenna comprising a dipole antenna which is used at the second frequency band and composed of a combination of the upper printed wiring board and the lower printed wiring board via the conductive hinge part and an impedance element which is inserted in a joint part of the upper printed wiring board and the lower printed wiring board and eliminates influence to the first frequency band.



US 20100245193A1

(19) **United States**

(12) **Patent Application Publication**

Nagai et al.

(10) **Pub. No.: US 2010/0245193 A1**

(43) **Pub. Date: Sep. 30, 2010**

(54) **ONE-WAVELENGTH LOOP ANTENNA**

(75) Inventors: **Takuya Nagai**, Aichi (JP); **Tomohiro Sawazaki**, Aichi (JP)

Correspondence Address:
DAY PITNEY LLP
7 TIMES SQUARE
NEW YORK, NY 10036-7311 (US)

(73) Assignee: **Brother Kogyo Kabushiki Kaisha**, Aichi-ken (JP)

(21) Appl. No.: **12/721,976**

(22) Filed: **Mar. 11, 2010**

(30) **Foreign Application Priority Data**

Mar. 30, 2009 (JP) 2009-083079

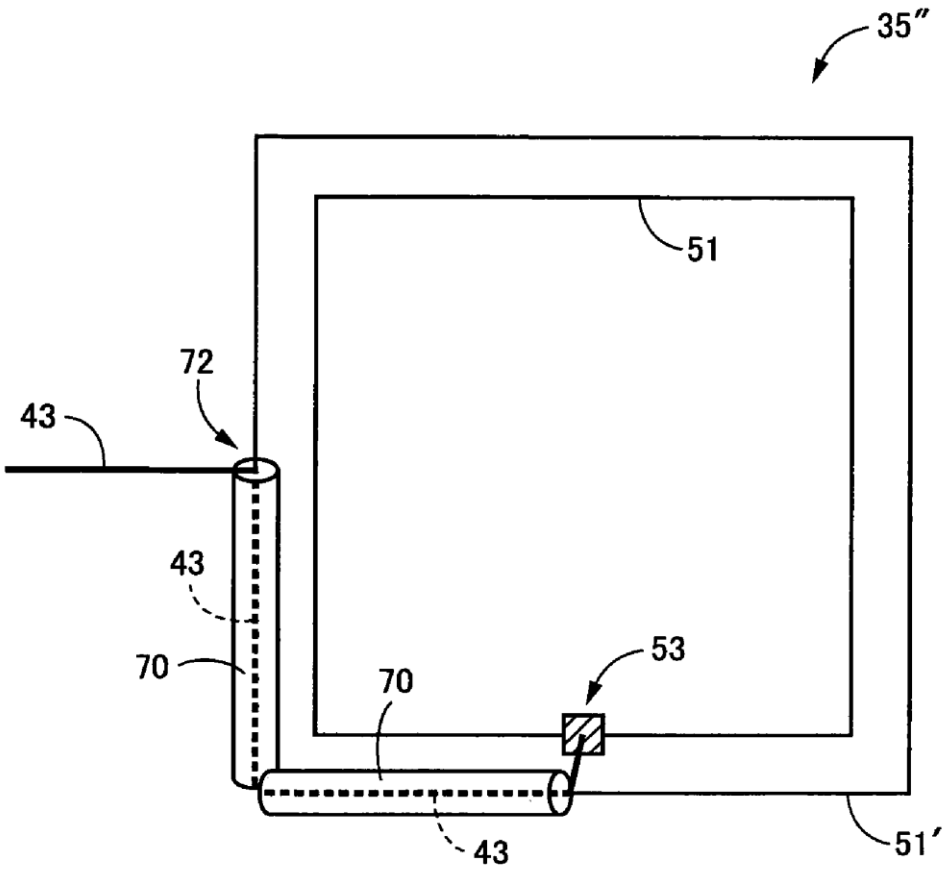
Publication Classification

(51) **Int. Cl.**
H01Q 11/12 (2006.01)
H01Q 1/00 (2006.01)

(52) **U.S. Cl.** **343/741**; 343/905

(57) **ABSTRACT**

A one-wavelength loop antenna includes a looped antenna element having a length equivalent to one wavelength related to communication; and a feeding cable for feeding current to a feeding point on the antenna element, wherein an inner conductor is disposed inside an outer conductor in a section between the feeding point and an extraction position of the feeding cable distanced from the feeding point by ⅛ wavelength or more, at least one of the outer and inner conductors functioning as the feeding cable.



US 20100245195A1

(19) **United States**

(12) **Patent Application Publication**

Wilson

(10) **Pub. No.: US 2010/0245195 A1**

(43) **Pub. Date: Sep. 30, 2010**

(54) **TUNABLE INVERTED F ANTENNA**

(75) Inventor: **David Wilson**, Toronto (CA)

Correspondence Address:
Gerald M Bluhm
Tyco Safety Products
50 Technology Drive
Westminster, MA 01441 (US)

(73) Assignee: **Tyco Safety Products Canada Ltd.**, Concord (CA)

(21) Appl. No.: **12/748,605**

(22) Filed: **Mar. 29, 2010**

Related U.S. Application Data

(60) Provisional application No. 61/165,053, filed on Mar. 31, 2009.

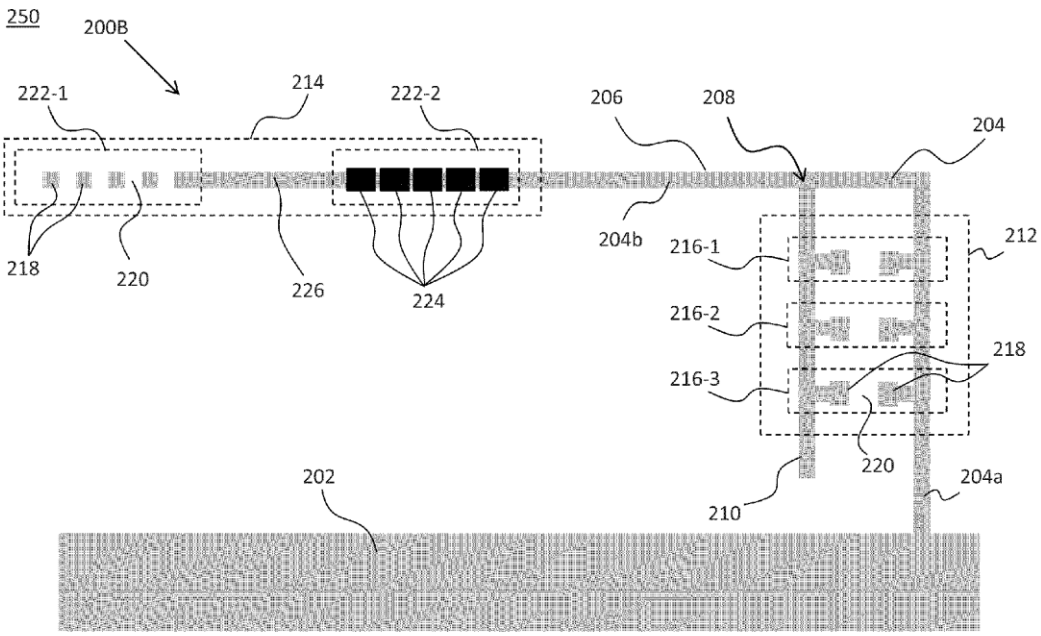
Publication Classification

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

(52) **U.S. Cl.** ..... **343/750**; 343/700 MS

(57) **ABSTRACT**

A planar antenna includes a ground plane on a substrate, a radiating element coupled to the ground plane on the substrate, and a feed line. An impedance tap point is defined by a connection between the feed line and the radiating element and the length of the radiating element defines the resonant frequency of the antenna. A first portion of the radiating element includes an impedance adjustment mechanism for defining the impedance tap point of the antenna and consequently the impedance of the antenna. A second portion of the radiating element includes a frequency adjustment section which adjusts the length of said radiating element and consequently the resonant frequency of the antenna.



US 20100245197A1

(19) **United States**

(12) **Patent Application Publication**

Kerselaers

(10) **Pub. No.: US 2010/0245197 A1**

(43) **Pub. Date: Sep. 30, 2010**

(54) **DUAL BAND SLOT ANTENNA**

(75) Inventor: **Anthony Kerselaers**, Herselt (BE)

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

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

(21) Appl. No.: **12/738,764**

(22) PCT Filed: **Oct. 16, 2008**

(86) PCT No.: **PCT/IB08/54257**

§ 371 (c)(1),
(2), (4) Date: **Apr. 19, 2010**

(30) **Foreign Application Priority Data**

Oct. 19, 2007 (WO) 07118836.1

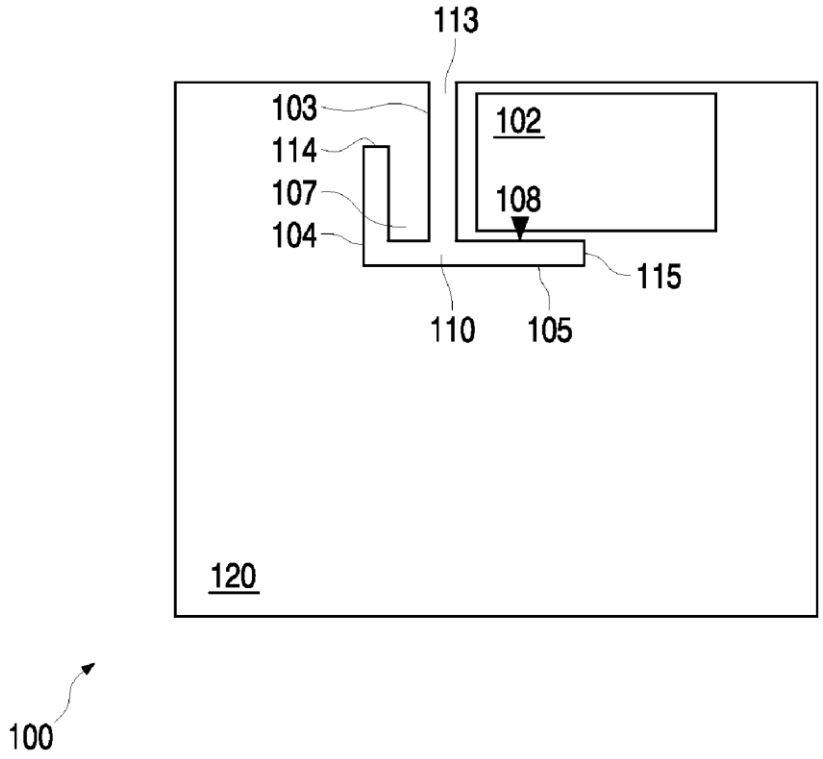
Publication Classification

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

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

(57) **ABSTRACT**

A dual-band antenna (**100**) for transmitting or receiving radio frequency signals in a lower and a higher frequency band, comprises a conductive plane (**120**), a slot (**110**) in the conductive plane (**120**), the slot (**110**) having first, second and third branches (**103**, **104**, **105**) emanating from a common point within the conductive plane (**120**). The first branch (**103**) has an end (**113**) open at an edge of the conductive plane (**120**) and the second and third branches (**104**, **105**) each have a closed end (**114**, **115**).



US 20100245198A1

(19) **United States**

(12) **Patent Application Publication**

Wilson

(10) **Pub. No.: US 2010/0245198 A1**

(43) **Pub. Date: Sep. 30, 2010**

(54) **QUAD-BAND PCB ANTENNA**

(75) Inventor: **David Wilson**, Toronto (CA)

Correspondence Address:
Gerald M Bluhm
Tyco Safety Products
50 Technology Drive
Westminster, MA 01441 (US)

(73) Assignee: **Tyco Safety Products Canada Ltd.**, Concord (CA)

(21) Appl. No.: **12/748,804**

(22) Filed: **Mar. 29, 2010**

Related U.S. Application Data

(60) Provisional application No. 61/165,070, filed on Mar. 31, 2009.

Publication Classification

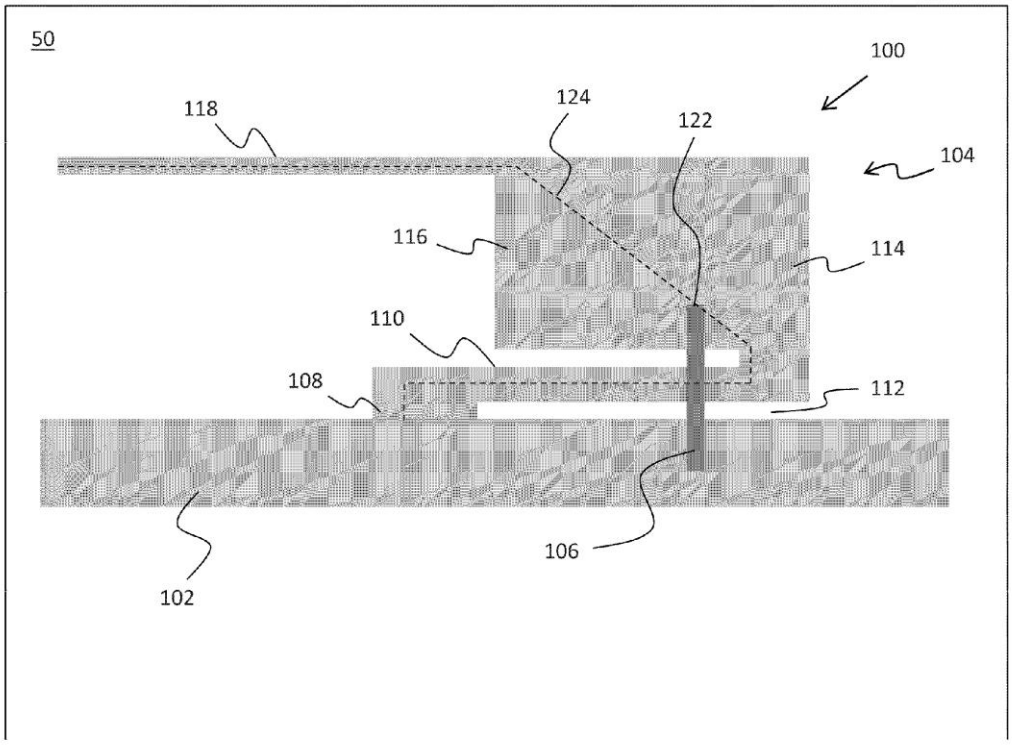
(51) **Int. Cl.**

H01Q 1/38	(2006.01)
H01Q 1/48	(2006.01)
H01Q 13/10	(2006.01)
H01Q 9/06	(2006.01)

(52) **U.S. Cl.** .... **343/767**; 343/848; 343/843; 343/700 MS

(57) **ABSTRACT**

A surface mount antenna includes a ground plane, a feed line, and a radiating element. The ground plane extends in a first direction on a first side of a substrate. The feed line extends in a second direction on a second side of the substrate. The radiating element includes a plurality of segments disposed on the first side of the substrate and is configured to resonate in a plurality of frequency modes.



US 20100245201A1

(19) **United States**

(12) **Patent Application Publication**

Hossain et al.

(10) **Pub. No.: US 2010/0245201 A1**

(43) **Pub. Date: Sep. 30, 2010**

(54) **FREQUENCY TUNABLE ANTENNA**

(75) Inventors: **Golam Sorwar Hossain**, Kawasaki (JP); **Takashi Yamagajo**, Kawasaki (JP)

Correspondence Address:
WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP
1250 CONNECTICUT AVENUE, NW, SUITE 700
WASHINGTON, DC 20036 (US)

(73) Assignee: **FUJITSU LIMITED**, Kawasaki-shi (JP)

(21) Appl. No.: **12/696,729**

(22) Filed: **Jan. 29, 2010**

(30) **Foreign Application Priority Data**

Mar. 30, 2009 (JP) 2009-082770

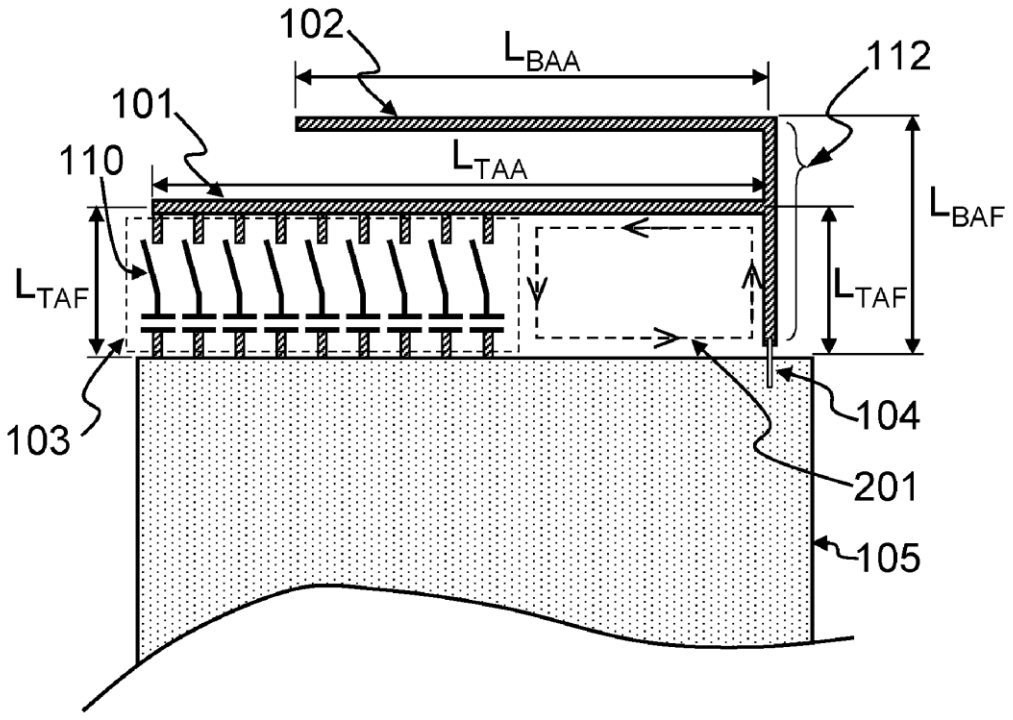
Publication Classification

(51) **Int. Cl.**
H01Q 7/00 (2006.01)
H01Q 1/48 (2006.01)

(52) **U.S. Cl.** **343/848**; 343/868

(57) **ABSTRACT**

There is provided an antenna for tuning a resonant frequency. The antenna includes a first and a second arms connected to the antenna feeding portion at a common end thereof. The second arm has each of the plurality of branches including a switch for selecting a length of an electrical loop formed by the second arm and an end of a ground plane, each of the switches is connected to the ground plane. A first resonant frequency performed by the first arm is higher than a second resonant frequency by the second arm when each of the switches is open, and the first resonant frequency is lower than a third resonant frequency by the second arm when one of the switches is selected to connect the second arm and the ground plane so that the length of the electrical loop is maximum.



US 20100245203A1

(19) **United States**

(12) **Patent Application Publication**

CHANG et al.

(10) **Pub. No.: US 2010/0245203 A1**

(43) **Pub. Date: Sep. 30, 2010**

(54) **MULTIBAND ANTENNA**

(75) Inventors: **HAO-YING CHANG**, Taoyuan (TW); **YI-HSIEN WENG**, Taoyuan (TW); **CHENG-ANG LEE**, Taoyuan (TW)

Correspondence Address:
Altis Law Group, Inc.
ATTN: Steven Reiss
288 SOUTH MAYO AVENUE
CITY OF INDUSTRY, CA 91789 (US)

(73) Assignee: **FOXCONN COMMUNICATION TECHNOLOGY CORP.**, Taoyuan County (TW)

(21) Appl. No.: **12/627,045**

(22) Filed: **Nov. 30, 2009**

(30) **Foreign Application Priority Data**

Mar. 30, 2009 (CN) 200910301227.9

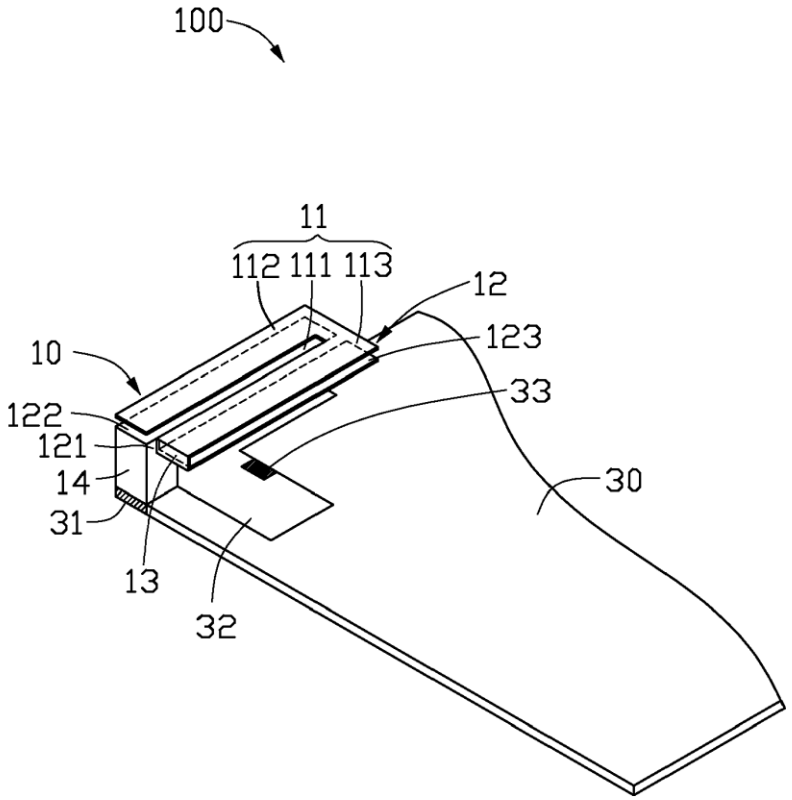
Publication Classification

(51) **Int. Cl.**
H01Q 1/38 (2006.01)
H01Q 1/50 (2006.01)

(52) **U.S. Cl.** ..... **343/860**; 343/700 MS

(57) **ABSTRACT**

A multiband antenna includes a radio unit and a base circuit board. The radio unit includes a first radio member and a second radio member connected to the first radio member. The first radio member and the second radio member have similar shapes and sizes to each other and are aligned with each other. The base circuit board is connected to the second radio member to provide feed signals to the radio unit and connect the radio unit to the ground. The first radio member independently sends/receives wireless signals at a first frequency, and the second radio member is coupled with the first radio member, thereby cooperating with the first radio member to send/receive wireless signals at a second working frequency.



US 20100245205A1

(19) **United States**

(12) **Patent Application Publication**

Tran

(10) **Pub. No.: US 2010/0245205 A1**

(43) **Pub. Date: Sep. 30, 2010**

(54) **WIDEBAND ANTENNA FOR PORTABLE COMPUTERS**

(75) Inventor: **Allen Minh-Triet Tran**, San Diego, CA (US)

Correspondence Address:
QUALCOMM INCORPORATED
5775 MOREHOUSE DR.
SAN DIEGO, CA 92121 (US)

(73) Assignee: **QUALCOMM INCORPORATED**, San Diego, CA (US)

(21) Appl. No.: **12/413,294**

(22) Filed: **Mar. 27, 2009**

Publication Classification

(51) **Int. Cl.**
H01Q 1/50 (2006.01)
H01Q 1/38 (2006.01)
H01Q 3/24 (2006.01)

(52) **U.S. Cl.** ..... **343/861**; 343/700 MS; 343/876

(57) **ABSTRACT**

A wideband antenna, for use in portable computers incorporating at least one wireless communication device, with improved radiated antenna efficiency across a broad range of operating frequency bands with minimal additional physical size or cost, is described. In an exemplary embodiment, the wideband antenna is defined by at least a first and second housing, where a first metal structure in at least a first one of the at least a first and second housings is commonly connected to at least two antenna RF feed ports at a boundary of the at least a first and second housing. In a further exemplary embodiment, the device is a portable computer, and the first housing is an upper display housing, the second housing includes a wireless communication device with at least two RF signal paths to at least two antenna RF feed ports, and the second housing further includes a second metal structure commonly connected to at least two antenna RF feed ports of the wideband antenna.