



US 20080099881A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0099881 A1**

(43) **Pub. Date: May 1, 2008**

(54) **SEMICONDUCTOR FOR MACRO AND MICRO FREQUENCY TUNING, AND ANTENNA AND FREQUENCY TUNING CIRCUIT HAVING THE SEMICONDUCTOR**

(30) **Foreign Application Priority Data**

Oct. 26, 2006 (KR) 10-2006-0104381

Publication Classification

(75) Inventors: **Chang-won Jung**, Hwaseong-si (KR); **Jung-han Choi**, Hwaseong-si (KR); **In-sang Song**, Seoul (KR); **Young-eil Kim**, Suwon-si (KR)

(51) **Int. Cl.**
H01L 29/93 (2006.01)
H01Q 23/00 (2006.01)
H03H 11/04 (2006.01)
H03H 11/28 (2006.01)

(52) **U.S. Cl.** **257/601; 333/172; 333/214; 333/32; 343/745; 257/E29.344**

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WASHINGTON, DC 20037

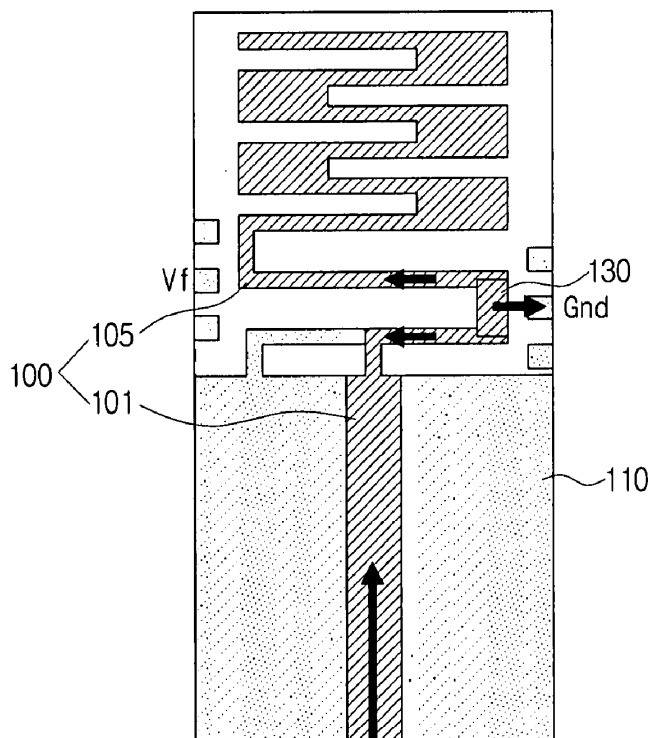
(57) **ABSTRACT**

A semiconductor element for macro and micro frequency tuning, and an antenna and a frequency tuning circuit having the semiconductor element, are provided. The semiconductor element includes first and second semiconductors which have a same polarity, a third semiconductor which has a polarity opposite to the polarity of the first and second semiconductors and is interposed between the first and the second semiconductors, a first intrinsic semiconductor which is interposed between the first and the third semiconductors, and a second intrinsic semiconductor which is interposed between the third and the second semiconductors.

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

(21) Appl. No.: **11/727,697**

(22) Filed: **Mar. 28, 2007**





US 20080100420A1

(19) **United States**

(12) **Patent Application Publication**
Hadley

(10) **Pub. No.: US 2008/0100420 A1**

(43) **Pub. Date: May 1, 2008**

(54) **DOUBLE INDUCTOR LOOP TAG ANTENNA**

Publication Classification

(76) Inventor: **Mark A. Hadley**, Newark, CA (US)

(51) **Int. Cl.**
H04Q 5/22 (2006.01)

Correspondence Address:
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(52) **U.S. Cl.** **340/10.1**

(21) Appl. No.: **11/951,299**

(57) **ABSTRACT**

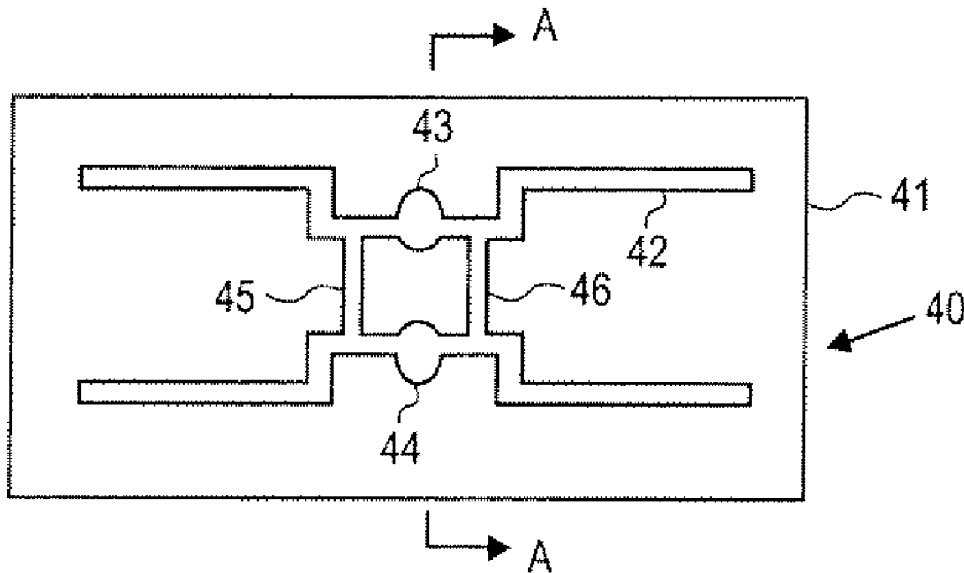
(22) Filed: **Dec. 5, 2007**

Related U.S. Application Data

(63) Continuation of application No. 10/848,643, filed on May 18, 2004, now Pat. No. 7,324,061.

(60) Provisional application No. 60/472,258, filed on May 20, 2003.

An RFID tag in one embodiment. The RFID tag includes at least one integrated circuit and an antenna pattern coupled to the integrated circuit, wherein the antenna pattern has an inductor pattern which limits the effect of misplacement of the integrated circuit relative to the inductor pattern. Other embodiments and methods of making these apparatuses are described.





US 20080100511A1

(19) **United States**

(12) **Patent Application Publication**
Stutzke

(10) **Pub. No.: US 2008/0100511 A1**

(43) **Pub. Date: May 1, 2008**

(54) **LOW PROFILE PARTIALLY LOADED PATCH ANTENNA**

Publication Classification

(76) Inventor: **Nathan Stutzke**, Louisville, CO (US)

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

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

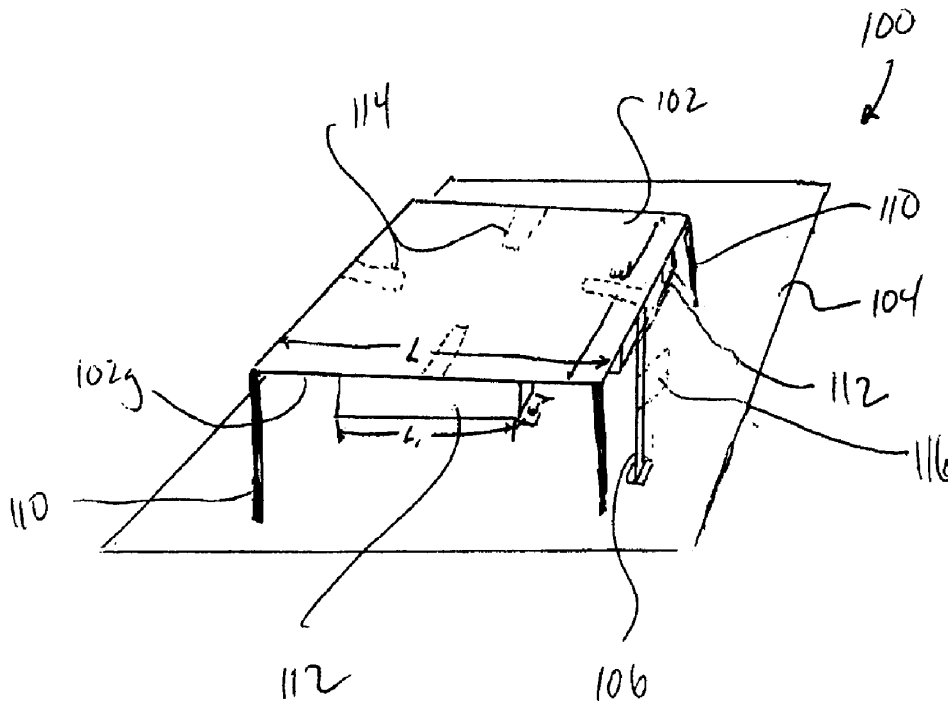
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(57) **ABSTRACT**

A low profile antenna comprises a radiating element arranged over a ground plane. The radiating element has a plurality of radiating edges. Dielectric elements are coupled to the radiating edges.

(21) Appl. No.: **11/552,868**

(22) Filed: **Oct. 25, 2006**





US 20080100512A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0100512 A1**

(43) **Pub. Date: May 1, 2008**

(54) **ANTENNA**

Publication Classification

(75) Inventors: **Jiunn-Ming Huang**, Taipei (TW);
Shen-Pin Wei, Taipei (TW);
Yuan-Li Chang, Taipei (TW)

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

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

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(57) **ABSTRACT**

An antenna comprises a first transmission element, a second transmission element, a conductive element, a ground element, a ground line and a signal line. The conductive element is connected to the ground element. The first transmission element is connected to the conductive element. The first transmission element comprises a first spiral structure and a first axis. The second transmission element is connected to the conductive element. The ground line is electrically connected to the ground element. The signal line is electrically connected to the conductive element at a feed point.

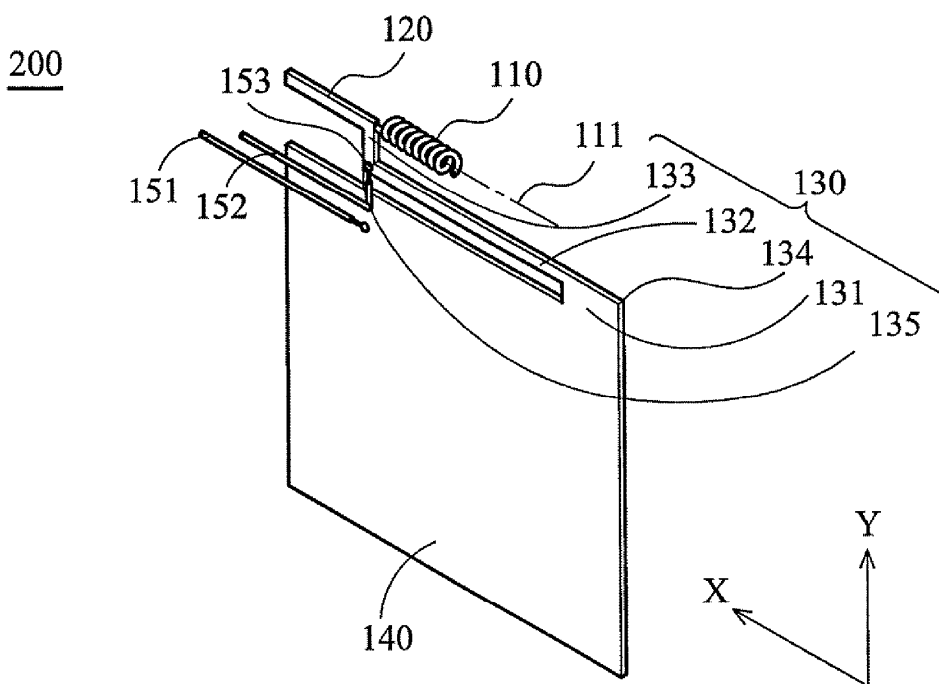
(73) Assignee: **WISTRON NEWEB CORP.**,
TAIPEI HSIEN (TW)

(21) Appl. No.: **11/769,638**

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

(30) **Foreign Application Priority Data**

Oct. 31, 2006 (TW) TW95140196





US 20080100513A1

(19) **United States**

(12) **Patent Application Publication**

Deng et al.

(10) **Pub. No.: US 2008/0100513 A1**

(43) **Pub. Date: May 1, 2008**

(54) **ANTENNA**

(30) **Foreign Application Priority Data**

Dec. 28, 2004 (TW)..... 93221065

(76) Inventors: **Sheng-Ming Deng**, Hsinchu (TW);
Cho-Kang Hsu, Hsinchu (TW)

Publication Classification

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

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

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(57) **ABSTRACT**

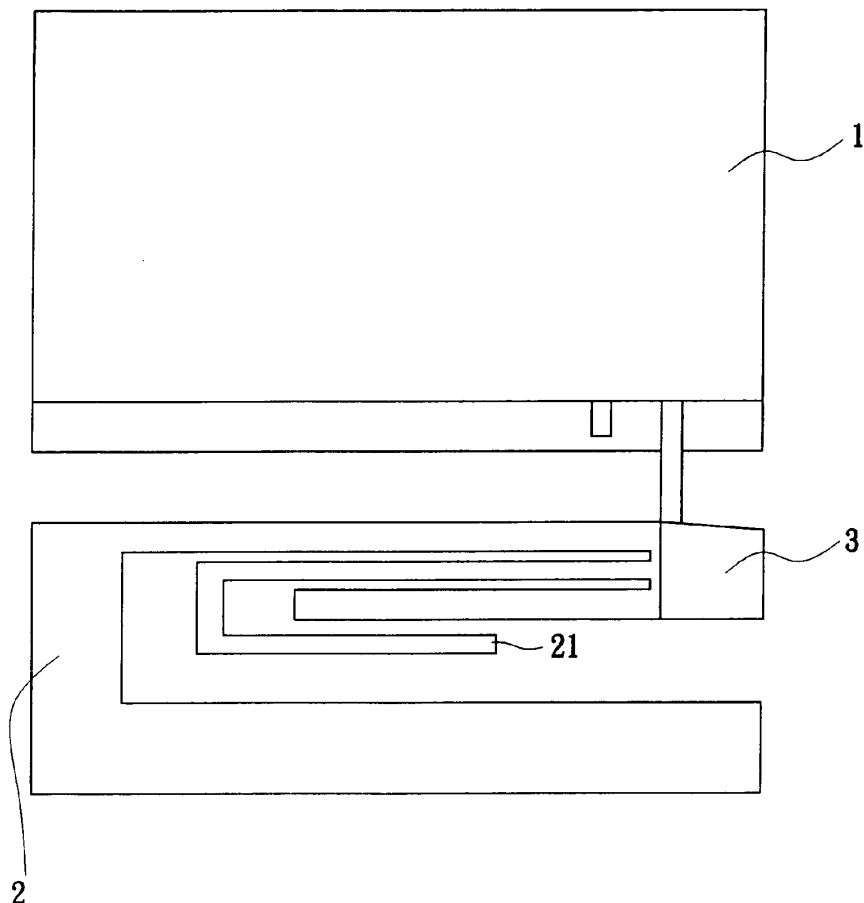
The present invention describes an antenna assembly. The antenna assembly has a planar antenna structure and a conductor. The planar antenna structure has at least three metallic sheets and is electrically connected with the conductor. The present invention is used to receive multiple frequency signals and produce a coupled effect. The conductor is connected with a planar substrate. The present invention is used to enlarge an operating frequency band of the signals using electromagnetic waves. Further, the frequency response of the antenna assembly is improved.

(21) Appl. No.: **12/003,092**

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

Related U.S. Application Data

(62) Division of application No. 11/316,933, filed on Dec. 27, 2005.





US 20080100514A1

(19) **United States**

(12) **Patent Application Publication**
Abdul-Gaffoor et al.

(10) **Pub. No.: US 2008/0100514 A1**

(43) **Pub. Date: May 1, 2008**

(54) **ANTENNA ARRANGEMENT FOR HINGED WIRELESS COMMUNICATION DEVICE**

Publication Classification

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

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

(57) **ABSTRACT**

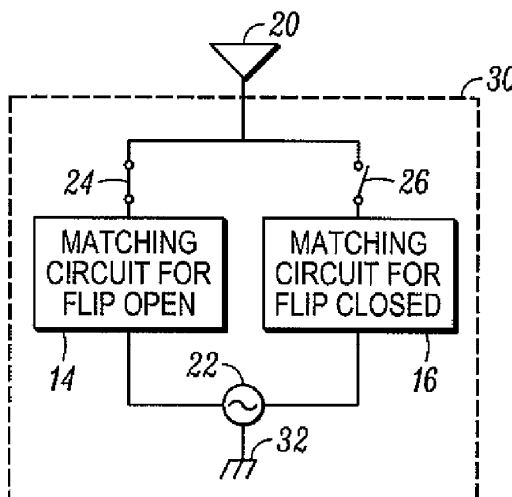
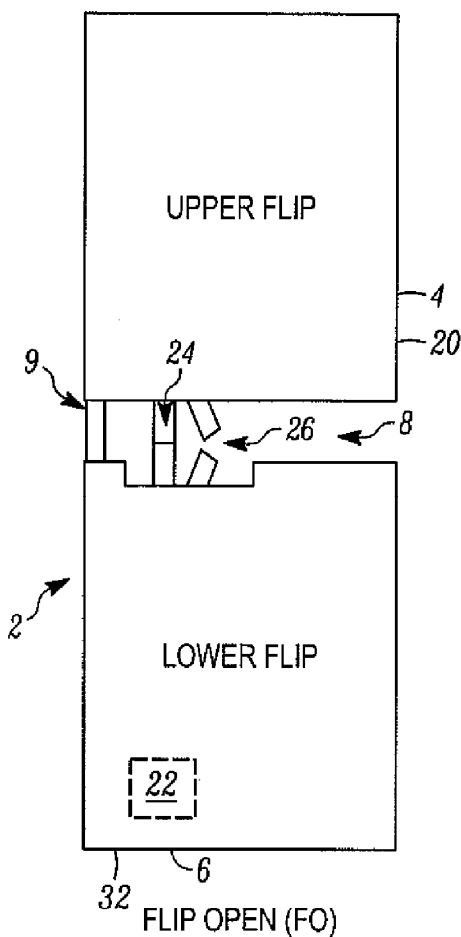
(76) **Inventors:** **Mohammed R. Abdul-Gaffoor,**
Palatine, IL (US); **Faisal Abedin,**
Lindenhurst, IL (US); **Prashant B. Patel,**
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An improved wireless communication device, such as a clamshell-type cellular telephone, and related method of operation are disclosed. In at least some embodiments, the wireless communication device includes a first structure and a second structure that is hingedly coupled to the first structure, where at least a part of at least one of the first and second structures is capable of operating as an antenna. The device further includes an electrical circuit at least partially governing operation of the antenna, where the electrical circuit is supported at least indirectly by at least one of the first and second structures. At least one electrical characteristic of the electrical circuit varies depending upon a relative positioning of the first structure with respect to the second structure.

(21) **Appl. No.: 11/552,596**

(22) **Filed: Oct. 25, 2006**





US 20080100515A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0100515 A1**

(43) **Pub. Date: May 1, 2008**

(54) **MULTIPLE-BAND MONOPOLE COUPLING ANTENNA**

Publication Classification

(75) Inventors: **Ching-Chi Lin**, Taipei Hsien (TW);
Kai Shih, Taipei Hsien (TW);
Yu-Yuan Wu, Taipei Hsien (TW)

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

(57) **ABSTRACT**

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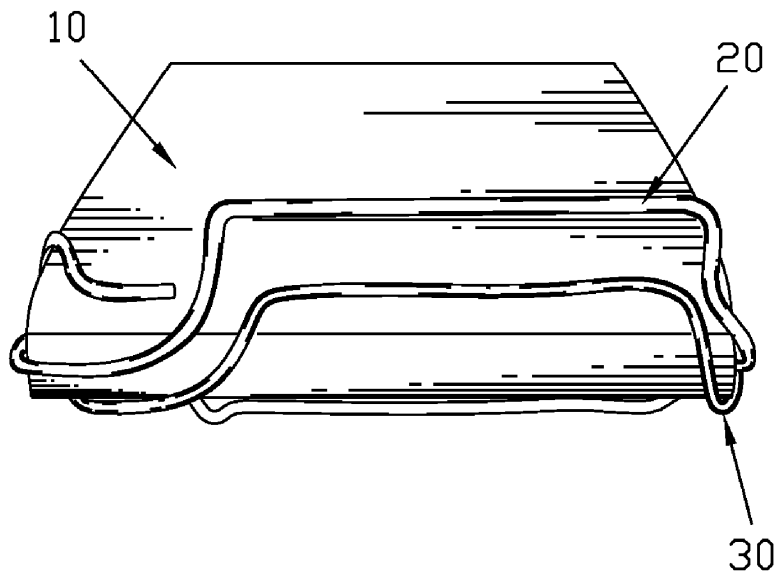
A multiple-band monopole coupling antenna includes a dielectric board, a low frequency antenna and a high frequency antenna. The low frequency antenna and the high frequency antenna are located on the front of the dielectric board. The length of the low frequency antenna equals to the half length of the low frequency waves and can receive and transmit two low frequency waves and a high frequency wave. The length of the high frequency antenna equals to the quarter length of the high frequency waves. The high frequency antenna is adjacent to the low frequency antenna and couples with the low frequency antenna while the low frequency antenna is receiving or transmitting signal. Thus, the high frequency antenna can receive and transmit three high frequency waves. The multiple-band monopole coupling antenna can receive and transmit all frequency bands, which are used in the mobile communication.

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

(21) Appl. No.: **11/552,943**

(22) Filed: **Oct. 25, 2006**

100





US 20080100516A1

(19) **United States**

(12) **Patent Application Publication**

DiNallo et al.

(10) **Pub. No.: US 2008/0100516 A1**

(43) **Pub. Date: May 1, 2008**

(54) **LOW PROFILE INTERNAL ANTENNA**

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

(76) **Inventors:** **Carlo DiNallo**, Plantation, FL (US); **Antonio Faraone**, Fort Lauderdale, FL (US)

(57) **ABSTRACT**

A multi-band folded inverted conformal antenna (101), suitable for use internally within an electronic device (501), facilitates low-profile designs with the multi-band folded inverted conformal antenna (601) extending less than five millimeters above a circuit substrate (102) in some embodiments. The multi-band folded inverted conformal antenna (601) includes planar sections and a slot (407), and is capable of multi-mode operation. For example, one embodiment is configured to operate in a first common mode (401), a differential mode (402), and a second common mode (403), thereby allowing the multi-band folded inverted conformal antenna (601) to operate in a first operational bandwidth, second operational bandwidth, and third operational bandwidth. Portions of the ground plane conductor (103) passing beneath the multi-band folded inverted conformal antenna (101) are selectively removed at areas corresponding to concentrations of electrical charge, thereby allowing a more low-profile design.

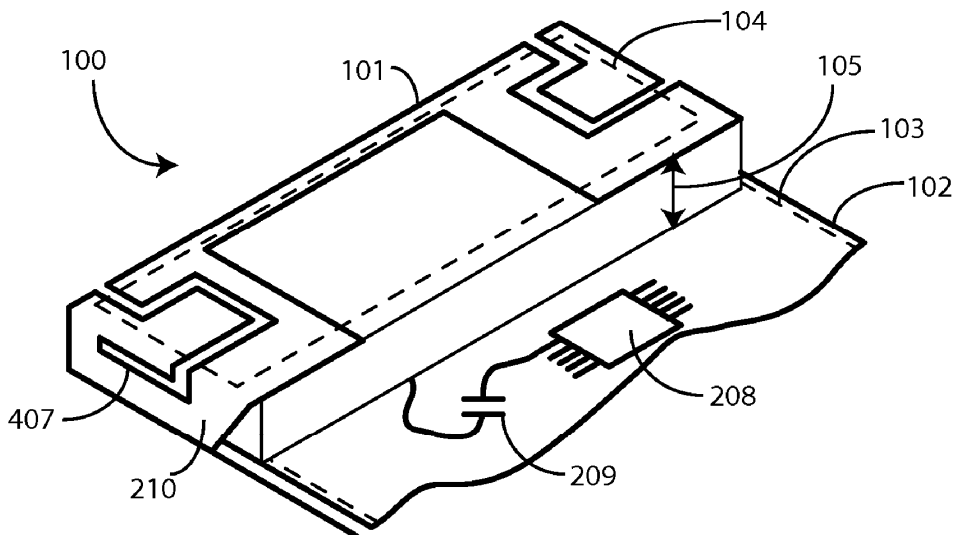
Correspondence Address:
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Atlanta, GA 30312

(21) **Appl. No.:** **11/553,845**

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

Publication Classification

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





US 20080100518A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0100518 A1**

(43) **Pub. Date: May 1, 2008**

(54) **ELECTRONIC DEVICE DETACHABLE ANTENNA ASSEMBLY**

(22) Filed: **Oct. 31, 2006**

Publication Classification

(76) Inventors: **Jeffrey A. Lev**, Cypress, TX (US);
Paul J. Doczy, Cypress, TX (US);
Mark S. Tracy, Tomball, TX (US)

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

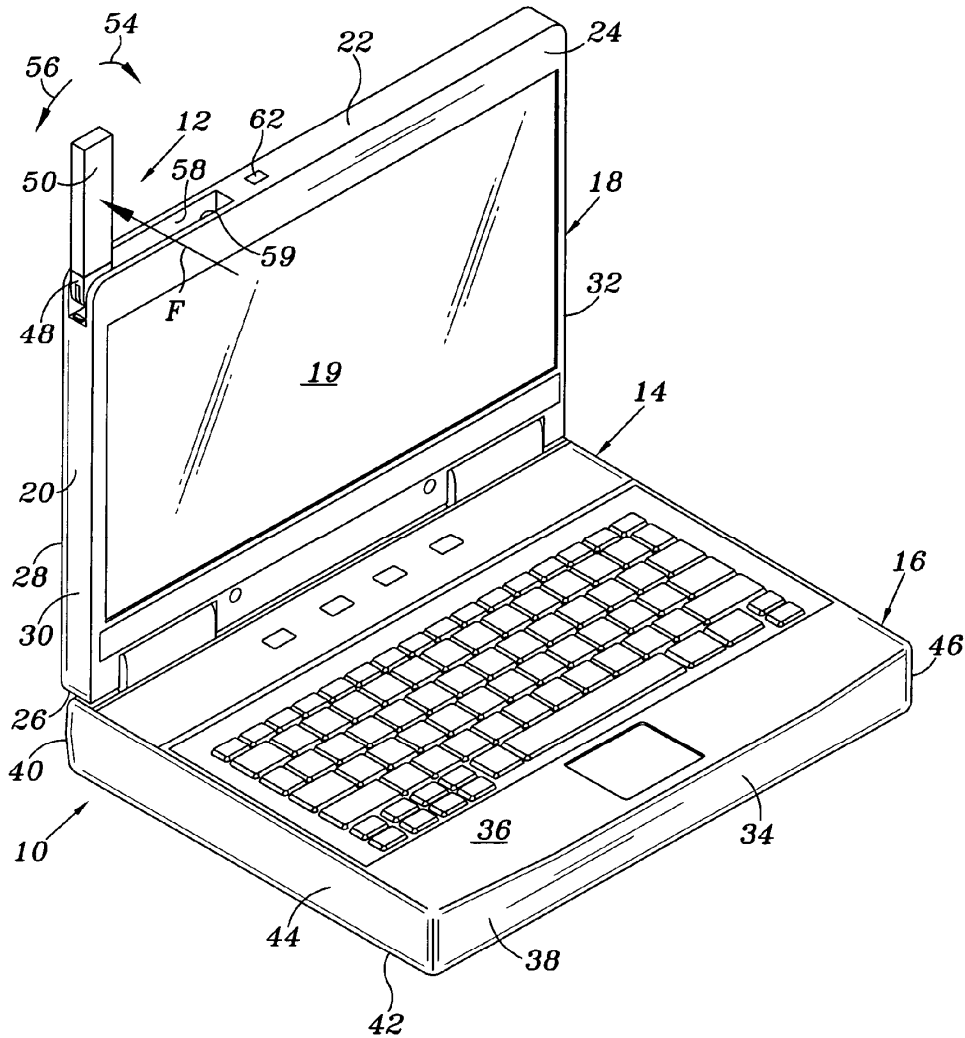
(52) **U.S. Cl.** **343/702**

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(57) **ABSTRACT**

An electronic device detachable antenna assembly comprises a connector member coupled to an electronic device and configured to receive an external antenna in pluggable engagement therewith, the antenna and the connector member movable between a stored position on the electronic device and an extended position relative to the electronic device.

(21) Appl. No.: **11/591,248**





US 20080100519A1

(19) **United States**

(12) **Patent Application Publication**
KU

(10) **Pub. No.: US 2008/0100519 A1**

(43) **Pub. Date: May 1, 2008**

(54) **BUILT-IN ANTENNA MODULE FOR PORTABLE WIRELESS TERMINAL**

Publication Classification

(75) Inventor: **Do-II KU, Suwon-si (KR)**

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

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

(57) **ABSTRACT**

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

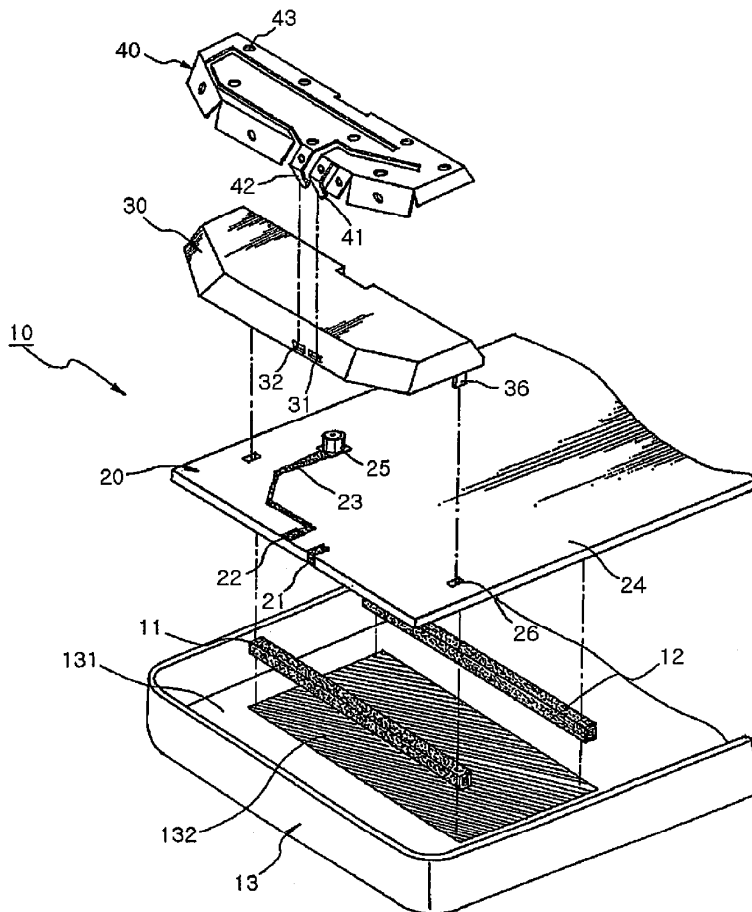
A built-in antenna module includes a main board including a feed pad, a ground pad, and a ground layer having a predetermined area; an antenna radiator installed on the main board to have a predetermined height, and including a feed pin and a ground pin, the feed pin and the ground pin being electrically connected to the feed pad and the ground pad of the main board, respectively; a conductor disposed on an inner surface of a case frame and having a predetermined area and thickness, the case frame providing an installation space for the main board and forming an exterior of the terminal; and at least one electrical connection unit interposed between the conductor and the main board and serving as a medium that electrically connects the conductor to the ground pad and the ground layer of the main board.

(21) Appl. No.: **11/925,550**

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

(30) **Foreign Application Priority Data**

Oct. 27, 2006 (KR) 2006-105324





US 20080100520A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0100520 A1**

(43) **Pub. Date: May 1, 2008**

(54) **INTERNAL ANTENNA OF WIRELESS COMMUNICATION TERMINAL**

(30) **Foreign Application Priority Data**

Jul. 6, 2004 (KR)..... 2004-52243

(75) Inventors: **Young Joon Ko**, Seoul (KR); **Hong Teuk Kim**, Yongin-si (KR)

Publication Classification

Correspondence Address:
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Chantilly, VA 20153-1200 (US)

(51) **Int. Cl.**
H01Q 1/24 (2006.01)
H01Q 9/04 (2006.01)
(52) **U.S. Cl.** **343/702; 343/700 MS**

(73) Assignee: **LG Electronics Inc.**

(57) **ABSTRACT**

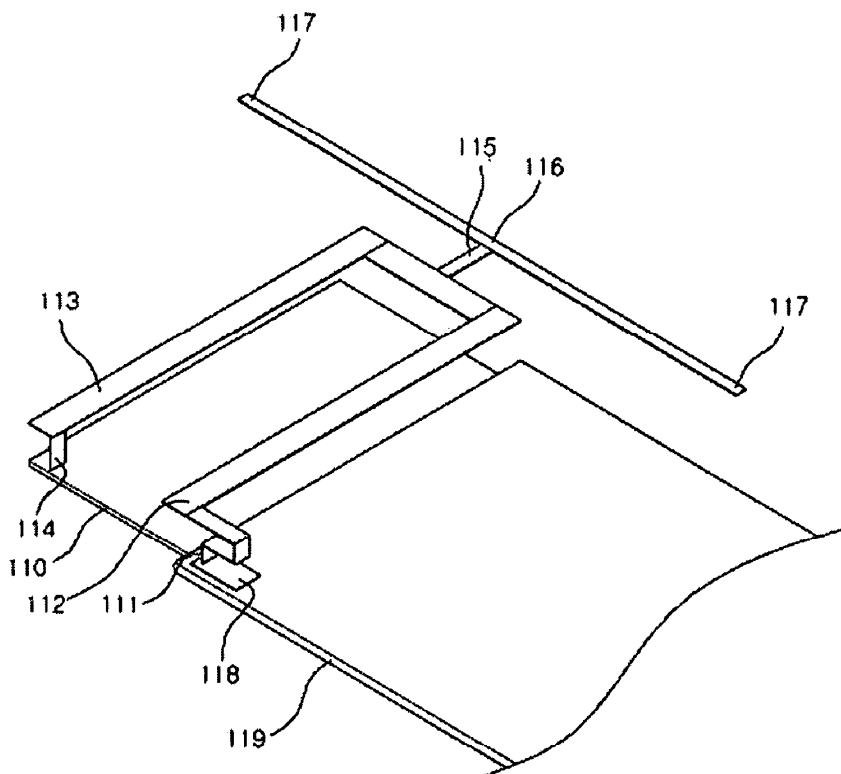
(21) Appl. No.: **11/978,664**

An internal antenna of a wireless communication terminal, in which internal style folded monopole antenna is installed, is provided. The internal antenna of a wireless communication terminal includes a folded monopole antenna. The folded monopole antenna includes two folded radiation planes having a quarter wavelength, and reactances loaded to predetermined positions of the two radiation planes. Therefore, a space for installing the antenna in the terminal is minimized, and due to the no directional characteristics, the internal antenna can be applied to a wireless communication system of dual bandwidths.

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

Related U.S. Application Data

(62) Division of application No. 11/172,970, filed on Jul. 5, 2005, now Pat. No. 7,312,755.





US 20080100522A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0100522 A1**

(43) **Pub. Date: May 1, 2008**

(54) **ANTENNA DEVICE AND DOOR HANDLE DEVICE**

(30) **Foreign Application Priority Data**

Sep. 28, 2004 (JP) 2004-282501

(75) Inventors: **Hisashi Inaba**, Aichi-ken (JP);
Kiyokazu Ieda, Aichi-ken (JP);
Rikuo Hatano, Aichi-ken (JP)

Publication Classification

(51) **Int. Cl.**
H01Q 7/00 (2006.01)
G01R 27/26 (2006.01)
H01Q 1/32 (2006.01)

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(52) **U.S. Cl.** **343/713; 324/658; 343/866**

(57) **ABSTRACT**

A transmission/reception antenna (21) comprises a core (31) and a coil (32) wound around the core (31). One of a plurality of core sheets (31a) constituting the core (31) is utilized as a sensor electrode (23). Conductors (33, 34) extending from the two ends of the coil (32) are connected to a transmission/reception drive circuit (22). The conductor (35) extending from a capacitance detector (24) is connected to one of the conductors (33, 34) extending between the coil (32) and the transmission/reception drive circuit (22). Consequently, the capacitance detector (24) is alternately connected to the sensor electrode (23) through a parasitic capacitance C1 generated between the coil (32) and the sensor electrode (23) (core sheet (31a)).

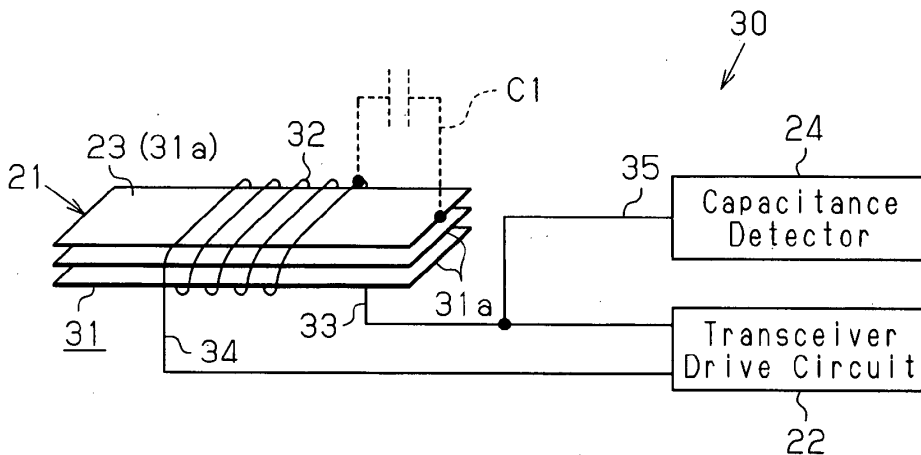
(73) Assignee: **Aisin Seiki Kabushiki Kaisha**,
Aichi-ken (JP)

(21) Appl. No.: **11/661,595**

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

(86) PCT No.: **PCT/JP05/17188**

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





US 20080100525A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0100525 A1**

(43) **Pub. Date: May 1, 2008**

(54) **BROADBAND ANTENNA**

(30) **Foreign Application Priority Data**

(75) Inventors: **Seok BAE**, Gyunhhi-do (KR); **In Young Kim**, Gyunggi-Do (KR)

Oct. 26, 2006 (KR) 10-2006-0104602

Publication Classification

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(51) **Int. Cl.**

H01Q 1/36 (2006.01)
H01Q 1/00 (2006.01)

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

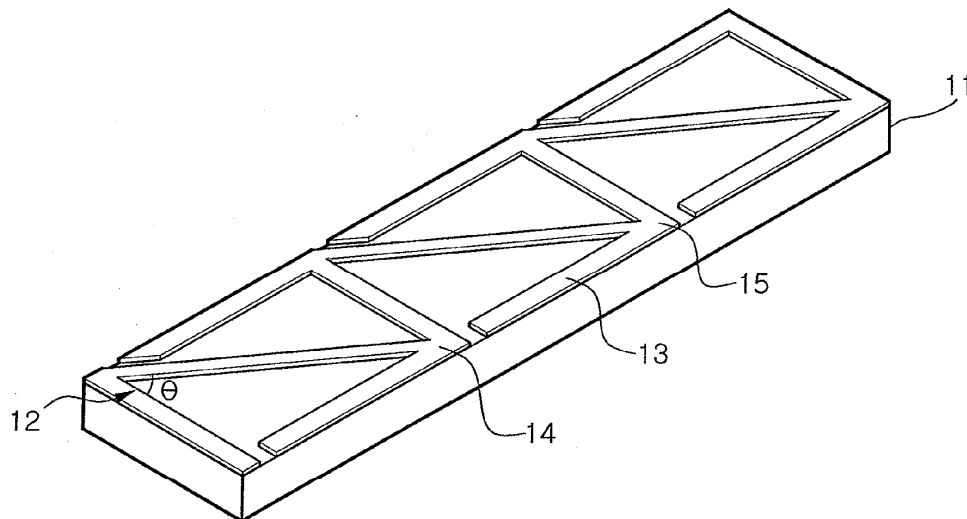
(73) Assignee: **SAMSUNG ELECTRO-MECHANICS CO., LTD.**, GYUNGGI-DO (KR)

(57) **ABSTRACT**

(21) Appl. No.: **11/867,301**

A broadband antenna including: a dielectric substrate; a meander line radiator formed on the dielectric substrate to be bent at an acute angle; and a stub extended from at least one of bending portions of the meander line radiator, wherein the meander line radiator has 2n number of the bending portions thereon to form an n number of turns, where $n \geq 1$.

(22) Filed: **Oct. 4, 2007**





US 20080100527A1

(19) **United States**

(12) **Patent Application Publication**
Rahim

(10) **Pub. No.: US 2008/0100527 A1**

(43) **Pub. Date: May 1, 2008**

(54) **ANTENNA ARRANGEMENT**

Publication Classification

(75) Inventor: **Muhammad R. Rahim**, Monroeville,
PA (US)

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

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

(57) **ABSTRACT**

(73) Assignee: **Mobile Aspects, Inc.**, Pittsburgh, PA

(21) Appl. No.: **11/899,951**

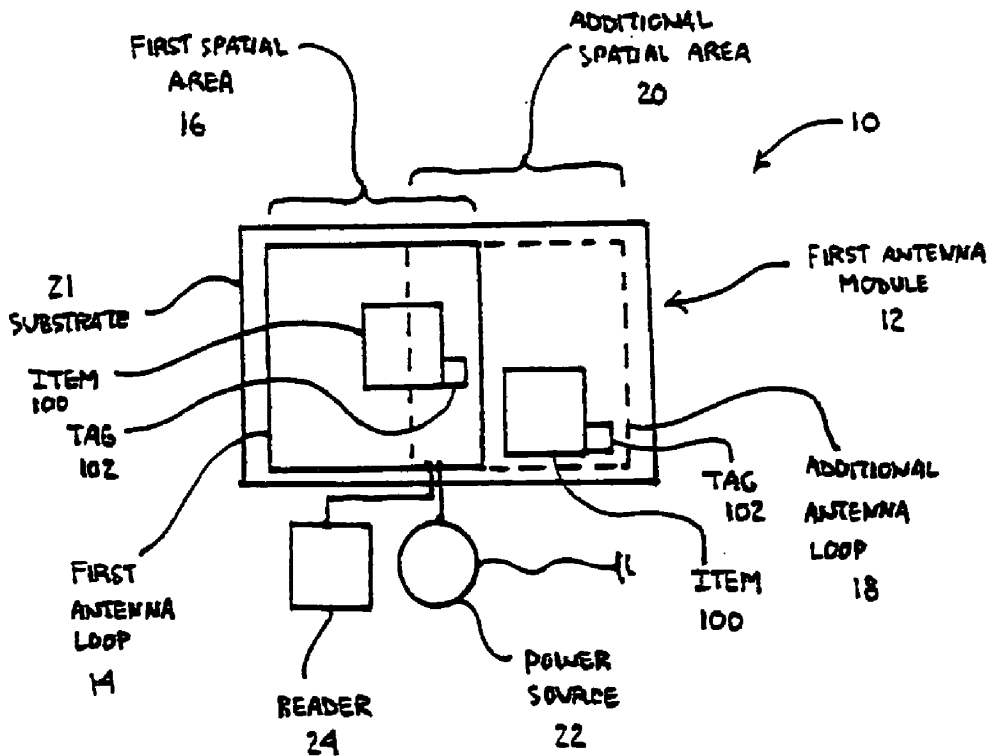
(22) Filed: **Sep. 7, 2007**

An antenna arrangement including a first antenna module having a first antenna loop positioned in a plane for emitting a signal in a first spatial area, and at least one additional antenna loop positioned in substantially the same plane for emitting a signal in an additional spatial area. The arrangement includes at least one power source in communication with the first antenna module for providing current thereto. The first spatial area and the additional spatial area at least partially overlap, and the first antenna loop and the additional antenna loop are powered by the power source in a specified pattern. A method of identifying at least one item is also disclosed.

Related U.S. Application Data

(63) Continuation of application No. 11/378,001, filed on Mar. 17, 2006, now Pat. No. 7,268,742.

(60) Provisional application No. 60/664,166, filed on Mar. 22, 2005.





US 20080100528A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0100528 A1**

(43) **Pub. Date: May 1, 2008**

(54) **ANTENNA APPARATUS**

(30) **Foreign Application Priority Data**

(75) Inventors: **Junichi Noro**, Akita-shi (JP);
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Oct. 26, 2006 (JP) 2006-291339

Publication Classification

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220 Fifth Avenue, 16TH Floor
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(51) **Int. Cl.**
H01Q 1/42 (2006.01)

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

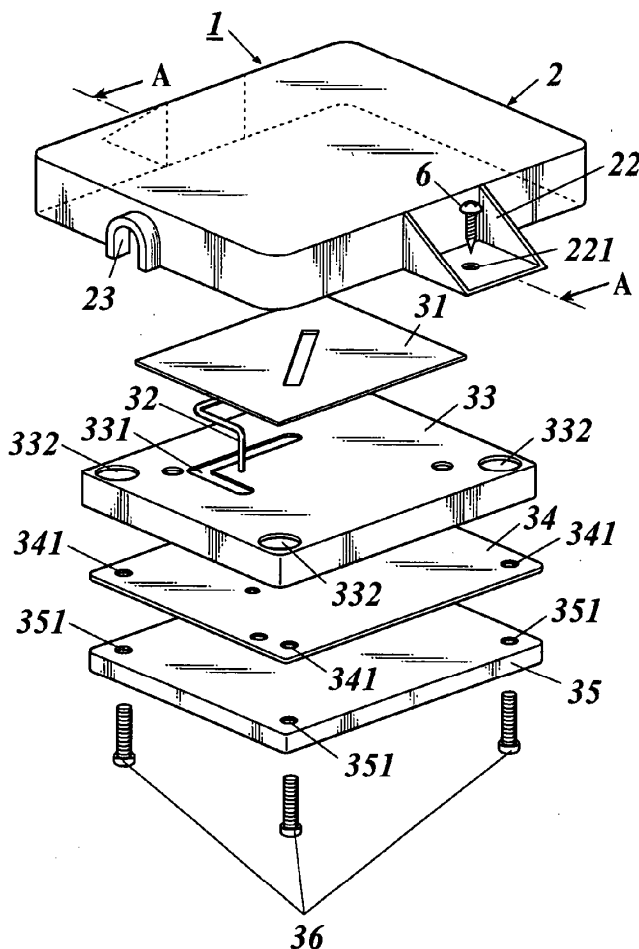
(57) **ABSTRACT**

Disclosed is an antenna apparatus comprising: an antenna module comprising a ground plate and an antenna element having a metal plate disposed at a predetermined distance from the ground plate; and an antenna cover to cover the antenna module, wherein the antenna cover includes an antenna holding section to hold the antenna module, and a mounting section which is integrally formed on the antenna holding section to mount the antenna cover on external equipment.

(73) Assignee: **Mitsumi Electric Co. Ltd.**,
Tama-shi (JP)

(21) Appl. No.: **11/975,933**

(22) Filed: **Oct. 23, 2007**





US 20080101416A1

(19) **United States**

(12) **Patent Application Publication**
Chen

(10) **Pub. No.: US 2008/0101416 A1**

(43) **Pub. Date: May 1, 2008**

(54) **BROADBAND ANTENNA**

(52) **U.S. Cl.** 370/487; 342/350; 343/725

(76) Inventor: **I-Fong Chen**, Taoyuan City (TW)

(57) **ABSTRACT**

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528 FALLSGROVE DRIVE
ROCKVILLE, MD 20850

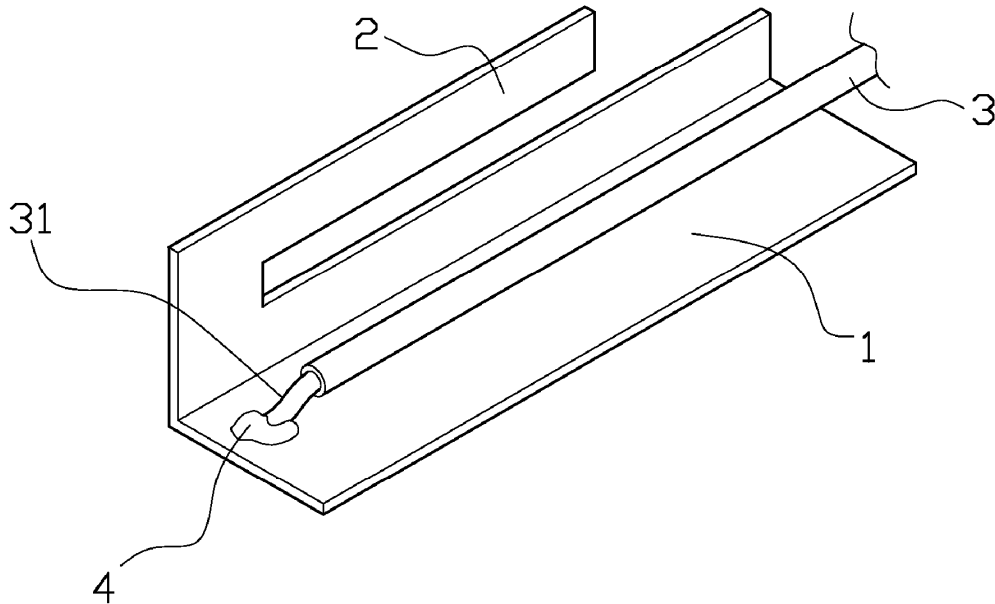
A broadband antenna applicable to a portable wireless electronic communication product, and especially suitable to be provided on the top or on two sides of a panel, it includes structurally a low-frequency antenna path, a high-frequency antenna path connected with the low-frequency antenna path, and a coaxial cable for feeding out a signal; the core line of the coaxial cable for signal transmission is connected with a signal feed-in point of the antenna, but a grounding line of the coaxial cable is not connected with the antenna to avoid making the coaxial cable a parasitic element of the antenna; the coaxial cable is arranged parallelly to the low-frequency antenna path or the high-frequency antenna path, the grounding line of the coaxial cable is used to do perturbation against the transmission path of the antenna, thereby the antenna can get an effect of a broad bandwidth.

(21) Appl. No.: **11/554,518**

(22) Filed: **Oct. 30, 2006**

Publication Classification

(51) **Int. Cl.**
H04H 20/28 (2008.01)





US 20080106470A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0106470 A1**

(43) **Pub. Date: May 8, 2008**

(54) **MULTI-BRANCH CONDUCTIVE STRIP
PLANAR ANTENNA**

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

Publication Classification

(75) Inventors: **Chuan-Lin Hu**, Taipei County (TW); **Chia-Sheng Liu**, Taipei County (TW); **Yu-Wei Chen**, Taipei County (TW); **Chang-Lun Liao**, Taipei County (TW)

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

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

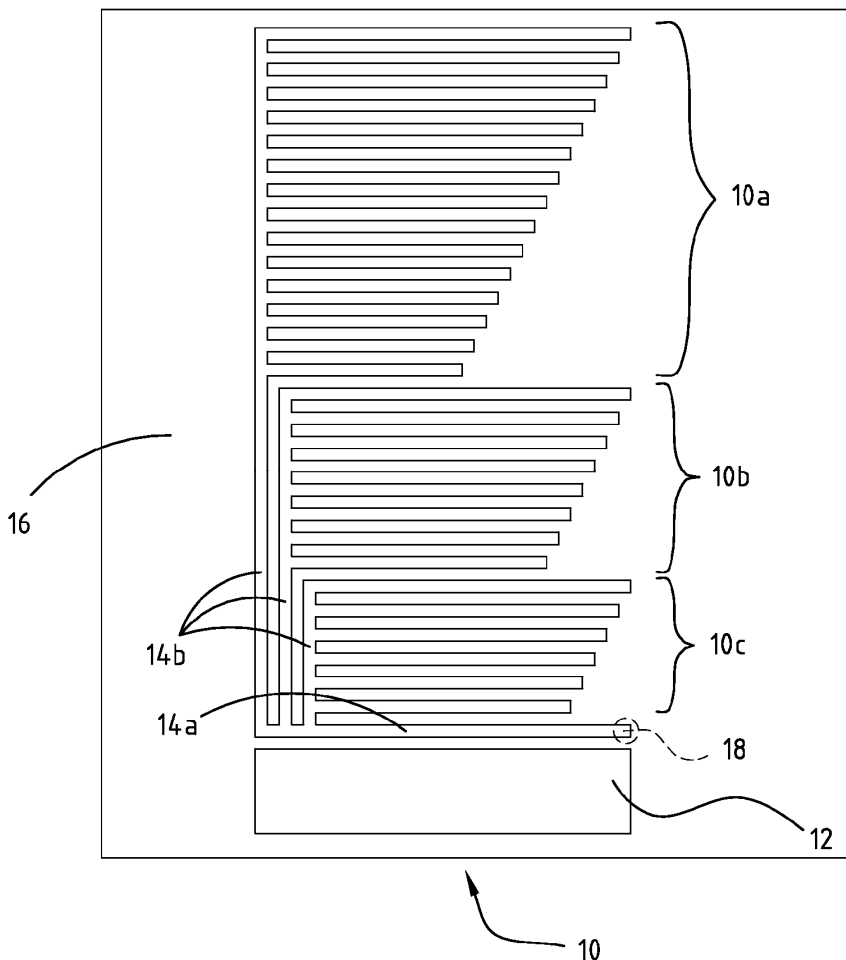
Correspondence Address:
WPAT, PC
INTELLECTUAL PROPERTY ATTORNEYS
2030 MAIN STREET, SUITE 1300
IRVINE, CA 92614

(57) **ABSTRACT**

A multi-branch conductive strip planar antenna is disclosed herein, which is basically a planar antenna with a radiator and a ground plane fed by a transmission line. Specifically, the radiator is composed of a plurality of taper-comb-shaped multi-branch conductive strips. Thus, a broadband antenna can be achieved through a plurality of coupled circuits and a plurality of current paths in the taper-comb-shaped conductive strips.

(73) Assignee: **CHANT SINCERE CO., LTD.**, Taoyuan County (TW)

(21) Appl. No.: **11/556,260**





US 20080106471A1

(19) **United States**

(12) **Patent Application Publication**
Yeh

(10) **Pub. No.: US 2008/0106471 A1**

(43) **Pub. Date: May 8, 2008**

(54) **COMPACT PCB ANTENNA**

Publication Classification

(75) Inventor: **Ming-Hao Yeh, Zhubei City (TW)**

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

Correspondence Address:
REED SMITH LLP
ATTN: Juan Carlos A. Marquez
Suite 1400, 3110 Fairview Park Drive
Falls Church, VA 22042

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

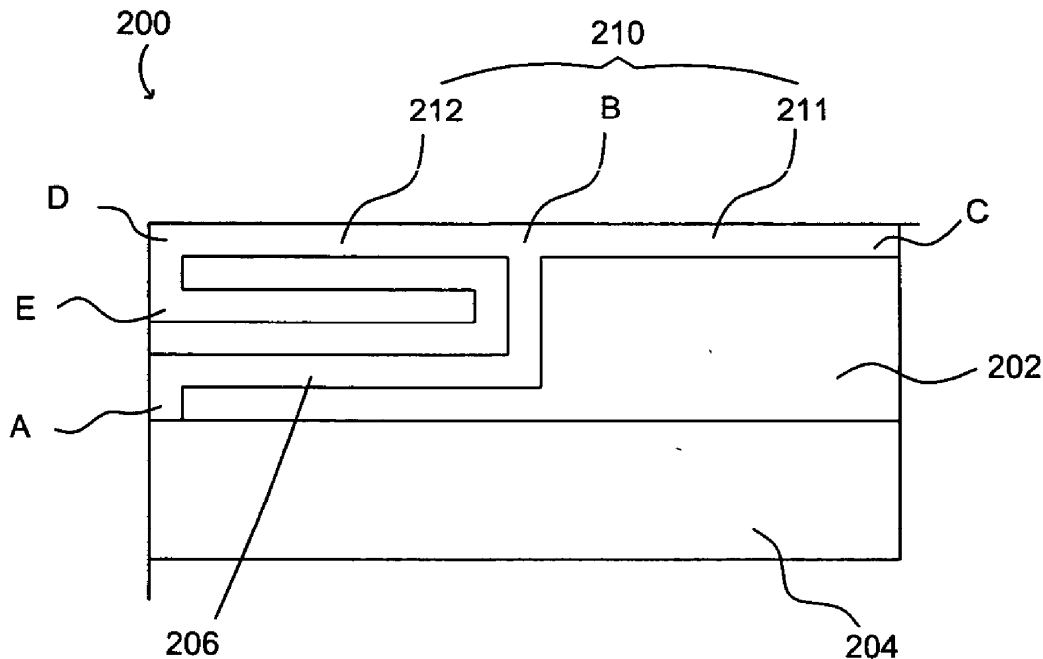
(57) **ABSTRACT**

(73) Assignee: **Media Tek Inc.**

A compact PCB antenna is disclosed. The compact PCB antenna has a substrate; a ground on the substrate; a radiating element patterned on the substrate; and a shorting path patterned on the substrate, the shorting path extends from a branch point of the radiating element; wherein the branch point defines a first section and a second section of the radiating element, and the first section has a feed pin at one end of the first section and the second section winds; and wherein the shorting path between the radiating element and the ground surrounds a part of the second section and connects to the ground.

(21) Appl. No.: **11/593,553**

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





US 20080106472A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0106472 A1**

(43) **Pub. Date: May 8, 2008**

(54) **PATTERN ANTENNA STRUCTURE**

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

(76) **Inventors: Cho-Kang Hsu, Hsinchu (TW);
Ming-Tsan Tseng, Hsinchu (TW)**

(57) **ABSTRACT**

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

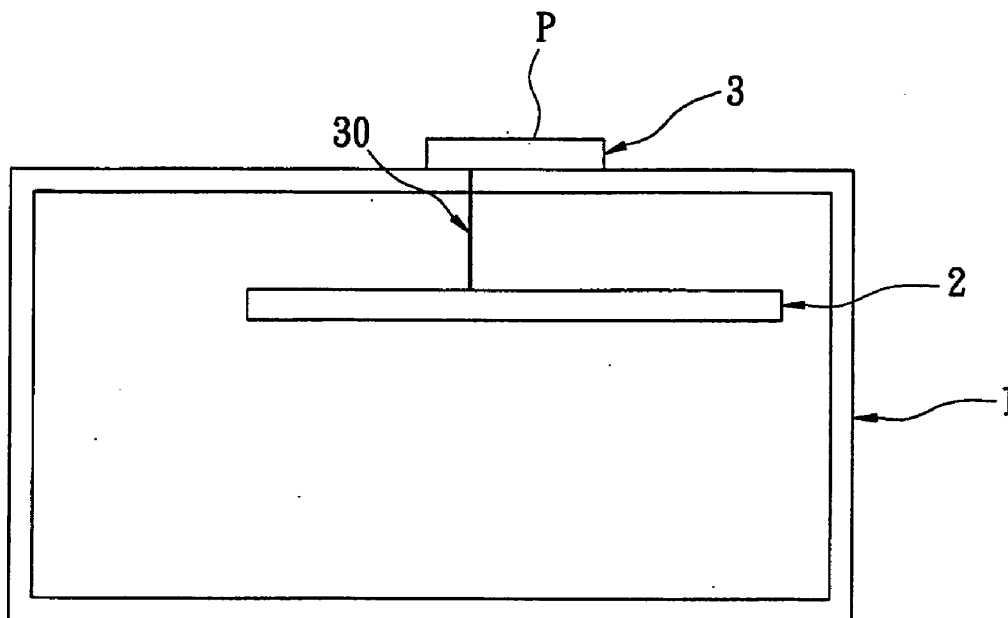
A pattern antenna structure includes a casing, a PCB, and an antenna unit. The PCB is disposed in the casing. The antenna unit is electrically connected with the PCB, and the antenna unit is disposed on the casing to form a predetermined pattern. Hence, the antenna unit of the present invention is the predetermined pattern exactly, and the predetermined is the antenna unit exactly. Especially for the predetermined pattern applied to a trademark, not only the trademark has an antenna function and a trademark appearance function, but also the trademark has an anti-counterfeit function. In other words, consumers can judge whether a purchase product with the trademark is true via testing whether the trademark has the antenna function or not.

(21) **Appl. No.: 11/594,189**

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

Publication Classification

(51) **Int. Cl.**
H01Q 9/04 (2006.01)
H01Q 1/36 (2006.01)





US 20080106473A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0106473 A1**

(43) **Pub. Date: May 8, 2008**

(54) **PLANAR ANTENNA**

Publication Classification

(75) Inventors: **CHO-JU CHUNG**, Tu-Cheng (TW); **TENG-HUEI CHU**, Tu-Cheng (TW)

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

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

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

(57) **ABSTRACT**

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

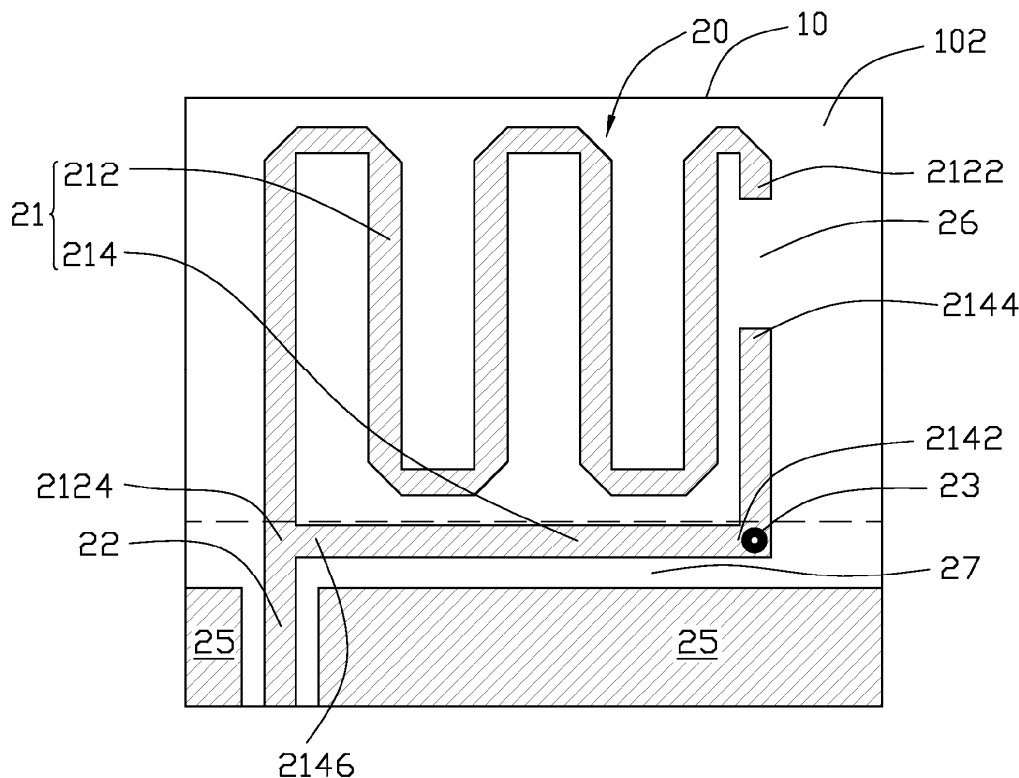
A planar antenna (20) disposed on a substrate (10) including a first surface (102) and a second surface (104). The planar antenna includes a radiating body (21) laid on the first surface for transmitting and receiving radio frequency (RF) signals, a feeding portion (22), and a first metallic ground plane (24) laid on the second surface. The radiating body includes a first radiating portion (212) and a second radiating portion (214). The first radiating portion includes an open end (2122), and a connecting portion (2124). The second radiating portion includes a free end (2144) and an end (2146) connected to the connecting portion. A first gap (26) is formed between the open end and the free end. The feeding portion is laid on the first surface and electrically connected to the connecting portion. The first ground plane is electrically connected to the second radiating portion through a via (23).

(21) Appl. No.: **11/615,019**

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

(30) **Foreign Application Priority Data**

Nov. 3, 2006 (CN) 200610201062.4





US 20080106474A1

(19) **United States**

(12) **Patent Application Publication**
Kerselaers

(10) **Pub. No.: US 2008/0106474 A1**

(43) **Pub. Date: May 8, 2008**

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

Publication Classification

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

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

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

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

(57) **ABSTRACT**

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

In devices (1) comprising antennas (2) for exchanging radio frequency signals, the antennas (2) comprise two conductive planes (21,22) which comprise two connection points (31a, 32a) and which are separated by gaps (23) for separating the conductive planes (21,22) from each other and which are coupled to each other by conductive bridges (24). These antennas (2) have a sufficient antenna performance, do not require power amplifiers to be over dimensioned, do not introduce extra power consumption, have sufficient bandwidth, are low cost and can easily be manufactured. The conductive planes (21,22) carry processing circuitry (41) and interfacing circuitry (42). By introducing two further connection points (31b,32b), the gaps (23) are divided into first gaps (23a) and second gaps (23b) by the conductive bridges (24) and the antennas (2) can be used in different frequency bands. The conductive planes (21,22) may make an angle with respect to each other, to allow the antennas (2) to be shaped in dependence of device constructions.

(21) **Appl. No.: 11/720,521**

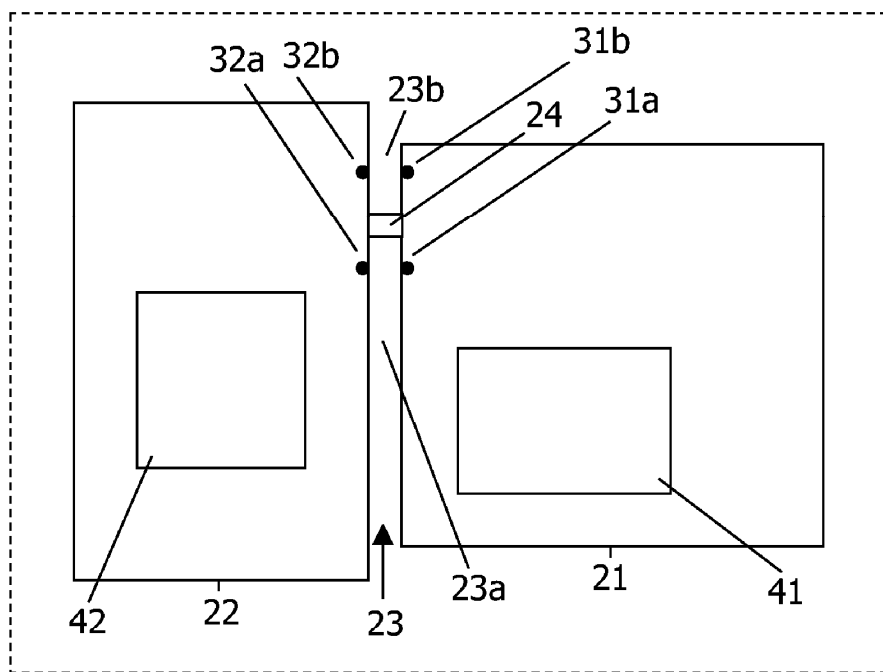
(22) **PCT Filed: Nov. 29, 2005**

(86) **PCT No.: PCT/IB05/53952**

§ 371 (c)(1),
(2), (4) **Date: May 31, 2007**

(30) **Foreign Application Priority Data**

Dec. 6, 2004 (EP) 04106327.2





US 20080106478A1

(19) **United States**

(12) **Patent Application Publication**
Hill

(10) **Pub. No.: US 2008/0106478 A1**

(43) **Pub. Date: May 8, 2008**

(54) **BROADBAND ANTENNA WITH COUPLED FEED FOR HANDHELD ELECTRONIC DEVICES**

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

(57) **ABSTRACT**

(76) Inventor: **Robert J. Hill, Salinas, CA (US)**

Broadband antennas and handheld electronic devices with broadband antennas are provided. A handheld electronic device may have a housing in which electrical components such as integrated circuits and a broadband antenna are mounted. The broadband antenna may have a ground element and a resonating element. The resonating element may have two arms of unequal length and may have a self-resonant element. The antenna may have a feed terminal connected to the self-resonant element and a ground terminal connected to the ground element. The self-resonant element may be near-field coupled to one of the arms of the resonating element. With one suitable arrangement, the self-resonant element may be formed using a conductive rectangular element that is not electrically shorted to the ground element or the arms of the resonating element. The antenna may operate over first and second frequency ranges of interest.

Correspondence Address:

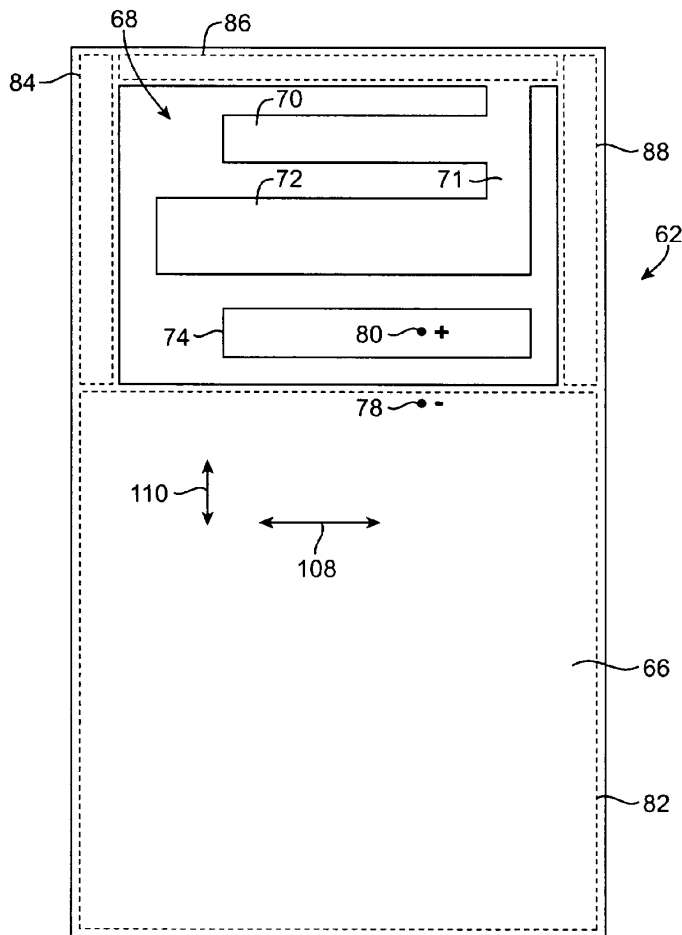
G. VICTOR TREYZ
870 MARKET STREET, FLOOD BUILDING,
SUITE 984
SAN FRANCISCO, CA 94102

(21) Appl. No.: **11/593,752**

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

Publication Classification

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





US 20080106481A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0106481 A1**

(43) **Pub. Date: May 8, 2008**

(54) **DIPOLE ANTENNA WITH REDUCED
FEEDLINE REVERSE CURRENT**

Publication Classification

(75) Inventors: **Zuo Hua Lin**, Hsinch (TW); **Wun
Man Huang**, Hsinchu (TW)

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

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

(57) **ABSTRACT**

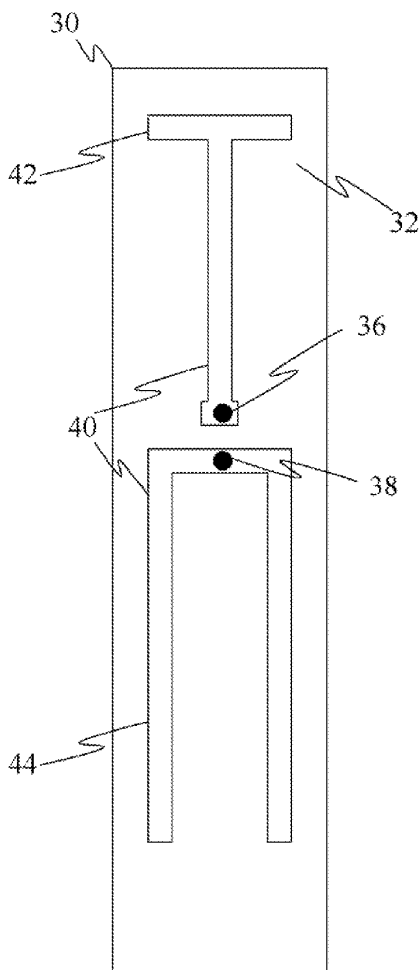
Correspondence Address:
APEX JURIS, PLLC
TRACY M HEIMS
**LAKE CITY CENTER, SUITE 410, 12360 LAKE
CITY WAY NORTHEAST**
SEATTLE, WA 98125

A dipole antenna with reduced feedline reverse current is provided. A substrate includes a first surface and a second surface, with a feed aperture and a ground aperture penetrating through both the first and second surfaces. A radiator is configured on the first surface for receiving and transmitting wireless signals. A feeder configured on the second surface connects the radiator through the feed aperture. A ground portion with a main notch is configured on the second surface and connects the radiator through the ground aperture. A feedline passing the main notch has an end connecting to the feeder and the ground portion. The reverse current of the feed line is absorbed by the ground portion around the main notch.

(73) Assignee: **Z-Com, Inc.**, Hsinchu (TW)

(21) Appl. No.: **11/556,821**

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





US 20080106482A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0106482 A1**

(43) **Pub. Date: May 8, 2008**

(54) **ELECTRONICALLY SCANNED
HEMISPHERIC ANTENNA**

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

Publication Classification

(76) Inventors: **Alan Cherrette**, Hermosa Beach, CA (US); **Carl Wise**, Severna Park, MD (US); **Arun Bhattacharyya**, El Segundo, CA (US); **Michael Wroblewski**, Los Angeles, CA (US); **Allan Goetz**, La Jolla, CA (US)

(51) **Int. Cl.**
H01Q 21/00 (2006.01)
H01Q 1/42 (2006.01)

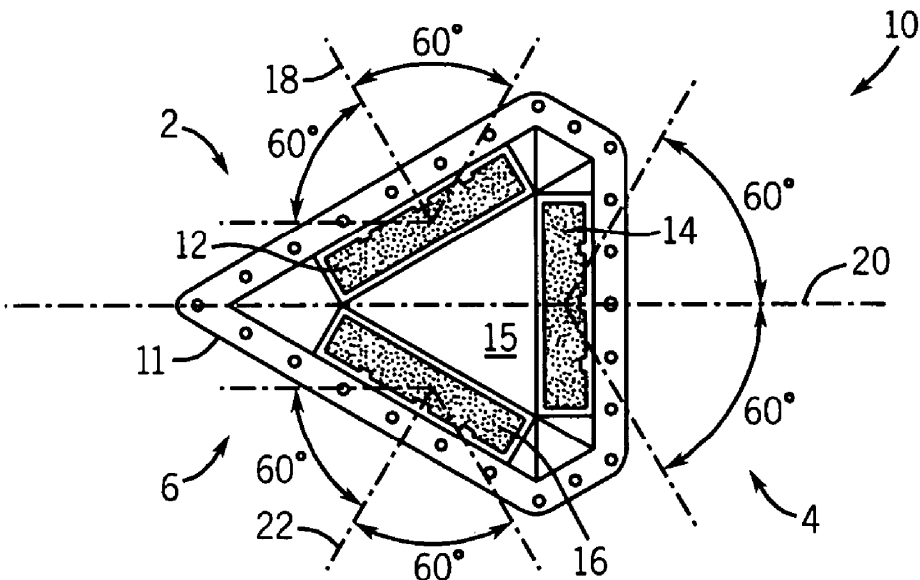
(52) **U.S. Cl.** **343/872; 343/893**

(57) **ABSTRACT**

A low-profile, electronically scanned antenna that can scan a hemisphere is comprised of three, phased array radiators. Each radiator face has an azimuth and elevation scan angle equal to 120 degrees. The three radiator faces are arranged in a truncated 3 sided pyramid such that they provide continuous hemispherical coverage. The three radiators are mounted to cooled panels of a truncated pyramid-shaped frame such that the radiators enable a full hemisphere to be scanned by radar.

Correspondence Address:
PATTI, HEWITT & AREZINA LLC
**ONE NORTH LASALLE STREET, 44TH
FLOOR**
CHICAGO, IL 60602

(21) Appl. No.: **11/594,320**





US 20080106485A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0106485 A1**

(43) **Pub. Date: May 8, 2008**

(54) **PORTABLE ELECTRONIC DEVICE AND ANTENNA THEREOF**

(30) **Foreign Application Priority Data**

Nov. 7, 2006 (TW) 095141199

(75) Inventors: **Jiunn-Ming Huang**, Taipei Hsien (TW); **Chih-Lung Chen**, Taipei Hsien (TW); **Bang-Lin Liu**, Taipei Hsien (TW); **Pi-Hsi Cheng**, Taipei Hsien (TW)

Publication Classification

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

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

(57) **ABSTRACT**

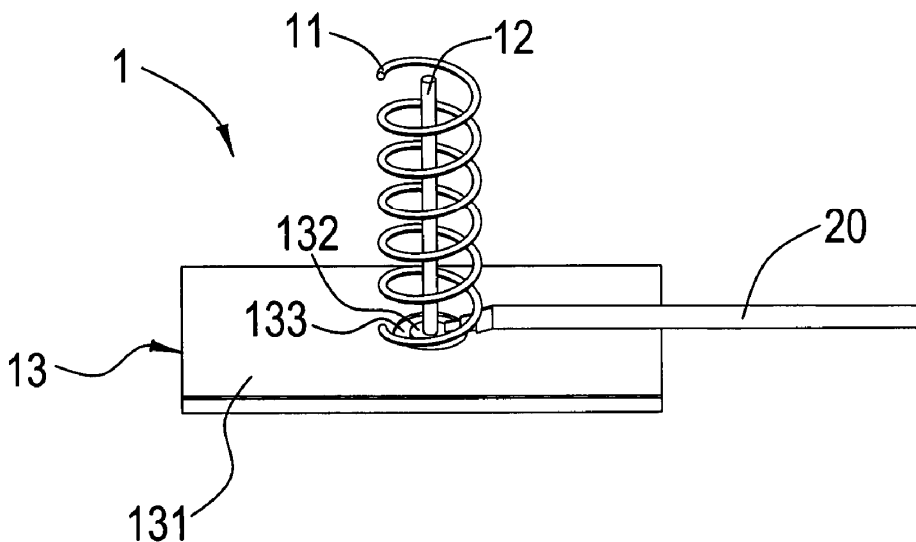
A portable electronic device with function of receiving and radiating radio frequency (RF) signal and an antenna thereof are disclosed. The portable electronic device comprises an RF module and an antenna connecting to the RF module. The antenna comprises a helix element, a radiating element, and a base. The base comprises a ground element and a feeding portion that are separated from each other. The radiating element is disposed within the helix element. The radiating element is connected to the feeding portion, and the helix element is connected to the ground element.

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

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

(21) Appl. No.: **11/806,287**

(22) Filed: **May 31, 2007**





US 20080111743A1

(19) **United States**

(12) **Patent Application Publication**
QIN

(10) **Pub. No.: US 2008/0111743 A1**

(43) **Pub. Date: May 15, 2008**

(54) **BROADBAND ANTENNA**

(30) **Foreign Application Priority Data**

(75) Inventor: **XIANG-HONG QIN**, Shenzhen
(CN)

Nov. 10, 2006 (CN) 200610063580.4

Publication Classification

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

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

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

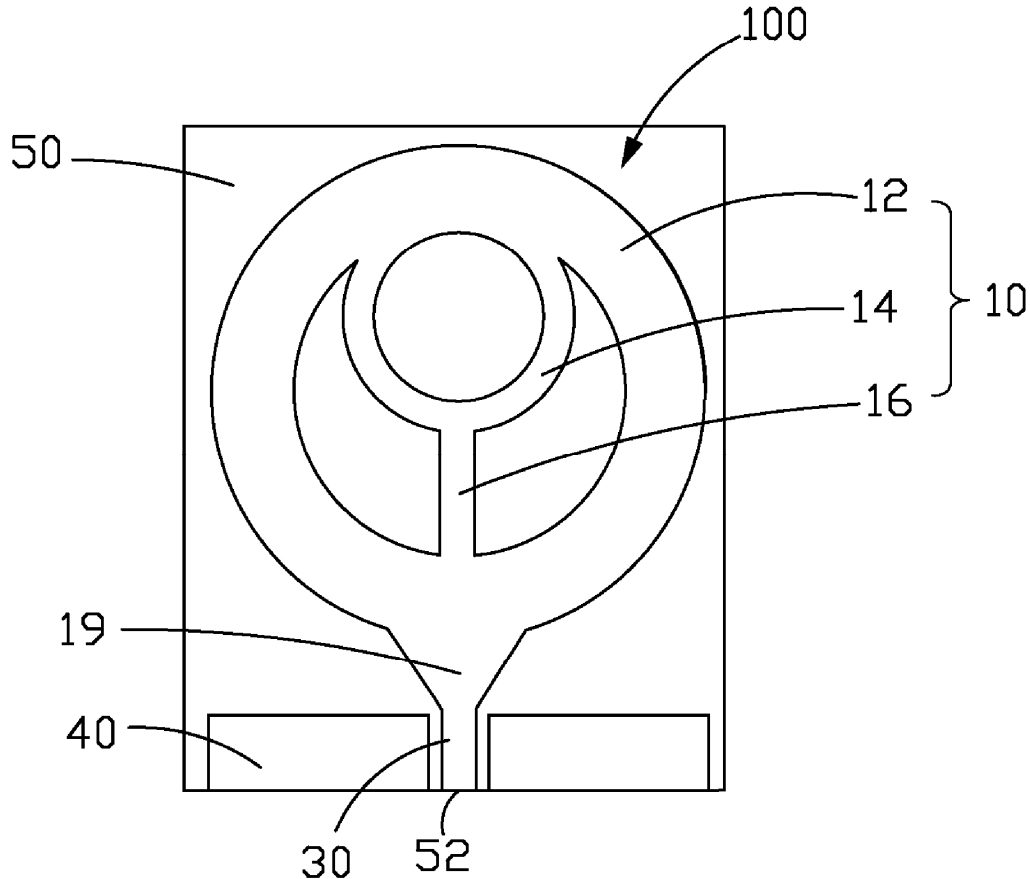
(57) **ABSTRACT**

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

A broadband antenna includes a radiation part (10) for radiating and receiving electromagnetic signals, a feed portion (30) for feeding the electromagnetic signals, and a pair of ground planes (40) respectively disposed on sides of the feed portion. The radiation part comprises an annular first radiation segment (12) and an annular radiation second segment (14) being inscribed within a space defined by the annular shape of the first radiation segment. The feed portion is electrically connected to the radiation part.

(21) Appl. No.: **11/616,900**

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





US 2008011744A1

(19) **United States**

(12) **Patent Application Publication**

Tsai et al.

(10) **Pub. No.: US 2008/011744 A1**

(43) **Pub. Date: May 15, 2008**

(54) **ANTENNA STRUCTURE**

Publication Classification

(76) Inventors: **Tony Tsai**, Taipei (TW); **Ryan Chang**, Shanghai (CN); **Yanping Gao**, Shanghai (CN); **Jie Zhou**, Shanghai (CN)

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

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

(57) **ABSTRACT**

An antenna structure is disposed on a substrate. The antenna structure includes a Γ -shaped radiation body and a first radiation body, and both share a feeding end and a grounding end. The feeding end and the grounding end are disposed to a side edge of the Γ -shaped radiation body. The positions of the feeding end and the grounding end allow the Γ -shaped radiation body to form the operation of two frequency bands. Moreover, the first radiation body is vertically extended from the side edge near the feeding end disposed to the Γ -shaped radiation body, and continuously extended from an end to keep a spacing between periphery of the Γ -shaped radiation body and the first radiation body, and extended to a front of an opening of the Γ -shaped radiation body, thereby vertically extending toward the opening. Therefore, the first radiation body could provide the operation of another frequency band.

Correspondence Address:

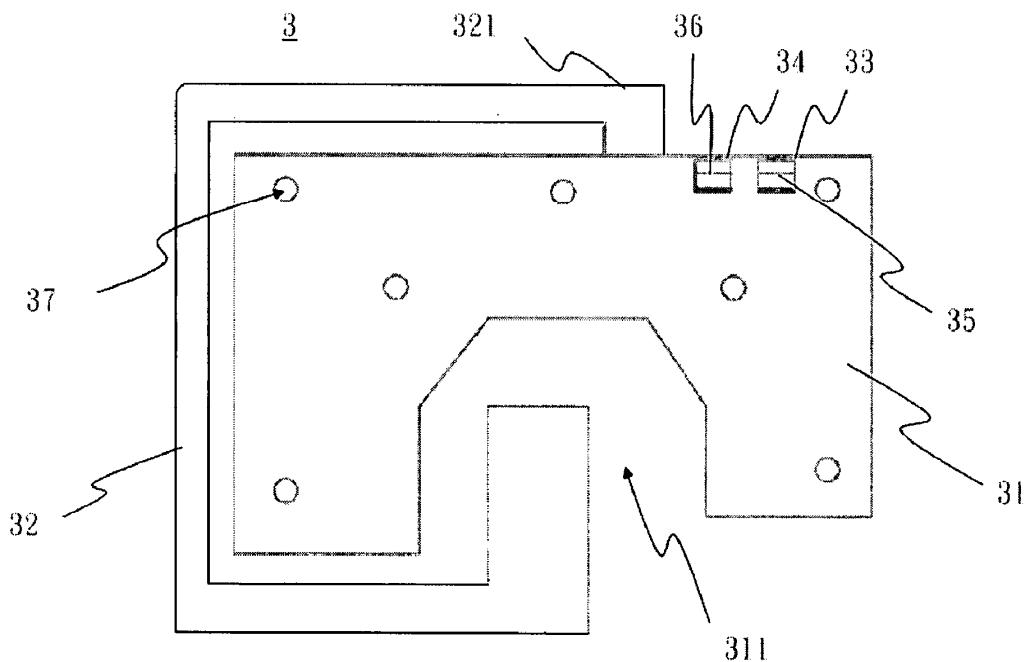
ROSENBERG, KLEIN & LEE
3458 ELLICOTT CENTER DRIVE-SUITE 101
ELLICOTT CITY, MD 21043

(21) Appl. No.: **11/819,177**

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

(30) **Foreign Application Priority Data**

Nov. 13, 2006 (TW) 095219974





US 20080111745A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0111745 A1**

(43) **Pub. Date: May 15, 2008**

(54) **ANTENNA**

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

(76) Inventors: **Yoshinao Takada**, Tokyo (JP);
Daisuke Nozue, Kanagawa (JP);
Hiroshi Ikeda, Kanagawa (JP)

Correspondence Address:
BARLEY SNYDER, LLC
1000 WESTLAKES DRIVE, SUITE 275
BERWYN, PA 19312

(21) Appl. No.: **11/937,251**

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

(30) **Foreign Application Priority Data**

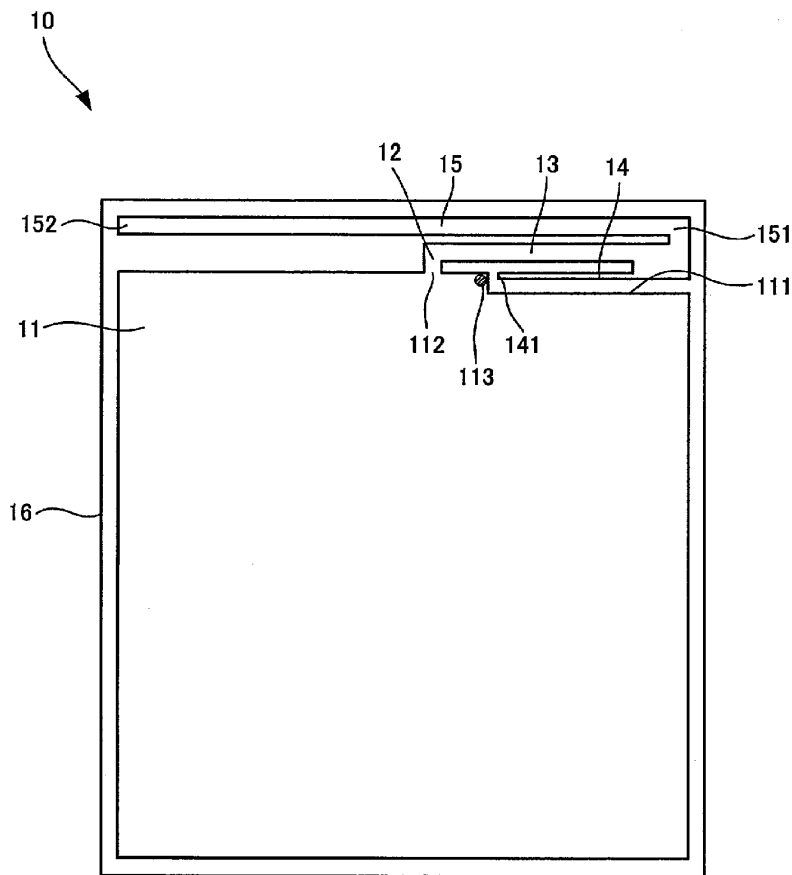
Nov. 9, 2006 (JP) 2006-303832

Publication Classification

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

(57) **ABSTRACT**

An antenna having a ground plane having an edge and a first antenna element extending substantially parallel to the edge is disclosed. A ground element electrically connects the first antenna element with the ground plane. A second antenna element extends substantially parallel to the first antenna element and is disposed between the edge and the first antenna element and is connected at one end of the second antenna element to the first antenna element with the remaining end of the second antenna element located closer to the ground element. A third antenna element is disposed so that the first antenna element is between the second antenna element and the third antenna element and the third antenna element extends substantially parallel to the first antenna element, with a rear end electrically connected with the first antenna element and a remaining end of the third antenna element is electrically open.





US 2008011747A1

(19) **United States**

(12) **Patent Application Publication**
YING

(10) **Pub. No.: US 2008/011747 A1**

(43) **Pub. Date: May 15, 2008**

(54) **ANTENNA FOR A PEN-SHAPED MOBILE PHONE**

Publication Classification

(75) Inventor: **Zhinong YING**, Lund (SE)

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

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

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

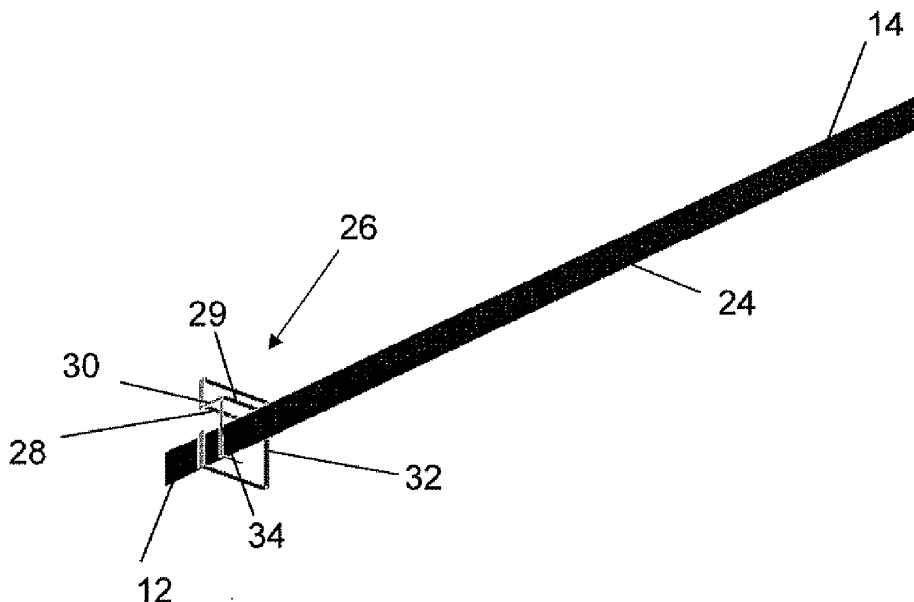
(73) Assignee: **SONY ERICSSON MOBILE COMMUNICATIONS AB**, Lund (SE)

(57) **ABSTRACT**

The present invention relates to an antenna arrangement for a thin elongated portable communication device as well as to a thin elongated portable communication device comprising such an antenna arrangement. The antenna arrangement includes a first radiating antenna element dimensioned for operation at a first frequency and provided in the form of a first strip encircling most of a circuit board that comprises a ground plane. The antenna arrangement that is small sized, can be provided inside the thin elongated portable communication device and still has good antenna properties.

(21) Appl. No.: **11/558,754**

(22) Filed: **Nov. 10, 2006**





US 2008011749A1

(19) **United States**

(12) **Patent Application Publication**
Nam

(10) **Pub. No.: US 2008/011749 A1**

(43) **Pub. Date: May 15, 2008**

(54) **ANTENNA AND MOBILE COMMUNICATION
TERMINAL COMPRISING THE SAME**

Publication Classification

(75) Inventor: **Soo Hyun Nam, Seoul (KR)**

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

Correspondence Address:
**LEE, HONG, DEGERMAN, KANG &
SCHMADEKA**
660 S. FIGUEROA STREET, Suite 2300
LOS ANGELES, CA 90017

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

(57) **ABSTRACT**

A mobile terminal and antenna including a case configured to include a circuit board and an antenna disposed inside the case. The antenna including an antenna pattern formed on a substrate, a feed unit having a first end connected to the antenna pattern and a second end connected to the circuit board. The feed unit is configured to supply an electrical signal to the antenna pattern, and an Electromagnetic Interference (EMI) attenuation unit is disposed in a location corresponding to the feed unit and configured to attenuate the EMI generated by the feed unit.

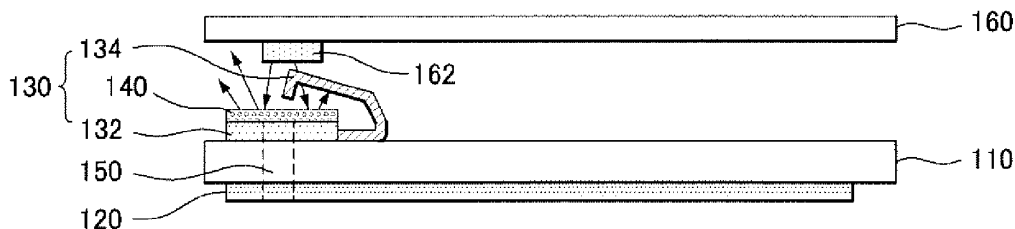
(73) Assignee: **LG Electronics Inc.**

(21) Appl. No.: **11/944,297**

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

(30) **Foreign Application Priority Data**

Nov. 13, 2006 (KR) 10-2006-0116280





US 2008011753A1

(19) **United States**

(12) **Patent Application Publication**
Cheng

(10) **Pub. No.: US 2008/011753 A1**

(43) **Pub. Date: May 15, 2008**

(54) **DUAL BAND PRINTED ANTENNA AND DUAL BAND PRINTED ANTENNA MODULE**

Publication Classification

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

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

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

(57) **ABSTRACT**

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

A dual band printed antenna includes a first metal sheet, a second metal sheet, a substrate and a conductive unit. The first metal sheet is triangular and has a slit and a feeding part. The slit is extended from a side to another side of the first metal sheet. The slit and the feeding part divide the first metal sheet into a first radiating part and a second radiating part. The second metal sheet has a breach and a grounding part. The breach is triangular and located opposite to the first metal sheet. The first and second metal sheets are disposed on the substrate. The first metal sheet is apart a distance from the second metal sheet. The conductive unit has a conductive body, which is electronically connected with the feeding part, and a grounding body, which is electronically connected with the grounding part. A dual band printed antenna module is also disclosed.

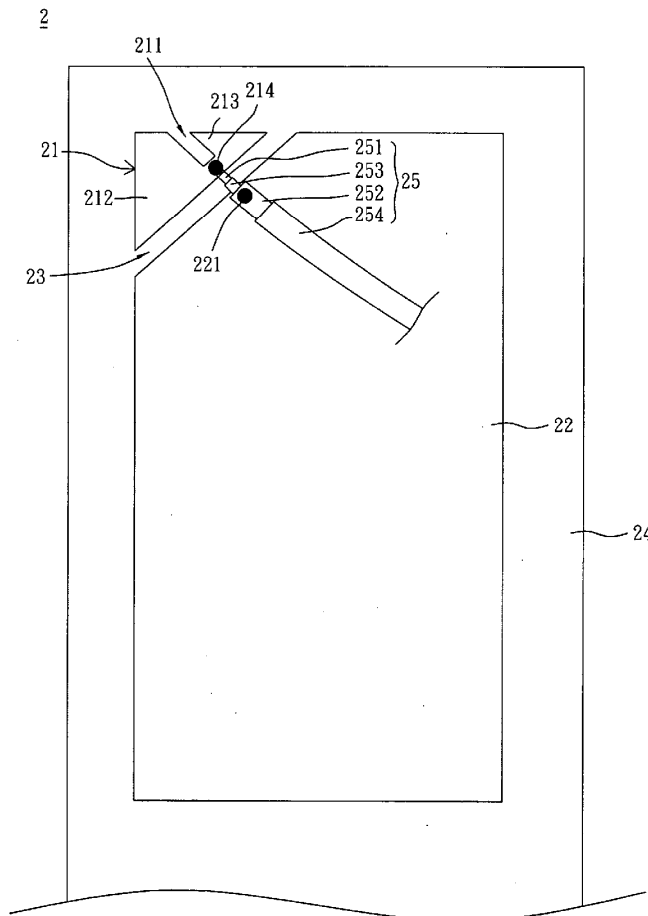
(73) Assignee: **Arcadyan Technology Corporation**

(21) Appl. No.: **11/882,040**

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

(30) **Foreign Application Priority Data**

Nov. 9, 2006 (TW) 095141494





US 20080117107A1

(19) **United States**

(12) **Patent Application Publication**
Wan

(10) **Pub. No.: US 2008/0117107 A1**

(43) **Pub. Date: May 22, 2008**

(54) **FLAT PANEL ANTENNA**

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

(75) **Inventor: Tze-Chung Wan, Jhongli City (TW)**

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

(73) **Assignee: Joymax Electronics Co., Ltd.**

(21) **Appl. No.: 11/603,110**

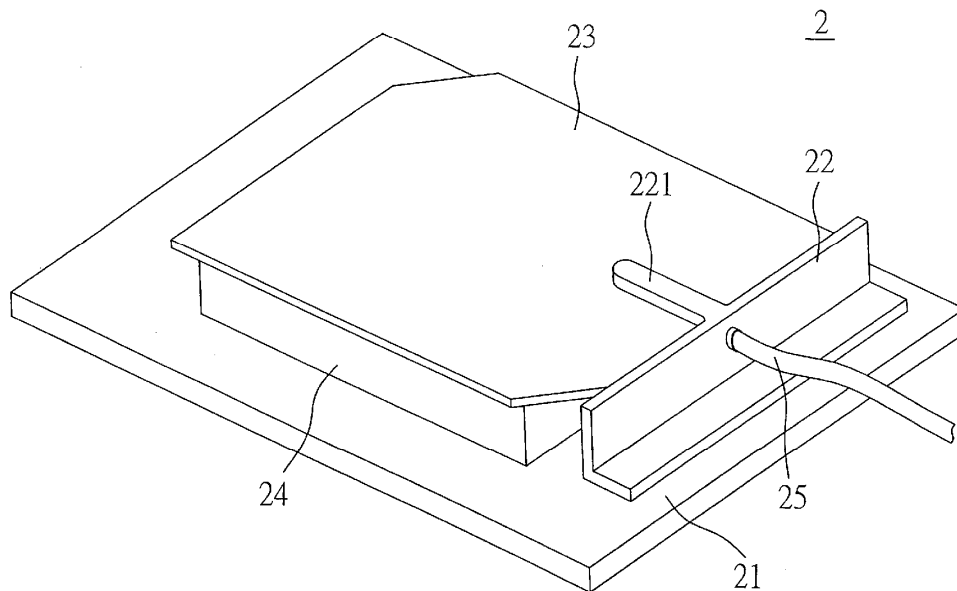
(22) **Filed: Nov. 22, 2006**

Publication Classification

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

(57) **ABSTRACT**

A flat panel antenna includes a horizontal ground plan, a vertical ground plane, a radiation metal member disposed over and in parallel with the horizontal ground plane; the vertical ground plane being disposed at a level higher than that of the radiation metal member, an extension member extending from the vertical ground plane in the direction of and in parallel with the radiation metal member to penetrate into the radiation metal member for a proper length for precise control impedance of the antenna for the normalized impedance to approach 1, i.e. 50-ohm of the system impedance of the antenna to upgrade radiation efficiency of the flat panel antenna.





US 20080117108A1

(19) **United States**

(12) **Patent Application Publication**
Deng

(10) **Pub. No.: US 2008/0117108 A1**

(43) **Pub. Date: May 22, 2008**

(54) **MINIATURE ANTENNA WITH FEEDING
COUPLED LINE**

Publication Classification

(75) Inventor: **Sheng Ming Deng**, Hsinchu County
(TW)

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

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

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

(57) **ABSTRACT**

The present invention provides a micro antenna with feeding coupled line comprising a dielectric body, an antenna metal surface, a ground metal surface, and a feeding line. The ground metal surface is to couple the antenna metal surface and the feeding line for signal transmitting; namely, the ground metal surface and the feeding line form a feeding coupled line. The antenna metal surface, the feeding line, and the ground metal surface are set on the surface of the dielectric body. The dielectric body can be a rectangular parallel-piped made of ceramic materials. The feeding line and the ground metal surface can be set on the same surface or on different surfaces of the rectangular parallelepiped. The length of the antenna metal surface is one quarter of the wavelength of the transmitting and receiving signals multiplied by an integer.

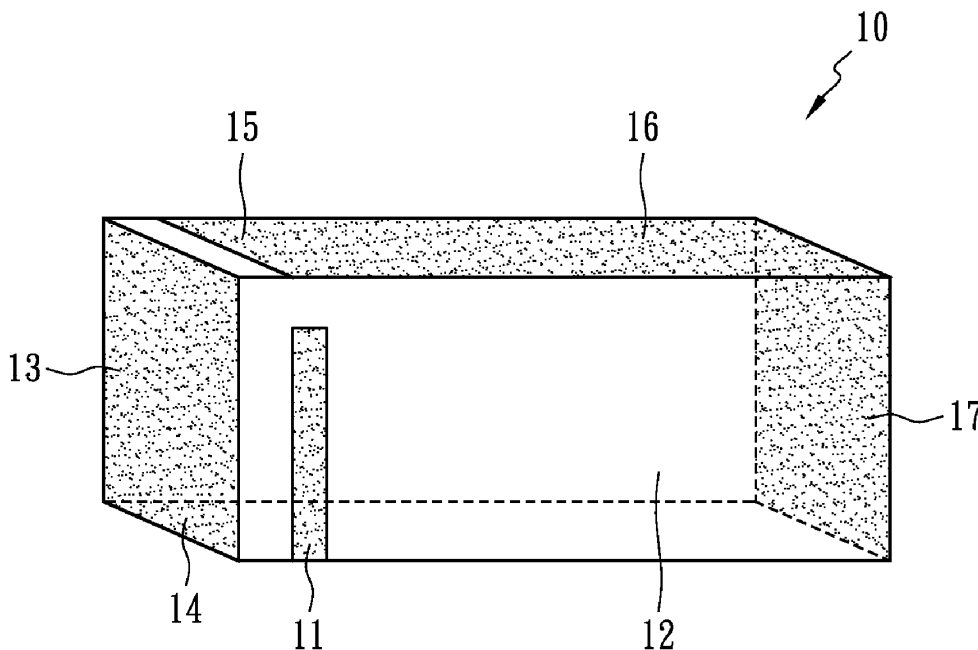
(73) Assignees: **WAVEFAR TECHNOLOGY CO.,
LTD**, Hsinchu (TW); **WAVERAY
TECHNOLOGY CORP.**, Hsinchu
County (TW)

(21) Appl. No.: **11/941,878**

(22) Filed: **Nov. 16, 2007**

(30) **Foreign Application Priority Data**

Nov. 22, 2006 (TW) 095220551





US 20080119138A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0119138 A1**

(43) **Pub. Date: May 22, 2008**

(54) **BLUETOOTH HEADSET WITH BUILT-IN ANTENNA MODULE**

(30) **Foreign Application Priority Data**

Nov. 13, 2006 (KR) 2006-0111542

(75) Inventors: **Joo-Hyun Kim**, Seoul (KR);
Ju-Sang Park, Suwon-si (KR);
Sung-Yoon Hwang, Yongin-si (KR);
Hong-Chul Kim, Suwon-si (KR);
Kye-Yong Lee, Seoul (KR)

Publication Classification

(51) **Int. Cl.**
H04B 7/00 (2006.01)
H04M 1/00 (2006.01)
(52) **U.S. Cl.** **455/41.2; 455/575.2**

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

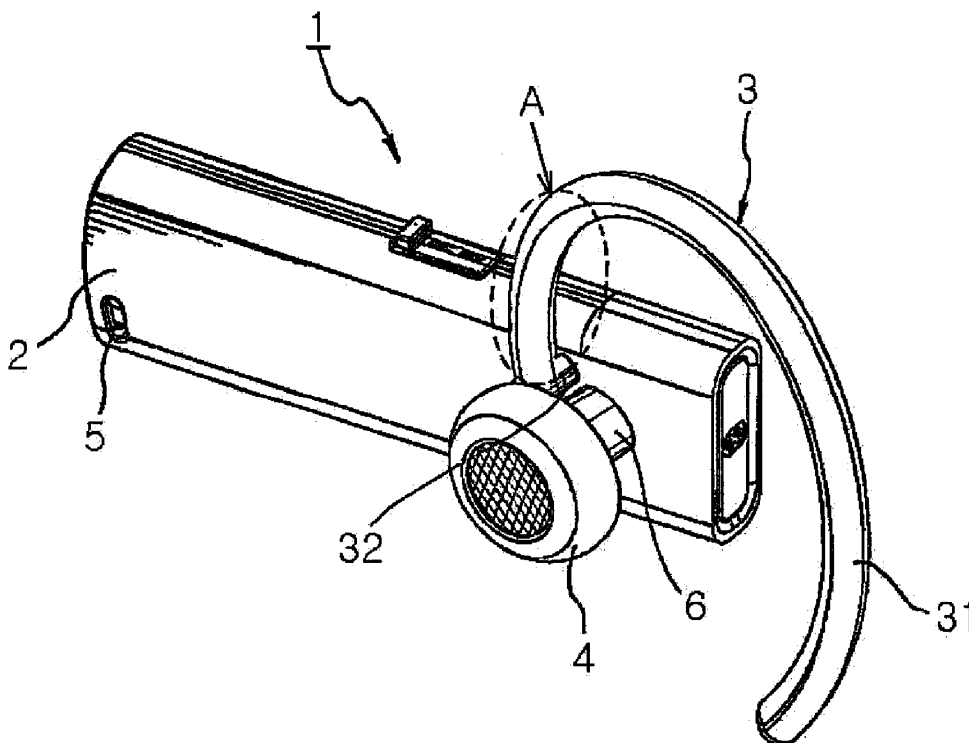
(57) **ABSTRACT**

A Bluetooth headset is disclosed that includes a body having a microphone and an earphone having a Bluetooth module therein; an ear hook having a curved shape, fixed to the body, and worn on a user's ear; and an antenna module disposed to the ear hook. The antenna module includes an antenna radiator mounted inside the ear hook; and an electrical connection element which is electrically connected to the antenna radiator, is drawn out from one connection end of the body of the ear hook, and is power-fed by the Bluetooth module included in the body.

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

(21) Appl. No.: **11/937,998**

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





US 20080122697A1

(19) **United States**

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

(10) **Pub. No.:** US 2008/0122697 A1

(43) **Pub. Date:** May 29, 2008

(54) **MULTILAYER ANTENNA OF PLANAR CONSTRUCTION**

Publication Classification

(75) **Inventors:** Frank Mierke, Munchen (DE);
Gerald Schillmeier, Munchen (DE)

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

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

Correspondence Address:
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901 NORTH GLEBE ROAD, 11TH FLOOR
ARLINGTON, VA 22203

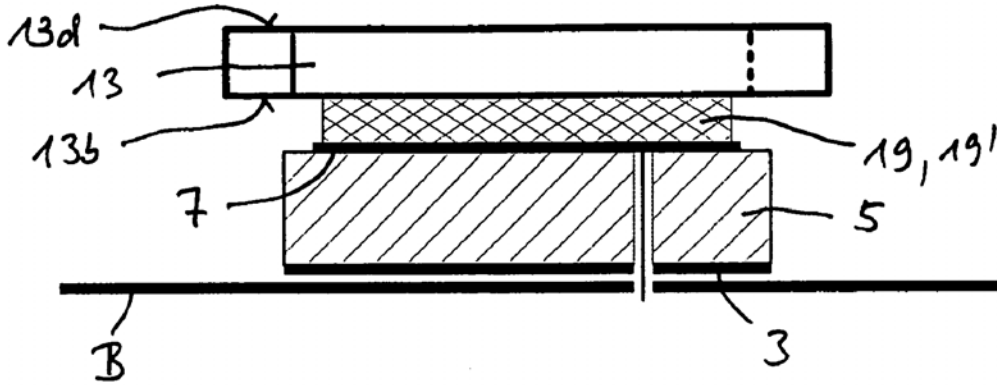
(57) **ABSTRACT**

A multilayer antenna of planar construction comprises an electrically conductive ground face and a conductive radiation face which is arranged with lateral spacing from the ground face and extends substantially parallel thereto. A dielectric carrier is arranged between the ground face and the radiation face. Above the radiation face there is a carrying means. Above the carrying means there is provided an electrically conductive patch element. The carrying means has a thickness or height which is less than the thickness or height of the patch element.

(73) **Assignee:** Kathrein-Werke KG, Rosenheim (DE)

(21) **Appl. No.:** 11/453,253

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





US 20080122698A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0122698 A1**

(43) **Pub. Date: May 29, 2008**

(54) **MULTIBAND ANTENNA ARRANGEMENT**

Publication Classification

(75) Inventors: **Jani Ollikainen**, Helsinki (FI);
Antero Lehtola, Turku (FI); **Joonas Krogerus**, Espoo (FI); **Jussi Rahola**, Espoo (FI)

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

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

(57) **ABSTRACT**

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

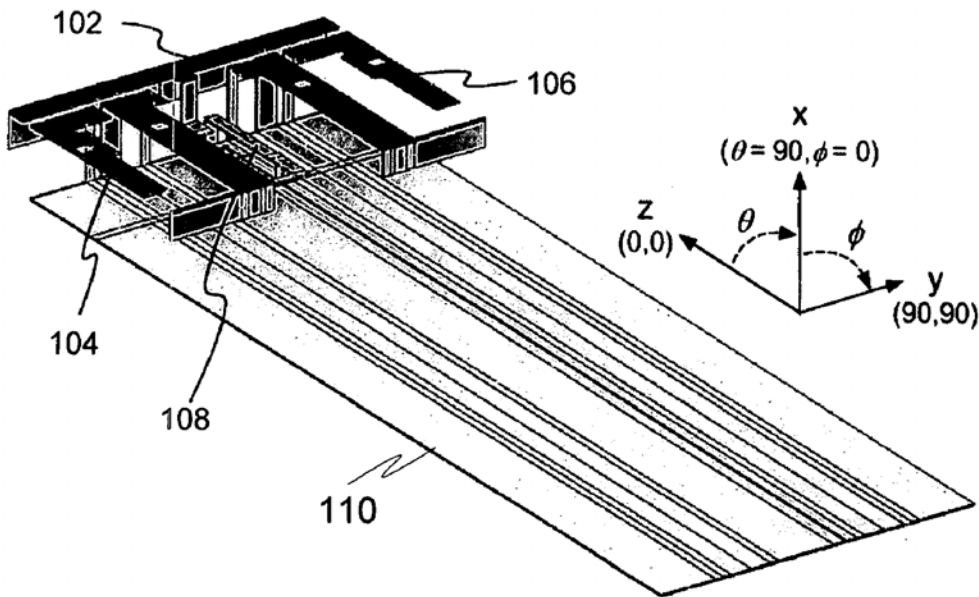
The invention relates to a radio antenna and, more specifically, to an internal multiband antenna for use e.g. in a portable telecommunication device, such as a mobile phone. In particular the invention relates to an antenna module for a mobile terminal comprising including a non-resonant antenna element, two resonant antenna elements each covering at least any one of a first, second, third or fourth frequency band, said two resonant elements are substantially in the same plane and define a planar surface wherein the two resonant elements are each positioned at a corner of the planar surface and the non-resonant element is positioned along an edge of the planar surface.

(73) Assignee: **Nokia Corporation**

(21) Appl. No.: **11/479,651**

(22) Filed: **Jun. 30, 2006**

100





US 20080122699A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0122699 A1**

(43) **Pub. Date: May 29, 2008**

(54) **BROADBAND ANTENNA**

(30) **Foreign Application Priority Data**

(75) Inventors: **Shih-Huang Yeh**, Douliou City (TW); **Kin-Lu Wong**, Kaohsiung (TW); **Yun-Wen Chi**, Sinjhuang City (TW)

Jun. 15, 2006 (TW) 95121386

Publication Classification

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

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

(57) **ABSTRACT**

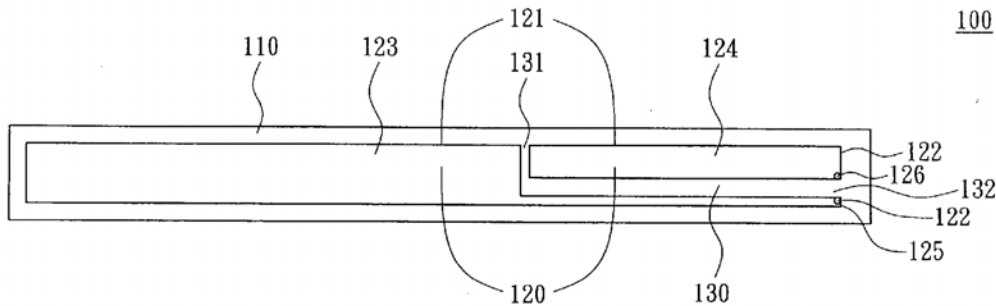
Correspondence Address:
BACON & THOMAS, PLLC
625 SLATERS LANE, FOURTH FLOOR
ALEXANDRIA, VA 22314

A broadband antenna includes a dielectric substrate, a radiation conductor and a feeding gap. The radiation conductor is disposed on the dielectric substrate and has a first side and a second side. The first side is adjacent to the second side, and the first side is longer than the second side. The second side has a first feeding point and a second feeding point. The feeding gap has a first end located at the first side and a second end located at the second side. The feeding gap divides the radiation conductor into a first sub-radiation conductor and a second sub-radiation conductor. The first feeding point is located on the first sub-radiation conductor and the second feeding point is located on the second sub-radiation conductor.

(73) Assignees: **INDUSTRIAL TECHNOLOGY RESEARCH INSTITUTE**, Chutung (TW); **National Sun Yat-Sen University**, Kaohsiung (TW)

(21) Appl. No.: **11/503,235**

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





US 20080122700A1

(19) **United States**

(12) **Patent Application Publication**
MEI

(10) **Pub. No.: US 2008/0122700 A1**

(43) **Pub. Date: May 29, 2008**

(54) **DUAL-BAND ANTENNA**

Publication Classification

(75) Inventor: **CHIA-HAO MEI**, Tu-Cheng (TW)

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

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

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

(57) **ABSTRACT**

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

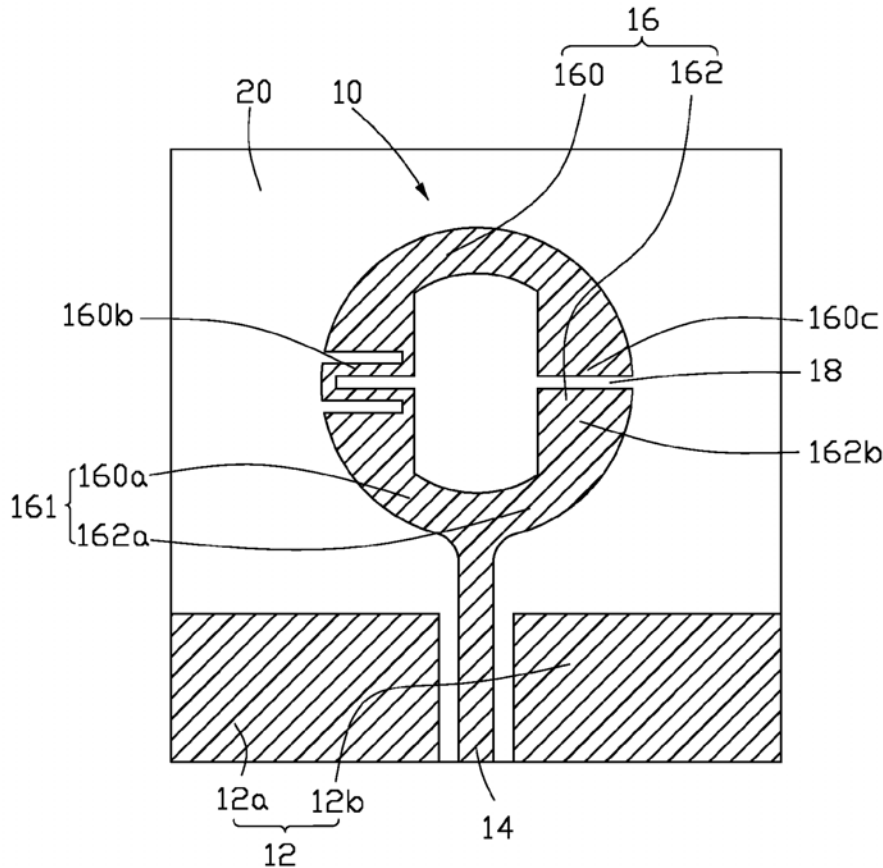
A dual-band antenna (10) is disposed on a substrate (20), for transeiving electromagnetic signals of different frequencies. The dual-band antenna includes a grounded portion (12), a feeding portion (14), and a radiation body (16). The feeding portion is adjacent to the grounded portion. The radiation body electronically connected to the feeding portion, includes a first radiation portion (160) and a second radiation portion (162). The first radiation portion includes a first free end (160c), a first connecting end (160a) electronically connected to the feeding portion, and a serpentine portion (160b) between the first free end and the first connecting end. The second radiation portion, includes a second connecting end (162a) electronically connected to the first connecting end, and a second free end (162b), wherein the first free end and the second free end face each other and a gap (18) is formed therebetween.

(21) Appl. No.: **11/684,639**

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

(30) **Foreign Application Priority Data**

Nov. 24, 2006 (CN) 200610157057.8





US 20080122701A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0122701 A1**

(43) **Pub. Date: May 29, 2008**

(54) **MULTI-BAND PLANAR INVERTED-F ANTENNA**

(30) **Foreign Application Priority Data**

Nov. 28, 2006 (TW) 095220914

(75) Inventors: **Ching-Neng Kan**, Taoyuan County (TW); **Hsuan-Yi Kuo**, Taoyuan County (TW); **Hsien-Chen Dai**, Taoyuan County (TW); **Yi-Hung Chang**, Taoyuan County (TW)

Publication Classification

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

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

(57) **ABSTRACT**

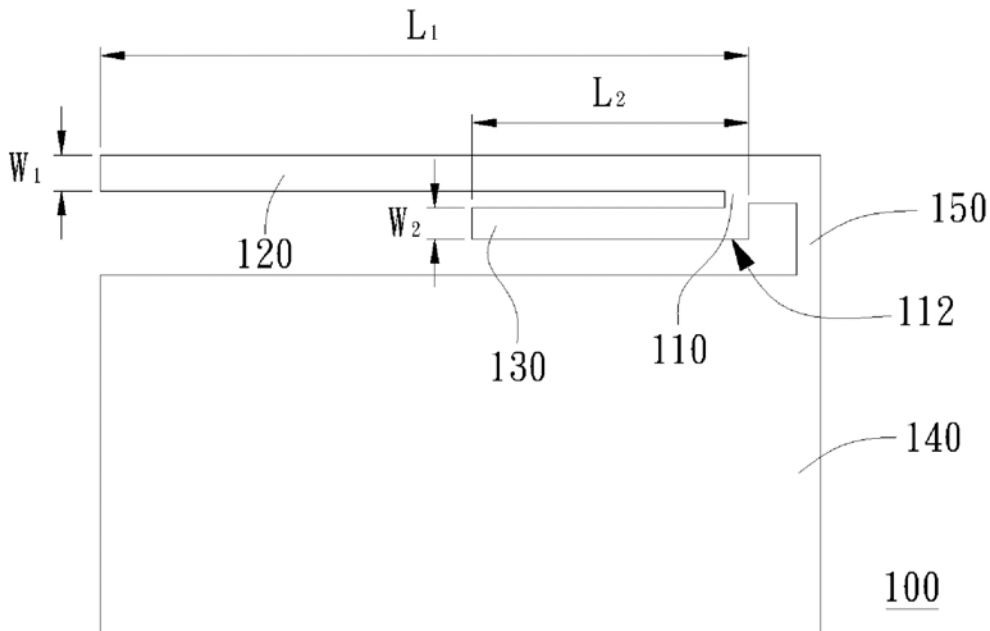
A multi-band planar inverted-F antenna, adapted for a wireless communication device, is disclosed, which is comprised of: a feeding port, a first radiation area, a second radiation area, a ground area and a connecting port. The wireless communication device is connected to the feeding port through a signal line so as to transmit/receive signal using the antenna. The first and the second radiation areas are connected to the feeding port while being arranged at a same side with respect to the feeding port. The connecting port, being connected to the ground area, is connected to the feeding port while being arranged at a side opposite to the first radiation area with respect to the feeding port. As the structure of the aforesaid multi-band planar inverted-F antenna is simple, it is easy to be manufactured.

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

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

(21) Appl. No.: **11/686,116**

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





US 20080122702A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0122702 A1**

(43) **Pub. Date: May 29, 2008**

(54) **MULTIBAND ANTENNA**

Publication Classification

(76) Inventors: **Sheng-Chih Lin**, Hsin-Tien City (TW); **Tsung-Wen Chiu**, Hsin-Tien City (TW); **Fu-Ren Hsiao**, Hsin-Tien City (TW)

(51) **Int. Cl.**
H01Q 9/04 (2006.01)
H01Q 1/38 (2006.01)
(52) **U.S. Cl.** **343/700 MS**

(57) **ABSTRACT**

Correspondence Address:
RABIN & Berdo, PC
1101 14TH STREET, NW, SUITE 500
WASHINGTON, DC 20005

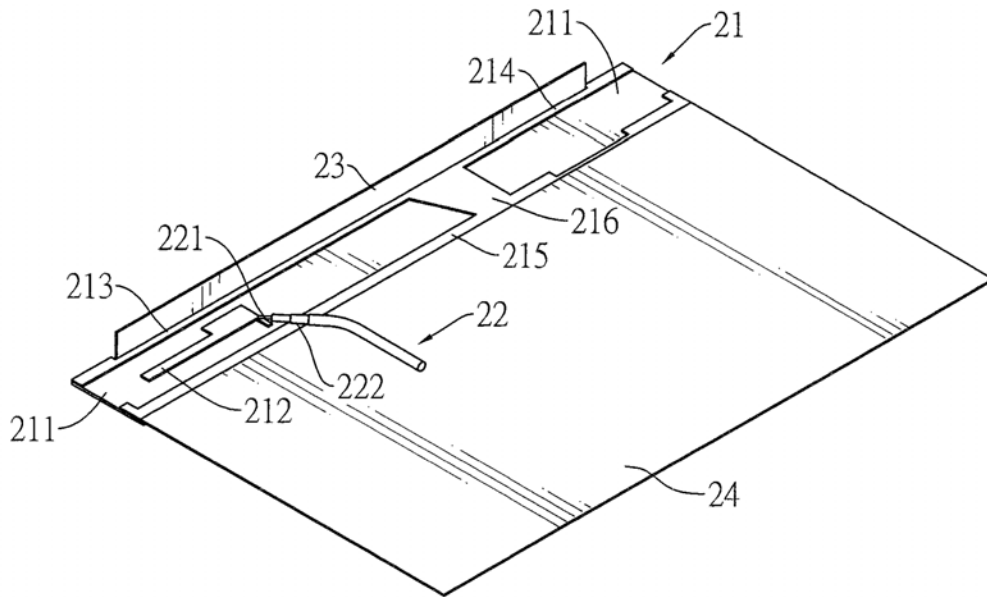
A multiband antenna with the broadband function has a radiator, a feed cable, a first extension conductor, and a second extension conductor. The radiator has a microwave substrate, a coupling conductor, a first conductor, a second conductor, a third conductor, and a connecting conductor. The coupling conductor is connected with a positive signal wire of the feed cable. The third conductor is connected with a negative signal of the feed cable for transmitting electrical signals. The radiator generates the multiband mode of the antenna. By connecting the first extension conductor and the second extension conductor with the radiator, the surface current distribution and impedance variation of the antenna can be effectively adjusted to achieve the broadband effect.

(21) Appl. No.: **11/943,799**

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

(30) **Foreign Application Priority Data**

Nov. 24, 2006 (TW) 095143543





US 20080122703A1

(19) **United States**

(12) **Patent Application Publication**
YING

(10) **Pub. No.: US 2008/0122703 A1**

(43) **Pub. Date: May 29, 2008**

(54) **COMPACT DIELECTRIC RESONATOR ANTENNA**

(75) Inventor: **Zhinong YING, Lund (SE)**

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

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

(21) Appl. No.: **11/534,480**

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

Related U.S. Application Data

(60) Provisional application No. 60/805,536, filed on Jun. 22, 2006.

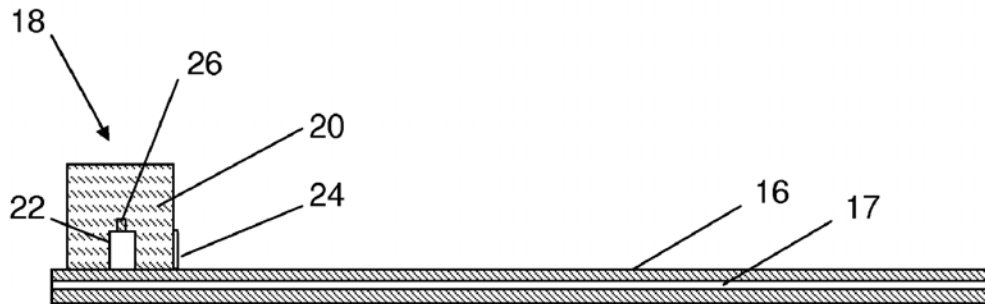
Publication Classification

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

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

(57) **ABSTRACT**

A dielectric radiator antenna arrangement for a communication device having a ground plane is provided. The antenna arrangement may include a dielectric volume having a central axis normal to the ground plane, and mode-exciting elements. The mode-exciting elements may include a first mode-exciting element provided in or attached to the dielectric volume and extending in a plane provided at a first distance from the central axis perpendicular to the ground plane, and a second mode-exciting element provided in or attached to the dielectric volume and extending in a plane provided at a second distance from the central axis and perpendicular to both the ground plane and the plane of the first mode-exciting element. The antenna arrangement can be used for simultaneously transmitting and receiving more than one signal at one frequency with reduced coupling.





US 20080122705A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0122705 A1**

(43) **Pub. Date: May 29, 2008**

(54) **ANTENNA APPARATUS AND ELECTRONIC DEVICE**

Related U.S. Application Data

(63) Continuation of application No. 11/341,368, filed on Jan. 30, 2006, now Pat. No. 7,339,533.

(75) Inventors: **Shigemi Kurashima**, Shinagawa (JP); **Masahiro Yanagi**, Shinagawa (JP); **Hideki Iwata**, Shinagawa (JP); **Takashi Arita**, Shinagawa (JP); **Takashi Yuba**, Shinagawa (JP); **Kazuhiko Ikeda**, Iiyama (JP); **Yuriko Segawa**, Shinagawa (JP)

(30) **Foreign Application Priority Data**

Jan. 31, 2005 (JP) 2005-023846
Jul. 11, 2005 (JP) 2005-202154
Aug. 24, 2005 (JP) 2005-243040
Nov. 14, 2005 (JP) 2005-328514

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

Publication Classification

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

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

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

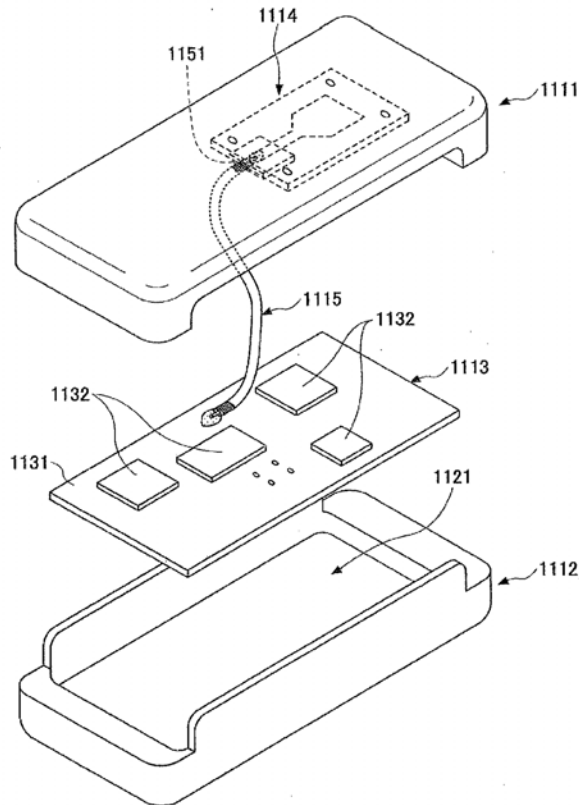
(57) **ABSTRACT**

(21) Appl. No.: **11/972,508**

The present invention discloses an antenna apparatus including a dielectric substrate on which an element including a conductive material pattern is formed. The dielectric substrate is a film.

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

1100





US 20080122710A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0122710 A1**
(43) **Pub. Date: May 29, 2008**

(54) **FOLDED DIPOLE LOOP ANTENNA HAVING MATCHING CIRCUIT INTEGRALLY FORMED THEREIN**

(30) **Foreign Application Priority Data**

Sep. 12, 2006 (KR) 10-2006-0088238

(75) Inventors: **Yong-jin Kim**, Yongin-si (KR);
Wee-sang Park, Yongin-si (KR);
Young-eil Kim, Yongin-si (KR);
Yun-taek Im, Yongin-si (KR)

Publication Classification

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

(52) **U.S. Cl.** 343/742

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

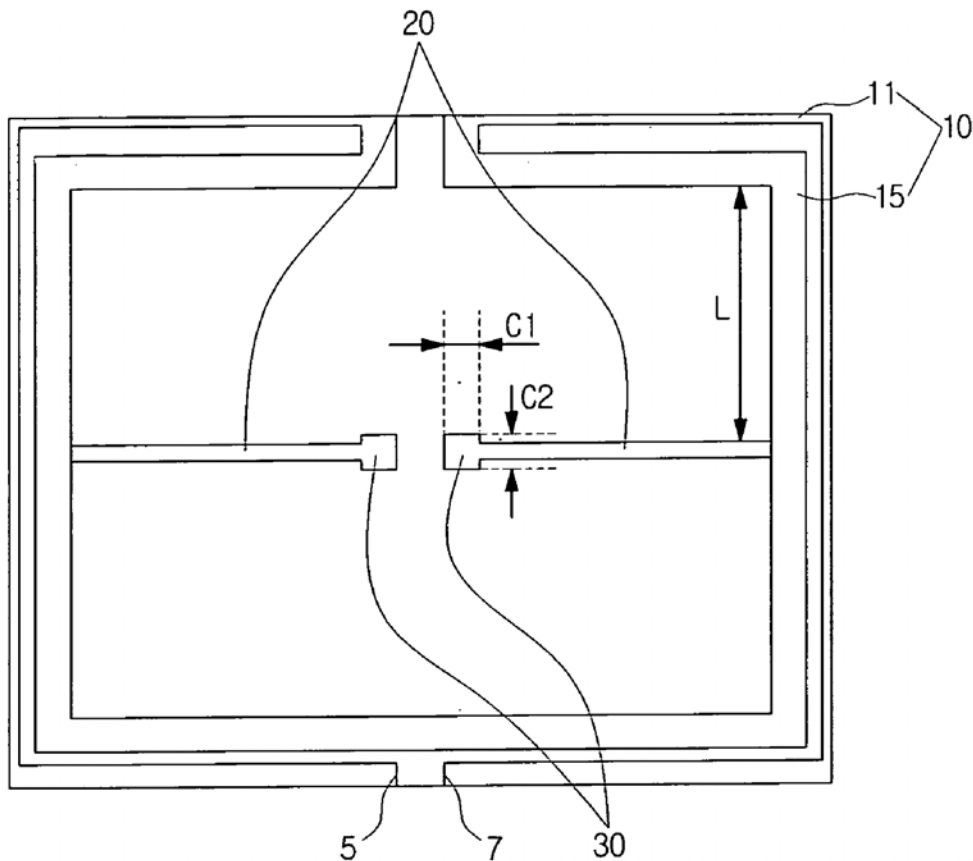
(57) **ABSTRACT**

A folded dipole loop antenna has a matching circuit integrally formed therein. The antenna includes a radiating unit formed in the shape of a loop, and the matching circuit has an extended part projected and extended toward a central area of the radiating unit from an inner side surface of the radiating unit, thereby eliminating the need for a separate space for the matching circuit. The antenna can change a resonant frequency thereof by adjusting input reactance through the matching circuit.

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

(21) Appl. No.: **11/700,049**

(22) Filed: **Jan. 31, 2007**





US 20080122712A1

(19) **United States**
(12) **Patent Application Publication**
Chen

(10) **Pub. No.: US 2008/0122712 A1**
(43) **Pub. Date: May 29, 2008**

(54) **TUNABLE ANTENNA INCLUDING TUNABLE CAPACITOR INSERTED INSIDE THE ANTENNA**

(75) Inventor: **Lee-Yin V. Chen, Goleta, CA (US)**

Correspondence Address:
FENWICK & WEST LLP
SILICON VALLEY CENTER, 801 CALIFORNIA STREET
MOUNTAIN VIEW, CA 94041

(73) Assignee: **Agile RF, Inc., Goleta, CA (US)**

(21) Appl. No.: **11/943,511**

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

Related U.S. Application Data

(60) Provisional application No. 60/867,481, filed on Nov. 28, 2006.

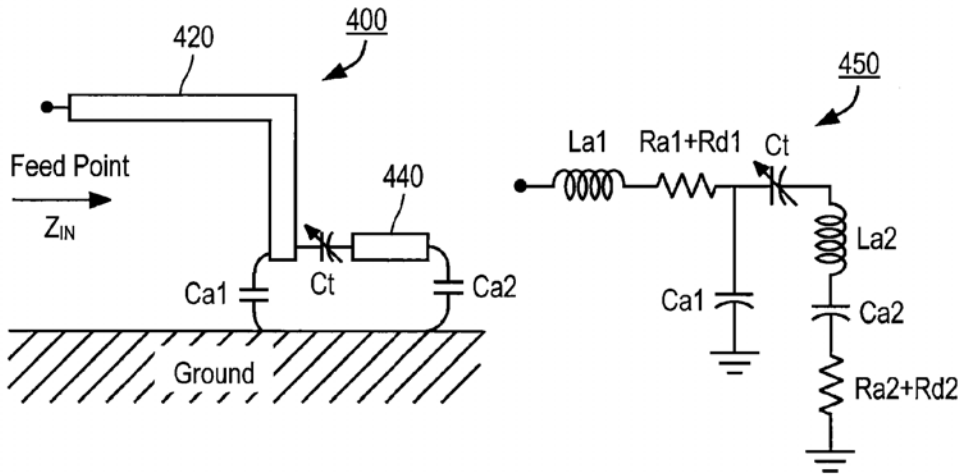
Publication Classification

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

(52) **U.S. Cl.** **343/745**

(57) **ABSTRACT**

A tunable component such as a tunable BST (Barium Strontium Titanate) capacitor is added inside the antenna structure, and the input impedance of the antenna is tuned by tuning this tunable component, rather than adding a multiple-component impedance matching network at the feed point of the antenna outside the antenna as in conventional solutions. With this structure, the input impedance of the antenna may be adjusted very precisely and efficiently.





US 20080122714A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0122714 A1**

(43) **Pub. Date: May 29, 2008**

(54) **ANTENNA STRUCTURE AND RADIO COMMUNICATION APPARATUS INCLUDING THE SAME**

(76) Inventors: **Takashi Ishihara**, Tokyo-to (JP);
Kengo Onaka, Yokohama-shi (JP);
Shoji Nagumo, Sagamihara-shi (JP)

Correspondence Address:
DICKSTEIN SHAPIRO LLP
1177 AVENUE OF THE AMERICAS (6TH AVENUE)
NEW YORK, NY 10036-2714

(21) Appl. No.: **11/772,380**

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

Related U.S. Application Data

(63) Continuation of application No. PCT/JP05/22100, filed on Dec. 1, 2005.

(30) **Foreign Application Priority Data**

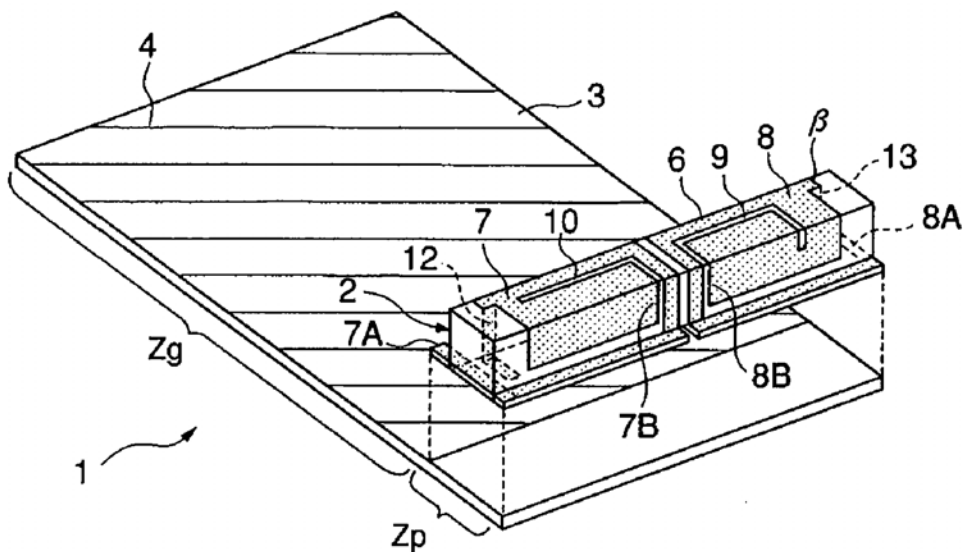
Jan. 5, 2005 (JP) 2005-000773

Publication Classification

(51) **Int. Cl.**
H01Q 1/38 (2006.01)
H01Q 9/00 (2006.01)
H01Q 1/36 (2006.01)
(52) **U.S. Cl.** **343/750; 343/700 MS; 343/895**

(57) **ABSTRACT**

In an antenna structure 1 in which a feed radiation electrode provided on a dielectric base member performs an antenna operation in a fundamental mode and an antenna operation in a higher-order mode with a resonant frequency higher than that in the fundamental mode, one end of the feed radiation electrode defines a feed end connected to a circuit for radio communication, and the other end of the feed radiation electrode defines an open end. The position of a capacitance-loading portion α is set in advance between the feed end and the open end of the feed radiation electrode. A capacitance-loading conductor is connected to one or both of the feed end and the capacitance-loading portion α of the feed radiation electrode. The capacitance-loading conductor forms a capacitance for adjusting a resonant frequency in the fundamental mode between the feed end and the capacitance-loading portion α .





US 20080122715A1

(19) **United States**

(12) **Patent Application Publication**
Puente Baliarda et al.

(10) **Pub. No.: US 2008/0122715 A1**

(43) **Pub. Date: May 29, 2008**

(54) **LOADED ANTENNA**

continuation of application No. PCT/EP01/11914,
filed on Oct. 16, 2001.

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Publication Classification

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

(52) **U.S. Cl.** **343/752**

(21) Appl. No.: **11/824,823**

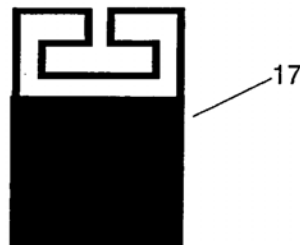
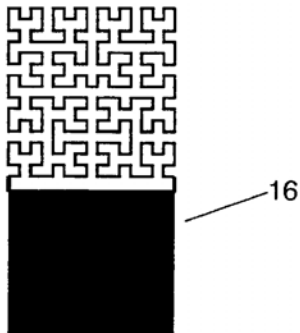
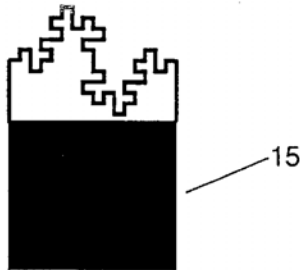
(57) **ABSTRACT**

(22) Filed: **Jul. 3, 2007**

Related U.S. Application Data

(63) Continuation of application No. 10/822,933, filed on
Apr. 13, 2004, now Pat. No. 7,312,762, which is a

A novel loaded antenna is defined in the present invention. The radiating element of the loaded antenna consists of two different parts: a conducting surface and a loading structure. By means of this configuration, the antenna provides a small and multiband performance, and hence it features a similar behaviour through different frequency bands.





US 20080122717A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0122717 A1**

(43) **Pub. Date: May 29, 2008**

(54) **FLAT MINIATURIZED ANTENNA AND RELATED ELECTRONIC DEVICE OPERATED IN WIDE BAND**

Publication Classification

(76) Inventors: **Hsin-Lung Su**, Taipei Hsien (TW); **Wei-Shan Chang**, Taipei Hsien (TW); **Jiunn-Ming Huang**, Taipei Hsien (TW)

(51) **Int. Cl.**
H01Q 1/38 (2006.01)
H01Q 1/00 (2006.01)
H01Q 9/04 (2006.01)

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

(57) **ABSTRACT**

A flat miniaturized antenna includes a substrate, a radiation element, a short circuit metal arm, and a feed element. The substrate includes a first sheet and a second sheet. The first sheet is perpendicular to the second sheet. The radiation element includes a first radiation plate approximately paralleling the first sheet, a second radiation plate approximately paralleling the first sheet and extended in a direction opposite to the first radiation plate, and a third radiation plate positioned between the second radiation plate and the first sheet and perpendicular to the second radiation plate. The short circuit metal arm is installed between the first radiation plate and the first sheet. The short circuit metal arm includes a start terminal coupled to the third radiation plate and an end terminal coupled to the substrate. The feed element is used for connecting the third radiation plate to the first sheet electrically.

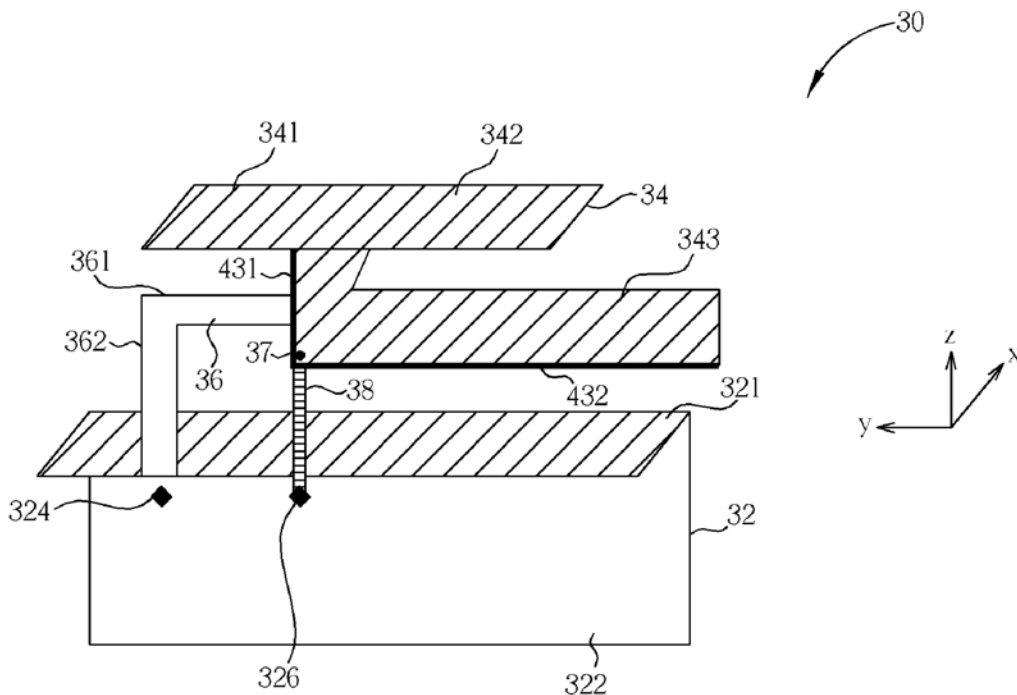
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(21) Appl. No.: **11/624,223**

(22) Filed: **Jan. 18, 2007**

(30) **Foreign Application Priority Data**

Nov. 2, 2006 (TW) 095140576





US 20080122720A1

(19) **United States**

(12) **Patent Application Publication**
LIAO

(10) **Pub. No.: US 2008/0122720 A1**

(43) **Pub. Date: May 29, 2008**

(54) **ANTENNA STRUCTURE**

Publication Classification

(75) Inventor: **YEN-JANG LIAO, TAOYUAN HSIEN (TW)**

(51) **Int. Cl.**
H01Q 1/48 (2006.01)
H01Q 1/38 (2006.01)

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

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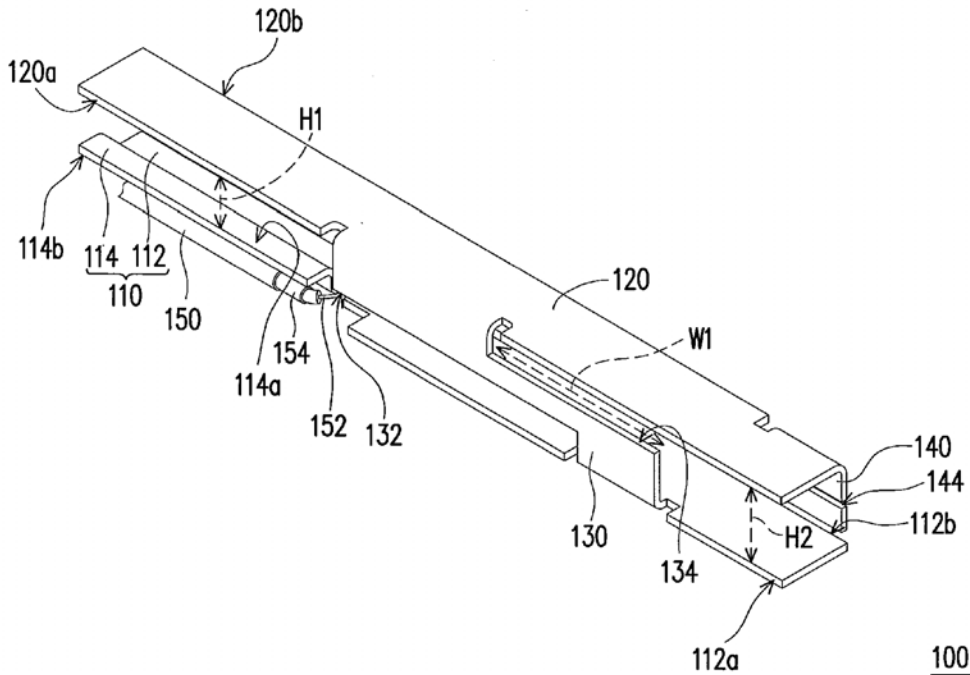
(57) **ABSTRACT**

An antenna structure is suitable for being embedded in an electronic device. The antenna structure includes a grounding plate, a radiating plate, and a shorting plate. The grounding plate has a body and a bending portion extending from the body. The radiating plate is disposed above the grounding plate and is extended with an auxiliary radiating plate. The gap between the bending portion and the radiating plate is less than that between the body and the radiating plate. In addition, one end of the shorting plate is connected to the grounding plate, and the other end of the shorting plate is connected to the radiating plate.

(73) Assignee: **SPEED TECH CORP., TAOYUAN HSIEN (TW)**

(21) Appl. No.: **11/563,543**

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



100



US 20080122722A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0122722 A1**

(43) **Pub. Date: May 29, 2008**

(54) **CHIP ANTENNA**

Publication Classification

(75) Inventors: **Ki Won CHANG**, Suwon (KR);
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(51) **Int. Cl.**
H01Q 1/50 (2006.01)
H01Q 1/38 (2006.01)
H01Q 9/04 (2006.01)

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

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(57) **ABSTRACT**

There is provided a chip antenna including: a dielectric block; a first conductive pattern formed on at least one surface of the dielectric block to connect to an external feeding part; a second conductive pattern spaced apart from the first conductive pattern at a certain distance so as to be capacitively coupled to the first conductive pattern to act as a radiator, the second conductive pattern having one end connected to an external ground part; and a third conductive pattern spaced apart from the first conductive pattern at a certain distance so as to be capacitively coupled to the first conductive pattern to enable impedance matching of the antenna, the third conductive pattern having one end connected to the external ground part.

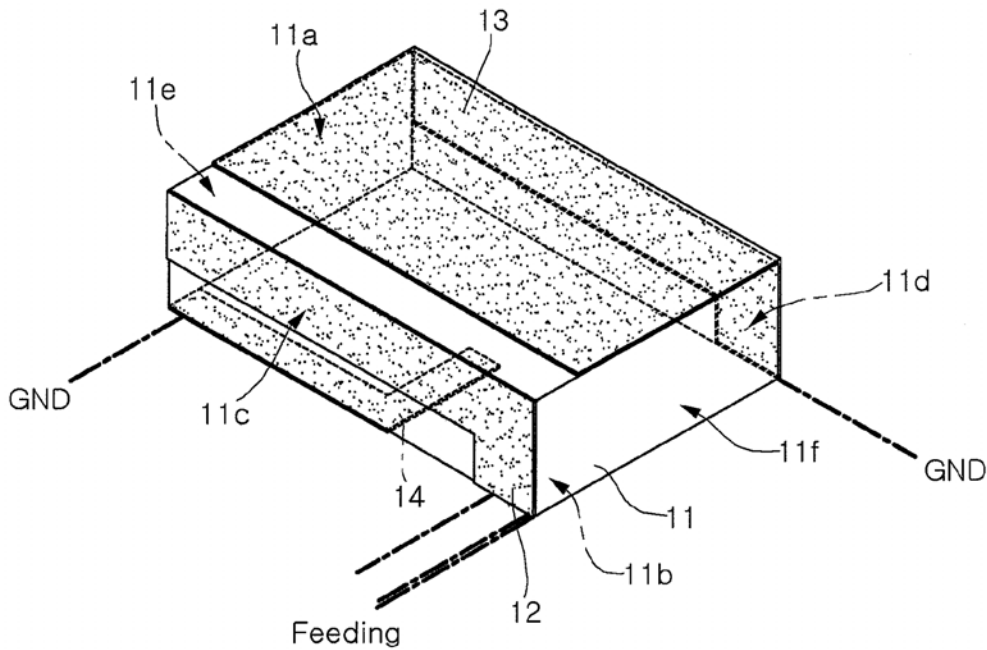
(73) Assignee: **SAMSUNG ELECTRO-MECHANICS CO., LTD.**, GYUNGGI-DO (KR)

(21) Appl. No.: **11/944,575**

(22) Filed: **Nov. 23, 2007**

(30) **Foreign Application Priority Data**

Nov. 22, 2006 (KR) 10-2006-115951





US 20080122724A1

(19) **United States**

(12) **Patent Application Publication**
KATO

(10) **Pub. No.: US 2008/0122724 A1**

(43) **Pub. Date: May 29, 2008**

(54) **ANTENNA**

(30) **Foreign Application Priority Data**

(75) Inventor: **Noboru KATO**, Moriyama-shi (JP)

Apr. 14, 2006 (JP) 2006-112352

Sep. 20, 2006 (JP) 2006-254153

Nov. 17, 2006 (JP) 2006-311546

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Publication Classification

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

H01Q 21/00 (2006.01)

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

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

(57) **ABSTRACT**

(21) Appl. No.: **11/928,502**

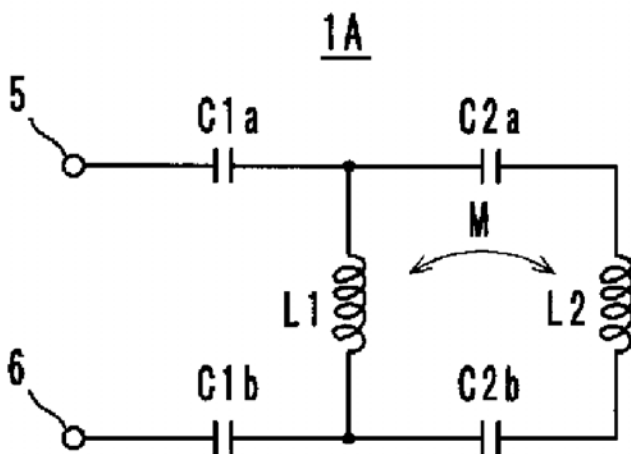
(22) Filed: **Oct. 30, 2007**

An antenna includes inductance elements that are magnetically coupled together, an LC series resonant circuit that includes one of the inductance elements and capacitance elements, and an LC series resonant circuit that includes another of the inductance elements and capacitance elements. The plurality of LC series resonant circuits are used to radiate radio waves and are used as inductances of a matching circuit that matches an impedance when a power supply side is viewed from power supply terminals and a radiation impedance of free space.

Related U.S. Application Data

(63) Continuation of application No. 11/688,290, filed on Mar. 20, 2007.

(60) Provisional application No. 60/745,884, filed on Apr. 28, 2006.



L 1

Q: 100

F: 0.915GHz

M: 1

L 2

Q: 100

F: 0.915GHz

M: 1



US 20080122731A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0122731 A1**

(43) **Pub. Date: May 29, 2008**

(54) **METHOD FOR MOUNTING A TRIDIMENSIONAL ANTENNA**

(30) **Foreign Application Priority Data**

Nov. 24, 2006 (CN) 200610157035.1

(75) Inventors: **KUANG-WEI CHENG**, Tu-Cheng (TW); **CHUN-FA LIAO**, Tu-Cheng (TW)

Publication Classification

(51) **Int. Cl.**
H01Q 1/12 (2006.01)
H01P 11/00 (2006.01)

(52) **U.S. Cl.** **343/878; 29/600**

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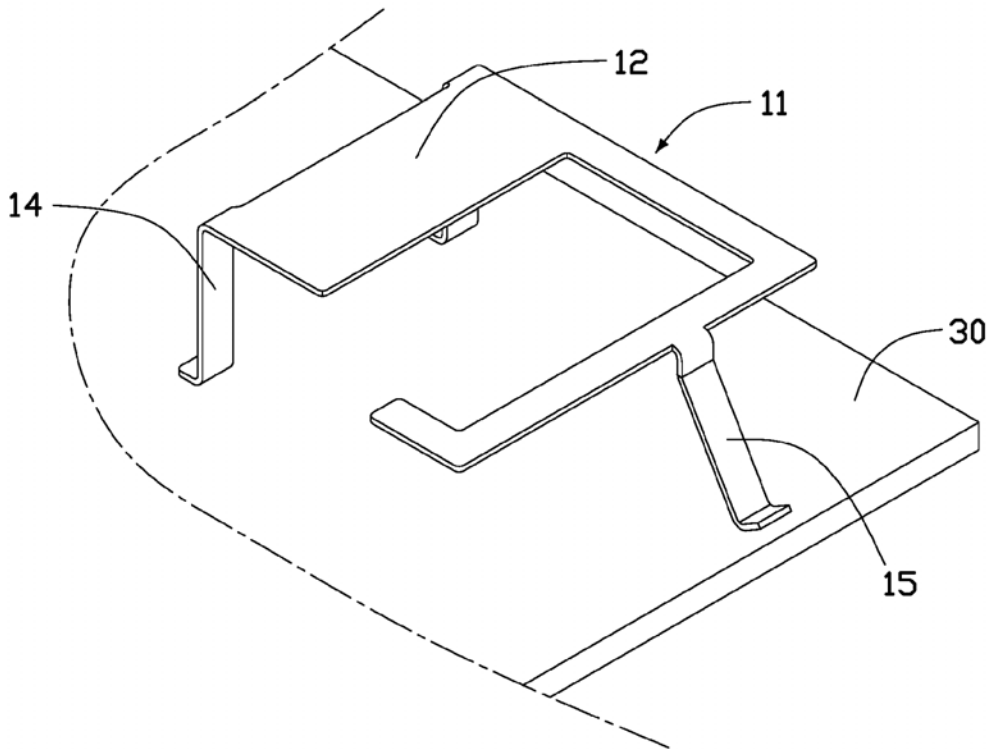
(57) **ABSTRACT**

A method for mounting a tridimensional antenna includes steps of: providing the tridimensional antenna including a radiating body, a feeding foot, a grounding foot, and a supporting foot connected to the radiating body, the supporting foot including a supporting portion, at least one groove and a bent portion, the bent portion connecting the radiating body and the supporting portion, the groove defined in the supporting portion and adjacent to the bent portion; the tridimensional antenna mounted on a substrate by surface mounted technology (SMT); the feeding foot and the grounding foot soldered on the substrate; and the supporting foot broken away at the groove after mounting of the tridimensional antenna.

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

(21) Appl. No.: **11/944,420**

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





US 20080122733A1

(19) **United States**

(12) **Patent Application Publication**
O'Neill et al.

(10) **Pub. No.: US 2008/0122733 A1**

(43) **Pub. Date: May 29, 2008**

(54) **QUADRIFILAR HELICAL ANTENNA**

(76) Inventors: **Gregory A. O'Neill**, Rockledge, FL (US); **Murray Fugate**, Coral Springs, FL (US); **Young-Min Jo**, Viera, FL (US); **John C. Farrar**, Indialantic, FL (US); **Myung Sung Lee**, Seoul (KR); **Se-hyun Oh**, Seoul (KR); **Joo Mun Lee**, Kyunggi-do (KR); **Jin Hee Yoon**, Seoul (KR); **Sang Ok Choi**, Seoul (KR); **Eun Seok Han**, Seoul (KR)

(60) Provisional application No. 60/592,011, filed on Jul. 28, 2004.

Publication Classification

(51) **Int. Cl.**
H01Q 1/36 (2006.01)
H01Q 1/50 (2006.01)
(52) **U.S. Cl.** **343/895; 343/860**

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(57) **ABSTRACT**

A quadrifilar helical antenna comprising two pairs of filars having unequal lengths and phase quadrature signals propagating thereon. A conductive H-shaped impedance matching element matches a source impedance to an antenna impedance. The impedance matching element having a feed terminal at the center thereof from which current is supplied to the two filars of each filar pair disposed about an edge of the impedance matching element and symmetric with respect to a center of the impedance matching element. The impedance matching element further comprises a reactive element for matching the antenna and source impedances.

(21) Appl. No.: **11/879,208**

(22) Filed: **Jul. 16, 2007**

Related U.S. Application Data

(62) Division of application No. 10/998,301, filed on Nov. 26, 2004, now Pat. No. 7,245,268.

