



US 20090219212A1

(19) **United States**

(12) **Patent Application Publication**

Itoh et al.

(10) **Pub. No.: US 2009/0219212 A1**

(43) **Pub. Date: Sep. 3, 2009**

(54) **PLANAR ANTENNA AND MANUFACTURING METHOD THEREOF**

(30) **Foreign Application Priority Data**

Mar. 25, 2005 (JP) 2005-87897

(75) Inventors: **Kiyohiko Itoh, Mie (JP); Kentaro Mori, Shiga (JP)**

Publication Classification

Correspondence Address:
**RATNERPRESTIA
P.O. BOX 980
VALLEY FORGE, PA 19482 (US)**

(51) **Int. Cl.**
H01Q 1/38 (2006.01)
B44C 1/22 (2006.01)

(52) **U.S. Cl.** **343/700 MS; 216/13**

(73) Assignee: **TORAY INDUSTRIES, INC.,**
Chuo-ku, Tokyo, JP (JP)

(57) **ABSTRACT**

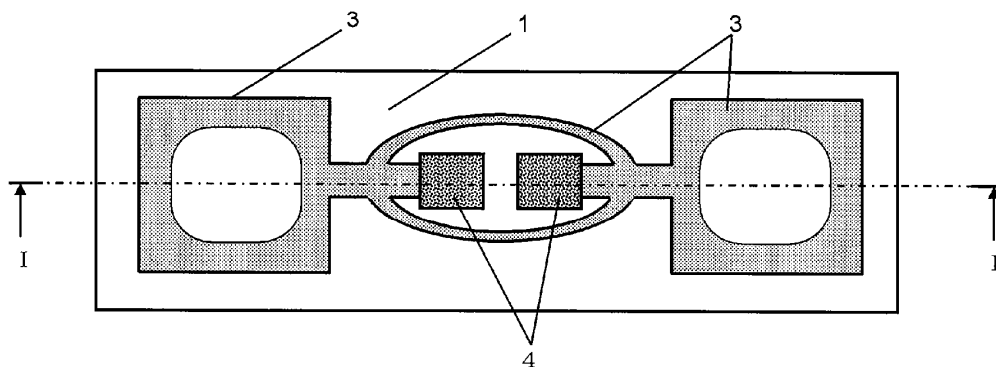
(21) Appl. No.: **11/909,570**

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

(86) PCT No.: **PCT/JP2006/305643**

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

A planar antenna has a circuit pattern including an antenna part and a connection terminal part on a plastic film, in which the circuit pattern has a metal layer and a heat-sealable conductive layer provided on a surface layer of a connection terminal part of the metal layer. The planar antenna is obtained by forming a circuit pattern including a metal layer on a plastic film, providing a heat-sealable conductive layer in a connection terminal part of the circuit pattern, and then removing an unnecessary part with etching.





US 20090219214A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0219214 A1**

(43) **Pub. Date: Sep. 3, 2009**

(54) **WIRELESS HANDSET WITH IMPROVED HEARING AID COMPATIBILITY**

Publication Classification

(75) Inventors: **Sung-Hoon Oh**, Tamarac, FL (US);
Carlo Dinallo, Plantation, FL (US);
Mattia Pascolini, Plantation, FL (US)

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

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

(57) **ABSTRACT**

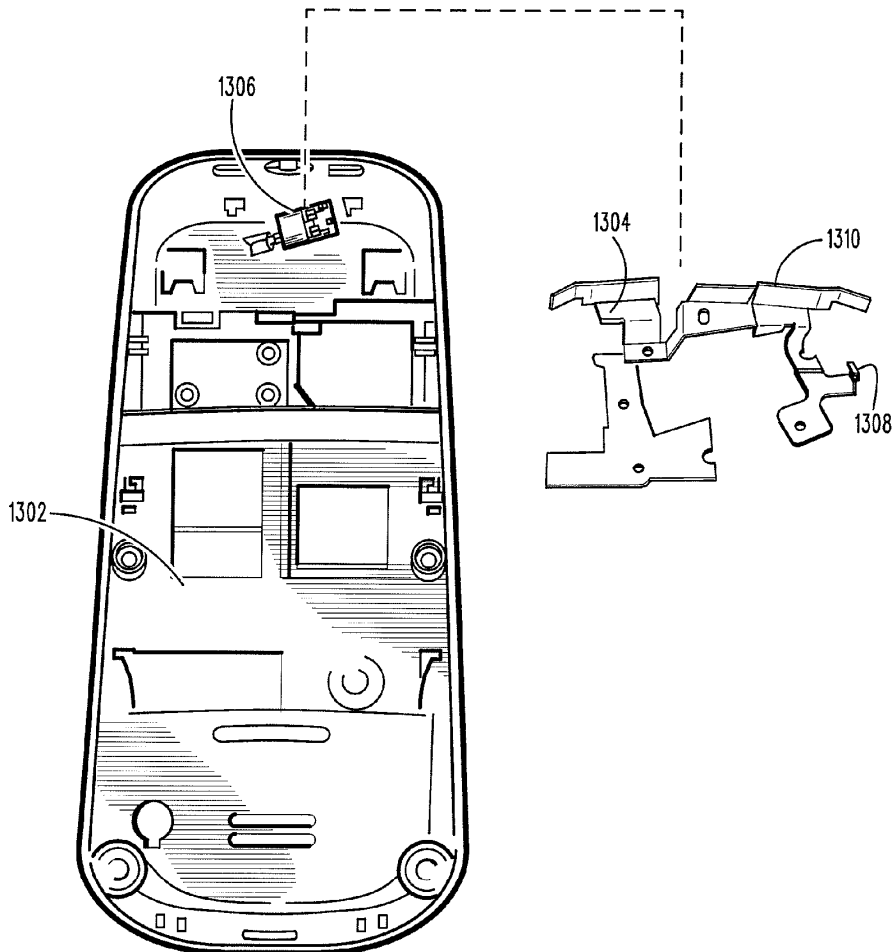
Correspondence Address:
MOTOROLA, INC.
1303 EAST ALGONQUIN ROAD, IL01/3RD
SCHAUMBURG, IL 60196

A "candy bar" form factor wireless handset (200) having an internal antenna (222, 306) a bottom end of an main internal circuit board (208) and an auxiliary field shaping conductor (226, 502, 1102, 1304) at a top end of the main internal circuit board (208) behind the an earpiece speaker (104). The field shaping conductor (226, 502, 1102, 1304) is spaced from a ground plane (304) of the main circuit board (208) but is inductively and capacitively coupled to the ground plane (304). The field shaping conductor (226, 502, 1102, 1304) lowers the electric field intensity in front of the earpiece speaker and thereby reduces interference of the wireless handset (200) with hearing aids.

(73) Assignee: **MOTOROLA, INC.**, Schaumburg, IL (US)

(21) Appl. No.: **12/040,455**

(22) Filed: **Feb. 29, 2008**





US 20090219215A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0219215 A1**

(43) **Pub. Date: Sep. 3, 2009**

(54) **MULTIPLE RESONANT ANTENNA UNIT,
ASSOCIATED PRINTED CIRCUIT BOARD
AND RADIO COMMUNICATION DEVICE**

(86) PCT No.: **PCT/EP2006/067530**

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

(75) Inventors: **Stefan Huber**, Muenchen (DE);
Michael Schreiber,
Aying-Goggenhofen (DE)

(30) **Foreign Application Priority Data**

Oct. 18, 2005 (DE) 10 2005 049 820.5

Publication Classification

Correspondence Address:
K&L Gates LLP
P.O. Box 1135
CHICAGO, IL 60690 (US)

(51) **Int. Cl.**
H01Q 1/36 (2006.01)
H01Q 1/24 (2006.01)
H01Q 1/38 (2006.01)

(52) **U.S. Cl.** **343/702; 343/895; 343/700 MS**

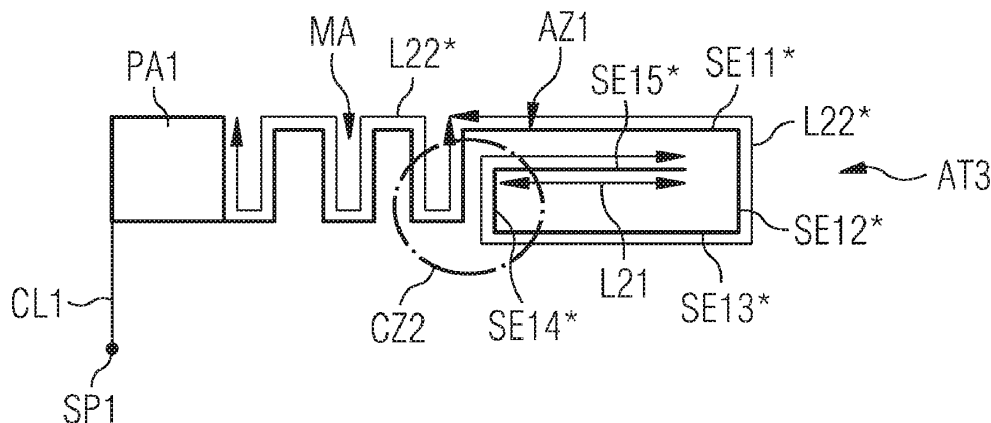
(57) **ABSTRACT**

(73) Assignee: **BENQ MOBILE GMBH & CO.**
OHG, MUNCHEN (DE)

A multiple resonant antenna unit (AT2) comprises a current feed area (SP1) from which only a single, spiral-like antenna branch (AZI) emanates. The total course of this spiral-like antenna branch (AZI) forms a first resonant antenna structure for a low frequency range and at least one partial section (SE15) inside the total course of this spiral-like antenna structure (AZI) forms a second resonant antenna structure for a higher frequency range.

(21) Appl. No.: **12/090,783**

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





US 20090221243A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0221243 A1**

(43) **Pub. Date: Sep. 3, 2009**

(54) **PORTABLE WIRELESS DEVICE**

Publication Classification

(75) Inventors: **Kiyoshi Egawa**, Tokyo (JP); **Yoshio Koyanagi**, Kanagawa (JP); **Hiroshi Haruki**, Kanagawa (JP)

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

(52) **U.S. Cl.** **455/90.3**

Correspondence Address:
PEARNE & GORDON LLP
1801 EAST 9TH STREET, SUITE 1200
CLEVELAND, OH 44114-3108 (US)

(57) **ABSTRACT**

(73) Assignee: **MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.**, Kadoma-Shi, Osaka (JP)

Herein disclosed is a portable wireless device comprising a first monopole antenna section **11** having a length substantially equal to $\frac{3}{4}$ of a wavelength of a first frequency band, an open sleeve section **12** having a length substantially equal to $\frac{1}{4}$ of a wavelength of the first frequency band, the open sleeve section **12** being arranged under the condition that the first monopole antenna section **11** and the open sleeve section **12** are parallel to each other, and perpendicular to a line extending through one end of the first monopole antenna section **11** and one end of the open sleeve section **12**, a feeding section **13** for feeding a radio frequency signal to the first monopole antenna section **11** and the open sleeve section **12** at the same time, a grounded base plate **14** made of conductive material, and a wireless circuit **15** arranged on the grounded base plate **14**. The portable wireless device is useful for an ultra wide-band system, and able to reduce the influence from the operator.

(21) Appl. No.: **11/816,977**

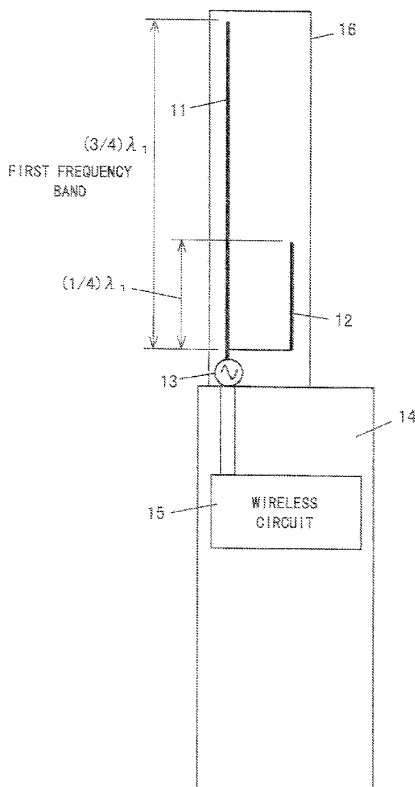
(22) PCT Filed: **Feb. 21, 2006**

(86) PCT No.: **PCT/JP2006/302999**

§ 371 (c)(1),
(2), (4) Date: **May 14, 2009**

(30) **Foreign Application Priority Data**

Feb. 24, 2005 (JP) 2005-049361





US 20090224979A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0224979 A1**

(43) **Pub. Date: Sep. 10, 2009**

(54) **MULTI-BAND ANTENNA**

(30) **Foreign Application Priority Data**

(75) Inventors: **Yi-Hung Chiu**, Taipei Hsien (TW);
Chia-Tien Li, Taipei Hsien (TW)

Mar. 5, 2008 (TW) 97107723

Publication Classification

Correspondence Address:
PAI PATENT & TRADEMARK LAW FIRM
1001 FOURTH AVENUE, SUITE 3200
SEATTLE, WA 98154 (US)

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

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

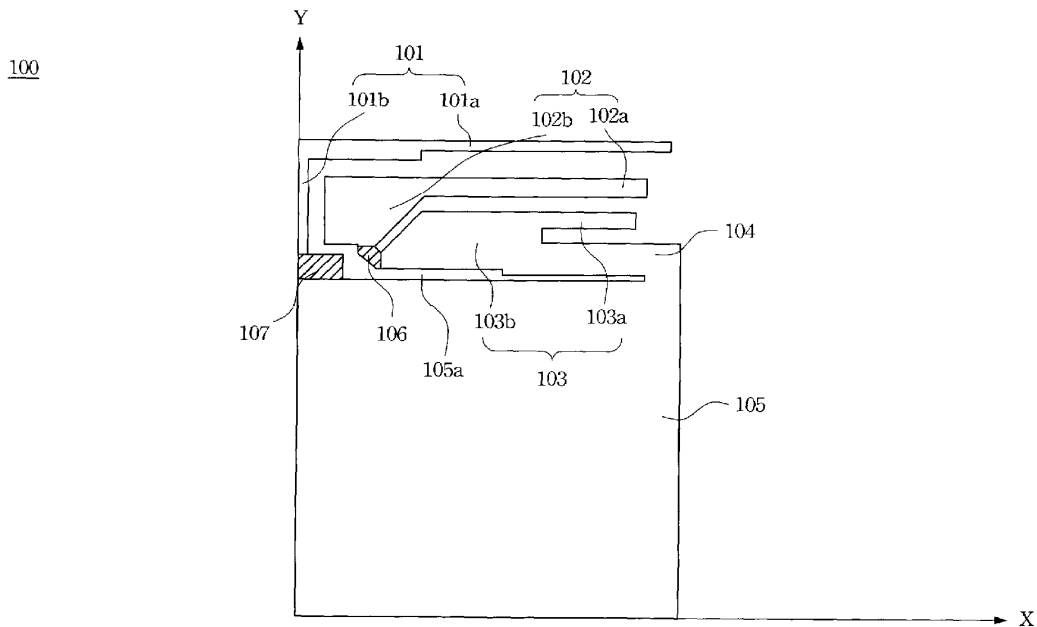
(57) **ABSTRACT**

The present invention discloses a multi-band antenna. The antenna includes a ground portion, a parasitic unit connecting with the ground portion and operated at a first frequency band, a first radiation portion having a feeding point and operated at a second frequency band, a second radiation portion connecting with the feeding point and operated at a third frequency band. The first radiation portion and the second radiation portion are located between the parasitic unit and the ground portion.

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

(21) Appl. No.: **12/129,685**

(22) Filed: **May 30, 2008**





US 20090224980A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0224980 A1**

(43) **Pub. Date: Sep. 10, 2009**

(54) **PRINTED ANTENNA HAVING A DUAL-BEAM DIAGRAM**

Publication Classification

(76) Inventors: **Eduardo Motta Cruz**, Saint Herblain (FR); **Jean Philippe Dessarce**, Palinges (FR); **Mohamed Himdi**, Rennes (FR); **Franck Colombel**, Montfort Sur Meu (FR)

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

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

(57) **ABSTRACT**

Correspondence Address:
BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP
1279 OAKMEAD PARKWAY
SUNNYVALE, CA 94085-4040 (US)

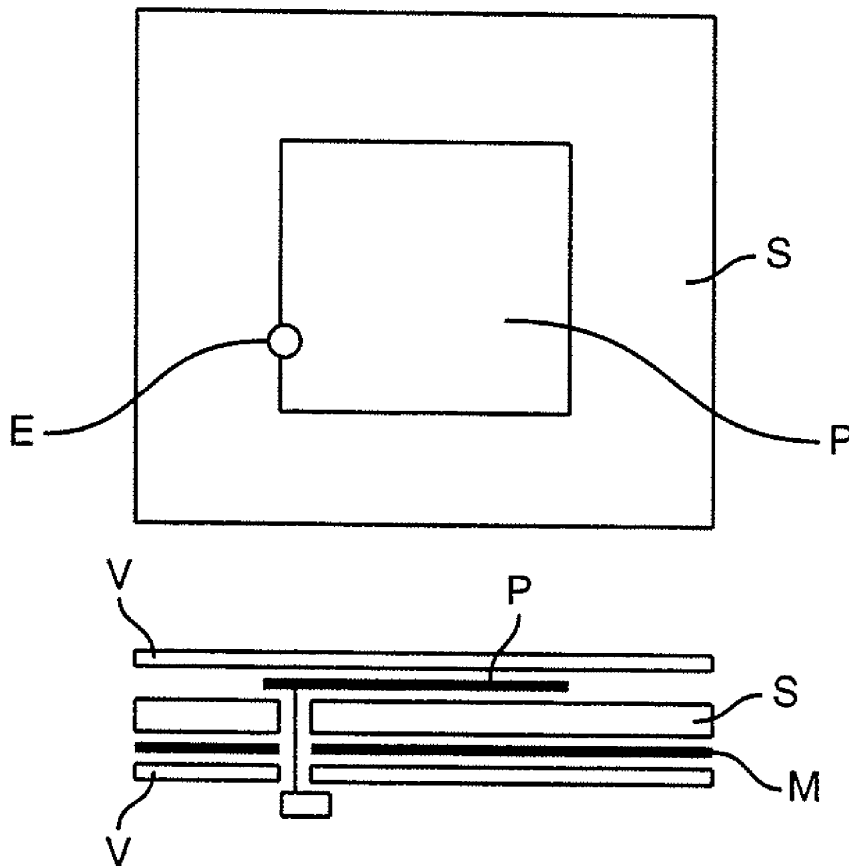
The invention relates to a printed antenna comprising a ground plane, a substrate stacked to the ground plane, a metal deposit made on the substrate in order to form therein a resonating patch (3), and a means of supplying to excite the resonating patch, characterised in that the patch has dimensions that are adapted for the patch to be able to radiate in both upper electromagnetic modes TM_{02} and TM_{20} , and in that the means of supplying makes it possible to excite the patch on an excitation point (4) arranged along the patch so that the patch resonates in a single of said upper electromagnetic modes, by inducing this way a dual-beam radiation diagram with, in the same plane orthogonal to the patch, two main misaligned and symmetric lobes in relation to the normal to the patch.

(21) Appl. No.: **12/362,335**

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

(30) **Foreign Application Priority Data**

Jan. 30, 2008 (FR) 0850581





US 20090224996A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0224996 A1**
(43) **Pub. Date: Sep. 10, 2009**

(54) **ANTENNA DEVICE**

(30) **Foreign Application Priority Data**

(75) Inventors: **Ju Hyung Kim**, Seoul (KR); **Tae Wook Lim**, Suwon (KR); **Seung Mo Park**, Suwon (KR); **Tae Sung Kim**, Seoul (KR); **Jae Suk Sung**, Yongin (KR)

Mar. 4, 2008 (KR) 10-2008-0020014

Publication Classification

(51) **Int. Cl.**
H01Q 1/50 (2006.01)
H01Q 7/00 (2006.01)
(52) **U.S. Cl.** 343/860; 343/866

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

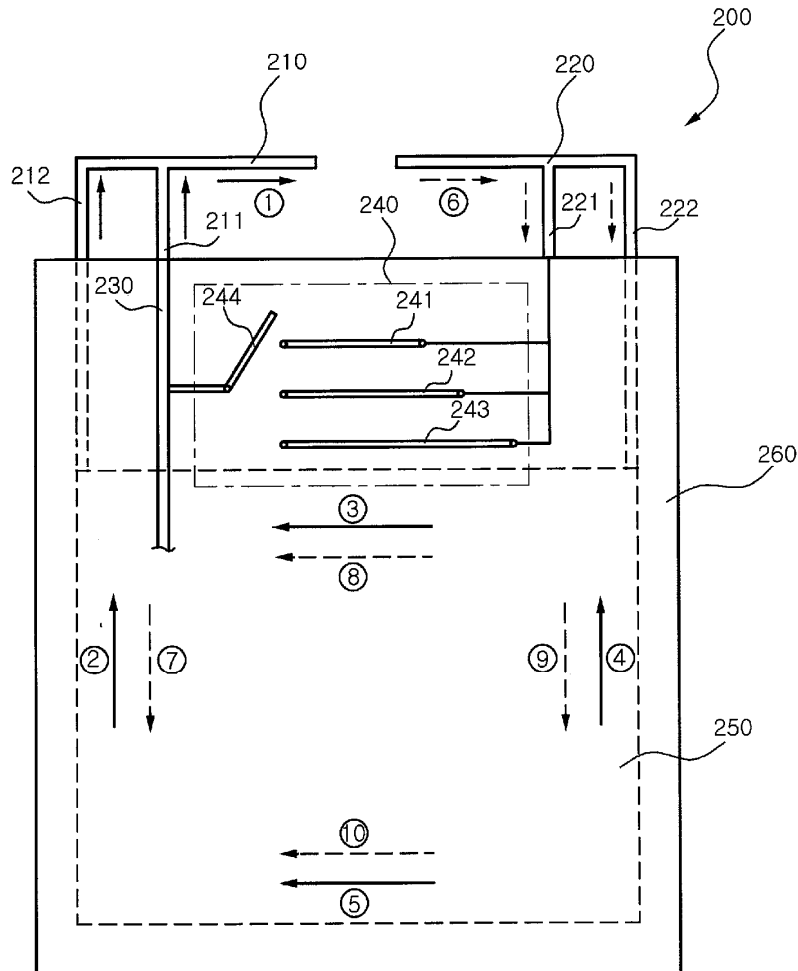
(57) **ABSTRACT**

An antenna device includes a first radiator receiving a first feed signal, a second radiator spaced apart from the first radiator at a predetermined distance and capacitively coupled with the first radiator, a feed line connected to a feed terminal of the first radiator, and a phase shifter diverging from the feed line, connected to a feed terminal of the second radiator, and supplying a second feed signal having a predetermined phase difference with the first feed signal to the second radiator.

(73) Assignee: **Samsung Electro-Mechanics Co., Ltd.**, Suwon (KR)

(21) Appl. No.: **12/332,280**

(22) Filed: **Dec. 10, 2008**





US 20090231199A1

(19) **United States**

(12) **Patent Application Publication**
VANCE

(10) **Pub. No.: US 2009/0231199 A1**

(43) **Pub. Date: Sep. 17, 2009**

(54) **CARRIER AND DEVICE**

Publication Classification

(75) Inventor: **Scott VANCE**, Staffanstorp (SE)

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

Correspondence Address:
HARRITY & HARRITY, LLP
11350 RANDOM HILLS ROAD, SUITE 600
FAIRFAX, VA 22030 (US)

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

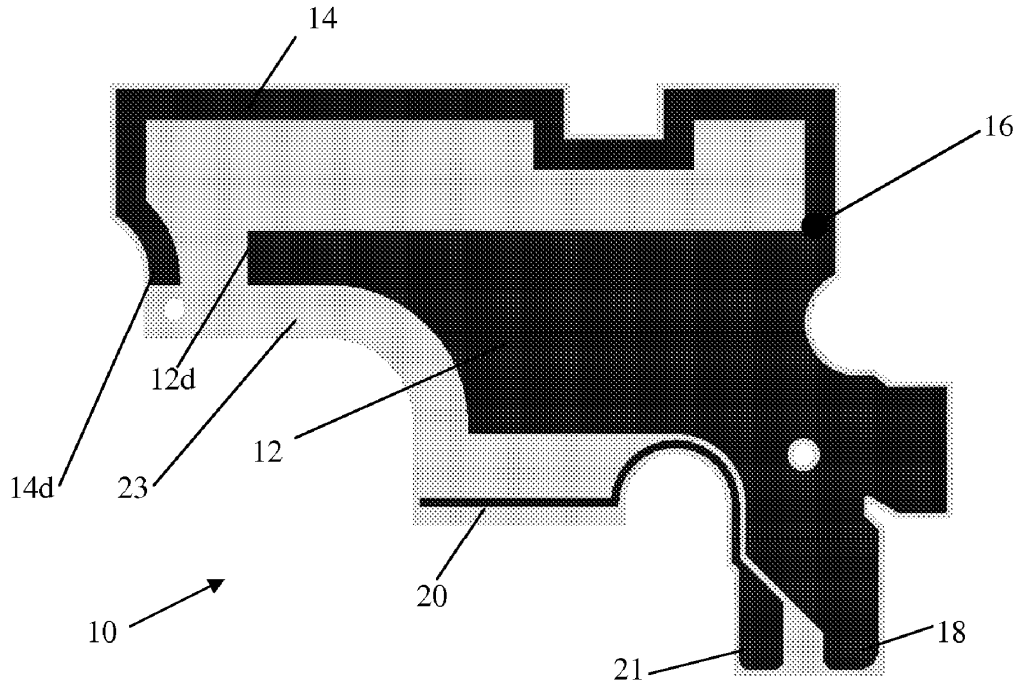
(57) **ABSTRACT**

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

A carrier that extends in three mutually orthogonal directions, X, Y and Z, when in use and which comprises a back surface defining a first XY-plane and a side surface defining an XZ-plane, whereby the carrier comprises an antenna pattern. The antenna pattern comprises a wider branch that is located on the back surface of the carrier, and a narrower branch that comprises a first section that extends substantially along the Z-direction of the side surface and a second section that extends substantially in the X-direction of the side surface.

(21) Appl. No.: **12/048,889**

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





US 20090231200A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0231200 A1**

(43) **Pub. Date: Sep. 17, 2009**

(54) **MULTI-ANTENNA MODULE**

Publication Classification

(75) Inventors: **Tsung-Wen Chiu**, Taipei County (TW); **Sheng-Chih Lin**, Taipei County (TW); **Yi-Wei Tseng**, Taipei County (TW); **Fu-Ren Hsiao**, Taipei County (TW)

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

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

Correspondence Address:
SCHMEISER OLSEN & WATTS
18 E UNIVERSITY DRIVE, SUITE # 101
MESA, AZ 85201

(57) **ABSTRACT**

A multi-antenna module comprises a ground plane, a primary conductor, a secondary conductor and a plurality of coupling conductors, wherein the framework of the parallel primary radiation arm and secondary radiation arm can infinitely expand the number of antenna units in the same antenna structure. The capacitive coupling effect of parallel radiation arms and the inductance of the radiation arms themselves can effectively reduce the signal interference between antennae, whereby a plurality of antennae can be integrated to achieve antenna miniaturization. The primary conductor, the secondary conductor and the coupling conductors are all connected to the same ground plane, whereby the layout space is reduced, and the multi-antenna module is easy-to-assemble for various electronic devices.

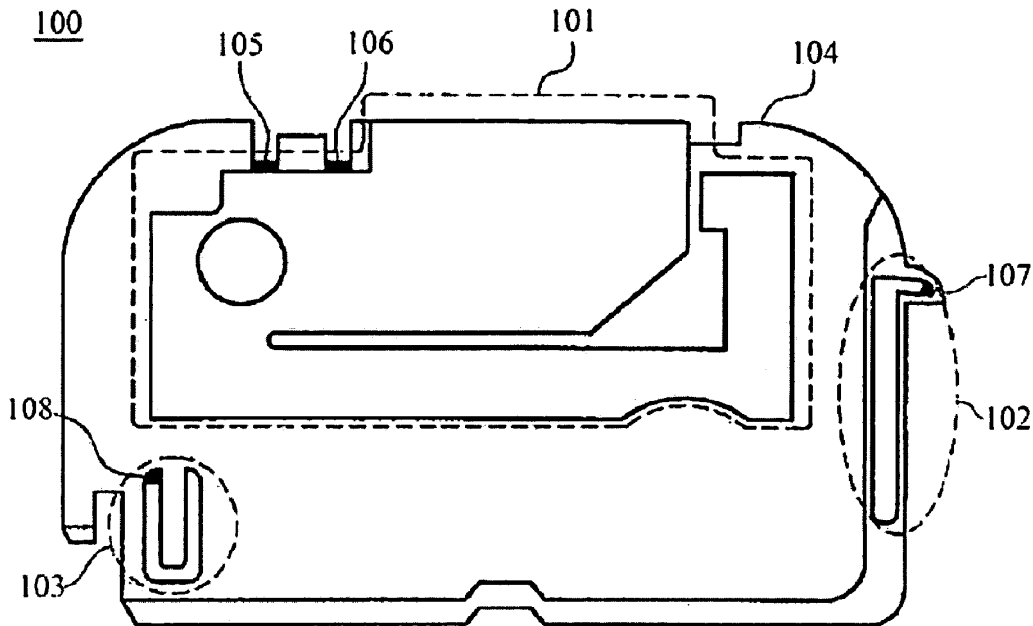
(73) Assignee: **ADVANCED CONNECTEK INC.**, Taipei County (TW)

(21) Appl. No.: **12/208,273**

(22) Filed: **Sep. 10, 2008**

(30) **Foreign Application Priority Data**

Mar. 14, 2008 (TW) 097109034





US 20090231201A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0231201 A1**

(43) **Pub. Date: Sep. 17, 2009**

(54) **DUAL ANTENNA AND METHODS**

Publication Classification

(76) Inventors: **Petteri Annamaa**, Oulunsalo (FI);
Pertti Nissinen, Kempele (FI)

(51) **Int. Cl.**
H01Q 1/38 (2006.01)
H01Q 5/00 (2006.01)

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

(57) **ABSTRACT**

Correspondence Address:
GAZDZINSKI & ASSOCIATES
11440 WEST BERNARDO COURT, SUITE 375
SAN DIEGO, CA 92127 (US)

A dielectric dual antenna (300) intended especially for small-sized radio apparatuses, with one partial antenna (310) of which is implemented the lower operating band of the antenna and with the second partial antenna (320) the upper operating band. The partial antennas have a shared feed point (FP) in the antenna structure, e.g. at the end of a radiating element (312) of one partial antenna, in which case the other partial antenna receives its feed galvanically through said radiating element by a short intermediate conductor (332). The partial antennas are located so that their substrates (311, 321) are heads face to face, and the main directions of the radiating elements i.e. the conductive coatings of the substrates starting from the shared feed point are opposing. The tunings of the partial antennas corresponding to different operating bands are obtained independent from each other without discrete matching components.

(21) Appl. No.: **12/227,746**

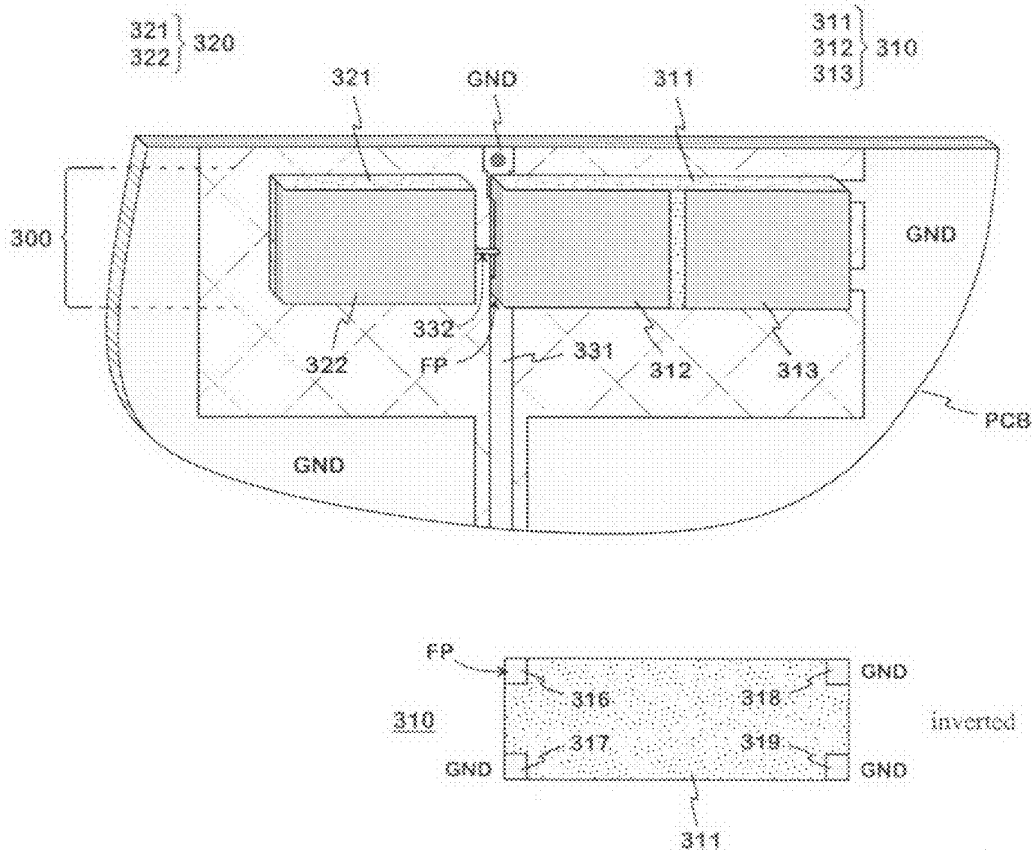
(22) PCT Filed: **May 8, 2007**

(86) PCT No.: **PCT/FI2007/050256**

§ 371 (c)(1),
(2), (4) Date: **May 19, 2009**

(30) **Foreign Application Priority Data**

May 26, 2006 (FI) 20065357





US 20090231202A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0231202 A1**

(43) **Pub. Date: Sep. 17, 2009**

(54) **ANTENNA STRUCTURE**

(30) **Foreign Application Priority Data**

(75) Inventors: **Hae-soo KIM**, Suwon-si (KR);
Alexander Goudilev, Suwon-si
(KR); **Byung-sik Kim**, Suwon-si
(KR); **Kwang-hyun Baek**,
Suwon-si (KR)

Mar. 17, 2008 (KR) 2008-24368

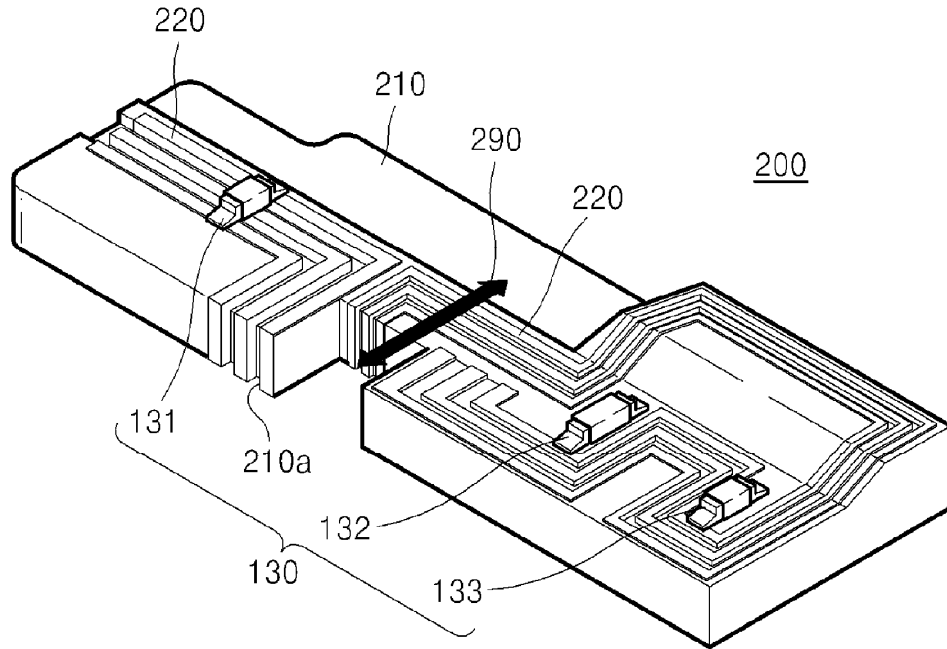
Publication Classification

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

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

(57) **ABSTRACT**

An antenna structure of an information communication terminal, the antenna structure including: a frame having a three dimensional shape; an antenna pattern formed in the frame; and a circuit lumped element mounted on a surface of the antenna pattern. In the antenna structure, an antenna is directly provided on the frame such that a sufficient antenna characteristic can be ensured in a small space, thereby realizing a slim and miniaturized information communication terminal.



(73) Assignee: **Samsung Electronics Co., Ltd.**,
Suwon-si (KR)

(21) Appl. No.: **12/259,384**

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



US 20090231213A1

(19) **United States**

(12) **Patent Application Publication**
Ishimiya

(10) **Pub. No.: US 2009/0231213 A1**

(43) **Pub. Date: Sep. 17, 2009**

(54) **MULTIBAND ANTENNA DEVICE AND COMMUNICATION TERMINAL DEVICE**

(30) **Foreign Application Priority Data**

Oct. 25, 2005 (JP) 2005-309345

(75) Inventor: **Katsunori Ishimiya, Tokyo (JP)**

Publication Classification

Correspondence Address:

OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314 (US)

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

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

(73) Assignee: **SONY ERICSSON MOBILE COMMUNICATIONS JAPAN, INC., Minato-ku, Tokyo (JP)**

(57) **ABSTRACT**

(21) Appl. No.: **12/089,922**

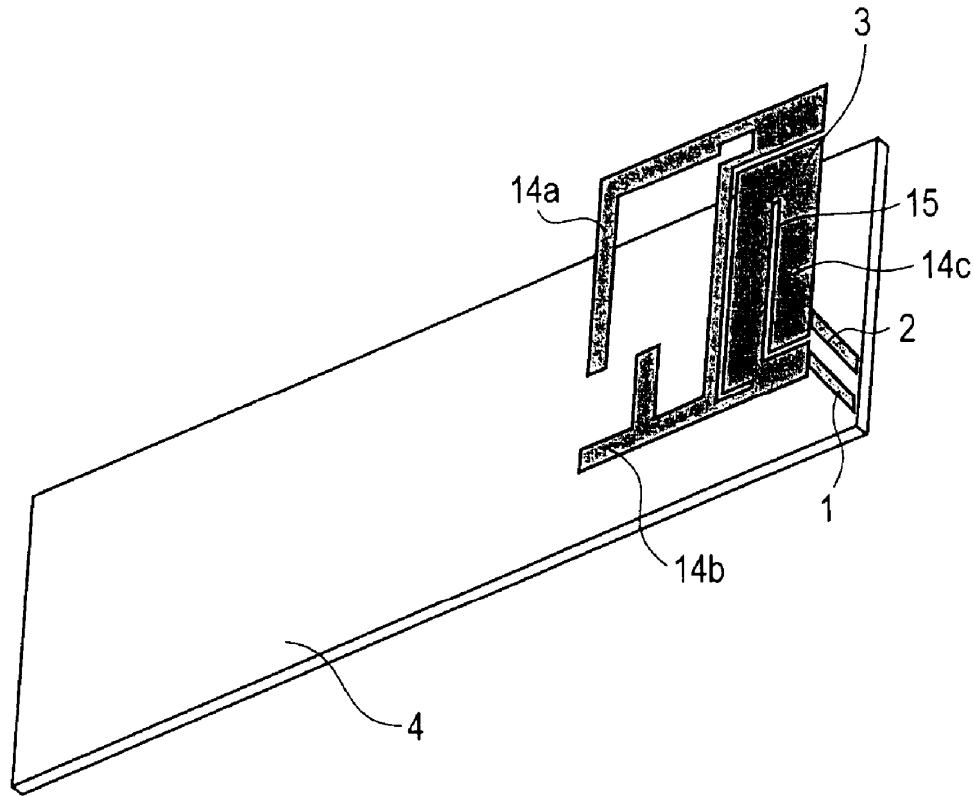
A slit (15) is formed between a feed point and GND point of an inverted-F antenna to make the points electrically distant from each other, and at least three antenna elements (14a, 14b, and 14c) are formed. The at least three antenna elements (14a, 14b, and 14c) generate at least three resonance points. An antenna radiating plate (3) projects outwardly so that at least a major part thereof does not face a ground plate (4). Therefore, a multi-band antenna device capable of achieving a wider bandwidth without using a parasitic element, and a communication terminal apparatus are provided.

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

(86) PCT No.: **PCT/JP2006/318859**

§ 371 (c)(1),
(2), (4) Date:

Apr. 11, 2008





US 20090231214A1

(19) **United States**

(12) **Patent Application Publication**
Mukouyama

(10) **Pub. No.: US 2009/0231214 A1**

(43) **Pub. Date: Sep. 17, 2009**

(54) **ANTENNA UNIT AND COMMUNICATION DEVICE**

Publication Classification

(76) Inventor: **Atsushi Mukouyama, Tokyo (JP)**

(51) **Int. Cl.**
H01Q 1/36 (2006.01)
H01Q 1/24 (2006.01)

Correspondence Address:
NEC CORPORATION OF AMERICA
6535 N. STATE HWY 161
IRVING, TX 75039 (US)

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

(57) **ABSTRACT**

(21) Appl. No.: **12/090,132**

The present invention is to provide an antenna unit for suppressing deterioration of antenna characteristics when a plurality of antenna conductive elements are disposed in a housing. The antenna unit comprises a plurality of antenna conductive elements (4, 5) with different resonant frequencies disposed in a housing (2), wherein the plurality of antenna conductive elements (4, 5) comprise at least a first antenna conductive element (4) and a second antenna conductive element (5) that resonates at a lower frequency than the first antenna conductive element (4), and the second antenna conductive element (5) is disposed farther from a shell of the housing (2) than the first antenna conductive element (4).

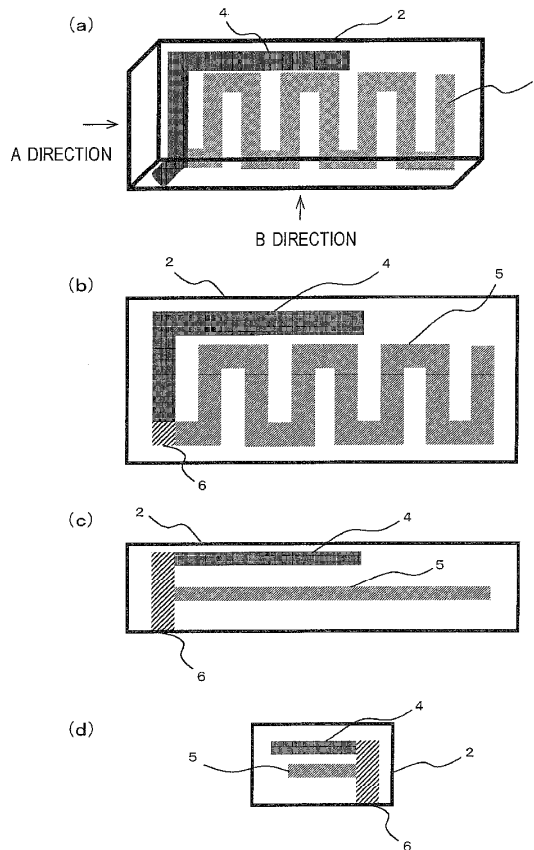
(22) PCT Filed: **Oct. 11, 2006**

(86) PCT No.: **PCT/JP2006/320313**

§ 371 (c)(1),
(2), (4) Date: **Apr. 25, 2008**

(30) **Foreign Application Priority Data**

Oct. 17, 2005 (JP) 2005-301808





US 20090231215A1

(19) **United States**

(12) **Patent Application Publication**
Taura

(10) **Pub. No.: US 2009/0231215 A1**

(43) **Pub. Date: Sep. 17, 2009**

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

Publication Classification

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

(51) **Int. Cl.**
H01Q 13/10 (2006.01)
H01Q 1/24 (2006.01)
(52) **U.S. Cl.** **343/702; 343/767**

Correspondence Address:
YOUNG & THOMPSON
209 Madison Street, Suite 500
ALEXANDRIA, VA 22314 (US)

(57) **ABSTRACT**

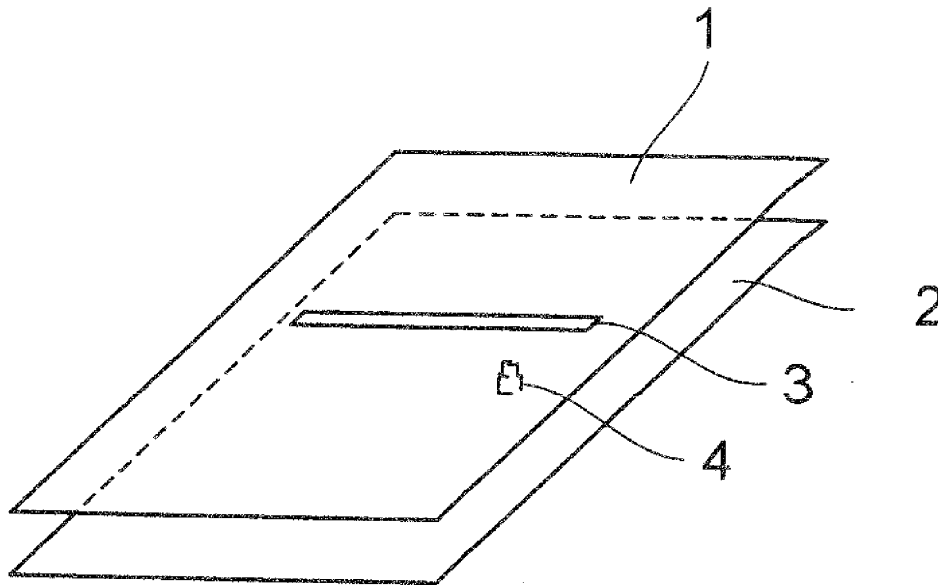
A slot antenna is provided with at least two conductive plates arranged to face each other. A slot is arranged on one of or both of the facing conductive plates and has a long and narrow opening shape. A power feeding unit is arranged between the facing conductive plates and is electrically and physically connected with the facing conductive plates, respectively. When power is fed to the power feeding unit, the power is fed between the facing conductive plates by the power feeding unit. Thus, excitation with a frequency dependent on the electrical length of the slot is induced at the slot, and a current excited at the slot is distributed entirely over one conductive plate, the current becomes a radiation source, and an electromagnetic wave is radiated from the one conductive plate. At this time, the other conductive plate operates as the reflecting plate of the electromagnetic wave.

(21) Appl. No.: **12/094,248**

(22) PCT Filed: **Nov. 16, 2006**

(86) PCT No.: **PCT/JP2006/322807**

§ 371 (c)(1),
(2), (4) Date: **May 19, 2008**





US 20090231222A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0231222 A1**

(43) **Pub. Date: Sep. 17, 2009**

(54) **COMPACT PORTABLE ANTENNA FOR
DIGITAL TERRESTRIAL TELEVISION WITH
FREQUENCY REJECTION**

(30) **Foreign Application Priority Data**

May 12, 2006 (FR) 0604270

(75) Inventors: **Philippe Minard**, Saint Medard Sur
Ille (FR); **Jean-Francois Pintos**,
Bourgbarre (FR); **Ali Louzir**,
Rennes (FR)

Publication Classification

(51) **Int. Cl.**
H01Q 5/01 (2006.01)
H01Q 9/16 (2006.01)

Correspondence Address:
Thomson Licensing LLC
P.O. Box 5312, Two Independence Way
PRINCETON, NJ 08543-5312 (US)

(52) **U.S. Cl.** **343/730; 343/802; 343/767**

(73) Assignee: **THOMSON LICENSING,**
Boulogne-Billancourt (FR)

(57) **ABSTRACT**

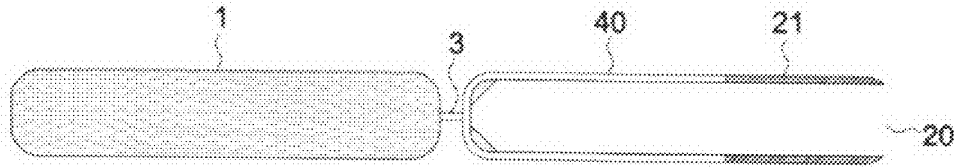
(21) Appl. No.: **12/227,245**

The invention relates to a portable compact antenna formed from a first dipole type radiating element operating in a first frequency band and comprising a first and at least one second conductive arm, differentially supplied, the first arm, referred to as cold arm, forming at least one cover for an electronic card and the second arm, referred to as hot arm, being linked to the cold arm at the level of the supply. According to the invention, the hot arm comprises at least one slot resonating in a second frequency band such as the GSM band.

(22) PCT Filed: **May 4, 2007**

(86) PCT No.: **PCT/FR2007/051226**

§ 371 (c)(1),
(2), (4) Date: **Nov. 12, 2008**





US 20090231229A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0231229 A1**

(43) **Pub. Date: Sep. 17, 2009**

(54) **CIRCULAR POLARIZED ANTENNA**

Publication Classification

(75) Inventors: **JAMES P. PHILLIPS**, LAKE IN THE HILLS, IL (US); **GUANGLI YANG**, WAUKEGAN, IL (US); **ROBERT N. SHADDOCK**, TEMPE, AZ (US); **THOMAS J. WALCZAK**, WOODSTOCK, IL (US)

(51) **Int. Cl.**
H01Q 9/00 (2006.01)
H01Q 1/38 (2006.01)
H01Q 1/24 (2006.01)

(52) **U.S. Cl.** **343/843; 343/702; 343/700 MS**

Correspondence Address:
MOTOROLA INC
600 NORTH US HIGHWAY 45, W4 - 39Q
LIBERTYVILLE, IL 60048-5343 (US)

(73) Assignee: **MOTOROLA, INC.**, LIBERTYVILLE, IL (US)

(57) **ABSTRACT**

(21) Appl. No.: **12/433,983**

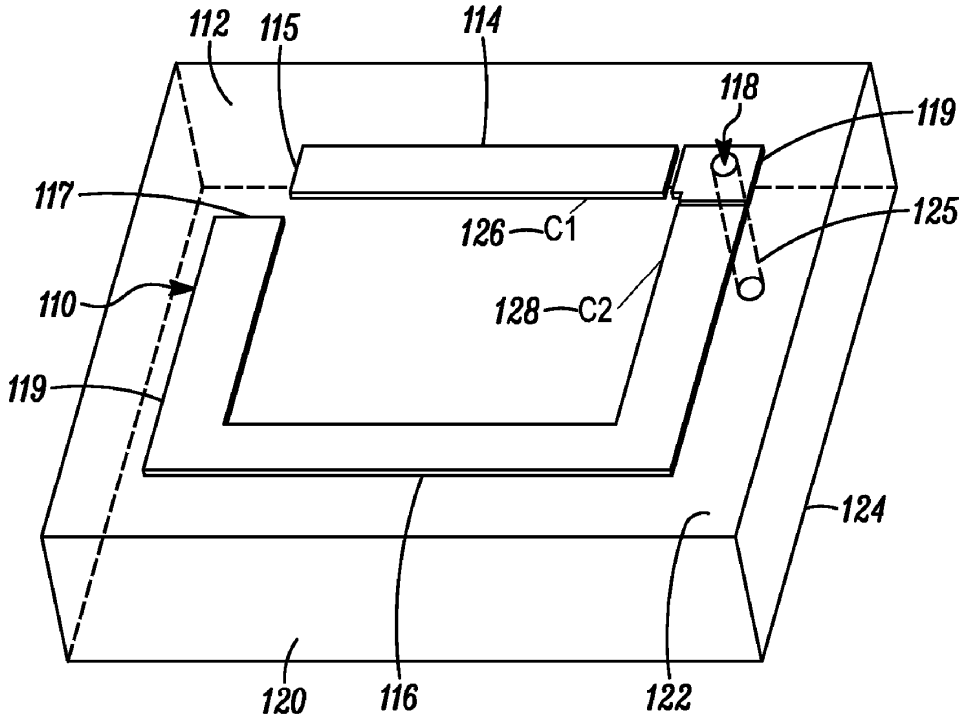
A circular polarized signal receiving antenna including an active element having first and second ends separated by a gap, a dimension of the active element, between the first and second ends thereof, corresponding to approximately one wavelength of a resonant operating frequency of the antenna. A feed-point is coupled to the active element, wherein the feed-point is located approximately one-quarter of the wavelength from the first end of the active element and approximately three-quarters of the wavelength from the second end of the active element. In one embodiment, the feed-point is coupled to the active element.

(22) Filed: **May 1, 2009**

Related U.S. Application Data

(63) Continuation of application No. 11/778,790, filed on Jul. 17, 2007, now Pat. No. 7,532,164, Continuation of application No. 11/749,435, filed on May 16, 2007, now abandoned.

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US 20090231230A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0231230 A1**

(43) **Pub. Date: Sep. 17, 2009**

(54) **MULTI-BAND ANTENNA WITH IMPROVED CONNECTING PORTION**

(30) **Foreign Application Priority Data**

Mar. 17, 2008 (TW) 97109279

(75) Inventors: **Chen-Ta Hung**, Tu-Cheng (TW);
Hsien-Sheng Tseng, Tu-Cheng (TW);
Chun-Ming Chiu, Tu-Cheng (TW)

Publication Classification

(51) **Int. Cl.**
H01Q 5/00 (2006.01)
H01Q 1/48 (2006.01)

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

(57) **ABSTRACT**

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

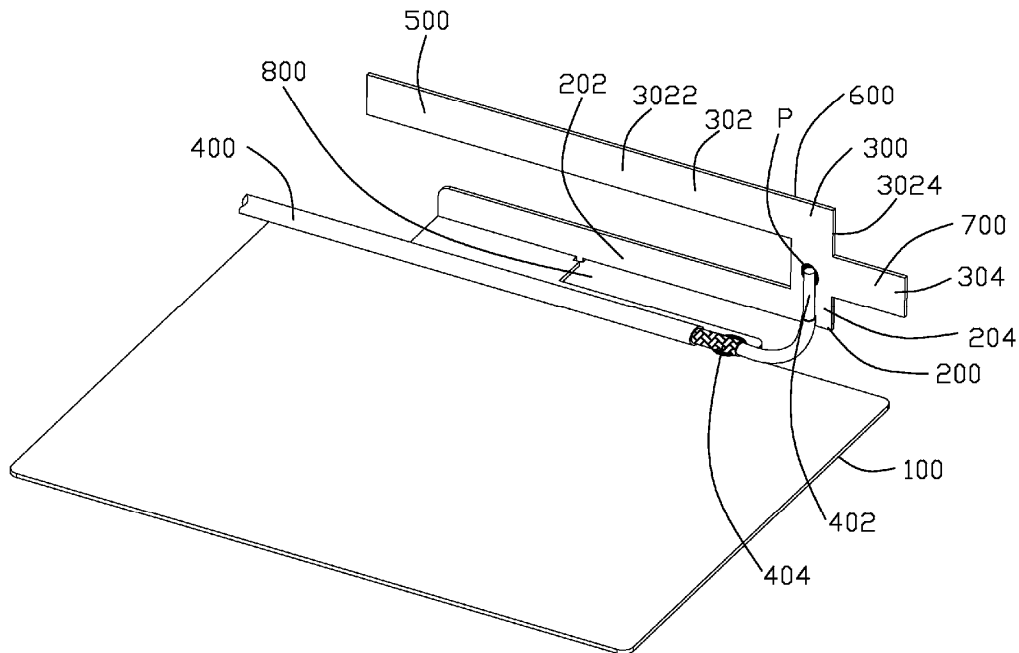
A multi-band antenna includes a grounding element, a connecting element, a first radiating portion and a second radiating portion. The grounding element is located on a first plane. The connecting element extends upwardly from the grounding element to be defined as an L shape and comprises a longer first side and a shorter second side. The first radiating portion includes a first side and a second side. The second radiating portion is connected to the first radiating portion on a first point. The first radiating portion together with the second radiating portion forms a Z shape. The second side of the connecting element is connected to one of the two radiating portions on a second point.

(73) Assignee: **HON HAI PRECISION INDUSTRY CO., LTD.**, Tu-Cheng (TW)

(21) Appl. No.: **12/394,010**

(22) Filed: **Feb. 26, 2009**

1





US 20090233657A1

(19) **United States**

(12) **Patent Application Publication**
Ogawa

(10) **Pub. No.: US 2009/0233657 A1**

(43) **Pub. Date: Sep. 17, 2009**

(54) **FOLDING MOBILE RADIO DEVICE**

Publication Classification

(75) Inventor: **Kenji Ogawa, Kanagawa (JP)**

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

(52) **U.S. Cl.** **455/575.3**

(57) **ABSTRACT**

Correspondence Address:
PEARNE & GORDON LLP
1801 EAST 9TH STREET, SUITE 1200
CLEVELAND, OH 44114-3108 (US)

Even when a case is held to tilt at any angle to the ground, a high gain can be implemented and a SAR reducing effect can be achieved and also frequencies in multiple bands can be handled.

(73) Assignee: **MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD., Osaka (JP)**

A configuration of three antenna elements consisting of a planar element 16 arranged in a lower case 12 in the width direction of the case, a planar element 17 arranged in an upper case 11 in the longitudinal direction of the case to have a wide antenna area, and a planar element 18 arranged in the upper case 11 in parallel with the planar element 16 is employed such that the planar element 16 is coupled with the planar element 17 via a capacitive coupling and also coupled with the planar element 18 via an electromagnetic coupling in the opened state of the case. Also, the planar element 16 is connected to a radio circuit 14 on a circuit board 13 having the ground pattern via a matching circuit 15.

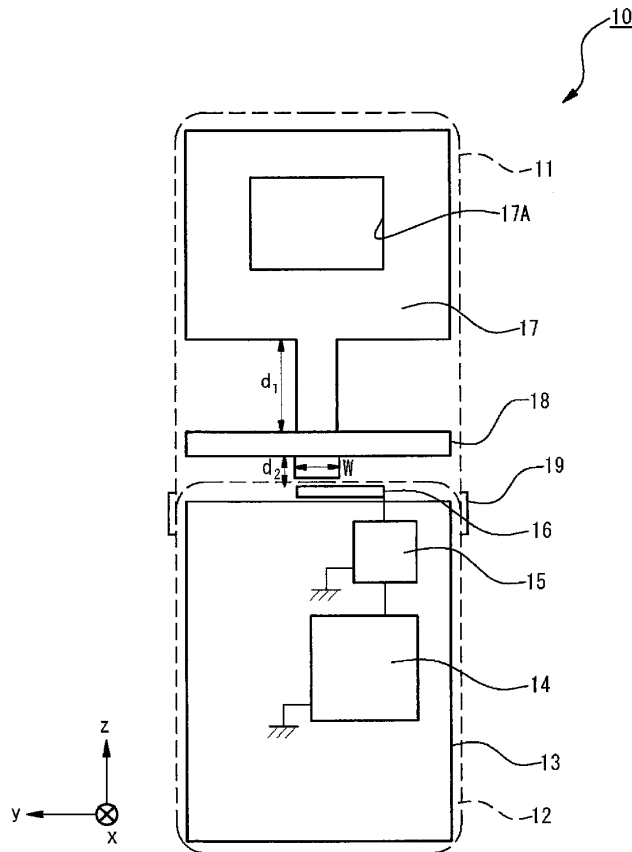
(21) Appl. No.: **11/908,867**

(22) PCT Filed: **Oct. 4, 2005**

(86) PCT No.: **PCT/JP2005/018363**

§ 371 (c)(1),
(2), (4) Date:

Sep. 17, 2007





US 20090237306A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0237306 A1**

(43) **Pub. Date: Sep. 24, 2009**

(54) **COMPACT INTEGRATED MONOPOLE ANTENNAS**

(75) Inventors: **Jau-Jr Lin**, Gainesville, FL (US);
Hsin-Ta Wu, Gainesville, FL (US);
Kenneth K. O., Gainesville, FL (US)

Correspondence Address:
SALIWANCHIK LLOYD & SALIWANCHIK
A PROFESSIONAL ASSOCIATION
PO Box 142950
GAINESVILLE, FL 32614 (US)

(73) Assignee: **UNIVERSITY OF FLORIDA RESEARCH FOUNDATION, INC.**, Gainesville, FL (US)

(21) Appl. No.: **12/095,853**

(22) PCT Filed: **Nov. 30, 2006**

(86) PCT No.: **PCT/US2006/061412**

§ 371 (c)(1),
(2), (4) Date:

Sep. 2, 2008

Related U.S. Application Data

(60) Provisional application No. 60/741,926, filed on Dec. 2, 2005.

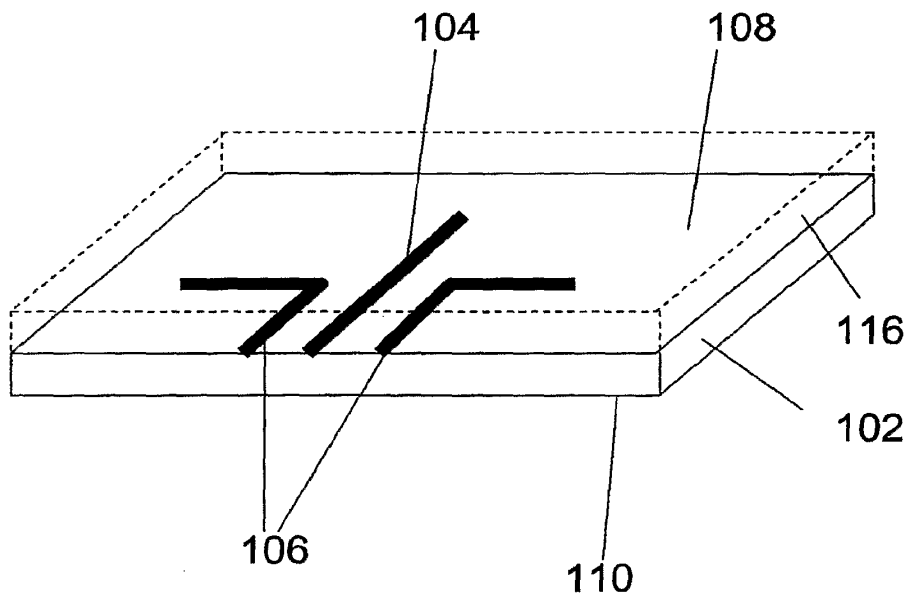
Publication Classification

(51) **Int. Cl.**
H01Q 1/38 (2006.01)
H01Q 23/00 (2006.01)

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

(57) **ABSTRACT**

A compact integrated monopole antenna is provided, where the antenna can include a bulk semiconducting substrate, an electrically conductive antenna element disposed on said substrate, where the antenna element extending continuously along an antenna element path spanning an antenna length in a first direction. The antenna also can include a plurality of spaced apart electrically conductive grounding elements disposed on the substrate, where a first of the plurality of grounding elements is disposed on a first side of the antenna path along the antenna length and a second of the plurality of grounding elements is disposed on the other side of the antenna path along the antenna length, where the plurality of grounding elements is configured to effectively lengthen the antenna length as compared to a linear ground plane.



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US 20090237307A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0237307 A1**

(43) **Pub. Date: Sep. 24, 2009**

(54) **ULTRA-WIDEBAND ANTENNA**

(30) **Foreign Application Priority Data**

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

Mar. 19, 2008 (TW) 097109618

Publication Classification

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

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

Correspondence Address:
BROMBERG & SUNSTEIN LLP
125 SUMMER STREET
BOSTON, MA 02110-1618 (US)

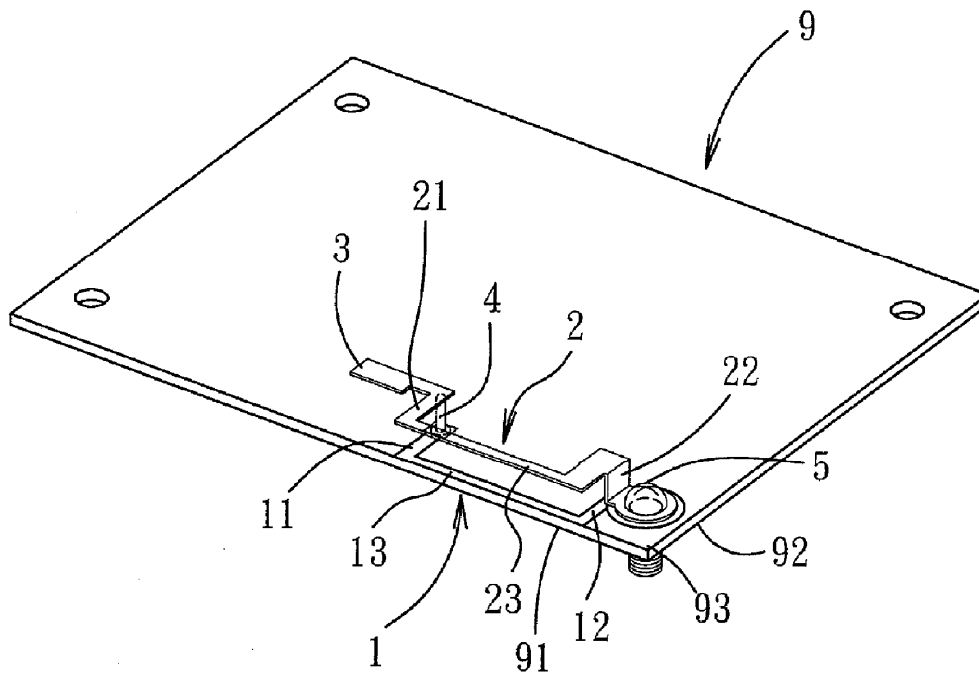
(57) **ABSTRACT**

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

An antenna includes first and second radiating elements and a conductive arm. The second radiating element has opposite feeding and grounding end portions, each of which is coupled to a respective one of feeding and grounding end portions of the first radiating element. The conductive arm is coupled to the feeding end portion of the second radiating element.

(21) Appl. No.: **12/169,346**

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





US 20090237308A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0237308 A1**

(43) **Pub. Date: Sep. 24, 2009**

(54) **PLANAR ANTENNA**

(30) **Foreign Application Priority Data**

(75) Inventors: **Tiao-Hsing Tsai**, Yungho City
(TW); **Chih-Wei Liao**, Su-ao
Township (TW); **Chao-Hsu Wu**, Lu
Chu Hsiang (TW)

Mar. 19, 2008 (TW) 097109619

Publication Classification

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

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

(57) **ABSTRACT**

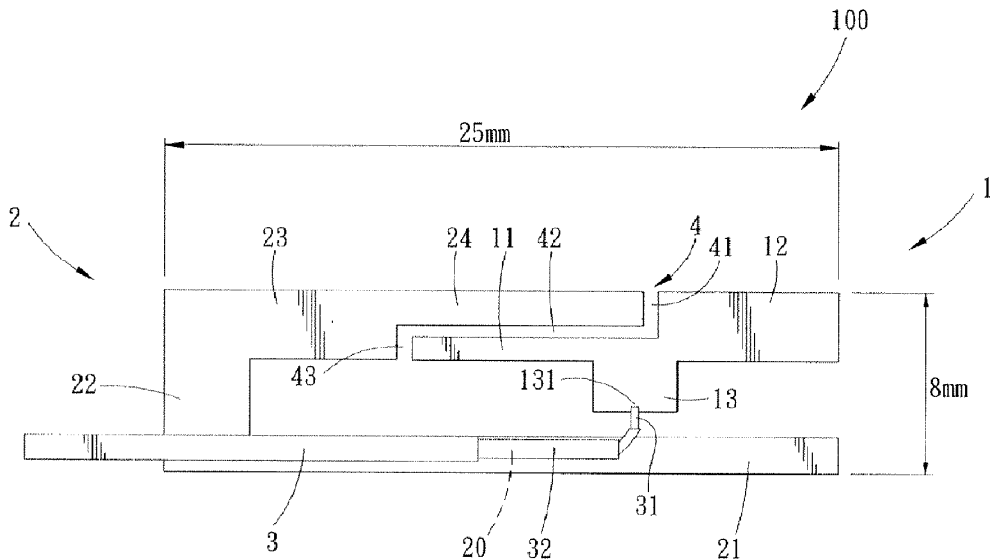
An antenna includes first and second radiating elements. The first radiating element is operable in a first frequency range. The second radiating element cooperates with the first radiating element to define a slot therebetween in such a manner that the second radiating element is coupled electromagnetically to the first radiating element. The construction as such permits operation of the second radiating element in a second frequency range different from the first frequency range, and a third frequency range different from the first and second frequency ranges.

Correspondence Address:
BROMBERG & SUNSTEIN LLP
125 SUMMER STREET
BOSTON, MA 02110-1618 (US)

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

(21) Appl. No.: **12/174,757**

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





US 20090237311A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0237311 A1**

(43) **Pub. Date: Sep. 24, 2009**

(54) **SINGLE-PLATE DUAL-BAND ANTENNA AND WIRELESS NETWORK DEVICE HAVING THE SAME**

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

(57) **ABSTRACT**

(76) Inventors: **Jung Tai Wu**, Taipei City (TW);
Jin-Bo Chen, Taipei City (TW)

The present invention discloses a single-plate dual-band antenna for a wireless network device. The antenna comprises a base portion, a ground portion, a radiating portion and a signal portion. The base portion is combined with the wireless network device. The ground portion has an end connected with the base portion and extends upwards from the base portion to a certain height. The signal portion is generally perpendicular to the radiating portion, the ground portion and the base portion, respectively. The signal portion has an upper side and a lower end. The upper side is formed with a connecting edge connected with the radiating portion while the lower end is formed with a feed pin, so that the signal portion generally has a downwardly tapered, inverted triangular structure. The radiating portion further comprises a first radiating section and a second radiating section. The first radiating section extends a first length from an upper end of the ground portion along the connecting edge of the signal portion, while the second radiating section extends a second length sinuously from an end of the first radiating section distal from the ground portion.

Correspondence Address:
Raymond Sun
12420 Woodhall Way
Tustin, CA 92782 (US)

(21) Appl. No.: **12/077,333**

(22) Filed: **Mar. 18, 2008**

Publication Classification

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

