US 20070182636A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0182636 A1**

Carlson (43) **Pub. Date: Aug. 9, 2007**

(54) **DUAL BAND TRACE ANTENNA FOR WLAN FREQUENCIES IN A MOBILE PHONE**

(75) Inventor: **Nicklas Carlson**, Marieita, GA (US)

Correspondence Address:
FOLEY & LARDNER LLP
P.O. BOX 80278
SAN DIEGO, CA 92138-0278

(73) Assignee: **Nokia Corporation**

(21) Appl. No.: **11/348,025**

(22) Filed: **Feb. 6, 2006**

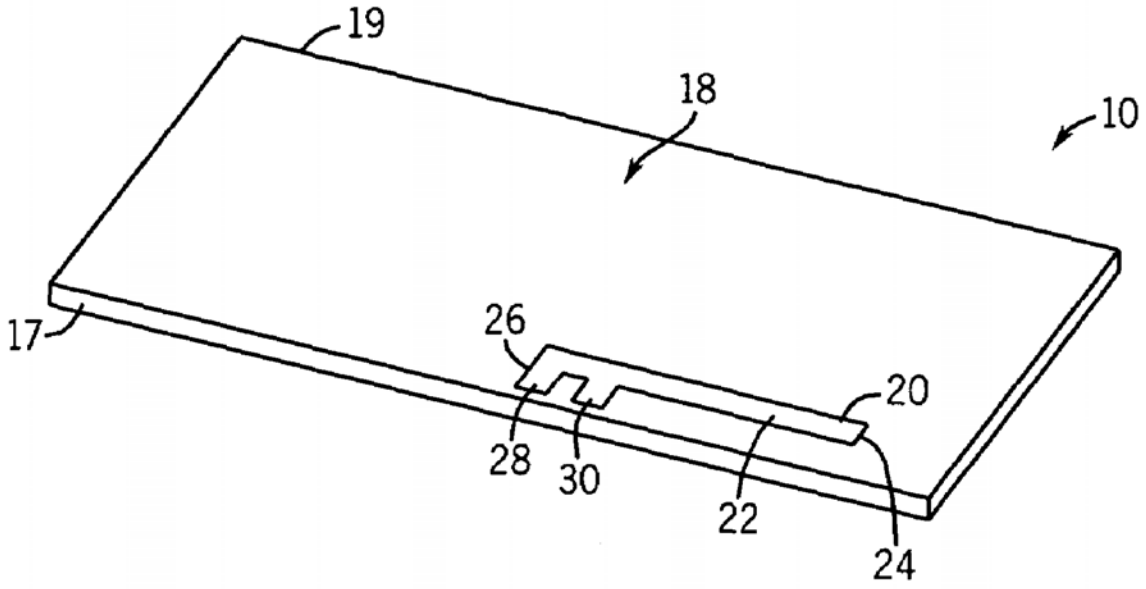
Publication Classification

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

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

(57) **ABSTRACT**

An antenna for use in mobile electronic devices at more than one frequency. A circuit board contains a first antenna element at a first layer and a second antenna element at a second layer. The antenna elements have a common feed connection and ground connection. The antenna elements are arranged substantially parallel to each other on their respective layers in the circuit board. The first antenna element has a length that differs from that of the second antenna element to provide each with a different resonant frequency.



US 20070182640A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0182640 A1**

Oohira (43) **Pub. Date: Aug. 9, 2007**

(54) **HIGHLY DIELECTRIC ELASTOMER COMPOSITION AND DIELECTRIC ANTENNA**

(76) Inventor: **Kouya Oohira**, Shizuoka (JP)

Correspondence Address:
HEDMAN & COSTIGAN P.C.
1185 AVENUE OF THE AMERICAS
NEW YORK, NY 10036 (US)

(21) Appl. No.: **11/629,646**

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

(86) PCT No.: **PCT/JP05/10949**

§ 371(c)(1),
(2), (4) Date: **Dec. 15, 2006**

(30) **Foreign Application Priority Data**

Jun. 16, 2004 (JP) P2004-177969
Jul. 30, 2004 (JP) P2004-222910
Dec. 10, 2004 (JP) P2004-358623

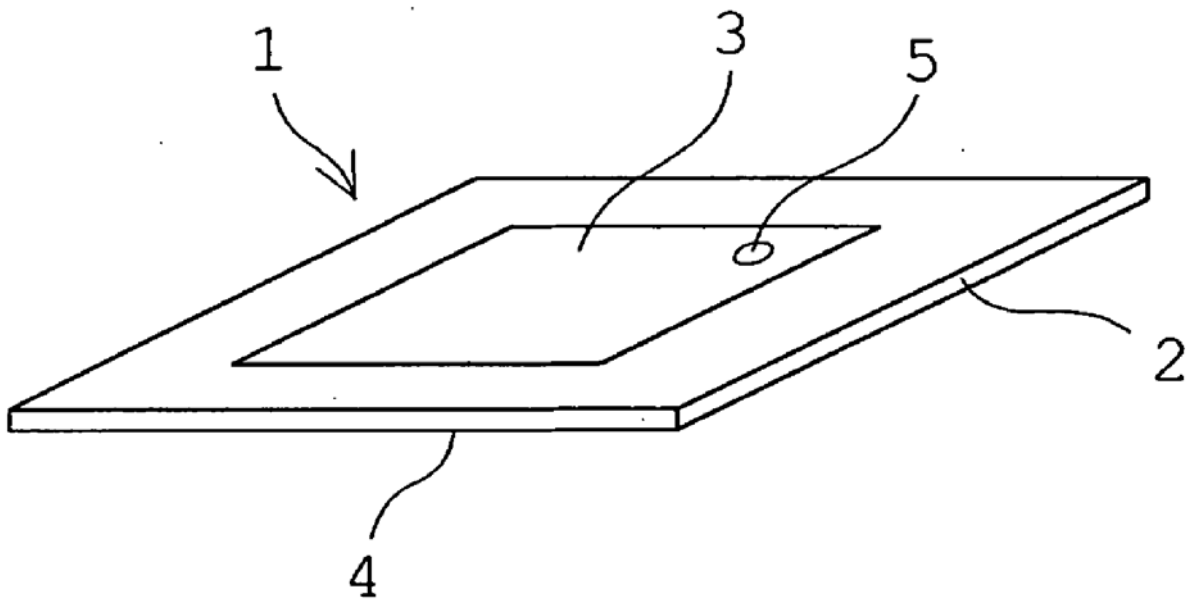
Publication Classification

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

(52) **U.S. Cl.** ..... **343/700 MS**; 524/543

(57) **ABSTRACT**

The present invention provides a highly dielectric elastomer composition which shows a high dielectric constant in a wide temperature range from low to high temperature and has a low dielectric loss tangent, and a dielectric antenna composed of the highly dielectric elastomer composition. A dielectric antenna including a molding of a highly dielectric elastomer composition composed of an elastomer and a highly dielectric ceramic powder mixed with the elastomer and an electrode formed on the molding. The highly dielectric ceramic powder of barium titanate•neodymium ceramic has a temperature coefficient α (unit: 1/° C.) of a dielectric constant of the ceramic powder on 25° C. standard ranging from -200×10^{-6} to 100×10^{-6} over a temperature range from −40° C. to 100° C. The dielectric constant of the highly dielectric elastomer composition is ≧7 and a dielectric loss tangent thereof is ≦0.01.



US 20070182642A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0182642 A1**

Yanagi et al. (43) **Pub. Date: Aug. 9, 2007**

(54) **ANTENNA APPARATUS**

(75) Inventors: **Masahiro Yanagi**, Shinagawa (JP); **Shigemi Kurashima**, Shinagawa (JP); **Hiroto Inoue**, Shinagawa (JP); **Takuya Uchiyama**, Shinagawa (JP)

Correspondence Address:
STAAS & HALSEY LLP
SUITE 700
1201 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005 (US)

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

(21) Appl. No.: **11/783,216**

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

Related U.S. Application Data

(63) Continuation of application No. 11/119,732, filed on May 3, 2005.

(30) **Foreign Application Priority Data**

Sep. 17, 2004 (JP) 2004-271580

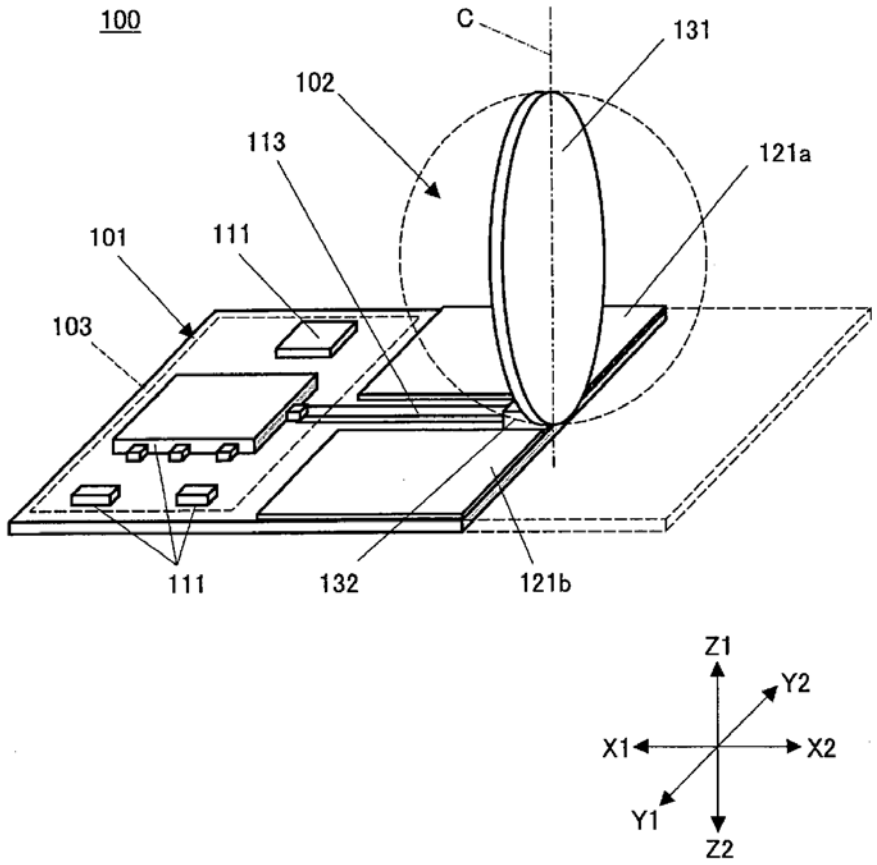
Publication Classification

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

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

(57) **ABSTRACT**

An antenna apparatus is disclosed. The antenna apparatus is structured by a ground plate that is shaped like a plate, and a feeding unit that is formed by a plate-like member, the feeding unit extending from the ground plate generally perpendicular to the ground plate at a predetermined angle to the ground plate for a predetermined length.



US 20070182643A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0182643 A1**

Li et al. (43) **Pub. Date: Aug. 9, 2007**

(54) **DUAL BAND WLAN ANTENNA**

(75) Inventors: **James Li**, Santa Clara, CA (US); **Jing Jiang**, San Jose, CA (US)

Correspondence Address:
HARNESS, DICKEY & PIERCE P.L.C.
5445 CORPORATE DRIVE
SUITE 200
TROY, MI 48098 (US)

(73) Assignee: **Marvell International Ltd.**, Hamilton (BM)

(21) Appl. No.: **11/519,979**

(22) Filed: **Sep. 12, 2006**

Related U.S. Application Data

(60) Provisional application No. 60/771,634, filed on Feb. 9, 2006.

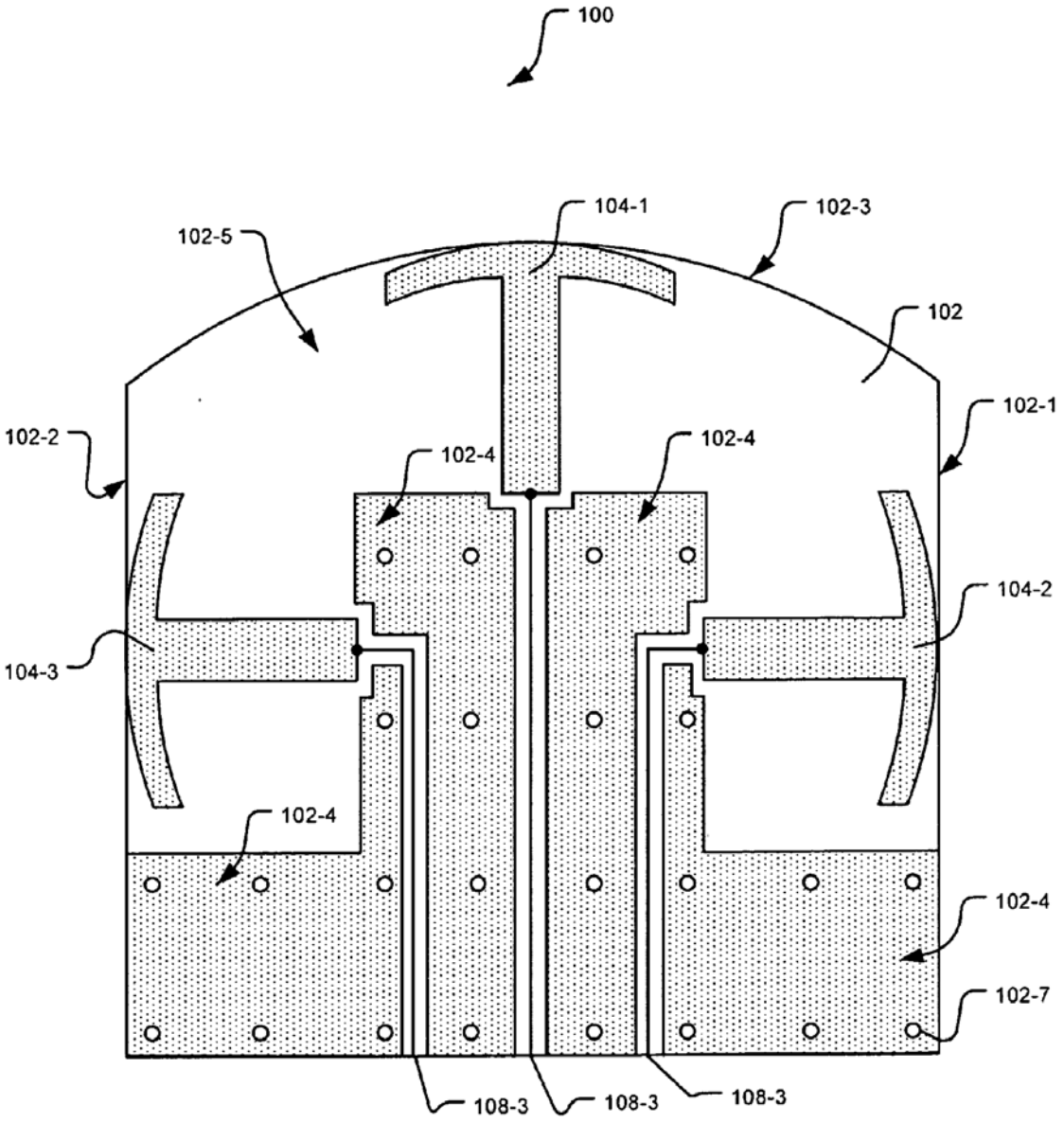
Publication Classification

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

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

(57) **ABSTRACT**

An antenna system comprises first, second, and third antennas that are arranged on a printed circuit board (PCB) and that include an arc-shaped element having a concave side and a convex side, and a conducting element that extends substantially radially from a center of the concave side.



US 20070182644A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0182644 A1**

Li et al. (43) **Pub. Date: Aug. 9, 2007**

(54) **DUAL BAND WLAN ANTENNA**

(75) Inventors: **James Li**, Santa Clara, CA (US); **Jing Jiang**, San Jose, CA (US)

Correspondence Address:
HARNESS, DICKEY & PIERCE P.L.C.
5445 CORPORATE DRIVE
SUITE 200
TROY, MI 48098 (US)

(73) Assignee: **Marvell International Ltd.**, Hamilton HM (BM)

(21) Appl. No.: **11/581,286**

(22) Filed: **Oct. 16, 2006**

Related U.S. Application Data

(63) Continuation of application No. 11/519,979, filed on Sep. 12, 2006.

(60) Provisional application No. 60/771,634, filed on Feb. 9, 2006.

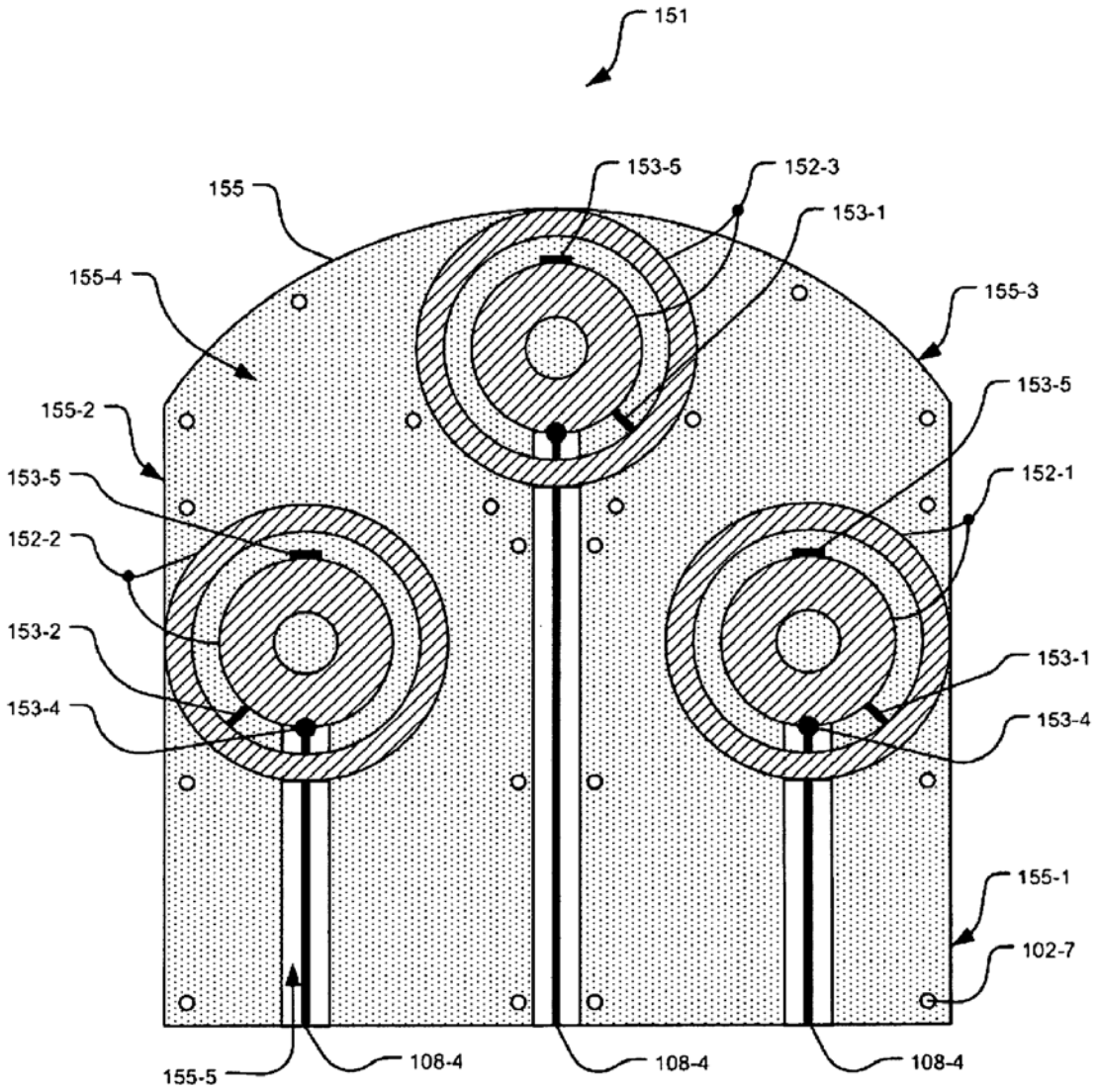
Publication Classification

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

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

(57) **ABSTRACT**

An antenna system comprises first, second, and third antennas that are arranged on a printed circuit board (PCB) and that include an inner ring and an outer ring that is concentric to said inner ring.



US 20070182645A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0182645 A1**

Li et al. (43) **Pub. Date: Aug. 9, 2007**

(54) **DUAL BAND WLAN ANTENNA**

(75) Inventors: **James Li**, Santa Clara, CA (US); **Jing Jiang**, San Jose, CA (US)

Correspondence Address:
HARNESS, DICKEY & PIERCE P.L.C.
5445 CORPORATE DRIVE
SUITE 200
TROY, MI 48098 (US)

(73) Assignee: **Marvell International Ltd.**, Hamilton (BM)

(21) Appl. No.: **11/581,502**

(22) Filed: **Oct. 16, 2006**

Related U.S. Application Data

(63) Continuation of application No. 11/519,979, filed on Sep. 12, 2006.

(60) Provisional application No. 60/771,634, filed on Feb. 9, 2006.

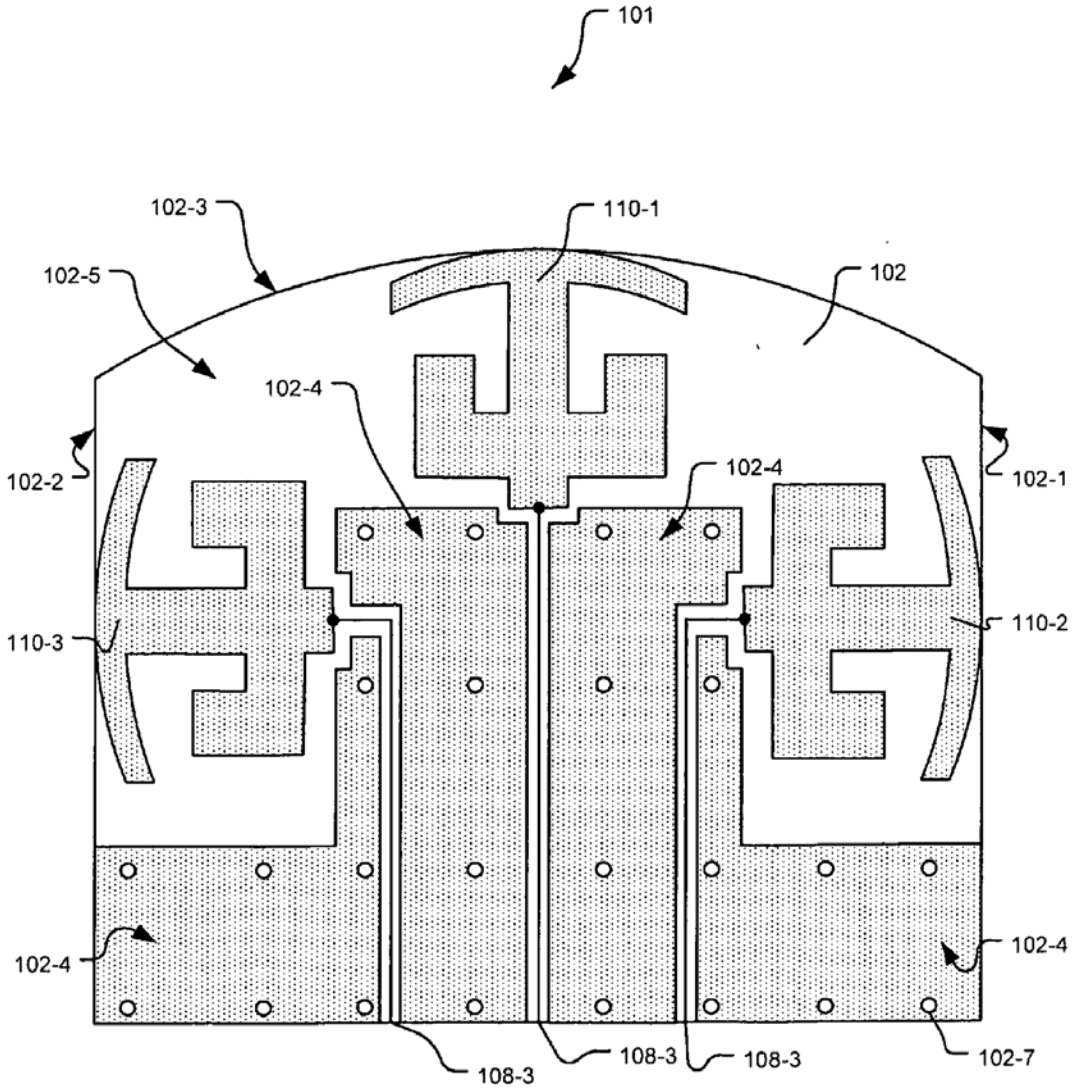
Publication Classification

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

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

(57) **ABSTRACT**

An antenna system comprises first, second, and third antennas that are arranged on a printed circuit board (PCB) and that include an arc-shaped element having a concave side and a convex side. A conducting element extends substantially radially from a center of the concave side. A U-shaped element has a base portion with a center that communicates with the conducting element and two side portions that extend from ends of the base portion towards the concave side.



US 20070182646A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0182646 A1**

Li et al. (43) **Pub. Date: Aug. 9, 2007**

(54) **DUAL BAND WLAN ANTENNA**

(75) Inventors: **James Li**, Santa Clara, CA (US); **Jing Jiang**, San Jose, CA (US)

Correspondence Address:
HARNESS, DICKEY & PIERCE P.L.C.
5445 CORPORATE DRIVE
SUITE 200
TROY, MI 48098 (US)

(73) Assignee: **Marvell International Ltd.**, Hamilton (BM)

(21) Appl. No.: **11/581,540**

(22) Filed: **Oct. 16, 2006**

Related U.S. Application Data

(63) Continuation of application No. 11/519,979, filed on Sep. 12, 2006.

(60) Provisional application No. 60/771,634, filed on Feb. 9, 2006.

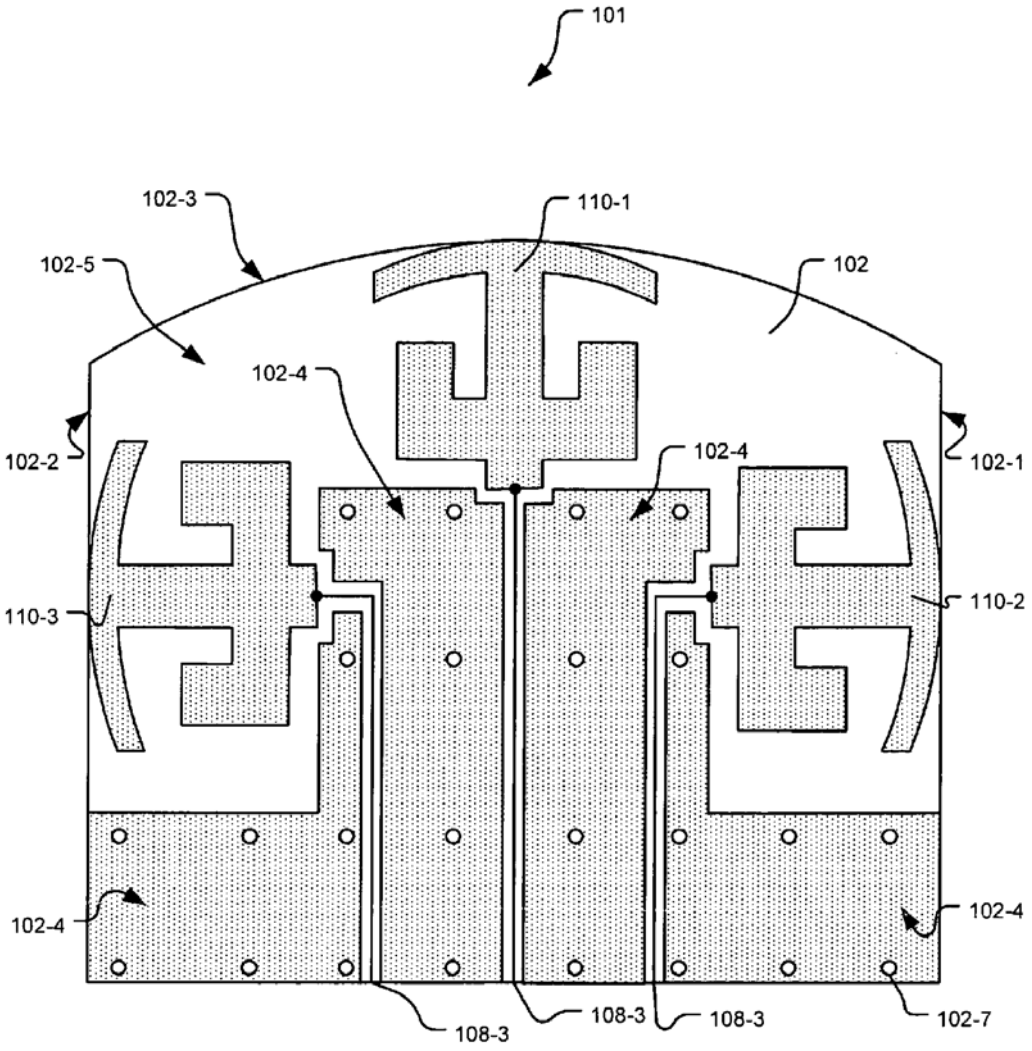
Publication Classification

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

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

(57) **ABSTRACT**

An antenna system comprises a first antenna that is arranged on a printed circuit board (PCB) and that includes an arc-shaped element having a concave side and a convex side. A conducting element extends substantially radially from a center of the concave side. A U-shaped element has a base portion with a center that communicates with the conducting element and two side portions that extend from ends of the base portion towards the concave side. Second and third antennas are arranged on the PCB and include an inner ring and an outer ring that is concentric to the inner ring.



US 20070182647A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0182647 A1**

Li et al. (43) **Pub. Date: Aug. 9, 2007**

(54) **DUAL BAND WLAN ANTENNA**

(75) Inventors: **James Li**, Santa Clara, CA (US); **Jing Jiang**, San Jose, CA (US)

Correspondence Address:
HARNESS, DICKEY & PIERCE P.L.C.
5445 CORPORATE DRIVE
SUITE 200
TROY, MI 48098 (US)

(73) Assignee: **Marvell International Ltd.**, Hamilton (BM)

(21) Appl. No.: **11/581,717**

(22) Filed: **Oct. 16, 2006**

Related U.S. Application Data

(63) Continuation of application No. 11/519,979, filed on Sep. 12, 2006.

(60) Provisional application No. 60/771,634, filed on Feb. 9, 2006.

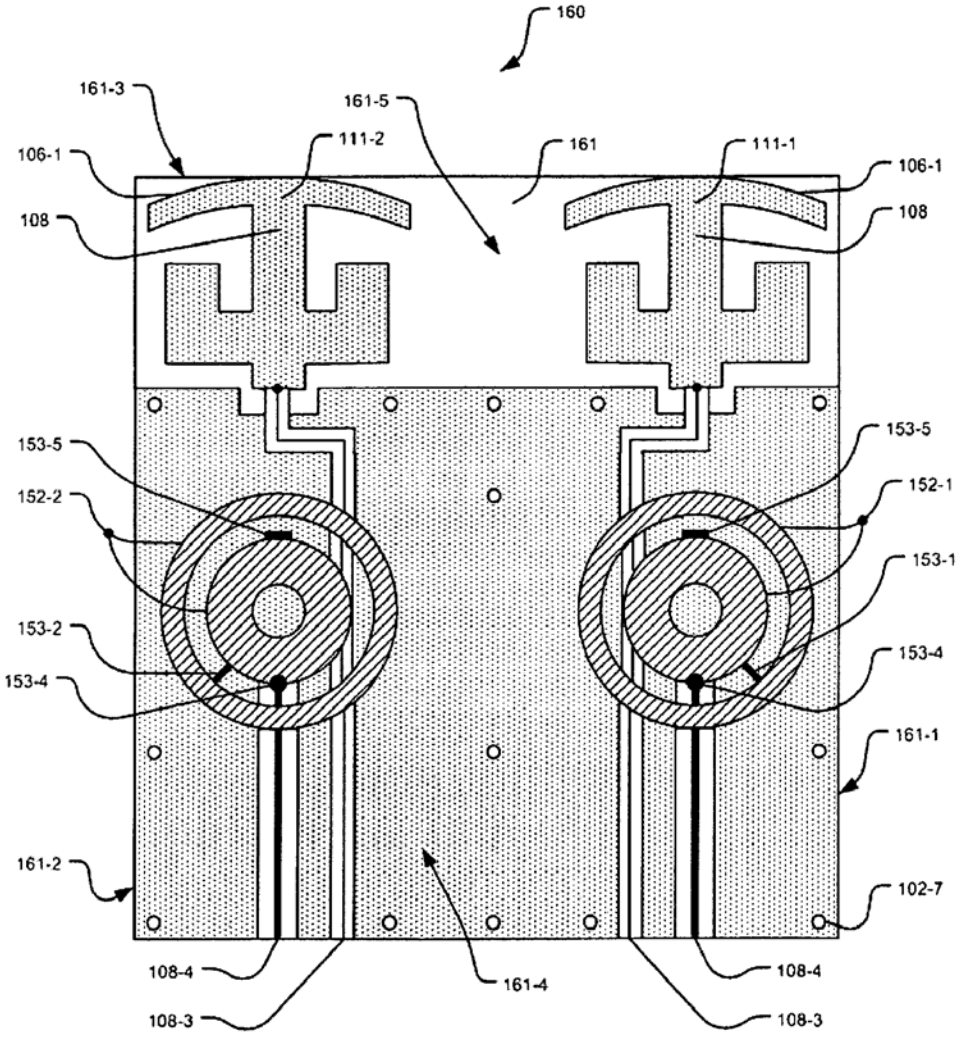
Publication Classification

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

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

(57) **ABSTRACT**

An antenna system comprises first and second antennas that are arranged on a printed circuit board (PCB) and that include an arc-shaped element having a concave side and a convex side. A conducting element extends substantially radially from a center of the concave side. A U-shaped element has a base portion with a center that communicates with the conducting element and two side portions that extend from ends of the base portion towards the concave side. Third and fourth antennas are arranged on the PCB and include an inner ring and an outer ring that is concentric to the inner ring.



US 20070182648A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0182648 A1

Shimamori et al. (43) Pub. Date: Aug. 9, 2007

(54) ANTENNA DEVICE

(75) Inventors: **Takao Shimamori**, Yokohama-shi (JP); **Miroru Hasegawa**, Yokohama-shi (JP)

Correspondence Address:
THE FARRELL LAW FIRM, P.C.
333 EARLE OVINGTON BOULEVARD
SUITE 701
UNIONDALE, NY 11553 (US)

(73) Assignee: **SAMSUNG ELECTRONICS CO., LTD.**, Suwon-si (KR)

(21) Appl. No.: **11/644,787**

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

(30) **Foreign Application Priority Data**

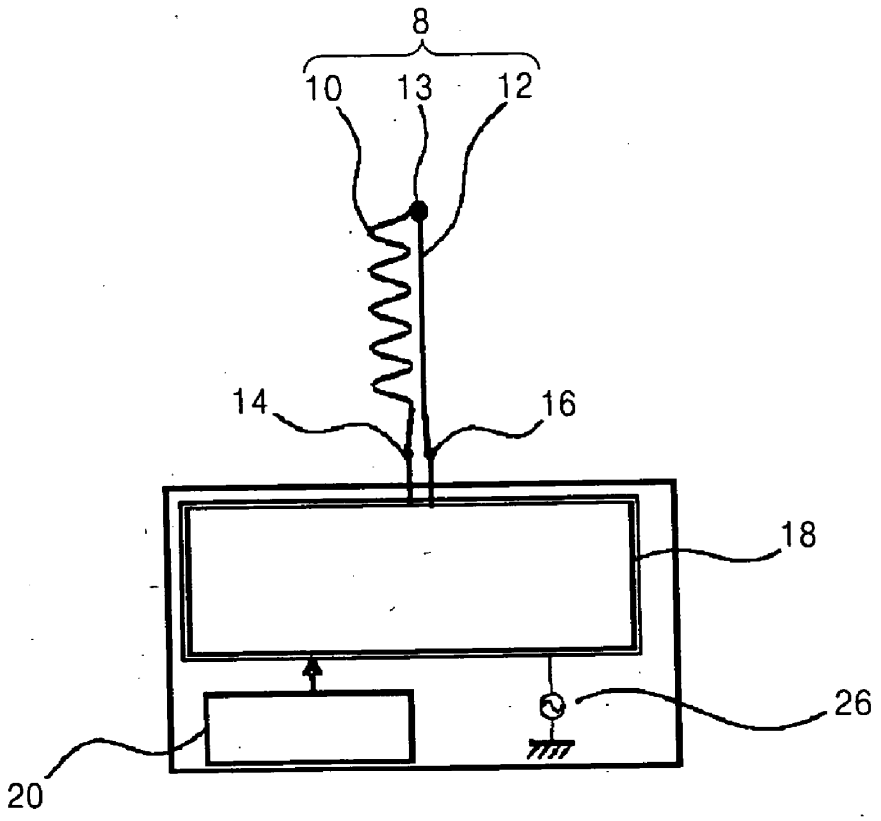
Dec. 22, 2005 (JP) 2005-370029
Aug. 21, 2006 (KR) 10-2006-0078761

Publication Classification

(51) **Int. Cl.**
H01Q 1/24 (2006.01)
(52) **U.S. Cl.** **343/702**; 343/895

(57) **ABSTRACT**

Provided is a compact antenna for installment in a portable terminal and adjusting a resonant frequency. The compact antenna device includes an antenna unit including first and second elements, the first element including a first antenna terminal having at least one of meandering and curved patterns wholly or partially, and the second element including an end connected to another end of the first element and another end having a second antenna terminal, a feeding unit exciting the antenna unit through the first and second antenna terminals, a switching circuit connected between the antenna unit and the feeding unit and selectively switching one or both of the first and second elements in order to connect one or both of the first and second elements to the feeding unit. A resonant frequency of the antenna unit varies during feeding by the feeding unit depending on the switching operation of the switching circuit.



US 20070182651A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0182651 A1**

Grant et al. (43) **Pub. Date: Aug. 9, 2007**

(54) **COMPACT VEHICLE-MOUNTED ANTENNA**

(75) Inventors: **Gary W. Grant**, Oregon City, OR (US); **Douglas W. Sherman**, Auburn, IN (US)

Correspondence Address:
KLARQUIST SPARKMAN, LLP
121 SW SALMON STREET
SUITE 1600
PORTLAND, OR 97204 (US)

(73) Assignee: **Radiall Antenna Technologies, Inc.,**

(21) Appl. No.: **11/784,448**

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

Related U.S. Application Data

(63) Continuation of application No. 10/529,024, filed on Mar. 22, 2005, now Pat. No. 7,202,826, filed as 371 of international application No. PCT/US03/30453, filed on Sep. 26, 2003.

(60) Provisional application No. 60/414,606, filed on Sep. 27, 2002.

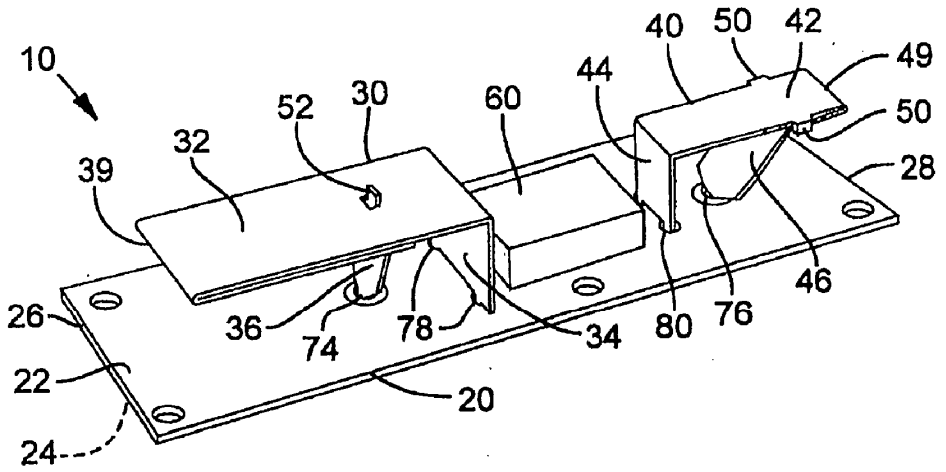
Publication Classification

(51) **Int. Cl.**
H01Q 1/32 (2006.01)
H01Q 1/38 (2006.01)

(52) **U.S. Cl.** ..... **343/713**; 343/700 MS

(57) **ABSTRACT**

A compact, vehicle-mounted antenna (**10**) is disclosed. In one embodiment, a first and second antenna elementS (**30, 40**) are positioned on a conductive ground plane (FIG. **1**). The antenna elements can comprise platforms supported by a ground (**34**) and a feed (**36**). The antenna elements can be tuned to various bands (e.g., cellular of PCS). At least one additional antenna element (e.g., a GPS receive antenna (**60**)) can be positioned between the two antenna elements. One of the feeds of the antenna elements can be angled so that the antenna element has a desired height (e.g., a height matching the other antenna element). The antenna elements can be electrically connected to a transmission line (**116**) via a single feed line.



US 20070182655A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0182655 A1

Lee et al. (43) Pub. Date: Aug. 9, 2007

(54) BROAD-BAND LOG-PERIODIC DIPOLE ANTENNA

(75) Inventors: **Han-Lim Lee**, Seoul (KR); **Seong-Taek Hwang**, Pyeongtaek-si (KR); **Sung-Hun Kim**, Sacheon-si (KR); **Young-Sik Kim**, Seoul (KR); **Ji-Chai Jeong**, Seoul (KR); **Jung-Woo Baik**, Seoul (KR)

Correspondence Address:
CHA & REITER, LLC
210 ROUTE 4 EAST STE 103
PARAMUS, NJ 07652

(73) Assignee: **Samsung Electronics Co., LTD**

(21) Appl. No.: **11/601,422**

(22) Filed: **Nov. 17, 2006**

(30) **Foreign Application Priority Data**

Feb. 7, 2006 (KR) 11670/2006

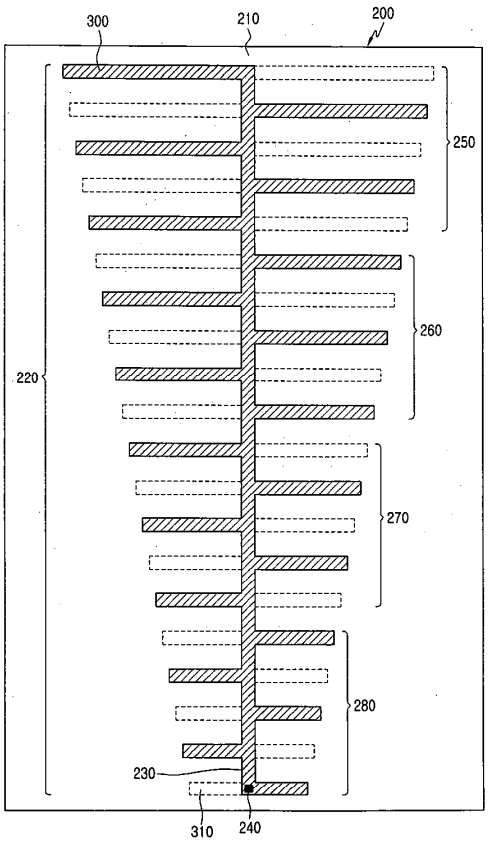
Publication Classification

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

(52) **U.S. Cl.** **343/792.5**

(57) **ABSTRACT**

Disclosed is a broadband log-periodic dipole antenna, which has first and second radiating elements alternately and symmetrically arranged in both surfaces of a dielectric substrate according to the corresponding PCS frequency band, IMT-2000 frequency band, and wireless LAN (IEEE 802, 11a/b) frequency band, so that the first and second radiating elements are alternately supplied with signals to make the impedance matching, thereby producing high gain in each of the resonant frequency bands and preventing the distortion of the radiating patterns owing to the broadband characteristics. The arrangement of the first and second radiating elements in both surfaces of the dielectric substrate considerably also reduces the size of the antenna, thereby facilitating mass production with low cost.



US 20070182656A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0182656 A1

Qi et al. (43) Pub. Date: Aug. 9, 2007

(54) BALANCED DIPOLE ANTENNA

(75) Inventors: **Yihong Qi**, Waterloo (CA); **Perry Jarmuszewski**, Guelph (CA); **Paul Dullaert**, Kitchener (CA)

Correspondence Address:
BRENDA POMERANCE
LAW OFFICE OF BRENDA POMERANCE
260 WEST 52 STREET SUITE 27B
NEW YORK, NY 10019 (US)

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

(21) Appl. No.: **11/725,733**

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

Related U.S. Application Data

(63) Continuation of application No. 10/984,699, filed on Nov. 9, 2004, now Pat. No. 7,193,579.

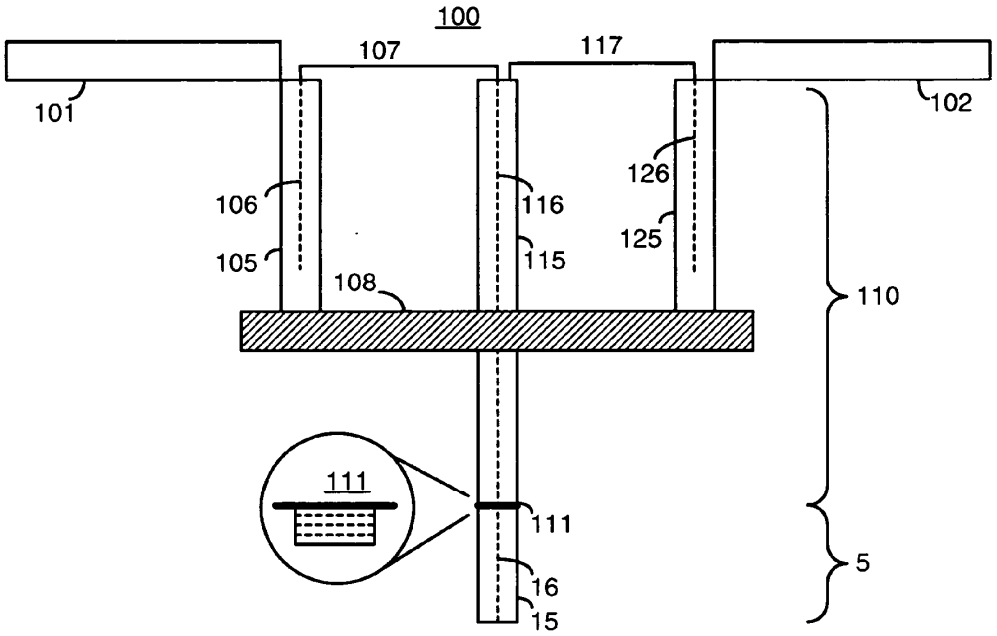
Publication Classification

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

(52) **U.S. Cl.** **343/820**; 343/793; 343/821

(57) **ABSTRACT**

A balanced dipole antenna has a coaxial cable connected between a load or source and the left and right dipole arms to substantially eliminate common mode current and radiative coupling between the coaxial cable and the left and right dipole arms. The connection between the source/load coaxial cable and the left and right dipole arms is a symmetric balun having a center branch that is an extension of the source/load coaxial cable, and left and right stubs. When the stubs are segments of coaxial cable, the outer conductors of the left and right stubs of the symmetric balun are respectively coupled to the left and right dipole arms, and one of the inner conductors of the left and right stubs is connected to the inner conductor of the center branch, while the other of the inner conductor of the left and right stubs is connected to the outer conductor of the center branch. When the stubs are metallic, the inner conductor of the center branch is electrically connected to one of the left and right dipole arms, while the outer conductor of the center branch is electrically connected to the other of the left and right dipole arms. A sliding bar at the base of the stubs electrically connects the outer conductors of the left and right stubs and the center branch.



US 20070182657A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0182657 A1**

Chiang et al. (43) **Pub. Date: Aug. 9, 2007**

(54) **DIRECTIVE ANTENNA IN A DUAL BAND PHASED ARRAY EMPLOYING SPATIAL SECOND HARMONICS**

(75) Inventors: **Bing Chiang**, Melbourne, FL (US); **Michael J. Lynch**, Merritt Island, FL (US); **Griffin K. Gothard**, Satellite Beach, FL (US)

Correspondence Address:
VOLPE AND KOENIG, P.C.
DEPT. ICC
UNITED PLAZA, SUITE 1600
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103 (US)

(73) Assignee: **IPR Licensing, Inc.**, Wilmington, DE (US)

(21) Appl. No.: **11/731,509**

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

Related U.S. Application Data

(63) Continuation of application No. 10/873,834, filed on Jun. 22, 2004, now Pat. No. 7,202,835, which is a continuation of application No. 10/292,384, filed on Nov. 8, 2002, now Pat. No. 6,753,826.

(60) Provisional application No. 60/345,412, filed on Nov. 9, 2001.

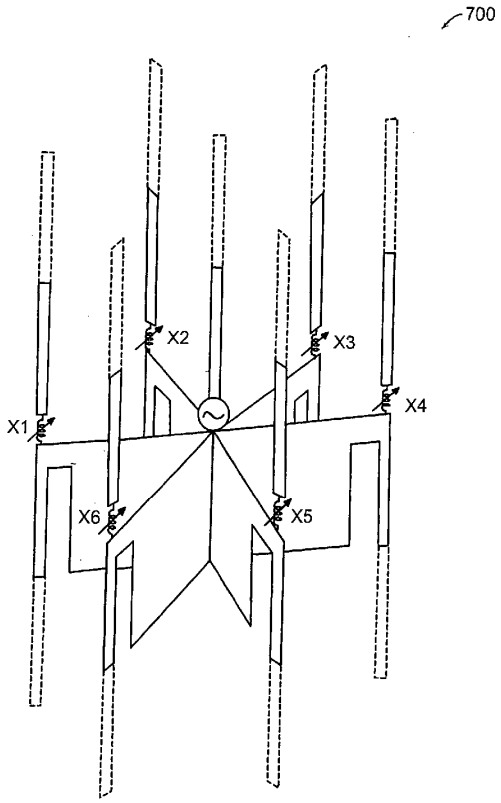
Publication Classification

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

(52) **U.S. Cl.** **343/834**; 343/833; 343/819

(57) **ABSTRACT**

A directive antenna operable in multiple frequency bands includes a ground plate, an active antenna electrically coupled to the ground plate, and at least one passive antenna, coupled to the ground plate via either a first or second reactive component. When the at least one passive antenna is coupled to the ground plate via the first reactive component, an effective length of the at least one passive antenna is increased. When the at least one passive antenna is connected to the ground plate via the second reactive component, an effective length of the at least one passive antenna is decreased.



US 20070182658A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0182658 A1**

Ozden (43) **Pub. Date: Aug. 9, 2007**

(54) **LOOP ANTENNA WITH A PARASITIC RADIATOR**

(75) Inventor: **Sinasi Ozden**, Copenhagen (DK)

Correspondence Address:
HARRINGTON & SMITH, PC
4 RESEARCH DRIVE
SHELTON, CT 06484-6212 (US)

(73) Assignee: **Nokia Corporation**

(21) Appl. No.: **11/350,155**

(22) Filed: **Feb. 7, 2006**

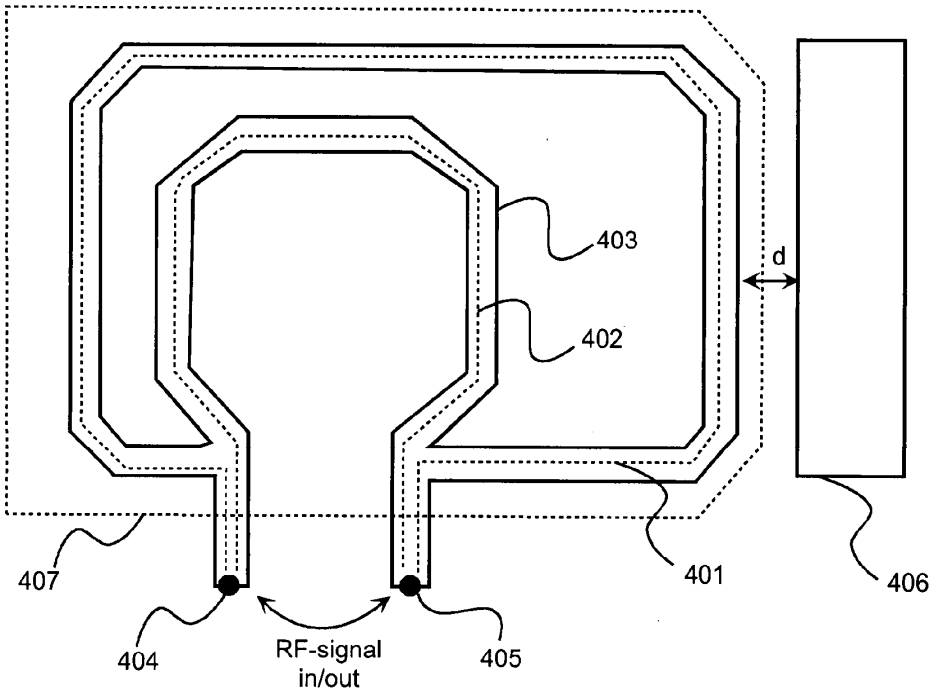
Publication Classification

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

(52) **U.S. Cl.** **343/866**; 343/867

(57) **ABSTRACT**

It is an objective of the present invention to provide an antenna construction that allows the thickness of an antenna structure be lower than that of planar antennas according to prior art without sacrificing the radiation efficiency at the desired RF-bands as 900 MHz GSM and 1800 MHz/1900 MHz DCS/PCS. A further object of the invention is to provide an antenna construction that is insensitive to changes in positions of electrically conductive objects in the vicinity. The objectives of the invention are achieved by a loop antenna structure equipped with an electrically conductive parasitic radiator that is electro-magnetically coupled with the antenna loop. Performance at the DCS/PCS bands can be further improved by using an electrically conductive tuner element that provides a stronger electromagnetic coupling between the antenna loop and the parasitic radiator.



US 20070183133A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0183133 A1

Buij et al. (43) Pub. Date: Aug. 9, 2007

(54) **MAINS WIRE ANTENNA FOR WIRELESS INTERFACE APPLICATIONS**

(75) Inventors: **Arnold Willem Buij**, Eindhoven (NL); **Marcel Beij**, Eindhoven (NL); **Johannes Hendrik Wessels**, Eindhoven (NL)

Correspondence Address:
PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510 (US)

(73) Assignee: **KONINKLIJKE PHILIPS ELECTRONICS, N.V.**, EINDHOVEN (NL)

(21) Appl. No.: **10/599,844**

(22) PCT Filed: **Apr. 12, 2005**

(86) PCT No.: **PCT/IB05/51199**

§ 371(c)(1),
(2), (4) Date: **Oct. 11, 2006**

(30) **Foreign Application Priority Data**

Apr. 15, 2004 (EP) 04101557.9

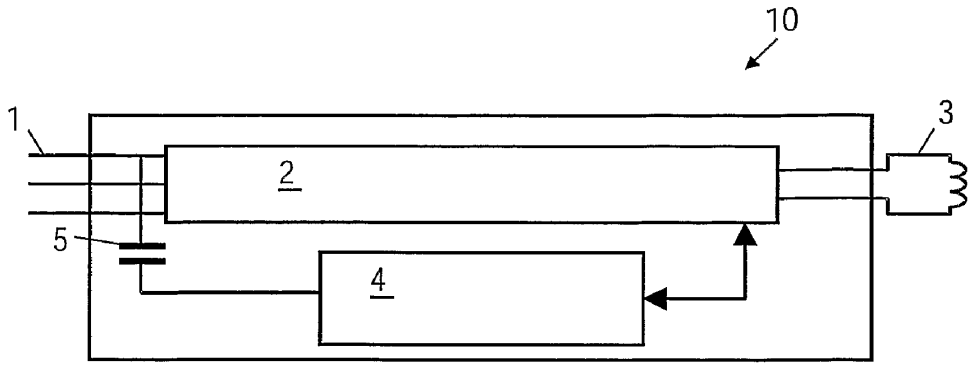
Publication Classification

(51) **Int. Cl.**
F21V 33/00 (2006.01)

(52) **U.S. Cl.** **362/85**

(57) **ABSTRACT**

The present invention deals with wireless control of a lamp such as a fluorescent lamp controlled by a ballast with a wireless control interface for RF communication. The receiver input and the transmitter output of the control interface module are connected to one or more mains wires by means of (a) coupling capacitor(s) or a Lecher line transformer. During operation the one or more mains wires serve as the lamp antenna.



US 20070188314A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0188314 A1

Shimura (43) Pub. Date: Aug. 16, 2007

(54) ANTENNA DEVICE

(76) Inventor: **Kazuhiro Shimura**, Kanagawa-ken (JP)

Correspondence Address:
GREER, BURNS & CRAIN
300 S WACKER DR
25TH FLOOR
CHICAGO, IL 60606 (US)

(21) Appl. No.: **10/590,559**

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

(86) PCT No.: **PCT/JP05/04624**

§ 371(c)(1),
(2), (4) Date: **Aug. 24, 2006**

(30) **Foreign Application Priority Data**

Mar. 17, 2004 (JP) JP2004-075782

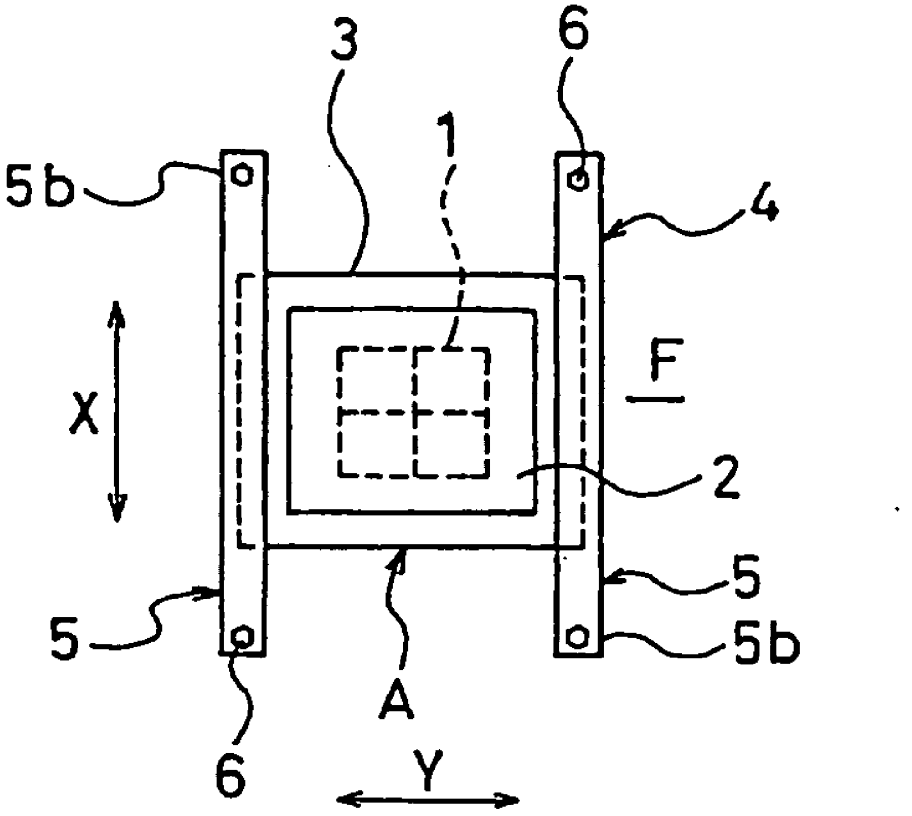
Publication Classification

(51) **Int. Cl.**
B60C 23/00 (2006.01)

(52) **U.S. Cl.** **340/447**

(57) **ABSTRACT**

An antenna device having an antenna to be mounted on the body side of a vehicle for receiving a radio signal from a tire condition detection device mounted on a tire side, or giving and receiving a radio signal between the tire condition detection device and a device mounted on the vehicle body side. The antenna device includes attachment means with which the antenna can be temporarily attached, moved and securely attached to the vehicle body side.



US 20070188383A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0188383 A1

Onaka et al. (43) Pub. Date: Aug. 16, 2007

(54) ANTENNA AND PORTABLE RADIO COMMUNICATION APPARATUS

(75) Inventors: **Kengo Onaka**, Kanagawa-ken (JP); **Jin Sato**, Kanagawa-ken (JP); **Takashi Ishihara**, Tokyo-to (JP); **Shoji Nagumo**, Kanagawa-ken (JP); **Kazunari Kawahata**, Tokyo-to (JP)

Correspondence Address:
MURATA MANUFACTURING COMPANY, LTD.
C/O KEATING & BENNETT, LLP
8180 GREENSBORO DRIVE
SUITE 850
MCLEAN, VA 22102 (US)

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

(21) Appl. No.: **10/598,893**

(22) PCT Filed: **Jan. 27, 2005**

(86) PCT No.: **PCT/JP05/01075**

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

(30) **Foreign Application Priority Data**

Apr. 27, 2004 (JP) 2004-132033

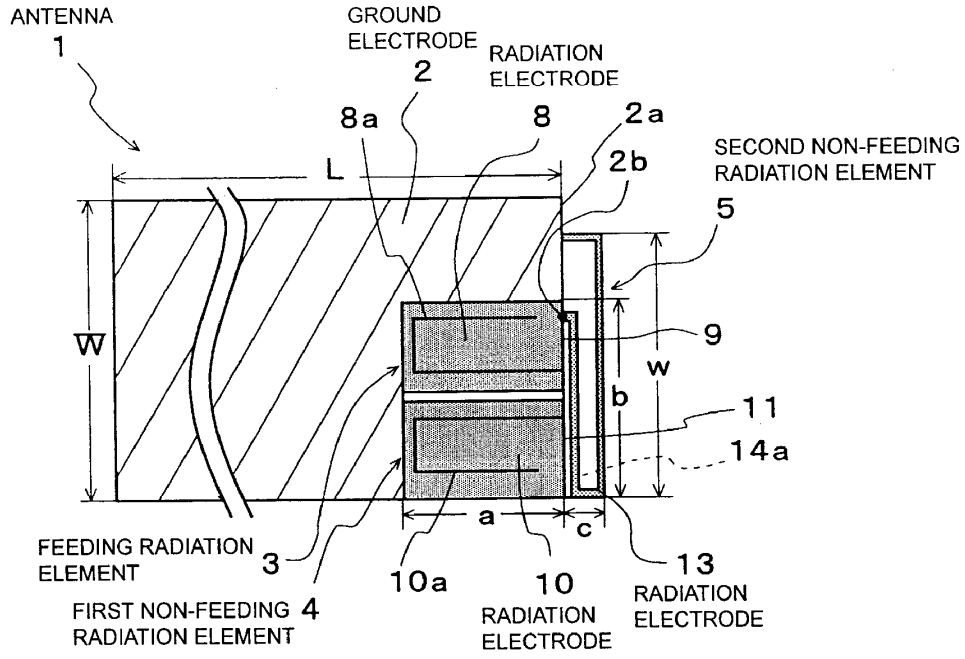
Publication Classification

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

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

(57) **ABSTRACT**

In an antenna, a feeding radiation element and a first non-feeding radiation element that are loaded with dielectric substances are provided on a ground electrode, and a second non-feeding radiation element is disposed such that substantially the entire second non-feeding radiation element projects outside from a desired side of the ground electrode. More specifically, each of the three electrode elements is loaded with a dielectric substance, and a radiation electrode of the second non-feeding radiation element is electrically connected at a substantially central location of the desired side of the ground electrode via a connection wire.



US 20070188384A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0188384 A1**

Liu (43) **Pub. Date: Aug. 16, 2007**

(54) **CO-CONSTRUCTION WITH ANTENNA AND EMI SHIELD**

(75) Inventor: **I-Ru Liu**, Taipei City (TW)

Correspondence Address:
BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747 (US)

(73) Assignee: **Accton Technology Corporation**

(21) Appl. No.: **11/353,037**

(22) Filed: **Feb. 14, 2006**

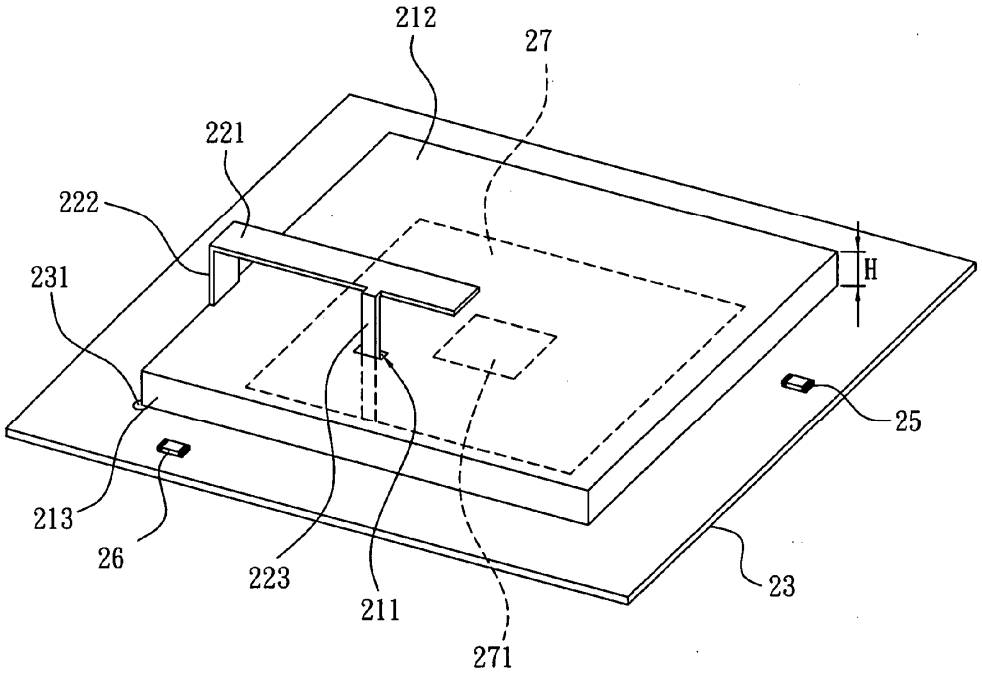
Publication Classification

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

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

(57) **ABSTRACT**

A co-construction with an antenna function and an EMI shielding function is electrically connected with a printed circuit board (PCB). A radio frequency circuit having a high frequency element is disposed on the PCB. The co-construction includes a shield and a first antenna. The shield has a first hole. The first antenna has a first radiator, a first ground point and a first feeding point. The first ground point is electrically connected to the first radiator and shield respectively. The first feeding point extends from one side of the first radiator and passes through the shield via the first hole to electrically connect to the radio frequency circuit of the PCB.



US 20070188386A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0188386 A1**

Cheng (43) **Pub. Date: Aug. 16, 2007**

(54) **SOLID FLAT ANTENNA**

(75) Inventor: **Shih-Chieh Cheng**, Tainan County (TW)

Correspondence Address:
BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747 (US)

(73) Assignee: **Arcadyan Tehnology Corporation**

(21) Appl. No.: **11/407,197**

(22) Filed: **Apr. 20, 2006**

(30) **Foreign Application Priority Data**

Feb. 10, 2006 (TW)..... 095104547

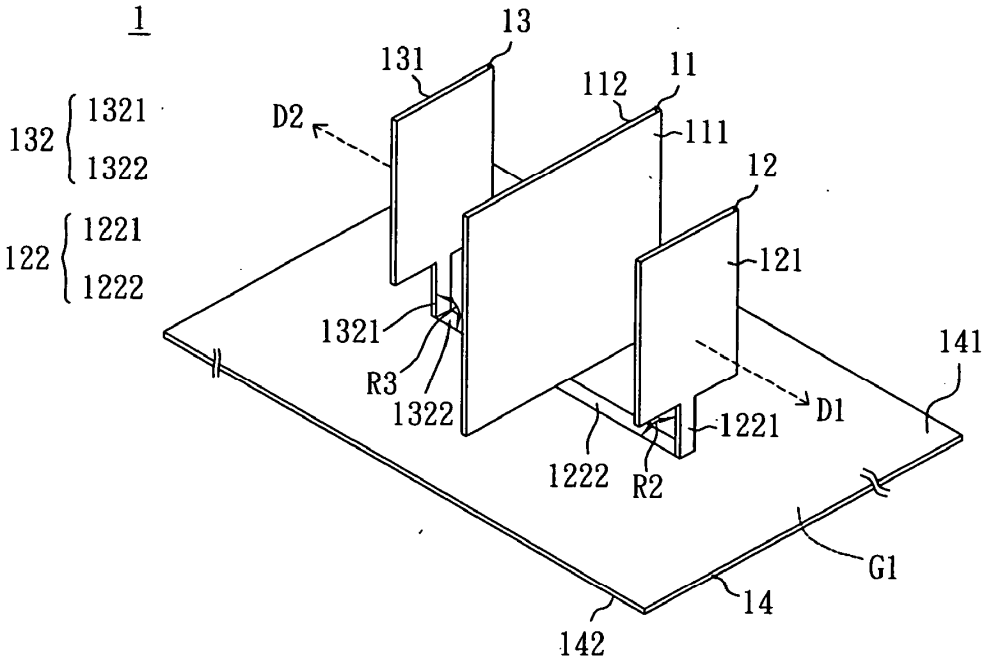
Publication Classification

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

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

(57) **ABSTRACT**

A solid flat antenna includes a reflecting unit, a first radiating unit and a second radiating unit. The reflecting unit has a first reflecting surface and a second reflecting surface. The first radiating unit, which has a first radiating portion and a first electrically connecting portion, is disposed opposite to the first reflecting surface, and one end of the first electrically connecting portion is electrically connected with the first radiating portion, which is disposed parallel to the first reflecting surface approximately. The second radiating unit, which has a second radiating portion and a second electrically connecting portion, is disposed opposite to the second reflecting surface, and one end of the second electrically connecting portion is electrically connected with the second radiating portion, which is disposed parallel to the second reflecting surface approximately. The other ends of the second electrically connecting portion and the first electrically connecting portion are electrically connected.



US 20070188387A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0188387 A1

Kerslaers (43) Pub. Date: Aug. 16, 2007

(54) **DEVICE COMPRISING AN ANTENNA FOR EXCHANGING RADIO FREQUENCY SIGNALS**

(75) Inventor: **Anthony Kerslaers**, Leuven (BE)

Correspondence Address:
PHILIPS INTELLECTUAL PROPERTY & STANDARDS
P.O. BOX 3001
BRIARCLIFF MANOR, NY 10510 (US)

(73) Assignee: **KONINKLIJKE PHILIPS ELECTRONICS, N.V.**, EINDHOVEN (NL)

(21) Appl. No.: **11/568,720**

(22) PCT Filed: **May 9, 2005**

(86) PCT No.: **PCT/IB05/51492**

§ 371(c)(1),
(2), (4) Date: **Nov. 6, 2006**

(30) **Foreign Application Priority Data**

May 12, 2004 (EP) 04102048.8

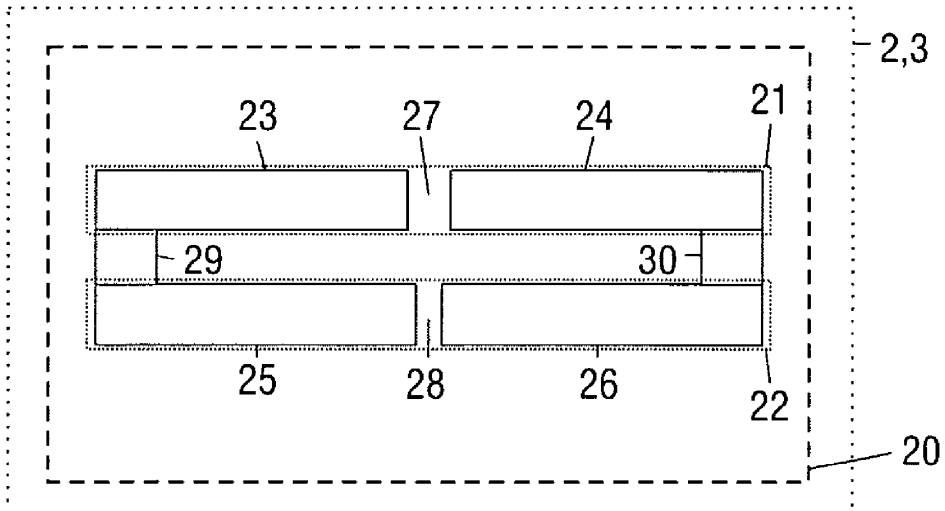
Publication Classification

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

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

(57) **ABSTRACT**

Relatively small omnidirectional antennas (**2,3**) with sufficient antenna impedance for exchanging radio frequency signals are provided with two parallel elements (**21,22**) coupled to each other via their outer ends. Each element (**21,22**) comprises two subelements (**23,24,25,26**) separated by a gap (**27,28**). The elements (**21,22**) have lengths smaller than half the wavelength of the radio frequency signals. The antennas (**2,3**) do not need to be operated against a ground surface, and can be used in a non-horizontal position. The elements (**21,22**) are planar elements. The antennas (**2,3**) further comprise two further elements (**41,42**) located in a plane parallel to a plane of the elements (**21,22**). This increases the impedance and improves the return loss of the antennas (**2,3**). One of the further elements (**41**) comprises two sub-elements (**43,44**) separated by a gap (**47**), to realise a simulated return loss with one dip. Alternatively, the other further element (**42**) comprises a gap, to realise a simulated return loss with two dips for dual-band environment.



US 20070188388A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0188388 A1**

Feng et al. (43) **Pub. Date: Aug. 16, 2007**

(54) **MULTIBAND ANTENNA AND MULTIBAND ANTENNA SYSTEM**

(75) Inventors: **Zheng He Feng**, Beijing (CN); **Peng Sun**, Columbus, OH (US)

Correspondence Address:
NDQ&M WATCHSTONE LLP
1300 EYE STREET, NW
SUITE 1000 WEST TOWER
WASHINGTON, DC 20005 (US)

(73) Assignee: **Sanyo Electric Co., Ltd.**, Moriguchi-city (JP)

(21) Appl. No.: **11/638,458**

(22) Filed: **Dec. 14, 2006**

(30) **Foreign Application Priority Data**

Dec. 14, 2005 (CN) CN200510129644.1

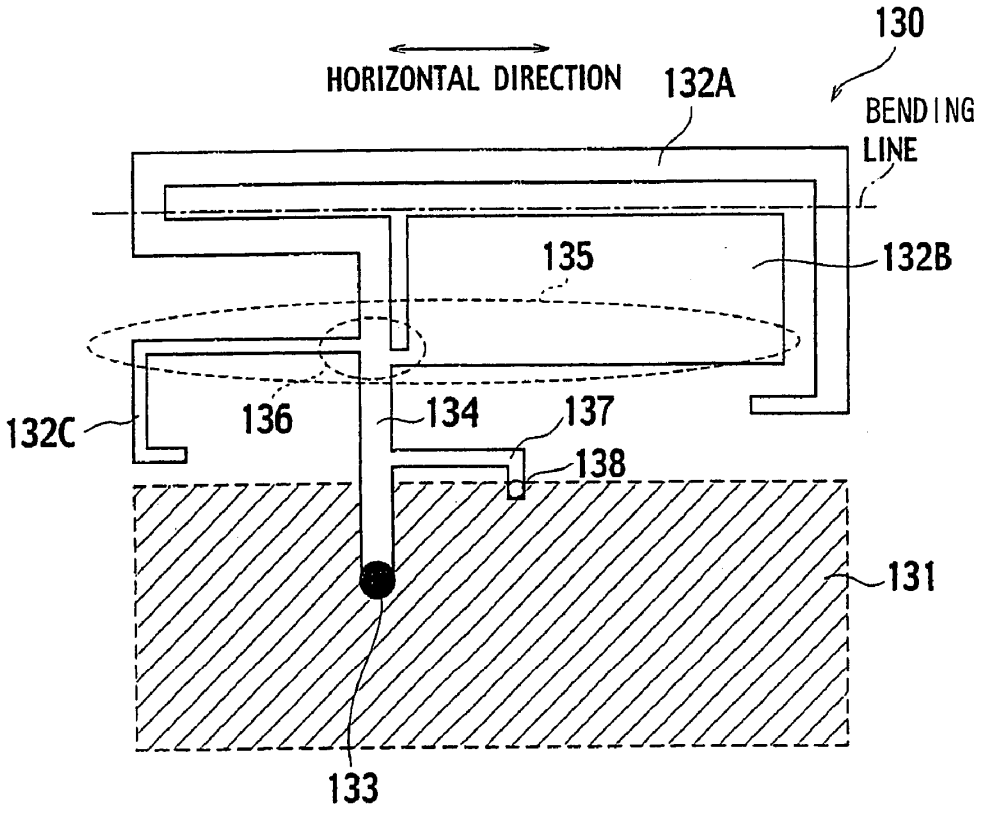
Publication Classification

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

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

(57) **ABSTRACT**

A multiband antenna includes an antenna portion having a front surface and a back surface and a ground plane located adjacent to the antenna portion. The multiband antenna includes a front surface side element arranged on the front surface side and connected to a feeding point. The back surface side element arranged on the back surface side and connected to the ground plane.



US 20070188389A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0188389 A1**

Pintos et al. (43) **Pub. Date: Aug. 16, 2007**

(54) **ELECTROMAGNETIC WAVE RECEPTION AND DECODING SYSTEM PROVIDED WITH A COMPACT ANTENNA**

(75) Inventors: **Jean-Francois Pintos**, Bourgbarre (FR); **Jean-Luc Robert**, Betton (FR); **Philippe Minaro**, Medard Sur Ille (FR); **Ali Louzir**, Rennes (FR)

Correspondence Address:
JOSEPH J. LAKS, VICE PRESIDENT
THOMSON LICENSING LLC
PATENT OPERATIONS
PO BOX 5312
PRINCETON, NJ 08543-5312 (US)

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

(21) Appl. No.: **10/593,222**

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

(86) PCT No.: **PCT/EP05/51175**

§ 371(c)(1),
(2), (4) Date: **Sep. 18, 2006**

(30) **Foreign Application Priority Data**

Mar. 22, 2004 (FR) 04/02955

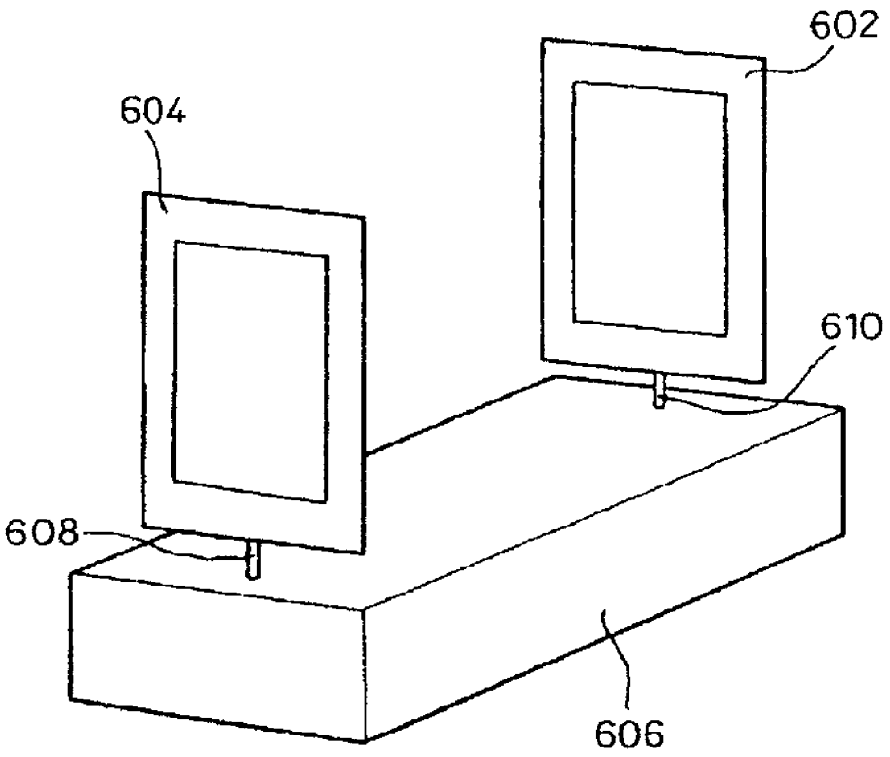
Publication Classification

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

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

(57) **ABSTRACT**

The invention relates to a data transmission system comprising an antenna provided with a monopole radiating element held in place by an earth plane provided with a conducting surface. According to the invention, the radiating element is located facing the surface of the earth plane so as to interact with the latter in order to improve its performance.



US 20070188391A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0188391 A1**

Tu et al. (43) **Pub. Date: Aug. 16, 2007**

(54) **INTERNAL ANTENNA AND MOTHERBOARD ARCHITECTURE**

(75) Inventors: **Jerome Tu**, Saratoga, CA (US); **Weiping Dou**, San Jose, CA (US)

Correspondence Address:
KACVINSKY LLC
C/O INTELLEVATE
P.O. BOX 52050
MINNEAPOLIS, MN 55402 (US)

(73) Assignee: **PALM, INC.**

(21) Appl. No.: **11/355,159**

(22) Filed: **Feb. 14, 2006**

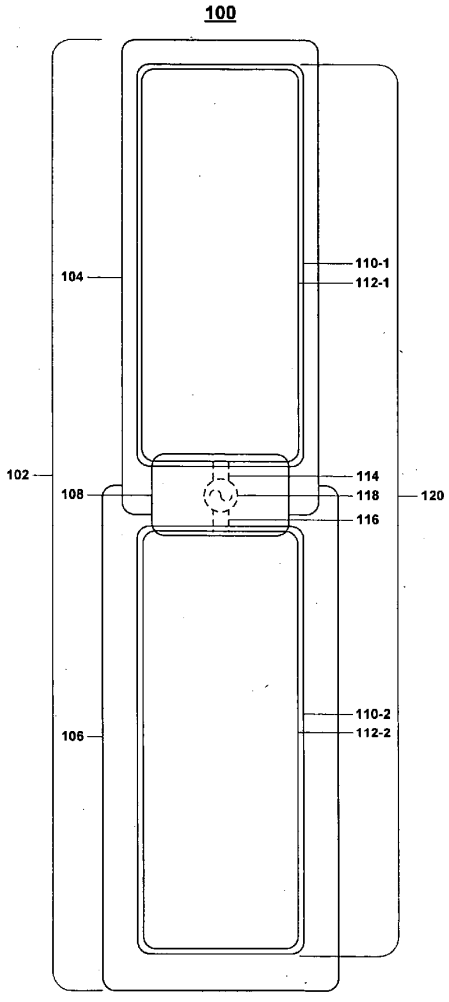
Publication Classification

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

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

(57) **ABSTRACT**

Various embodiments of an internal antenna and motherboard architecture are described. In one embodiment, a wireless device may include a housing enclosing a first motherboard and a second motherboard. The ground plane of the first motherboard may be coupled to the ground plane of the second motherboard within the housing. The first motherboard and the second motherboard may act as an internal antenna system for the wireless device. Other embodiments are described and claimed.



US 20070188392A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0188392 A1

Kanazawa et al. (43) Pub. Date: Aug. 16, 2007

(54) ANTENNA APPARATUS AND RADIO COMMUNICATION APPARATUS

(75) Inventors: **Masaru Kanazawa**, Kawasaki (JP); **Shin Watanabe**, Kawasaki (JP)

Correspondence Address:
KATTEN MUCHIN ROSENMAN LLP
575 MADISON AVENUE
NEW YORK, NY 10022-2585 (US)

(73) Assignee: **FUJITSU LIMITED**

(21) Appl. No.: **11/439,462**

(22) Filed: **May 23, 2006**

(30) **Foreign Application Priority Data**

Feb. 15, 2006 (JP) 2006-037404

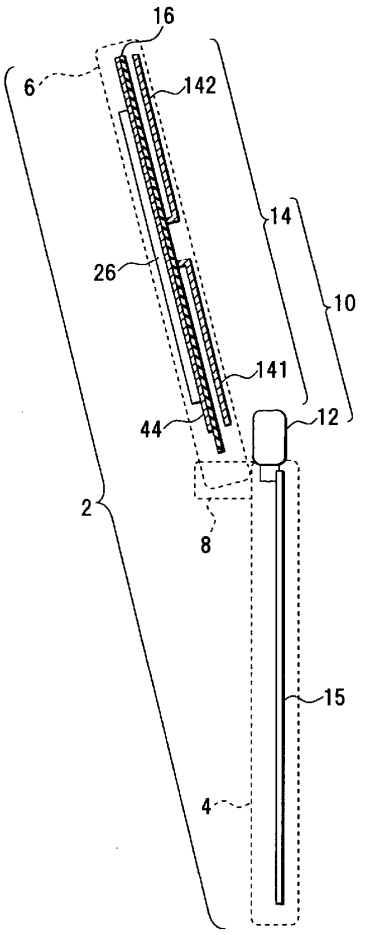
Publication Classification

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

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

(57) **ABSTRACT**

The present invention relates to an antenna apparatus corresponding to a plurality of multi-bands, etc. and makes a plurality of radio communication frequencies easily changed or set. The present invention includes a passive element composed of a plurality of element units (elements **141, 142, 143**) linked with a switching element (PIN diode) between the element units, and since the operating frequency of the passive element is switched by opening and closing the switching element and the passive element acts as a waveguide element, a radiation pattern can be acquired by the passive element and the effect of a human body is reduced on the radiant efficiency.



US 20070188394A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0188394 A1

Wangsvick et al. (43) Pub. Date: Aug. 16, 2007

(54) COMPACT BROADBAND ANTENNA

(76) Inventors: **Chad M. Wangsvick**, Tucson, AZ (US); **Gary M. Salvail**, Camarillo, CA (US); **Joseph A. Robson**, Tucson, AZ (US)

Correspondence Address:
THOMAS J. FINN, ESQ.
RAYTHEON COMPANY, EO/E4/N119
2000 E. EL SEGUNDO BLVD.
P.O. BOX 902
EL SEGUNDO, CA 90245-0902 (US)

(21) Appl. No.: **10/838,549**

(22) Filed: **May 4, 2004**

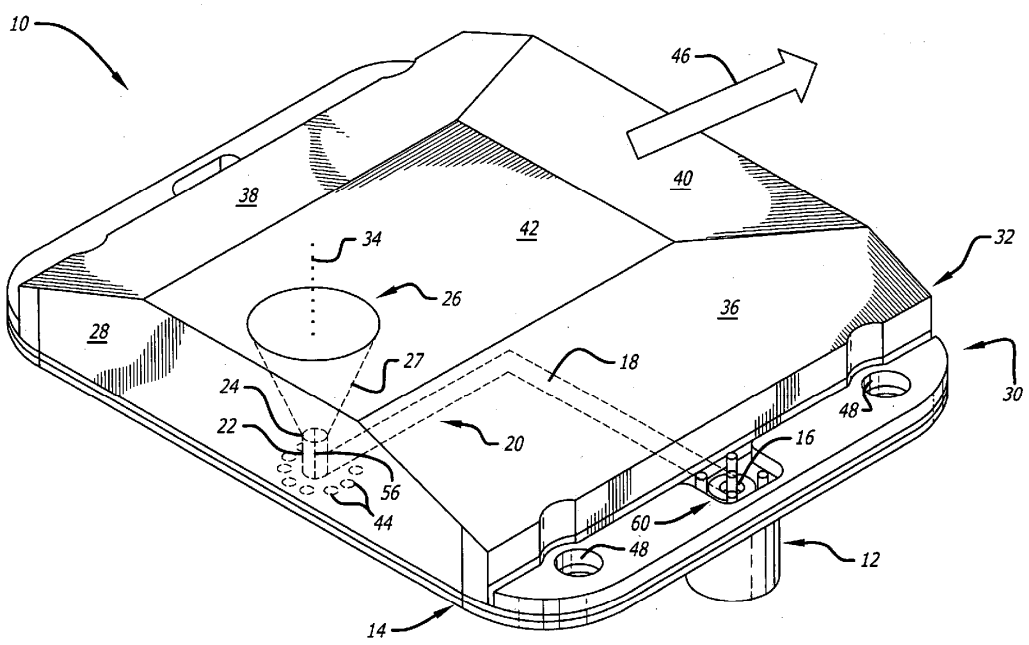
Publication Classification

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

(52) **U.S. Cl.** **343/775**; 343/786

(57) **ABSTRACT**

A compact broadband antenna. The antenna includes a first mechanism for receiving input electromagnetic energy. A second mechanism provides radiated electromagnetic energy upon receipt of the input electromagnetic energy. The radiated electromagnetic energy is provided via an antenna element having one or more angled surfaces. A third mechanism directs the radiated electromagnetic energy in a specific direction. In a more specific embodiment, the third mechanism includes a reflective backstop that is selectively positioned behind the second mechanism to reflect back-radiated energy forward of the second mechanism, thereby causing reflected electromagnetic energy to combine in phase with forward-radiated energy from the second mechanism. The third mechanism further includes plural layers of dielectric material. One or more of the plural layers of dielectric material partially surround an angled radiating surface of the second mechanism, which is implemented via a substantially conical transmit element in the specific embodiment.



US 20070188399A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0188399 A1**

Rickenbrock (43) **Pub. Date: Aug. 16, 2007**

(54) **DIPOLE ANTENNA**

(75) Inventor: **Marc Rickenbrock**, Halver (DE)

Correspondence Address:
K.F. ROSS P.C.
5683 RIVERDALE AVENUE, SUITE 203 BOX 900
BRONX, NY 10471-0900

(73) Assignee: **LUMBERG CONNECT GMBH & CO KG**

(21) Appl. No.: **11/704,157**

(22) Filed: **Feb. 8, 2007**

(30) **Foreign Application Priority Data**

Feb. 10, 2006 (DE) 102006006144.6

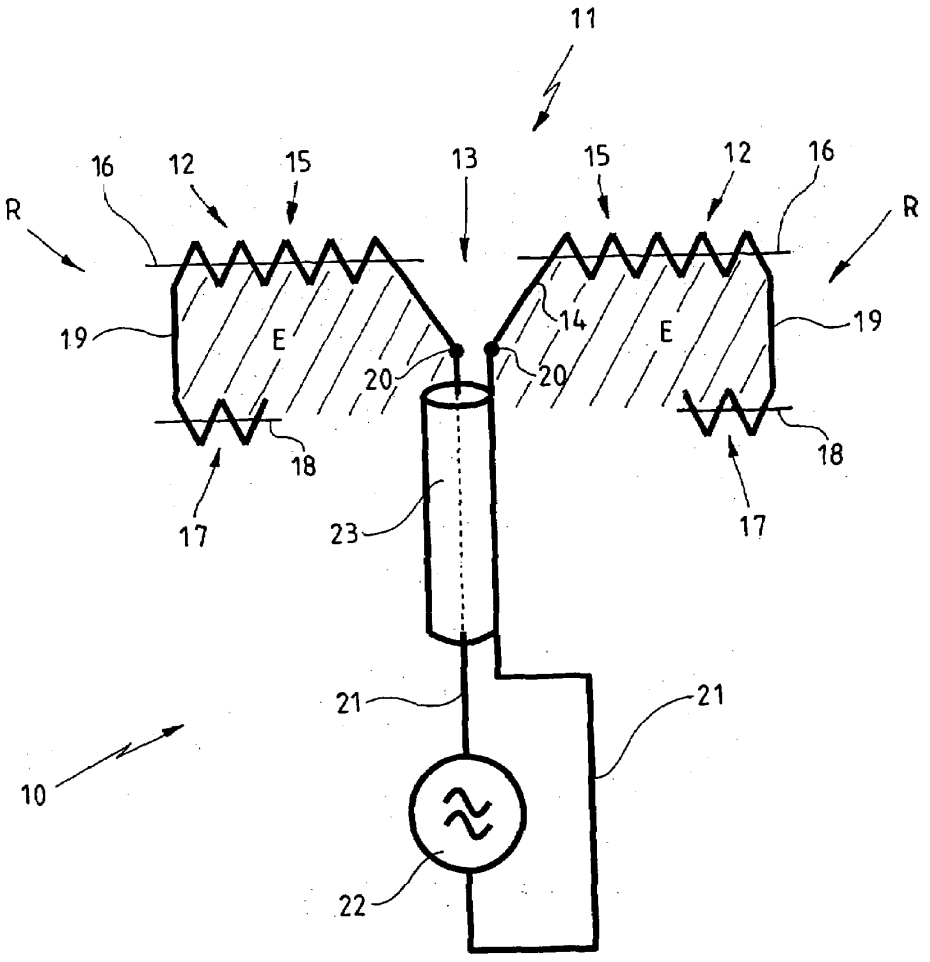
Publication Classification

(51) **Int. Cl.**
H01Q 9/26 (2006.01)

(52) **U.S. Cl.** **343/803**

(57) **ABSTRACT**

A conductor for use as a radiator in an antenna has a contact section adapted to connect to a high-frequency source, a first section of alternating shape extending along a first longitudinal axis from an inner end at the contact section to an outer end, and a second section of alternating shape extending along a second longitudinal axis generally coplanar with and parallel to the first axis from the first-section outer end toward the contact section. It can also have a third section of alternating shape extending along a third longitudinal axis generally coplanar with and parallel to the first and second axes from the contact section and having an outer end flanked by the first and second sections.



US 20070188400A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0188400 A1**

Fujita (43) **Pub. Date: Aug. 16, 2007**

(54) **CORNER REFLECTOR ANTENNA WITH GROUND PLATE**

(76) Inventor: **Mutsuo Fujita**, Kitamoto-shi (JP)

Correspondence Address:
BACON & THOMAS, PLLC
625 SLATERS LANE, FOURTH FLOOR
ALEXANDRIA, VA 22314

(21) Appl. No.: **11/705,751**

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

(30) **Foreign Application Priority Data**

Feb. 14, 2006 (JP) 2006-036700
Oct. 31, 2006 (JP) 2006-297097

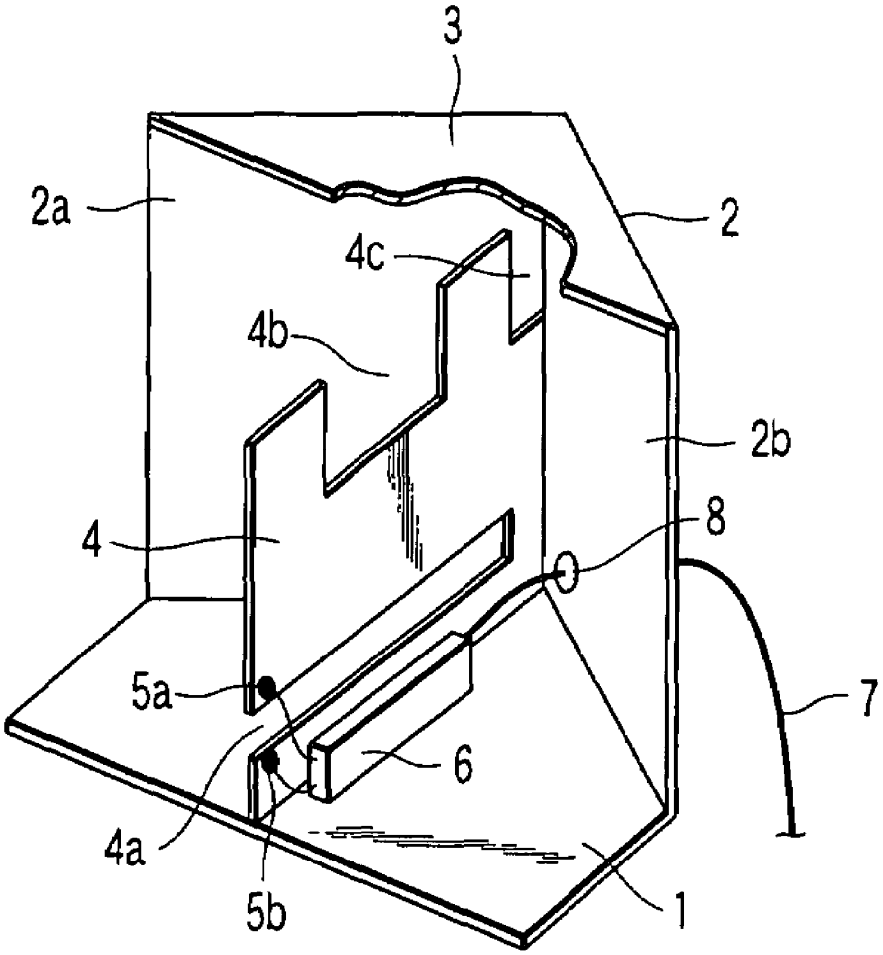
Publication Classification

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

(52) **U.S. Cl.** ..... **343/834**; 343/700 MS

(57) **ABSTRACT**

A corner reflector antenna includes a ground plate having a main surface, a reflector including a rectangular first metal plate and a rectangular second metal plate which are perpendicularly provided on the main surface of the ground plate, the first and second metal plates being combined together to form a prescribed angle, a radiator including a rectangular third metal plate perpendicularly provided on the main surface, at a position where the angle is divided in half, the third metal plate including a first edge which is opposite the main surface, the first edge having a plurality of first cutouts, and a second edge which is opposite the reflector, the second edge having a second cutout extending toward the reflector, and a first feeding point and a second feeding point provided on respective sides of the second cutout on the third metal plate in the vicinity of the second edge.



US 20070188402A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0188402 A1

Knudsen et al. (43) Pub. Date: Aug. 16, 2007

(54) **LOOP ANTENNA FOR IN THE EAR AUDIO DEVICE**

(75) Inventors: **Ove Knudsen**, Smorum (DK); **Kare Tais Christensen**, Smorum (DK)

Correspondence Address:
BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747 (US)

(73) Assignee: **OTICON A/S**, Smorum (DK)

(21) Appl. No.: **11/657,447**

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

(30) **Foreign Application Priority Data**

Feb. 15, 2006 (EP) 06 101 703.4

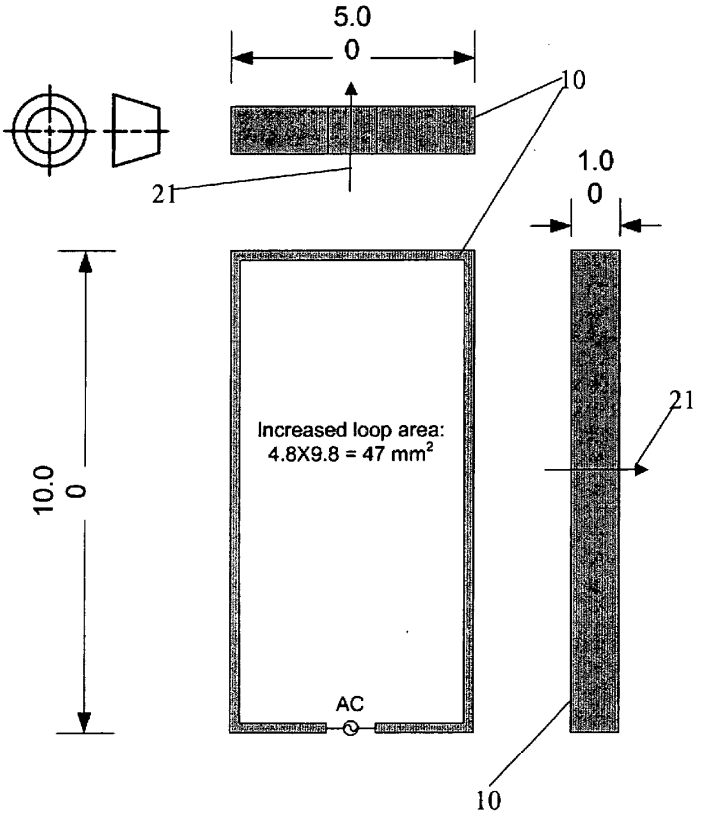
Publication Classification

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

(52) **U.S. Cl.** **343/866**; 343/702; 343/718

(57) **ABSTRACT**

The invention regards a communication device which is adapted for placement in a users ear and comprises a shell part enclosing an input transducer for receiving an input signal, a signal processing device and an output transducer for providing a signal perceivable as sound, a battery located at a surface part of the shell which is facing away from the head of the user, a transmission and reception circuit for transmission and/or reception of electromagnetic energy, and where an antenna for radiating and/or receiving electromagnetic energy is arranged with a first surface turned towards the surroundings and a second surface located in close proximity of the battery whereby the antenna forms a loop with a loop axis pointing away from the ear and head, whereby the loop material has a wider extension in the direction of the loop axis than in the direction perpendicular to the loop axis.



US 20070189325A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0189325 A1**

Hoffmann et al. (43) **Pub. Date: Aug. 16, 2007**

(54) **METHOD AND APPARATUS FOR ANTENNA STEERING FOR WLAN**

(75) Inventors: **John E. Hoffmann**, Indialantic, FL (US); **George Rodney Nelson JR.**, Merritt Island, FL (US); **John A. Regnier**, Palm Bay, FL (US); **Kevin P. Johnson**, Palm Bay, FL (US)

Correspondence Address:
VOLPE AND KOENIG, P.C.
DEPT. ICC
UNITED PLAZA, SUITE 1600
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103 (US)

(73) Assignee: **IPR Licensing, Inc.**, Wilmington, DE (US)

(21) Appl. No.: **11/784,651**

(22) Filed: **Apr. 9, 2007**

Related U.S. Application Data

(63) Continuation of application No. 10/675,563, filed on Sep. 30, 2003, now Pat. No. 7,212,499.

(60) Provisional application No. 60/414,946, filed on Sep. 30, 2002.

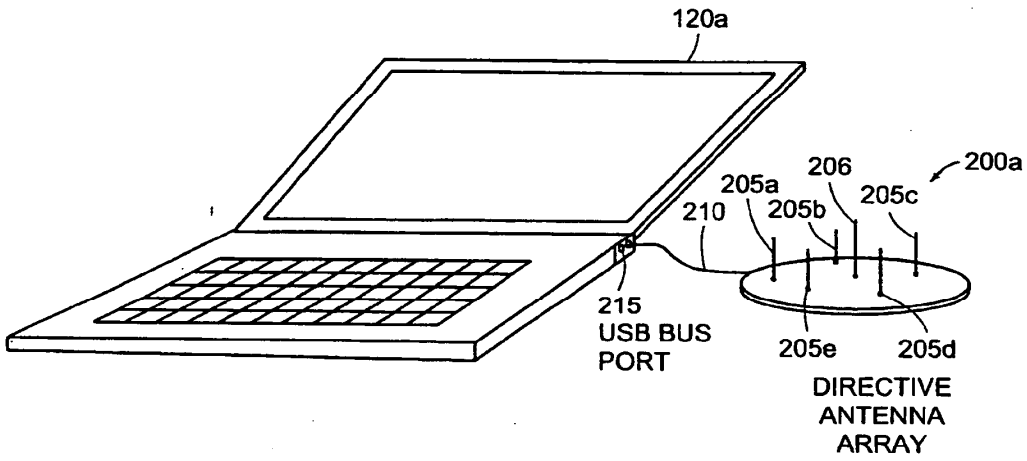
Publication Classification

(51) **Int. Cl.**
H04J 15/00 (2006.01)

(52) **U.S. Cl.** **370/464**

(57) **ABSTRACT**

A Station Management Entity (SME) steers a directional antenna for a station to communicate with an Access Point (AP) in an 802.11 protocol system. The SME can steer the antenna before or after an 802.11 station has authenticated and associated with the Access Point. During a passive scan, the steering process cycles through the available antenna positions and monitors an AP beacon signal to determine a best position based on, for example, a Received Signal Strength Indication (RSSI). During an active scan where access probing is used, the steering process cycles through the antenna positions and monitors a probe response to determine the best antenna position. Additional scans may be performed based on a decision that the received signal level of the currently selected antenna position has dropped below a predetermined threshold.



US 20070194427A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0194427 A1

Choi et al. (43) Pub. Date: Aug. 23, 2007

(54) SEMICONDUCTOR PACKAGE INCLUDING TRANSFORMER OR ANTENNA

(76) Inventors: **Yun-Seok Choi**, Hwaseong-si (KR); **Hee-Seok Lee**, Hwaseong-si (KR)

Correspondence Address:
VOLENTINE & WHITT PLLC
ONE FREEDOM SQUARE, 11951 FREEDOM DRIVE SUITE 1260
RESTON, VA 20190

(21) Appl. No.: **11/541,779**

(22) Filed: **Oct. 3, 2006**

(30) **Foreign Application Priority Data**

Feb. 23, 2006 (KR) 2006-0017903

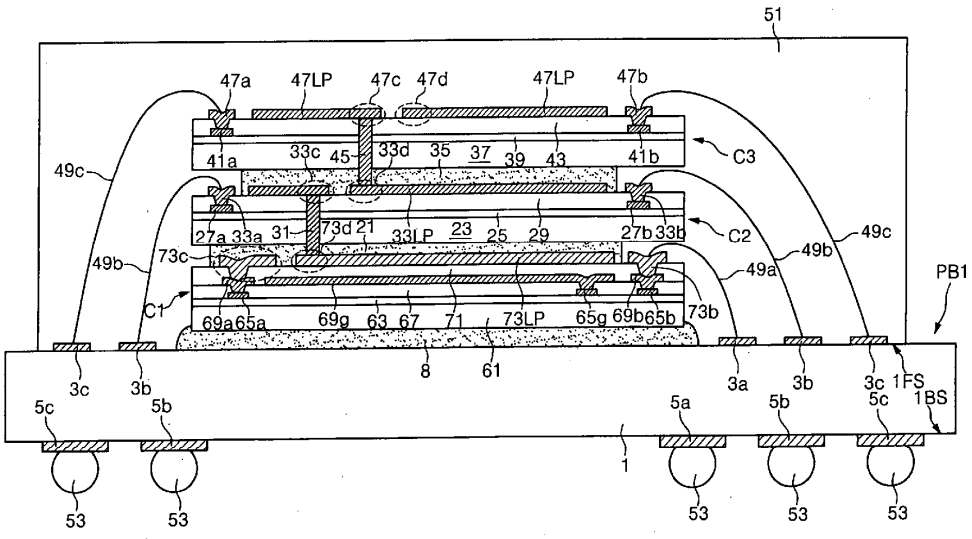
Publication Classification

(51) **Int. Cl.**
H01L 23/02 (2006.01)

(52) **U.S. Cl.** **257/686**

(57) **ABSTRACT**

A semiconductor package comprises a package board and a plurality of semiconductor chips sequentially stacked on the package board. Each of the semiconductor chips comprises a semiconductor substrate and an open loop-shaped chip line formed on the semiconductor substrate. The open loop-shaped chip line has first and second end portions. The first and second end portions of the open loop-shaped chip lines are electrically connected to each other by connectors, and the connectors and the open loop-shaped chip lines constitute a spiral antenna.



US 20070194989A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0194989 A1**

Tsai et al. (43) **Pub. Date: Aug. 23, 2007**

(54) **PLANAR ANTENNA HAVING A WIDE OPERATING BANDWIDTH**

(75) Inventors: **Tiao-Hsing Tsai**, Yungho City (TW); **Chieh-Ping Chiu**, Yunlin Shien (TW); **Chih-Wei Liao**, Yilan Shien (TW)

Correspondence Address:
LADAS & PARRY
Suite 2100
5670 Wilshire Boulevard
Los Angeles, CA 90036-5679 (US)

(73) Assignee: **Quanta Computer Inc.**

(21) Appl. No.: **11/486,258**

(22) Filed: **Jul. 12, 2006**

(30) **Foreign Application Priority Data**

Feb. 17, 2006 (TW)..... 095105414

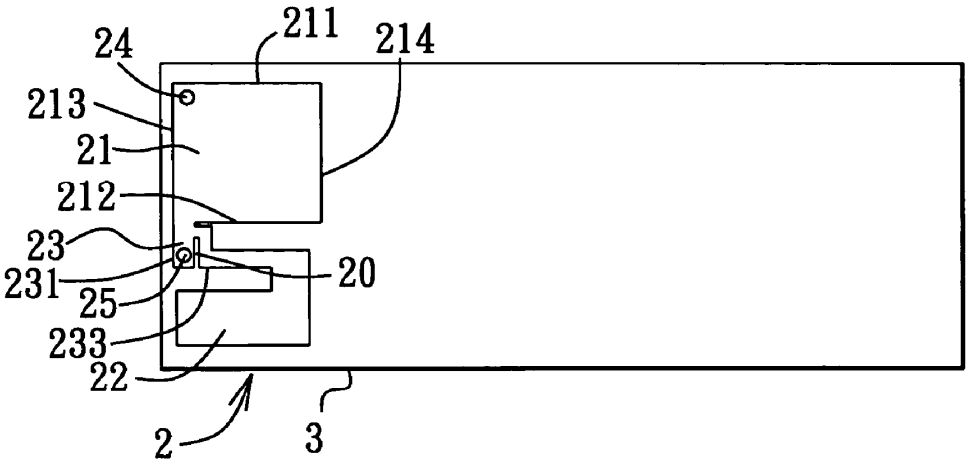
Publication Classification

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

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

(57) **ABSTRACT**

A planar antenna includes a high frequency radiating element, a meandering low frequency radiating element, and an interconnecting element. The low frequency radiating element has an operating bandwidth which is lower than that of the high frequency radiating element. The interconnecting element interconnects the high frequency radiating element and the low frequency radiating element. A feeding point is provided on the high frequency radiating element and is distal from the interconnecting element. A grounding point is provided on either the interconnecting element, or the high frequency radiating element proximate to the interconnecting element.



US 20070194990A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0194990 A1**

Ling et al. (43) **Pub. Date: Aug. 23, 2007**

(54) **MONOPOLE ANTENNA FOR ULTRAWIDEBAND APPLICATIONS**

(76) Inventors: **Ching-Wei Ling**, Taipei (TW); **Shyh-Jong Chung**, Taipei (TW); **Wen Hsin Lo**, Taipei (TW)

Correspondence Address:
CHRISTIE, PARKER & HALE, LLP
PO BOX 7068
PASADENA, CA 91109-7068 (US)

(21) Appl. No.: **11/516,168**

(22) Filed: **Sep. 5, 2006**

Related U.S. Application Data

(60) Provisional application No. 60/713,777, filed on Sep. 2, 2005.

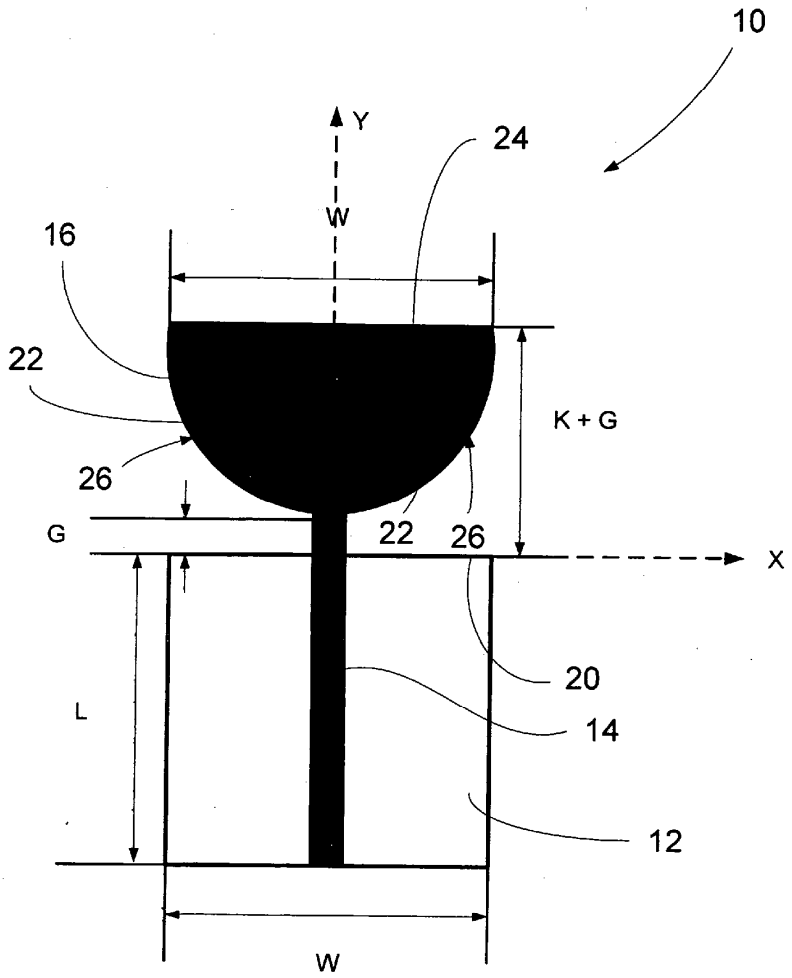
Publication Classification

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

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

(57) **ABSTRACT**

An ultra wideband antenna includes a substrate, a transmission line coupled to the substrate, and a radiating element coupled to the transmission line at a distance from the substrate and being symmetric about the transmission line. An outer edge of the radiating element has a shape defined by a binomial function.



US 20070194995A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0194995 A1

Fang et al. (43) Pub. Date: Aug. 23, 2007

(54) ANTENNA APPARATUS AND MOBILE COMMUNICATION DEVICE USING THE SAME

(75) Inventors: **Shyh-Tirng Fang**, Tai-Nan City (TW); **Meng-Hann Shieh**, Hsinchu City (TW)

Correspondence Address:
THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP
100 GALLERIA PARKWAY, NW
STE 1750
ATLANTA, GA 30339-5948 (US)

(73) Assignee: **MEDIATEK INC.**, Hsin-Chu (TW)

(21) Appl. No.: **11/424,041**

(22) Filed: **Jun. 14, 2006**

Related U.S. Application Data

(60) Provisional application No. 60/780,007, filed on Mar. 7, 2006. Provisional application No. 60/775,575, filed on Feb. 22, 2006.

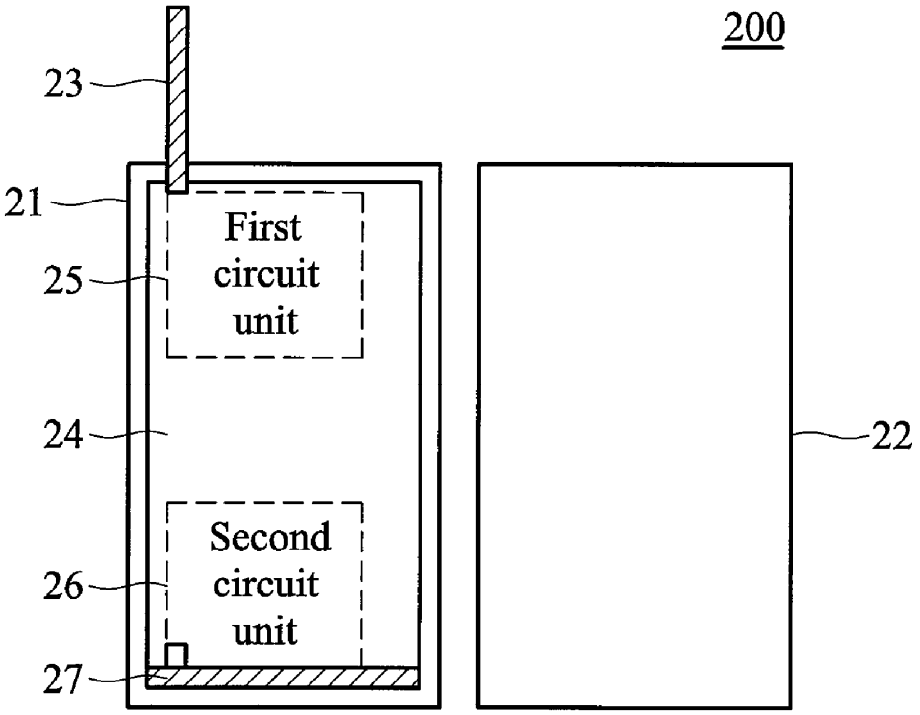
Publication Classification

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

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

(57) **ABSTRACT**

An antenna apparatus having an antenna unit with length shorter than ¼ the operating wavelength. The antenna unit formed on a first plane can be arranged to set a first distance and a first angle with respect to a ground plane of the antenna apparatus, to tune and improve impedance matching between the antenna unit and a communication module coupled to the antenna unit. A mobile communication device using the antenna apparatus is also disclosed.



US 20070194996A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0194996 A1**

Hu et al. (43) **Pub. Date: Aug. 23, 2007**

(54) **CHIP ANTENNA MOUNTING APPARATUS**

(75) Inventors: **Chuan-Lin Hu**, Sijhih City (TW); **Yu-Wei Chen**, Sijhih City (TW); **Chang-Lun Liao**, Sijhih City (TW); **Shun-Tian Lin**, Taipei City (TW); **Chang-Fa Yang**, Taipei City (TW); **Yen-Ming Chen**, Taipei City (TW); **Chao-Wei Wang**, Taipei City (TW)

Correspondence Address:
THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP
100 GALLERIA PARKWAY, NW, STE 1750
ATLANTA, GA 30339-5948

(73) Assignee: **Chant Sincere Co., Ltd.**, Hsi Chih City (TW)

(21) Appl. No.: **11/564,033**

(22) Filed: **Nov. 28, 2006**

(30) **Foreign Application Priority Data**

Feb. 20, 2006 (TW) 95105666

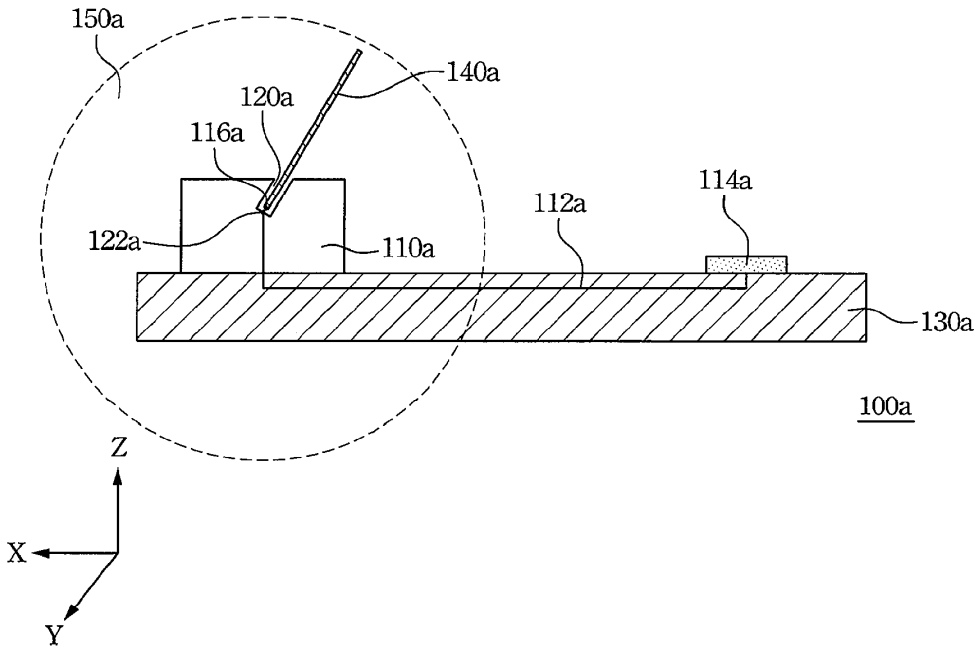
Publication Classification

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

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

(57) **ABSTRACT**

A connection apparatus for a chip antenna includes a connection base and at least one chip slot. The connection base is disposed on a circuit board and connects to the electronic components of the circuit board via a connection wire. The chip slot is disposed on the connection base for inserting the chip antenna. Thus, the chip antenna is connected to the electronic components of the circuit board via the connection wire.



US 20070194999A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0194999 A1**

Morton (43) **Pub. Date: Aug. 23, 2007**

(54) **SLIT LOADED TAPERED SLOT PATCH ANTENNA**

(75) Inventor: **Jacob Morton**, Melbourne, FL (US)

Correspondence Address:
SACCO & ASSOCIATES, PA
P.O. BOX 30999
PALM BEACH GARDENS, FL 33420-0999 (US)

(73) Assignee: **HARRIS CORPORATION**, Melbourne, FL

(21) Appl. No.: **11/358,146**

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

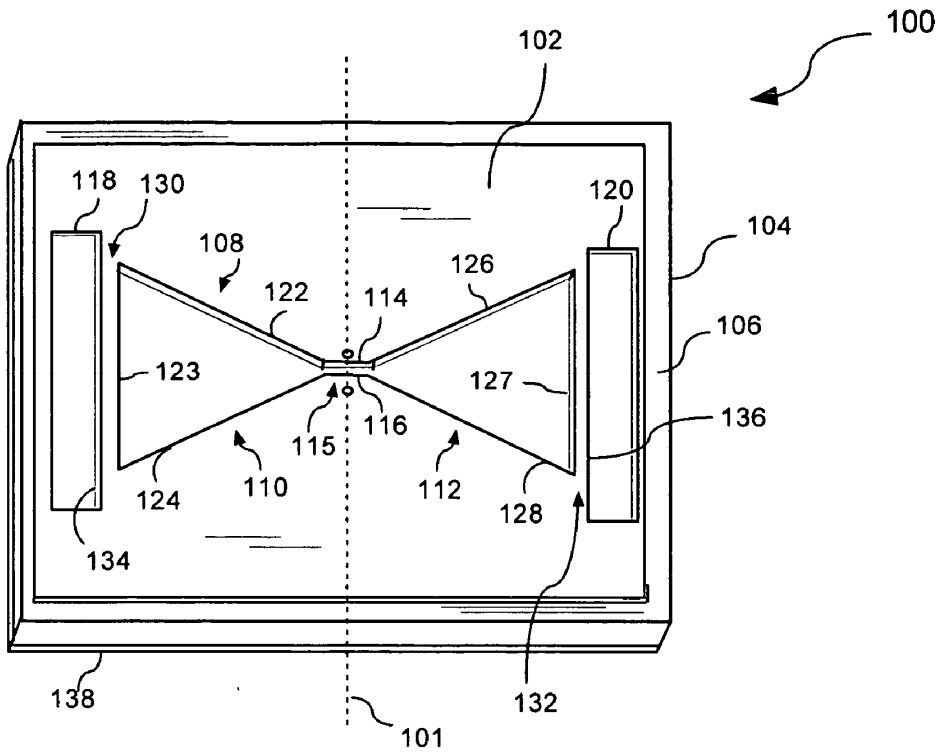
Publication Classification

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

(52) **U.S. Cl.** ..... **343/767**; 343/700 MS; 343/795

(57) **ABSTRACT**

Patch antenna (**100**) for a wireless communications device has a reduced size. The patch antenna is operable on a fundamental frequency f_0 and a first harmonic f, of the fundamental frequency, with substantially co-located peak gain directions on both frequencies. The patch antenna (**100**) is formed from a conductive ground plane (**102**) of generally rectangular shape. A first aperture (**108**) provided in the conductive ground plane member (**102**) defines a bow-tie shape. Additional elongated apertures (**118, 120**) are provided for reactive loading. The elongated apertures (**118, 120**) disrupt the phasing of surface currents within the conductive ground plane member (**102**) around the periphery of the first aperture (**108**).



US 20070195002A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0195002 A1

Wong et al. (43) Pub. Date: Aug. 23, 2007

(54) **DIGITAL-TELEVISION RECEIVING ANTENNA**

(76) Inventors: **Kin-Lu Wong**, Kao-Hsiung City (TW); **Yun-Wen Chi**, Taipei County (TW); **Saou-Wen Su**, Taipei City (TW)

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

(21) Appl. No.: **11/464,498**

(22) Filed: **Aug. 15, 2006**

(30) **Foreign Application Priority Data**

Feb. 22, 2006 (TW) 095105844

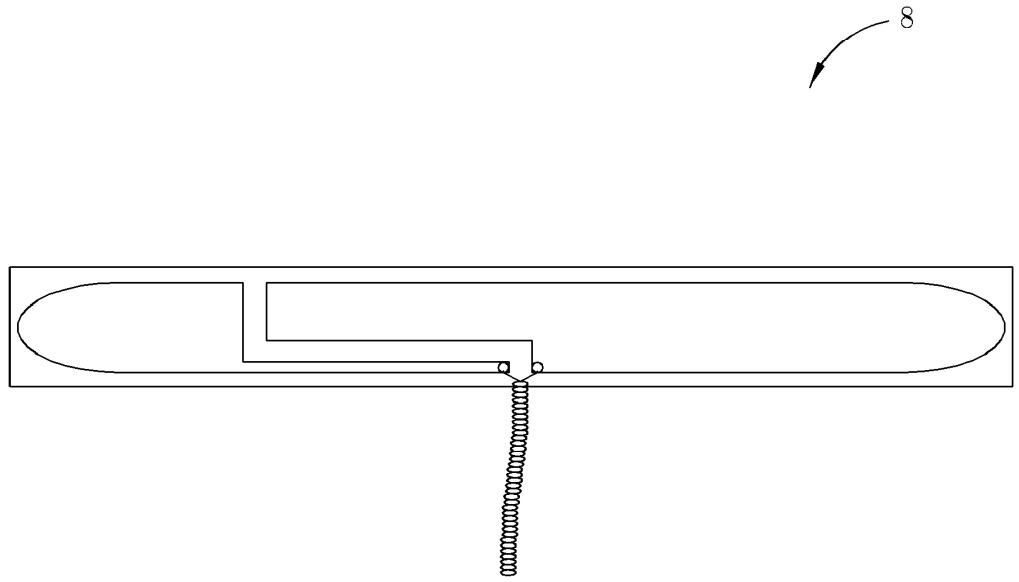
Publication Classification

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

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

(57) **ABSTRACT**

A receiving antenna for digital television signal reception includes a dielectric substrate, a radiating plate formed on the dielectric substrate with a bar shape, having a first long edge and a second long edge corresponding to the first long edge, a slit formed on the radiating plate with a length at least two times the width of the radiating plate, having a terminal at about the center of the first long edge and a terminal at the second long edge, and separating the radiating plate into a first sub-plate and a second sub-plate, a first feeding point formed on the first sub-plate, a second feeding point formed on the second sub-plate, and a feeding coaxial cable having a core conductor connected to the first feeding point and a grounding conductor connected to the second feeding point.



US 20070196088A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0196088 A1**

Tsai et al. (43) **Pub. Date: Aug. 23, 2007**

(54) **ELECTRONIC DEVICE CAPABLE OF PREVENTING AN ELECTROMAGNETIC SIGNAL RADIATED BY AN ANTENNA THEREOF FROM BEING ATTENUATED THEREBY**

(75) Inventors: **Tiao-Hsing Tsai**, Yungho City (TW); **Chieh-Ping Chiu**, Er Lun Hsiang (TW); **Chih-Wei Liao**, Su Ao Township (TW)

Correspondence Address:
LADAS & PARRY
Suite 2100
5670 Wilshire Boulevard
Los Angeles, CA 90036-5679 (US)

(73) Assignee: **Quanta Computer Inc.**

(21) Appl. No.: **11/486,257**

(22) Filed: **Jul. 12, 2006**

(30) **Foreign Application Priority Data**

Feb. 21, 2006 (TW)..... 095105754

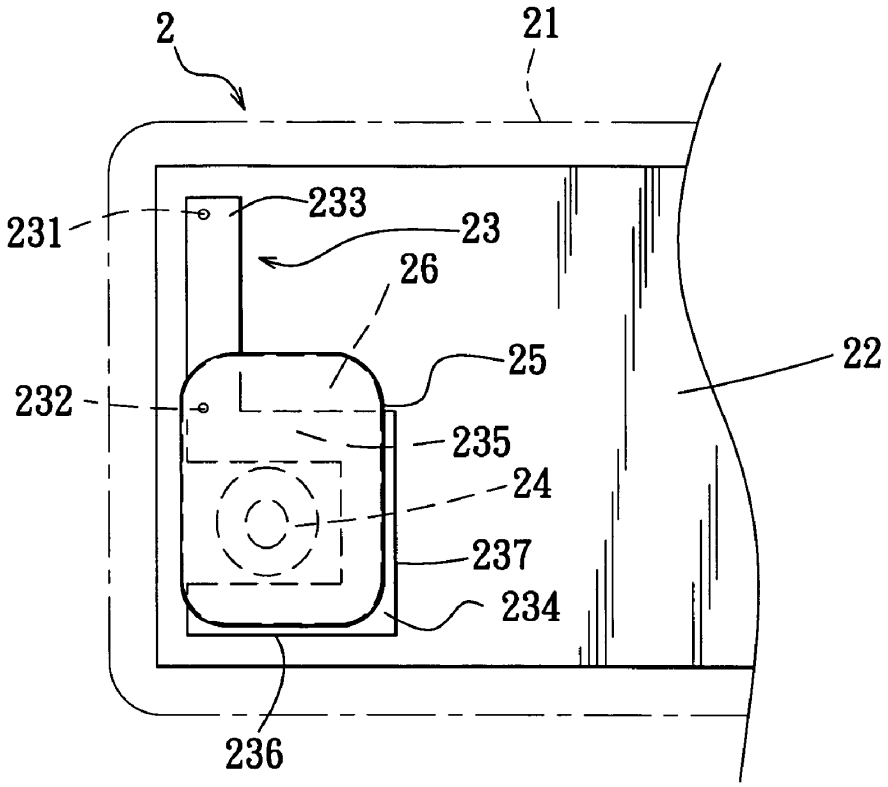
Publication Classification

(51) **Int. Cl.**
G03B 17/00 (2006.01)

(52) **U.S. Cl.** **396/56**

(57) **ABSTRACT**

An electronic device includes a casing, an antenna, a signal attenuating member, and a signal reflecting member. The antenna is disposed in the casing for radiating an electromagnetic signal. The signal attenuating member is mounted on the casing. The signal reflecting member is disposed between the antenna and the signal attenuating member, is free of physical contact with the antenna, and reflects a portion of the electromagnetic signal, which is radiated by the antenna toward the signal attenuating member, away from the signal attenuating member.



US 20070198006A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0198006 A1

Prakash et al. (43) Pub. Date: Aug. 23, 2007

(54) MICROWAVE ANTENNA HAVING A CURVED CONFIGURATION

(76) Inventors: **Mani Prakash**, Campbell, CA (US); **Francesca Rossetto**, San Francisco, CA (US); **Steven Kim**, Los Altos, CA (US); **Brian Shiu**, Sunnyvale, CA (US); **Thomas J. Fogarty**, Portola Valley, CA (US); **Sascha Zarins**, Los Gatos, CA (US)

Correspondence Address:
UNITED STATES SURGICAL,
A DIVISION OF TYCO HEALTHCARE GROUP LP
195 MCDERMOTT ROAD
NORTH HAVEN, CT 06473 (US)

(21) Appl. No.: **11/713,927**

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

Related U.S. Application Data

(63) Continuation of application No. 10/272,314, filed on Oct. 15, 2002, now Pat. No. 7,197,363.

(60) Provisional application No. 60/373,190, filed on Apr. 16, 2002.

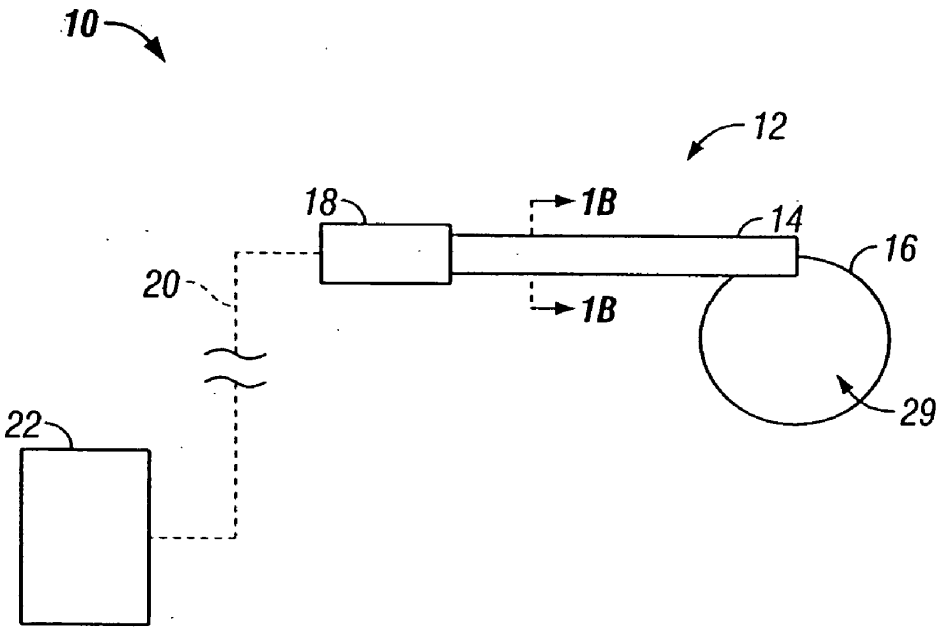
Publication Classification

(51) **Int. Cl.**
A61B 18/04 (2006.01)
A61N 1/00 (2006.01)

(52) **U.S. Cl.** **606/33**; 607/156

(57) **ABSTRACT**

A microwave antenna having a curved configuration is described herein. The antenna portion is formed into various shapes whereby the antenna substantially encloses, by a partial or complete loop or enclosure, at least a majority of the tissue to be irradiated. When microwave energy is delivered through the antenna, the curved configuration forms an ablation field or region defined by the curved antenna and any tissue enclosed within the ablation region becomes irradiated by the microwave energy. The microwave antenna is deployed through one of several methods, and multiple curved antennas can be used in conjunction with one another. Moreover, RF energy can also be used at the distal tip of the antenna to provide a cutting tip for the antenna during deployment in tissue.



US 20070200706A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0200706 A1

Lee (43) Pub. Date: Aug. 30, 2007

(54) **RFID TAG AND CERAMIC PATCH ANTENNA**

(75) Inventor: **Dong-Jin Lee**, Jeollanam-Do (KR)

Correspondence Address:
JONATHAN Y. KANG, ESQ.
LEE, HONG, DEGERMAN, KANG & SCHMADEKA
14th Floor, 801 S. Figueroa Street
Los Angeles, CA 90017

(73) Assignee: **SONTEC CO., LTD.**

(21) Appl. No.: **11/553,329**

(22) Filed: **Oct. 26, 2006**

(30) **Foreign Application Priority Data**

Feb. 28, 2006 (KR) 10-2006-0019547

Publication Classification

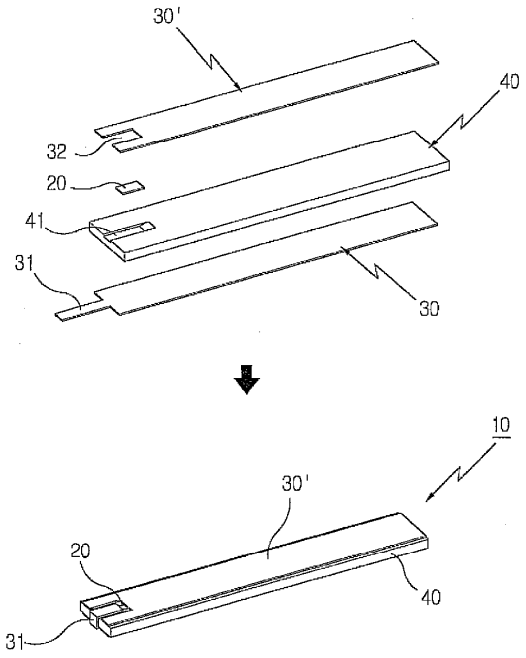
(51) **Int. Cl.**
G08B 13/14 (2006.01)

(52) **U.S. Cl.** **340/572.7**

(57) **ABSTRACT**

This invention relates to a radio frequency identification (RFID) tag and ceramic patch antenna for radio frequency identification systems. The radio frequency identification tag in accordance with this invention comprises; lower antenna member of which one end is formed with coupling projection for conjoining; upper antenna member of which one end is formed with coupling groove for conjoining; an RFID chip of which one end is conjoined with the coupling projection of the said lower antenna member and the other end is conjoined with the coupling groove of the said upper antenna member, containing the information of the objective management item which communicates with the terminal device; and a spacer which electrically isolates the said antenna members. The said antenna members are conjoined on the top and bottom sides of the said spacer in parallel direction. The RFID chip which is conjoined with the said antenna members is placed on the top or bottom side of the said spacer.

The ceramic patch antenna in accordance with this invention comprises; a dielectric ceramic member formed with ceramic substance of which the permittivity is 4.0~210 and formed with a feeder hole punched at the center; conductive film formed on one side of the said dielectric ceramic member; an earth plate affixed on the other side of the said dielectric ceramic and formed with a punched feeder hole at the center; a feeder pin which is inserted in the feeder hole of the said dielectric ceramic and contacted with and feeds electricity to the said conductive film. The said feeder pin is inserted into the feeder hole of the said dielectric ceramic. The said conductive film covers the feeder hole formed in the said dielectric ceramic and electrically contacts with the feeder pin inserted into the feeder hole, The feeder hole of the said earth plate is formed larger than the feeder hole of the said dielectric ceramic, so that electrically isolated with the said feeder pin.



US 20070200708A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0200708 A1**

Hayama et al. (43) **Pub. Date: Aug. 30, 2007**

(54) **LOOP ANTENNA AND RFID TAG**

(76) Inventors: **Kosuke Hayama**, Kyoto (JP); **Keisuke Saito**, Kyoto (JP)

Correspondence Address:
DICKSTEIN SHAPIRO LLP
1825 EYE STREET NW
Washington, DC 20006-5403

(21) Appl. No.: **11/588,272**

(22) Filed: **Oct. 27, 2006**

(30) **Foreign Application Priority Data**

Feb. 24, 2006 (JP) P2006-047868

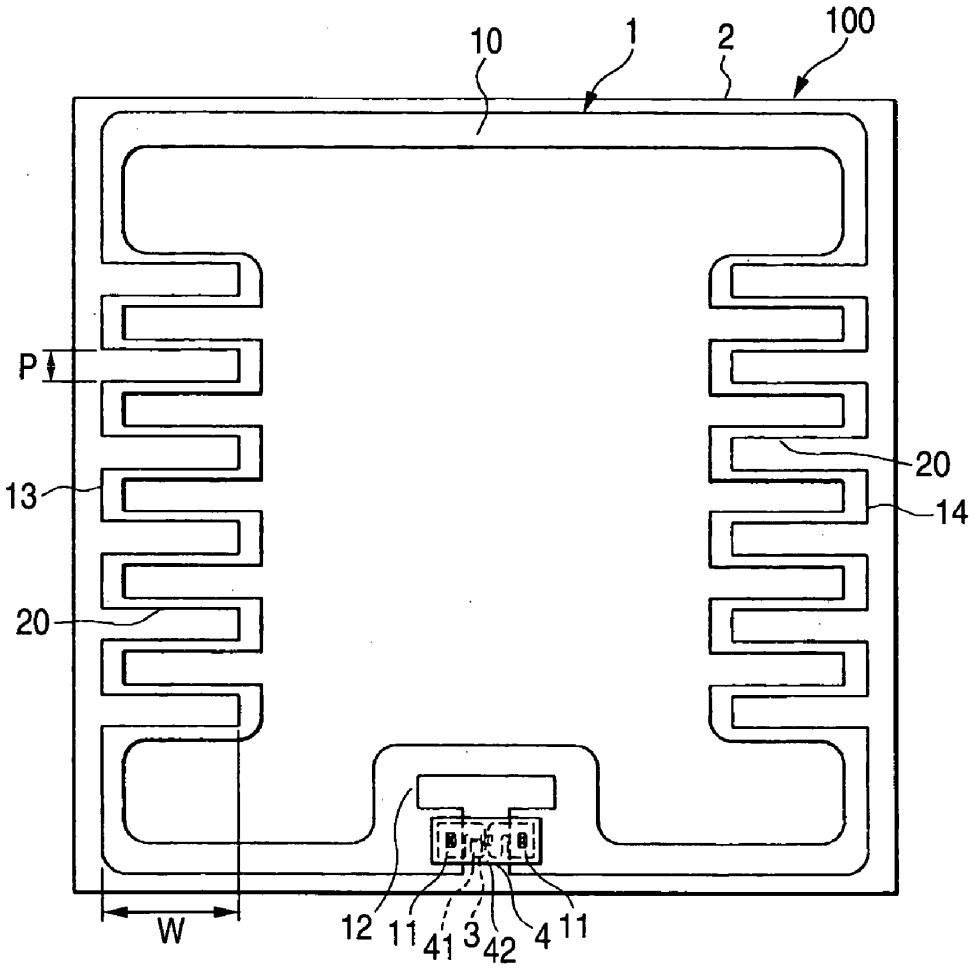
Publication Classification

(51) **Int. Cl.**
G08B 13/14 (2006.01)
H01Q 7/00 (2006.01)

(52) **U.S. Cl.** **340/572.7**; 343/866

(57) **ABSTRACT**

A loop antenna **1** for an RFID tag **100** includes an annular line member **10** that includes meandering parts **13** and **14** disposed on a dielectric substrate **2**, and power feeding parts **11** that are provided on the line member **10**. The annular line member **10** includes the meandering parts **13** and **14** at portions except for the vicinity of positions corresponding to loops of a standing wave occurring in the loop antenna **1**.



US 20070200711A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0200711 A1**

Kai et al. (43) **Pub. Date: Aug. 30, 2007**

(54) **ANTENNA AND NON-CONTACT TAG**

(76) Inventors: **Manabu Kai**, Kawasaki (JP); **Toru Maniwa**, Kawasaki (JP); **Takashi Yamagajo**, Kawasaki (JP)

Correspondence Address:
Edward A. Pennington
Bingham McCutchen LLP
2020 K Street N.W.
Washington, DC 20007 (US)

(21) Appl. No.: **11/790,580**

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

Related U.S. Application Data

(63) Continuation of application No. PCT/JP04/18610, filed on Dec. 14, 2004.

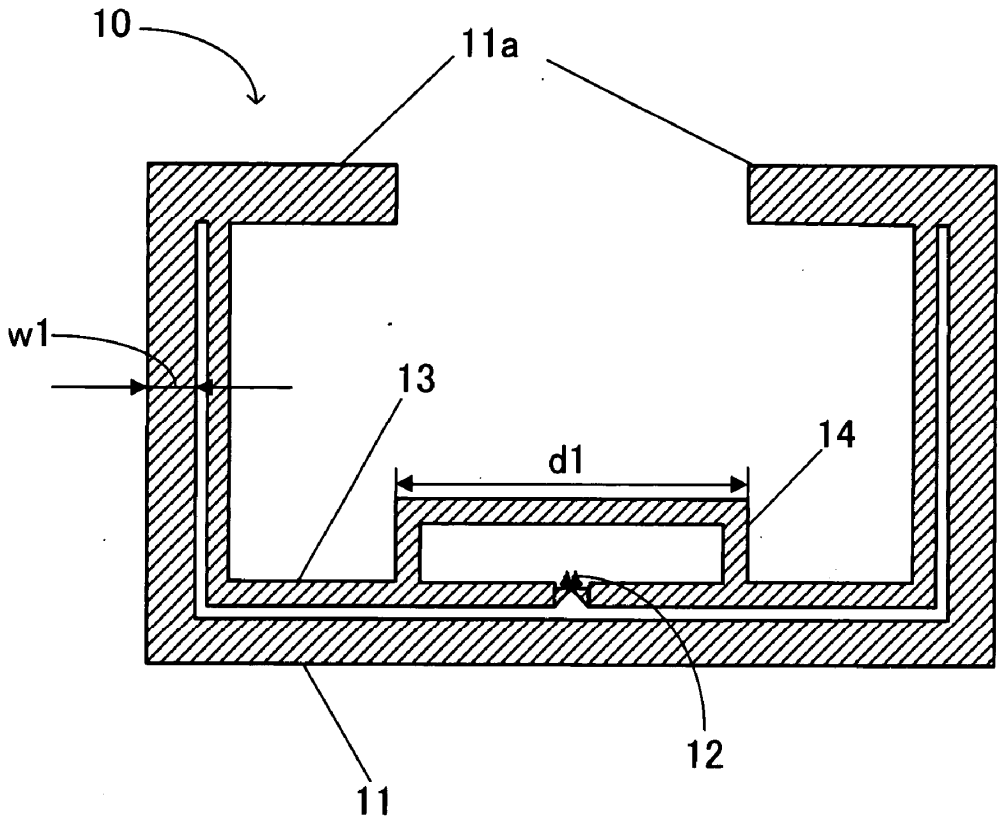
Publication Classification

(51) **Int. Cl.**
G08B 13/14 (2006.01)
H01Q 11/12 (2006.01)

(52) **U.S. Cl.** **340/572.7**; 343/741

(57) **ABSTRACT**

An RFID antenna that can be disposed in a space-saving manner. The RFID antenna comprises an outermost peripheral conductive line that is bent in a manner extending along sides of a generally rectangular shape having a predetermined size, and a power-feeding conductive line that is disposed close to an inner periphery of the outermost peripheral conductive line in a manner extending parallel therewith, and is electrically connected to the outermost peripheral conductive line at ends thereof, the power-feeding conductive line including a portion thereof formed with a feeder part. Therefore, the antenna fits into a rectangle having a predetermined size, such as a card size.



US 20070200762A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0200762 A1**

Frank et al. (43) **Pub. Date: Aug. 30, 2007**

(54) **ULTRA WIDE BAND FLAT ANTENNA**

(76) Inventors: **Zvi Henry Frank**, Elkana (IL); **Ran Timar**, Kfar Saba (IL)

Correspondence Address:
PEARL COHEN ZEDEK LATZER, LLP
1500 BROADWAY 12TH FLOOR
NEW YORK, NY 10036 (US)

(21) Appl. No.: **11/363,133**

(22) Filed: **Feb. 28, 2006**

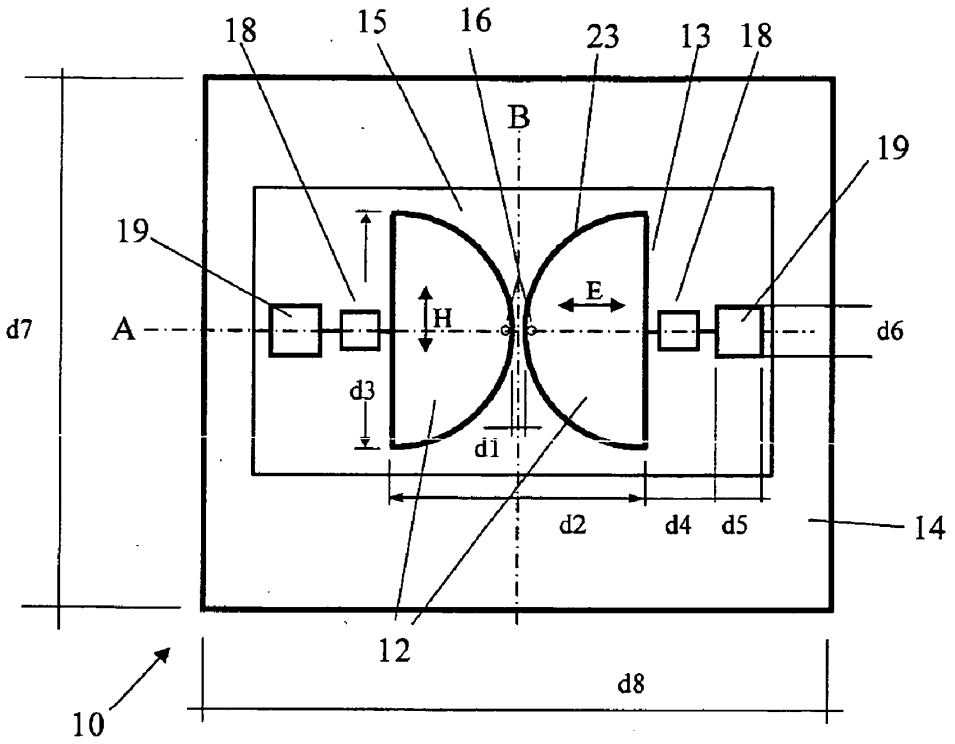
Publication Classification

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

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

(57) **ABSTRACT**

A flat, ultra wideband, unidirectional antenna is disclosed, the antenna may comprise a pair of active elements having the shape of substantially half-circles or half-ellipsoids made of thin conductive material and a ground element made of thin conductive material placed parallel and against to the active electrodes and spaced from them, the antenna having a nominal gain of at least **6** dbi and variations of gain in that range of **+/−1.5** dbi at its bore sight.



US 20070200767A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0200767 A1**

YOSHIOKA et al. (43) **Pub. Date: Aug. 30, 2007**

(54) **ASYMMETRICAL FLAT ANTENNA, METHOD OF MANUFACTURING THE ASYMMETRICAL FLAT ANTENNA, AND SIGNAL-PROCESSING UNIT USING THE SAME**

(75) Inventors: **Masahiro YOSHIOKA**, Tokyo (JP); **Takashi Nakanishi**, Tokyo (JP); **Seiji Wada**, Kanagawa (JP); **Tetsujiro Kondo**, Tokyo (JP)

Correspondence Address:
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

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

(21) Appl. No.: **11/677,286**

(22) Filed: **Feb. 21, 2007**

(30) **Foreign Application Priority Data**

Feb. 28, 2006 (JP) 2006-053732

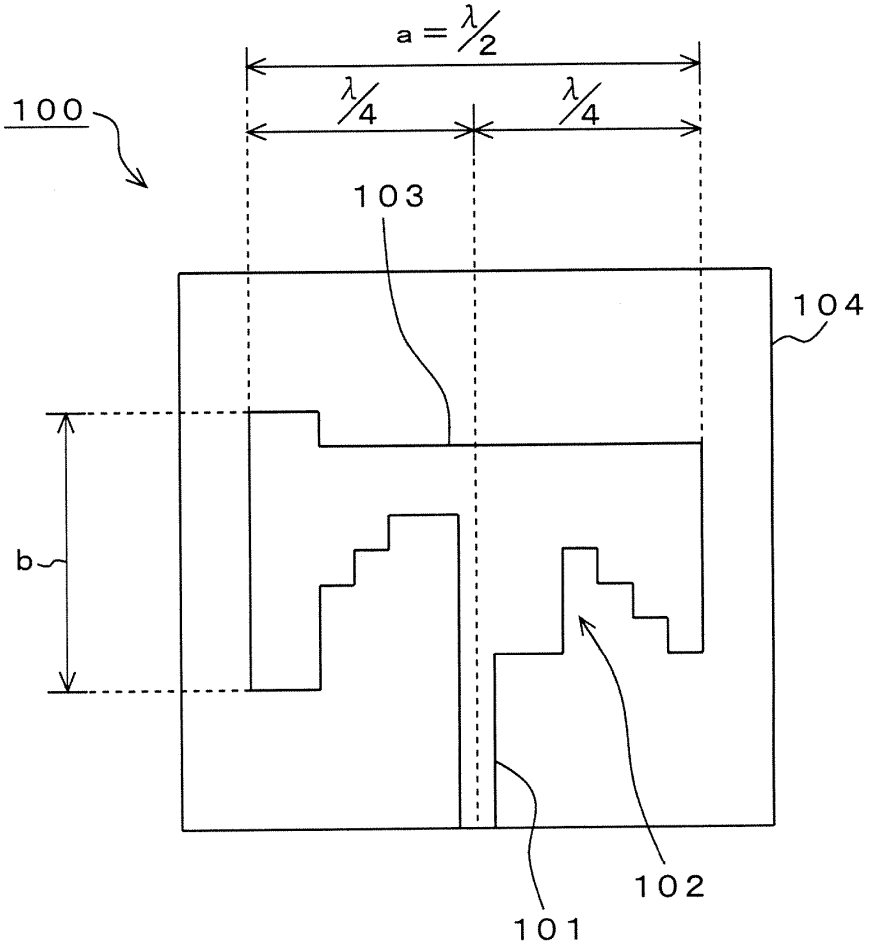
Publication Classification

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

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

(57) **ABSTRACT**

An asymmetrical flat antenna contains an insulation layer. The antenna also contains a conductive power supply pattern that is provided on the insulation layer and a conductive antenna pattern that extends from the power supply pattern and is provided on the insulation layer. The conductive antenna pattern has an asymmetrical configuration with respect to the power supply pattern.



US 20070200769A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0200769 A1**

Nakano et al. (43) **Pub. Date: Aug. 30, 2007**

(54) **BROADBAND ANTENNA UNIT COMPRISING A GROUND PLATE HAVING A LOWER PORTION WHERE BOTH SIDE CORNER PORTIONS ARE DELETED**

(75) Inventors: **Hisamatsu Nakano**, Tokyo (JP); **Satoshi Hattori**, Tokyo (JP); **Junji Yamauchi**, Tokyo (JP); **Akira Miyoshi**, Tokyo (JP)

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

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

(21) Appl. No.: **11/699,816**

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

(30) **Foreign Application Priority Data**

Feb. 28, 2006 (JP) 2006-53116

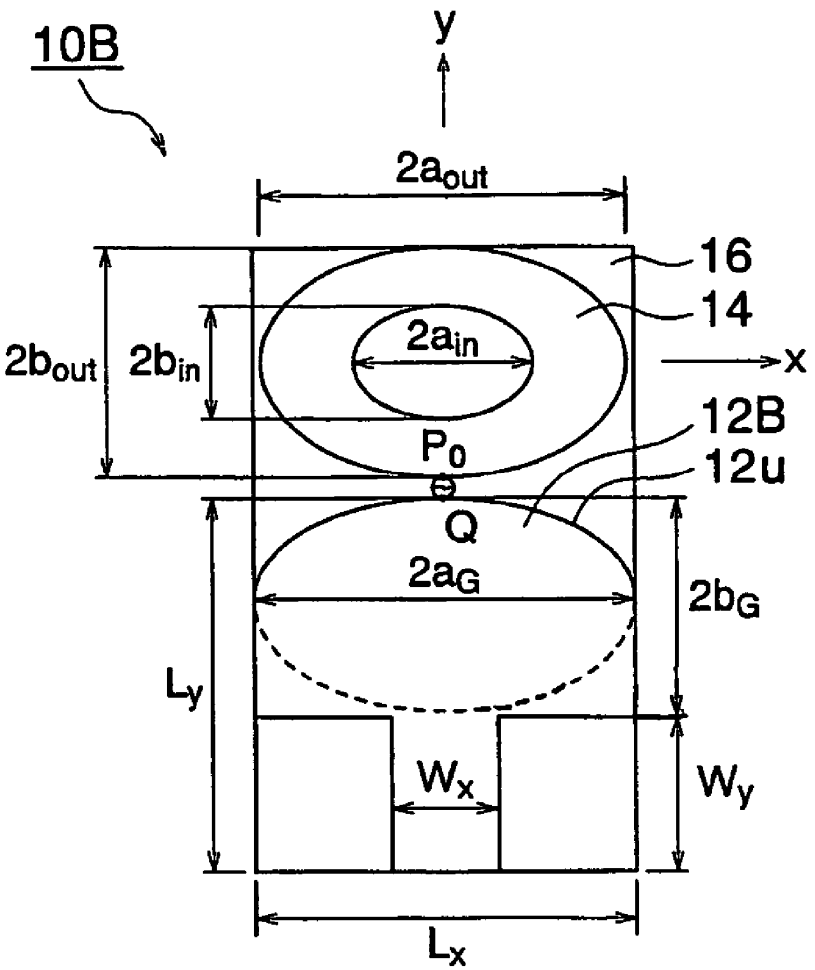
Publication Classification

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

(52) **U.S. Cl.** ..... **343/700 MS**; 343/846

(57) **ABSTRACT**

In a broadband antenna unit having a ground plate and an elliptically shaped radiation element disposed at an upper portion of the ground plate in a plane where the ground plate extends, the ground plate has a semi-elliptically shaped upper edge and a lower portion where both side corner portions are deleted with a central portion left. The ground plate and the radiation element are formed on a substrate.



US 20070200771A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0200771 A1**

Schack et al. (43) **Pub. Date: Aug. 30, 2007**

(54) **FOLDABLE MOBILE TELEPHONE TERMINAL WITH ANTENNA AND GROUND PLANE MADE IN ONE PIECE**

(76) Inventors: **Goran Schack**, Ahus (SE); **Pernilla Jonsson**, Malmo (SE); **Olof Simonsson**, Malmo (SE)

Correspondence Address:
MYERS BIGEL SIBLEY & SAJOVEC, P.A.
P.O. BOX 37428
RALEIGH, NC 27627 (US)

(21) Appl. No.: **10/591,818**

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

(86) PCT No.: **PCT/EP05/01557**

§ 371(c)(1),
(2), (4) Date: **Sep. 6, 2006**

Related U.S. Application Data

(60) Provisional application No. 60/554,282, filed on Mar. 18, 2004.

(30) **Foreign Application Priority Data**

Mar. 12, 2004 (EP) 04005861.2

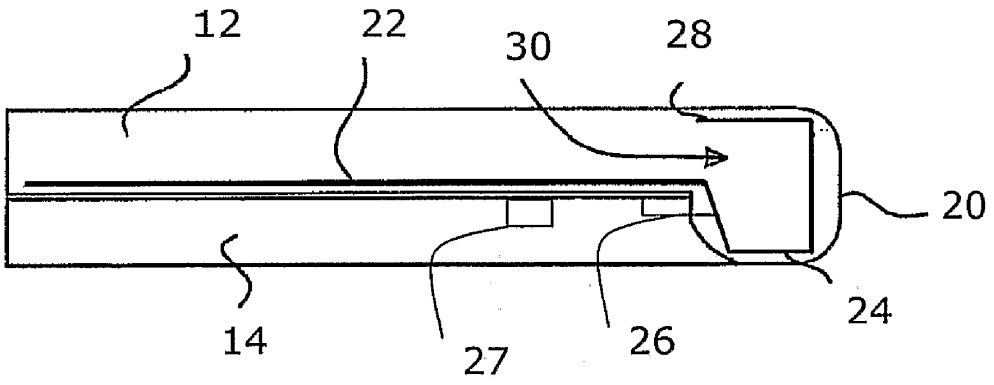
Publication Classification

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

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

(57) **ABSTRACT**

The present invention relates to a portable communication device and an antenna system. The device comprises an antenna feeding circuit and at least a first part having a hollow interior where different electrical elements are provided and provided with a main section having a certain width, length and a first height, and an antenna system. The antenna system comprises a ground plane (**22, 24**) located within and extending along essentially the whole width and length of at least the main section and an antenna element (**28**) located within the first part. The ground plane is provided in one piece and the only electrical elements of the first part being electrically connected to say ground plane are radio transmission elements.



US 20070200774A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0200774 A1

Wang et al. (43) Pub. Date: Aug. 30, 2007

(54) ANTENNA FOR WWAN AND INTEGRATED ANTENNA FOR WWAN, GPS AND WLAN

(76) Inventors: **Chi-Yueh Wang**, Kaohsiung (TW); **Cheng-Han Lee**, Kaohsiung (TW); **Ching-Chia Mai**, Kaohsiung (TW)

Correspondence Address:
VOLENTINE & WHITT PLLC
ONE FREEDOM SQUARE
11951 FREEDOM DRIVE SUITE 1260
RESTON, VA 20190 (US)

(21) Appl. No.: 11/437,686

(22) Filed: May 22, 2006

(30) Foreign Application Priority Data

Feb. 24, 2006 (TW)..... 095106360

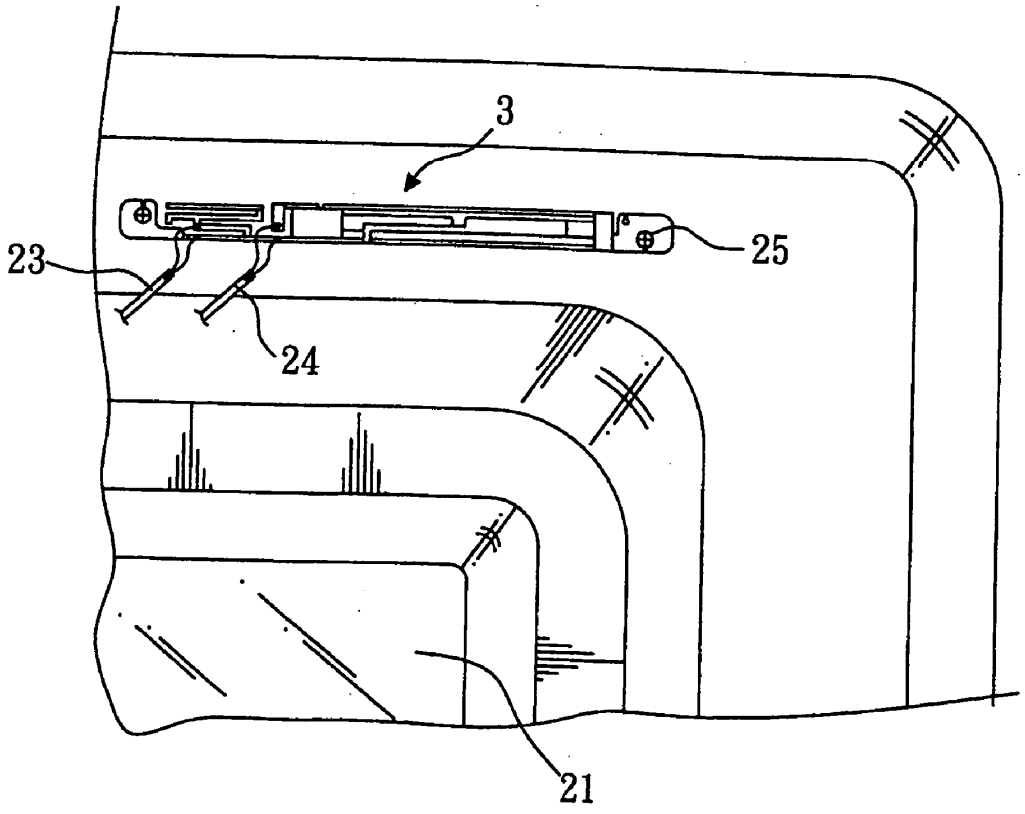
Publication Classification

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

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

(57) ABSTRACT

The present invention relates to an antenna for WWAN and an integrated antenna for WWAN, WLAN, and GPS. The integrated antenna comprises a ground metal plate, a coupled WWAN antenna, a WLAN antenna, an auxiliary grounding element, and at least one supporting element. The integrated antenna of the invention can be applied to a wireless electronic device with WWAN and WLAN by utilizing the coupled WWAN antenna to induce a WWAN frequency and the WLAN antenna to induce a WLAN frequency. In addition, the ground metal plate and the auxiliary grounding element are selectively connected or not connected to a ground end of the wireless electronic device, and can be separately used to provide grounding effect. Therefore, the integrated antenna can be mounted on any part of the wireless electronic device, and can have stable electrical characteristic.



US 20070200777A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0200777 A1

Chen et al. (43) Pub. Date: Aug. 30, 2007

(54) MULTI-BAND ANTENNA OF COMPACT SIZE

(76) Inventors: **Yun-Ta Chen**, Tao-Yuan City (TW); **Chien-Pang Chou**, Tao-Yuan City (TW); **Chang-Hao Hsieh**, Tao-Yuan City (TW)

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

(21) Appl. No.: **11/560,812**

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

(30) **Foreign Application Priority Data**

Feb. 27, 2006 (TW) 095106679

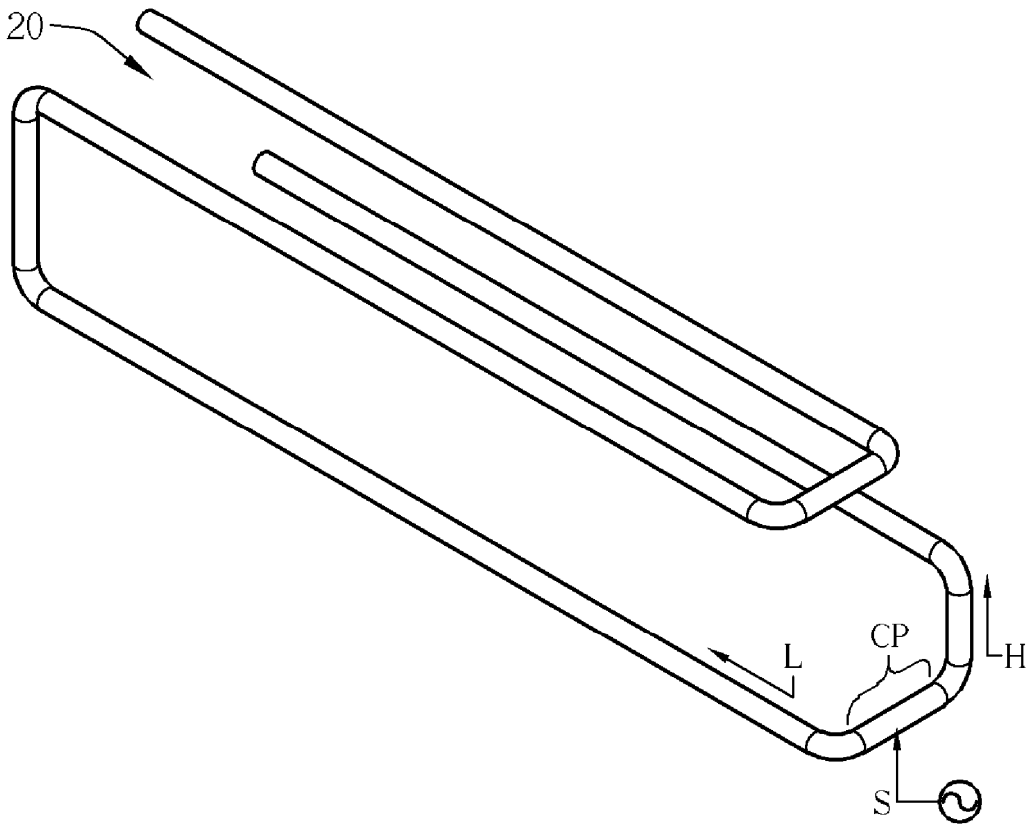
Publication Classification

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

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

(57) **ABSTRACT**

A multi-band antenna of compact size includes a conductor of uniform cross-section folded to form the antenna with a connection portion, a low-frequency first radiation portion, and a high-frequency second radiation portion. The connection portion has a feeding point for signal feeding. The first and second radiation portions connect to two ends of the connection portion. The first radiation portion is folded along two different planes to form three main sections. The second radiation portion is folded along a plane to form two sections. A terminal section of the first radiation portion and a terminal section of the second radiation portion are parallel, such that radiation of these two sections is coupled to enhance radiation characteristics of the antenna. Also, the folded structure helps to achieve compact size of the antenna.



US 20070200782A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0200782 A1**

Hayama et al. (43) **Pub. Date: Aug. 30, 2007**

(54) **ANTENNA AND RFID TAG**

(76) Inventors: **Kosuke Hayama**, Kyoto (JP); **Keisuke Saito**, Kyoto (JP)

Correspondence Address:
DICKSTEIN SHAPIRO LLP
1825 EYE STREET NW
Washington, DC 20006-5403

(21) Appl. No.: **11/588,273**

(22) Filed: **Oct. 27, 2006**

(30) **Foreign Application Priority Data**

Feb. 24, 2006 (JP) P2006-047867

Publication Classification

(51) **Int. Cl.**
H01Q 9/28 (2006.01)
H01Q 1/38 (2006.01)

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

(57) **ABSTRACT**

An antenna for an RFID tag includes each power feeding parts **11** that is formed of a conductor, meandering parts **13***a* and **13***b* that are formed of conductors shaped as a pair of meandering lines, connected to the power feeding parts **11**, and extend from the power feeding parts **11** toward both ends of the power feeding parts **11**, respectively, a pair of radiating parts **14***a* and **14***b* that are formed of conductors and connected to outer ends of the pair of meandering parts **13***a* and **13***b*, respectively. The meandering parts **13***a* and **13***b* include a plurality of sides arranged in a longitudinal direction where the meandering parts **13***a* and **13***b* extend. Further, the lengths of portions, where the ends of the radiating parts **14***a* and **14***b* facing the meandering parts **13***a* and **13***b* face the sides closest to the radiating parts **14***a* and **14***b* among the plurality of sides of the meandering parts **13***a* and **13***b* in a direction orthogonal to the longitudinal direction, are smaller than the widths of the widest portions of the radiating parts.