US 20100302105A1

(19) **United States**

(12) **Patent Application Publication**

Yen et al.

(10) **Pub. No.: US 2010/0302105 A1**

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

(54) **ANTENNA STRUCTURE**

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(21) Appl. No.: **12/563,171**

(22) Filed: **Sep. 21, 2009**

(30) **Foreign Application Priority Data**

May 27, 2009 (TW) 098209373

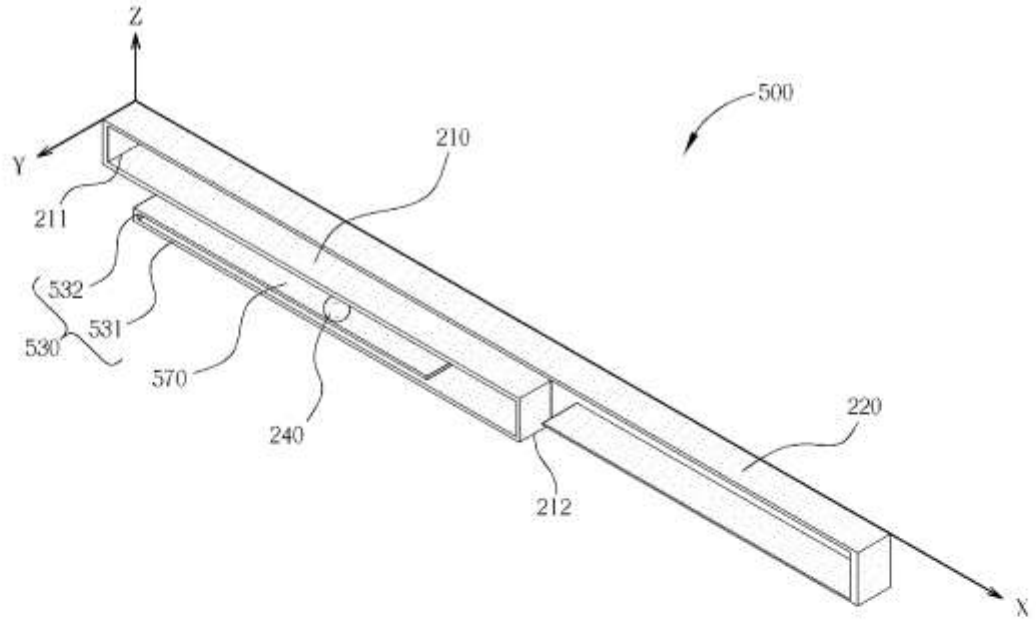
Publication Classification

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

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

(57) **ABSTRACT**

An antenna structure has a first resonance mode and a second resonance mode. The antenna structure consists of a first radiation element, a second radiation element, a grounding element, and a signal feeding element. The first radiation element resonates at a first operating frequency band corresponding to the first resonance mode. The second radiation element is extended from a first end of the first radiation element and resonates at a second operating frequency band corresponding to the second resonance mode. The grounding element is extended from a second end of the first radiation element. The signal feeding element is disposed between the first radiation element and the grounding element. The second radiation element, the first radiation element, and the grounding element are formed by bending a slender metal sheet.



US 20100302108A1

(19) **United States**

(12) **Patent Application Publication**

Luke et al.

(10) **Pub. No.: US 2010/0302108 A1**

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

(54) **MOBILE COMMUNICATION DEVICE**

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(21) Appl. No.: **12/689,218**

(22) Filed: **Jan. 18, 2010**

(30) **Foreign Application Priority Data**

May 26, 2009 (TW) 98117456

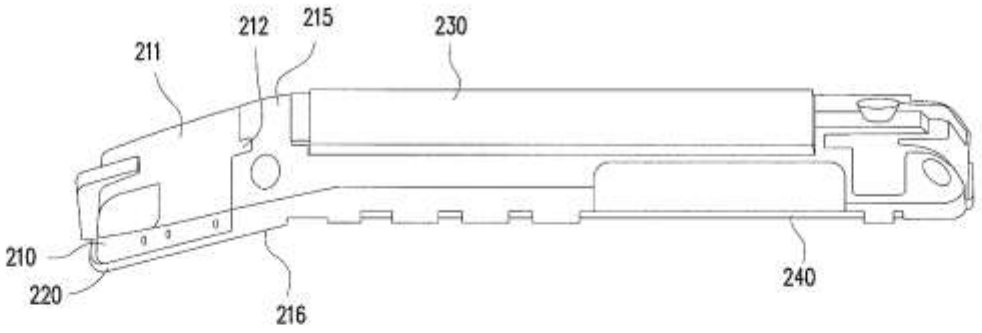
Publication Classification

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

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

(57) **ABSTRACT**

A mobile communication device including a first appearance and an antenna is provided. An upper surface of the first appearance is bent a first angle from a border between a display area and a non-display area toward a display direction, and a lower surface of the first appearance is bent a second angle from a bending point toward the display direction, wherein the bending point of the lower surface is corresponding to the display area of the upper surface. The antenna is disposed in the mobile communication device and corresponding to the non-display area of the first appearance. The antenna transmits and receives signals processed by the mobile communication device.



US 20100302110A1

(19) **United States**

(12) **Patent Application Publication**

Leem

(10) **Pub. No.: US 2010/0302110 A1**

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

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

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(73) Assignee: **LG ELECTRONICS INC.**

(21) Appl. No.: **12/709,427**

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

(30) **Foreign Application Priority Data**

May 26, 2009 (KR) 10-2009-0046102

Jul. 30, 2009 (KR) 10-2009-0070255

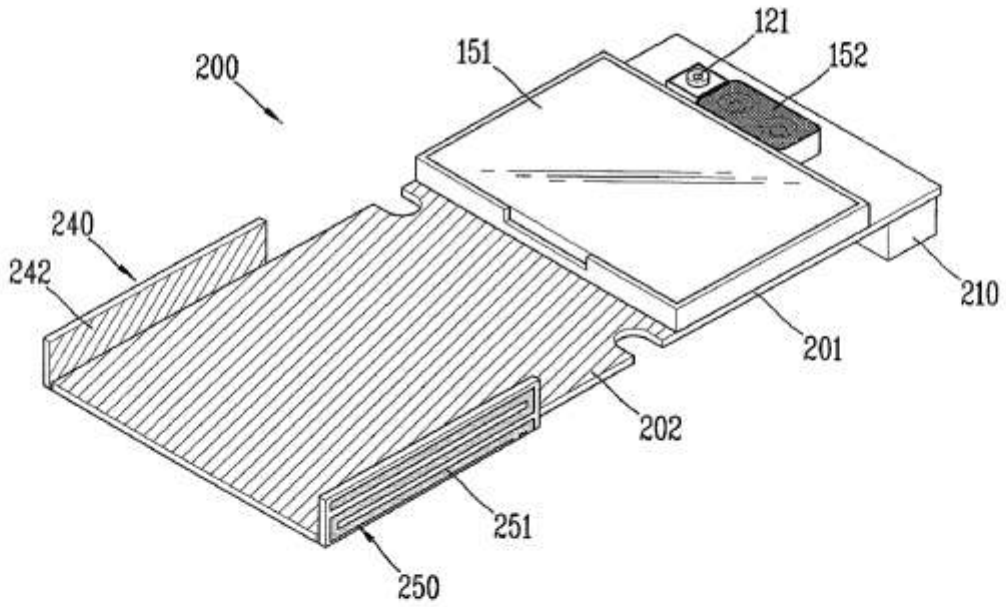
Publication Classification

(51) **Int. Cl.**
H01Q 1/24 (2006.01)
H01Q 21/00 (2006.01)

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

(57) **ABSTRACT**

A portable terminal includes a terminal body, a first antenna provided on a first portion of a circuit board having a first ground that is used by the first antenna, and an antenna assembly integrated into the terminal body. The antenna assembly of the portable terminal includes at least one diversity antenna fed to the circuit board and formed on a second portion of the circuit board having a ground that is independent from the first ground. The at least one diversity antenna is formed into an angled configuration with respect to the circuit board.



US 20100302111A1

(19) **United States**

(12) **Patent Application Publication**

KOTAKA et al.

(10) **Pub. No.: US 2010/0302111 A1**

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

(54) **MULTIBAND PLANAR ANTENNA AND ELECTRONIC EQUIPMENT**

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(21) Appl. No.: **12/776,583**

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

(30) **Foreign Application Priority Data**

May 27, 2009 (JP) 2009-127122

Publication Classification

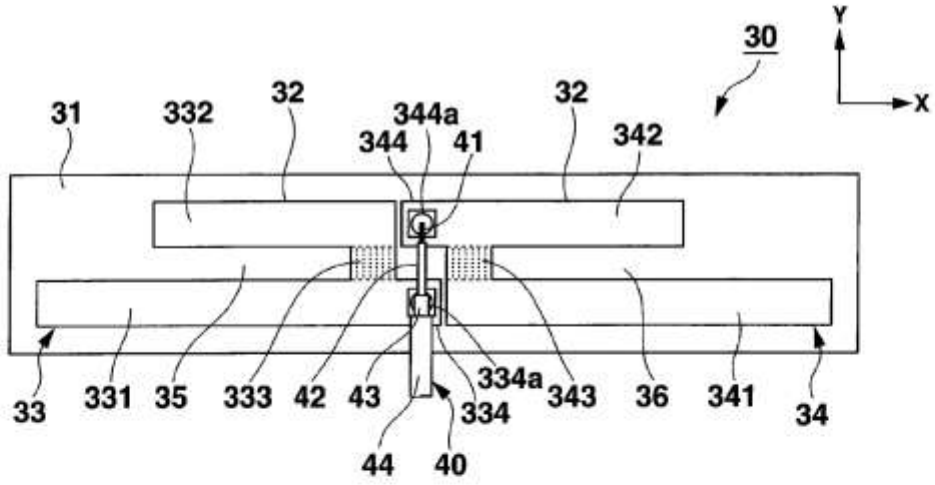
(51) **Int. Cl.**

H01Q 9/04	(2006.01)
H01Q 1/24	(2006.01)
H01Q 5/00	(2006.01)

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

(57) **ABSTRACT**

Disclosed is a multiband planar antenna including: an insulating film, a first antenna section and a second antenna section facing to the first antenna section across a feeding point on a film, wherein the first antenna section includes: a first antenna element including a side having a length in an extending direction corresponds to a first resonance frequency; a shorter second antenna element at a predetermined distance from and in parallel with the first antenna element; and a first coupling section to couple the first and second antenna elements, wherein a length in the extending direction of a first clearance corresponds to a resonance frequency higher than the first resonance frequency, and wherein the second antenna section includes: third and fourth antenna elements; a second coupling section; and a second clearance similar to the above.



US 20100302115A1

(19) **United States**

(12) **Patent Application Publication**

CHEN

(10) **Pub. No.: US 2010/0302115 A1**

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

(54) **HYBRID DUAL DIPOLE SINGLE SLOT ANTENNA FOR MIMO COMMUNICATION SYSTEMS**

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(21) Appl. No.: **12/855,689**

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

Related U.S. Application Data

(63) Continuation of application No. 11/969,243, filed on Jan. 4, 2008, now Pat. No. 7,786,942.

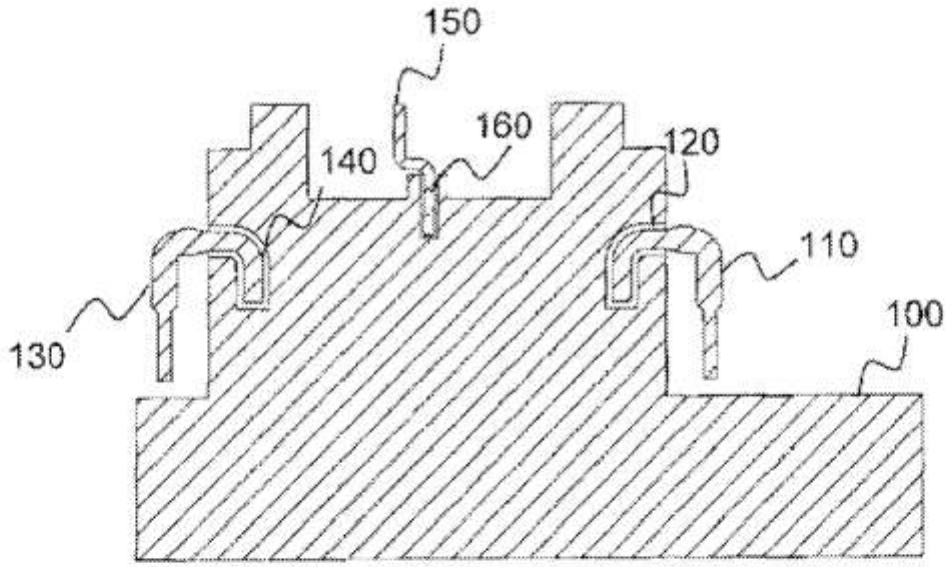
Publication Classification

(51) **Int. Cl.**
H01Q 21/29 (2006.01)
H01Q 5/01 (2006.01)

(52) **U.S. Cl.** **343/727**

(57) **ABSTRACT**

An antenna arrangement implemented within a printed circuit board (PCB) having three metal co planar layers, for use in multiple input multiple output (MIMO) communication systems. The antenna arrangement comprises a first dipole antenna and second dipole antenna, substantially symmetrical to the first dipole antenna a slot antenna positioned substantially between the first and the second dipole antennas. The antenna arrangement is implemented in three coplanar metal layers. The antennas are used for MIMO communication systems, specifically complying with IEEE 802.11n and are shaped such that their combined radiation pattern exhibits a substantially omni-directional radiation pattern.



US 20100302121A1

(19) **United States**

(12) **Patent Application Publication**

Tu

(10) **Pub. No.: US 2010/0302121 A1**

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

(54) **MICROSTRIP ANTENNA**

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(21) Appl. No.: **12/699,252**

(22) Filed: **Feb. 3, 2010**

(30) **Foreign Application Priority Data**

Jun. 2, 2009 (CN) 200910302835.1

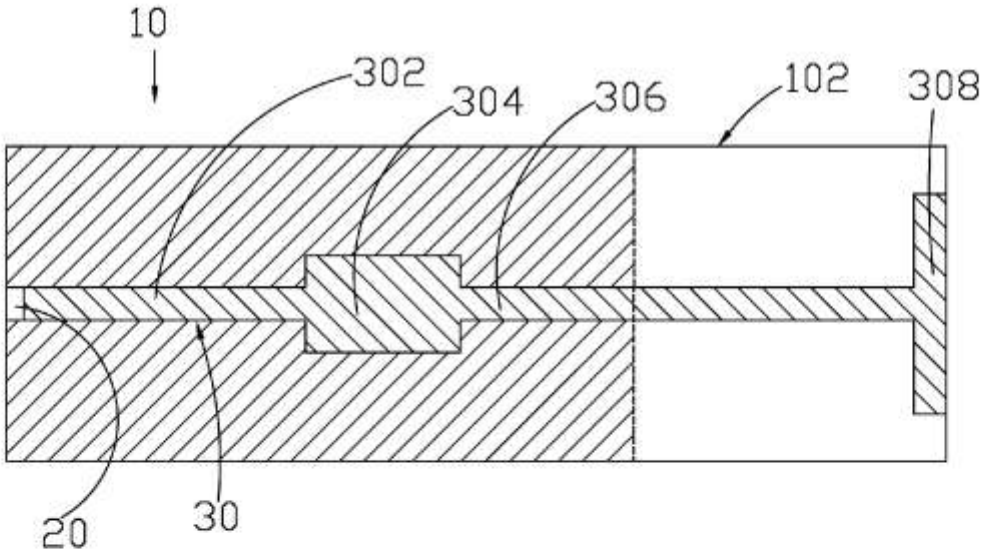
Publication Classification

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

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

(57) **ABSTRACT**

A microstrip antenna located on a substrate with a first surface and a second surface opposite to the first surface includes a feeding portion, a grounding portion, and a radiating portion. The feeding portion is located on the first surface of the substrate to feed electromagnetic signals. The grounding portion is located on the second surface of the substrate. The radiating portion is located on the first surface and includes a first radiating part, a second radiating part, a third radiating part, and a fourth radiating part. Each of the first radiating part, the second radiating part, and the third radiating part is on a rectangle-shaped strip line. The first radiating part is connected to the feeding portion. The fourth radiating part is perpendicularly connected to a second end of the third radiating part.



US 20100304785A1

(19) **United States**

(12) **Patent Application Publication**

Marlett et al.

(10) **Pub. No.: US 2010/0304785 A1**

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

(54) **ENHANCED INTERNAL ANTENNA ARCHITECTURE FOR A MOBILE COMPUTING DEVICE**

(75) Inventors: **Jeff Marlett**, Los Altos, CA (US); **Philip Wright**, Sunnyvale, CA (US); **Guining Shi**, San Diego, CA (US); **Jerome Tu**, Saratoga, CA (US)

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(21) Appl. No.: **12/476,007**

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

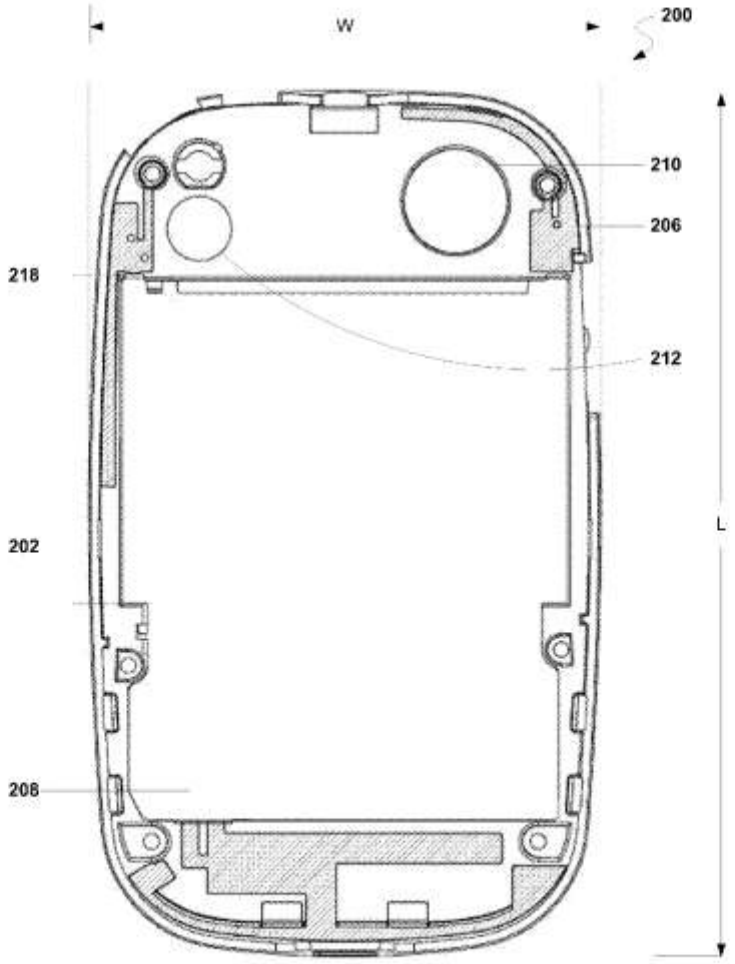
Publication Classification

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

(52) **U.S. Cl.** **455/552.1**; 455/575.1

(57) **ABSTRACT**

Various embodiments of an internal multi-band antenna architecture for a mobile computing device are described. An internal antenna architecture for a mobile computing device may include multiple antenna elements, including a first internal antenna element configured to operate in a downlink frequency sub-band of at least one frequency band for communication in a first mode, and a second internal antenna element configured to operate in an uplink frequency sub-band of the at least one frequency band for communication in the first mode. Other embodiments are described and claimed.



US 20100307787A1

(19) **United States**

(12) **Patent Application Publication**

Ohmori et al.

(10) **Pub. No.: US 2010/0307787 A1**

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

(54) **SLIDABLE-TYPE PORTABLE TERMINAL**

(75) Inventors: **Hiroaki Ohmori**, Miyagi (JP); **Hideo Nakanishi**, Kanagawa (JP); **Takeshi Yamaguchi**, Kanagawa (JP); **Akito Sakamoto**, Kanagawa (JP); **Yasunori Komukai**, Miyagi (JP)

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(21) Appl. No.: **12/865,352**

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

(86) PCT No.: **PCT/JP2008/003902**

§ 371 (c)(1),
(2), (4) Date: **Jul. 29, 2010**

(30) **Foreign Application Priority Data**

Jan. 31, 2008 (JP) 2008-020757

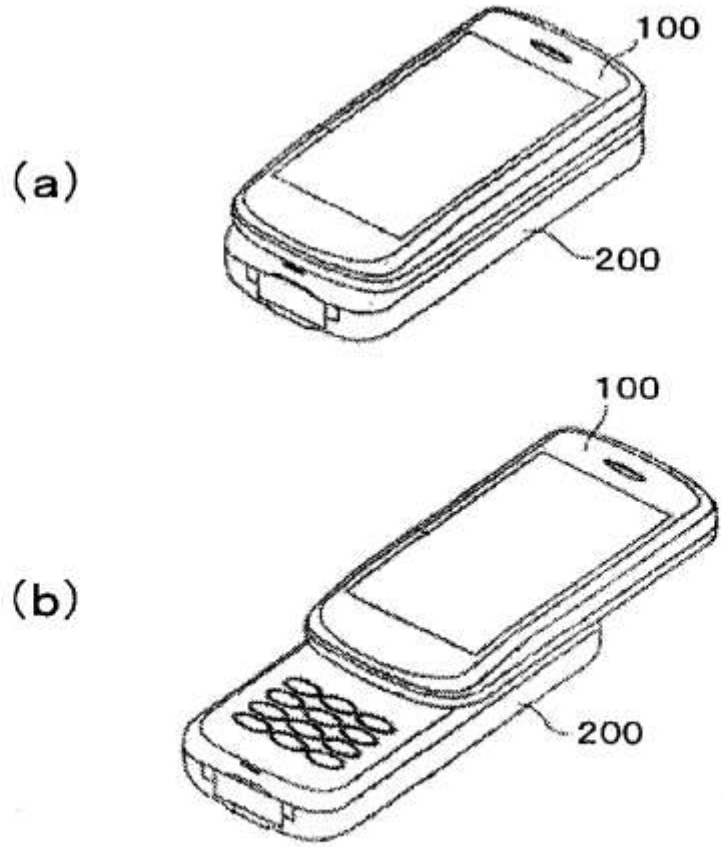
Publication Classification

(51) **Int. Cl.**
H05K 5/02 (2006.01)

(52) **U.S. Cl.** **174/51**

(57) **ABSTRACT**

A slidable-type portable terminal has a first enclosure; a second enclosure; a first board arranged in the first enclosure; a second board arranged in the second enclosure; an antenna electrically connected to the first board; a connecting unit that electrically connects together the first board and the second board; a plurality of sliding units that slidably connects the first enclosure to the second enclosure; and a conductor for electrically connecting the connecting unit to one of the plurality of sliding units. The one of the plurality of sliding units is electrically connected to a ground of the connecting unit by means of the conductor.



US 20100309060A1

(19) **United States**

(12) **Patent Application Publication**

Harihara

(10) **Pub. No.: US 2010/0309060 A1**

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

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

(76) Inventor: **Yasumasa Harihara**, Tokyo (JP)

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(21) Appl. No.: **12/739,859**

(22) PCT Filed: **Oct. 23, 2008**

(86) PCT No.: **PCT/JP2008/069198**

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

(30) **Foreign Application Priority Data**

Oct. 26, 2007 (JP) 2007-279418

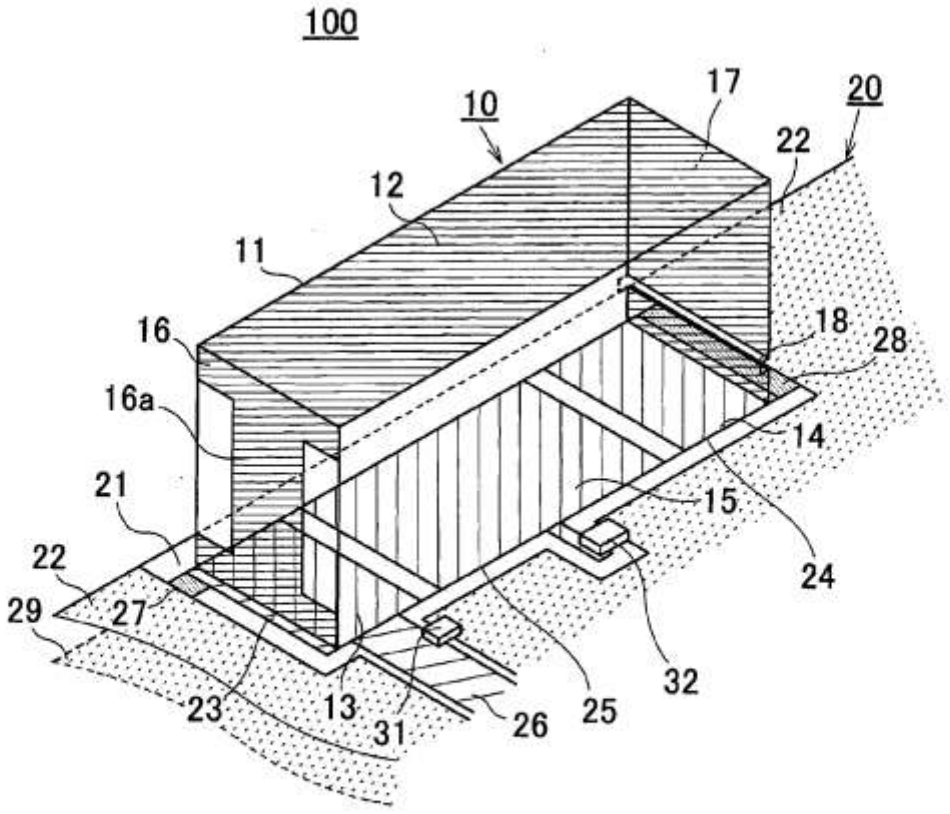
Publication Classification

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

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

(57) **ABSTRACT**

An object of the present invention is to provide a compact, high-performance antenna device in which a decrease in production yield caused by a production variation can be prevented. An antenna device **100** of the present invention is a direct feed type of λ/4 inverted F antenna, and the antenna device **100** includes an antenna block **10** and a mounting board **20** on which the antenna block **10** is mounted. First and second pad electrodes **13** and **14**, a side surface conductor **17**, and an upper surface conductor **12**, which are formed on a base **11** of the antenna block **10**, constitute one continuous radiation conductor. A gap **18** is provided in the second side surface conductor **17**, and a trench is formed in a surface of the base **11** in a position where the gap **18** is formed. An impedance adjusting pattern **27** that is of a ground electrode is provided between a first land **23** and a ground pattern **22**. That is, the production variation can be prevented because the antenna device **100** has a structure in which the antenna block does not include the ground electrode.



US 20100309063A1

(19) **United States**

(12) **Patent Application Publication**

Wong et al.

(10) **Pub. No.: US 2010/0309063 A1**

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

(54) **MOBILE COMMUNICATION DEVICE**

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(73) Assignee: **ACER INCORPORATED**, Hsichih (TW)

(21) Appl. No.: **12/554,904**

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

(30) **Foreign Application Priority Data**

Jun. 6, 2009 (TW) 098118973

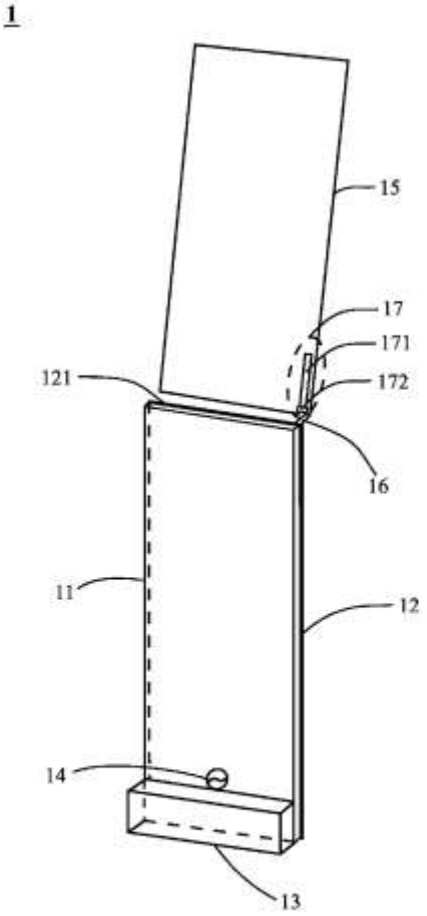
Publication Classification

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

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

(57) **ABSTRACT**

The present invention is related to a mobile communication device. The device comprises a dielectric substrate, a first ground plane, an antenna element, a second ground plane, and an equivalent band-stop circuit. The first ground plane is disposed on the dielectric substrate. The antenna element is disposed on the dielectric substrate or nearby the dielectric substrate and is connected to a signal source disposed on the dielectric substrate. The second ground plane is disposed nearby one edge of the first ground plane and is connected to the first ground plane through a metal strip. The equivalent band-stop circuit is disposed on the second ground plane and includes a slit and a capacitive element. The open end of the slit is near the metal strip. The capacitive element is mounted across the slit.



US 20100309064A1

(19) **United States**

(12) **Patent Application Publication**

Sung et al.

(10) **Pub. No.: US 2010/0309064 A1**

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

(54) **BUILT-IN ANTENNA FOR GLOBAL POSITIONING SYSTEM IN A PORTABLE TERMINAL**

(75) Inventors: **Sang-Bong Sung**, Gyeonggi-do (KR); **Kong-Min Sa**, Gyeongbuk (KR); **Kyung-Jong Lee**, Gyeonggi-do (KR); **Dong-Hwan Kim**, Gyeonggi-do (KR); **Jae-Ho Lee**, Yongin-si (KR); **Byung-Chan Jang**, Gyeongbuk (KR)

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(73) Assignee: **Samsung Electronics Co., LTD.**, Gyeonggi-Do (KR)

(21) Appl. No.: **12/802,592**

(22) Filed: **Jun. 9, 2010**

(30) **Foreign Application Priority Data**

Jun. 9, 2009 (KR) 10-2009-0050970

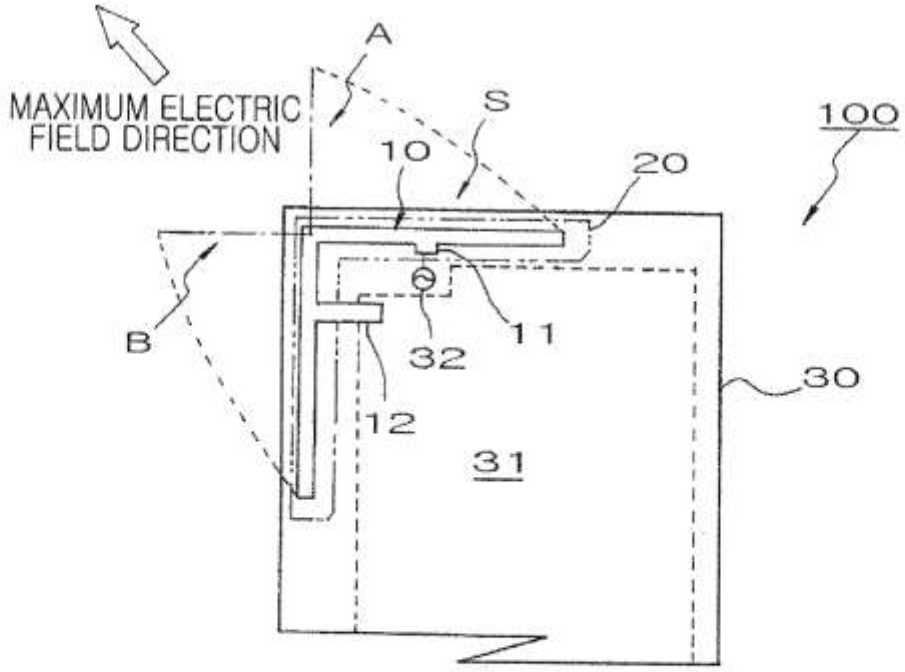
Publication Classification

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

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

(57) **ABSTRACT**

A built-in antenna apparatus for a Global Positioning System (GPS) of a portable terminal is provided. The apparatus includes a case frame for forming an exterior of the terminal, a main board fastened by the case frame and having a feeding portion and a ground portion of an antenna radiator, and an antenna radiator having a feeding point and ground point to be electrically connected to the feeding portion and ground portion of the main board, and is curved in a horizontal direction and a vertical direction of the terminal about a center of one upper-side corner of the terminal.



US 20100309067A1

(19) **United States**

(12) **Patent Application Publication**

TSOU et al.

(10) **Pub. No.: US 2010/0309067 A1**

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

(54) **MULTIBAND ANTENNA**

(75) Inventors: **TUN-YUAN TSOU**, Tu-Cheng (TW); **YI-CHIEH LEE**, Tu-Cheng (TW)

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

(21) Appl. No.: **12/693,641**

(22) Filed: **Jan. 26, 2010**

(30) **Foreign Application Priority Data**

Jun. 8, 2009 (CN) 200910303052.5

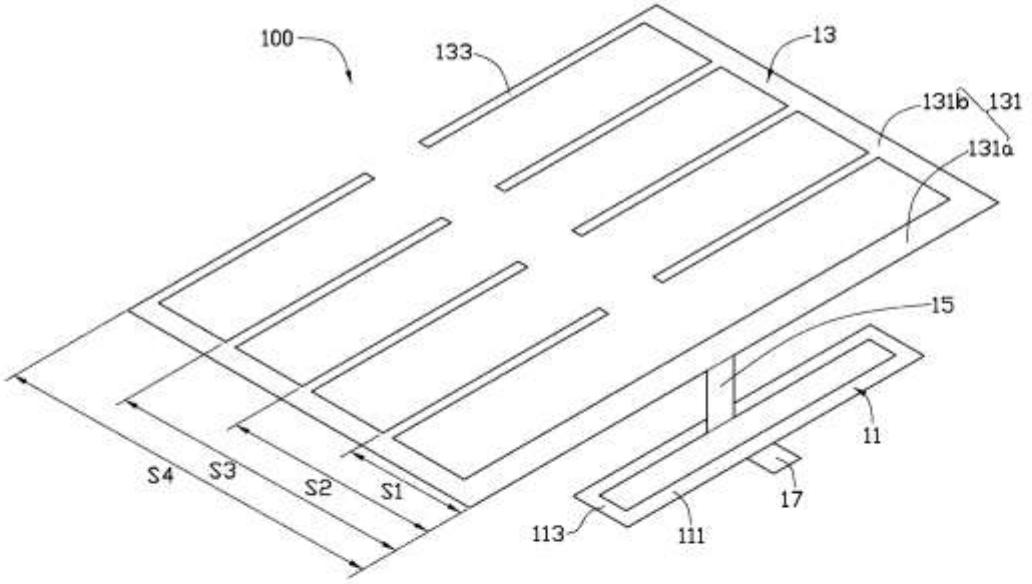
Publication Classification

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

(52) **U.S. Cl.** ..... **343/726**; 343/700 MS

(57) **ABSTRACT**

A multiband antenna includes a first radio unit closed loop and a second radio unit connected to the first radio unit and symmetrical structure. When the multiband antenna functions, the first radio unit functions as a balanced loop antenna, and the second radio unit functions as a dipole antenna.



US 20100309068A1

(19) **United States**

(12) **Patent Application Publication**

Duron et al.

(10) **Pub. No.: US 2010/0309068 A1**

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

(54) **METHODS AND APPARATUS FOR A LOW REFLECTIVITY COMPENSATED ANTENNA**

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(21) Appl. No.: **12/480,370**

(22) Filed: **Jun. 8, 2009**

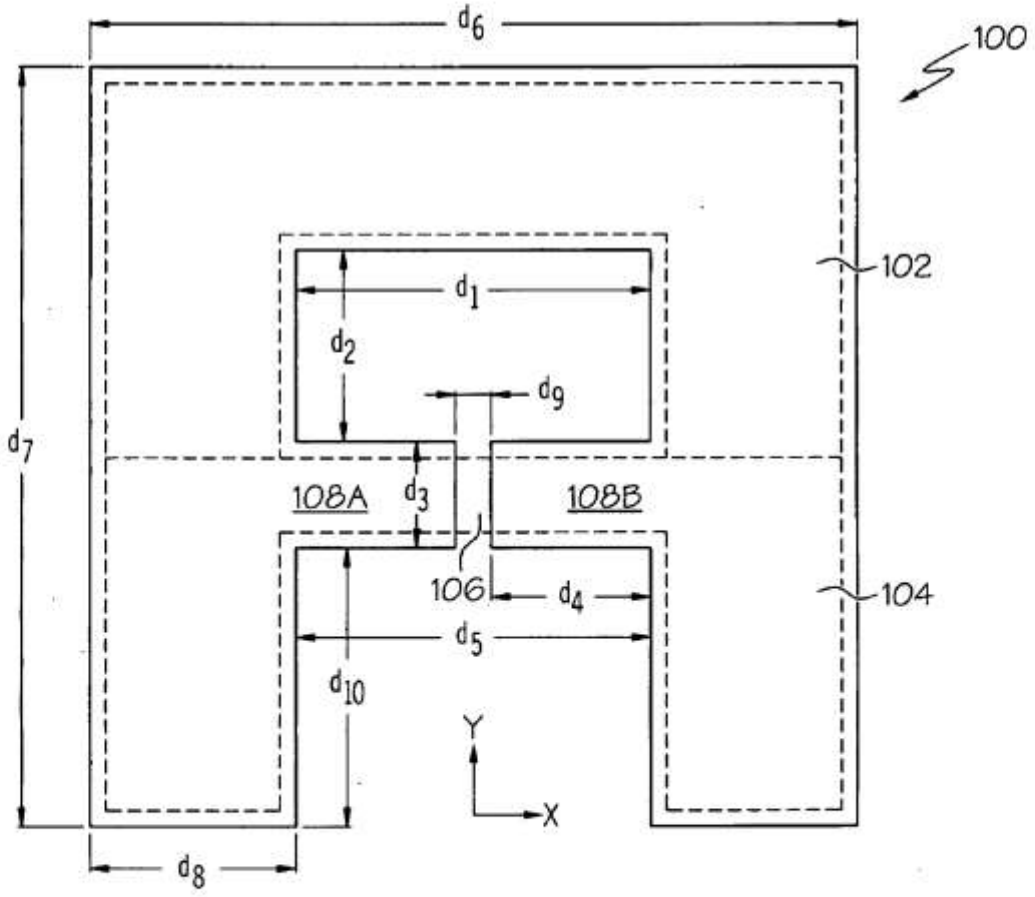
Publication Classification

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

(52) **U.S. Cl.** ..... **343/730**; 343/700 MS

(57) **ABSTRACT**

An antenna includes a dipole radiator region forming a series resonant tank having a first quality factor value Q1, and a loop compensator/radiator region integral with the dipole region and forming a parallel resonant tank having a second quality factor value Q2 that is substantially equal to Q2. The antenna may be a conductive sheet antenna (e.g., comprising copper tape) having a generally "A" shaped structure with a discontinuity in a middle segment.



US 20100309070A1

(19) **United States**

(12) **Patent Application Publication**

Wong et al.

(10) **Pub. No.: US 2010/0309070 A1**

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

(54) **MULTIBAND SINGLE-STRIP MONOPOLE ANTENNA**

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(21) Appl. No.: **12/561,226**

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

(30) **Foreign Application Priority Data**

Jun. 6, 2009 (TW) 098118975

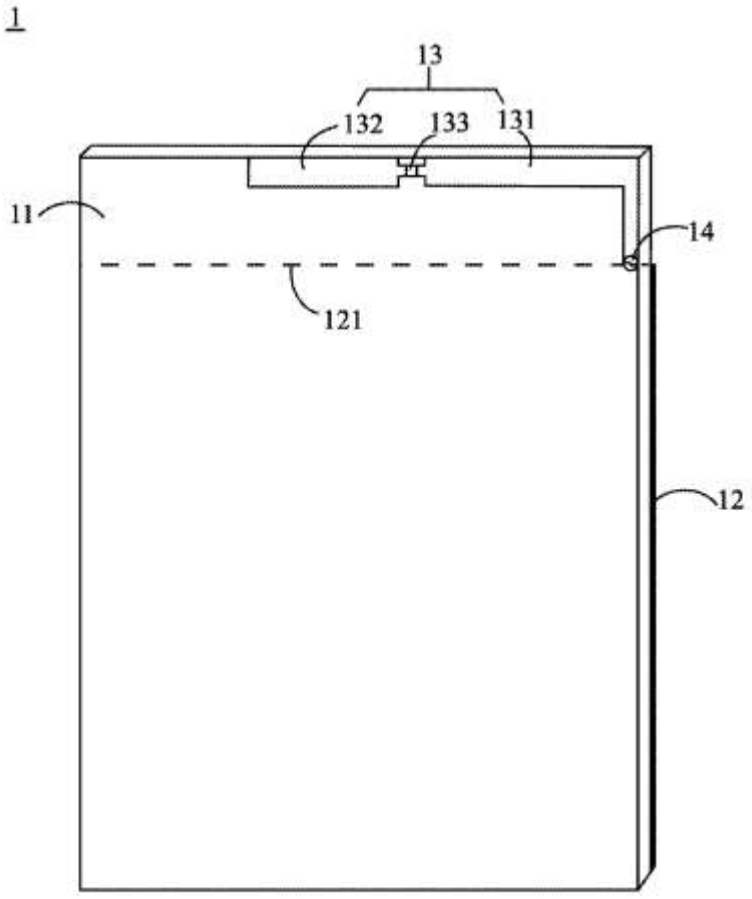
Publication Classification

(51) **Int. Cl.**
H01Q 1/38 (2006.01)
H01Q 9/00 (2006.01)
H01Q 1/48 (2006.01)

(52) **U.S. Cl.** ..... **343/749**; 343/700 MS; 343/843; 343/848

(57) **ABSTRACT**

A multiband single-strip monopole antenna includes a dielectric substrate, a ground plane, and a radiating portion. The ground plane is disposed on one surface of the dielectric substrate without completely covering the surface of the dielectric substrate. The radiating portion is disposed on the surface of the dielectric substrate without overlapping the ground plane, and is internally embedded with an inductive element, via which a continuous path through the inductive element is formed between a start point and an open end of the radiating portion. Since the inductive element can compensate for an increased capacitive reactance caused by a reduced antenna length, good antenna matching can still be achieved even when the size of the antenna is reduced.



US 20100309087A1

(19) **United States**

(12) **Patent Application Publication**

Tsai et al.

(10) **Pub. No.: US 2010/0309087 A1**

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

(54) **CHIP ANTENNA DEVICE**

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(21) Appl. No.: **12/457,229**

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

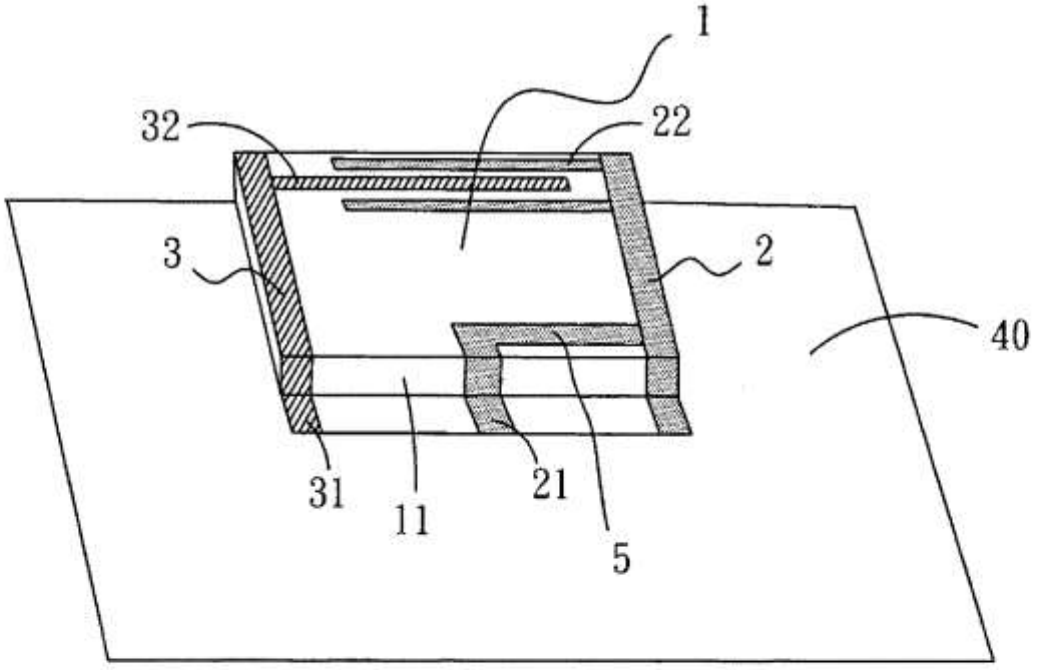
Publication Classification

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

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

(57) **ABSTRACT**

A chip antenna device includes a single or multi-layer dielectric substrate, a radiator body, one or a plurality of first coupling electrodes formed on the radiator body, and a ground radiator formed on the upper or lower surface or inter-layer in another end of the substrate. It is designed by using loops and coupling concepts. The chip antenna device does not require large areas and clear space but has high radiation efficiency. It adjusts the impedance matching and operation frequency by changing the signal feed position, so that low frequency operation can be achieved without increasing the area of said antenna meeting the requirements of compact size for electronic products.



US 20100315293A1

(19) **United States**

(12) **Patent Application Publication**

Lehtola et al.

(10) **Pub. No.: US 2010/0315293 A1**

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

(54) **RADIATION PATTERN CONTROL**

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(21) Appl. No.: **12/449,631**

(22) PCT Filed: **Feb. 28, 2007**

(86) PCT No.: **PCT/IB2007/001678**

§ 371 (c)(1),
(2), (4) Date: **Aug. 18, 2009**

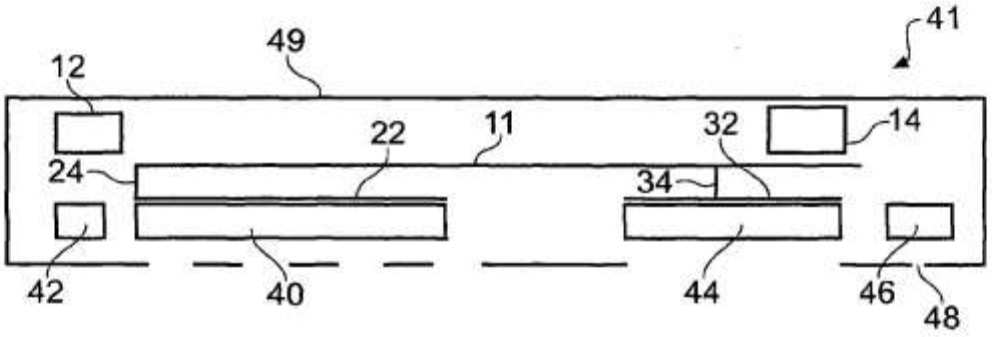
Publication Classification

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

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

(57) **ABSTRACT**

An apparatus including: a first antenna element; a second antenna element; a ground plane element for at least one of the first and second antenna elements; a first choke arranged to affect a first maximum of current density produced in the ground plane element by the first antenna element; and a second choke arranged to affect a second maximum of current density produced in the ground plane element by the second antenna element.



US 20100315294A1

(19) **United States**

(12) **Patent Application Publication**

Chang et al.

(10) **Pub. No.: US 2010/0315294 A1**

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

(54) **INTEGRATED MULTI-BAND ANTENNA MODULE**

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(21) Appl. No.: **12/482,457**

(22) Filed: **Jun. 11, 2009**

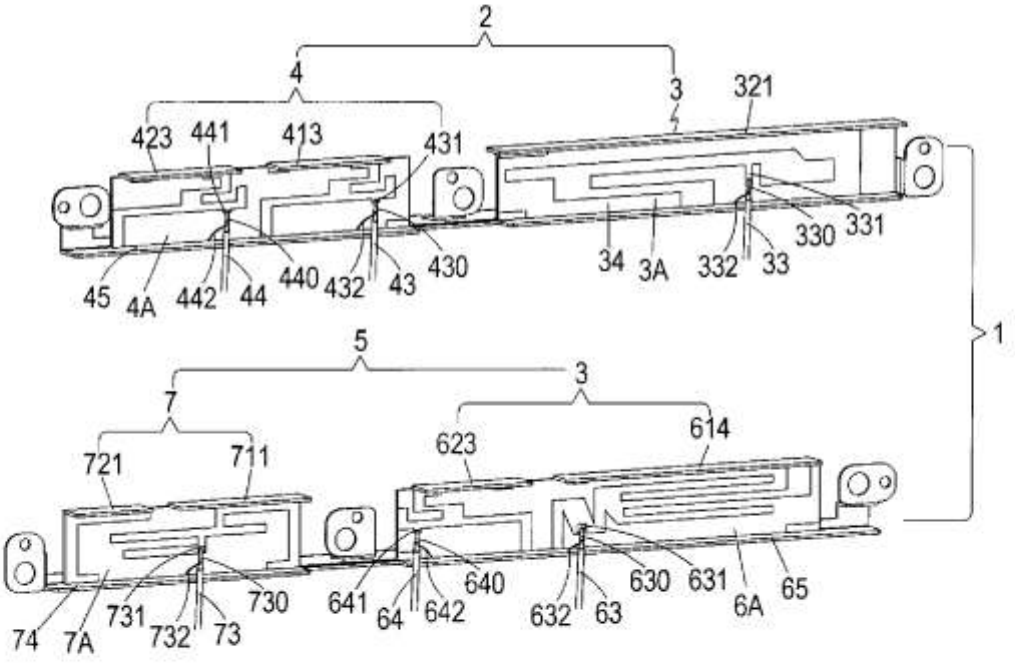
Publication Classification

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

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

(57) **ABSTRACT**

An integrated multi-band antenna module includes a first antenna body having a first body and a second body, and a second antenna body having a third body and a fourth body. The first to the fourth body have relative radiating portions, feed lines, and ground lines. The radiating portions have relative arms, antenna portions, feed arms, and conducting top plates. Resonant excitation sources are formed by capacitive coupling effects from gaps between the above components. The capacitive coupling effects also lower the inductance effect and the reflection loss. Mirror effect and large-scaling conducting top plates are used to raise a radiating effect. The relative gaps form the capacitive coupling effects to receive optimized frequencies so that a small-size integrated antenna with multi-band, high radiating effect, good resonant effect, and suitable for an ultra wide bandwidth operation is achieved.



US 20100315297A1

(19) **United States**

(12) **Patent Application Publication**

Wu et al.

(10) **Pub. No.: US 2010/0315297 A1**

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

(54) **WIRELESS DEVICE AND METHOD FOR MANUFACTURING THE SAME**

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(21) Appl. No.: **12/562,122**

(22) Filed: **Sep. 17, 2009**

Related U.S. Application Data

(60) Provisional application No. 61/186,381, filed on Jun. 12, 2009.

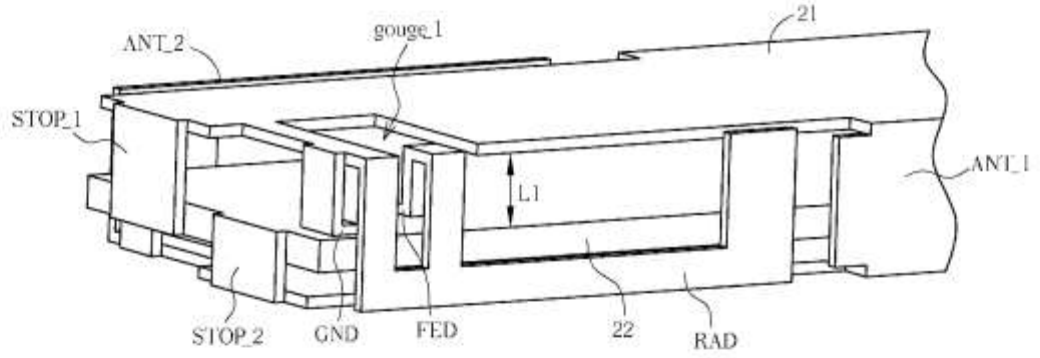
Publication Classification

(51) **Int. Cl.**
H01Q 1/24 (2006.01)
H05K 13/00 (2006.01)

(52) **U.S. Cl.** **343/702**; 29/592.1

(57) **ABSTRACT**

The present invention discloses a wireless device, which includes a housing and a printed circuit board (PCB). The housing has an opening at one end, and includes at least one antenna each formed on one side of the housing. The PCB, disposed inside the housing, includes a plurality of contacts, formed on both sides of the PCB, for coupling to the at least one antenna such that vertical position of the PCB is fixed by the at least one antenna. The housing and the PCB further form a connector of the wireless device at the opening.



US 20100315300A1

(19) **United States**

(12) **Patent Application Publication**

Wu et al.

(10) **Pub. No.: US 2010/0315300 A1**

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

(54) **HANDHELD ELECTRONIC DEVICE**

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

(21) Appl. No.: **12/694,432**

(22) Filed: **Jan. 27, 2010**

(30) **Foreign Application Priority Data**

Jun. 15, 2009 (TW) 098119958

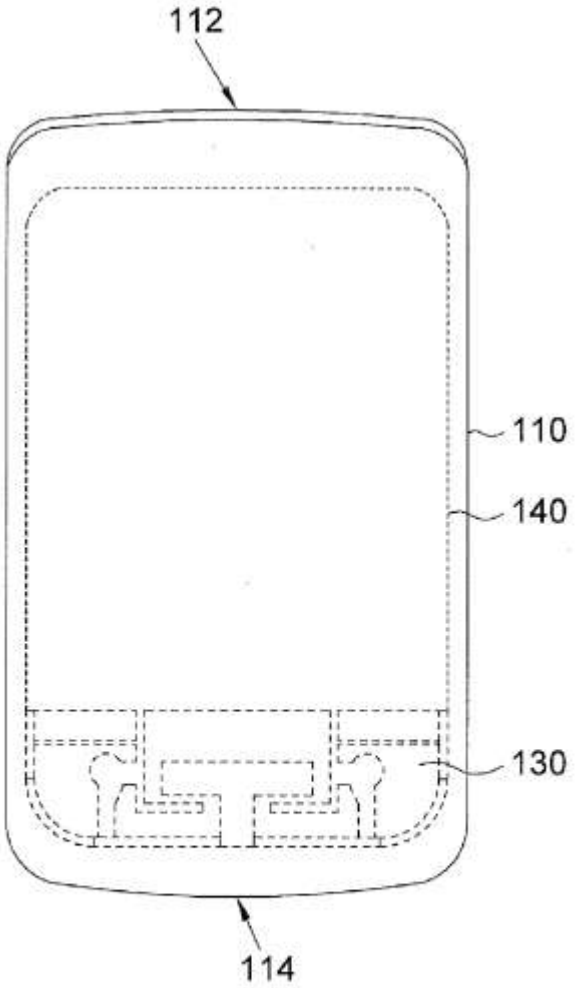
Publication Classification

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

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

(57) **ABSTRACT**

A handheld electronic device comprises a housing, a receiver, a balance antenna and a body. The housing comprises a top end and a bottom end. The receiver is located in the housing and near the top end, and the balance antenna is located in the housing and near the bottom end. The body is located in the housing and electrically couples to the receiver and the balance antenna.



US 20100321255A1

(19) **United States**

(12) **Patent Application Publication**

Kough et al.

(10) **Pub. No.: US 2010/0321255 A1**

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

(54) **ANTENNAS FOR ELECTRONIC DEVICES WITH CONDUCTIVE HOUSING**

(76) Inventors: **Douglas B. Kough**, San Jose, CA (US); **Gregory A. Springer**, Sunnyvale, CA (US); **Bing Chiang**, Melbourne, FL (US); **Enrique Ayala Vazquez**, Watsonville, CA (US); **Hao Xu**, Cupertino, CA (US)

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(21) Appl. No.: **12/490,286**

(22) Filed: **Jun. 23, 2009**

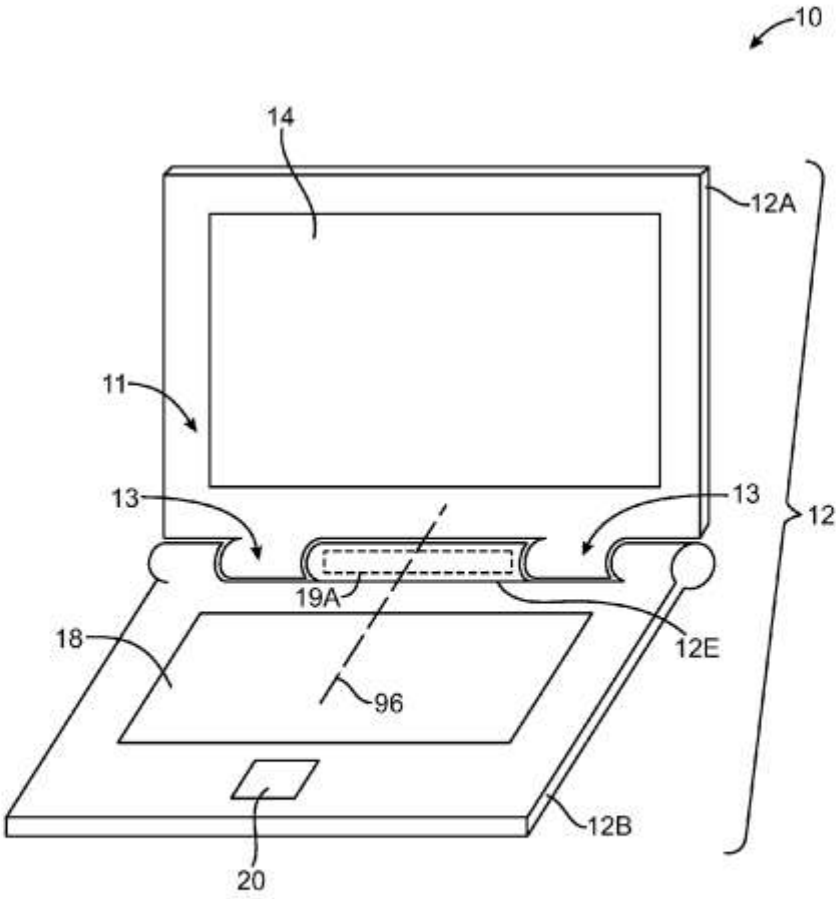
Publication Classification

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

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

(57) **ABSTRACT**

An electronic device may be provided with a conductive housing. The conductive housing may be formed from a metal. Slots may be formed in the housing. The slots may serve as an antenna and may be fed using an antenna feed structure within the electronic device housing. The electronic device may have a frame to which housing structures are attached and may have a stand or other support structure. The frame may be used to mount a display, to support housing walls, to support clutch barrel structures, etc. The slots may be formed in the frame or in a space between the frame and the housing walls. The slots or other antenna structures may also be formed in the stand. Multiple slots may be used together to support operations in two or more communications bands. There may be multiple dual slot antennas in the electronic device.



US 20100321264A1

(19) **United States**

(12) **Patent Application Publication**

TU

(10) **Pub. No.: US 2010/0321264 A1**

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

(54) **SLOT ANTENNA**

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(21) Appl. No.: **12/641,576**

(22) Filed: **Dec. 18, 2009**

(30) **Foreign Application Priority Data**

Jun. 18, 2009 (CN) 200910303410.2

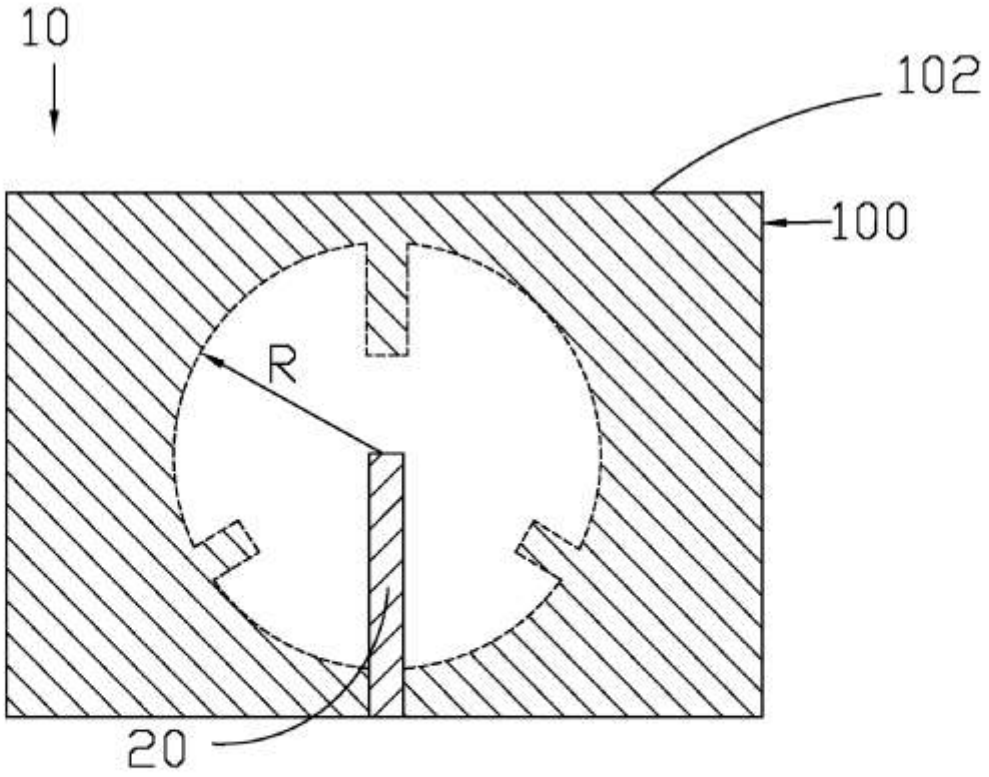
Publication Classification

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

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

(57) **ABSTRACT**

A slot antenna located on a substrate with a first surface and a second surface opposite to the first surface includes a feeding portion, a grounding portion and a radiating portion. The feeding portion is located on the first surface of the substrate to feed electromagnetic signals. The grounding portion is rectangular and located on the second surface of the substrate, and defines a circular clearance in a substantial center portion thereof. The radiating portion is located on the second surface of the substrate and comprises at least one elongated microstrip with one end connected to the grounding portion and the other end extending towards the centre of the circular clearance, wherein the feeding portion interacts with the radiating portion to transmit the electromagnetic signals.



US 20100321266A1

(19) **United States**

(12) **Patent Application Publication**

Schreider et al.

(10) **Pub. No.: US 2010/0321266 A1**

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

(54) **ANTENNA HAVING A REFLECTOR WITH COVERAGE AND FREQUENCY FLEXIBILITY AND SATELLITE COMPRISING SUCH AN ANTENNA**

(75) Inventors: **Ludovic Schreider**, Ville (FR); **Pierre Bosshard**, Tournefeuille (FR); **Serge Depeyre**, Blagnac (FR)

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(21) Appl. No.: **12/820,013**

(22) Filed: **Jun. 21, 2010**

(30) **Foreign Application Priority Data**

Jun. 19, 2009 (FR) 0902995

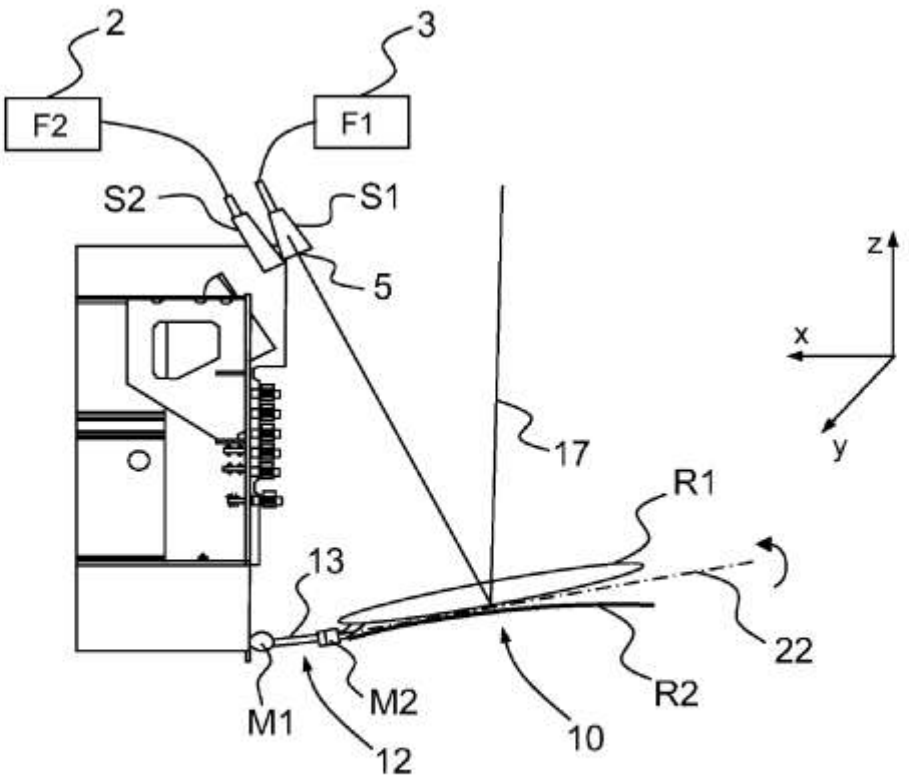
Publication Classification

(51) **Int. Cl.**
H01Q 15/14 (2006.01)

(52) **U.S. Cl.** **343/777**

(57) **ABSTRACT**

An antenna including a reflector with coverage and frequency flexibility is provided. The antenna comprises a reversible reflector having two separate reflecting surfaces shaped geometrically so as to cover respectively a first and a second geographical zone which are different and have predetermined shapes, in which the two reflecting surfaces are fastened back to back on a common support, and at least two independent sources arranged in a fixed configuration and connected to separate radiofrequency supply chains defining different and predefined operating frequency planes, the reflector having a first deployment position, in which the focal point of the first reflecting surface is located at the phase centre of the first source, and a second deployment position, in which the focal point of the second reflecting surface is located at the phase centre of the second source. Application notably to the field of satellite telecommunication antennae.



US 20100321267A1

(19) **United States**

(12) **Patent Application Publication**

ITO et al.

(10) **Pub. No.: US 2010/0321267 A1**

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

(54) **ANTENNA DEVICE**

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

(21) Appl. No.: **12/819,853**

(22) Filed: **Jun. 21, 2010**

(30) **Foreign Application Priority Data**

Jun. 22, 2009 (JP) 2009-147496

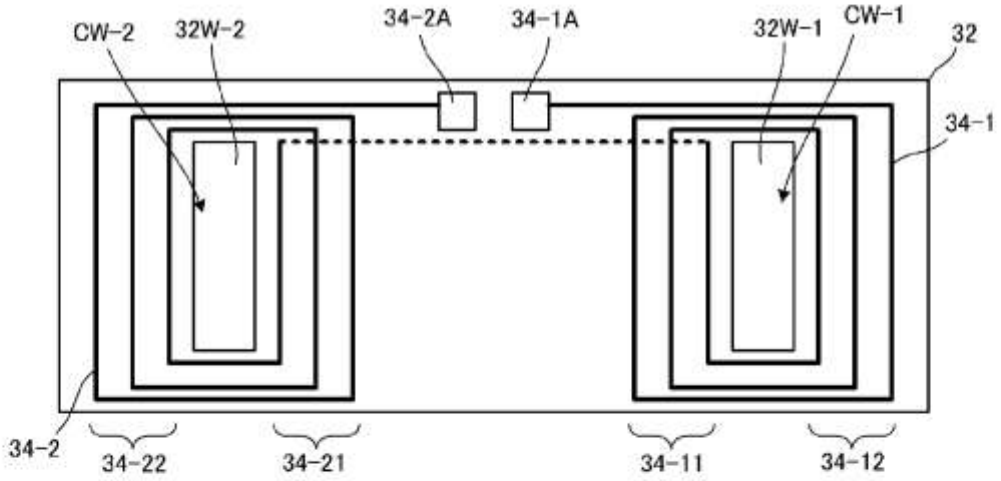
Publication Classification

(51) **Int. Cl.**
H01Q 7/08 (2006.01)

(52) **U.S. Cl.** **343/788**

(57) **ABSTRACT**

An antenna device includes a circuit board and an antenna coil that includes a flexible board on which plural coil conductors are formed and a magnetic core inserted into through holes provided in the flexible board. In each of the plural coil conductors, a first conductor portion is adjacent to a first principal surface of the magnetic core and a second conductor portion is adjacent to a second principal surface of the magnetic core and are positioned so as not to overlap each other in a normal direction with respect to the first or second principal surfaces. The second conductor portion is located farther from the center of the circuit board than the first conductor portion.



US 20100321270A1

(19) **United States**

(12) **Patent Application Publication**

Pan et al.

(10) **Pub. No.: US 2010/0321270 A1**

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

(54) **HIGH GAIN MULTIPLE PLANAR REFLECTOR ULTRA-WIDE BAND (UWB) ANTENNA STRUCTURE**

(75) Inventors: **Bo Pan**, Irvine, CA (US); **Frederic Battaglia**, Irvine, CA (US); **KuangYu Li**, Irvine, CA (US); **Ran-Hong Yan**, Irvine, CA (US); **Kuan Lock Sun**, Irvine, CA (US)

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(73) Assignee: **Wionics Technologies, Inc.**, Irvine, CA (US)

(21) Appl. No.: **12/488,509**

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

Publication Classification

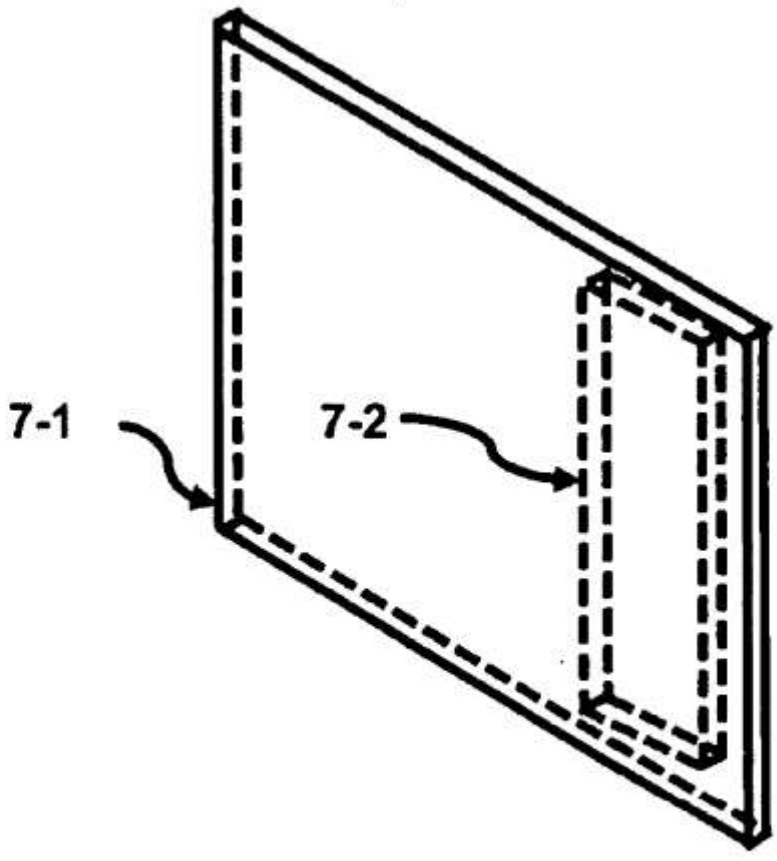
(51) **Int. Cl.**

H01Q 5/00	(2006.01)
H01Q 19/10	(2006.01)
H01Q 1/38	(2006.01)

(52) **U.S. Cl.** ..... **343/837**; 343/700 MS

(57) **ABSTRACT**

Multiple out-of-plane planar reflectors can be used to build a receive/transmit high-gain directional antenna. The driver portion and the first reflector of the antenna are formed within a metal layer of a PWB. A plurality of sets of reflector plates can be placed on the PWB, on a non-conductive low-dielectric constant material coating both opposing planar surfaces of the PWB, or on the opposing sidewalls of the product housing unit. The metal layer in the PWB is placed between the reflector plates. The plates can have either a parallel or non-parallel orientation to each another. This greatly increase the received power and thus increases the operating range of a low-power UWB system, as well as significantly improves wireless data transmission throughput. This antenna is applicable for USB communications systems.



US 20100328158A1

(19) **United States**

(12) **Patent Application Publication**

SAVOLAINEN

(10) **Pub. No.: US 2010/0328158 A1**

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

(54) **ANTENNA ARRANGEMENT**

(75) Inventor: **Risto Kalevi SAVOLAINEN**, Le Rouret (FR)

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(73) Assignee: **BLUESKY POSITIONING LIMITED**, Surbiton (GB)

(21) Appl. No.: **12/877,371**

(22) Filed: **Sep. 8, 2010**

Related U.S. Application Data

(62) Division of application No. 12/090,650, filed on May 31, 2008, filed as application No. PCT/FI2006/050448 on Oct. 18, 2006.

(30) **Foreign Application Priority Data**

Oct. 19, 2005 (EP) 05109729.3

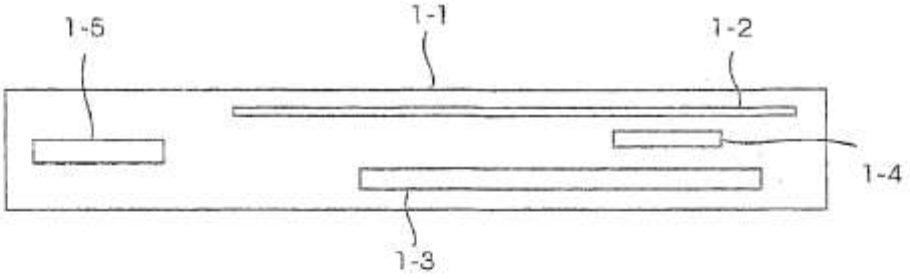
Publication Classification

(51) **Int. Cl.**
G01S 3/02 (2006.01)
H01Q 1/00 (2006.01)

(52) **U.S. Cl.** **342/451**; 343/722; 342/450

(57) **ABSTRACT**

An antenna (**2-20**) for use in a mobile device (**1-1**) includes elements for receiving (**2-5**, **3-1**, **4-1**, **5-1**, **6-5**) a signal from a satellite positioning system; a first layer of dielectric material (**2-4***a*, **2-4***b*, **3-2**, **3-3**, **5-2**, **4-3**, **5-2**, **5-3**, **6-4**, **6-15**) and a second layer of dielectric material (**2-4***a*, **2-4***b*, **3-2**, **3-3**, **5-2**, **4-3**, **5-2**, **5-3**, **6-4**, **6-15**), wherein the elements for receiving (**2-5**, **3-1**, **4-1**, **5-1**, **6-5**, **7-6**) the signal is at least partly between the first dielectric layer (**2-4***a*, **2-4***b*, **3-2**, **3-3**, **5-2**, **4-3**, **5-2**, **5-3**, **6-4**, **6-15**) and the second dielectric layer (**2-4***a*, **2-4***b*, **3-2**, **3-3**, **5-2**, **4-3**, **5-2**, **5-3**, **6-4**, **6-15**).



US 20100328159A1

(19) **United States**

(12) **Patent Application Publication**

Yang et al.

(10) **Pub. No.: US 2010/0328159 A1**

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

(54) **ANTENNA STRUCTURE**

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(21) Appl. No.: **12/491,242**

(22) Filed: **Jun. 25, 2009**

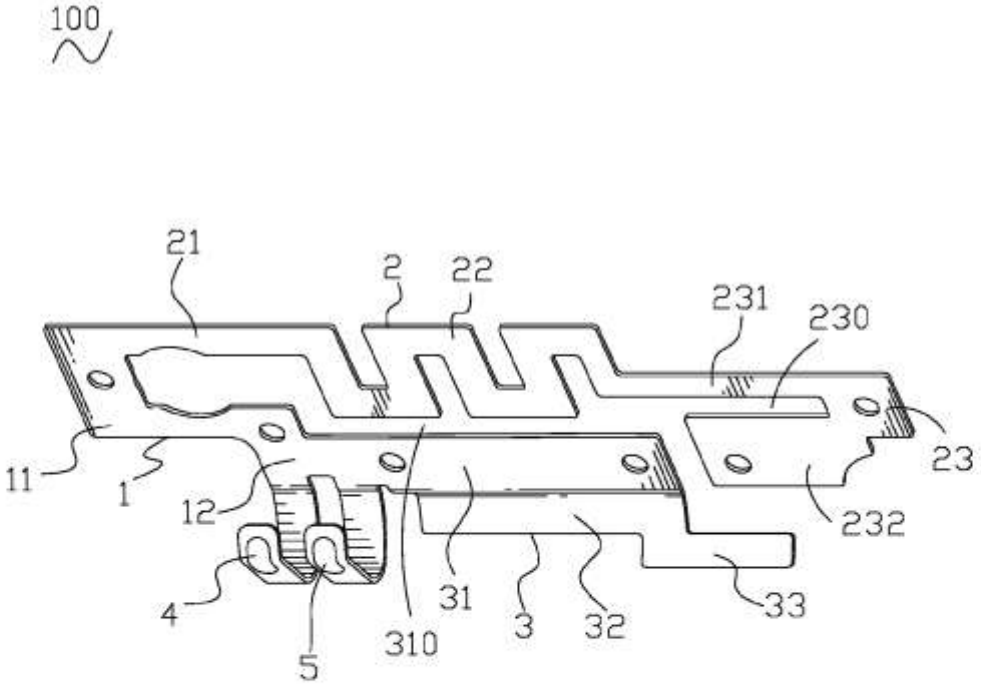
Publication Classification

(51) **Int. Cl.**
H01Q 5/00 (2006.01)
H01Q 1/36 (2006.01)

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

(57) **ABSTRACT**

An antenna structure includes a low frequency radiator, a high frequency radiator, and a connecting element. The connecting element has a rear end and a front end opposite to the rear end. A feeding element and a grounding element are extended from the front end of the connecting element and arranged adjacent to each other. The low frequency radiator includes a substantially inverted-L shaped first radiating part extended from the rear end of the connecting element, a meander-like second radiating part extended frontward from a front end of the first radiating part, and a substantially lying U-shaped third radiating part with a rearward opening extended from a free end of the second radiating part. The high frequency radiator includes a first extension piece extended frontward from the front end of the connecting element and located under the second radiating part with space.



US 20100328160A1

(19) **United States**

(12) **Patent Application Publication**

Hsu et al.

(10) **Pub. No.: US 2010/0328160 A1**

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

(54) **DUAL ANTENNA DEVICE**

(76) Inventors: **Chieh-Sheng Hsu**, Taipei Hsien (TW); **Chang-Hsiu Huang**, Taipei Hsien (TW)

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(21) Appl. No.: **12/783,525**

(22) Filed: **May 19, 2010**

(30) **Foreign Application Priority Data**

Jun. 30, 2009 (TW) 098122033

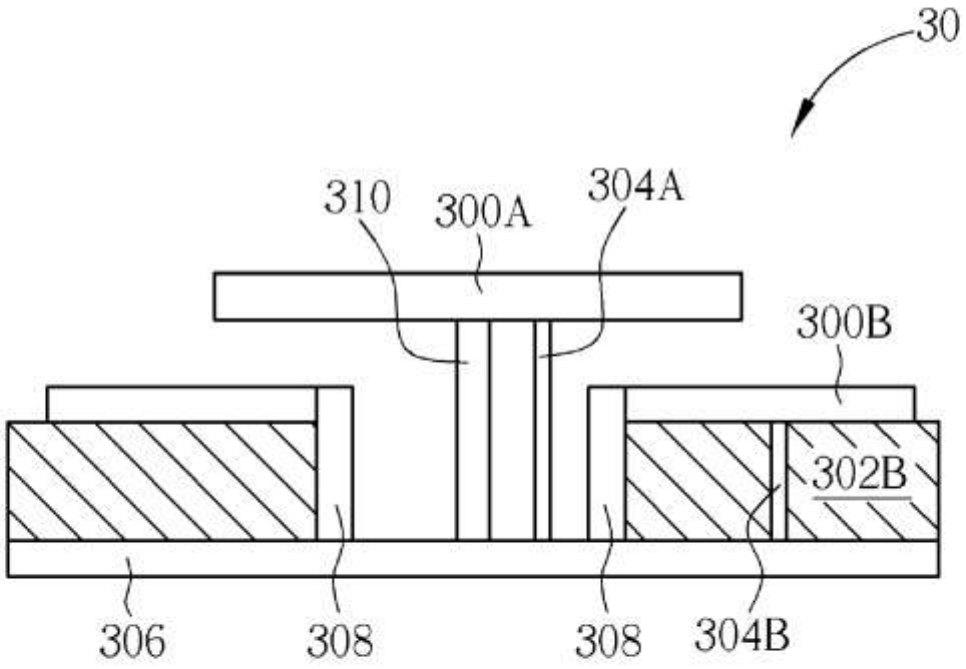
Publication Classification

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

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

(57) **ABSTRACT**

A dual antenna device includes a first antenna of a first polarization, a second antenna of a second polarization, and a conducting wall. The first antenna includes a grounding unit, a first substrate positioned on the grounding unit, a first radiating unit positioned on the first substrate, and a first feeding unit coupled to the first radiating unit. The conducting wall is coupled to the grounding unit and the first radiating unit, and forms a space above the grounding unit. The second antenna includes a second radiating unit and a second feeding unit coupled to the second radiating unit and placed through the space.



US 20100328164A1

(19) **United States**

(12) **Patent Application Publication**

Huynh

(10) **Pub. No.: US 2010/0328164 A1**

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

(54) **SWITCHED ANTENNA WITH AN ULTRA WIDEBAND FEED ELEMENT**

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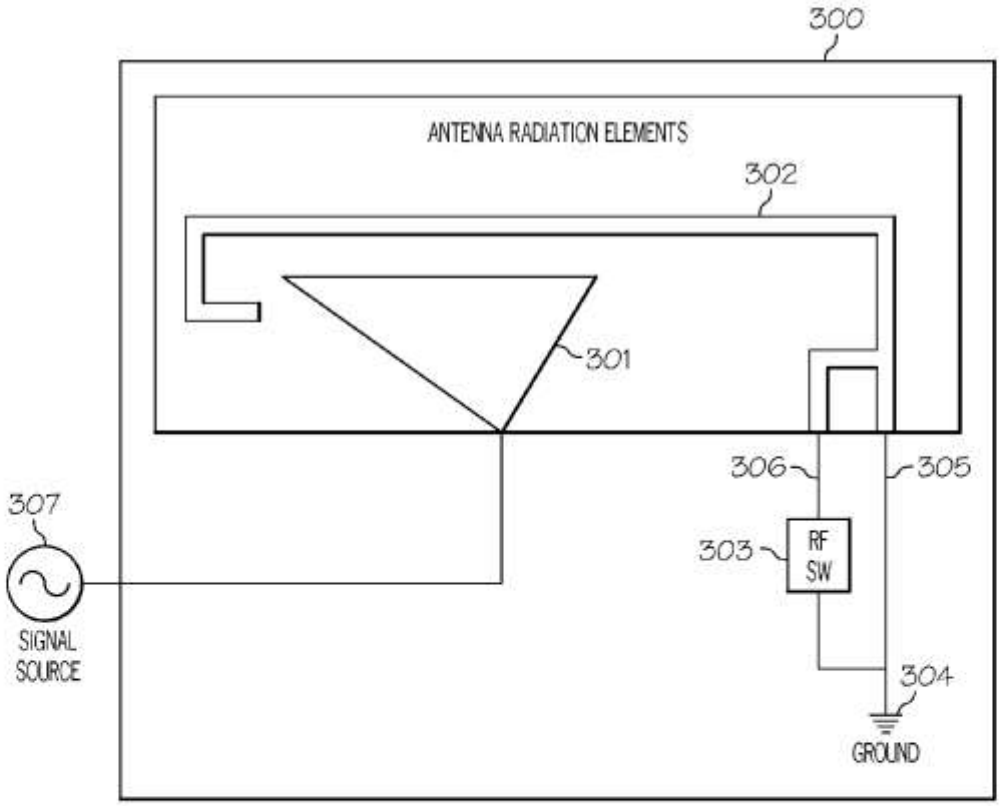
(52) **U.S. Cl.** ..... **343/702**; 343/700 MS

(57) **ABSTRACT**

An antenna that includes an ultra wideband (UWB) feed element, a parasitic conductive element, and a radio frequency (RF) switch. The UWB feed element is capable of radiating a first frequency band. The parasitic conductive element is connected to an electrical ground and capable of radiating a second frequency band. The parasitic conductive element has no electrical contact with the UWB feed element. The RF switch is connected between the parasitic conductive element and the electrical ground and configured to vary an electrical current path between the parasitic conductive element and the electrical ground. The varying of the electrical current path changes a resonant frequency of the second frequency band of the antenna.



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

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(30) **Foreign Application Priority Data**

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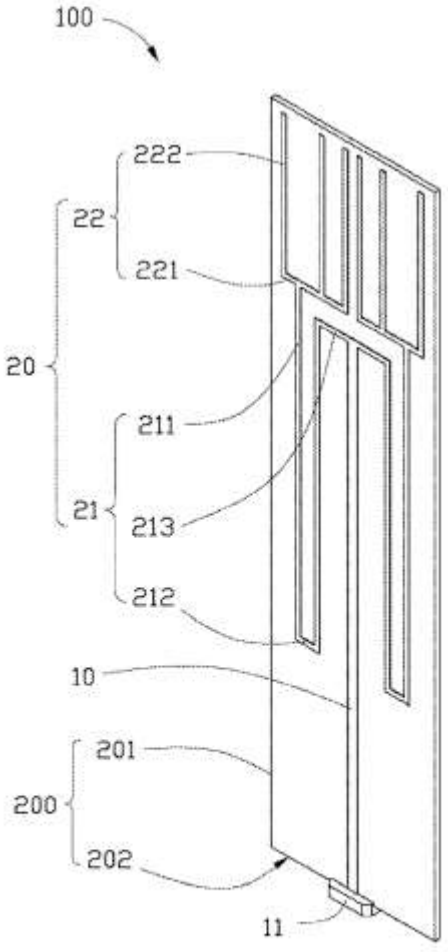
(52) **U.S. Cl.** ..... **343/702**; 343/700 MS

(57) **ABSTRACT**

An antenna mounted on a baseboard including a first surface and a second surface opposite to the first surface includes a feed portion, two radiating portions, a ground portion and a coupling portion. The feed portion and the two radiating portions are disposed on the first surface, and the two radiating portions are connected to the feed portion. The ground portion and the coupling portion are disposed on the second surface, and the coupling portion is connected to the ground portion. The coupling portion passes through the baseboard and couples with two radiating portions.



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Rao

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(54) **SINGLE FEED PLANAR DUAL-POLARIZATION MULTI-LOOP ELEMENT ANTENNA**

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(51) **Int. Cl.**
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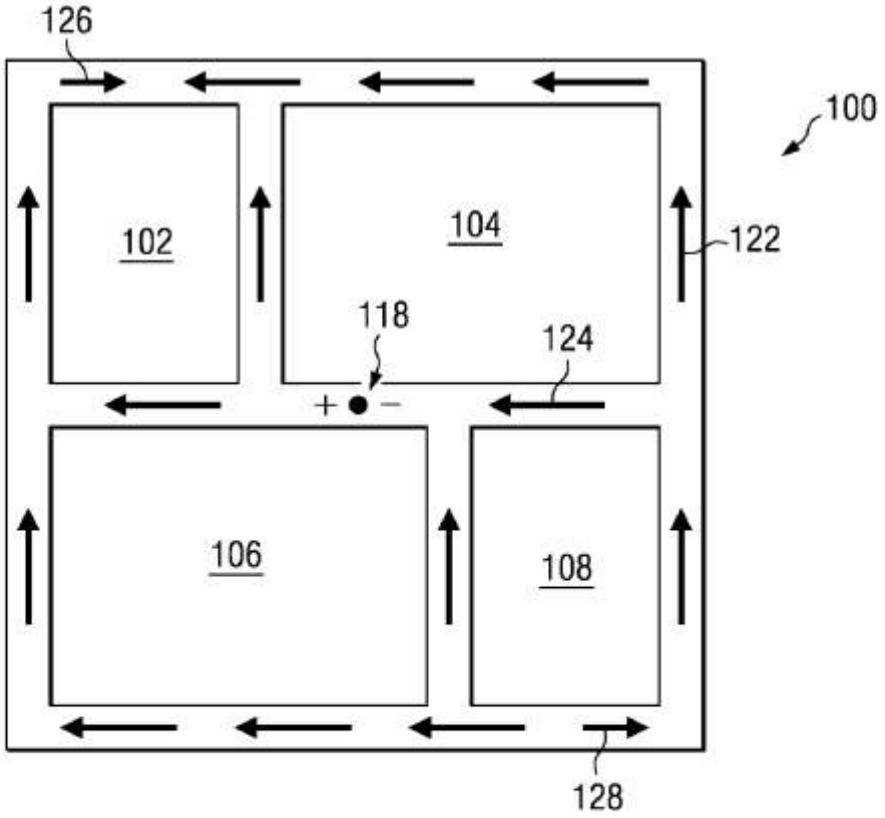
(52) **U.S. Cl.** ..... **343/742**; 343/700 MS; 343/843; 343/867

(57) **ABSTRACT**

Dual polarization in an antenna structure that results from a number of radiating elements arranged in a loop configuration. The antenna structure is excited by a single coaxial feedline in an interior portion of the antenna structure. The antenna structure may include a ground plane that enables a directional radiation pattern. The antenna structure may also be operational without a ground plane to enable an omnidirectional radiation pattern. The antenna structure may be configured in a number of loop configurations electrically connected to each other by a number of microstrip loops extending in a horizontal and vertical planar direction.



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Wong et al.

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(54) **MULTIBAND ANTENNA**

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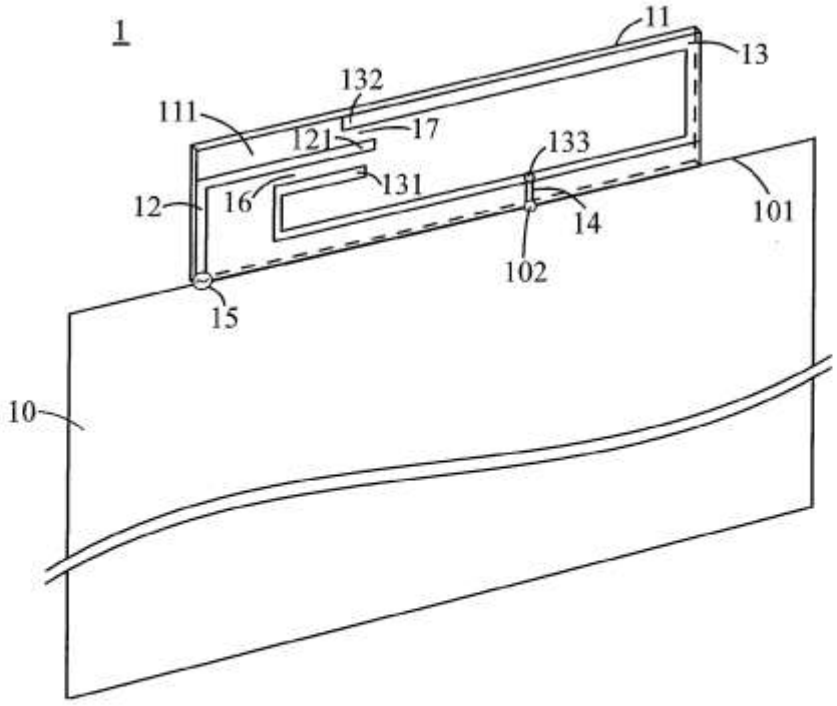
(52) **U.S. Cl.** ..... **343/848**; 343/700 MS

(57) **ABSTRACT**

The present invention discloses a multiband antenna. The antenna comprises a ground plane, a dielectric substrate and a radiating metal portion. The dielectric substrate is located at one side edge of the ground plane. The radiating metal portion is disposed on one surface of the dielectric substrate and comprises a first metal portion and a second metal portion. The first metal portion is substantially of an L-shape. One end of the first metal portion is adjacent to the side edge of the ground plane and is the antenna's feeding point connected to a signal source, and the other end of the first metal portion is an open end. The second metal portion comprises a U-shape portion. The second metal portion comprises a first open end and a second open end, which are respectively located on two opposite sides of the open end of the first metal portion. The first open end has a first coupling gap between the first open end and the open end of the first metal portion; and the second open end has a second coupling gap between the second open end and the open end of the first metal portion. The second metal portion is further short-circuited to the ground plane by a shorting metal line.



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(19) **United States**

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(54) **MOBILE WIRELESS COMMUNICATIONS DEVICE INCLUDING A GROUND PATCH PROVIDING SPECIFIC ABSORPTION RATE (SAR) REDUCTION AND RELATED METHODS**

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Related U.S. Application Data

(63) Continuation of application No. 12/472,638, filed on May 27, 2009, now Pat. No. 7,791,547, which is a continuation of application No. 11/733,360, filed on Apr. 10, 2007, now Pat. No. 7,554,496.

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

(57) **ABSTRACT**

A mobile wireless communications device may include a portable housing, a dielectric substrate carried by the portable housing having a front side facing toward a user and a back side opposite the front side, and a ground plane carried by the dielectric substrate. The device may further include at least one circuit carried by the dielectric substrate, and an antenna carried by the dielectric substrate adjacent an end thereof and electrically connected to the at least one circuit. A ground patch may be adjacent the front side of the dielectric substrate that is electrically connected to the ground plane and spaced apart from and at least partially overlapping the antenna.