US 20120105286A1

(19) **United States**

(12) **Patent Application Publication**

RHYU et al.

(10) **Pub. No.: US 2012/0105286 A1**

(43) **Pub. Date: May 3, 2012**

(54) **MOBILE TERMINAL**

(76) Inventors: **Hanphil RHYU**, Seoul (KR); **Sungjung Rho**, Seoul (KR); **Sungjoon Hong**, Gyeonggi-do (KR); **Yochuol Ho**, Gyeonggi-do (KR); **Euntaek Jeoung**, Gyeonggi-do (KR); **Ansun Hyun**, Seoul (KR)

(21) Appl. No.: **13/213,244**

(22) Filed: **Aug. 19, 2011**

(30) **Foreign Application Priority Data**

Nov. 1, 2010 (KR) 10-2010-0107862

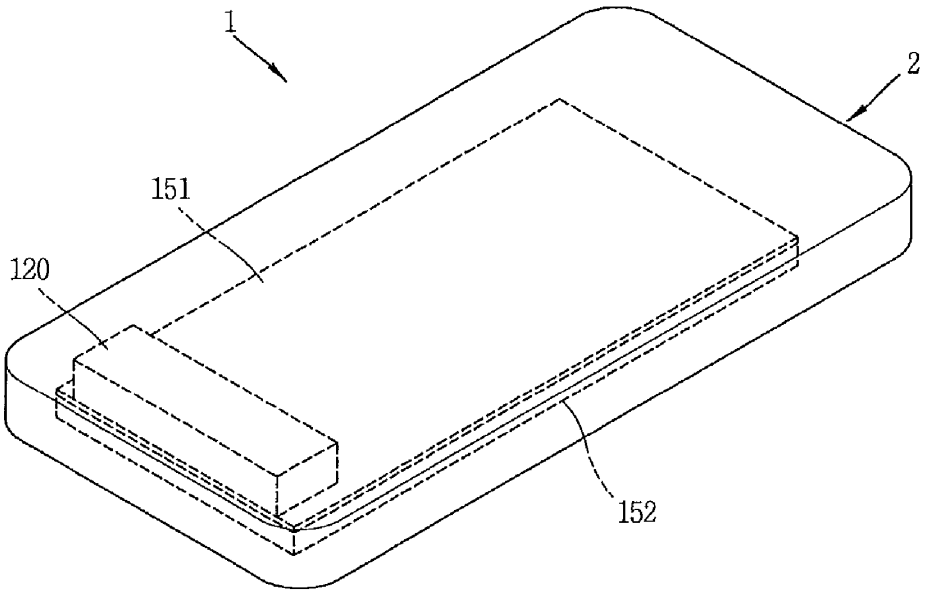
Publication Classification

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

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

(57) **ABSTRACT**

An antenna unit and a mobile terminal having the same are provided. the mobile terminal includes a terminal body having a circuit board for processing wireless signals, a first radiator disposed to overlap the circuit board with being spaced apart from the circuit board, a second radiator disposed adjacent to the first radiator, a first feeding connector configured to allow a feeding connection between the first radiator and the circuit board, and a first ground connector configured to allow a ground connection between the circuit board and the second radiator. With this configuration, the antenna unit can satisfy a multiband characteristic even within a space, in which the antenna unit may be interrupted by the circuit board or a display panel inside the terminal body.



US 20120105287A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2012/0105287 A1

(43) Pub. Date: May 3, 2012

JUNG et al.

(54) MOBILE COMMUNICATION TERMINAL

(76) Inventors: **Byungwoon JUNG**, Seoul (KR); **Youngbae Kwon**, Nam-Gu (KR); **Jina Park**, Yeonsu-Gu (KR); **Ansun Hyun**, Seoul (KR); **Changwon Yun**, Gwangmeoung (KR)

(21) Appl. No.: **13/214,721**

(22) Filed: **Aug. 22, 2011**

(30) **Foreign Application Priority Data**

Nov. 1, 2010 (KR) 10-2010-0107861

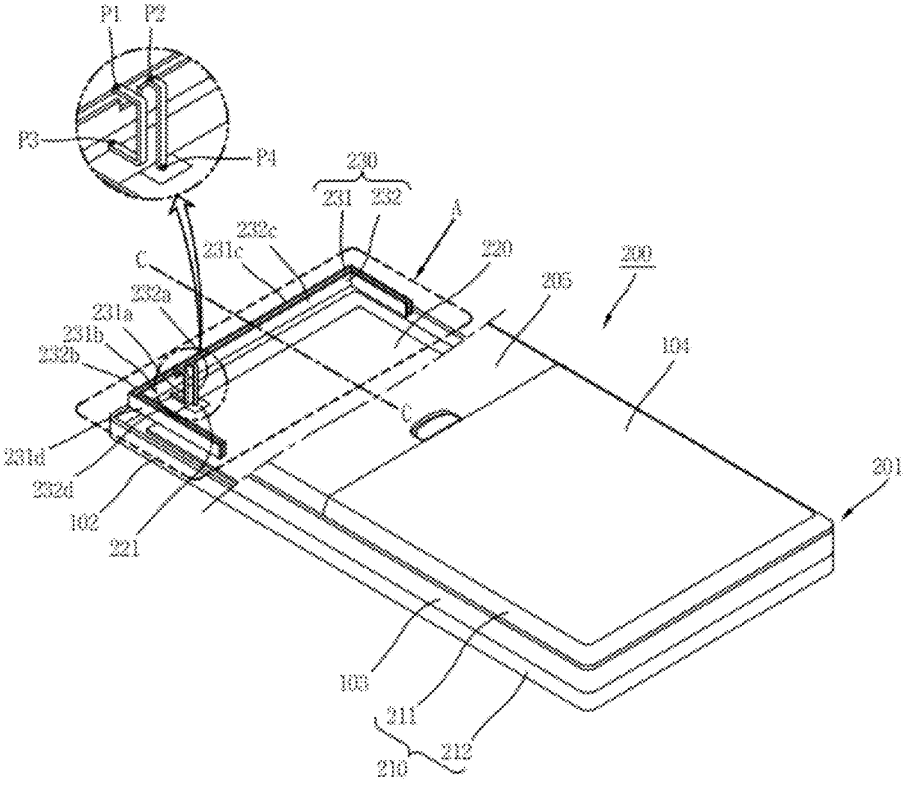
Publication Classification

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

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

(57) **ABSTRACT**

A mobile communication terminal including a wireless communication unit configured to communicate with at least one other terminal; a body including a metal frame having a specified length and a width; a power feeding portion formed on an internal circuit board in the terminal and configured to supply RF signals; and an antenna portion disposed inside the terminal. Further, the antenna portion includes a shorting arm overlapping and being separated from the metal frame, and electrically connected to the metal frame at a first location offset from a middle of an edge of the metal frame; and a feeding arm disposed in parallel to the shorting arm, and electrically connected to the power feeding portion at a second location offset from the middle.



US 20120105291A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2012/0105291 A1

(43) Pub. Date: May 3, 2012

TU

(54) **SOLID ANTENNA WITH UPPER-LOWER STRUCTURE**

(75) Inventor: **HSIN-LUNG TU**, Tu-Cheng (TW)

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

(21) Appl. No.: **12/948,768**

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

(30) **Foreign Application Priority Data**

Nov. 1, 2010 (CN) 201020587467.8

Publication Classification

(51) **Int. Cl.**

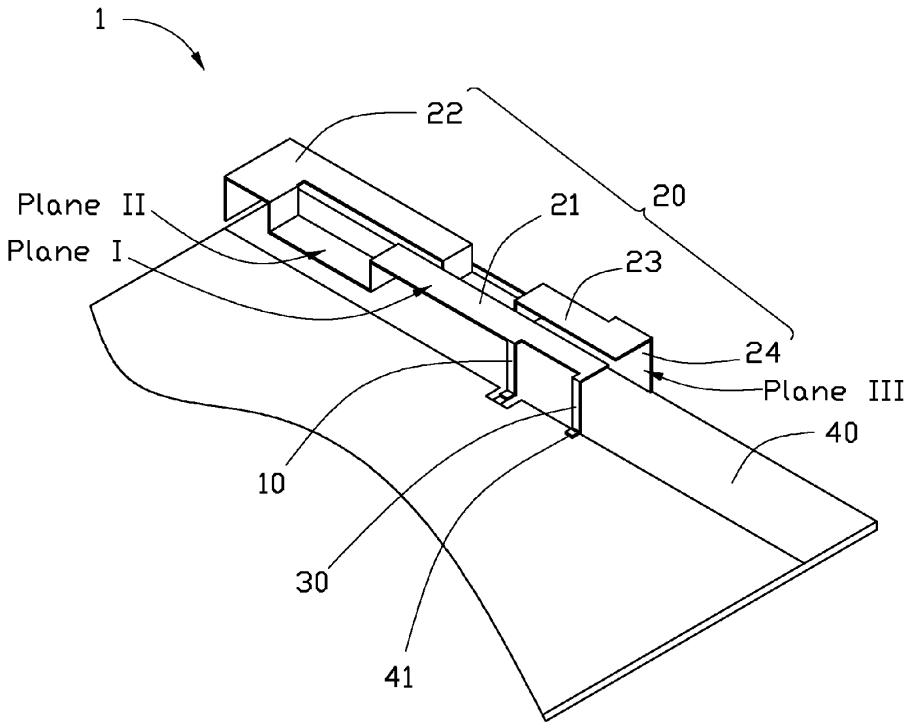
H01Q 9/04 (2006.01)

H01Q 9/00 (2006.01)

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

(57) **ABSTRACT**

A solid antenna configured above a substrate includes a short portion, a feeding portion and a radiating portion including four radiators connected one-by-one. A first radiator includes a first upper section on a first plane, a first lower section on a second plane, and a first connection section connecting the first upper section to the first lower section. The second radiator includes a second upper section on the first plane, and a second connection portion connecting the second upper section to the first lower section. The third radiator includes a third upper section and a fourth upper section on the first plane, a second lower section on the second plane, a third connection section connecting the third upper section to the second lower section, and a fourth connection section connecting the second lower section to the fourth upper section. The fourth radiator extends towards the substrate.



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(19) **United States**

(12) **Patent Application Publication**

Wong et al.

(10) **Pub. No.: US 2012/0105292 A1**

(43) **Pub. Date: May 3, 2012**

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

(75) Inventors: **Kin-Lu Wong**, Hsichih (TW); **Yu-Wei Chang**, Hsichih (TW)

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

(21) Appl. No.: **13/088,574**

(22) Filed: **Apr. 18, 2011**

(30) **Foreign Application Priority Data**

Oct. 27, 2010 (TW) 99136670

Publication Classification

(51) **Int. Cl.**

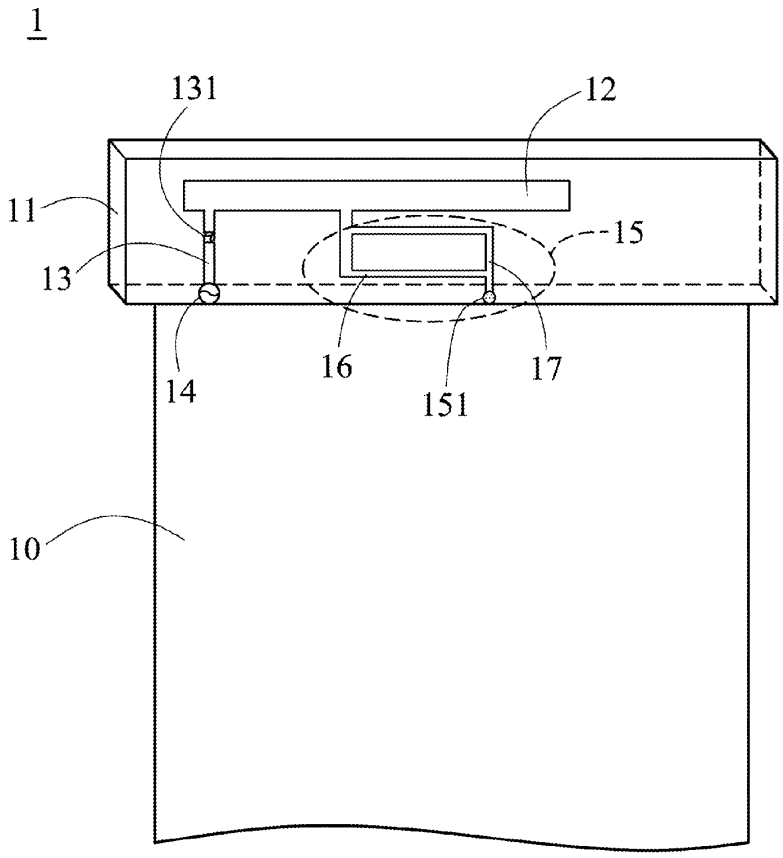
H01Q 1/36 (2006.01)

H01Q 5/01 (2006.01)

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

(57) **ABSTRACT**

A communication device is provided, including a ground element, a substrate and an antenna. The substrate is adjacent to the ground element. The antenna provides a first band and a second band, and the antenna is disposed on the substrate. The antenna includes a radiator, a feed conductor, a capacitor unit and a short-circuiting unit. An end of the feed conductor is connected to a signal source, and another end of the feed conductor is electrically connected to the radiator. The capacitor unit is disposed on the feed conductor. The short-circuiting unit includes a first short-circuiting path and a second short-circuiting path, wherein the first and a second short-circuiting paths electrically connect the radiator to the ground element, the first short-circuiting path has a first path length, the second short-circuiting path has a second path length, and the first and second path lengths are longer than 0.05 times that of a wavelength of a lowest frequency of the first band.



US 20120105295A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2012/0105295 A1

(43) Pub. Date: May 3, 2012

Lin et al.

(54) **STRUCTURE FOR ADJUSTING AN EM WAVE PENETRATION RESPONSE AND ANTENNA STRUCTURE FOR ADJUSTING AN EM WAVE RADIATION CHARACTERISTIC**

(75) Inventors: **Hung-Hsuan Lin**, Taipei City (TW); **Chun-Yih Wu**, Taichung City (TW); **Ken-Huang Lin**, Kaohsiung City (TW); **Hsin-Lung Su**, Kaohsiung City (TW); **Yi-Jen Wang**, Tainan County (TW)

(73) Assignees: **NATIONAL SUN YAT-SEN UNIVERSITY**, Kaohsiung City (TW); **INDUSTRIAL TECHNOLOGY RESEARCH INSTITUTE**, Hsinchu (TW)

(21) Appl. No.: **13/012,805**

(22) Filed: **Jan. 25, 2011**

(30) **Foreign Application Priority Data**

Nov. 2, 2010 (TW) 99137645

Publication Classification

(51) **Int. Cl.**

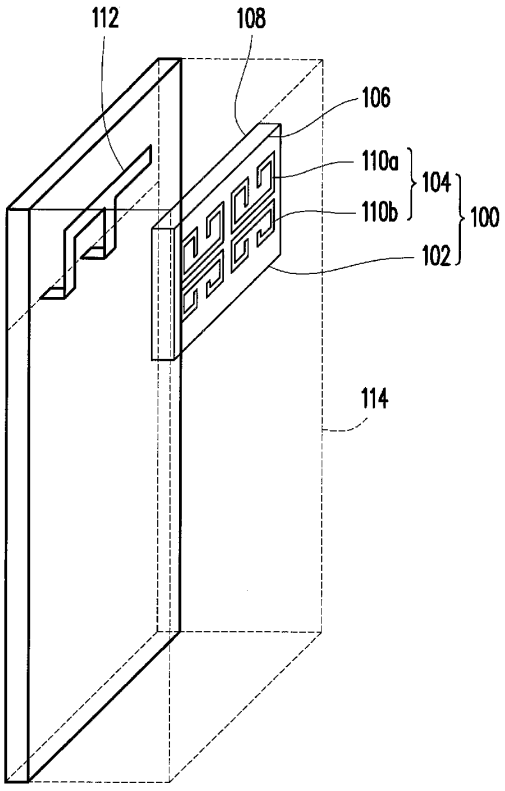
H01Q 1/52 (2006.01)

H01P 1/22 (2006.01)

(52) **U.S. Cl.** ..... **343/841**; 333/81 R

(57) **ABSTRACT**

A structure for adjusting electromagnetic wave (EM wave) penetration response includes a plurality of structure units and a dielectric substrate with an upper surface and a lower surface. The structure units are disposed on the upper surface and/or the lower surface. The structure unit consists of metal lines or complementary slits so as to enable an EM wave penetration response of the structure to include a pass band and a stop band. The frequency of the stop band is higher than that of the pass band. If a distance between the structure and an object with a high dielectric constant is longer than a predetermined distance, the pass band covers a radiation frequency of an antenna. If the distance between the structure and the object with the high dielectric constant is within the predetermined distance, the stop band covers the radiation frequency of the antenna.



US 20120105296A1

(19) **United States**

(12) **Patent Application Publication**

CHUNG et al.

(10) **Pub. No.: US 2012/0105296 A1**

(43) **Pub. Date: May 3, 2012**

(54) **MIMO ANTENNA APPARATUS**

(75) Inventors: **Jae Young CHUNG**, Seoul (KR); **Dong-Jin KIM**, Seoul (KR); **Tae Sik YANG**, Suwon-si (KR); **Joong Ho JEONG**, Seoul (KR); **Ju Hyung LEE**, Gwacheon-si (KR)

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

(21) Appl. No.: **13/283,029**

(22) Filed: **Oct. 27, 2011**

(30) **Foreign Application Priority Data**

Oct. 27, 2010 (KR) 10-2010-0105144

Publication Classification

(51) **Int. Cl.**

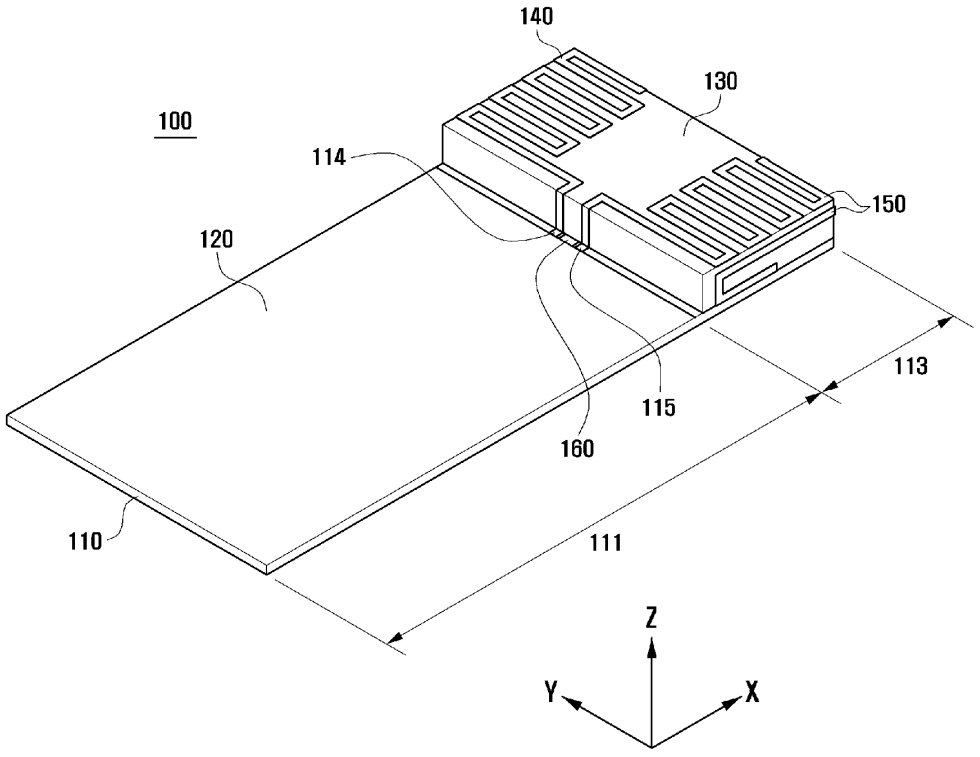
H01Q 21/28 (2006.01)

H01Q 1/52 (2006.01)

(52) **U.S. Cl.** **343/842**; 343/841; 343/907

(57) **ABSTRACT**

A Multiple Input Multiple Output (MIMO) antenna apparatus is provided. The apparatus includes antenna devices that operate in respective resonant frequency bands. The apparatus also includes a main board comprising a device region and a ground region. The antenna devices are disposed on the device region. The ground plate is disposed on the ground region for grounding the antenna devices. The apparatus also includes at least one isolation device having a negatively charged line that protrudes from the ground plate and extends between the antenna devices on the device region, and a positively charged line that extends around the negatively charged line and connects the antenna devices to each other. The isolation device induces an electromagnetic wave that is generated by the antenna devices between the negative and positively charged lines to isolate the antenna devices from each other.



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(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2012/0112851 A1

(43) Pub. Date: May 10, 2012

Manssen et al.

(54) METHOD AND APPARATUS FOR TUNING ANTENNAS IN A COMMUNICATION DEVICE

(75) Inventors: **Keith R. Manssen**, Bull Valley, IL (US); **Matthew R. Greene**, Crystal Lake, IL (US); **Duane Rabe**, Hawthorn Woods, IL (US)

(73) Assignee: **PARATEK MICROWAVE, INC.**, Nashua, NH (US)

(21) Appl. No.: **13/005,122**

(22) Filed: **Jan. 12, 2011**

Related U.S. Application Data

(63) Continuation of application No. 12/941,972, filed on Nov. 8, 2010.

Publication Classification

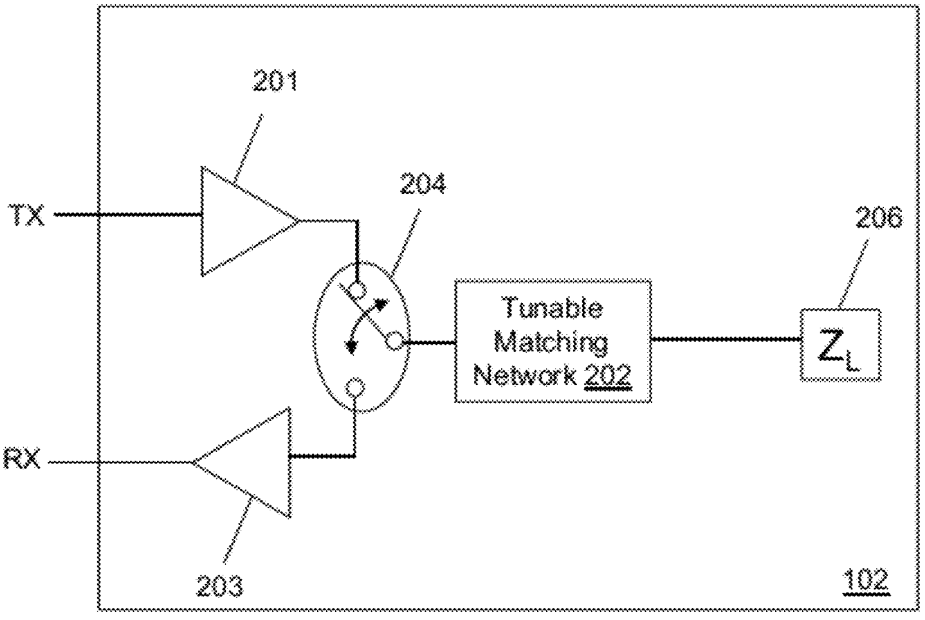
(51) **Int. Cl.**

H01P 1/10	(2006.01)
H01P 5/18	(2006.01)
H01P 5/12	(2006.01)

(52) **U.S. Cl.** **333/101**; 333/124; 333/112

(57) **ABSTRACT**

A system that incorporates teachings of the present disclosure may include, for example, a matching network for a communication device having first and second antennas, where the matching network includes a first variable component connectable and a detector. The first variable component can be connectable along a first path between the first antenna and a front end module of the communication device, where the first antenna is configured for transmit and receive operation. The detector can be connectable along a second path between the second antenna and the front end module of the communication device, where the detector obtains an RF voltage associated with the second path, where the second antenna is configured for a diversity receive operation, and where the first variable component is adjusted based on the detected RF voltage to tune the matching network. Additional embodiments are disclosed.



200

US 20120112964A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2012/0112964 A1

(43) Pub. Date: May 10, 2012

Thill et al.

(54) **DUAL FREQUENCY BAND COMMUNICATION ANTENNA ASSEMBLY HAVING AN INVERTED F RADIATING ELEMENT**

(76) Inventors: **Kevin M. Thill**, Scottsdale, AZ (US); **William J. Liimatainen**, Monroe, WI (US)

(21) Appl. No.: **12/942,340**

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

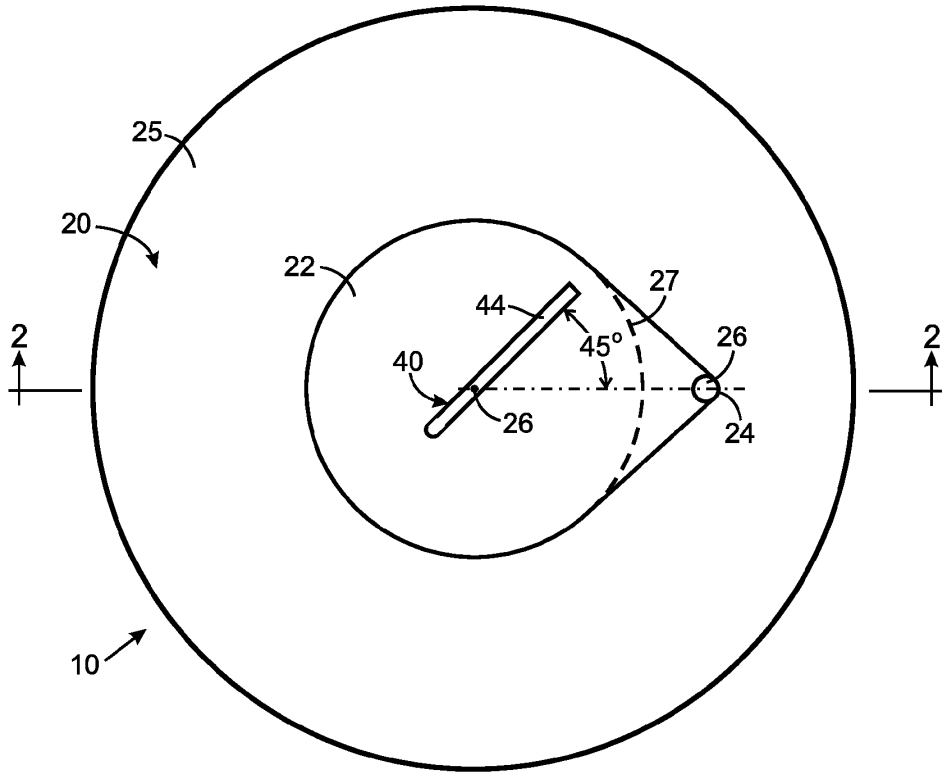
Publication Classification

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

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

(57) **ABSTRACT**

A dual frequency band antenna has a first section with a dielectric material separating parallel first and second conductive layers. An electrical shunt extends between the first and second electrically conductive layers. A second section includes an inverted F element electrically connected to the second electrically conductive layer. A transmission medium carries signals between the antenna assembly and a communication circuit and has a first electrical conductor connected to the first electrically conductive layer and a second electrical conductor connected to the inverted F element.



US 20120112965A1

(19) **United States**

(12) **Patent Application Publication**

Yen et al.

(10) **Pub. No.: US 2012/0112965 A1**

(43) **Pub. Date: May 10, 2012**

(54) **BROADBAND ANTENNA**

(75) Inventors: **Li-Jean Yen**, Hsinchu County (TW); **Shih-Chiang Wei**, Hsinchu County (TW); **Jhih - Yuan Ke**, Hsinchu County (TW)

(73) Assignee: **Wistron NeWeb Corporation**, Hsinchu County (TW)

(21) Appl. No.: **13/048,547**

(22) Filed: **Mar. 15, 2011**

(30) **Foreign Application Priority Data**

Nov. 10, 2010 (TW) 099221770

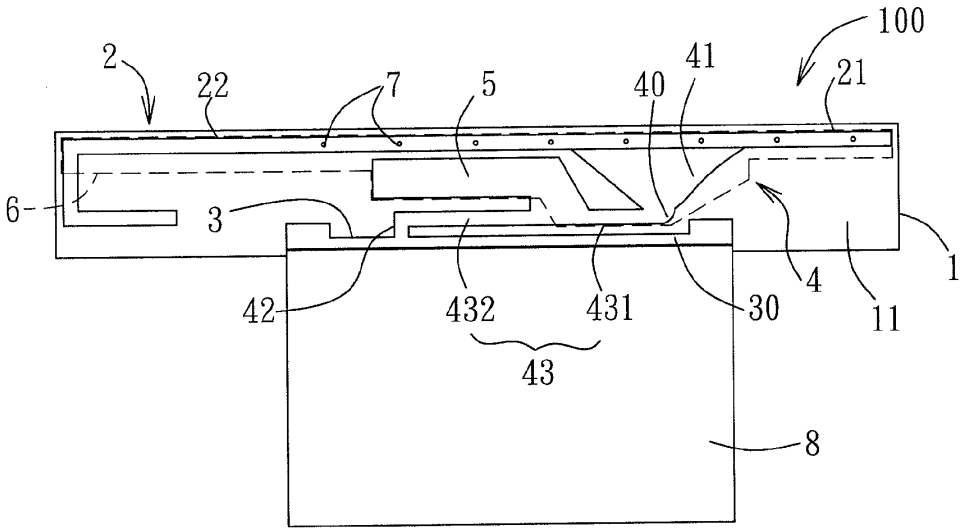
Publication Classification

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

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

(57) **ABSTRACT**

A broadband antenna includes a substrate, a radiator element disposed on a first surface of the substrate, a grounding element, a conductor element, a conductor arm, and a conductor piece disposed on a second surface of the substrate. The conductor element is provided with a feed point. The conductor element interconnects the radiator element and the grounding element and includes a first conductor section, a second conductor section, and a third conductor section interconnecting the first conductor section and the second conductor section. The third conductor section includes a first part, and a second part connected between the first part and the second conductor section. The first conductor section configures the radiator element into a first radiator portion and a second radiator portion. The conductor piece is conductively coupled to the radiator element and overlaps with projections of the first radiator portion, the first conductor section, the first part, and the conductor arm onto the second surface.



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(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2012/0112967 A1

(43) Pub. Date: May 10, 2012

Coupez et al.

(54) **DUAL FIN ANTENNA**

(76) Inventors: **Jean-Philippe Coupez**, Le Relecq Kerhuon (FR); **Zied Charaabi**, Tunis (TN); **Jérémie Hemery**, Tourch (FR); **Christian Person**, Saint Renan (FR)

(21) Appl. No.: **13/256,932**

(22) PCT Filed: **Mar. 16, 2010**

(86) PCT No.: **PCT/EP2010/053398**

§ 371 (c)(1), (2), (4) Date: **Jan. 19, 2012**

(30) **Foreign Application Priority Data**

Mar. 17, 2009 (FR) 0951677

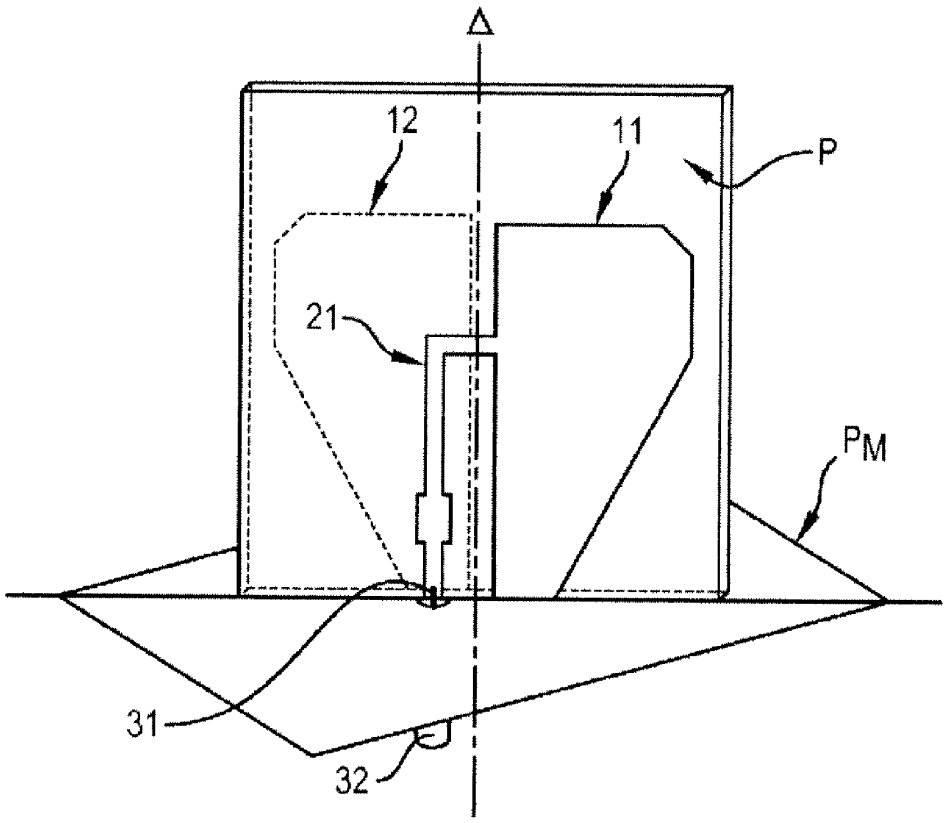
Publication Classification

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

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

(57) **ABSTRACT**

The invention relates to a broadband antenna, including: a floorplan (P_M); at least one assembly including: a layer (P) of a dielectric material arranged perpendicularly to the floorplan (P_M), the layer having a given thickness; a first metal member (**11**) arranged on a surface of the layer (P); a second metal member (**12**) arranged on a surface of the layer (P) opposite the surface receiving the first metal member such that the metal members are not opposite each other; a power line combined with one of the two metal members, the power line extending from the edge of the metal member closest to a central axis of symmetry (Δ) of the antenna towards the floorplan (P_M).



US 20120112969A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2012/0112969 A1

(43) Pub. Date: May 10, 2012

Caballero et al.

(54) ANTENNA SYSTEM WITH RECEIVER DIVERSITY AND TUNABLE MATCHING CIRCUIT

(76) Inventors: **Ruben Caballero**, San Jose, CA (US); **Mattia Pascolini**, Campbell, CA (US); **Mohit Narang**, Cupertino, CA (US); **Matt A. Mow**, Los Altos, CA (US); **Robert W. Schlub**, Cupertino, CA (US)

(21) Appl. No.: **12/941,010**

(22) Filed: **Nov. 5, 2010**

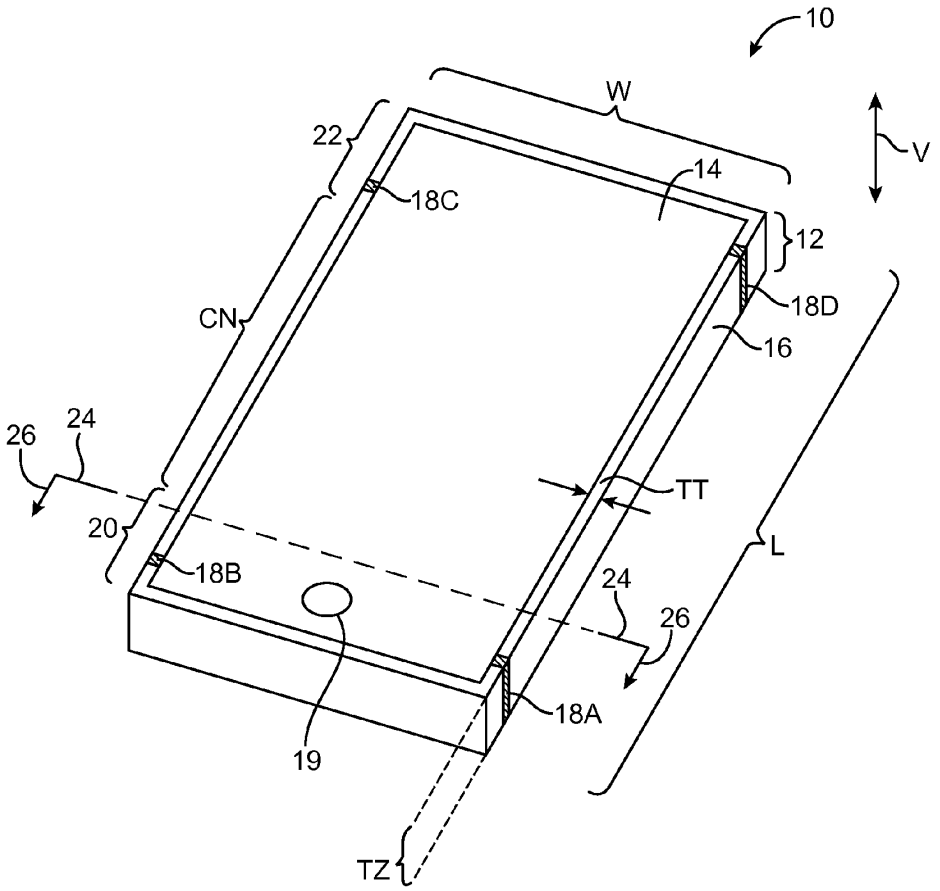
Publication Classification

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

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

(57) **ABSTRACT**

Electronic devices may be provided that contain wireless communications circuitry. The wireless communications circuitry may include radio-frequency transceiver circuitry and antenna structures. An electronic device may include a display mounted within a housing. A peripheral conductive member may run around the edges of the display and housing. Dielectric-filled gaps may divide the peripheral conductive member into individual segments. A ground plane may be formed within the housing from conductive housing structures, printed circuit boards, and other conductive elements. The ground plane and the segments of the peripheral conductive member may form antennas in upper and lower portions of the housing. The radio-frequency transceiver circuitry may implement receiver diversity using both the upper and lower antennas. The lower antenna may be used in transmitting signals. The upper antenna may be tuned using a tunable matching circuit.



US 20120112971A1

(19) **United States**

(12) **Patent Application Publication**

Takeyama et al.

(10) **Pub. No.: US 2012/0112971 A1**

(43) **Pub. Date: May 10, 2012**

(54) **ANTENNA UNIT AND PORTABLE WIRELESS DEVICE EQUIPPED WITH THE SAME**

(75) Inventors: **Kazuhiko Takeyama**, Ishikawa (JP); **Kenji Yanagi**, Kanagawa (JP); **Masao Otani**, Kanagawa (JP)

(73) Assignee: **PANASONIC CORPORATION**, Osaka (JP)

(21) Appl. No.: **13/380,356**

(22) PCT Filed: **Apr. 28, 2010**

(86) PCT No.: **PCT/JP2010/003070**

§ 371 (c)(1), (2), (4) Date: **Dec. 22, 2011**

(30) **Foreign Application Priority Data**

Jun. 24, 2009 (JP) 2009-150009
Mar. 11, 2010 (JP) 2010-054642

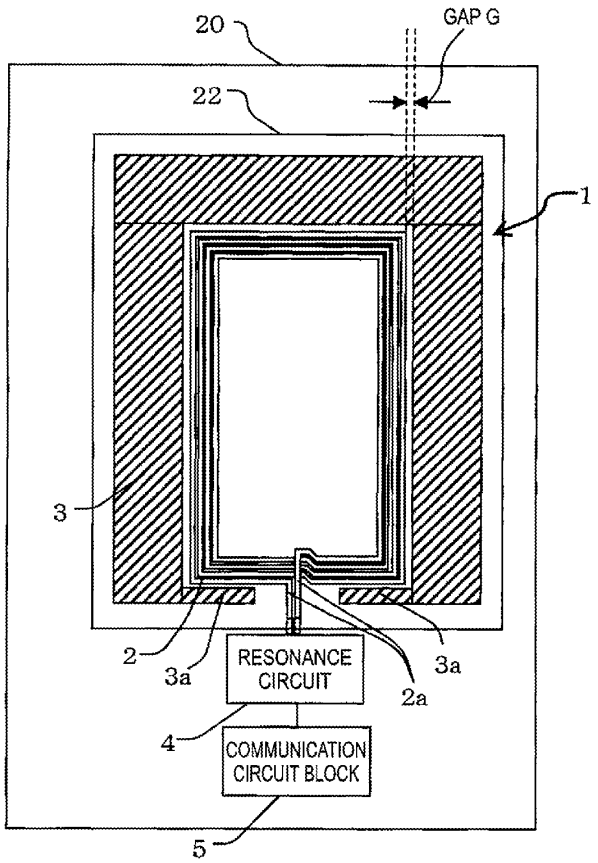
Publication Classification

(51) **Int. Cl.**
H01Q 7/00 (2006.01)
H01Q 1/24 (2006.01)

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

(57) **ABSTRACT**

It is an object to provide an antenna unit capable of operating in response to a plurality of types of counterpart equipment that operate at different resonance frequencies while enhancing its passing characteristic, as well as providing a portable wireless device equipped with the antenna unit. An antenna unit that performs wireless communication originating from induction coupling includes a loop antenna coiled by a conductor in a planar shape; and a metallic plate that is positioned while displaced from the loop antenna in one direction and that partially encloses a circumference of the loop antenna when viewed from the direction, wherein each of ends of the metallic plate overlaps a portion of the loop antenna when viewed from the direction.



US 20120112972A1

(19) **United States**

(12) **Patent Application Publication**

Ogawa

(10) **Pub. No.: US 2012/0112972 A1**

(43) **Pub. Date: May 10, 2012**

(54) **ANTENNA DEVICE**

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

(73) Assignee: **PANASONIC CORPORATION**, Osaka (JP)

(21) Appl. No.: **13/383,386**

(22) PCT Filed: **Jul. 15, 2010**

(86) PCT No.: **PCT/JP2010/004614**

§ 371 (c)(1),
(2), (4) Date: **Jan. 10, 2012**

(30) **Foreign Application Priority Data**

Jul. 16, 2009 (JP) 2009-168139
Jul. 7, 2010 (JP) 2010-154865

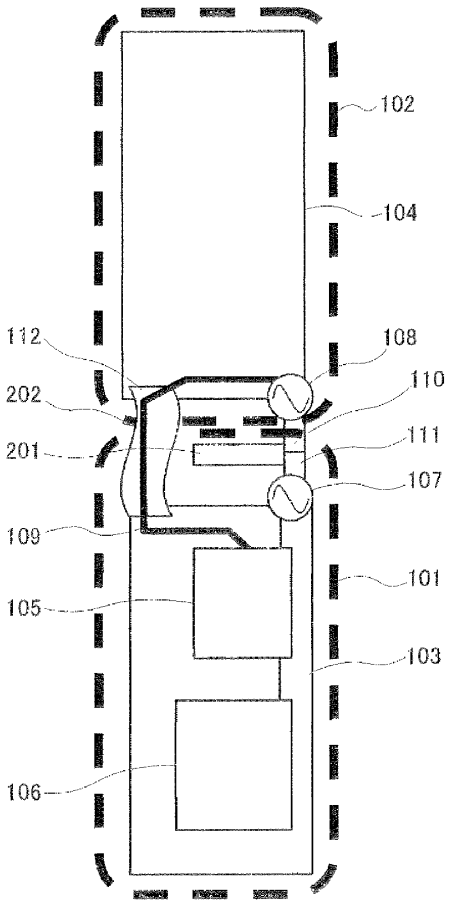
Publication Classification

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

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

(57) **ABSTRACT**

Disclosed is an antenna device that improves the antenna gain and reduces the correlation for a MIMO antenna. Said antenna device is provided with a first housing (**101**) and a second housing (**102**). In a folding handheld terminal wherein the first housing (**101**) and the second housing (**102**) are rotatably connected by a hinge (**202**), the first housing (**101**) is provided with a first power-supply unit (**107**) and the second housing (**102**) is provided with a second power-supply unit (**108**). An antenna element (**201**) is provided inside the first housing (**101**) near the hinge (**202**). One end of the antenna element is open, and the first power-supply unit (**107**) and second power-supply unit (**108**) supply power through the other end of the antenna.



US 20120112973A1

(19) **United States**

(12) **Patent Application Publication**

Ryou et al.

(10) **Pub. No.: US 2012/0112973 A1**

(43) **Pub. Date: May 10, 2012**

(54) **ANTENNA OF RESONANCE FREQUENCY VARIABLE TYPE**

(76) Inventors: **Byung Hoon Ryou**, Seoul (KR); **Won Mo Sung**, Gyeonggi-do (KR); **Jeong Pyo Kim**, Seoul (KR)

(21) Appl. No.: **12/673,163**

(22) PCT Filed: **Aug. 13, 2008**

(86) PCT No.: **PCT/KR08/04685**

§ 371 (c)(1),
(2), (4) Date: **Jul. 9, 2010**

(30) **Foreign Application Priority Data**

Aug. 13, 2007 (KR) 10-2007-0081227

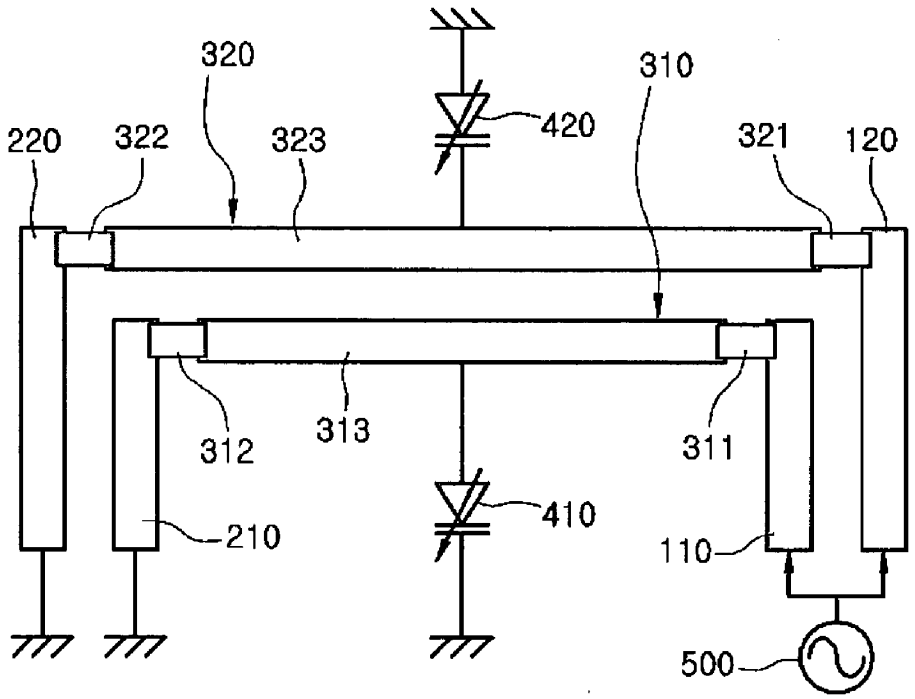
Publication Classification

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

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

(57) **ABSTRACT**

The present invention relates to a resonance frequency variable type antenna which has as low operating frequency as mobile broadcasting service bands of T-DMB and DVB-H and a wide frequency bandwidth and can select and receive various channels using a loop antenna capable of varying a resonance frequency through a variable capacitor. Particularly, the resonance frequency variable antenna can be mounted in a limited space, use two different service bands (T-DMB and DVB-H) and independently operate for the two service bands to achieve high-quality mobile broadcasting services. Accordingly, various mobile broadcasting services can be provided using a single antenna and the product values and reliabilities of the resonance frequency variable type antenna of the invention and mobile terminals including the resonance frequency variable antenna of the invention can be improved.



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(19) **United States**

(12) **Patent Application Publication**

HUANG et al.

(10) **Pub. No.: US 2012/0112982 A1**

(43) **Pub. Date: May 10, 2012**

(54) **SILICON-BASED SUSPENDING ANTENNA WITH PHOTONIC BANDGAP STRUCTURE**

(75) Inventors: **I-YU HUANG**, KAOHSIUNG (TW); **CHIAN-HAO SUN**, KAOHSIUNG (TW); **KUO-YI HSU**, TAICHUNG (TW)

(73) Assignee: **INDUSTRIAL TECHNOLOGY RESEARCH INSTITUTE**, HSINCHU (TW)

(21) Appl. No.: **13/034,025**

(22) Filed: **Feb. 24, 2011**

(30) **Foreign Application Priority Data**

Nov. 8, 2010 (TW) 099138398

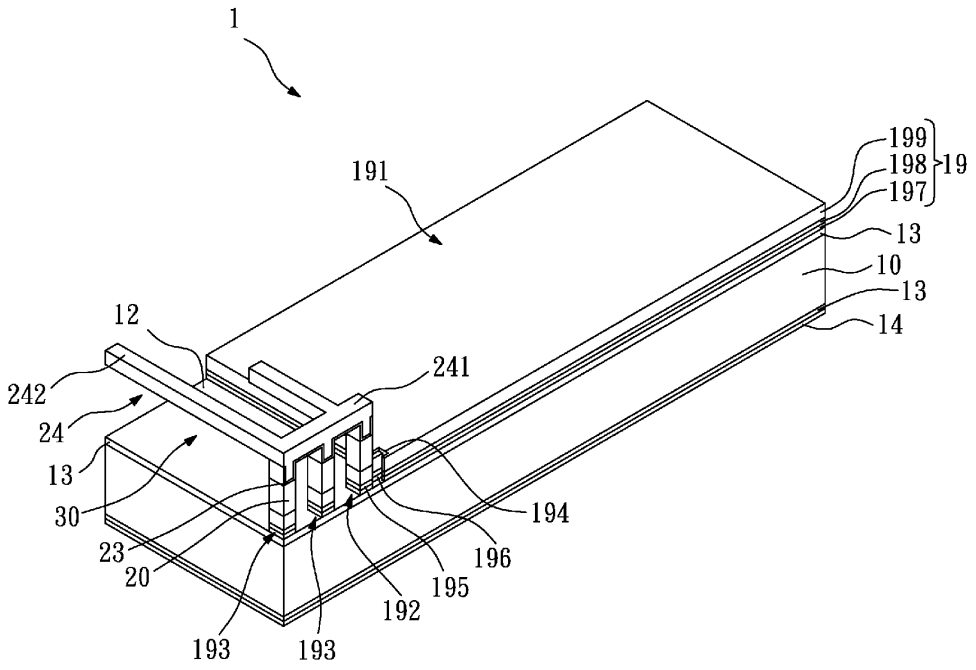
Publication Classification

(51) **Int. Cl.**
H01Q 1/12 (2006.01)
B05D 5/12 (2006.01)

(52) **U.S. Cl.** **343/890**; 427/77

(57) **ABSTRACT**

The disclosure provides a silicon-based suspending antenna with photonic bandgap structure which manufactured by IC thin film process, surface micromachining and bulk Micro-machining are provided. The silicon-based suspending antenna with photonic bandgap structure includes a silicon substrate, an electrode layer, a spacing part and an F-shaped structure. The silicon substrate has a first side surface and a second side surface oppositing to the first surface, the first side surface has a plurality of regular recesses and the second side surface has a longitudinal edge. The electrode layer has a flat part, a first base and at least one second base, in which one side of the flat part has a notch, the first base, the second base and the notch are separately disposed on the second side surface and essentially parallel to the longitudinal edge of the second side surface, the first base has a main body and an extension, and the extension extends from the main body and into the notch. The spacing part is disposed on the second base. The F-shaped structure has a longitudinal part disposed on the spacing part and is parallel to the second side surface.



US 20120114163A1

(19) **United States**

(12) **Patent Application Publication**

YANG

(10) **Pub. No.: US 2012/0114163 A1**

(43) **Pub. Date: May 10, 2012**

(54) **SPEAKER SYSTEM INCLUDING A SPEAKER DEVICE HAVING A SPEAKER UNIT MOUNTED WITH AN ANTENNA**

(76) Inventor: **Chung-Yen YANG**, New Taipei City (TW)

(21) Appl. No.: **13/086,720**

(22) Filed: **Apr. 14, 2011**

(30) **Foreign Application Priority Data**

Nov. 9, 2010 (TW) 099138483

Publication Classification

(51) **Int. Cl.**

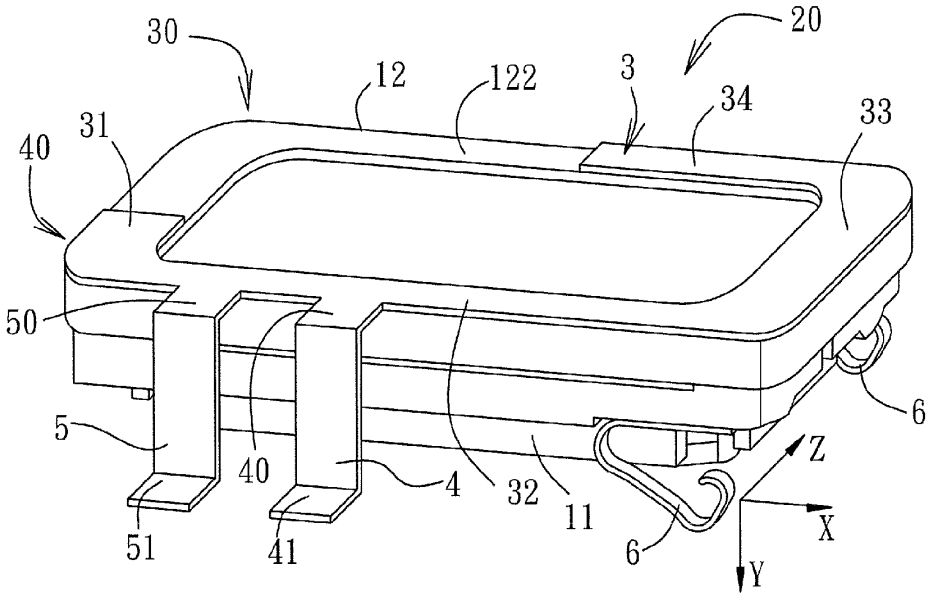
H04R 1/02 (2006.01)

H04R 25/00 (2006.01)

(52) **U.S. Cl.** **381/386**; 381/150

(57) **ABSTRACT**

A speaker system includes a circuit board and a speaker device disposed on the circuit board. The speaker device includes a speaker unit for generating an audio output, and an antenna directly mounted on the speaker unit for radiating and receiving radio waves.



US 20120115336A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2012/0115336 A1

(43) Pub. Date: May 10, 2012

Kanazawa et al.

(54) **SLIDE-TYPE WIRELESS TERMINAL APPARATUS**

(75) Inventors: **Masaru Kanazawa**, Kawasaki (JP); **Zhao Liu**, Kawasaki (JP); **Kouji Soekawa**, Kawasaki (JP)

(73) Assignee: **FUJITSU LIMITED**, Kawasaki-shi (JP)

(21) Appl. No.: **13/239,808**

(22) Filed: **Sep. 22, 2011**

(30) **Foreign Application Priority Data**

Nov. 5, 2010 (JP) 2010-249185

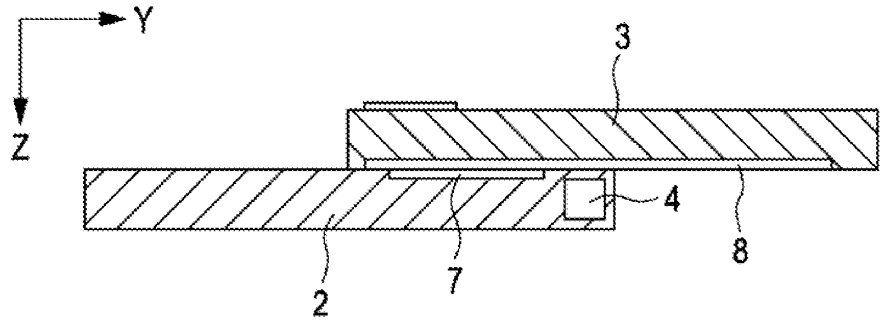
Publication Classification

(51) **Int. Cl.**
H01R 41/00 (2006.01)

(52) **U.S. Cl.** **439/32**

(57) **ABSTRACT**

A slide-type wireless terminal apparatus includes a first casing and a second casing slidable relative to the first casing. The wireless terminal apparatus includes a first circuit board which is provided in the first casing, an antenna which is provided in the first casing, a second circuit board which is provided in the second casing, a sliding member which is disposed between the first circuit board and the second circuit board, the sliding member including a portion which faces the antenna, the sliding member having electrical conductivity and being electrically connected to the first circuit board, and a guide member which is provided in the second casing, the guide member being for guiding the sliding member such that the sliding member slides relative to the guiding member.



US 20120115428A1

(19) **United States**

(12) **Patent Application Publication**

Rudberg

(10) **Pub. No.: US 2012/0115428 A1**

(43) **Pub. Date: May 10, 2012**

(54) **ANTENNA DIVERSITY METHOD WITH FALLBACK AND WEIGHTING**

(76) Inventor: **Mikael Rudberg**, Linkoeping (SE)

(21) Appl. No.: **13/288,016**

(22) Filed: **Nov. 2, 2011**

Related U.S. Application Data

(63) Continuation of application No. 11/066,801, filed on Feb. 25, 2005, now Pat. No. 8,064,862.

(30) **Foreign Application Priority Data**

Feb. 27, 2004 (SE) 0400492-5

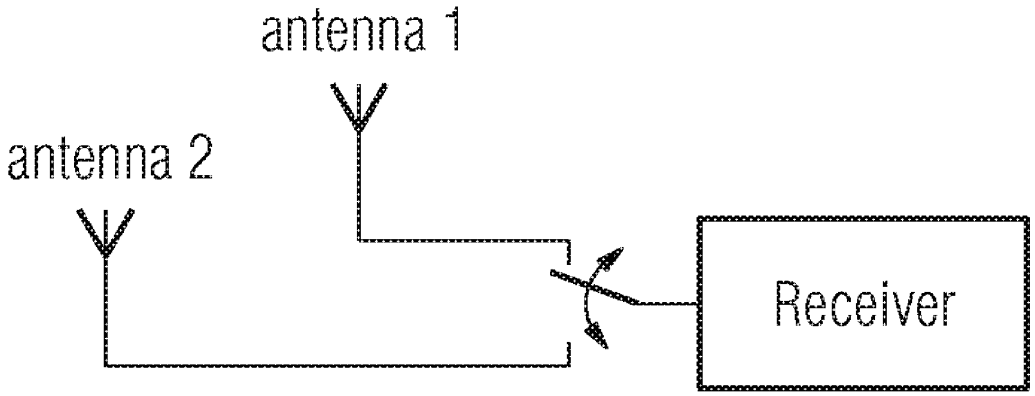
Publication Classification

(51) **Int. Cl.**
H04W 24/00 (2009.01)

(52) **U.S. Cl.** **455/226.2**

(57) **ABSTRACT**

In a radio communication station having antennas an antenna diversity system and a gain controllable amplifier the gain of the gain controllable amplifier is set by using a first antenna, the signal levels of signals received at the antennas is measured, a group of antennas is determined having a signal level which exceeds the signal level of the first antenna by no more than a predetermined value, and out of said group of antennas the antenna with the highest signal level is selected out or the first antenna is selected out if said group is empty.



US 20120119955A1

(19) **United States**

(12) **Patent Application Publication**

(10) **Pub. No.: US 2012/0119955 A1**

(43) **Pub. Date: May 17, 2012**

Milosavljevic et al.

(54) **ADJUSTABLE MULTIBAND ANTENNA AND METHODS**

(76) Inventors: **Zlatoljub Milosavljevic**, Espoo (FI); **Heikki Korva**, Tupos (FI)

(21) Appl. No.: **12/919,208**

(22) PCT Filed: **Feb. 18, 2008**

(86) PCT No.: **PCT/FI09/50133**

§ 371 (c)(1),
(2), (4) Date: **Jan. 26, 2012**

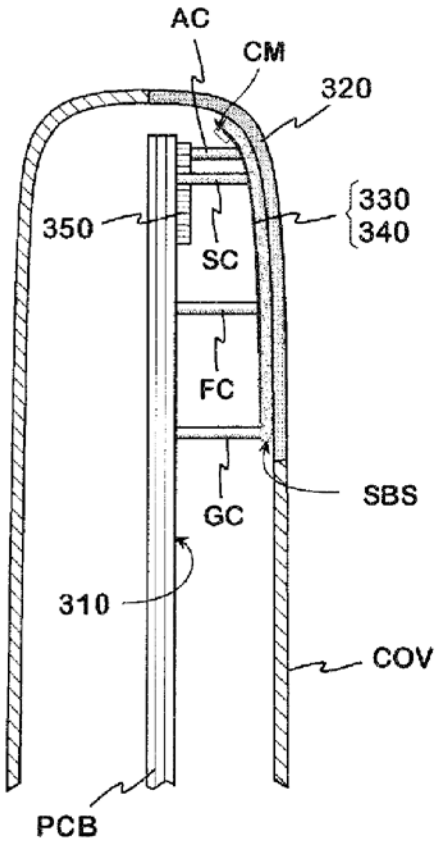
Publication Classification

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

(52) **U.S. Cl.** ..... **343/702**; 343/700 MS; 343/745

(57) **ABSTRACT**

An adjustable multiband antenna especially intended to mobile terminals. The antenna structure comprises a radiator (**320**), a feed element (**330**) and an adjusting circuit (**350**). The radiator is a conductive part of the outer cover (COV) of a radio device or conductive coating of the cover. It is fed electromagnetically by a feed element which is isolated from the radiator by a relatively thin dielectric substrate. The feed element is connected either directly or through an intermediate element (**340**) to the antenna port of the device and to the ground plane (**310**), and it is shaped so that the antenna has at least two operating bands. The adjusting circuit is connected to an adjusting point (AP) in the feed element, and the reactance between the adjusting point and ground and thus the electric size of the antenna can be changed by means of a switch (SW) in the adjusting circuit. Among other things, the component values of the adjusting circuit and the distance between the short-circuit (SP) and adjusting (AP) points in the feed element are variables from the point of view of the antenna adjustment. Displacements, which have desired directions and lengths, are obtained for at least two operation bands of the antenna independently from each other by changing the switch state. The efficiency of the antenna is better than of the corresponding known antennas, and its matching can be made good both in lower and upper operating band of the antenna.



US 20120119958A1

(19) **United States**

(12) **Patent Application Publication**

Uejima et al.

(10) **Pub. No.: US 2012/0119958 A1**

(43) **Pub. Date: May 17, 2012**

(54) **PORTABLE RADIO**

(75) Inventors: **Hiroyuki Uejima**, Ishikawa (JP); **Yoshio Koyanagi**, Kanagawa (JP); **Noriyoshi Sato**, Kanagawa (JP); **Daigo Imano**, Miyagi (JP); **Yasuhiro Nakamura**, Ishikawa (JP)

(73) Assignee: **PANASONIC CORPORATION**, Osaka (JP)

(21) Appl. No.: **13/383,571**

(22) PCT Filed: **Mar. 3, 2010**

(86) PCT No.: **PCT/JP2010/001477**

§ 371 (c)(1), (2), (4) Date: **Jan. 11, 2012**

(30) **Foreign Application Priority Data**

Jul. 16, 2009 (JP) 2009-167999

Publication Classification

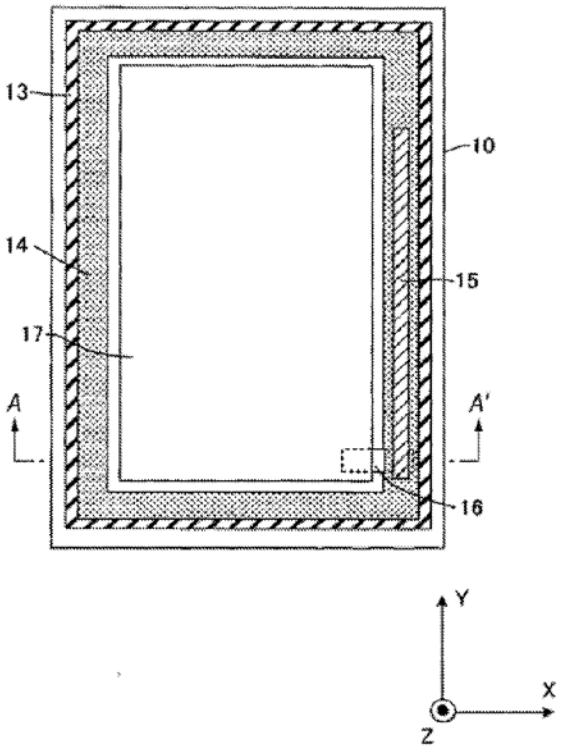
(51) **Int. Cl.**
H01Q 1/24 (2006.01)

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

(57) **ABSTRACT**

There is provided a portable radio capable of facilitating assuring water-tightness of a neighboring area of power feed sections and assuring a stable state of connection between a conductor, such as an antenna, and a circuit board.

A portable radio includes an annular resilient member **13** sandwiched between a first case **11** and a second case **12**; a flexible printed board **14** that is formed integrally with the annular resilient member **13** and that extends toward an area surrounded by the annular resilient member **13**; an antenna section **15** and a first power feed section **19** that are provided on the flexible printed board **14**; a circuit board **17** set in the area surrounded by the annular resilient member **13**; an electric circuit section **18** provided on the circuit board **17**; and a second power feed section **20** electrically connected to the electric circuit section **18**. The first power feed section **19** opposes the annular resilient member **13**, and an inter-space dimension of an area sandwiched between the flexible printed board **14** and a rib **12***b* is smaller than a thickness dimension d**2** of a part of the annular resilient member **13**. that is to be sandwiched in the area, the thickness dimension being achieved under no load conditions, with respect to a direction where the annular resilient member is sandwiched.



US 20120119963A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2012/0119963 A1

(43) Pub. Date: May 17, 2012

SOEKAWA

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

(75) Inventor: **Kouji SOEKAWA**, Kawasaki (JP)

(73) Assignee: **FUJITSU LIMITED**, KAWASAKI-SHI (JP)

(21) Appl. No.: **13/239,994**

(22) Filed: **Sep. 22, 2011**

(30) **Foreign Application Priority Data**

Nov. 11, 2010 (JP) 2010-252779

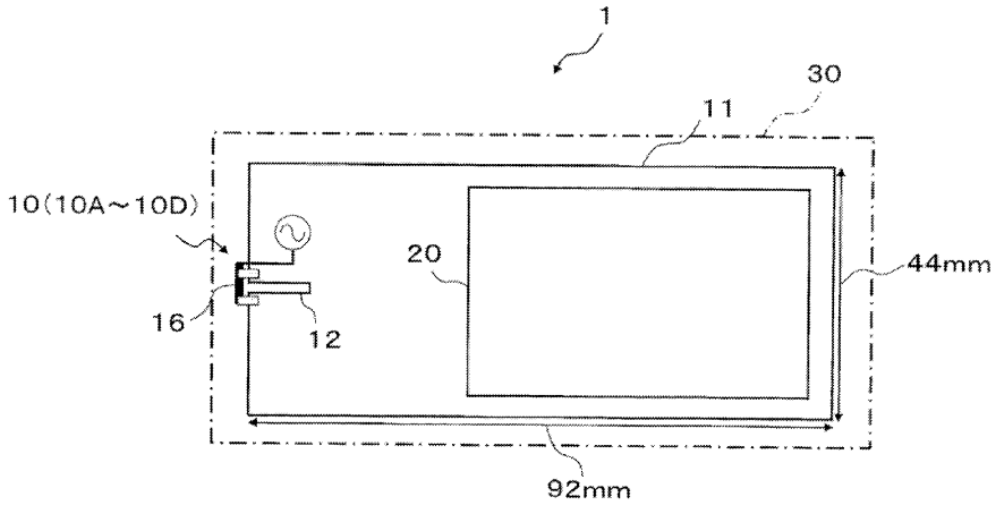
Publication Classification

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

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

(57) **ABSTRACT**

There is provided a radio apparatus which includes an antenna device and a housing to which the antenna device is attached. The antenna device includes a substrate includes an electrically conductive layer with a slit. The slit is formed at an end of the electrically conductive layer so that the slit includes an opening end. The antenna element is electrically coupled with the electrically conductive layer across the opening end via a matching circuit, and receives an electric power through one end of the antenna element.



US 20120119966A1

(19) **United States**

(12) **Patent Application Publication**

GUAN et al.

(10) **Pub. No.: US 2012/0119966 A1**

(43) **Pub. Date: May 17, 2012**

(54) **DIPOLE ANTENNA**

(75) Inventors: **Ning GUAN**, Sakura-shi (JP); **Hiroiku TAYAMA**, Sakura-shi (JP)

(73) Assignee: **FUJIKURA LTD.**, Tokyo (JP)

(21) Appl. No.: **13/356,296**

(22) Filed: **Jan. 23, 2012**

Related U.S. Application Data

(63) Continuation of application No. PCT/JP2010/062445, filed on Jul. 23, 2010.

(30) **Foreign Application Priority Data**

Jul. 24, 2009 (JP) 2009-173614
Jul. 24, 2009 (JP) 2009-173615

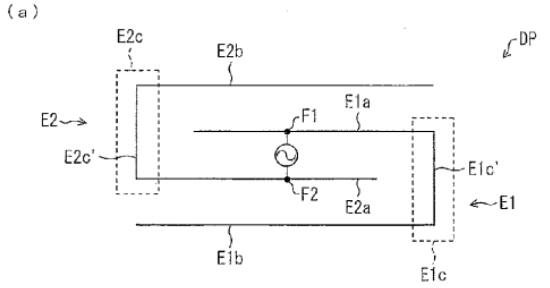
Publication Classification

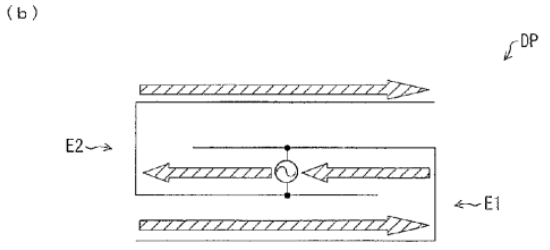
(51) **Int. Cl.**
H01Q 9/16 (2006.01)

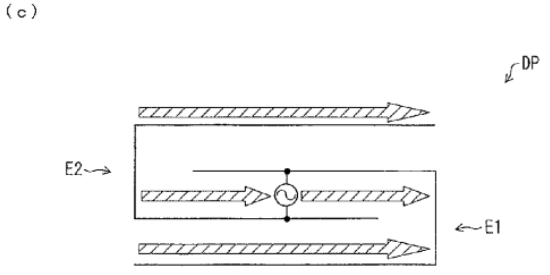
(52) **U.S. Cl.** **343/793**

(57) **ABSTRACT**

A dipole antenna of the present invention is more compact and has a wider bandwidth as compared with a conventional dipole antenna. A dipole antenna (DP) includes antenna elements (E**1**) and (E**2**) on a single plane. (E**1**) includes a linear section (E**1***a*) extending from an end of (E**1**) in a first direction, and a linear section (E**1***b*) connected to (E**1***a*) via a bending section (E**1***c*), (E**1***b*) extending from (E**1***c*) in a direction opposite to the first direction. (E**2**) includes a linear section (E**2***a*) extending from an end of (E**2**) in the direction opposite to the first direction, and a linear section (E**2***b*) connected to (E**2***a*) via a bending section (E**2***c*), (E**2***b*) extending from (E**2***c*) in the first direction. (E**1**) and (E**2**) are such that (E**1***a*) is provided between (E**2***a*) and (E**2***b*), and (E**2***a*) is provided between (E**1***a*) and (E**1***b*).







US 20120119967A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2012/0119967 A1

(43) Pub. Date: May 17, 2012

Qi et al.

(54) **ANTENNA WITH NEAR-FIELD RADIATION CONTROL**

(75) Inventors: **Yihong Qi**, Waterloo (CA); **Perry Jarmuszewski**, Waterloo (CA); **Adam D. Stevenson**, Waterloo (CA)

(73) Assignee: **RESEARCH IN MOTION LIMITED**, Waterloo (CA)

(21) Appl. No.: **13/358,126**

(22) Filed: **Jan. 25, 2012**

Related U.S. Application Data

(63) Continuation of application No. 13/156,728, filed on Jun. 9, 2011, now Pat. No. 8,125,397, which is a continuation of application No. 12/474,075, filed on May 28, 2009, now Pat. No. 7,961,154, which is a continuation of application No. 11/774,383, filed on Jul. 6, 2007, now Pat. No. 7,541,991, which is a continuation of application No. 10/940,869, filed on Sep. 14, 2004, now Pat. No. 7,253,775, which is a continuation of application No. 10/317,659, filed on Dec. 12, 2002, now Pat. No. 6,791,500.

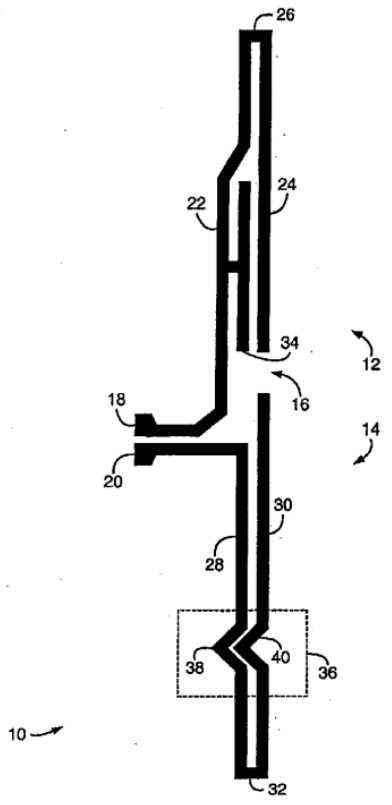
Publication Classification

(51) **Int. Cl.**
H01Q 9/26 (2006.01)
H01Q 19/02 (2006.01)

(52) **U.S. Cl.** **343/804**; 343/818

(57) **ABSTRACT**

An antenna and a wireless mobile communication device incorporating the antenna are provided. The antenna includes a first conductor section electrically coupled to a first feeding point, a second conductor section electrically coupled to a second feeding point, and a near-field radiation control structure adapted to control characteristics of near-field radiation generated by the antenna. Near-field radiation control structures include a parasitic element positioned adjacent the first conductor section and configured to control characteristics of near-field radiation generated by the first conductor section, and a diffuser in the second conductor section configured to diffuse near-field radiation generated by the second conductor section into a plurality of directions.



US 20120119970A1

(19) **United States**

(12) **Patent Application Publication**

WENG

(10) **Pub. No.: US 2012/0119970 A1**

(43) **Pub. Date: May 17, 2012**

(54) **MULTIBAND ANTENNA**

(75) Inventor: **YI-HSIEN WENG**, Taoyuan (TW)

(73) Assignee: **FOXCONN COMMUNICATION TECHNOLOGY CORP.**, Taoyuan County (TW)

(21) Appl. No.: **13/095,741**

(22) Filed: **Apr. 27, 2011**

(30) **Foreign Application Priority Data**

Nov. 15, 2010 (TW) 99139212

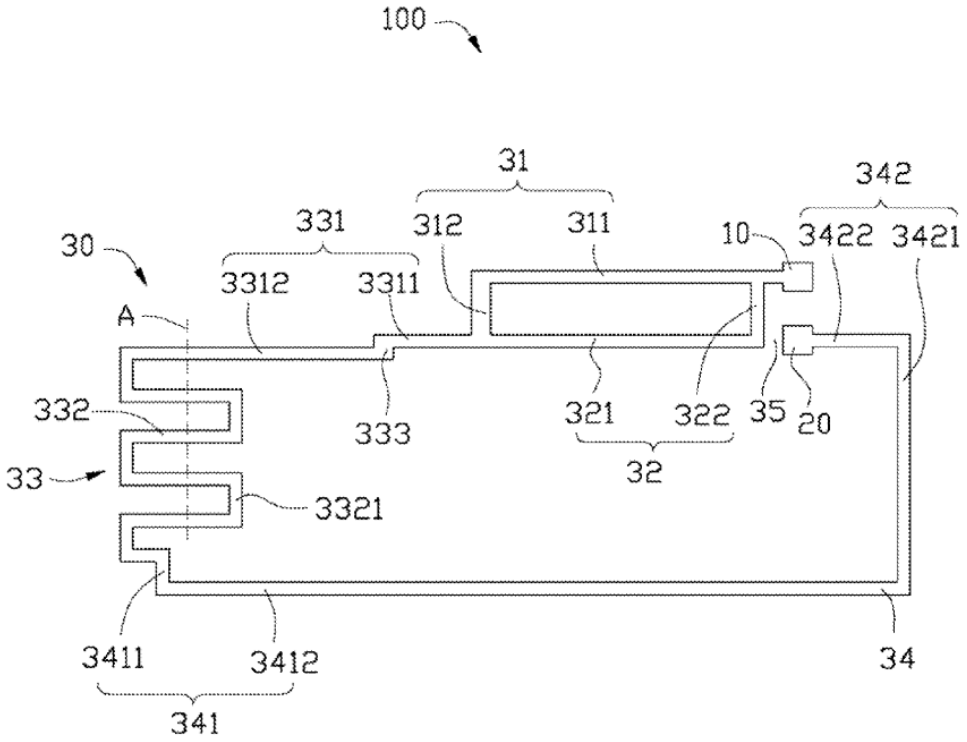
Publication Classification

(51) **Int. Cl.**
H01Q 5/01 (2006.01)
H01Q 11/12 (2006.01)

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

(57) **ABSTRACT**

A multiband antenna includes a feeding end, a ground end, and a main body. The main body includes a first radiating path, a second radiating path, a main radiating portion and a transmitting portion. The main radiating portion connected to the feeding end by the first and second radiating paths. The transmitting portion is connected to the main radiating portion and the ground end. The first and second radiating paths, the main radiating portion and the transmitting portion are coplanar.



US 20120122522A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2012/0122522 A1

(43) Pub. Date: May 17, 2012

JANG et al.

(54) **MOBILE TERMINAL DEVICE FOR RECEIVING DUAL BAND SIGNAL USING MULTIPLE RESONANCE ANTENNA**

(75) Inventors: **Kwang Seok JANG**, Suwon-si (KR); **Dae Chul KANG**, Hwaseong-si (KR); **Jae Ho HWANG**, Yongin-si (KR)

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

(21) Appl. No.: **13/291,575**

(22) Filed: **Nov. 8, 2011**

(30) **Foreign Application Priority Data**

Nov. 11, 2010 (KR) 10-2010-0111961

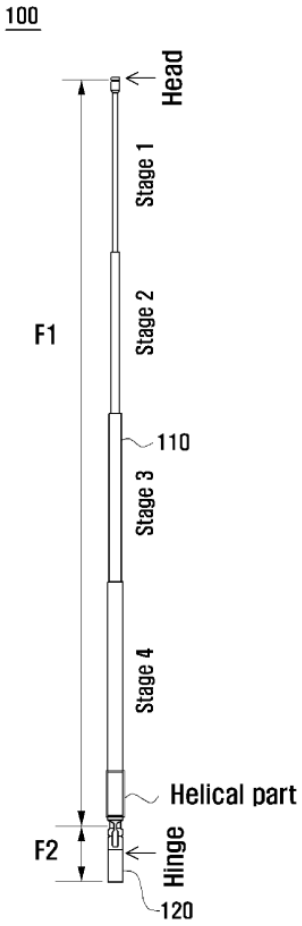
Publication Classification

(51) **Int. Cl.**
H04W 88/02 (2009.01)

(52) **U.S. Cl.** **455/557**; 455/550.1; 455/569.1

(57) **ABSTRACT**

A mobile terminal device for receiving a dual band signal using a multiple resonance antenna in a mobile terminal is provided. The mobile terminal device includes a multiple resonance antenna, a first band filter connecting with the multiple resonance antenna, for filtering a first band signal of a low band received through the multiple resonance antenna, a second band filter connecting with the multiple resonance antenna, for filtering a second band signal of a high band received through the multiple resonance antenna, and a signal processor including a first signal processing unit for converting a frequency of the first band signal to generate a first baseband signal and a second signal processing unit for converting a frequency of the second band signal to generate a second baseband signal, and for activating a corresponding signal processing unit according to selection of a user.



US 20120127036A1

(19) **United States**

(12) **Patent Application Publication**

YANG et al.

(10) **Pub. No.: US 2012/0127036 A1**

(43) **Pub. Date: May 24, 2012**

(54) **CAPACITIVE ANTENNA STRUCTURE**

(75) Inventors: **Tsai-Yi YANG**, Kuntien Hsiang (TW); **Wei-Hung Hsu**, Kuntien Hsiang (TW)

(73) Assignee: **Cirocomm Technology Corp.**

(21) Appl. No.: **12/950,104**

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

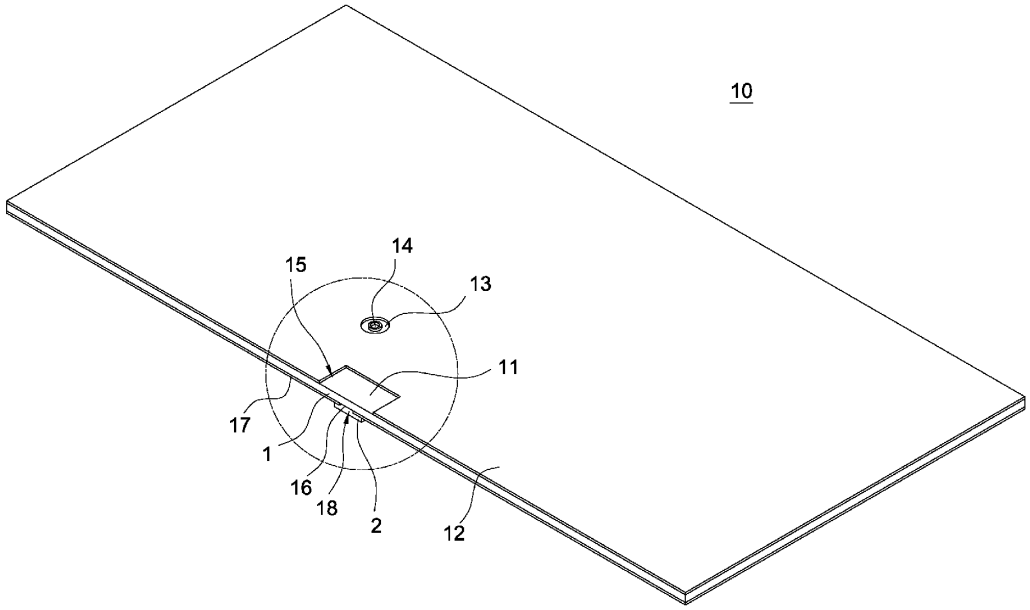
Publication Classification

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

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

(57) **ABSTRACT**

A capacitive antenna structure comprises a substrate and a sheet-shaped capacitor. The substrate has a radiating metal layer and a grounding metal layer thereon. The radiating metal layer has a first groove to expose the front surface of the substrate, the first groove having a signal feeding hole therein and having a second groove on the edge. The grounding metal layer has a third groove on the edge to expose the substrate, the third groove being opposite to the second groove, the third groove having a first contact and a second contact on two sides respectively to electrically connect to the capacitor. The third groove may connect to a fourth groove to expose the substrate, the fourth groove having a signal transmission line therein, and the signal transmission line having the signal feeding hole to connect a cable.



US 20120127038A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2012/0127038 A1

(43) Pub. Date: May 24, 2012

KIM et al.

(54) **MIMO ANTENNA HAVING PLURALITY OF ISOLATION ADJUSTMENT PORTIONS**

(75) Inventors: **Chan-Ho KIM**, Incheon (KR); **Jin-Myung KIM**, Seongnam (KR); **Jae-Ho LEE**, Gumi (KR); **Heung-Ju AHN**, Suwon (KR)

(73) Assignee: **MOBITECH CORP.**, Seoul (KR)

(21) Appl. No.: **13/300,413**

(22) Filed: **Nov. 18, 2011**

(30) **Foreign Application Priority Data**

Nov. 23, 2010 (KR) 10-2010-0116730

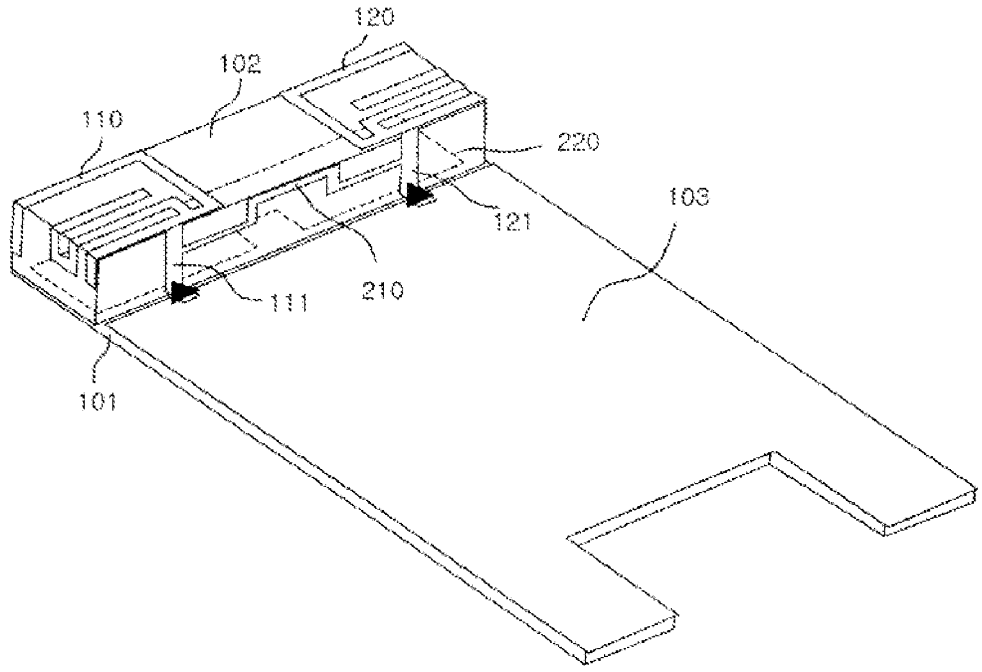
Publication Classification

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

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

(57) **ABSTRACT**

A Multiple-Input and Multiple-Output (MIMO) antenna having a plurality of isolation adjustment portions is provided. The MIMO antenna includes a plurality of radiation elements and a plurality of isolation adjustment portions. The plurality of radiation elements is symmetrically formed on the surfaces of the left and right sides of a dielectric element having a predetermined shape, is spaced apart from each other by a predetermined distance, operates in multiple frequency bands, and includes feeding portions, respectively. The plurality of isolation adjustment portions is coupled to the plurality of radiation elements so that they have electromagnetic characteristics different from those of the plurality of radiation elements, thereby improving isolation in each of the frequency bands in which the plurality of radiation elements operate.



US 20120127040A1

(19) **United States**

(12) **Patent Application Publication**

TANG et al.

(10) **Pub. No.: US 2012/0127040 A1**

(43) **Pub. Date: May 24, 2012**

(54) **ELECTRONIC DEVICE HOUSING ASSEMBLY AND MANUFACTURING METHOD THEREOF**

(75) Inventors: **ZI-MING TANG**, Shenzhen City (CN); **FA-GUANG SHI**, Shenzhen City (CN)

(73) Assignees: **HON HAI PRECISION INDUSTRY CO., LTD.**, Tu-Cheng (TW); **Fu Tai Hua Industry (Shenzhen) Co., Ltd.**, ShenZhen City (CN)

(21) Appl. No.: **13/163,871**

(22) Filed: **Jun. 20, 2011**

(30) **Foreign Application Priority Data**

Nov. 22, 2010 (CN) 201010553222.8

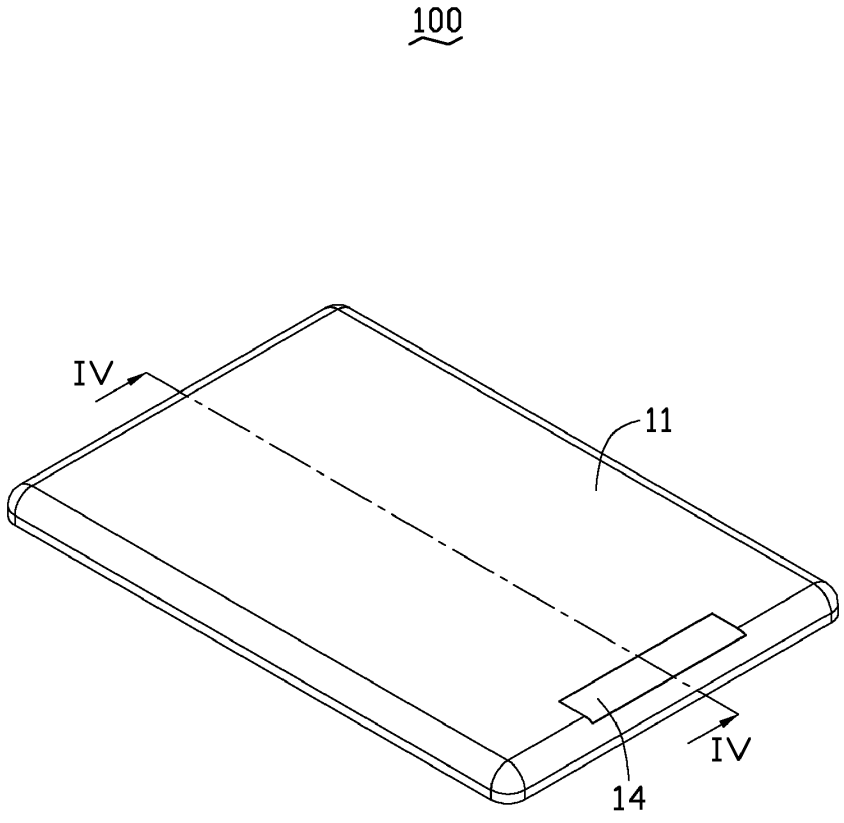
Publication Classification

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

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

(57) **ABSTRACT**

A housing assembly includes an outer housing, a support member, an antenna cover, a foam member, and an adhesive member. The outer housing defines an antenna opening. The support member is positioned in the outer housing, and encloses the antenna opening. The support member defines a receiving portion for receiving an antenna module, and the receiving portion is aligned with the antenna opening. The antenna cover is positioned in the antenna opening. Both of the foam member and the adhesive member are positioned between the support member and the antenna cover, and the foam member surrounds the adhesive member. The adhesive member connects or fixes the antenna cover to the support member. A method of manufacturing the housing assembly is also provided.



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(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2012/0127041 A1

(43) Pub. Date: May 24, 2012

Wang

(54) **MOBILE COMMUNICATION TERMINAL AND MOBILE COMMUNICATION TERMINAL HOUSING SET WITH AN ANTENNA**

(75) Inventor: **Lei Wang**, Shenzhen City (CN)

(73) Assignee: **ZTE CORPORATION**, Shenzhen City, Guangdong (CN)

(21) Appl. No.: **13/259,629**

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

(86) PCT No.: **PCT/CN2009/075719**

§ 371 (c)(1),
(2), (4) Date: **Feb. 2, 2012**

(30) **Foreign Application Priority Data**

Aug. 11, 2009 (CN) 200920172834.5

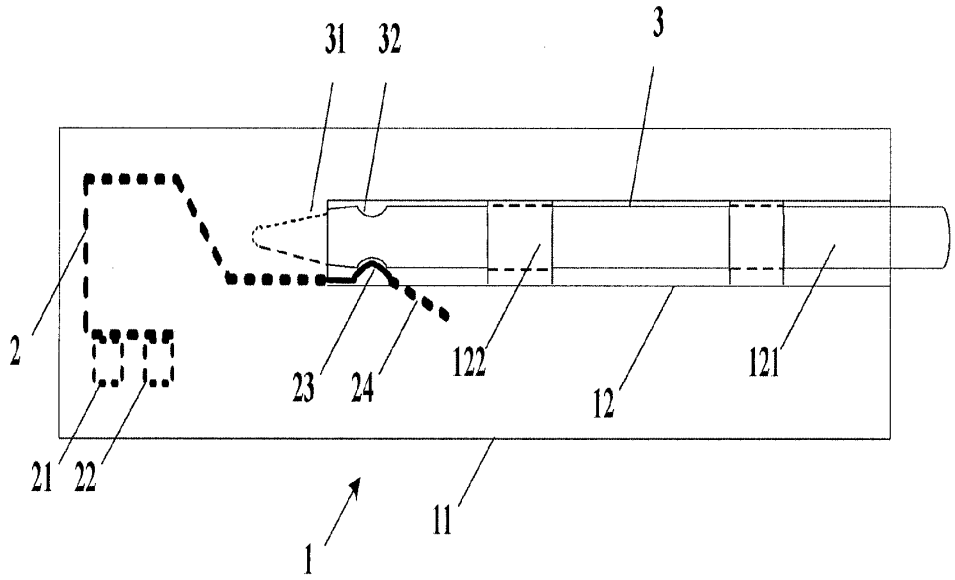
Publication Classification

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

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

(57) **ABSTRACT**

The present invention provides a mobile communication terminal and a mobile communication terminal shell provided with an antenna. The mobile communication terminal comprising a housing, a stylus holding structure for inserting a stylus and provided on the housing, and an antenna positioned in the housing, wherein one end of the antenna is provided with a feed terminal and a ground terminal for connecting a main board; and a portion of the antenna extends into the stylus holding structure, and the portion of the antenna that extends into the stylus holding structure has an elastic bulge which is used to fix the stylus. The mobile communication terminal also comprises a stylus comprising a front end, and the front end is made of an electrical insulation material and contacts with the elastic bulge.



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(19) **United States**

(12) **Patent Application Publication**

Ohishi et al.

(10) **Pub. No.: US 2012/0127042 A1**

(43) **Pub. Date: May 24, 2012**

(54) **COMMUNICATION APPARATUS**

(76) Inventors: **Takafumi Ohishi**, Yokohama-shi (JP); **Noriaki Oodachi**, Kawasaki-shi (JP); **Shuichi Obayashi**, Yokohama-shi (JP)

(21) Appl. No.: **13/361,011**

(22) Filed: **Jan. 30, 2012**

Related U.S. Application Data

(63) Continuation of application No. PCT/JP2009/004773, filed on Sep. 18, 2009.

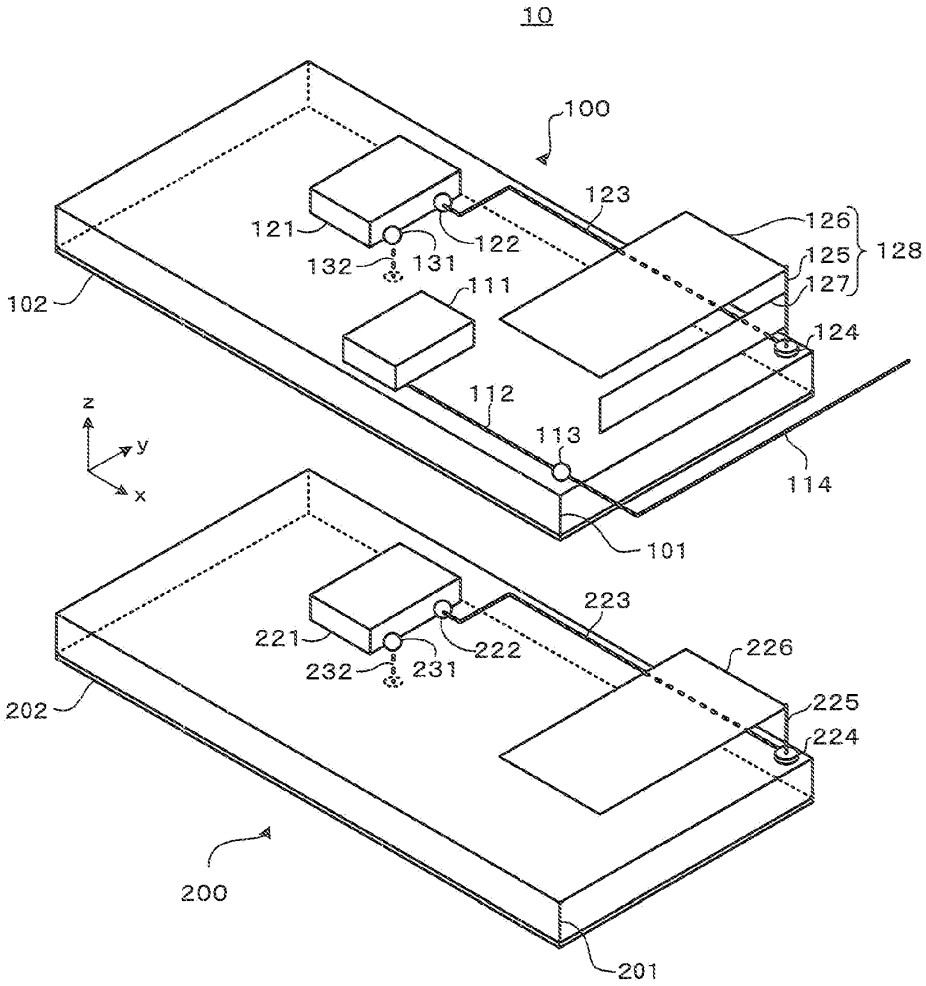
Publication Classification

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

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

(57) **ABSTRACT**

In one embodiment, a communication apparatus includes a substrate, an antenna disposed on the substrate, a first communication part transmitting or receiving a signal at a predetermined frequency via the antenna, a first conductor plate, a terminal disposed on the substrate and connected to the first conductor plate by a conductor line, a second communication part disposed on the substrate, connected electrically to the terminal, and communicating with a communication partner via the first conductor plate, and a second conductor plate connected electrically to the conductor line and having a length of substantially ¼ of the wavelength of the predetermined frequency.



US 20120127044A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2012/0127044 A1

(43) Pub. Date: May 24, 2012

Mashima et al.

(54) PORTABLE WIRELESS DEVICE

(75) Inventors: **Nobuharu Mashima**, Toyama (JP); **Yoshio Koyanagi**, Kanagawa (JP); **Noriyoshi Sato**, Kanagawa (JP)

(73) Assignee: **PANASONIC CORPORATION**, Osaka (JP)

(21) Appl. No.: **13/388,423**

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

(86) PCT No.: **PCT/JP2010/001095**

§ 371 (c)(1), (2), (4) Date: **Feb. 1, 2012**

(30) **Foreign Application Priority Data**

Aug. 7, 2009 (JP) 2009-184693

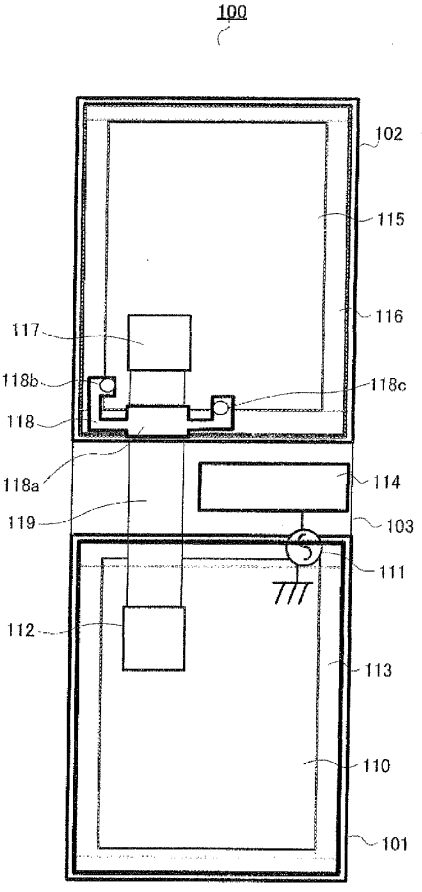
Publication Classification

(51) **Int. Cl.**
H01Q 1/24 (2006.01)
H05K 5/02 (2006.01)

(52) **U.S. Cl.** **343/702**; 361/752

(57) **ABSTRACT**

Provided is a portable wireless device capable of preventing deterioration in performance of an antenna caused by reverse phase current. The portable wireless device (**100**) comprises at least two box-shaped housings each of which is formed by fitting respective annular fitting surfaces of two cases. Further, in the portable wireless device (**100**), a first circuit board (**110**) is provided in a first housing (**101**). A second circuit board (**115**) is provided in a second housing (**102**). A signal line (**119**) electrically connects the first circuit board (**110**) and the second circuit board (**115**). A waterproofing packing (**116**) has an annular shape, and is provided between the fitting surfaces of the two cases and held by the two cases which constitute the second housing (**102**). A conductive element (**118**) is integrally formed with the waterproofing packing (**116**), electrically connected to an end of the second circuit board (**115**), and electrically connected to the signal line (**119**).



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(19) **United States**

(12) **Patent Application Publication**

CHOU

(10) **Pub. No.: US 2012/0127048 A1**

(43) **Pub. Date: May 24, 2012**

(54) **ANTENNA MODULE**

(75) Inventor: **MING-YU CHOU**, Tu-Cheng (TW)

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

(21) Appl. No.: **13/052,206**

(22) Filed: **Mar. 21, 2011**

(30) **Foreign Application Priority Data**

Nov. 23, 2010 (TW) 99140269

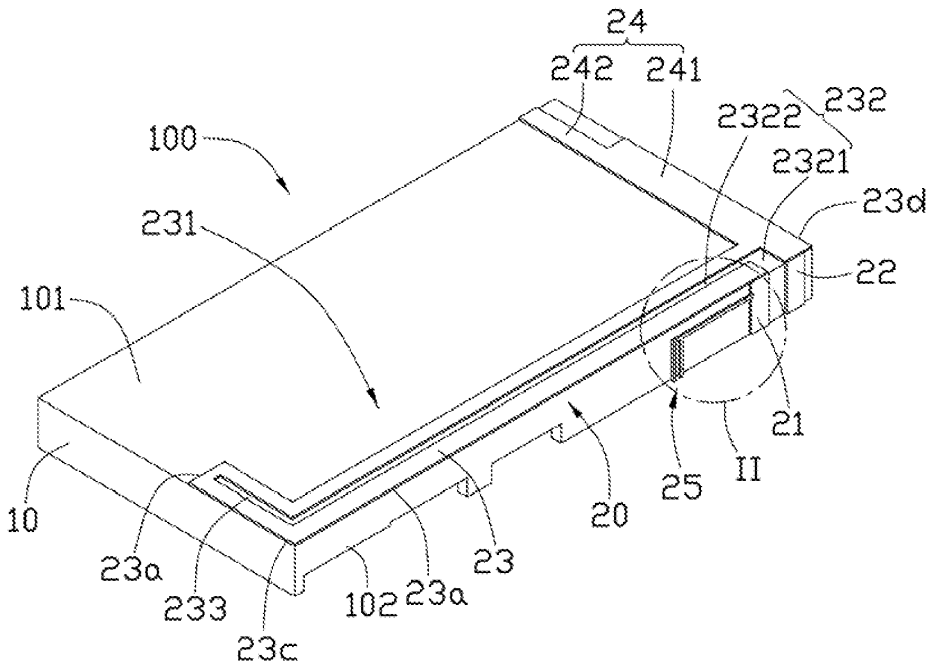
Publication Classification

(51) **Int. Cl.**
H01Q 1/36 (2006.01)
H01Q 9/30 (2006.01)

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

(57) **ABSTRACT**

An antenna includes a first antenna portion, a second antenna portion, a third antenna portion, a feed portion, and a ground portion. The first antenna portion perpendicularly connects to the feed portion and the ground portion. The second antenna portion connects to the first antenna portion. The third antenna portion connects to the feed portion. The first antenna portion and the second antenna portion are both located on a plane perpendicular to the feed portion. The feed portion, the ground portion, and the third antenna portion are coplanar.



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(19) **United States**

(12) **Patent Application Publication**

Chiu et al.

(10) **Pub. No.: US 2012/0127051 A1**

(43) **Pub. Date: May 24, 2012**

(54) **MULTI-BAND DIPOLE ANTENNA**

(75) Inventors: **Chieh-Ping Chiu**, Tianwei (TW); **Feng-Jen Weng**, Kuei Shan Hsiang (TW); **I-Ping Yen**, New Taipei City (TW); **Hsiao-Wei Wu**, Zhongli City (TW)

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

(21) Appl. No.: **13/079,411**

(22) Filed: **Apr. 4, 2011**

(30) **Foreign Application Priority Data**

Nov. 18, 2010 (TW) 099139713

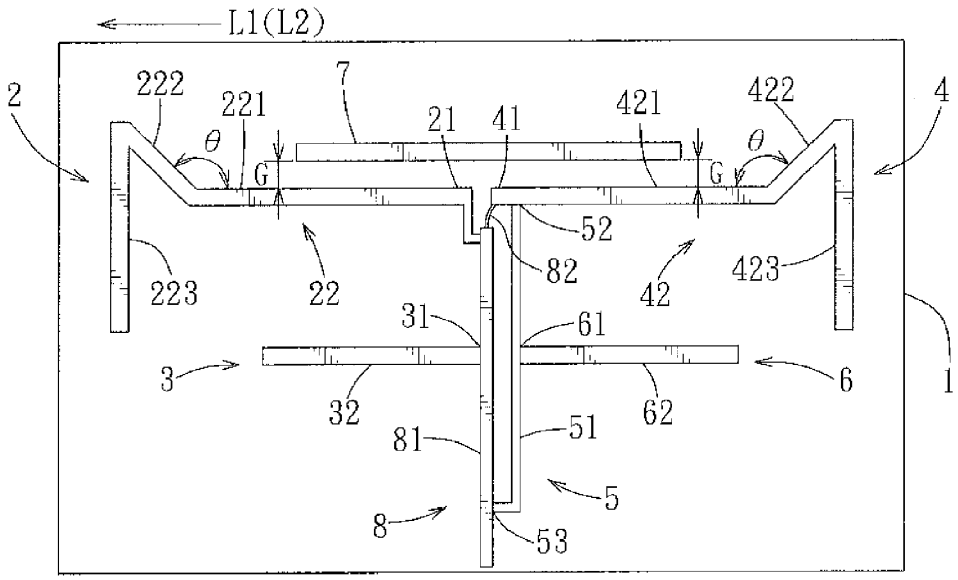
Publication Classification

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

(52) **U.S. Cl.** **343/814**

(57) **ABSTRACT**

A multi-band dipole antenna includes spaced part first and second radiator sections, first and second mirroring radiator sections, and a balun, which are disposed on a substrate. The first mirroring radiator section is symmetrically disposed with respect to the first radiator section and is spaced apart from the first radiator section. The first radiator section and the first mirroring radiator section cooperate to resonate in a first frequency band. The second radiator section cooperates with the second mirroring radiator section to resonate in a second frequency band.



US 20120127055A1

(19) **United States**

(12) **Patent Application Publication**

(10) **Pub. No.: US 2012/0127055 A1**

(43) **Pub. Date: May 24, 2012**

YAMAGAJO

(54) **ANTENNA DEVICE AND WIRELESS COMMUNICATION APPARATUS**

(75) Inventor: **Takashi YAMAGAJO**, Kawasaki (JP)

(73) Assignee: **FUJITSU LIMITED**, Kawasaki-shi (JP)

(21) Appl. No.: **13/207,533**

(22) Filed: **Aug. 11, 2011**

(30) **Foreign Application Priority Data**

Nov. 18, 2010 (JP) 2010-258270

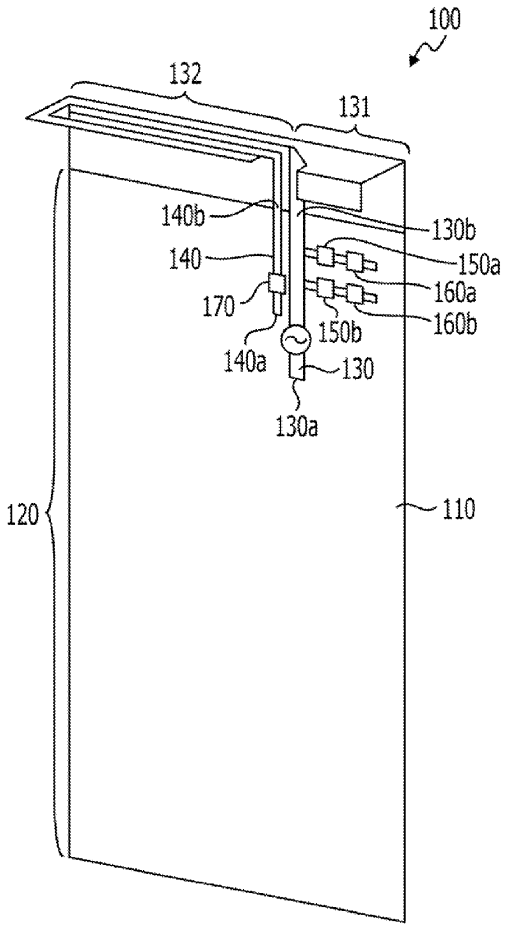
Publication Classification

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

(52) **U.S. Cl.** **343/850**

(57) **ABSTRACT**

An antenna device includes a feed element being of a length that allows resonance in a specified frequency band, a distributed constant feed line grounded at one end and coupled at another end to the feed element to form a feeding point, a reactive element grounded at one end and coupled at another end to a position a specified distance from the feeding point of the feed line, a first switch disposed between the feed line and the reactive element and used to select whether the feed line and the reactive element are coupled or uncoupled, a parasitic element disposed adjacent to the feed element and being of a length that allows resonance in a frequency band different from the frequency band in which the feed element resonates, and a second switch used to select whether the parasitic element is grounded.



US 20120127056A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2012/0127056 A1

(43) Pub. Date: May 24, 2012

Park et al.

(54) **MIMO ANTENNA APPARATUS**

(75) Inventors: **Sung Won Park**, Suwon-si (KR); **Yeon Joo Lee**, Yongin-si (KR)

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

(21) Appl. No.: **13/373,564**

(22) Filed: **Nov. 18, 2011**

(30) **Foreign Application Priority Data**

Nov. 24, 2010 (KR) 10-2010-0117467

Publication Classification

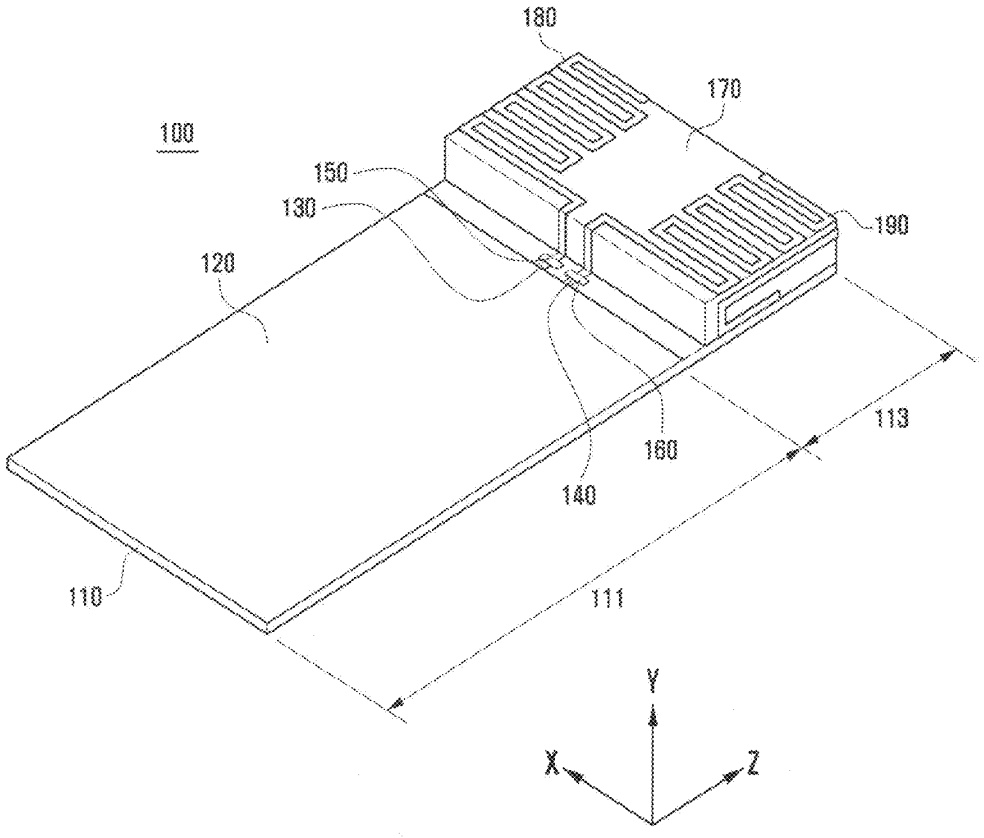
(51) **Int. Cl.**

H01Q 21/28 (2006.01)
H01Q 1/12 (2006.01)
H01Q 1/50 (2006.01)

(52) **U.S. Cl.** **343/853**; 343/893; 343/892

(57) **ABSTRACT**

A MIMO antenna apparatus is provided. The MIMO antenna apparatus includes a plurality of antenna devices each having an operation line extending parallel by a predetermined extension length from one end portion and configured to operate in a resonant frequency band when power is supplied. The apparatus also includes a main board divided into a device area and aground area. The apparatus further includes a plurality of ground pads each extending from the ground plate to the device area in the main board and configured to connect the one end portion of each of the antenna devices to the ground plate. The apparatus also includes a plurality of feeding pads mounted adjacent to the ground pad in the device area and configured to connect each of the antenna devices to the main board and to provide power to each of the antenna devices.



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(19) United States

(12) Patent Application Publication

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(43) Pub. Date: May 24, 2012

SU et al.

(54) ANTENNA FOR PORTABLE DEVICE

(75) Inventors: **TZUN-YAN SU**, Taoyuan County (TW); **CHENG-I CHANG**, Taoyuan County (TW); **YU-TING CHEN**, Taoyuan County (TW)

(73) Assignee: **FOXCONN COMMUNICATION TECHNOLOGY CORP.**, Taoyuan County (TW)

(21) Appl. No.: **13/037,484**

(22) Filed: **Mar. 1, 2011**

(30) **Foreign Application Priority Data**

Nov. 18, 2010 (TW) 99139637

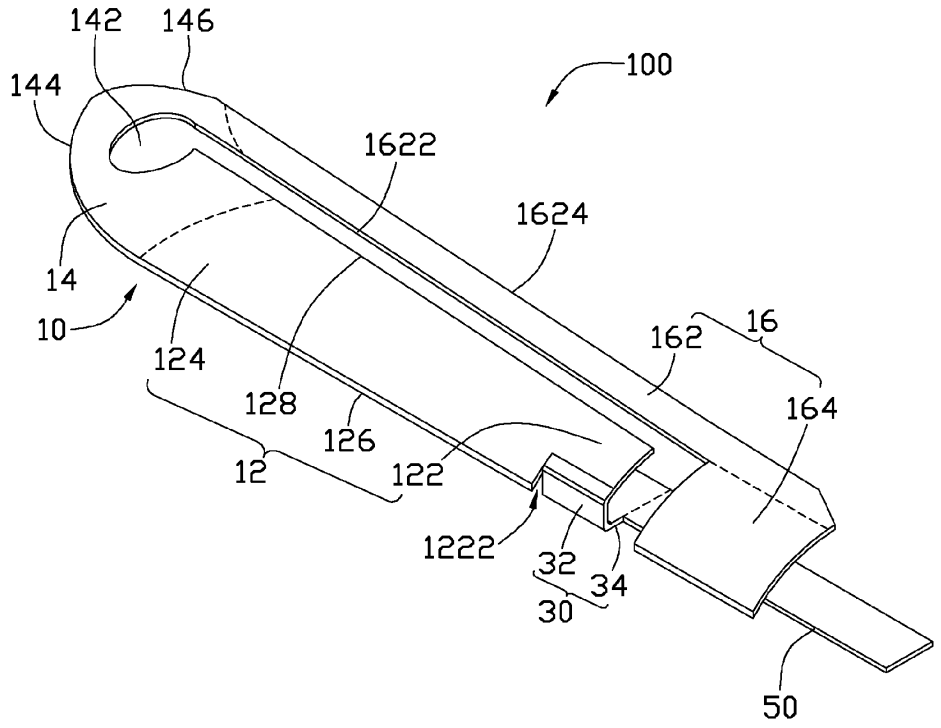
Publication Classification

(51) **Int. Cl.**
H01Q 9/42 (2006.01)

(52) **U.S. Cl.** **343/900**

(57) **ABSTRACT**

The disclosure provides an antenna used for a portable device. The antenna includes a feed portion, a first radiating portion, and a second radiating portion. The first radiating portion connects with the feed portion. The matching portion connects between the first radiating portion and the second radiating portion. The first radiating portion includes an initial end connecting with the feed portion, and a final end connecting with the matching portion. The second radiating portion extends from the matching portion and extends toward the initial end.



US 20120127059A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2012/0127059 A1

(43) Pub. Date: May 24, 2012

Su et al.

(54) **DUAL-BAND ANTENNA**

(75) Inventors: **Jia-hung Su**, Tu Cheng (TW); **Kai Shih**, Tu Cheng (TW)

(73) Assignee: **Cheng Uei Precision Industry Co., LTD.**, Tu Cheng City (TW)

(21) Appl. No.: **12/950,879**

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

Publication Classification

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

(52) **U.S. Cl.** **343/908**

(57) **ABSTRACT**

A dual-band antenna is provided and has a feed base portion, a low-frequency radiation portion and a high-frequency radiation portion. A first end of the feed base portion is bent and extended to form the low-frequency radiation portion which has a first transverse portion, a first longitudinal portion, a second transverse portion, a second longitudinal portion and a third transverse portion. A second end of the feed base portion is bent and extended to form the high-frequency radiation portion which has a third longitudinal portion, a fourth transverse portion and a fourth longitudinal portion. The feed base portion is further bent and extended to form a feed end. The dual-band antenna of the present invention has a roundabout bent structure, so that the dual-band antenna has a better effect for transmitting and receiving electro-magnetic signals of two frequency bands of 900 MHz and 1800 MHz.