



US 20090242633A1

(19) **United States**

(12) **Patent Application Publication**
Salfelner

(10) **Pub. No.: US 2009/0242633 A1**

(43) **Pub. Date: Oct. 1, 2009**

(54) **TRANSMITTER, RECEIVER, ANTENNA ARRANGEMENT FOR USE WITH A TRANSMITTER OR FOR USE WITH A RECEIVE, AND RFID TRANSPONDER**

(30) **Foreign Application Priority Data**

Feb. 24, 2006 (EP) 06110388.3

Publication Classification

(75) Inventor: **Anton Salfelner**, Pernegg (AT)

(51) **Int. Cl.**

H01Q 7/00 (2006.01)
G06K 7/00 (2006.01)

Correspondence Address:

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

(52) **U.S. Cl.** **235/439; 343/866; 343/748**

(57) **ABSTRACT**

An antenna arrangement comprises an electric antenna (4) configured to receive a reception signal from a sender and at least one conductive loop (3, 25) with two terminals (16, 17) to be connected to a receiver circuit (2, 24) which is configured to process an electric signal generated by the at least one conductive loop (3, 25). The at least one conductive loop (3, 25) is spaced within a distance from and magnetically coupled to the electric antenna (4) such that the at least one conductive loop (4, 25) generates the electric signal in response to the reception signal received by the electric antenna (4). Alternatively, the antenna arrangement may be used as a sending antenna used with a transmitter.

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

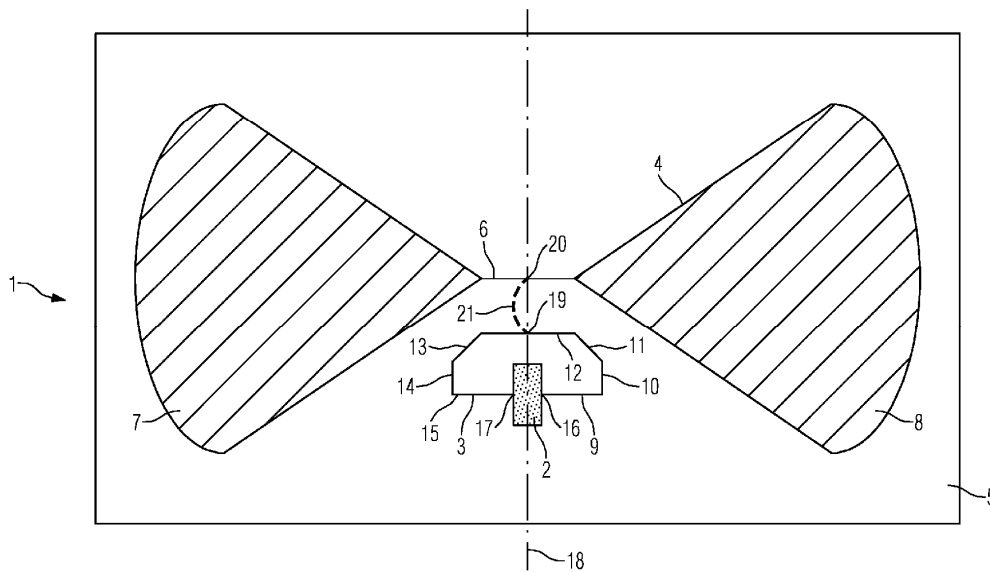
(21) Appl. No.: **12/280,184**

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

(86) PCT No.: **PCT/IB2007/050309**

§ 371 (c)(1),
(2), (4) Date:

Oct. 15, 2008





US 20090243935A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0243935 A1**

(43) **Pub. Date: Oct. 1, 2009**

(54) **PLANE SUPER WIDE BAND COUPLING ANTENNA**

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

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

(76) Inventors: **Ching-Hsiung Huang**, Taipei County (TW); **Ming-Han Perng**, Taipei County (TW); **Chung-Ming Lin**, Taipei County (TW); **Chia-Cheng Lo**, Taipei County (TW); **Ming-Lai Chen**, Taipei County (TW)

(57) **ABSTRACT**

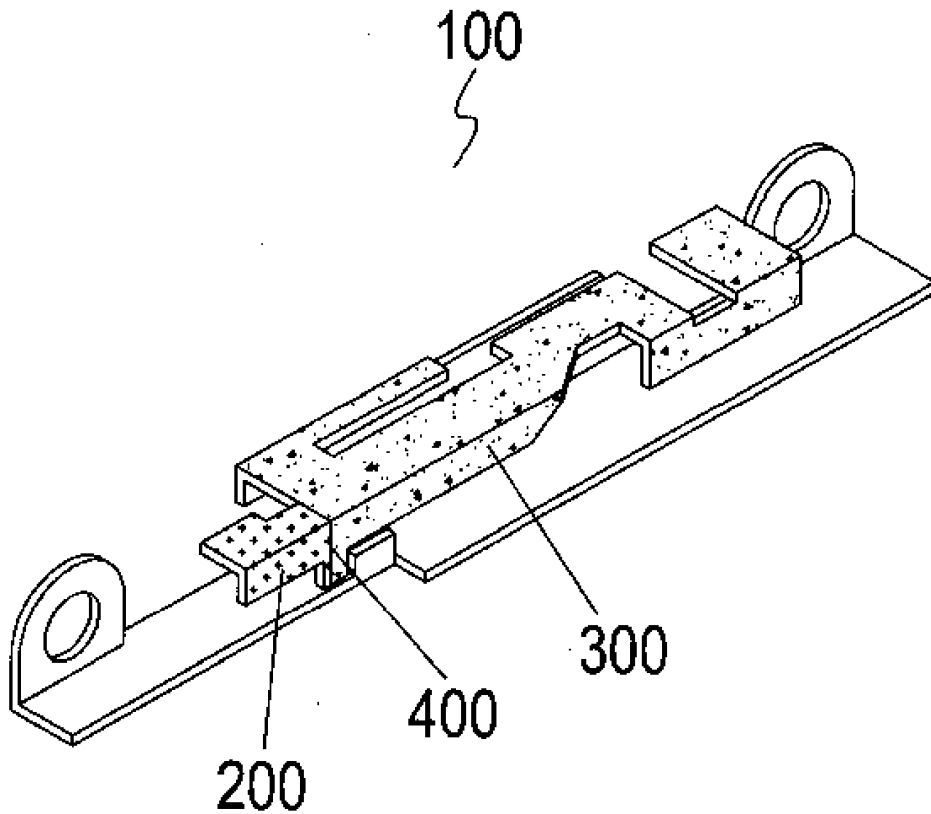
A plane super wide band coupling antenna comprises an isolating substrate for installing with a metal thin film layer by printing; a first radiating portion being a metal thin film layer printed upon the isolating substrate; the first radiating portion having a coupling section and being extended with a feeding point; a second radiating portion being a metal thin film layer printed upon the isolating substrate; the second radiating portion extending from a ground portion on the isolating substrate and being a bended structure; the second radiating portion being formed with gaps with the first radiating portion; the ground portion being formed by a metal thin film layer; one end thereof being electrically connected to the second radiating portion; a signal feeding wire being a coaxial cable; and the main signal wire of the signal feeding wire being electrically connected to the feeding point of the first radiating portion.

Correspondence Address:
Ching-Hsiung Huang
235 Chung - Ho, Box 8-24
Taipei 235 (TW)

(21) Appl. No.: **12/054,386**

(22) Filed: **Mar. 25, 2008**

Publication Classification





US 20090243936A1

(19) **United States**

(12) **Patent Application Publication**
HUANG

(10) **Pub. No.: US 2009/0243936 A1**

(43) **Pub. Date: Oct. 1, 2009**

(54) **DUAL-BAND INVERTED-F ANTENNA**

Publication Classification

(75) Inventor: **Chien-Lin HUANG**, Jhongli City
(TW)

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

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

Correspondence Address:
Workman Nydegger
1000 Eagle Gate Tower
60 East South Temple
Salt Lake City, UT 84111 (US)

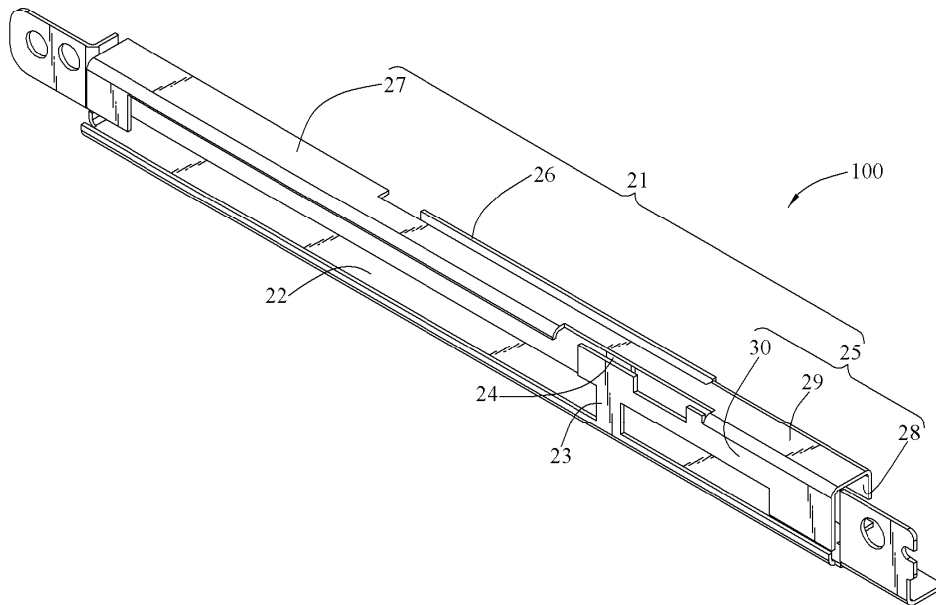
(57) **ABSTRACT**

A dual-band inverted-F antenna including a radiation element, a ground element, a conductive pin, and a signal feed-in portion is described. The radiation element includes a loop portion, a first radiation portion, and a second radiation portion. After being fed in through the signal feed-in portion, a first band signal and a second band signal are wirelessly transmitted/received by the first radiation portion and the second radiation portion respectively in one aspect, and transmitted to the conductive pin through the loop portion and finally to the ground element in another aspect. The loop portion is directly short-grounding, such that the bandwidths of the first and the second band signals in operation are increased, thereby improving the overall radiation efficiency.

(73) Assignee: **SMART APPROACH CO., LTD.**,
Hsinchu (TW)

(21) Appl. No.: **12/055,176**

(22) Filed: **Mar. 25, 2008**





US 20090243937A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0243937 A1**

(43) **Pub. Date: Oct. 1, 2009**

(54) **TWO-TIER WIDE BAND ANTENNA**

Publication Classification

(75) Inventors: **Denver Humphrey**, Broughshane (GB); **Brian Kearns**, Dublin (IE); **Bee Yen Toh**, Lisburn (GB)

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

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

(57) **ABSTRACT**

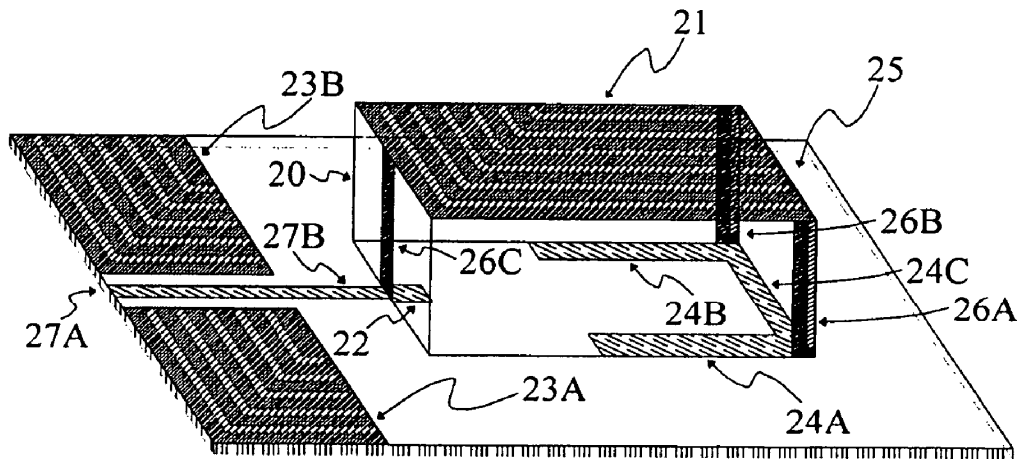
Correspondence Address:
OLIFF & BERRIDGE, PLC
P.O. BOX 320850
ALEXANDRIA, VA 22320-4850 (US)

A two-tier wideband antenna comprising a chip of a dielectric material with an upper radiating structure and a lower radiating structure, the dielectric chip being mounted on an insulating carrier substrate which includes a feed-line to connect the antenna to a transceiver device. The lower radiating structure comprises two side elements which have a large aspect ratio so as to reduce the frequency of the lower band edge of the frequency response of the antenna when compared with the frequency response of a monopole patch antenna fabricated on a similar dielectric chip. The antenna of the present invention is suitable for operation over an ultra wideband, e.g. a frequency range extending from 3.1 to 10.6 GHz

(73) Assignee: **TDK CORPORATION**, TOKYO (JP)

(21) Appl. No.: **12/078,440**

(22) Filed: **Mar. 31, 2008**





US 20090243938A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0243938 A1**

(43) **Pub. Date: Oct. 1, 2009**

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

(30) **Foreign Application Priority Data**

Apr. 1, 2008 (TW) 097111857

(75) Inventors: **Tiao-Hsing Tsai**, Taiwan (TW);
Chih-Wei Liao, Tao Yuan Shien (TW);
Chao-Hsu Wu, Tao Yuan Shien (TW);
Cheng-Hsiung Wu, Tao Yuan Shien (TW)

Publication Classification

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

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

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

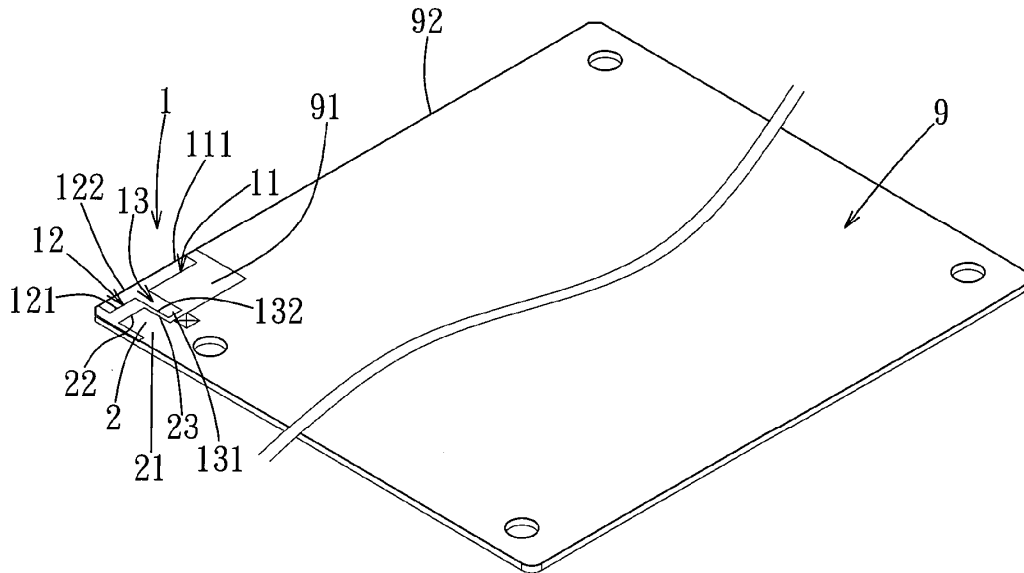
(57) **ABSTRACT**

An antenna includes a T-shaped radiating element and a coupling element. The radiating element includes opposite first and second radiating portions, and a feeding portion that extends transversely to the first and second radiating portions and that is connected to a junction of the first and second radiating portions. The coupling element is disposed between the second radiating portion and the feeding portion of the radiating element, and is coupled electromagnetically to at least one of the second radiating portion and the feeding portion of the radiating element.

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

(21) Appl. No.: **12/174,480**

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





US 20090243939A1

(19) **United States**

(12) **Patent Application Publication**
Teng

(10) **Pub. No.: US 2009/0243939 A1**

(43) **Pub. Date: Oct. 1, 2009**

(54) **MICROSTRIP ANTENNA**

Publication Classification

(75) Inventor: **Jia-Lin Teng, Tu-Cheng (TW)**

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

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

Correspondence Address:
PCE INDUSTRY, INC.
ATT. Steven Reiss
288 SOUTH MAYO AVENUE
CITY OF INDUSTRY, CA 91789 (US)

(57) **ABSTRACT**

A microstrip antenna positioned on a substrate includes a feeding portion, a grounding portion, and a radiating portion. The substrate includes a first surface and a second surface opposite to the first surface. The feeding portion is positioned on the first surface. The grounding portion is positioned on the second surface. The radiating portion is positioned on the first surface, and includes a first radiator, a second radiator in zigzag shape, and a third radiator. The first radiator includes a first radiating section and a second radiating section. The third radiator includes a third radiating section and a fourth radiating section. The first radiating section, the second radiating section, the second radiator, the third radiating section, and the fourth radiating section are perpendicular to one another connected one by one in sequence. The first radiator and the third radiator co-define a receiving area, and the second radiator is positioned in the receiving area.

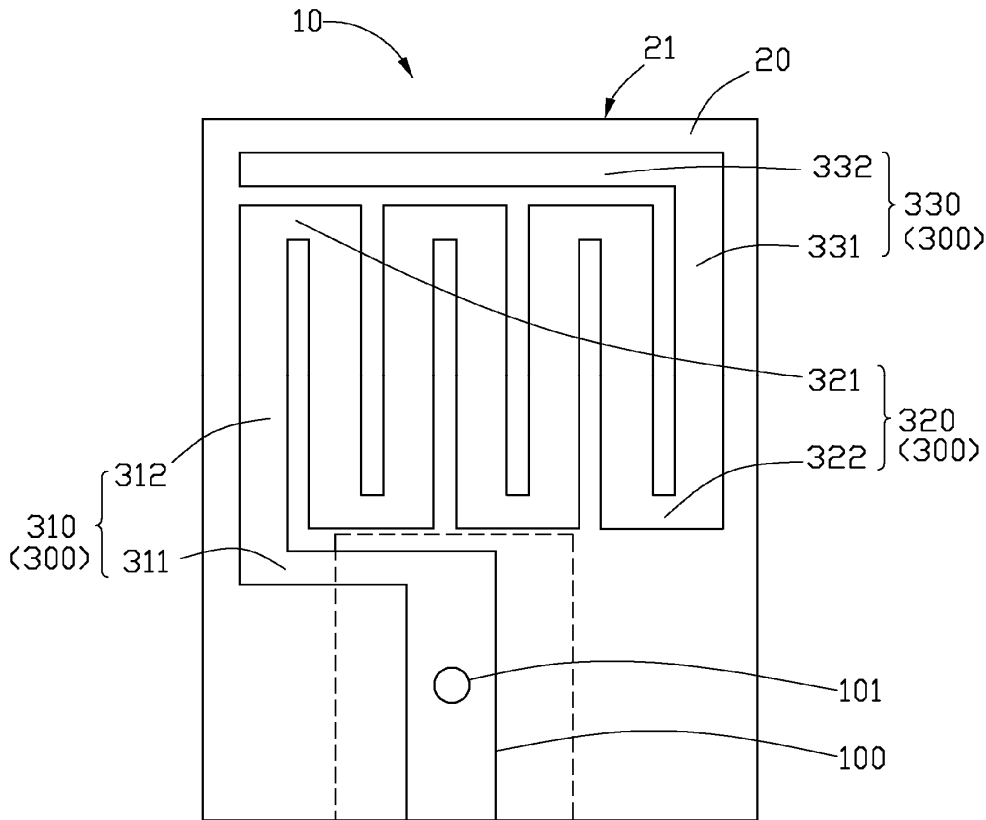
(73) Assignee: **HON HAI PRECISION**
INDUSTRY CO., LTD., Tu-Cheng
(TW)

(21) Appl. No.: **12/206,730**

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

(30) **Foreign Application Priority Data**

Mar. 28, 2008 (CN) 200810300767.0





US 20090243940A1

(19) **United States**

(12) **Patent Application Publication**
Humphrey

(10) **Pub. No.: US 2009/0243940 A1**

(43) **Pub. Date: Oct. 1, 2009**

(54) **FEED-POINT TUNED WIDE BAND ANTENNA**

Related U.S. Application Data

(75) Inventor: **Denver Humphrey**, Ballymena (GB)

(63) Continuation-in-part of application No. 12/078,440, filed on Mar. 31, 2008.

Publication Classification

Correspondence Address:
OLIFF & BERRIDGE, PLC
P.O. BOX 320850
ALEXANDRIA, VA 22320-4850 (US)

(51) **Int. Cl.**
H01Q 1/38 (2006.01)
H01Q 9/18 (2006.01)

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

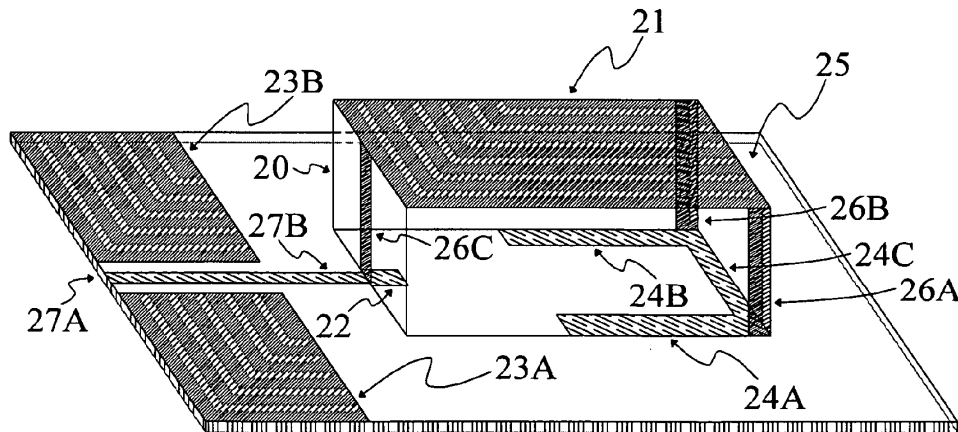
(57) **ABSTRACT**

(73) Assignee: **TDK CORPORATION**, TOKYO (JP)

A wideband chip antenna which is capable of receiving and transmitting signals from an ultra wideband system, where the ultra wideband system comprising a plurality of band groups, and where the response of the antenna can be tuned at the design stage so that a zero in the response of the antenna falls so that its peak is at a particular given frequency, and so that the zero occurs inside an unwanted band group of the ultra wideband system.

(21) Appl. No.: **12/320,970**

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





US 20090243942A1

(19) **United States**

(12) **Patent Application Publication**
Autti

(10) **Pub. No.: US 2009/0243942 A1**

(43) **Pub. Date: Oct. 1, 2009**

(54) **MULTIBAND ANTENNA**

Publication Classification

(76) Inventor: **Marko Tapio Autti, Oulu (FI)**

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

(51) **Int. Cl.**
H01Q 1/42 (2006.01)
H01P 11/00 (2006.01)
H01Q 1/24 (2006.01)
H01Q 1/36 (2006.01)

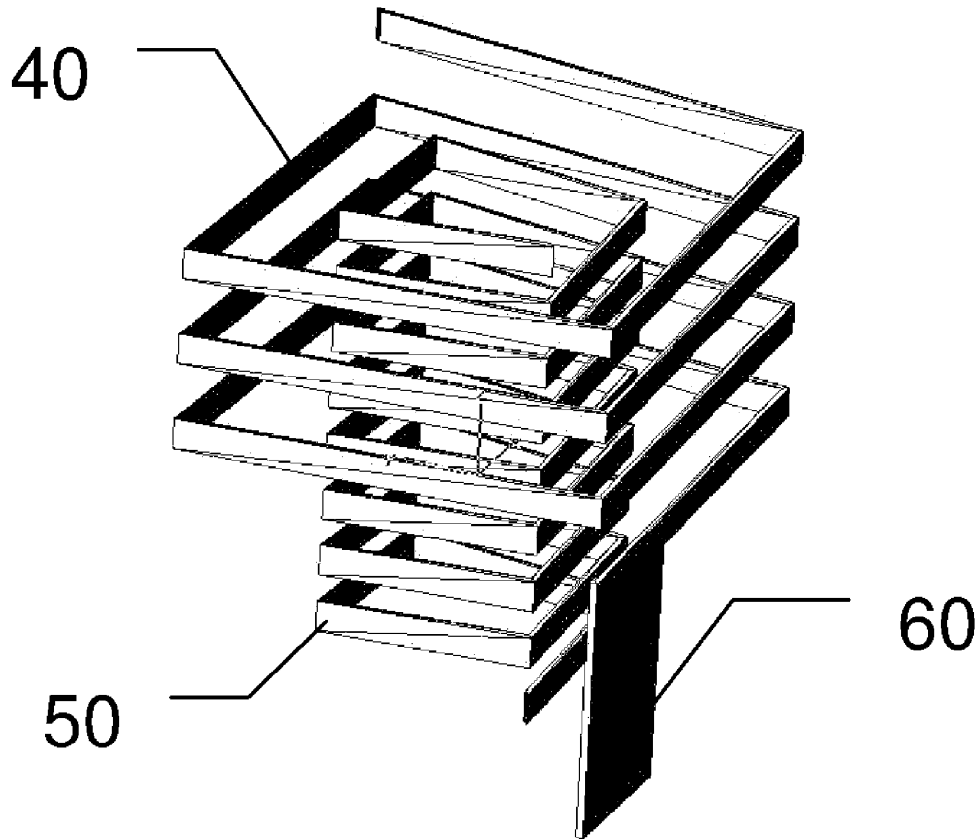
(52) **U.S. Cl. 343/702; 343/872; 343/895; 29/600**

(57) **ABSTRACT**

(21) Appl. No.: **12/059,334**

(22) Filed: **Mar. 31, 2008**

The present invention relates to a compact multiband antenna arrangement and method of manufacturing such an arrangement, wherein a first support body is provided, which is at least partially hollow and which has an outer surface and an inner surface. A first antenna element is carried on the outer surface, and a second antenna element is carried on the inner surface or on an outer surface of a second support body which is at least partially inserted inside the first support body.





US 20090243944A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0243944 A1**

(43) **Pub. Date: Oct. 1, 2009**

(54) **PORTABLE TERMINAL**

Publication Classification

(76) Inventors: **Kang-Jae JUNG**, Seoul (KR);
An-Sun Hyun, Seoul (KR);
Chang-Won Yun, Gwangmyeong (KR)

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

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

Correspondence Address:
KED & ASSOCIATES, LLP
P.O. Box 221200
Chantilly, VA 20153-1200 (US)

(57) **ABSTRACT**

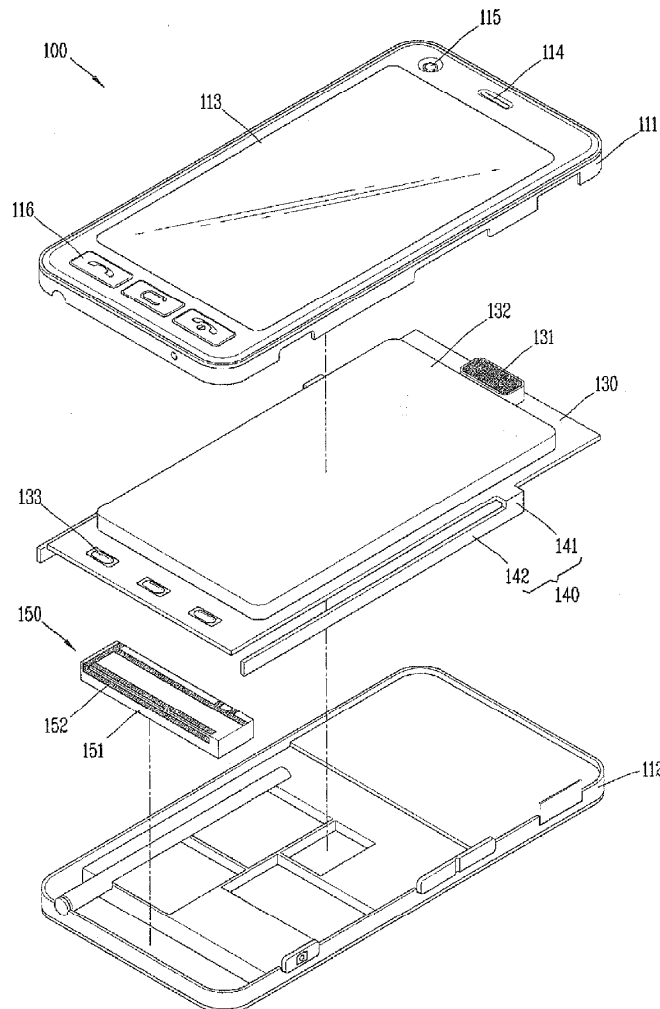
A portable terminal is provided that includes a terminal body having a receiver, a ground unit connected to an antenna unit at the terminal body, and an electric field reducing unit connected to the ground unit and partially transferring a current flowing in the ground unit to a side surface of the terminal body. The strength of the electric field formed at the periphery of the receiver of the portable terminal may be reduced, thus minimizing interference between the portable terminal and the hearing aid.

(21) Appl. No.: **12/394,224**

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

(30) **Foreign Application Priority Data**

Mar. 25, 2008 (KR) 10-2008-0027548





US 20090243947A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0243947 A1**

(43) **Pub. Date: Oct. 1, 2009**

(54) **ANTENNA WITH FIRST AND SECOND LOOP RADIATING ELEMENTS**

Publication Classification

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

(51) **Int. Cl.**
H01Q 11/12 (2006.01)
H01Q 1/38 (2006.01)
(52) **U.S. Cl.** **343/742; 343/700 MS**

Correspondence Address:
Sunstein Kann Murphy & Timbers LLP
125 SUMMER STREET
BOSTON, MA 02110-1618 (US)

(57) **ABSTRACT**

An antenna includes a dielectric substrate, first and second feeding points, first and second grounding points, first and second loop radiating elements, and a grounding element. The first and second feeding points and the first and second grounding points are formed on the dielectric substrate. The first and second radiating elements are spaced apart from each other and have a shape and a size that are identical. Each of the first and second loop radiating elements is operable in a frequency range, and has a feeding end coupled to a respective one of the first and second feeding points, and a grounding end coupled to a respective one of the first and second grounding points. The grounding element is formed on the dielectric substrate and is disposed between the first and second loop radiating elements.

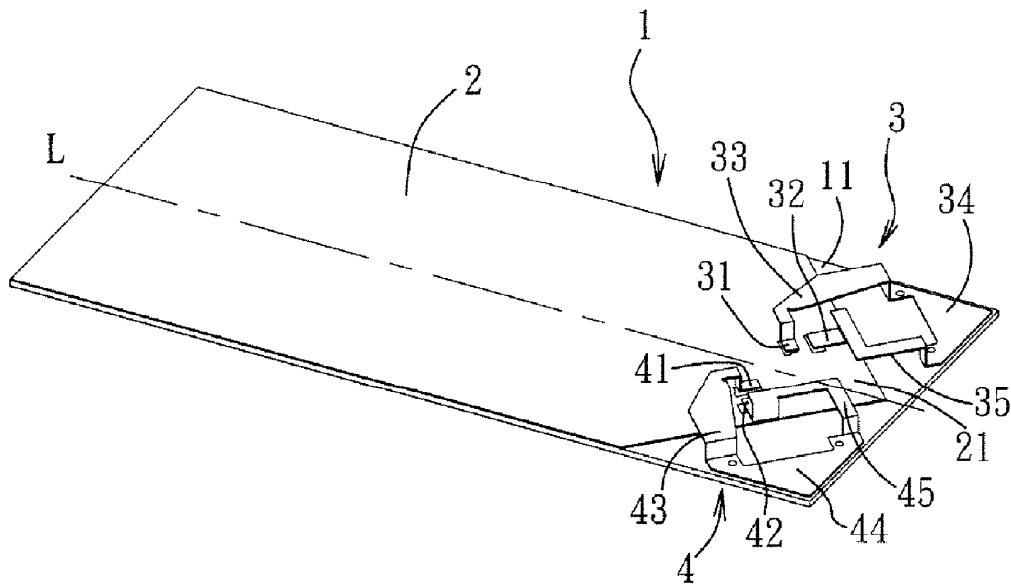
(73) Assignee: **QUANTA COMPUTER INC.**,
Kuei Shan Hsiang (TW)

(21) Appl. No.: **12/174,760**

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

(30) **Foreign Application Priority Data**

Apr. 1, 2008 (TW) 097111856





US 20090251380A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0251380 A1**

(43) **Pub. Date: Oct. 8, 2009**

(54) **DUAL POLARIZED ANTENNA**

Publication Classification

(75) Inventors: **Akio Kuramoto**, Tokyo (JP);
Hiroyuki Yusa, Tokyo (JP)

(51) **Int. Cl.**
H01Q 25/00 (2006.01)
H01Q 9/00 (2006.01)
H01Q 1/50 (2006.01)

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

(52) **U.S. Cl.** **343/843; 343/850; 343/756**

(57) **ABSTRACT**

To provide a dual polarized antenna capable of reducing correlation between antenna elements.

(73) Assignee: **NEC Corporation**, Minato-Ku,
Tokyo (JP)

A dual polarized antenna is constituted by a vertically polarized antenna and a horizontally polarized antenna formed on a printed circuit board and radiates two kinds of polarized waves. The vertically polarized antenna has a configuration in which: a first microstripline is extended along the longitudinal direction of the printed circuit board from the lower portion of the printed circuit board; a first conductive radiating element is disposed at one end of the first microstripline; a phase delay circuit is serially connected to the first conductive radiating element; a second conductive radiating element is added to one end of the phase delay circuit; and a third conductive radiating element is added to a ground conductor which is disposed on the rear side of the surface of the printed circuit board on which the first conductive radiating element and first microstripline are connected at a corresponding portion thereof.

(21) Appl. No.: **12/305,540**

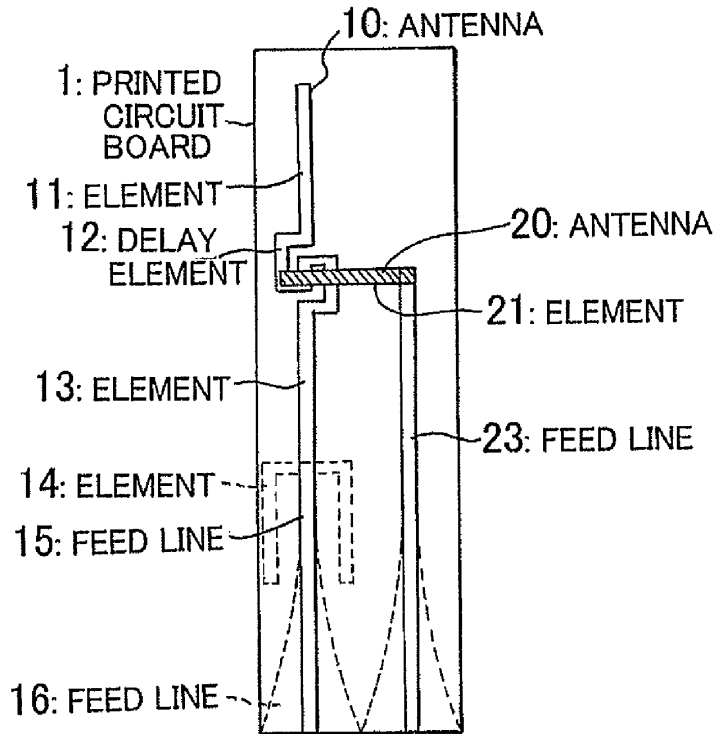
(22) PCT Filed: **Apr. 11, 2008**

(86) PCT No.: **PCT/JP2008/057136**

§ 371 (c)(1),
(2), (4) Date: **Dec. 18, 2008**

(30) **Foreign Application Priority Data**

Apr. 12, 2007 (JP) 2007-104837





US 20090251381A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0251381 A1**

(43) **Pub. Date: Oct. 8, 2009**

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

Publication Classification

(76) Inventors: **Jui-Hung Chou**, Taichung City (TW); **Saou-Wen Su**, Taipei City (TW)

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

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

(57) **ABSTRACT**

Correspondence Address:
ROSENBERG, KLEIN & LEE
3458 ELLICOTT CENTER DRIVE-SUITE 101
ELLICOTT CITY, MD 21043 (US)

A dual-feed and dual-band antenna includes a substrate, a grounding unit disposed on the substrate and having two opposite sides, a first radiating unit disposed on the substrate near the first side of the grounding unit, and a second radiating unit disposed on the substrate near the second side. The second radiating unit has a short-circuit strip electrically connected to the grounding unit. The antenna further includes a first coaxial cable electrically connected to the first radiating unit and the grounding unit, and a second coaxial cable electrically connected to the second radiating unit and the grounding unit.

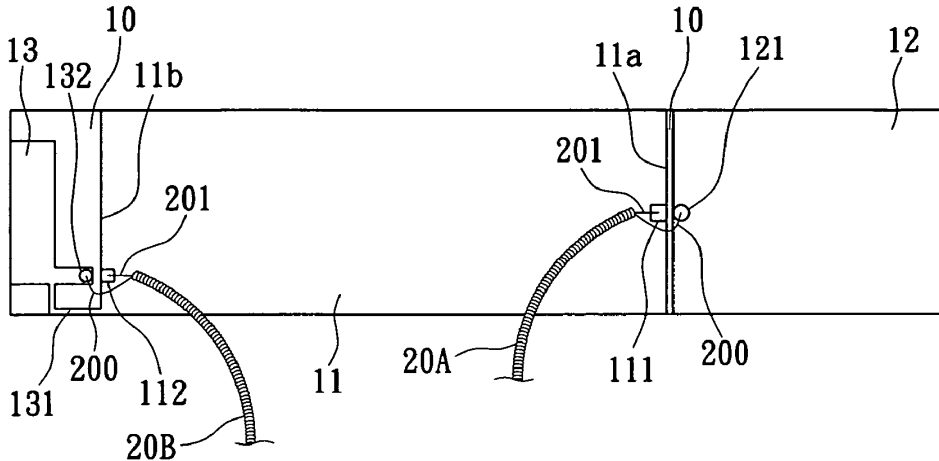
(21) Appl. No.: **12/216,726**

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

(30) **Foreign Application Priority Data**

Apr. 8, 2008 (CN) 200810089213.0

1





US 20090256753A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0256753 A1**

(43) **Pub. Date: Oct. 15, 2009**

(54) **DTV ANTENNA APPARATUS**

(30) **Foreign Application Priority Data**

(75) Inventors: **Yen-Yu Chen**, Chung Ho City (TW); **Kuo-Ying Su**, Chung Ho City (TW); **Yung-Da Lin**, Chung Ho City (TW)

Apr. 15, 2008 (TW) 97113633

Publication Classification

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

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

(57) **ABSTRACT**

Correspondence Address:
THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP
600 GALLERIA PARKWAY, S.E., STE 1500
ATLANTA, GA 30339-5994 (US)

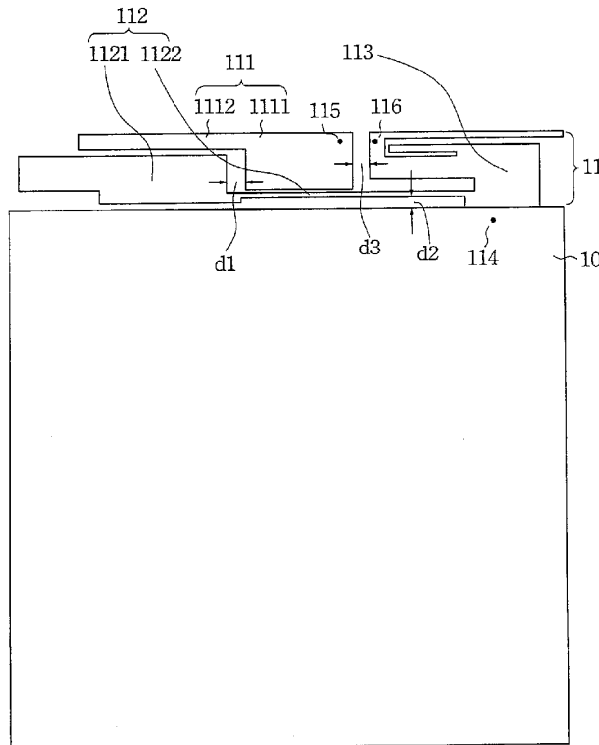
The present invention discloses a DTV antenna apparatus build in a portable device. The portable device includes a system ground. The DTV antenna includes a ground plane with a short circuit point, an extending metal arm with a grounding point and a radiation element. The ground plane is the system ground. The radiation element and the ground plane are arranged in parallel to each other. The extending metal arm connects with the short circuit point. The antenna receives signals with frequencies in the range from 470 MHz to 870 MHz. The radiation element includes a radiation arm and a parasitic arm. The radiation arm has a feeding terminal. The parasitic arm connects with the short circuit point.

(73) Assignee: **AVERMEDIA TECHNOLOGIES, INC.**, Chung Ho City (TW)

(21) Appl. No.: **12/146,886**

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

100





US 20090256754A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0256754 A1**

(43) **Pub. Date: Oct. 15, 2009**

(54) **ANTENNA HAVING A DIVERSITY EFFECT**

(30) **Foreign Application Priority Data**

(75) Inventors: **Tiao-Hsing Tsai**, Taipei Shien (TW); **Chih-Wei Liao**, Yilan Shien (TW); **Chao-Hsu Wu**, Tao Yuan Shien (TW)

Apr. 10, 2008 (TW) 097112992

Publication Classification

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

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

(57) **ABSTRACT**

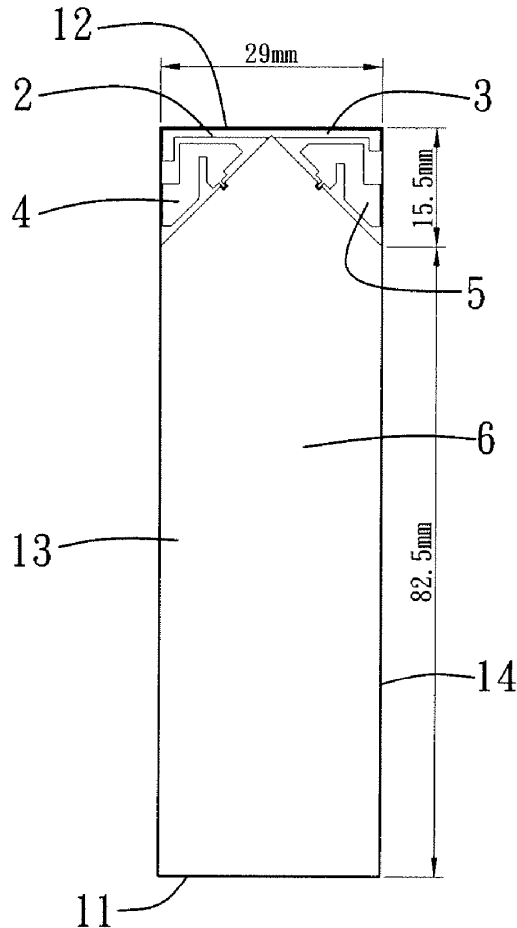
Correspondence Address:
FOLEY AND LARDNER LLP
SUITE 500
3000 K STREET NW
WASHINGTON, DC 20007 (US)

An antenna includes a dielectric substrate, a grounding plane, first and second grounding elements, and first and second radiating elements. The grounding plane is formed on the dielectric substrate and is disposed between the first and second radiating elements. The first and second grounding elements extend from the grounding plane away from each other. The first and second radiating elements are coupled electromagnetically to the first and second grounding elements, respectively.

(73) Assignee: **QUANTA COMPUTER INC.**

(21) Appl. No.: **12/197,885**

(22) Filed: **Aug. 25, 2008**





US 20090256755A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0256755 A1**

(43) **Pub. Date: Oct. 15, 2009**

(54) **PLANAR ANTENNA**

(30) **Foreign Application Priority Data**

(75) Inventors: **Tiao-Hsing TSAI**, Taipei Shien (TW); **Chih-Wei LIAO**, Yilan Shein (TW); **Chao-Hsu WU**, Tao Yuan Shein (TW); **Chieh-Ping CHIU**, Yunlin Shien (TW)

Apr. 10, 2008 (TW) 097112991

Publication Classification

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

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

(57) **ABSTRACT**

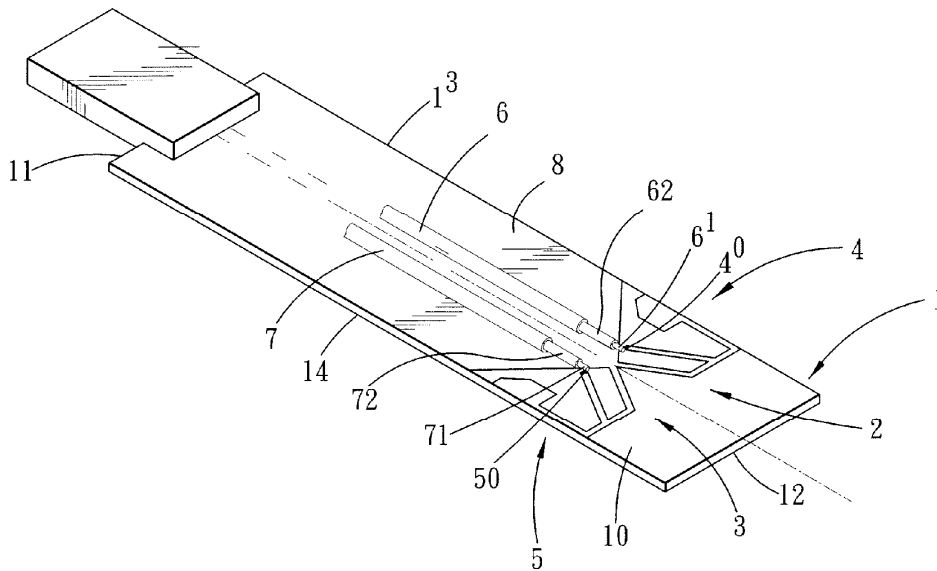
Correspondence Address:
FOLEY AND LARDNER LLP
SUITE 500
3000 K STREET NW
WASHINGTON, DC 20007 (US)

An antenna includes a dielectric substrate, a grounding plane, first and second grounding elements, and first and second radiating elements. The grounding plane is formed on the dielectric substrate. The first and second grounding elements are formed on the dielectric substrate, have a curved shape and a size that are identical, and are connected to the grounding plane. The first and second radiating elements are formed on the dielectric substrate, have a curved shape and a size that are identical, are operable in the same frequency range, and are connected to the first and second grounding elements, respectively.

(73) Assignee: **QUANTA COMPUTER INC.**

(21) Appl. No.: **12/199,143**

(22) Filed: **Aug. 27, 2008**





US 20090256756A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0256756 A1**

(43) **Pub. Date: Oct. 15, 2009**

(54) **DUAL FREQUENCY ANTENNA AND COMMUNICATION SYSTEM**

(30) **Foreign Application Priority Data**

Apr. 14, 2008 (CN) 200810301132.2

(75) Inventors: **CHIH-YUAN YANG**, Tu-Cheng (TW); **PO-WEI KUO**, Tu-Cheng (TW); **SUO-BING SU**, Tu-Cheng (TW); **HUNG-CHANG KO**, Tu-Cheng (TW); **WEN-CHUN CHEN**, Tu-Cheng (TW)

Publication Classification

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

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

Correspondence Address:
PCE INDUSTRY, INC.
ATT. Steven Reiss
288 SOUTH MAYO AVENUE
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(57) **ABSTRACT**

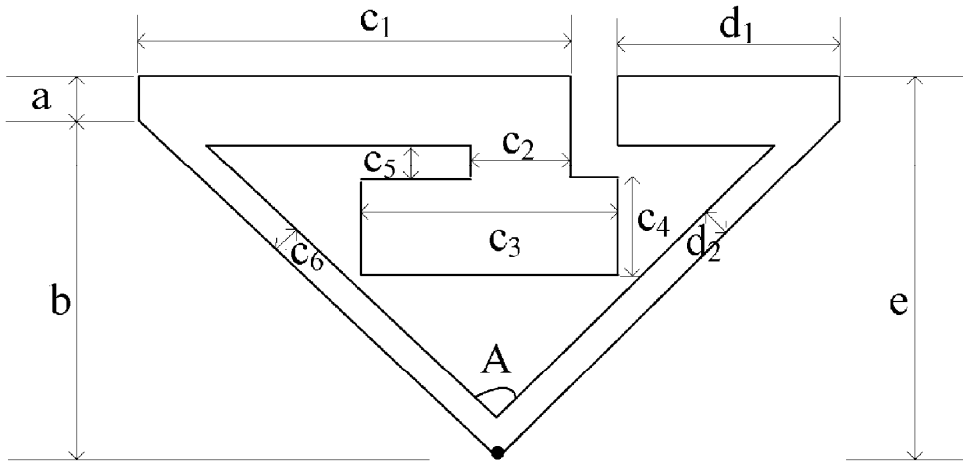
A dual frequency antenna includes a first scythe-shaped arm and a second scythe-shaped arm. The first scythe-shaped arm is configured for operating in a first band. The second scythe-shaped arm is configured for operating in a second band and includes an inverted-T-shaped strip with a foot of the inverted-T-shaped strip connected to the second scythe-shaped arm. The first scythe-shaped arm is attached to the second scythe-shaped arm at an apex. A head of the inverted-T-shaped strip is closer to the apex than the foot. A communication system is also provided.

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

(21) Appl. No.: **12/423,016**

(22) Filed: **Apr. 14, 2009**

12





US 20090256757A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0256757 A1**

(43) **Pub. Date: Oct. 15, 2009**

(54) **SLOT ANTENNAS FOR ELECTRONIC DEVICES**

Publication Classification

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

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

(57) **ABSTRACT**

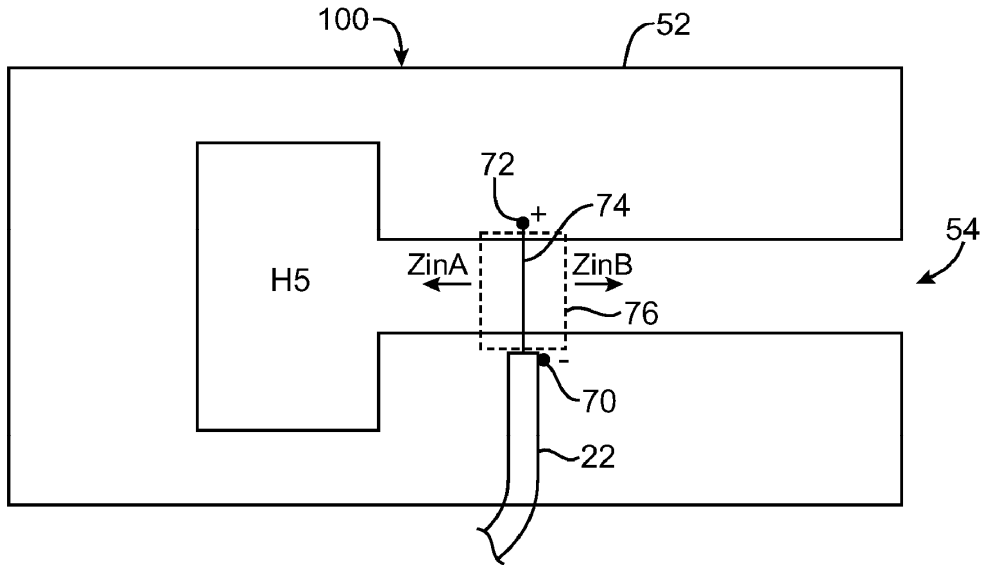
(76) Inventors: **Bing Chiang**, Cupertino, CA (US);
Douglas Blake Kough, San Jose, CA (US);
Enrique Ayala Vazquez, Watsonville, CA (US)

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

Slot antennas are provided for electronic devices such as portable electronic devices. The slot antennas may have a dielectric-filled slot that is formed in a ground plane element. The ground plane element may be formed from part of a conductive device housing. The slot may have one or more holes at its ends. The holes may affect the impedance characteristics of the slot antennas so that the length of the slot antennas may be reduced. For example, the holes can be used to synthesize the impedance of the slot antennas so that the slot antennas have a resonant frequency that is different from their natural resonant frequency. The holes may affect the impedance of the slot antennas in multiple radio-frequency bands.

(21) Appl. No.: **12/101,121**

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





US 20090256763A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0256763 A1**

(43) **Pub. Date: Oct. 15, 2009**

(54) **MULTIBAND FOLDED LOOP ANTENNA**

Publication Classification

(75) Inventors: **Yun-Wen Chi**, Taipei County (TW); **Kin-Lu Wong**, Kaohsiung City (TW)

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

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

(57) **ABSTRACT**

Correspondence Address:
OLIFF & BERRIDGE, PLC
P.O. BOX 320850
ALEXANDRIA, VA 22320-4850 (US)

The present invention relates to a multiband folded loop antenna comprising a dielectric substrate, a ground plane, a radiating portion and a matching circuit. The ground plane is located on the dielectric substrate and has a grounding point. The radiating portion comprises a supporter, a loop strip, and a tuning patch. The loop strip has a length about half wavelength of the antenna's lowest resonant frequency. The loop strip has a feeding end and a grounding end, with the grounding end electrically connected to the grounding point on the ground plane. The loop strip is folded into a three-dimensional structure and is supported by the supporter. The tuning patch is electrically connected to the loop strip. The matching circuit is located on the dielectric substrate with one terminal electrically connected to the feeding end of the loop strip and another terminal to a signal source.

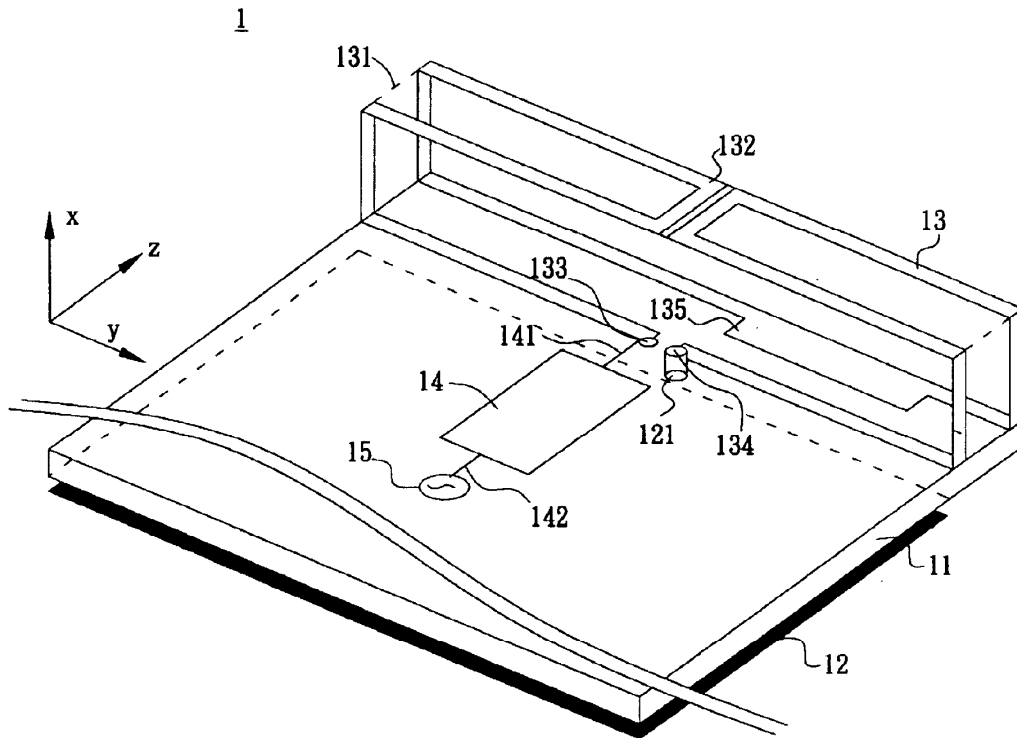
(73) Assignee: **ACER INCORPORATED**, Taipei Hsien (TW)

(21) Appl. No.: **12/213,166**

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

(30) **Foreign Application Priority Data**

Apr. 9, 2008 (TW) 097112916





US 20090256765A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0256765 A1**

(43) **Pub. Date: Oct. 15, 2009**

(54) **ANTENNA**

Publication Classification

(75) Inventors: **Yi-Fong Lu**, Taipei City (TW);
Yi-Cheng Lin, Taipei City (TW);
Kuo-Fong Hung, Taipei City (TW)

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

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

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QUINTERO LAW OFFICE, PC
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SANTA MONICA, CA 90405 (US)

(57) **ABSTRACT**

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

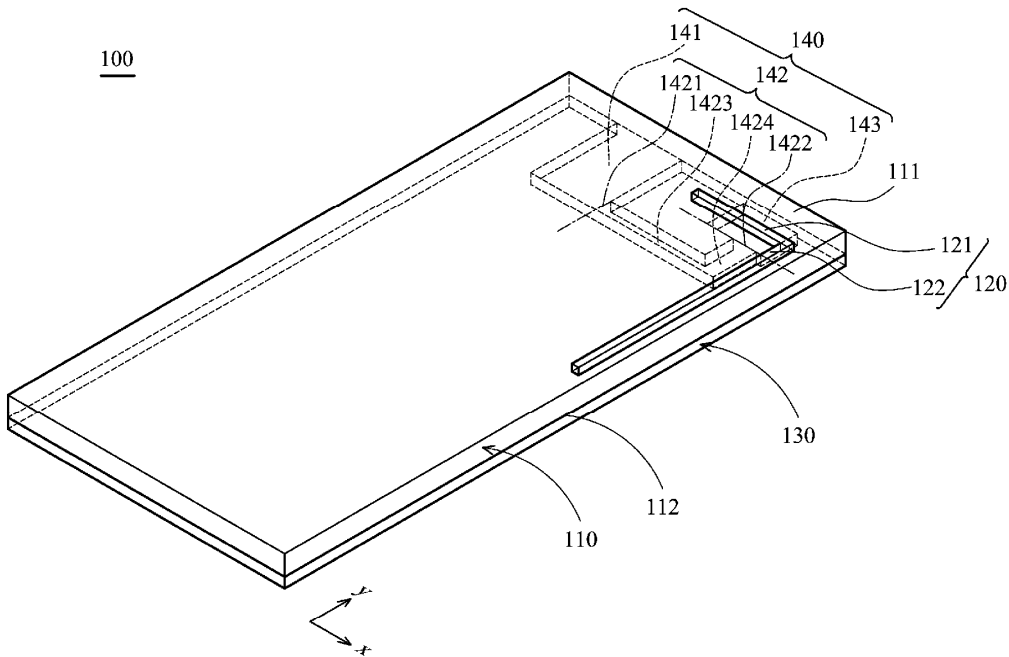
An antenna is provided. The antenna includes a substrate, a feed conductor, a ground layer and a radiation slot. The substrate includes a first surface and a second surface, wherein the first surface is opposite to the second surface. The feed conductor is formed on the first surface. The ground layer is formed on the second surface. The radiation slot is formed on the ground layer, including a first radiation portion, a second radiation portion and a third radiation portion, wherein the second radiation portion connects the first radiation portion and the third radiation portion, the radiation slot is U shaped, and the feed conductor corresponds to a location between the second radiation portion and the third radiation portion.

(21) Appl. No.: **12/259,978**

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

(30) **Foreign Application Priority Data**

Apr. 9, 2008 (TW) TW97112781





US 20090256767A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0256767 A1**

(43) **Pub. Date: Oct. 15, 2009**

(54) **SYMMETRICAL MATRIX REPRESENTATION OF DIPOLE UWB ANTENNA**

Publication Classification

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

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

(57) **ABSTRACT**

(75) **Inventors:** **CHING-NENG KAN**, Taoyuan County (TW); **HSUAN-YI KUO**, Taoyuan County (TW)

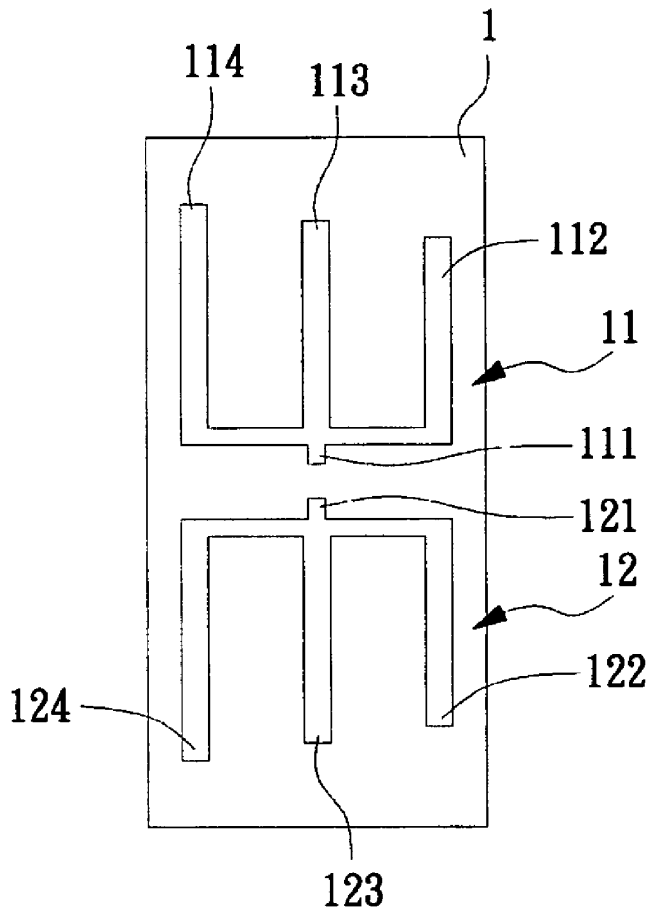
Correspondence Address:
WPAT, PC
7225 BEVERLY ST.
ANNANDALE, VA 22003 (US)

A symmetrical matrix representation of dipole UWB antenna, mounted on a substrate and attachable to a wireless communication apparatus, comprises a first radiation arm, said first radiation arm comprising a first feed point, a first branch, a second branch, and a third branch, said first branch, said second branch, and said third branch are spaced in parallel, said first feed point and said second branch are aligned; and a second radiation arm, said second radiation arm comprising a second feed point, a fourth branch, a fifth branch, and a sixth branch, said fourth branch, said fifth branch, and said sixth branch are spaced in parallel, said first feed point and said second branch are aligned; wherein said first feed point and said second feed point are interconnected to a wireless communication apparatus.

(73) **Assignee:** **KINSUN INDUSTRIES INC.**, Taoyuan County (TW)

(21) **Appl. No.:** **12/100,057**

(22) **Filed:** **Apr. 9, 2008**





US 20090256769A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0256769 A1**

(43) **Pub. Date: Oct. 15, 2009**

(54) **ASYMMETRICAL YAGI REPRESENTATION OF DIPOLE UWB ANTENNA**

Publication Classification

(75) Inventors: **CHING-NENG KAN**, Taoyuan County (TW); **HSUAN-YI KUO**, Taoyuan County (TW)

(51) **Int. Cl.**
H01Q 19/30 (2006.01)

(52) **U.S. Cl.** **343/819**

(57) **ABSTRACT**

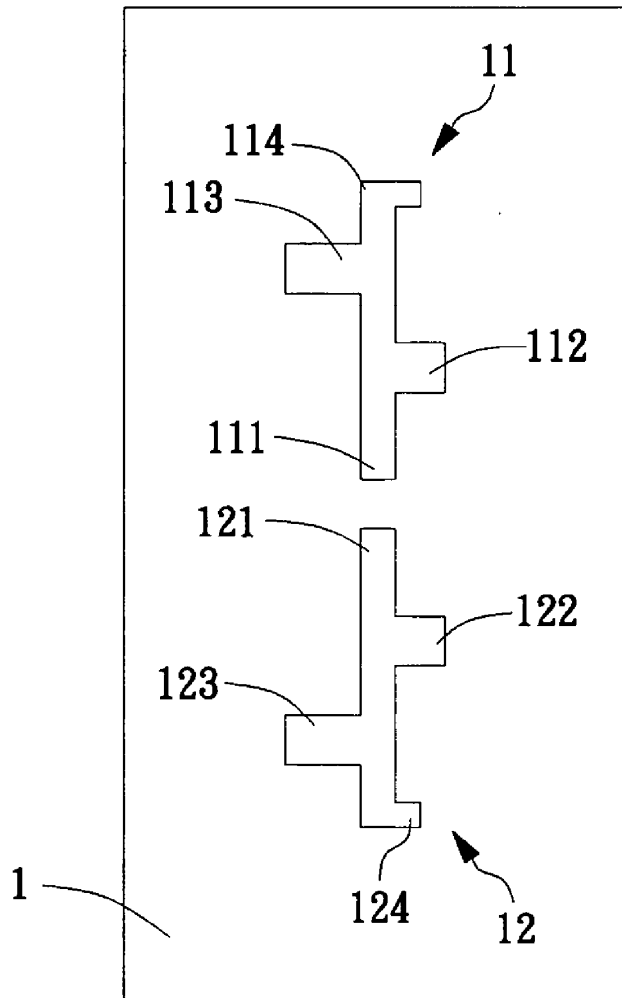
Correspondence Address:
WPAT, PC
7225 BEVERLY ST.
ANNANDALE, VA 22003 (US)

The present invention related an asymmetrical yagi representation of dipole UWB antenna herein, said antenna located on a substrate and able to be interconnected to a wireless communication apparatus. The antenna comprising: a first radiation arm, said radiation arm comprising a first feed point, a first branch, a second branch, and a first tail. The second radiation arm comprising a second feed point, a third branch, a fourth branch and a second tail. Said first tail and said second tail point are located at the farthest spot from the first radiation arm and the second radiation arm respectively.

(73) Assignee: **KINSUN INDUSTRIES INC.**, Taoyuan County (TW)

(21) Appl. No.: **12/100,022**

(22) Filed: **Apr. 9, 2008**





US 20090256779A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0256779 A1**

(43) **Pub. Date: Oct. 15, 2009**

(54) **HYBRID ANTENA FOR USE WITH WWAN
WLAN AND WMAN**

(52) **U.S. CL. 343/893**

(57) **ABSTRACT**

(75) Inventors: **Shu-Yean Wang**, Tu-cheng (TW);
Cheng-Ta Hung, Tu-cheng (TW);
Yun-Lung Ke, Tu-cheng (TW)

A multi-band antenna includes a grounding element, a first antenna connected to the grounding element, a second antenna connected to the grounding element and a coupling radiating arm extending from the grounding element. The grounding element extends along a lengthwise direction and includes first and second lengthwise sides. The first antenna includes a first connecting element extending from the grounding element and a first radiating element electrically connected to the first connecting element. The second antenna includes a second connecting element extending from the grounding element and a second radiating element electrically connected to the second connecting element. The first radiating element includes a first radiating portion extending from the first connecting element in both a longitudinal direction and a transverse direction and a second radiating portion substantially being leptosomatic. The second radiating element substantially extends in a lengthwise direction and forms a first radiating section operating on a first frequency band and a second radiating section operating on a second frequency band. The first antenna is located between the first antenna and the second antenna in a vertical direction. The coupling radiating arm is between the first radiating section of the second radiating element of the second antenna and the grounding element in a vertical direction.

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

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

(21) Appl. No.: **12/386,116**

(22) Filed: **Apr. 14, 2009**

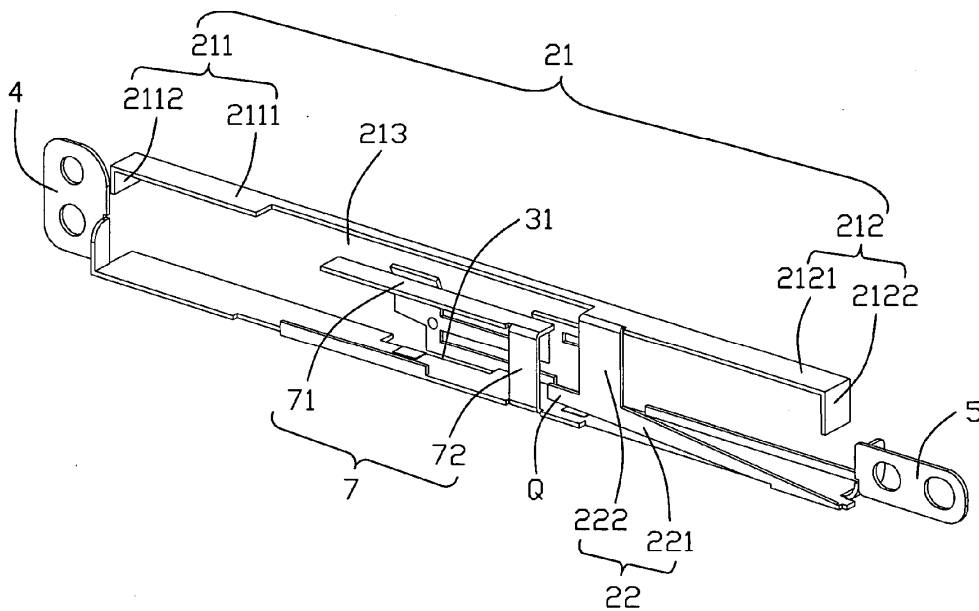
(30) **Foreign Application Priority Data**

Apr. 14, 2008 (TW) 97113435

Publication Classification

(51) **Int. Cl.**
H01Q 21/28 (2006.01)

100





US 20090262026A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0262026 A1**

(43) **Pub. Date: Oct. 22, 2009**

(54) **PRINTED ANTENNA**

(30) **Foreign Application Priority Data**

(75) Inventors: **Zhi-Cheng Yu**, Shenzhen City (CN); **Cho-Ju Chung**, Taipei Hsien (TW)

Apr. 16, 2008 (CN) 200810301147.9

Publication Classification

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

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

(57) **ABSTRACT**

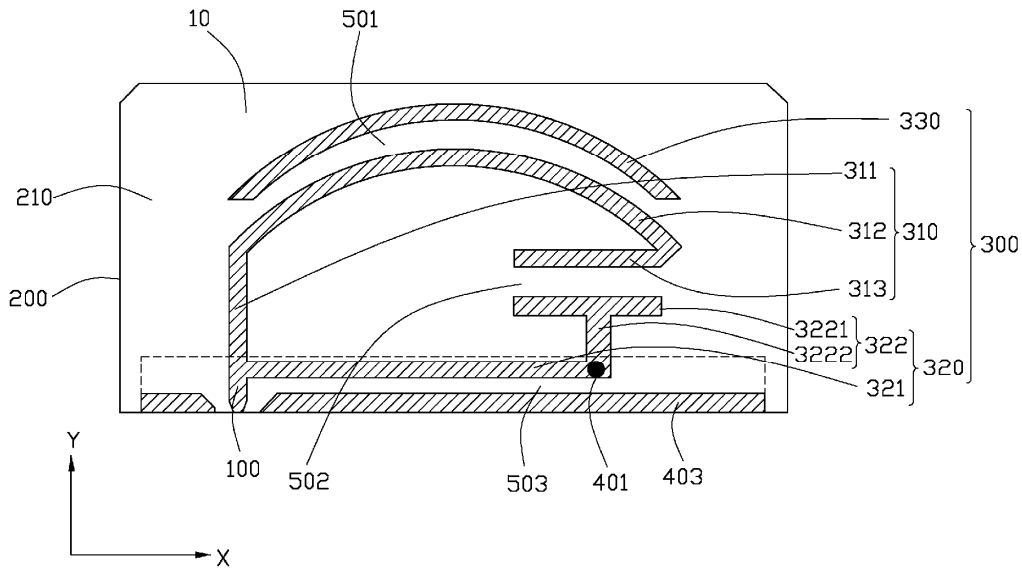
Correspondence Address:
PCE INDUSTRY, INC.
ATT. Steven Reiss
288 SOUTH MAYO AVENUE
CITY OF INDUSTRY, CA 91789 (US)

A printed antenna is positioned on a substrate, and includes a feeding portion and a radiating portion. The feeding portion is configured for feeding electromagnetic signals. The radiating portion is electronically connected to the feeding portion for transceiving the electromagnetic signals, and includes a first radiator, a second radiator, and a guiding portion. The first radiator is electronically connected to the feeding portion, and includes an arc-shaped radiating section. The second radiator is electronically connected to the feeding portion and the first radiator. The guiding portion is arc-shaped. The guiding portion and the second radiator are respectively positioned on different sides of the first radiator. A space between the guiding portion and the arc-shaped radiating section of the first radiator defines a first slot.

(73) Assignees: **HONG FU JIN PRECISION INDUSTRY (ShenZhen)O., LTD.**, Shenzhen City (CN); **HON HAI PRECISION INDUSTRY CO., LTD.**, Taipei Hsien (TW)

(21) Appl. No.: **12/206,725**

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





US 20090262027A1

(19) **United States**

(12) **Patent Application Publication**
Hsu

(10) **Pub. No.: US 2009/0262027 A1**

(43) **Pub. Date: Oct. 22, 2009**

(54) **DUAL-BAND ANTENNA**

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

(76) **Inventor: Min-Shun Hsu, Hsinchu City (TW)**

(57) **ABSTRACT**

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

A dual-band antenna is disclosed and used for receiving or transmitting a first frequency band signal corresponding to a first central frequency and a second frequency band signal corresponding to a second central frequency. The dual-band antenna includes a first radiator, a feed line, a second radiator, and two parallel substrates each of which a grounding plane is installed on. The first and second radiators are respectively installed on the substrates and spatially overlap to each other in part. The first radiator receives and transmits the first and second frequency band signals and includes a first metal strip, having a plurality of bends, and a second metal strip. The second metal strip and the feed line are coupled to the first metal strip. The second radiator is used for enhancing the efficiency of receiving the second frequency band signal for the first radiator.

(21) **Appl. No.: 12/426,277**

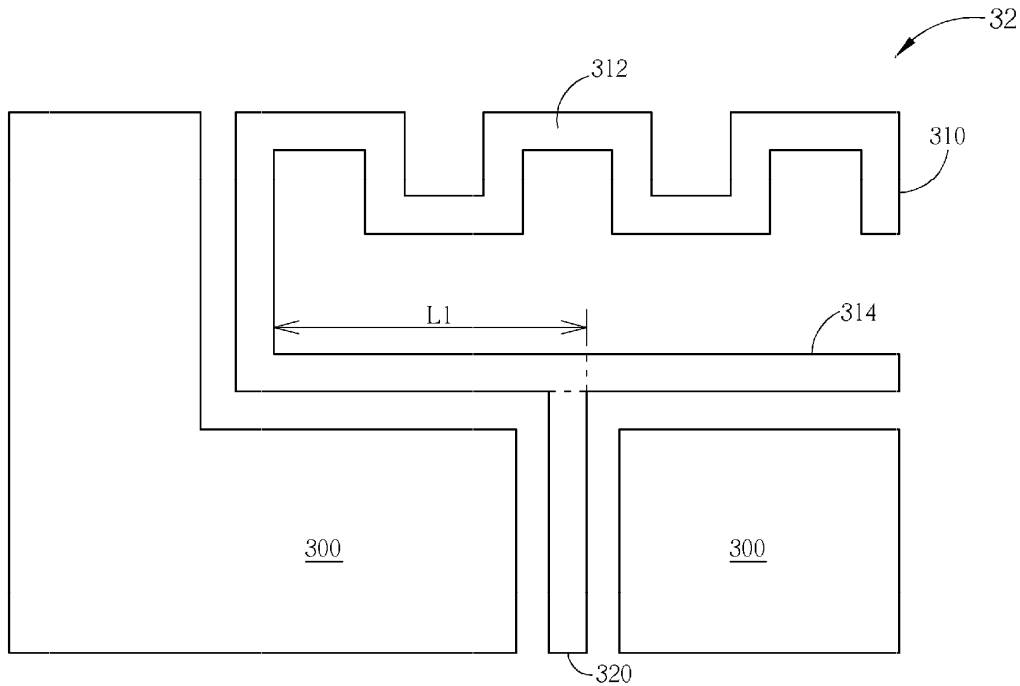
(22) **Filed: Apr. 19, 2009**

(30) **Foreign Application Priority Data**

Apr. 21, 2008 (TW) 097114471

Publication Classification

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





US 20090262029A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0262029 A1**

(43) **Pub. Date: Oct. 22, 2009**

(54) **ANTENNAS FOR WIRELESS ELECTRONIC DEVICES**

Publication Classification

(51) **Int. Cl.**
H01Q 1/24 (2006.01)
H01Q 13/00 (2006.01)
(52) **U.S. Cl.** **343/702; 343/785**

(76) Inventors: **Bing Chiang**, Cupertino, CA (US);
Douglas Blake Kough, San Jose, CA (US);
Enrique Ayala Vazquez, Watsonville, CA (US);
Eduardo Lopez Camacho, Watsonville, CA (US);
Gregory Allen Springer, Sunnyvale, CA (US)

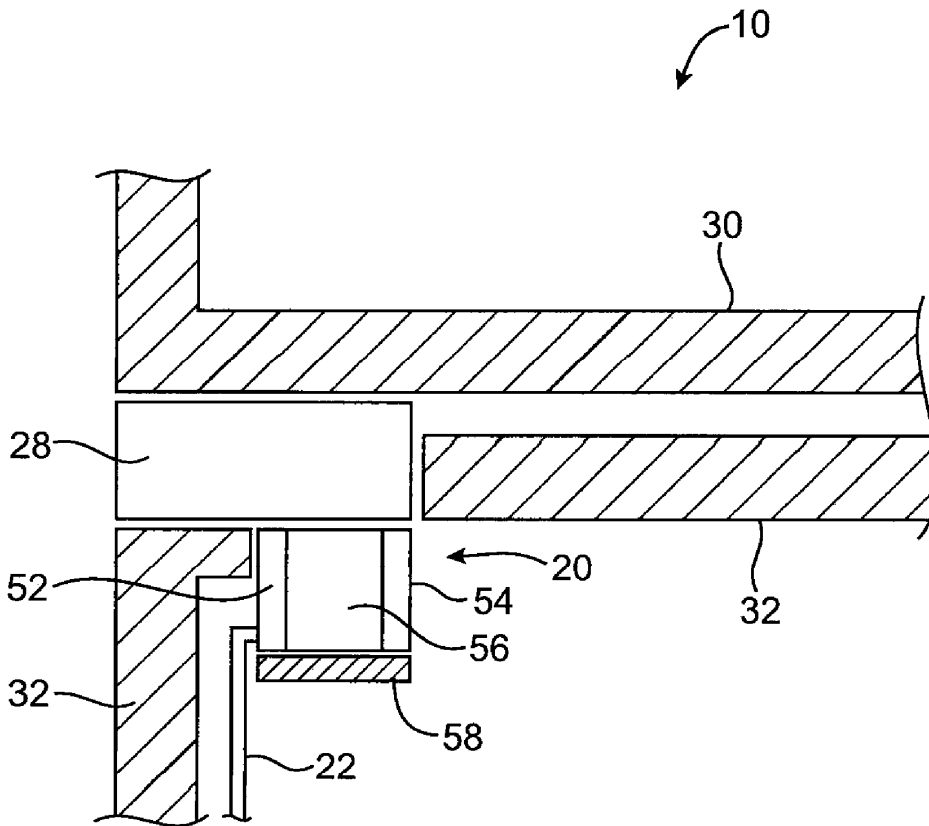
(57) **ABSTRACT**

Antenna window structures and antennas are provided for electronic devices. The electronic devices may be laptop computers or other devices that have conductive housings. Antenna windows can be formed from dielectric members. The dielectric members can have elastomeric properties. An antenna may be mounted inside a conductive housing beneath a dielectric member. The antenna can be formed from a parallel plate waveguide structure. The parallel plate waveguide structure may have a ground plate and a radiator plate and may have dielectric material between the ground and radiator plates. The ground plate can have a primary ground plate portion and a ground strip. The ground strip may reflect radio-frequency signals so that they travel through the dielectric member. The antenna may handle radio-frequency antenna signals in one or more communications bands. The radio-frequency antenna signals pass through the dielectric member.

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

(21) Appl. No.: **12/104,359**

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





US 20090267840A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0267840 A1**

(43) **Pub. Date: Oct. 29, 2009**

(54) **SOLID ANTENNA**

Publication Classification

(75) Inventors: **SU XU**, Shenzhen City (CN);
MAO-HSIU HSU, Tu-Cheng (TW)

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

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

Correspondence Address:
PCE INDUSTRY, INC.
ATT. Steven Reiss
288 SOUTH MAYO AVENUE
CITY OF INDUSTRY, CA 91789 (US)

(57) **ABSTRACT**

A solid antenna positioned on a substrate, includes a feeding portion for feeding electromagnetic signals and a radiating portion for transceiving the electromagnetic signals. The radiating portion includes a first radiator, a second radiator, a third radiator, a fourth radiator, a first connecting section, and a second connecting section. The first radiator and the second radiator are positioned on a first plane, and respectively comprise a first inverted-U-shaped radiating section and a second inverted-U-shaped radiating section. The third U-shaped radiator is positioned on a second plane perpendicular to the first plane. The first connecting section connects the first radiator to the third radiator. The second connecting section connects the second radiator to the third radiator. The fourth radiator is connected to the second radiator. The first connecting section, the second connecting section, and the fourth radiator comprise one radiating section positioned on a third plane.

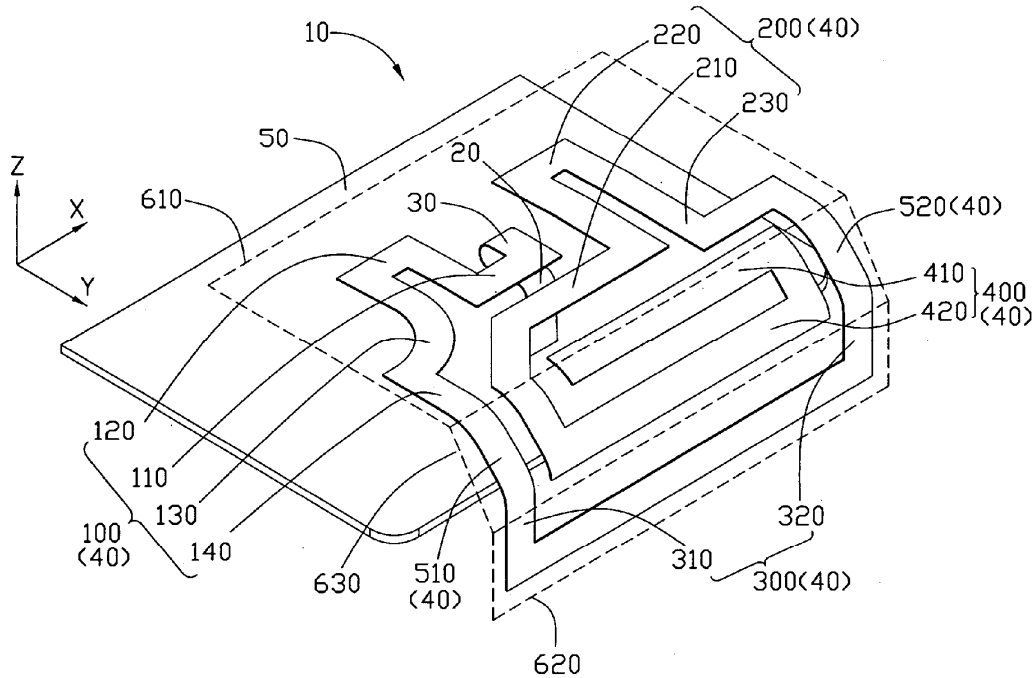
(73) Assignees: **HONG FU JIN PRECISION INDUSTRY (ShenZhen) CO., LTD.**, Shenzhen City (CN); **HON HAI PRECISION INDUSTRY CO., LTD.**, Tu-Cheng (TW)

(21) Appl. No.: **12/211,038**

(22) Filed: **Sep. 15, 2008**

(30) **Foreign Application Priority Data**

Apr. 28, 2008 (CN) 200810301380.7





US 20090267854A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0267854 A1**

(43) **Pub. Date: Oct. 29, 2009**

(54) **METHOD FOR ENHANCING AN ANTENNA PERFORMANCE, ANTENNA, AND APPARATUS**

(22) Filed: **Apr. 25, 2008**

Publication Classification

(76) Inventors: **Markku Oksanen**, Helsinki (FI);
Pekka Ikonen, Helsinki (FI);
Markku Heino, Espoo (FI); **Eira Seppala**, Helsinki (FI); **Reijo Lehtiniemi**, Helsinki (FI)

(51) **Int. Cl.**
H01Q 1/00 (2006.01)
H01Q 9/04 (2006.01)

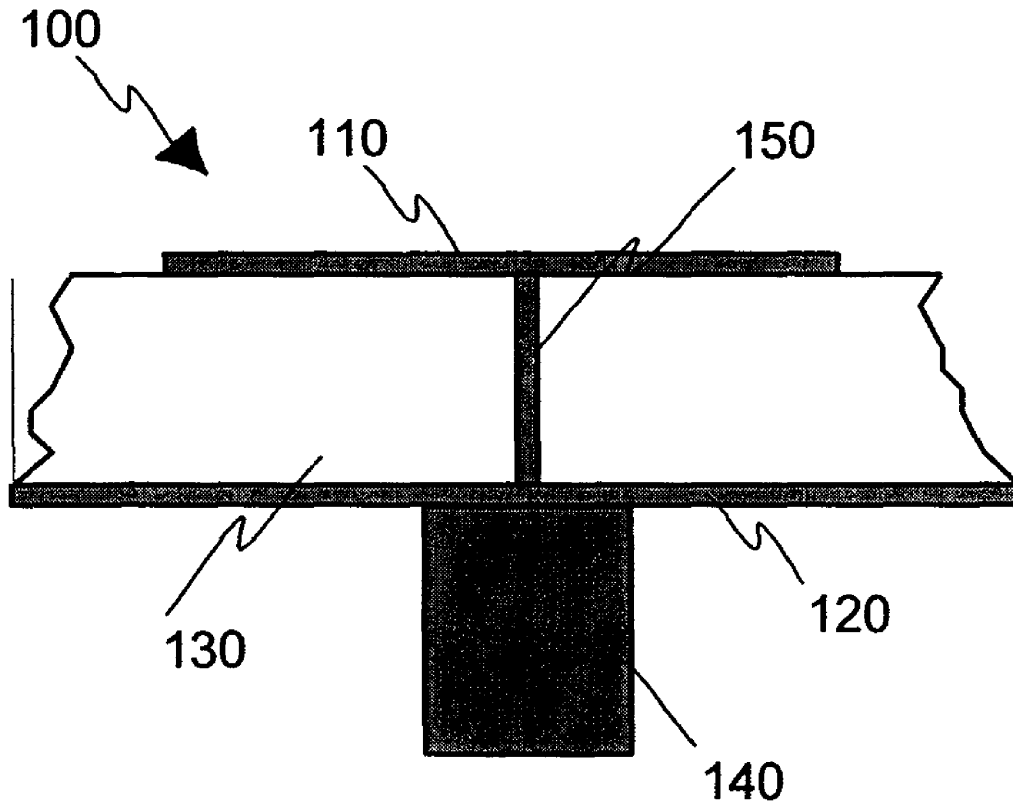
(52) **U.S. Cl.** **343/787; 343/700 MS**

Correspondence Address:
WARE FRESSOLA VAN DER SLUYS & ADOLPHSON, LLP
BRADFORD GREEN, BUILDING 5, 755 MAIN STREET, P O BOX 224
MONROE, CT 06468 (US)

(57) **ABSTRACT**

The invention relates to a method for enhancing an antenna performance, wherein the property of the antenna substrate is modified by using an ultra-sonic field. The invention also relates to an antenna comprising the modified antenna substrate, and to an apparatus comprising the modified antenna substrate.

(21) Appl. No.: **12/109,778**





US 20090267857A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0267857 A1**

(43) **Pub. Date: Oct. 29, 2009**

(54) **MULTIPLE INPUT MULTIPLE OUTPUT ANTENNA**

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

(75) Inventors: **XIAO-FENG LIU**, Shenzhen City (CN); **CHO-JU CHUNG**, Tu-Cheng (TW); **TENG-HUEI CHU**, Tu-Cheng (TW)

(30) **Foreign Application Priority Data**

Apr. 28, 2008 (CN) 200810301365.2

Publication Classification

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

(52) **U.S. Cl.** **343/812**

(57) **ABSTRACT**

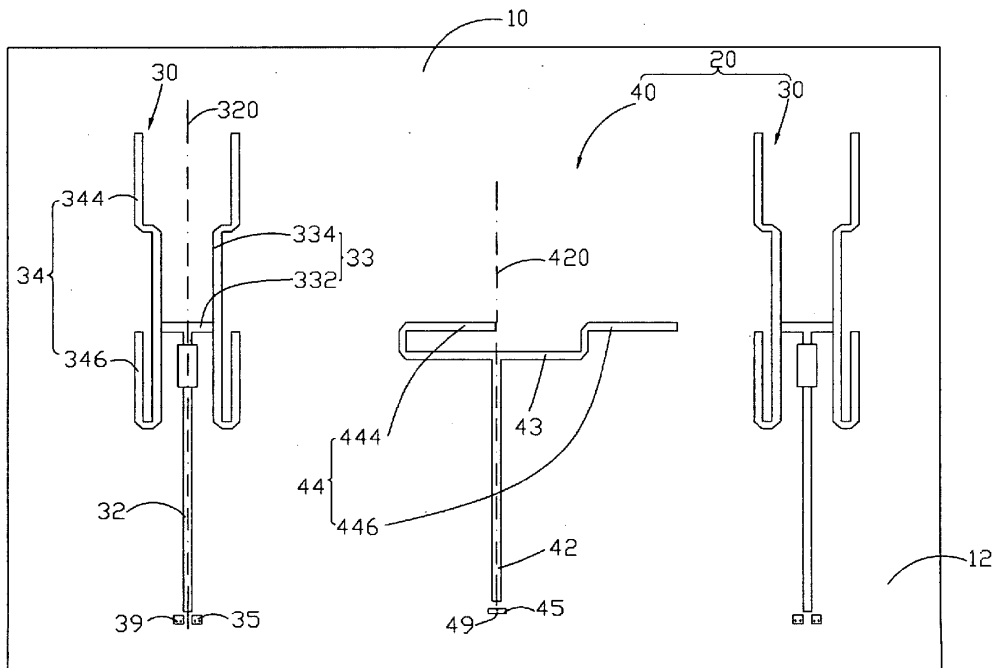
A MIMO antenna (20) is disposed on a substrate (10) including a first surface (12) and a second surface (14). The MIMO antenna includes a pair of parallel first antennas (30) spaced apart from each other and a second antenna (40) spaced apart from the first antennas. The second antenna is disposed between the first antennas. Each of the first and second antennas is disposed on the first and second surface of the substrate and is a dipole antenna.

Correspondence Address:

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

(21) Appl. No.: **12/185,107**





US 20090267864A1

(19) **United States**

(12) **Patent Application Publication**
Chiang

(10) **Pub. No.: US 2009/0267864 A1**

(43) **Pub. Date: Oct. 29, 2009**

(54) **PATCHED INVERSE F ANTENNA**

(30) **Foreign Application Priority Data**

(75) Inventor: **Meng-Chien Chiang**, Taipei
County (TW)

Apr. 24, 2008 (CN) 200820112012.3

Publication Classification

Correspondence Address:
**THOMAS, KAYDEN, HORSTEMEYER & RIS-
LEY, LLP**
600 GALLERIA PARKWAY, S.E., STE 1500
ATLANTA, GA 30339-5994 (US)

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

(52) **U.S. Cl.** **343/899**

(57) **ABSTRACT**

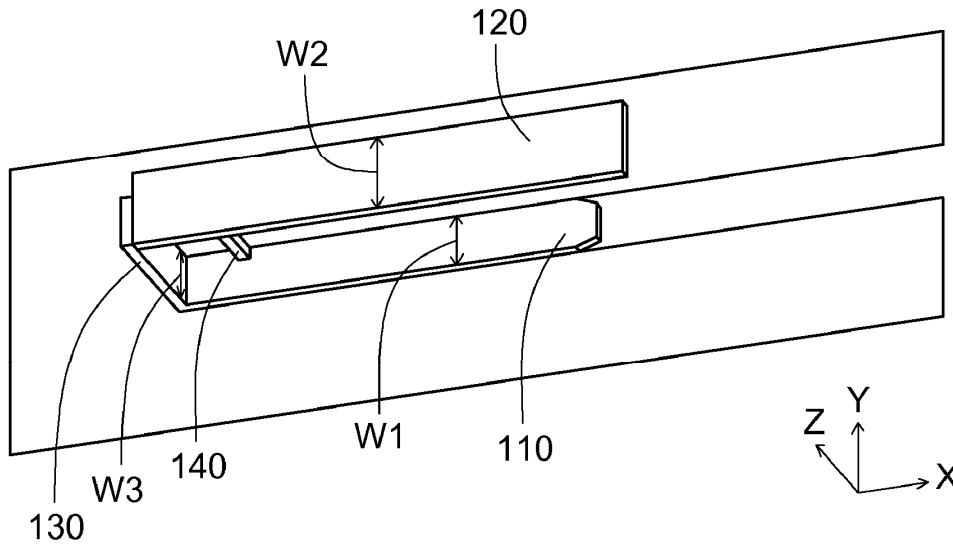
A patched inverse F antenna (PIFA) antenna is provided. The PIFA antenna includes a ground portion, a radiation portion, a short-circuit portion and a feed-in portion. The width of the radiation portion is larger than the width of the ground portion, such that the operating band of the PIFA antenna covers at least a first band and a second band at the same time. The short-circuit portion is disposed on the ground portion and is connected to the radiation portion. The feed-in portion is connected to the radiation portion.

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

(21) Appl. No.: **12/366,714**

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

10





US 20090270139A1

(19) **United States**

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

(10) **Pub. No.: US 2009/0270139 A1**

(43) **Pub. Date: Oct. 29, 2009**

(54) **PORTABLE COMMUNICATION TERMINAL**

Publication Classification

(76) Inventors: **Yusuke Okajima**, Chiba (JP);
Hiroyuki Takebe, Chiba (JP)

(51) **Int. Cl.**
H04M 1/00 (2006.01)
H01Q 1/24 (2006.01)
(52) **U.S. Cl.** **455/575.1; 343/702**

Correspondence Address:
BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
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(57) **ABSTRACT**

In a portable communication terminal capable of assuming a state where a first casing 1 and a second casing 2 connected rotatably overlap substantially and a state where they are rotated relative to each other by 90° from the former state, the second casing 2 including a display unit 3 is rotated by about 90°, so that the display unit 3 is made horizontally long, thus enabling the displaying with good visibility. At the same time, the rotation causes the first casing 1 at an upper edge thereof not to overlap with the second casing 2, and an antenna 5 is disposed at the not-overlapping portion, thus increasing an electrical volume of the antenna to provide broad-band and good antenna characteristics. Since the antenna 5 overlaps with the second casing 2 when in normal use, the antenna does not protrude, thus keeping the terminal compact and slim to provide excellent portability. In the portable communication unit provided with a rotatable casing including a display unit, the terminal as a whole can be kept compact so as not to let an antenna protrude therefrom both when in normal use and during standby, the display with a high level of visibility is enabled depending on the contents, and good antenna characteristics can be achieved.

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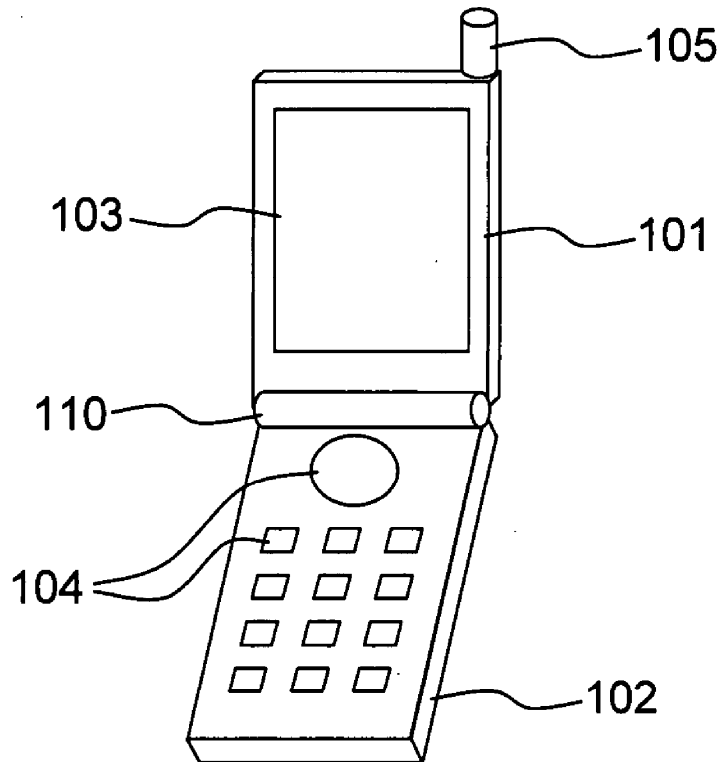
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(57) **ABSTRACT**

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To aim to provide a mobile telephone capable of reducing a physical space necessary for providing a reflector compared with that in conventional mobile telephones, and reducing the SAR by securing a distance between an antenna and a passive element operating as a reflector. A cabinet of a top housing 2 includes a passive element 22 in an overlap region overlapping between the top housing 2 and the bottom housing 3 in an unfolded state, and the bottom housing includes an antenna in the overlap region. This can suppress the thickness of the mobile telephone in a folded state and secure a distance between the antenna 31 and the passive element 22 operating as a reflector.

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