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BYUN et al.

(54) METHOD FOR FABRICATING ANTENNA DEVICE OF MOBILE COMMUNICATION TERMINAL

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(21) Appl. No.: **12/841,389**

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

(30) **Foreign Application Priority Data**

Jul. 22, 2009 (KR) 10-2009-0066760

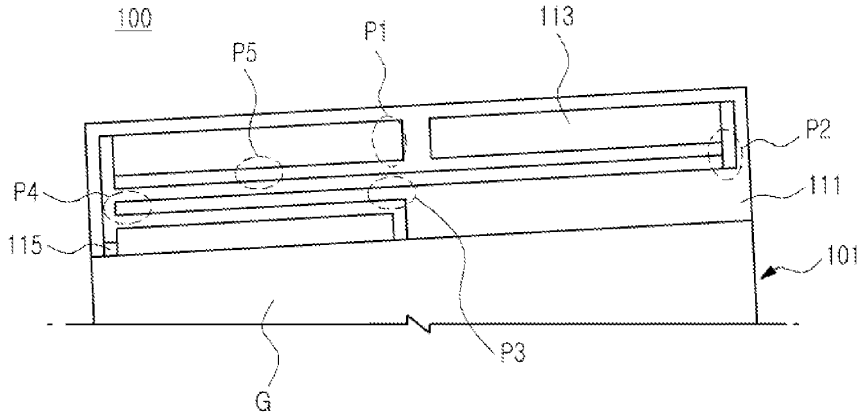
Publication Classification

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

(52) **U.S. Cl.** **29/600**

(57) **ABSTRACT**

A method for fabricating an antenna device of a mobile communication terminal, the method including selecting radiation patterns according to a usable frequency band, selecting and fabricating magneto dielectric modules for adjusting resonance frequencies of the selected radiation patterns, selecting and fabricating dielectric modules for adjusting resonance frequency of the selected radiation patterns, selecting and fabricating a radiation pattern having a number of resonance frequencies required for the terminal from among the radiation patterns selected in the pattern selection step, and selecting at least one of the magneto dielectric modules and the dielectric modules and installing it in the radiation pattern to tune a resonance frequency of the radiation pattern to the resonance frequency required for the terminal.



US 20110018770A1

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(12) Patent Application Publication

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(43) Pub. Date: Jan. 27, 2011

Tang et al.

(54) **BUILT-IN STRAIGHT MOBILE ANTENNA TYPE DUAL BAND ANTENNA ASSEMBLY WITH IMPROVED HAC PERFORMANCE**

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(21) Appl. No.: **12/509,556**

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

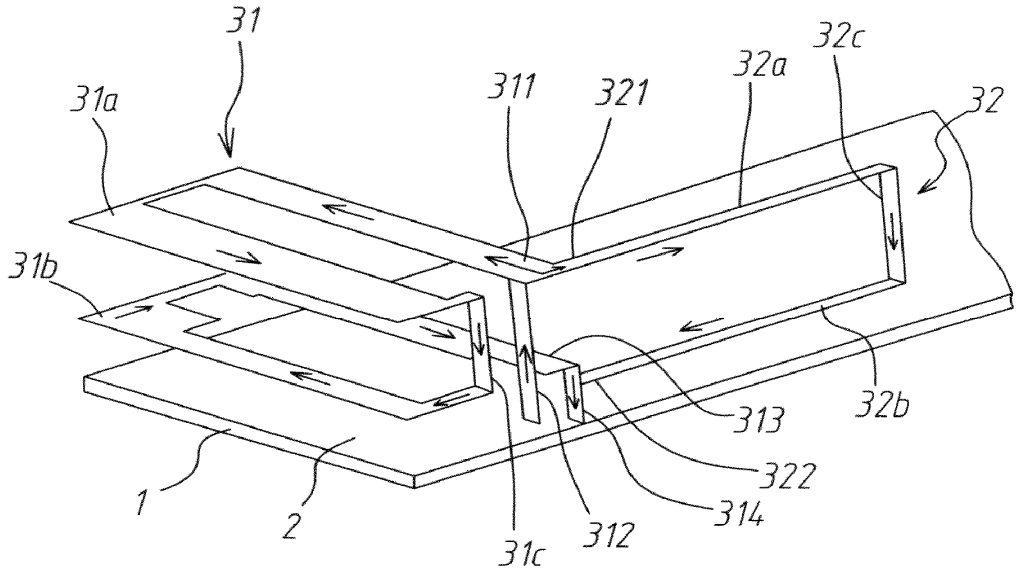
Publication Classification

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

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

(57) **ABSTRACT**

A built-in straight mobile antenna type dual band antenna assembly includes a circuit board, a first radiator transversely arranged on one end of the circuit board and having a first resonance frequency, and a second radiator longitudinally arranged on one lateral side of the circuit board. The first radiator and the second radiator constitute an L-shaped structure for signal input through a feed end, and are connected to a ground plane on the circuit board through a common grounding lug.



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(19) **United States**

(12) **Patent Application Publication**

Hikino

(10) **Pub. No.: US 2011/0018773 A1**

(43) **Pub. Date: Jan. 27, 2011**

(54) **WIRELESS DEVICE**

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(21) Appl. No.: **12/921,528**

(22) PCT Filed: **May 18, 2009**

(86) PCT No.: **PCT/JP2009/059134**

§ 371 (c)(1),
(2), (4) Date: **Sep. 8, 2010**

(30) **Foreign Application Priority Data**

Jun. 19, 2008 (JP) 2008-160792

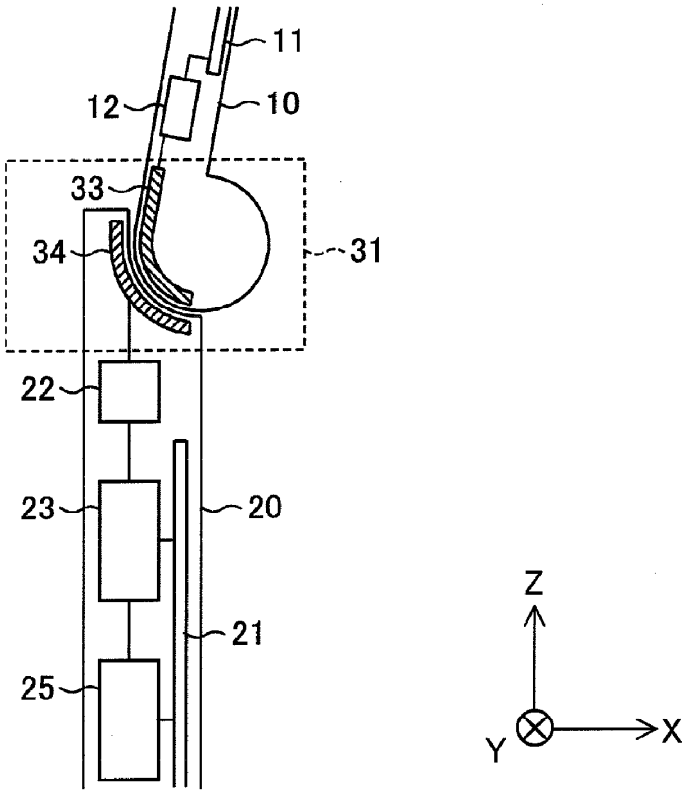
Publication Classification

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

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

(57) **ABSTRACT**

A wireless device, including an antenna different from another antenna included in one of two casings, in a joint part where the two casings are joined together, is capable of reducing deterioration in properties of the antenna included in the joint part. The wireless device (**1**) of the present invention includes: an upper casing (**10**), housing a casing antenna (**11**) that resonates with a first frequency; a lower casing (**20**), housing a matching circuit (**23**) of the casing antenna (**11**); a hinge part (**31**), joining the upper casing (**10**) with the lower casing (**20**), including a built-in antenna (**32**) that resonates with a second frequency different from the first frequency, and including feeding sections (**33**) and (**34**) for coupling the matching circuit (**23**) to the casing antenna (**11**); and transmission elements (**12**) and (**22**), being disposed on at least any one of a signal path that connects the casing antenna (**11**) and the feeding section (**33**) and a signal path that connects the matching circuit (**23**) and the feeding section (**34**), the transmission elements (**12**) and (**22**) (i) giving passage to a signal having the first frequency and (ii) blocking a signal having the second frequency.



US 20110018779A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2011/0018779 A1

(43) Pub. Date: Jan. 27, 2011

Yu et al.

(54) **MOBILE TELECOMMUNICATION TERMINAL**

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(73) Assignee: **Wen LI**, Waterloo, Ontario (CA)

(21) Appl. No.: **12/736,339**

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

(86) PCT No.: **PCT/CN2008/000642**

§ 371 (c)(1),
(2), (4) Date: **Sep. 30, 2010**

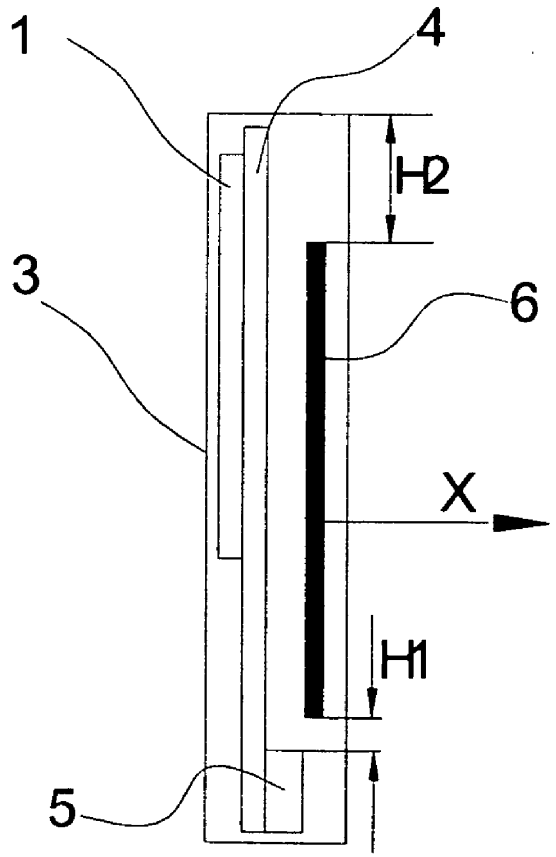
Publication Classification

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

(52) **U.S. Cl.** **343/834**

(57) **ABSTRACT**

A mobile communication terminal comprises a shell, and a backfire antenna which includes a main board disposed in the shell and having a transmitting circuit and a receiving circuit on the main board; a main antenna element coupled to the transmitting circuit and the receiving circuit on the main board; and a backfire resonator located at a side of the shell deviated from a user's head, and coupled to the main board and the main antenna element, in which the backfire resonator is fed by the main board from a position on the main board deviated from a center of the main board. The mobile communication terminal according to embodiment of the present disclosure may cause most electromagnetic waves to radiate towards a direction deviated form the user, thus reducing radiation and harm thereof to the user, strengthening the signal received by the base station, and improving the communication quality.



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(19) **United States**

(12) **Patent Application Publication**

Wu et al.

(10) **Pub. No.: US 2011/0018781 A1**

(43) **Pub. Date: Jan. 27, 2011**

(54) **ULTRA-WIDEBAND ANTENNA**

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(21) Appl. No.: **12/509,442**

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

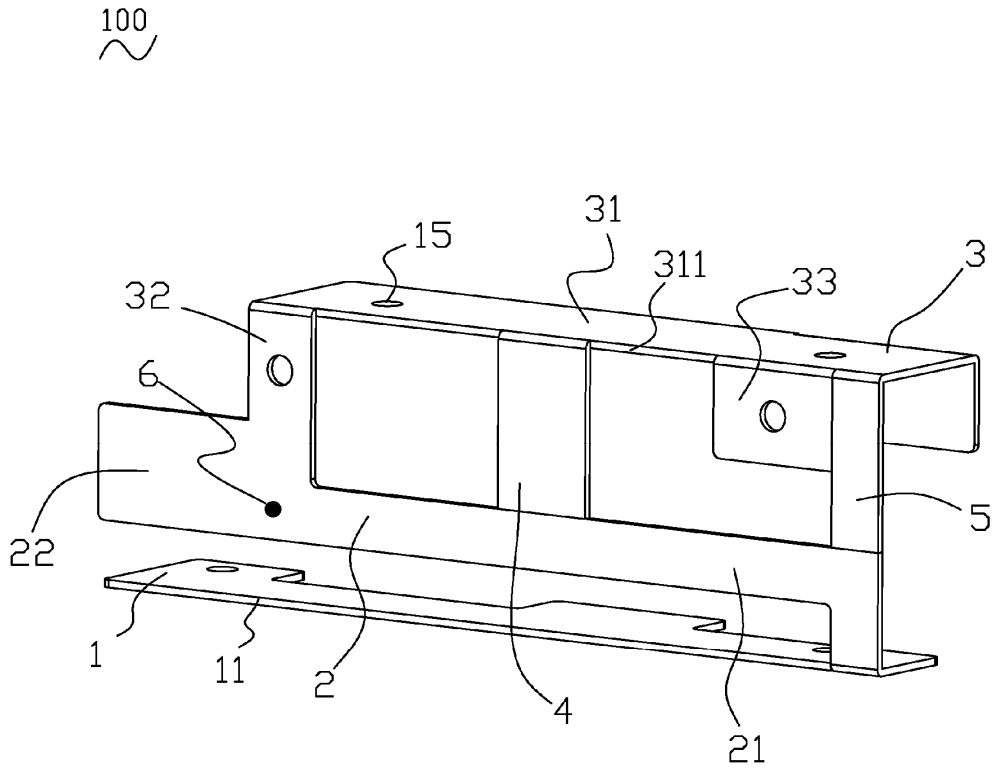
Publication Classification

(51) **Int. Cl.**
H01Q 1/48 (2006.01)
H01Q 1/36 (2006.01)

(52) **U.S. Cl.** ..... **343/845**; 343/700 MS

(57) **ABSTRACT**

An ultra-wideband has an elongated grounding plate disposed horizontally with a long front edge defined thereon. A connecting portion extends upwards from an end of the front edge. A first antenna radiator includes a first radiating strip extended from a side of the connecting portion and a second radiating strip connecting with a free end of the first radiating strip. A third antenna radiator includes a third radiating strip suspended over the grounding plate, a fourth radiating strip connecting with an end of a long front edge of the third radiating strip and an upper side of the second radiating strip, a fifth radiating strip extended downwards from the long front edge of the third radiating strip connecting with the connecting portion. A third antenna radiator extends downwards from a middle of the long front edge of the third radiating strip. A feeding point disposes on the second radiating strip.



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(19) **United States**

(12) **Patent Application Publication**

Lu et al.

(10) **Pub. No.: US 2011/0018782 A1**

(43) **Pub. Date: Jan. 27, 2011**

(54) **ANTENNA**

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(21) Appl. No.: **12/698,724**

(22) Filed: **Feb. 2, 2010**

(30) **Foreign Application Priority Data**

Jul. 21, 2009 (TW) TW098124539

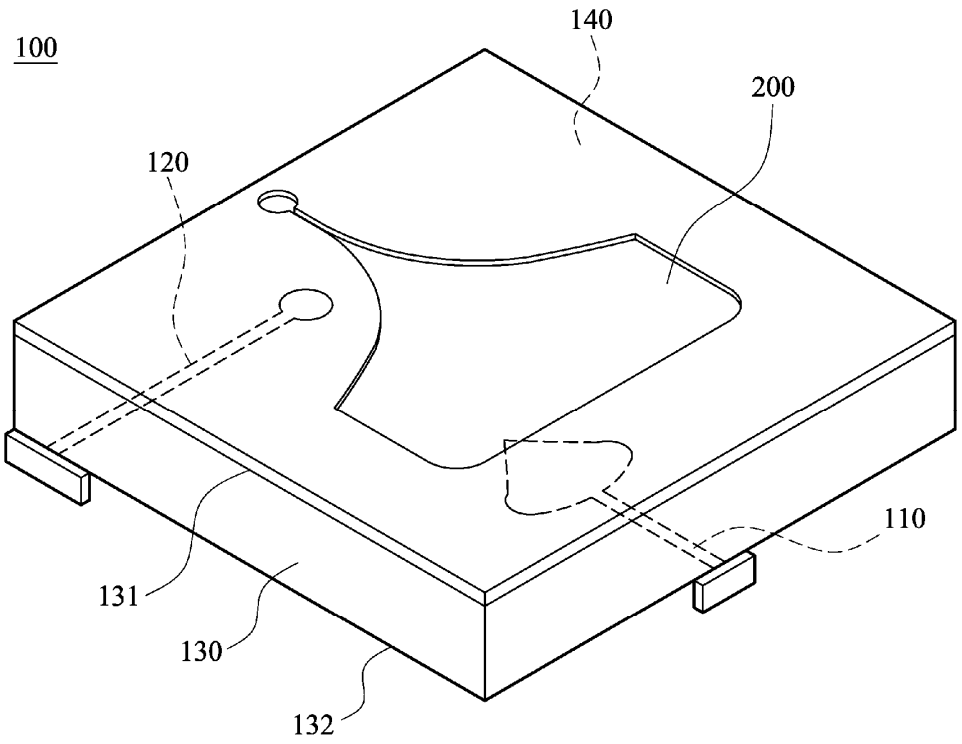
Publication Classification

(51) **Int. Cl.**
H01Q 1/36 (2006.01)
H01Q 1/48 (2006.01)

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

(57) **ABSTRACT**

An antenna is provided. The antenna includes a substrate, a ground element, a first feed conductor and a second feed conductor. The substrate includes a first surface and a second surface. The ground element is formed on the first surface, wherein the ground element has an aperture, the aperture is funnel shaped, the aperture has an opening portion and a convergent portion, and the opening portion is connected to the convergent portion. The first feed conductor is disposed on the second surface, wherein the first feed conductor feeds a first signal to the aperture. The second feed conductor is disposed on the second surface, wherein the second feed conductor feeds a second signal to the aperture.



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(19) **United States**

(12) **Patent Application Publication**

Wong et al.

(10) **Pub. No.: US 2011/0018783 A1**

(43) **Pub. Date: Jan. 27, 2011**

(54) **SHORTED MONOPOLE ANTENNA**

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(21) Appl. No.: **12/605,493**

(22) Filed: **Oct. 26, 2009**

(30) **Foreign Application Priority Data**

Jul. 24, 2009 (TW) 098125107

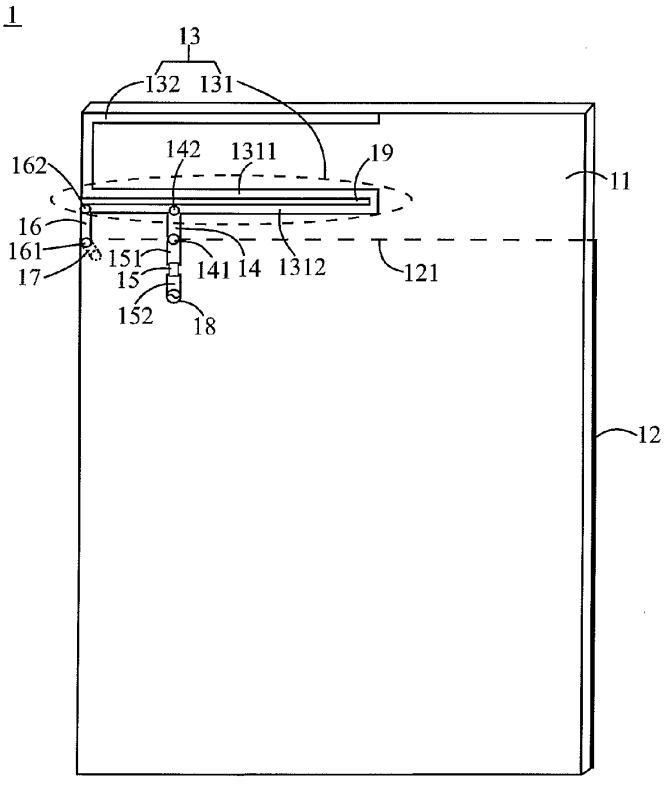
Publication Classification

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

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

(57) **ABSTRACT**

The present invention discloses a shorted monopole antenna comprising a dielectric substrate, a ground plane, a radiating portion, a feeding portion, a shorting portion, and a capacitive element. The ground plane is disposed on a portion of the dielectric substrate. The radiating portion comprises a first metal portion and a second metal portion and is located on the dielectric substrate, without overlapping with the ground plane. The first metal portion comprises a coupling section formed by bending the front portion of the first metal portion into two adjacent sections with a coupling gap. The length of the first metal portion is larger than one-eighth of the wavelength of the central frequency of the antenna's lower band. A first end of the second metal portion is electrically connected to the first metal portion. A second end of the second metal portion is open-ended. The feeding portion is disposed on the dielectric substrate, without overlapping with the ground plane. A first end of the feeding portion is electrically connected to the first metal portion. A second end of the feeding portion is the antenna's feeding point. The shorting portion is disposed on the dielectric substrate, without overlapping with the ground plane. A first end of the shorting portion is electrically connected to the first metal portion. A second end of the shorting portion is connected to the ground plane. The capacitive element is disposed on the dielectric substrate and overlaps with the ground plane. A first end of the capacitive element is electrically connected to the antenna's feeding point. A second end of the capacitive element is electrically connected to a source.



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(19) **United States**

(12) **Patent Application Publication**

Palmade et al.

(10) **Pub. No.: US 2011/0025463 A1**

(43) **Pub. Date: Feb. 3, 2011**

(54) **PARALLEL ANTENNAS FOR CONTACTLESS DEVICE**

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(21) Appl. No.: **12/534,726**

(22) Filed: **Aug. 3, 2009**

Publication Classification

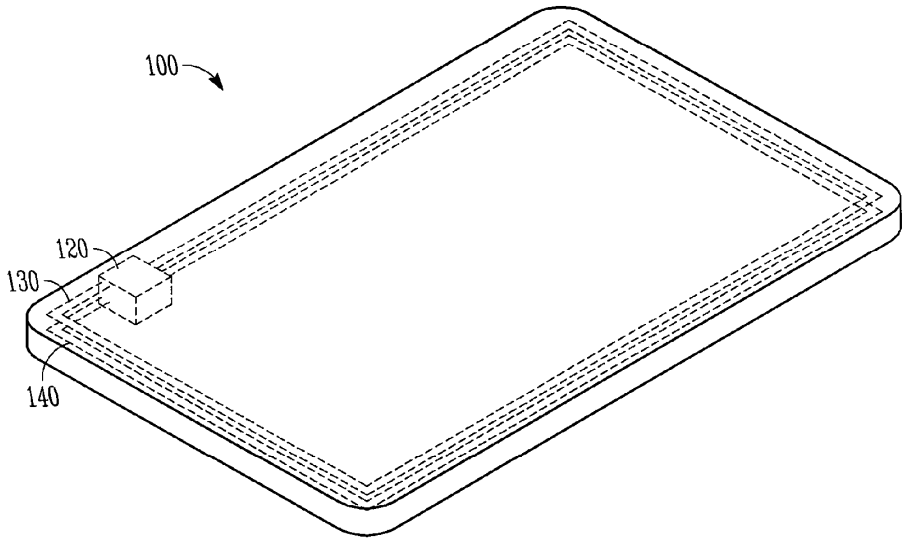
(51) **Int. Cl.**

H04Q 5/22	(2006.01)
G06K 19/06	(2006.01)
H01Q 21/00	(2006.01)
H01Q 7/00	(2006.01)

(52) **U.S. Cl.** **340/10.1**; 235/493; 343/867

(57) **ABSTRACT**

An electronic information device includes an integrated circuit embedded within the device. The electronic information device further includes a first antenna that is embedded within the device and is connected to the integrated circuit. The electronic information device further includes a second antenna that is embedded within the device and is connected to the integrated circuit. The first antenna is oriented within a first plane and the second antenna is oriented within a second plane that is substantially parallel to the first plane.



US 20110025566A1

(19) **United States**

(12) **Patent Application Publication**

Suh et al.

(10) **Pub. No.: US 2011/0025566 A1**

(43) **Pub. Date: Feb. 3, 2011**

(54) **NEAR-HORIZON ANTENNA STRUCTURE AND FLAT PANEL DISPLAY WITH INTEGRATED ANTENNA STRUCTURE**

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(21) Appl. No.: **12/533,140**

(22) Filed: **Jul. 31, 2009**

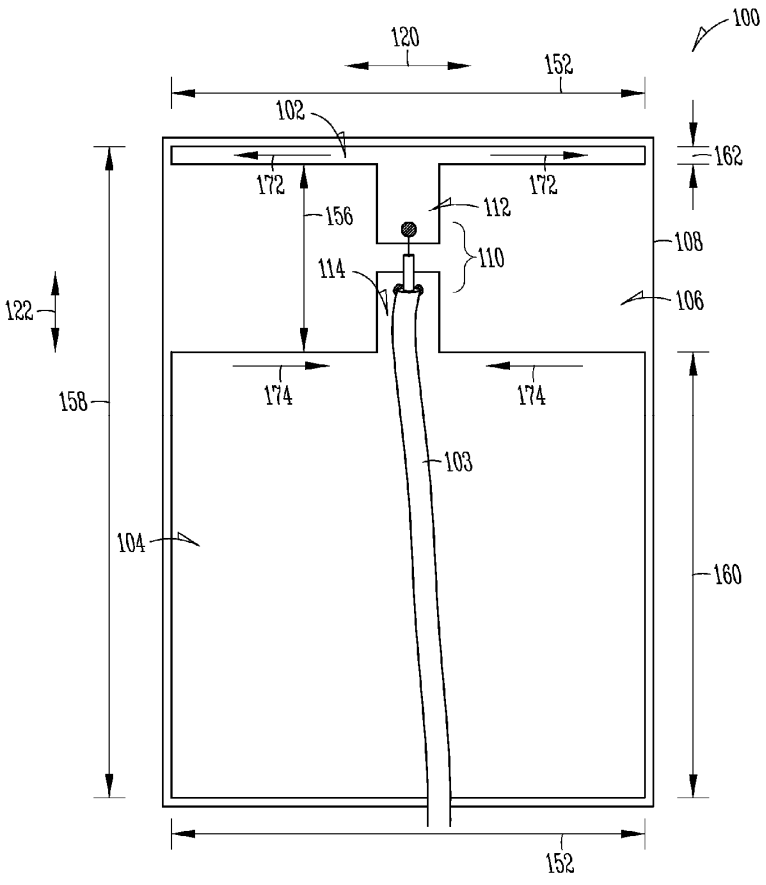
Publication Classification

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

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

(57) **ABSTRACT**

A near-horizon antenna structure includes an upper radiating element having a straight conductive trace disposed on a planar surface of a non-conductive substrate, a rectangular lower radiating element serving as a ground plane disposed on the planar surface, and a feed point provided between the upper and lower radiating elements. When the planar surface is positioned vertically, the far-field effects of horizontal current flowing in opposite directions on the radiating elements cancel to provide an antenna pattern with increased gain in horizontal directions and reduced gain in vertical directions. A flat panel display and a portable communication device are also provided with one or more near-horizon antenna structures integrated therein.



NEAR-HORIZON ANTENNA (FRONT VIEW)

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(19) **United States**

(12) **Patent Application Publication**

(10) **Pub. No.: US 2011/0025567 A1**

(43) **Pub. Date: Feb. 3, 2011**

Qi et al.

(54) **MOBILE WIRELESS COMMUNICATIONS DEVICE ANTENNA ASSEMBLY WITH ANTENNA ELEMENT AND FLOATING DIRECTOR ELEMENT ON FLEXIBLE SUBSTRATE AND RELATED METHODS**

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(21) Appl. No.: **12/901,641**

(22) Filed: **Oct. 11, 2010**

Related U.S. Application Data

(63) Continuation of application No. 11/863,324, filed on Sep. 28, 2007, now Pat. No. 7,812,773.

Publication Classification

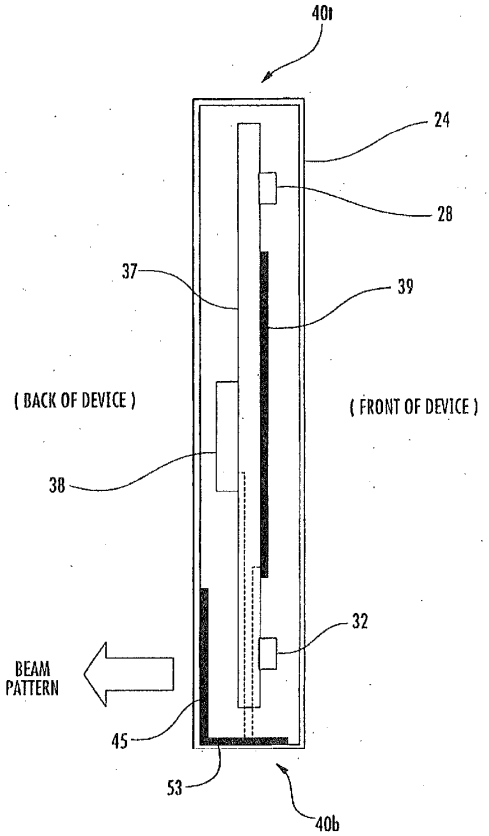
(51) **Int. Cl.**

H01Q 1/24	(2006.01)
H01Q 19/02	(2006.01)
H01Q 13/10	(2006.01)
H05K 13/00	(2006.01)

(52) **U.S. Cl.** **343/702**; 343/833; 343/770; 29/592.1

(57) **ABSTRACT**

A mobile wireless communications device may include a portable housing, a circuit board carried by the portable housing and having a ground plane thereon, wireless communications circuitry carried by the circuit board, and an antenna assembly carried by the housing. More particularly, the antenna assembly may include a flexible substrate, an electrically conductive antenna element on the flexible substrate and connected to the wireless communications circuitry and the ground plane, and a floating, electrically conductive director element on the flexible substrate for directing a beam pattern of the antenna element.



US 20110025570A1

(19) **United States**

(12) **Patent Application Publication**

SAKUMA

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(43) **Pub. Date: Feb. 3, 2011**

(54) **ANTENNA AND COMMUNICATION DEVICE INCLUDING THE SAME**

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(21) Appl. No.: **12/842,291**

(22) Filed: **Jul. 23, 2010**

(30) **Foreign Application Priority Data**

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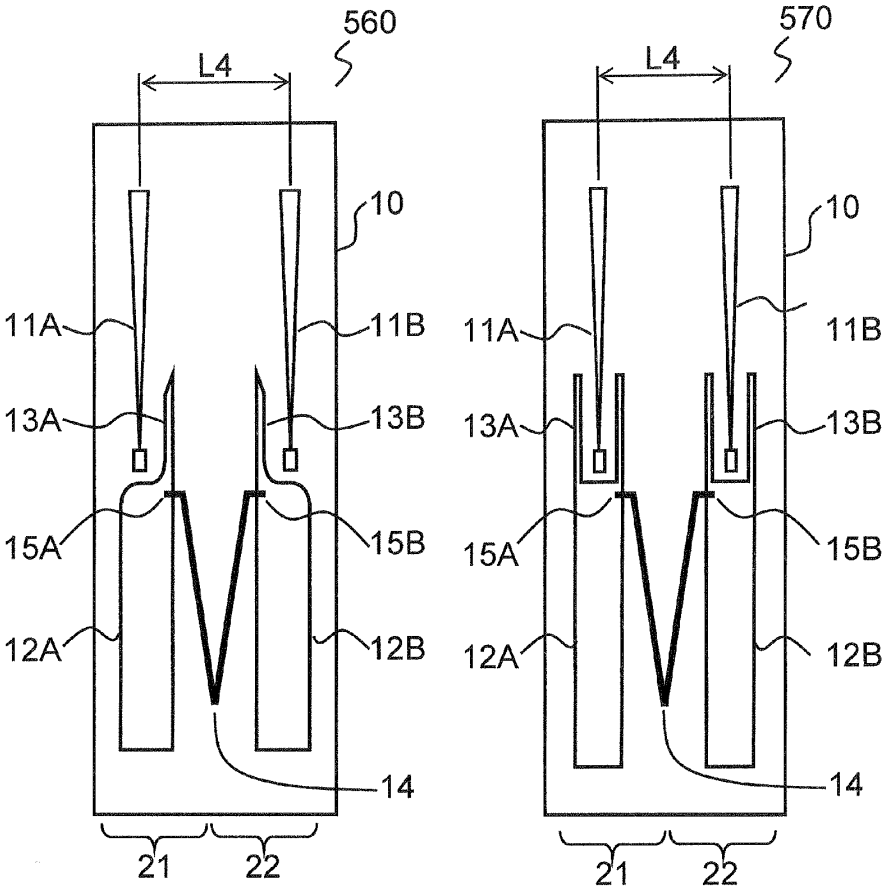
Publication Classification

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

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

(57) **ABSTRACT**

An antenna includes a dielectric substrate and an antenna element. The antenna element includes a power feeding element and a reference potential element. The power feeding element includes a first conductive layer formed over the dielectric substrate, the first conductive layer extending in a first direction and having a first length along the first direction. The reference potential element includes a second conductive layer formed over the dielectric substrate, the second conductive layer extending in a second direction opposed to the first direction from a second position, the second point being apart by a first distance from a first position on an end of the first conductive layer, and a third conductive layer formed over the dielectric substrate, the third conductive element extending from the second point in the first direction apart by a second distance from the first conductive layer and having a third length along the first direction.



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(19) **United States**

(12) **Patent Application Publication**

Adada et al.

(10) **Pub. No.: US 2011/0025571 A1**

(43) **Pub. Date: Feb. 3, 2011**

(54) **CIRCULARLY POLARIZED MICROSTRIP ANTENNAS**

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(73) Assignee: **Board of Trustees of the University of Arkansas**, Little Rock, AR (US)

(21) Appl. No.: **12/754,172**

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

Related U.S. Application Data

(60) Provisional application No. 61/211,848, filed on Apr. 3, 2009, provisional application No. 61/214,681, filed on Apr. 27, 2009.

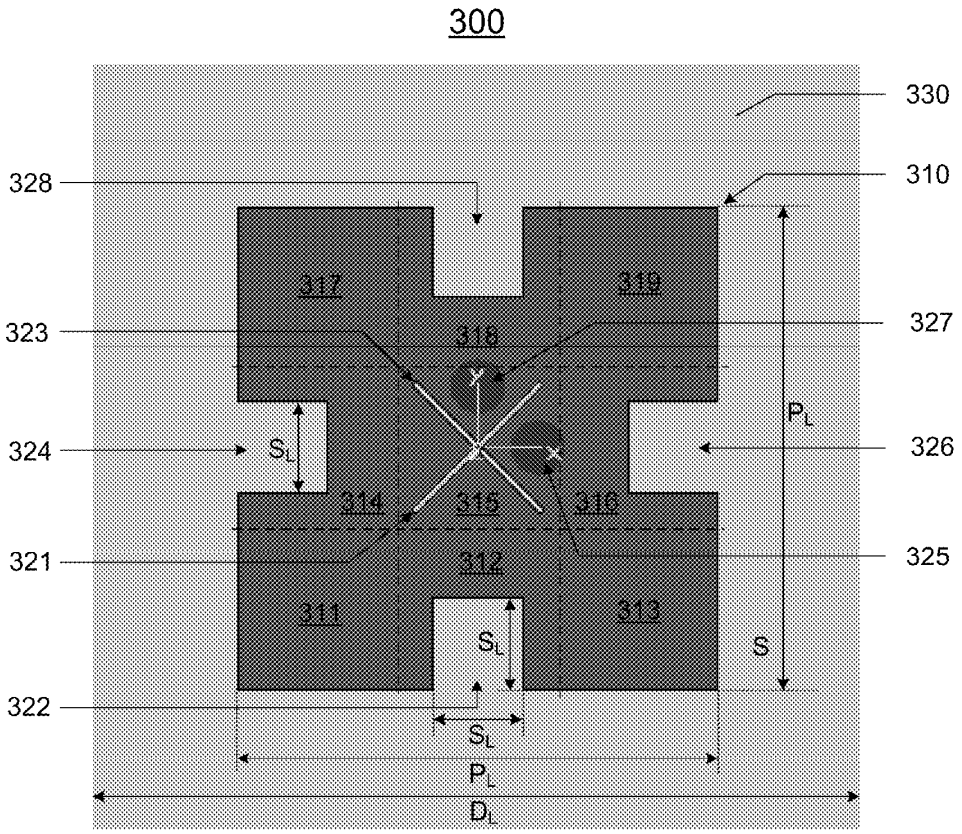
Publication Classification

(51) **Int. Cl.**
H01Q 13/10 (2006.01)
H01P 11/00 (2006.01)

(52) **U.S. Cl.** **343/770**; 29/600

(57) **ABSTRACT**

The present invention in one aspect relates to a circularly polarized antenna having a conductive ground layer, a conductive patch and a dielectric substrate formed between the conductive ground layer and the conductive patch. The conductive patch formed in a square shape with four equal sides and has four square slots with each formed in the central portion of each side, and two rectangular slots orthogonally formed in the central area of the square such that one rectangular slot is aligned with one diagonal of the square, the other rectangular slot is aligned with the other diagonal of the square, and the junction of the two rectangular slots is coincident with the geometrical center of the square.



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(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2011/0025576 A1

(43) Pub. Date: Feb. 3, 2011

Mao et al.

(54) **MULTI-BAND MICROSTRIP MEANDER-LINE ANTENNA**

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(21) Appl. No.: **12/606,168**

(22) Filed: **Oct. 26, 2009**

(30) **Foreign Application Priority Data**

Jul. 30, 2009 (TW) 098125670

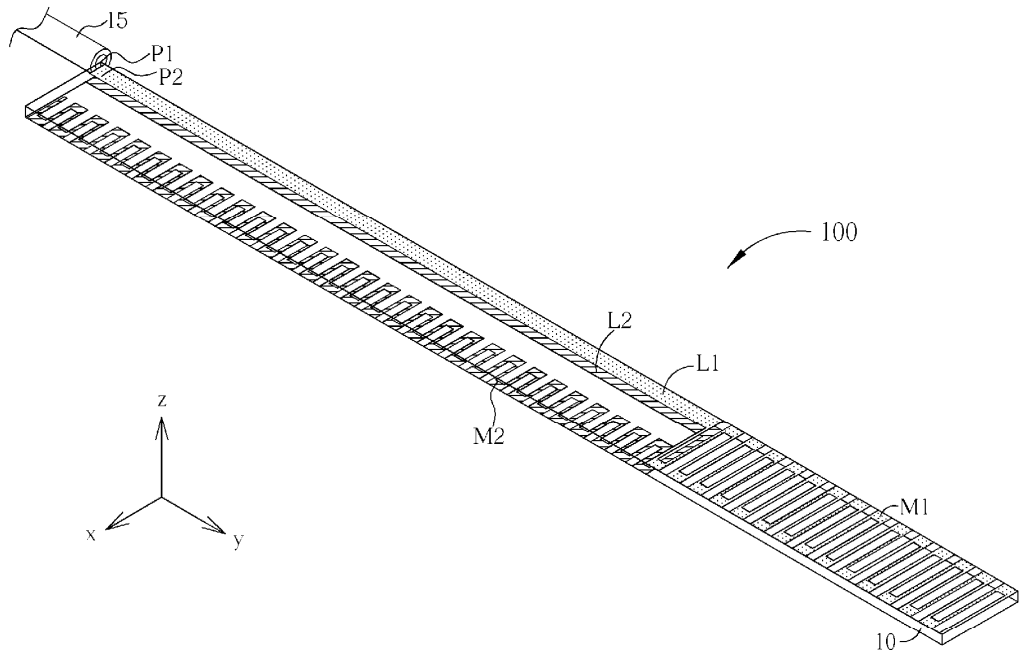
Publication Classification

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

(52) **U.S. Cl.** ..... **343/843**; 343/700 MS; 343/895

(57) **ABSTRACT**

A multi-band microstrip meander-line antenna includes a substrate, two meander-shaped conductors, and two feed lines. The first meander-shaped conductor is disposed on the substrate in a first reciprocating bend manner for providing a resonant frequency band corresponding to a first operating frequency. The second meander-shaped conductor is disposed on the substrate in a second reciprocating bend manner for providing a resonant frequency band corresponding to a second operating frequency. The first feed line includes the first end electrically connected to a first feed point of the antenna and the second end electrically connected to the end of the first meander-shaped conductor. The second feed line includes the first end electrically connected to the second feed point of the antenna and the second end electrically connected to the end of the second meander-shaped conductor.



US 20110028191A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2011/0028191 A1

(43) Pub. Date: Feb. 3, 2011

Huang et al.

(54) **INTEGRATED ANTENNA AND ELECTROSTATIC DISCHARGE PROTECTION**

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(21) Appl. No.: **12/533,119**

(22) Filed: **Jul. 31, 2009**

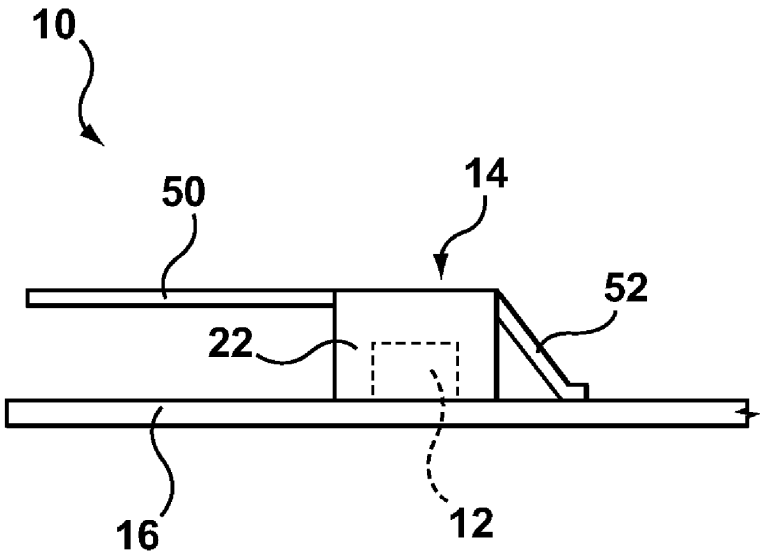
Publication Classification

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

(52) **U.S. Cl.** **455/575.7**

(57) **ABSTRACT**

A mobile communications device having an antenna partly formed from an electrostatic discharge shield covering a microphone. The antenna includes a radiator arm extending from the electrostatic discharge shield and includes a feed element connecting the electrostatic discharge shield to a signal trace. To the extent the microphone employs an acoustic tube to form an acoustic pathway between the device casing and the microphone, the radiator arm of the antenna may be arranged over the acoustic tube.



US 20110032154A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2011/0032154 A1

(43) Pub. Date: Feb. 10, 2011

Chung et al.

(54) **BROADBAND CIRCULARLY POLARIZED PATCH ANTENNA**

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(21) Appl. No.: **12/735,514**

(22) PCT Filed: **Jan. 22, 2009**

(86) PCT No.: **PCT/SG2009/000029**

§ 371 (c)(1),
(2), (4) Date: **Oct. 7, 2010**

Related U.S. Application Data

(60) Provisional application No. 61/022,541, filed on Jan. 22, 2008.

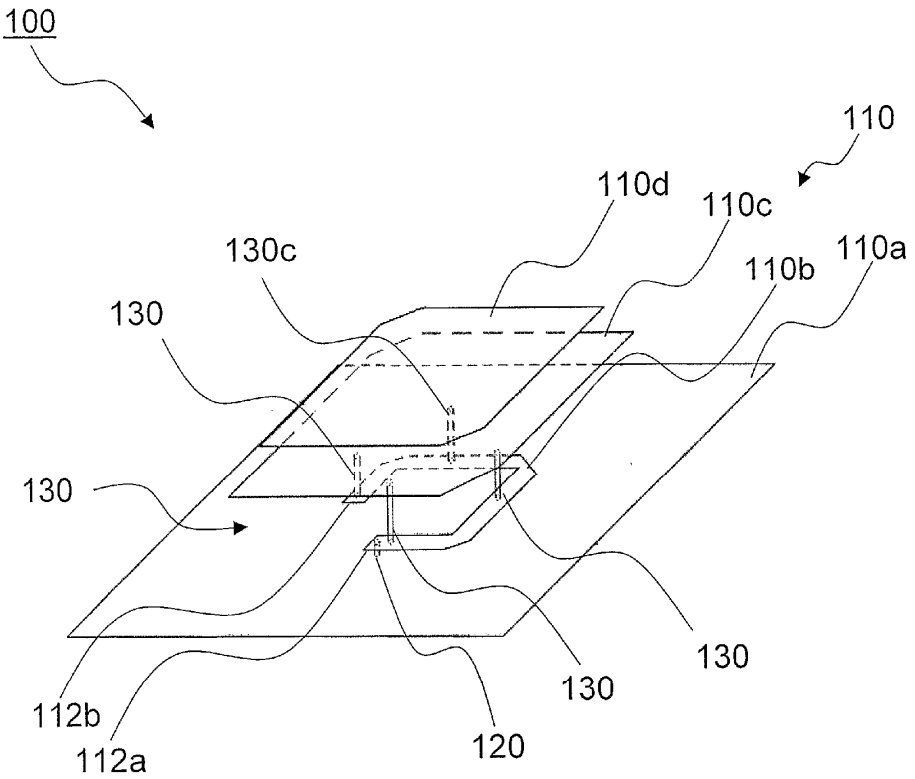
Publication Classification

(51) **Int. Cl.**
H01Q 21/24 (2006.01)
H01Q 5/00 (2006.01)

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

(57) **ABSTRACT**

An antenna structure for providing a broadband circularly polarized radiation. The antenna structure comprises a feed line layer having an input portion and a first radiating patch layer stacked adjacent to the feed line layer. The feed line layer is shaped and dimensioned as an open loop having an input portion and signals are feedable to the feed line layer via the input portion. The first radiating patch layer has a reference origin defined thereon. The antenna structure also comprises a plurality of probes disposed between the feed line layer and the first radiating patch layer for coupling therebetween. The signals are feedable to the first radiating patch layer via the plurality of probes and each of the plurality of probes are positioned about the reference origin of the radiating patch layer along the length of the feed line layer. The signals achieve a phase difference for providing circularly polarized radiation in response to being fed via the plurality of probes being positioned about the reference origin of the radiating patch layer along the length of the feed line layer.



US 20110032170A1

(19) **United States**

(12) **Patent Application Publication**

CHIANG et al.

(10) **Pub. No.: US 2011/0032170 A1**

(43) **Pub. Date: Feb. 10, 2011**

(54) **MULTI-BAND ANTENNA FOR NOTEBOOK COMPUTER**

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(21) Appl. No.: **12/535,605**

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

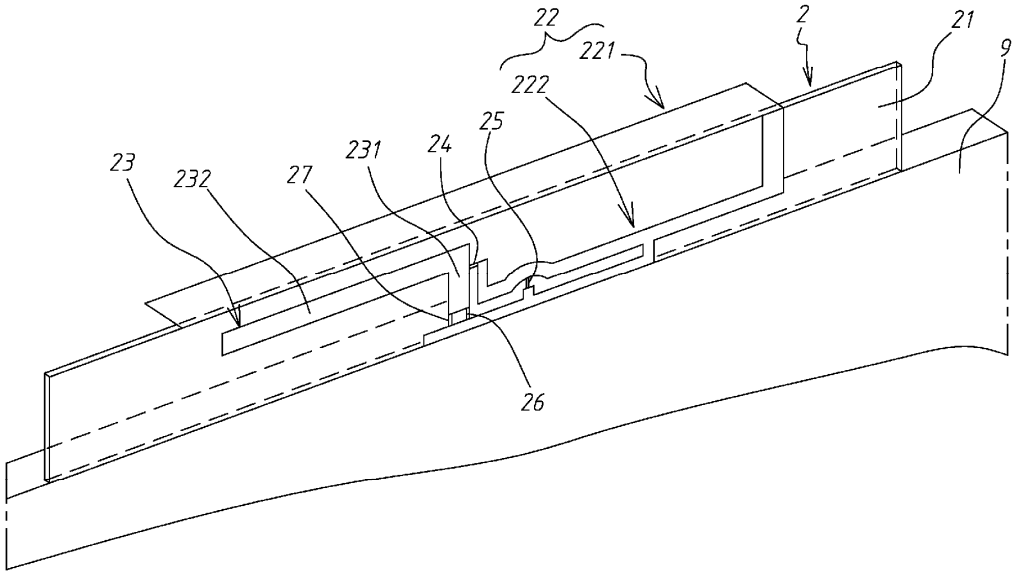
Publication Classification

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

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

(57) **ABSTRACT**

A multi-band antenna includes an insulative carrier board arranged on the top side of the display screen of a notebook computer, a main antenna which has the top metal strip thereof disposed at the top edge of the insulative carrier board and the grounding metal strip thereon arranged on the insulative carrier board, an inverted L antenna arranged on the insulative carrier board, a first capacitor, a second capacitor, an antenna feed-in terminal and/or an inductor set between the inverted L antenna and the main antenna to achieve optimal matching subject to adjustment of the capacitance values of the first and second capacitors and the inductance value and position of the inductor.



US 20110036914A1

(19) **United States**

(12) **Patent Application Publication**

Shingu et al.

(10) **Pub. No.: US 2011/0036914 A1**

(43) **Pub. Date: Feb. 17, 2011**

(54) **ANTENNA CIRCUIT CONSTITUENT BODY FOR IC CARD/TAG AND IC CARD**

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(21) Appl. No.: **12/988,210**

(22) PCT Filed: **Apr. 28, 2009**

(86) PCT No.: **PCT/JP2009/058315**

§ 371 (c)(1),
(2), (4) Date: **Oct. 15, 2010**

(30) **Foreign Application Priority Data**

May 9, 2008 (JP) 2008-123624

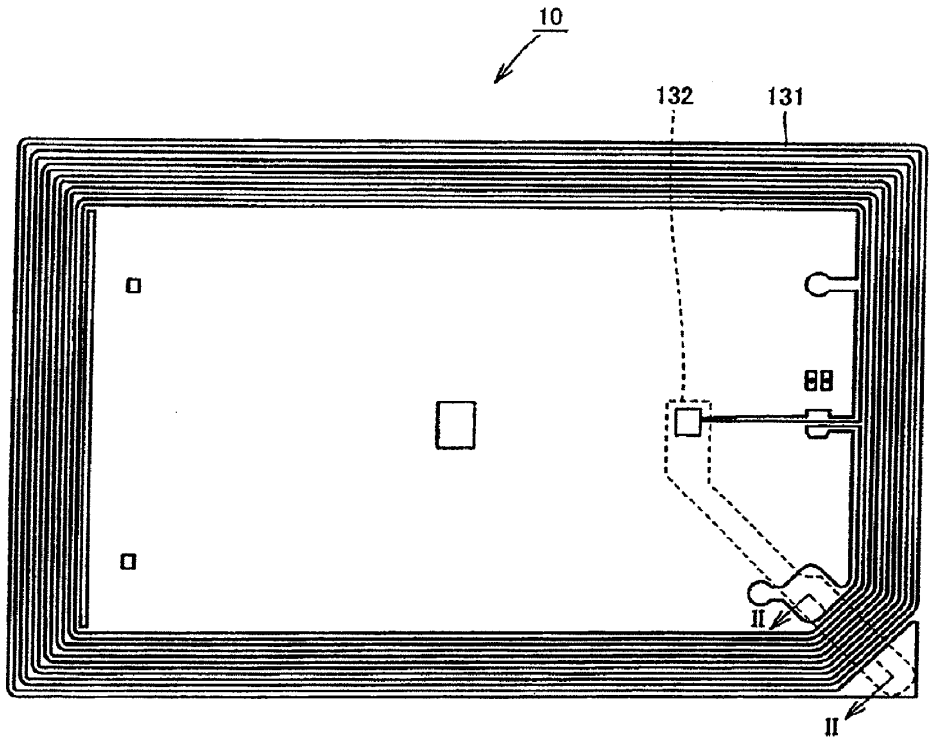
Publication Classification

(51) **Int. Cl.**
G06K 19/077 (2006.01)
H01Q 7/00 (2006.01)

(52) **U.S. Cl.** **235/492**; 343/866

(57) **ABSTRACT**

Provided are an antenna circuit constituent body for an IC card/tag, which is capable of enhancing a Q value by reducing a permittivity of a resin film of which a base material is made; and an IC card. The antenna circuit constituent body (**10**) for an IC card/tag comprises: the base material (**11**) made of the resin film; and circuit pattern layers (**131** and **132**) each formed on each of both sides of the base material (**11**) and made of aluminum foil. The circuit pattern layer (**131**) includes a coiled pattern layer. Parts of the circuit pattern layers (**131** and **132**), which mutually face each other; and a part of the base material (**11**), which is interposed between the parts of the circuit pattern layers (**131** and **132**), constitute a capacitor. The circuit pattern layers (**131** and **132**) are electrically connected by means of crimping parts (**13***a* and **13***b*). The base material (**11**) includes a plurality of void-state-air layers. A relative density of the base material (**11**) with respect to a density of a resin is less than or equal to 0.9. An average volume of the void-state-air layers is greater than or equal to 2 μm^3 and less than or equal to 90 μm^3.



US 20110037654A1

(19) **United States**

(12) **Patent Application Publication**

Chiu et al.

(10) **Pub. No.: US 2011/0037654 A1**

(43) **Pub. Date: Feb. 17, 2011**

(54) **DUAL-FREQUENCY ANTENNA**

(76) Inventors: **Chih-Hsin Chiu**, Ji-an Township (TW); **Chung-Ta Yu**, Keelung City (TW); **Chun-Chieh Wang**, Taipei City (TW); **Chih-Ming Su**, Taipei City (TW)

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(21) Appl. No.: **12/461,391**

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

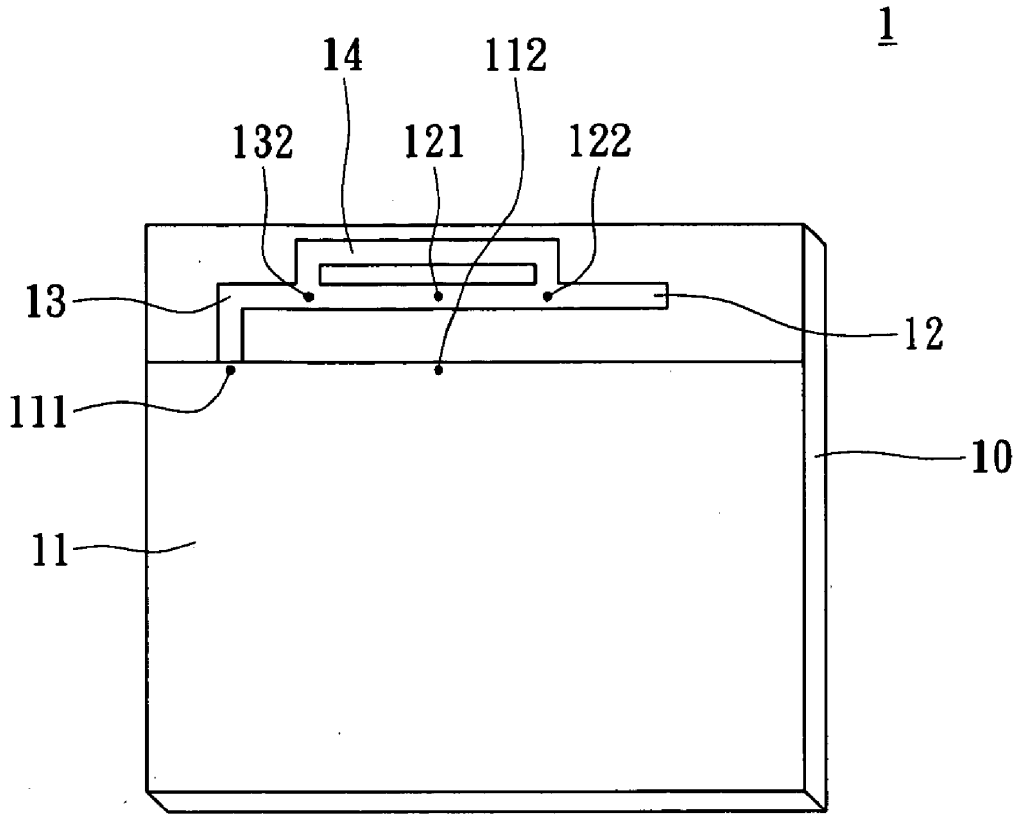
Publication Classification

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

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

(57) **ABSTRACT**

A dual-frequency antenna includes a substrate, a ground plane, a radiation path, a short-circuit path and a connection path. The ground plane is disposed on the substrate and has a short-circuit point and a ground point. The radiation path is disposed on the substrate, adjacent to the ground plane. A feed point is disposed on one end of the radiation path, corresponding to the ground point; and a first connecting point is formed on the radiation path. A short-circuit path is disposed on the substrate, two ends of the short-circuit path respectively electrically connected with the short-circuit point and the feed point, and a second connecting point is formed on the short-circuit path. The connection path is disposed on the substrate, two ends of the connection path respectively electrically connected with the first connecting point and the second connecting point.



US 20110037655A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2011/0037655 A1

(43) Pub. Date: Feb. 17, 2011

Tsai et al.

(54) **DIELECTRIC-LOADED AND COUPLED PLANAR ANTENNA**

(76) Inventors: **Yueh-Lin Tsai**, Shueilin Township (TW); **Sheng-Kai Wen**, Kaohsiung City (TW); **Chih-Wei Chen**, Houlong Township (TW); **Po-Chun Huang**, Taichung City (TW); **Lee-Ting Hsieh**, Yanpu Township (TW)

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(21) Appl. No.: **12/461,565**

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

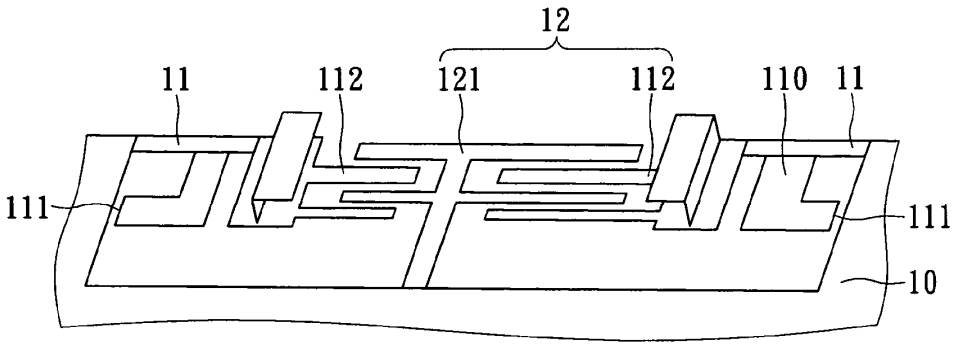
Publication Classification

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

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

(57) **ABSTRACT**

A dielectric-loaded and coupled planar antenna includes a ground plane, a radiator, a ceramic substrate and at least one ground coupling electrode. The radiator is formed by extending one side of the ground plane, and a feeding point is formed between the radiator and the ground plane. The radiator extends at least one end portion on the ceramic substrate. The ground coupling electrode is formed on the ceramic substrate by extending the other side of the ground plane. The ground coupling electrode formed on the ceramic substrate and the end portion of the radiator formed on the ceramic substrate are coupled with each other to form a coupling electrode. The present invention can adjust the coupling amount loaded by the ceramic substrate so as to be operated in a desired frequency range. The present invention can be operated in a single-frequency, dual-frequency or multi-frequency condition.



US 20110037656A1

(19) **United States**

(12) **Patent Application Publication**

Bremner et al.

(10) **Pub. No.: US 2011/0037656 A1**

(43) **Pub. Date: Feb. 17, 2011**

(54) **ULTRA WIDEBAND ANTENNA**

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(73) Assignee: **ITI SCOTLAND LIMITED**, Glasgow, Scotland (GB)

(21) Appl. No.: **12/596,543**

(22) PCT Filed: **Apr. 17, 2008**

(86) PCT No.: **PCT/GB2008/001364**

§ 371 (c)(1),
(2), (4) Date: **Aug. 17, 2010**

(30) **Foreign Application Priority Data**

Apr. 20, 2007 (GB) 0707742.3

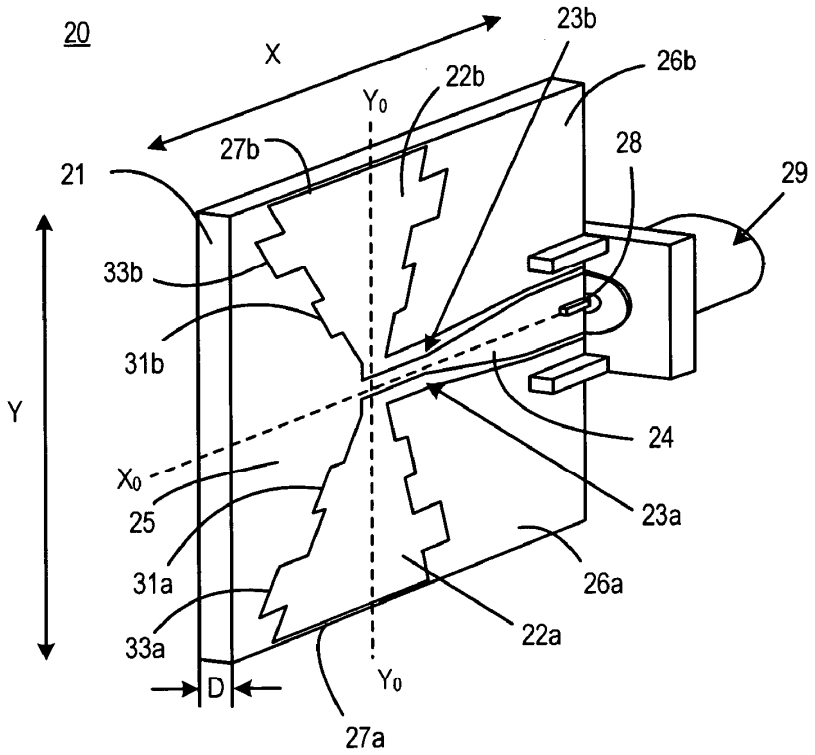
Publication Classification

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

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

(57) **ABSTRACT**

An ultra wideband antenna comprises a substrate (**21**). A metal layer deposited on the substrate comprises first and second non-metallic regions (**22***a*, **22***b*) defined therein. The first and second non-metallic regions (**22***a*, **22***b*) are arranged on either side of a longitudinal axis (X_0), the longitudinal axis (X_0) corresponding to a feed axis of the antenna. The first and second non-metallic regions taper towards the first longitudinal (X_0) to form a bowtie pattern. Each of the first and second non-metallic regions (**22***a*, **22***b*) comprises at least one tuning slot (**31**, **33**), the at least one tuning slot (**31**, **33**) being arranged about a respective first axis (X_1, X_2), the first axis (X_1, X_2) being parallel to the longitudinal axis (X_0), and wherein the at least one tuning slot extends along its respective axis (X_1, X_2) to form a non-metallic area outside the non-metallic area defined by the respective first and second non-metallic region (**22***a*, **22***b*). The tapering of the first and second non-metallic regions (**22***a*, **22***b*) in combination with the at least one pair of tuning slots (**31**, **33**) enables the antenna to be reduced in size, while being capable of operating over at least the UWB frequency range.



US 20110037658A1

(19) **United States**

(12) **Patent Application Publication**

PARK

(10) **Pub. No.: US 2011/0037658 A1**

(43) **Pub. Date: Feb. 17, 2011**

(54) **MULTI-LAYER THIN FILM INTERNAL ANTENNA, TERMINAL HAVING THE SAME, AND METHOD FOR MANUFACTURING MULTI-LAYER THIN FILM INTERNAL ANTENNA**

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(21) Appl. No.: **12/776,183**

(22) Filed: **May 7, 2010**

(30) **Foreign Application Priority Data**

Aug. 17, 2009 (KR) 10-2009-0075749

Publication Classification

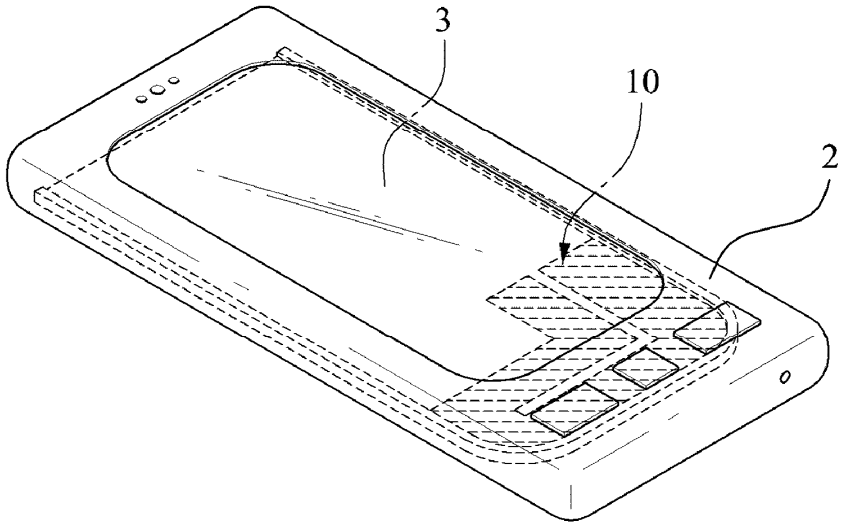
(51) **Int. Cl.**
H01Q 1/38 (2006.01)
C23C 14/14 (2006.01)

(52) **U.S. Cl.** ..... **343/700 MS**; 204/192.15

(57) **ABSTRACT**

A multi-layer thin film internal antenna is formed by sequentially sputter depositing a deposition layer and a conductive layer on a substrate. The deposition layer and the conductive layer may be formed using, as target materials, nickel and silver, respectively. A protecting layer may be further sputter deposited on the conductive layer.

1



US 20110037659A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2011/0037659 A1

(43) Pub. Date: Feb. 17, 2011

Yanagi et al.

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

(21) Appl. No.: **12/851,648**

(22) Filed: **Aug. 6, 2010**

(30) **Foreign Application Priority Data**

Aug. 14, 2009 (JP) 2009-187940

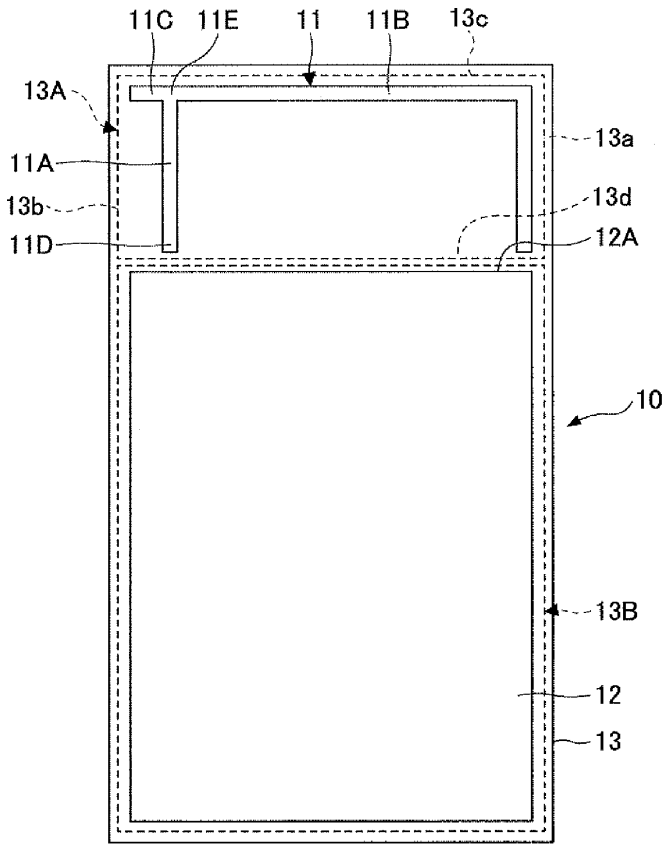
Publication Classification

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

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

(57) **ABSTRACT**

An antenna apparatus includes a dielectric substrate having first and second rectangular regions on a surface of the dielectric substrate, an antenna element formed inside the first rectangular region, and a ground element formed inside the second rectangular region, the ground element having a proximity side positioned proximate to and along a borderline between the first and second rectangular regions. The antenna element includes a first elongation extending from a first end to a second end, the first end including a power feed part positioned proximate to a side edge of the proximity side, the second end being positioned proximate to an upper side of the first rectangular region facing the borderline, a second elongation extending from the second end in a direction along the upper side, and a stub part extending from the second end in a direction opposite to the extending direction of the second elongation.



US 20110037660A1

(19) **United States**

(12) **Patent Application Publication**

CHENG et al.

(10) **Pub. No.: US 2011/0037660 A1**

(43) **Pub. Date: Feb. 17, 2011**

(54) **DUAL-BAND DUAL-ANTENNA STRUCTURE**

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(73) Assignee: **Arcadyan Technology Corporation**, Hsinchu (TW)

(21) Appl. No.: **12/857,033**

(22) Filed: **Aug. 16, 2010**

(30) **Foreign Application Priority Data**

Aug. 14, 2009 (TW) 98127427

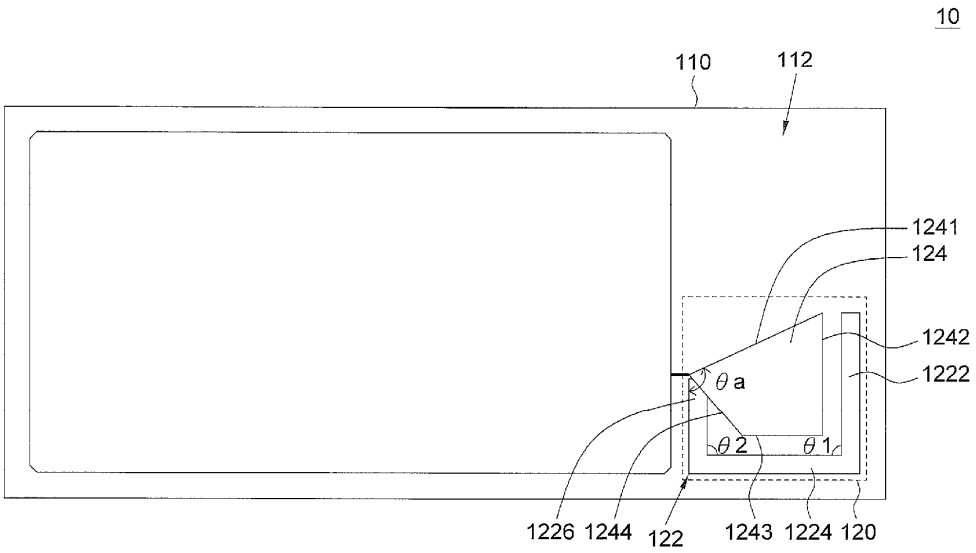
Publication Classification

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

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

(57) **ABSTRACT**

A dual-band dual-antenna structure is provided. The dual-band dual-antenna structure comprises a substrate, a first antenna and a second antenna. The substrate comprises a first signal transport layer and a second signal transport layer, wherein the second signal transport layer is not coplanar with the first signal transport layer. The first antenna is disposed on the first signal transport layer and comprises a first U-shaped radiation element and a first polygon radiation element. The first polygon radiation element is disposed in an opening of the first U-shaped radiation element. The second antenna is disposed on the second signal transport layer but does not overlap under the first antenna. The second antenna comprises a second U-shaped radiation element and a second polygon radiation element. The second polygon radiation element is disposed in an opening of the second U-shaped radiation element.



US 20110037662A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2011/0037662 A1

(43) Pub. Date: Feb. 17, 2011

Teng et al.

(54) **HANDHELD DEVICE**

(75) Inventors: **Pei-Ling Teng**, Taoyuan County (TW); **Yi-Chun Chen**, Taoyuan County (TW); **Kuo-Cheng Chen**, Taoyuan County (TW); **Chung-Ting Hung**, Taoyuan County (TW)

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

(21) Appl. No.: **12/761,389**

(22) Filed: **Apr. 15, 2010**

(30) **Foreign Application Priority Data**

Aug. 13, 2009 (TW) 98127288

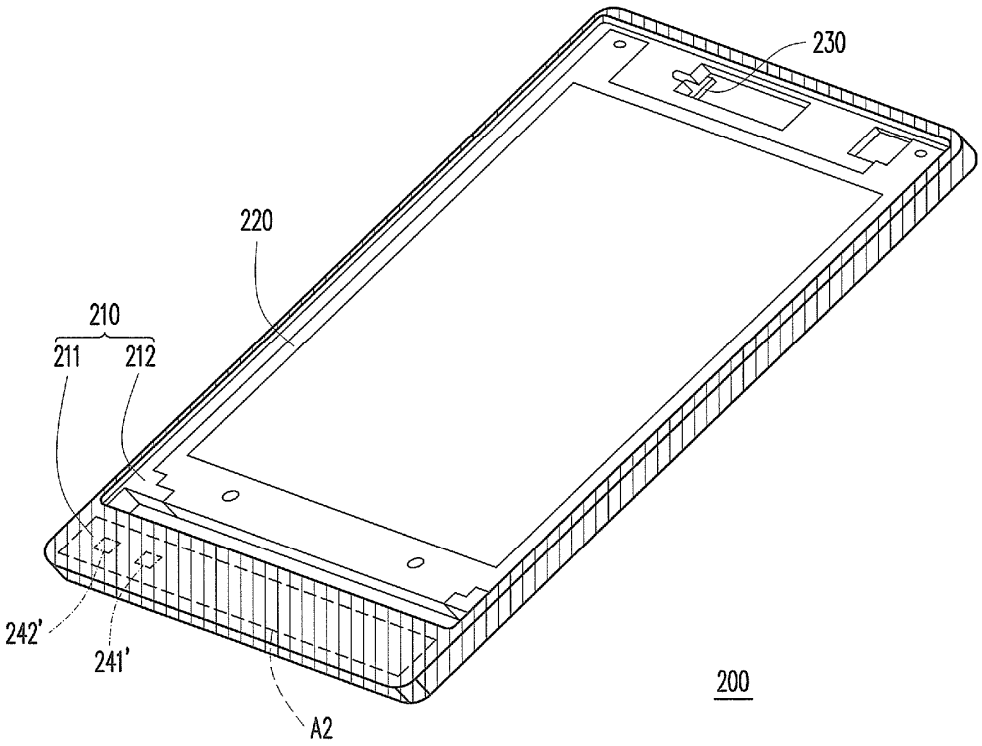
Publication Classification

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

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

(57) **ABSTRACT**

A handheld device includes an antenna area and an outer frame, wherein the outer frame includes a frame body and a carrier. The antenna area is for transmitting a radio frequency signal with a first wavelength and has a ground part and a feeding part. In addition, the ground part within the antenna area is electrically connected to a ground plane. The frame body of the outer frame has an extended area corresponding to the antenna area to form a projected feeding point. The carrier of the outer frame is disposed at the peripheral area of the opening of the frame body, wherein the peripheral area of the frame body has a first ground point electrically connected to the ground plane, and the spacing between the first ground point and the projected feeding point is correlated to the first wavelength.



US 20110037663A1

(19) **United States**

(12) **Patent Application Publication**

Huang

(10) **Pub. No.: US 2011/0037663 A1**

(43) **Pub. Date: Feb. 17, 2011**

(54) **ANTENNA MODULE AND ELECTRONIC DEVICE USING THE SAME**

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(21) Appl. No.: **12/843,059**

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

(30) **Foreign Application Priority Data**

Aug. 13, 2009 (TW) 098127291

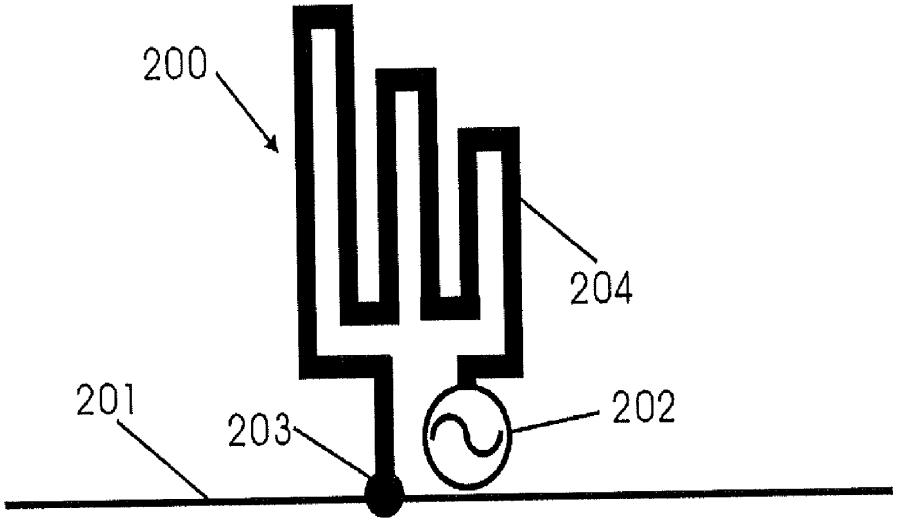
Publication Classification

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

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

(57) **ABSTRACT**

This invention provides an antenna module and an electronic device using the same. The antenna module includes a signal feeding part, a ground part, and a first asymmetric meander line. One terminal of the first asymmetric meander line is connected with the signal feeding part, the other terminal is connected with the ground part, and the first asymmetric meander line does not meander toward its inner side. A signal is fed in via the signal feeding part to allow the first asymmetric meander line to excite a first resonance frequency. An area of the antenna module in the invention is smaller than that of a conventional planar antenna, and the antenna module can generate an inductive effect to improve antenna radiation efficiency. Besides, since the area of the antenna module is small, a metal electronic component in the electronic device and the antenna module won't overlap thus to reduce interference.



US 20110037664A1

(19) **United States**

(12) **Patent Application Publication**

CHO et al.

(10) **Pub. No.: US 2011/0037664 A1**

(43) **Pub. Date: Feb. 17, 2011**

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

(75) Inventors: **Young-Jun CHO**, Gyeonggi-do (KR); **Byoung-Man LIM**, Seoul (KR); **Austin KIM**, Gyeonggi-do (KR); **Yong-Jin KIM**, Seoul (KR); **Jae-Ho LEE**, Gyeonggi-do (KR)

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(73) Assignee: **SAMSUNG ELECTRONICS CO., LTD.**, Gyeonggi-Do (KR)

(21) Appl. No.: **12/849,339**

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

(30) **Foreign Application Priority Data**

Aug. 11, 2009 (KR) 10-2009-0073622

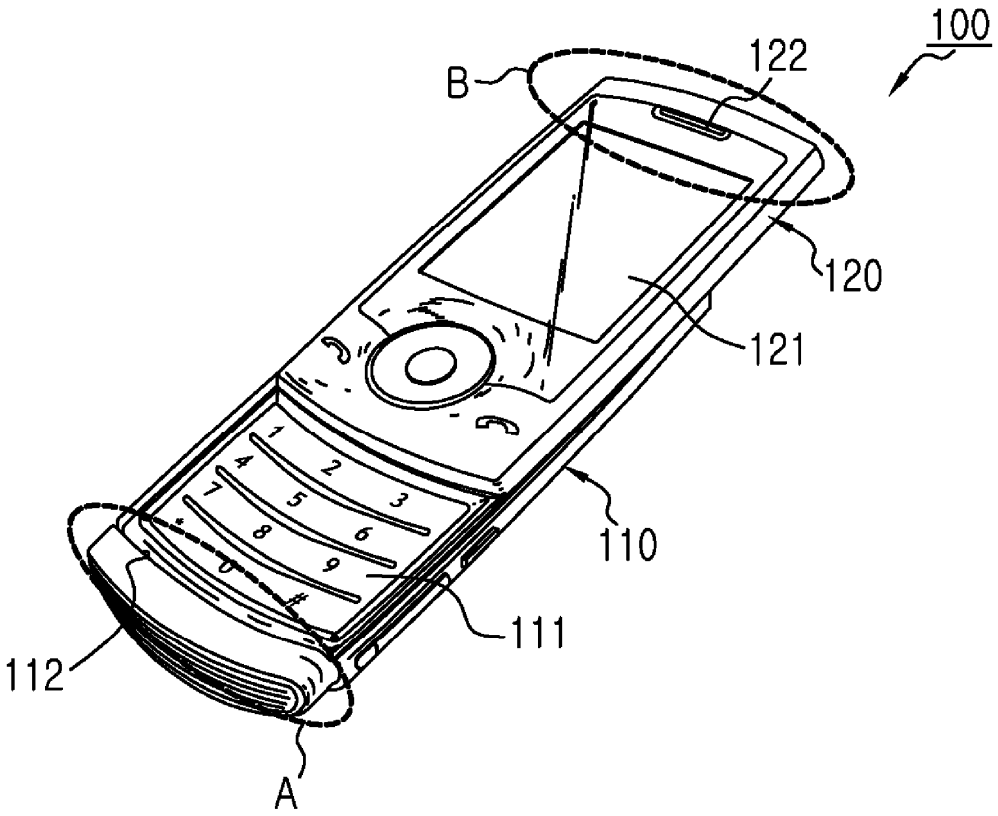
Publication Classification

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

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

(57) **ABSTRACT**

A built-in antenna module of a portable wireless terminal includes an antenna radiator, electrically connected to a main board, for transmitting and receiving a signal of a specific frequency band, and at least one unit fixed to a specific structural member and electrically connected to the main board by means of a Flexible Printed Circuit Board (FPCB), wherein the antenna radiator is implemented integrally with the FPCB.



US 20110037665A1

(19) **United States**

(12) **Patent Application Publication**

AHN et al.

(10) **Pub. No.: US 2011/0037665 A1**

(43) **Pub. Date: Feb. 17, 2011**

(54) **MULTIBAND BUILT-IN ANTENNA FOR PORTABLE TERMINAL**

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(21) Appl. No.: **12/852,568**

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

(30) **Foreign Application Priority Data**

Aug. 17, 2009 (KR) 10-2009-0075683

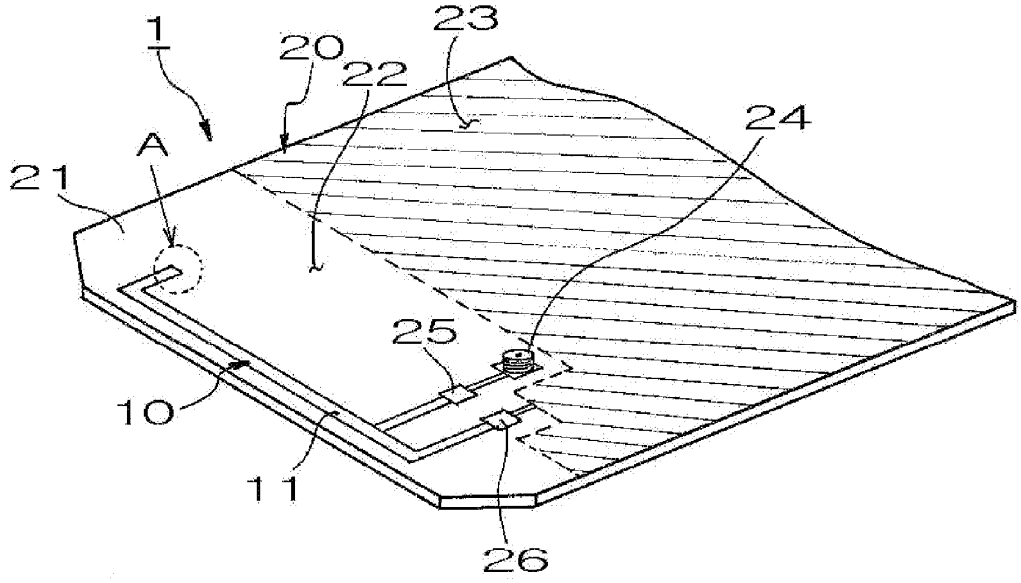
Publication Classification

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

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

(57) **ABSTRACT**

A multiband built-in antenna of a portable terminal is provided. The multiband built-in antenna includes a main board having a ground area and a non-ground area on a front surface and an opposite surface, and an antenna radiator having a specific pattern directly formed on the non-ground area of the main board, wherein the antenna radiator comprises a first antenna radiator of which one end is branched off into two parts on the front surface of the main board so that one part is used for feeding and the other part is electrically connected to the ground area, and of which the other end is extended by a specific length in a widthwise direction of the terminal, and a second antenna radiator which protrudes towards the opposite surface of the main board from the other end of the first antenna radiator and is formed in a specific pattern in the non-ground area on the opposite surface of the main board.



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(19) **United States**

(12) **Patent Application Publication**

TSENG et al.

(10) **Pub. No.: US 2011/0037672 A1**

(43) **Pub. Date: Feb. 17, 2011**

(54) **TRIPLE-BAND ANTENNA WITH LOW PROFILE**

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(21) Appl. No.: **12/857,764**

(22) Filed: **Aug. 17, 2010**

(30) **Foreign Application Priority Data**

Aug. 17, 2009 (TW) 98127534

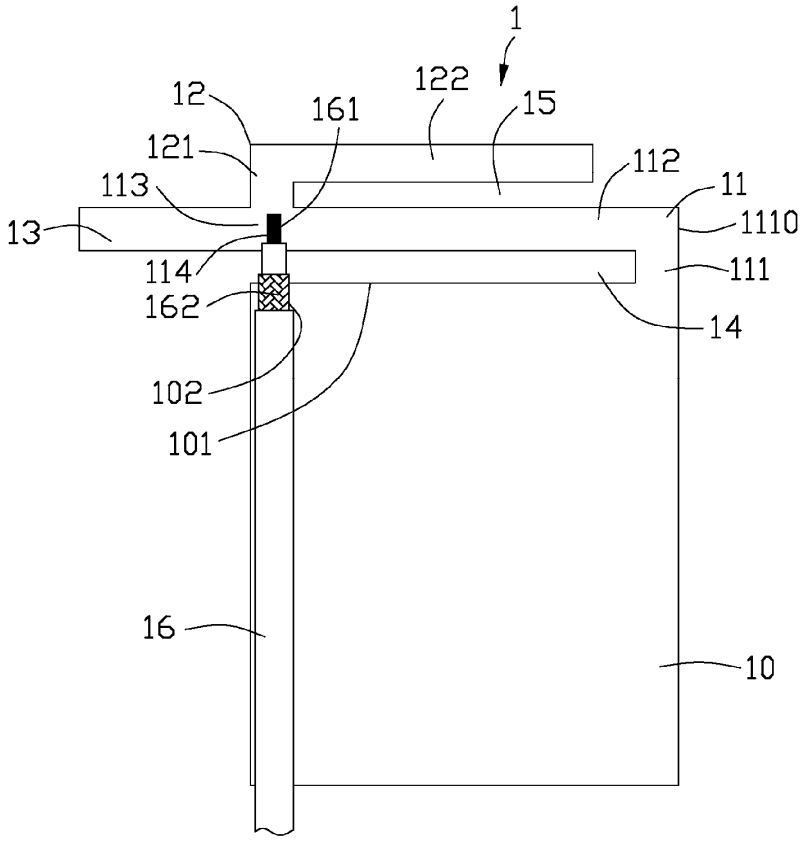
Publication Classification

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

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

(57) **ABSTRACT**

A multi-band antenna includes a grounding element having an edge and a grounding point, a first radiating arm being substantially of L shape and located above the grounding element, a second radiating arm working at a first frequency band and being substantially of L shape above the first radiating arm, a third radiating arm working at a second frequency band and being substantially of rectangular metal patch parallel to the edge of the grounding element, and a feeding line including an inner conductor connected to the first radiating arm and an outer conductor connected to the grounding point of the grounding element. The feeding line, the first radiating arm, the grounding element commonly compose a slot operating at a third frequency band.



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(19) **United States**

(12) **Patent Application Publication**

Huang

(10) **Pub. No.: US 2011/0037673 A1**

(43) **Pub. Date: Feb. 17, 2011**

(54) **PLANAR ANTENNA WITH ISOTROPIC RADIATION PATTERN**

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(21) Appl. No.: **12/619,689**

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

(30) **Foreign Application Priority Data**

Aug. 14, 2009 (TW) 98127503

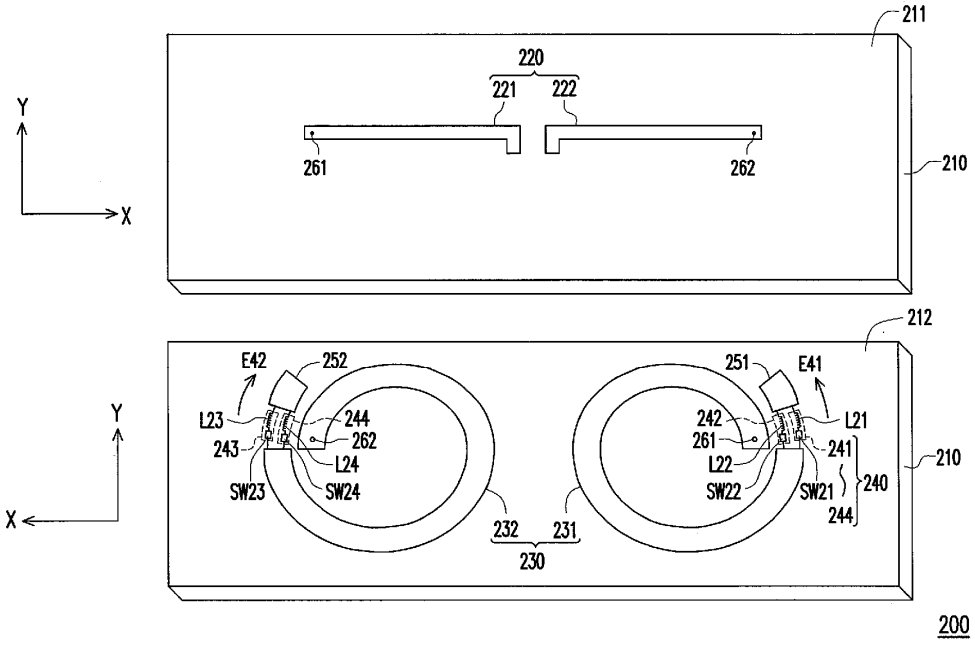
Publication Classification

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

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

(57) **ABSTRACT**

A planar antenna with an isotropic radiation pattern is provided. The planar antenna includes a substrate, a dipole antenna, a microstrip line set, and a channel selection module. The dipole antenna is disposed on a first surface of the substrate, and the microstrip line set and the channel selection module are disposed on a second surface of the substrate. A first microstrip line and a second microstrip line of the microstrip line set are spirally extended along two opposite rotation trails on a vertical projection plane to form a high-frequency path with the dipole antenna. The planar antenna controls the on/off state of the channel selection module so that a low-frequency path is formed when the dipole antenna is connected to a first line and a second line. A plurality of channels having different operating frequencies is respectively generated within the high-frequency path and the low-frequency path.



US 20110037675A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2011/0037675 A1

(43) Pub. Date: Feb. 17, 2011

Chen et al.

(54) **COPLANAR ANTENNA UNIT AND COPLANAR ANTENNA**

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(21) Appl. No.: **12/603,845**

(22) Filed: **Oct. 22, 2009**

(30) **Foreign Application Priority Data**

Aug. 14, 2009 (TW) 098127509

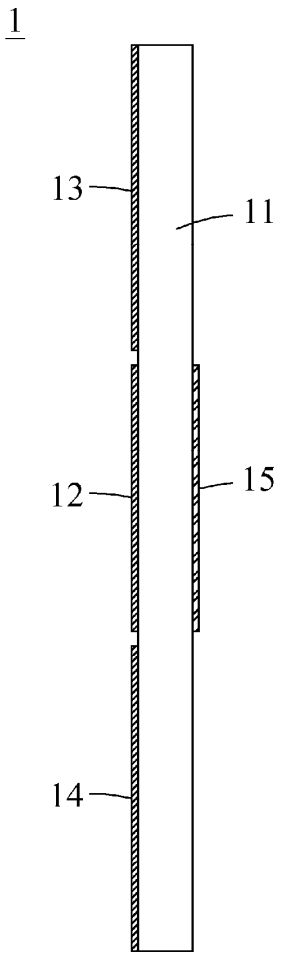
Publication Classification

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

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

(57) **ABSTRACT**

The present invention is related to a coplanar antenna unit and a coplanar antenna. By utilizing the unique properties of meta-material to design 1-D balanced CRLH leaky-wave antenna. The antenna can be realized with the coplanar antenna unit consisting of MIM capacitor and grounded inductor. In this invention, all proposed elements are implemented by planar print circuit broad, so the full-space switched beam scanning antenna has shorter length of leaky-wave antenna and good radiation performance.



US 20110037678A1

(19) **United States**

(12) **Patent Application Publication**

TANG et al.

(10) **Pub. No.: US 2011/0037678 A1**

(43) **Pub. Date: Feb. 17, 2011**

(54) **MULTIFUNCTIONAL ANTENNA CHIP**

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(21) Appl. No.: **12/542,093**

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

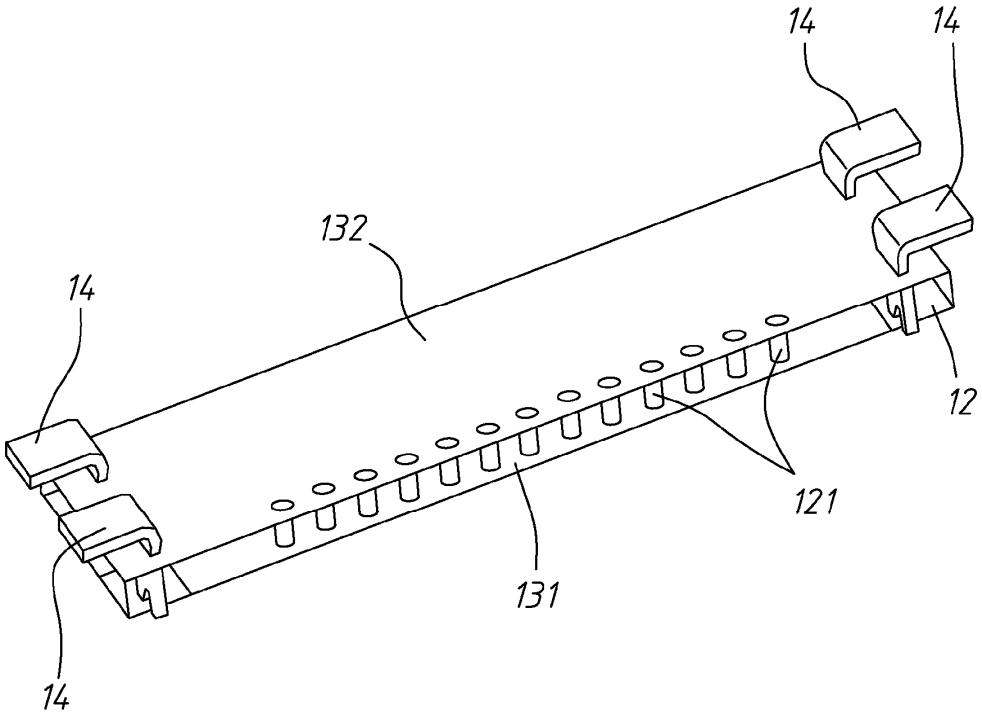
Publication Classification

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

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

(57) **ABSTRACT**

A multifunctional antenna chip is able to mate with many kinds of matched circuits and is able to adjust the character of an antenna structure of the multifunctional antenna chip, in order that the antenna structure has one or multiple standard working frequencies. The antenna structure is a folded antenna structure basically; this can save its volume occupied. And the multifunctional antenna chip has a non-signal inputting pin for connection to thereby increase shape of the antenna for adjusting the style of the antenna structure designed.



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(19) **United States**

(12) **Patent Application Publication**

CHIU et al.

(10) **Pub. No.: US 2011/0037680 A1**

(43) **Pub. Date: Feb. 17, 2011**

(54) **MULTI-BAND ANTENNA**

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(21) Appl. No.: **12/857,769**

(22) Filed: **Aug. 17, 2010**

(30) **Foreign Application Priority Data**

Aug. 17, 2009 (TW) 98127535

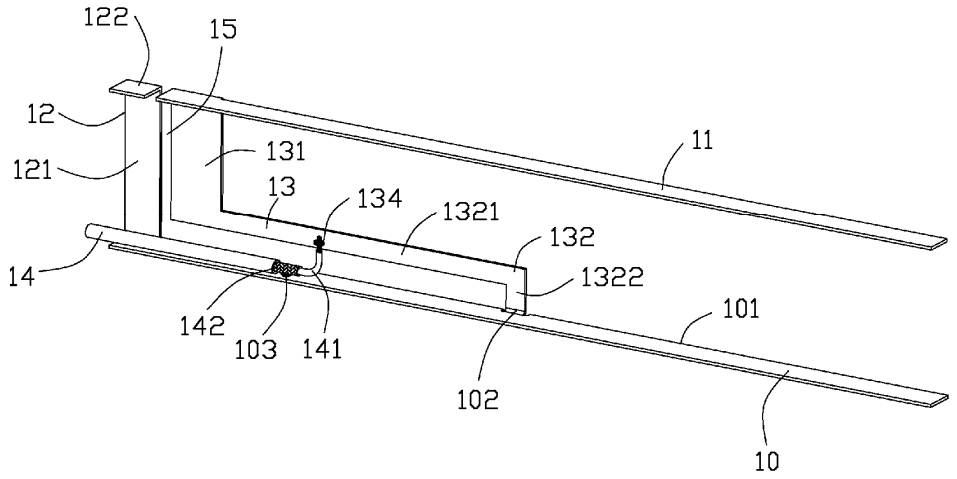
Publication Classification

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

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

(57) **ABSTRACT**

A multi-band antenna (**1**) includes a grounding element (**10**) extending along a horizontal direction and including a side edge (**101**) with a connecting point (**102**) and a grounding point (**103**) distanced from the connecting point by a length, a first radiating element (**11**) disposed above and parallel to the grounding element (**10**), a second radiating element (**12**) apart from the first radiating element and extending upwardly from the side edge of the grounding portion, a connecting element (**13**) located between the first radiating element and the grounding element, a feeding point (**134**) disposed on the connecting element (**13**), and a feeding line (**14**) including an inner conductor (**141**) connected to the feeding point and an outer conductor (**142**) connected to the grounding point. The first radiating element operates in a first frequency band. The second radiating element defines a L-shaped configuration in a side view and operates in a second frequency band. The connecting element (**13**) includes a first end linked to an end of said first radiating element and a second end connecting to said connecting point of the grounding element. Said first radiating element extends from said first end of the connecting element along a direction away from the second radiating element, and forms a slot (**15**) together with said second radiating element and said connecting element.



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(19) **United States**

(12) **Patent Application Publication**

Shi et al.

(10) **Pub. No.: US 2011/0043408 A1**

(43) **Pub. Date: Feb. 24, 2011**

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

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(21) Appl. No.: **12/619,558**

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

Related U.S. Application Data

(60) Provisional application No. 61/235,636, filed on Aug. 20, 2009.

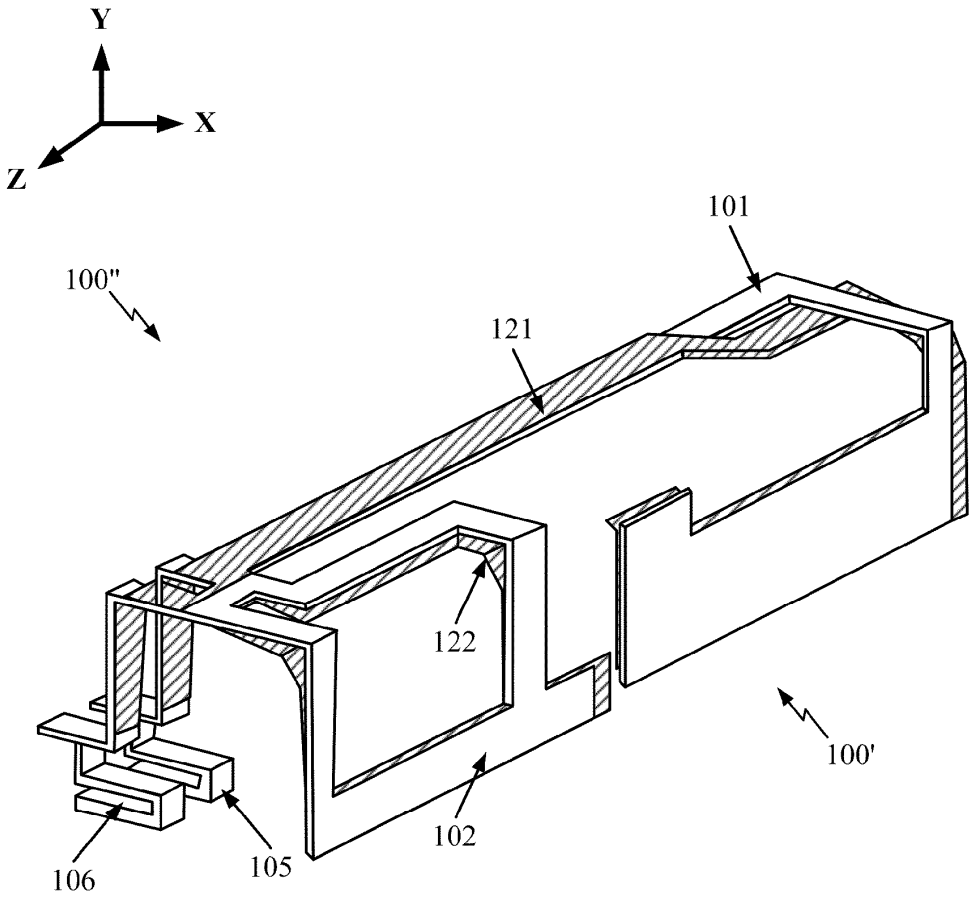
Publication Classification

(51) **Int. Cl.**
H01Q 9/04 (2006.01)
H01Q 5/00 (2006.01)

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

(57) **ABSTRACT**

A simple, compact multi-band PIFA including two arm portions, where one arm portion is grounded at two points to form a loop, a ground plane, and a plastic carrier and housing. The antenna radiates a same signal from both arm portions, at different efficiencies according to the radiated frequency and the effective length of each arm. The antenna is made from a single standard metal sheet by cutting it and is assembled with the metal ground plane and the other plastic parts. In one embodiment, the antenna is folded into a 3D U-shape to reduce its size for use in mobile communication devices. In another embodiment, the antenna is a penta-band antenna with return loss of −6 B or better and measures 40×8×8 mm or smaller.



US 20110043410A1

(19) **United States**

(12) **Patent Application Publication**

Lee et al.

(10) **Pub. No.: US 2011/0043410 A1**

(43) **Pub. Date: Feb. 24, 2011**

(54) **UNSYMMETRICAL DUAL BAND ANTENNA**

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(21) Appl. No.: **12/805,771**

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

(30) **Foreign Application Priority Data**

Aug. 19, 2009 (TW) 098127886

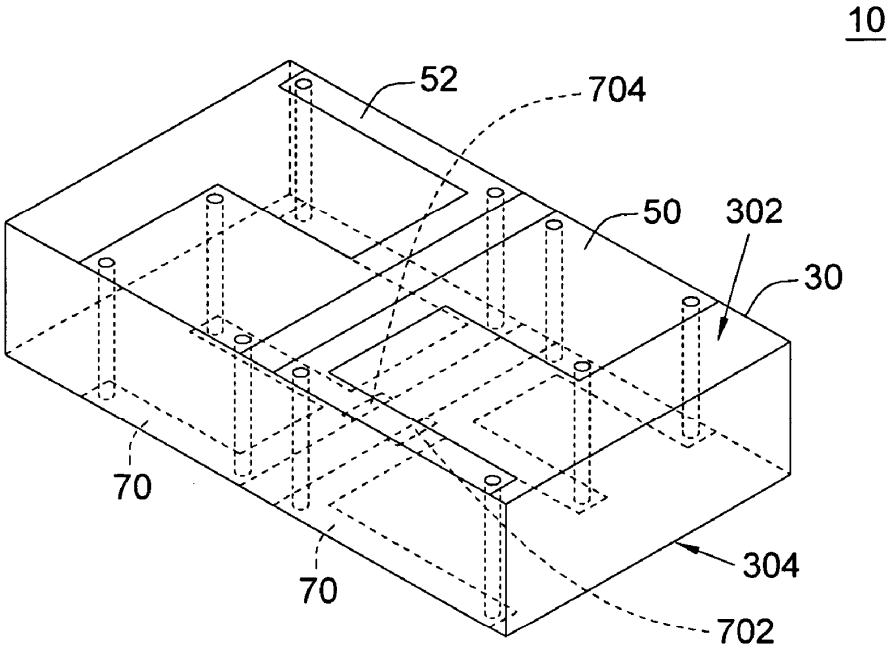
Publication Classification

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

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

(57) **ABSTRACT**

An unsymmetrical dual-band antenna including a substrate, a first radiation unit, a second radiation unit and an impedance matching unit is provided. The substrate has a first surface and a second surface opposite to the first surface. The first radiation unit disposed on the first surface of the substrate includes first and second radiation portions connected to each other. The second radiation unit disposed on the first surface of the substrate includes third and fourth radiation portions connected to each other. The third radiation portion is disposed on the first surface of the substrate and adjacent to the first radiation portion. The impedance matching unit disposed on the second surface includes first to fourth patches. The first and the second patch are electrically connected to a feeding point. The third and the fourth patch are electrically connected to a ground point.



US 20110043411A1

(19) **United States**

(12) **Patent Application Publication**

WU et al.

(10) **Pub. No.: US 2011/0043411 A1**

(43) **Pub. Date: Feb. 24, 2011**

(54) **MULTIPLE ANTENNA COMMUNICATION APPARATUS**

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(21) Appl. No.: **12/842,797**

(22) Filed: **Jul. 23, 2010**

(30) **Foreign Application Priority Data**

Aug. 21, 2009 (TW) 098128155

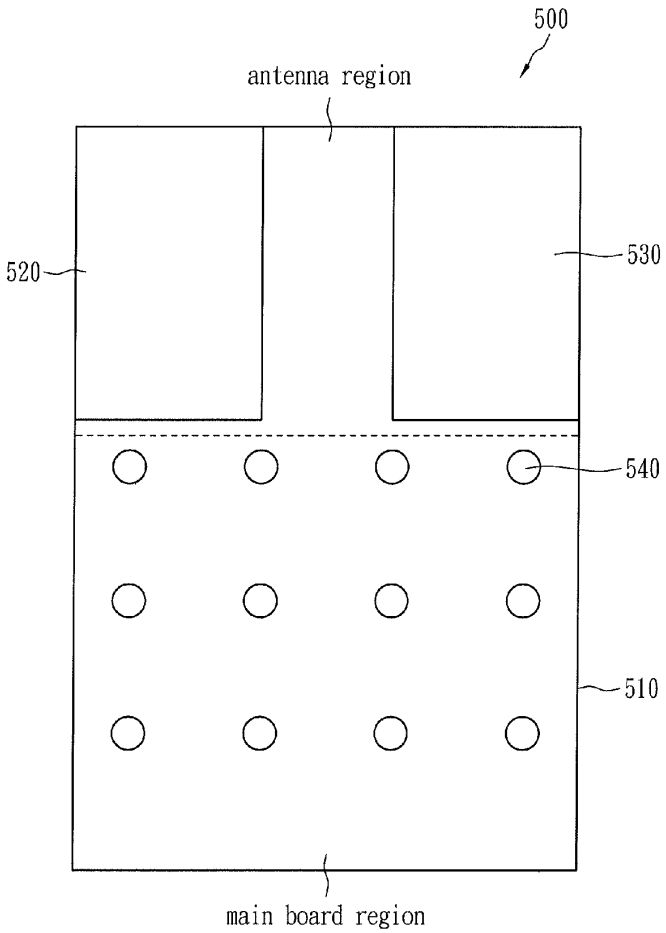
Publication Classification

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

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

(57) **ABSTRACT**

A multiple antenna communication apparatus includes a printed circuit board having multiple layers and two antenna devices. The two antenna devices are disposed on antenna regions of the printed circuit board, and each antenna device comprises a ground terminal. Each ground terminal is coupled to a conductor on a different layer of the printed circuit board. The antenna regions on which the two antenna devices are disposed do not contain any main ground via.



US 20110043412A1

(19) **United States**

(12) **Patent Application Publication**

Kim

(10) **Pub. No.: US 2011/0043412 A1**

(43) **Pub. Date: Feb. 24, 2011**

(54) **INTERNAL WIDE BAND ANTENNA USING SLOW WAVE STRUCTURE**

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(21) Appl. No.: **12/989,928**

(22) PCT Filed: **Mar. 30, 2009**

(86) PCT No.: **PCT/KR09/01609**

§ 371 (c)(1),
(2), (4) Date: **Oct. 27, 2010**

(30) **Foreign Application Priority Data**

Apr. 30, 2008 (KR) 10-2008-004087

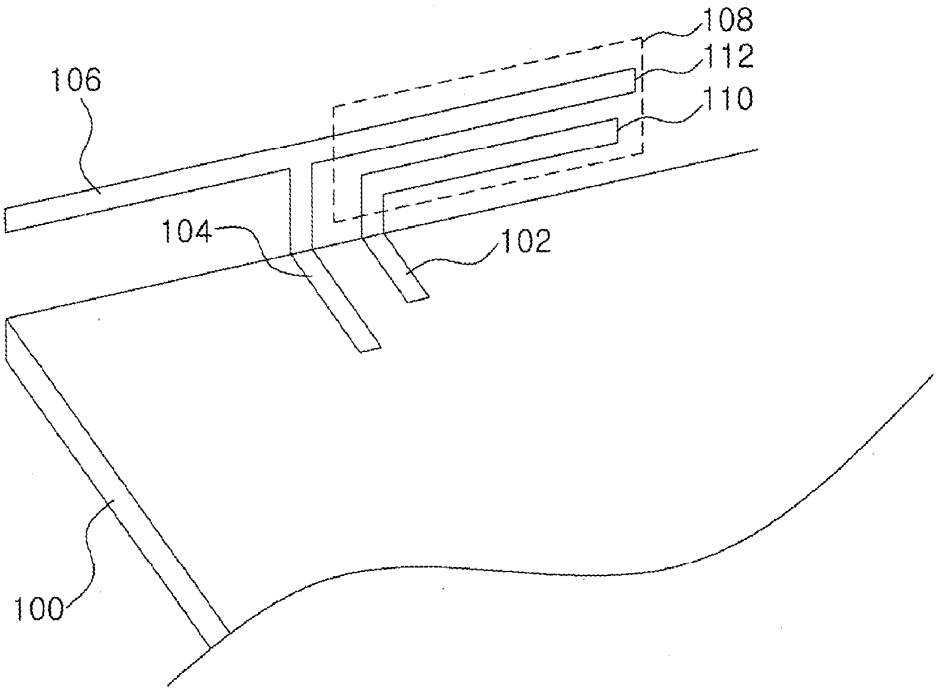
Publication Classification

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

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

(57) **ABSTRACT**

Disclosed is a wide-band internal antenna that uses a slow-wave structure. The antenna includes an impedance matching/power feed part, which includes a first conductive element that extends from a power feed line and a second conductive element that is separated by a particular distance from the first conductive element and is electrically connected with a ground, and at least one radiator extending from the impedance matching/power feed part. Here, the first conductive element and the second conductive element of the impedance matching/power feed part form a slow-wave structure. By applying a slow-wave structure to coupling matching, the antenna provides the advantage of resolving the problem of narrow band characteristics found in inverted-F antennas while maintaining a low profile.



US 20110043413A1

(19) **United States**

(12) **Patent Application Publication**

Zadesky et al.

(10) **Pub. No.: US 2011/0043413 A1**

(43) **Pub. Date: Feb. 24, 2011**

(54) **CONNECTORS WITH EMBEDDED ANTENNAS**

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(21) Appl. No.: **12/543,457**

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

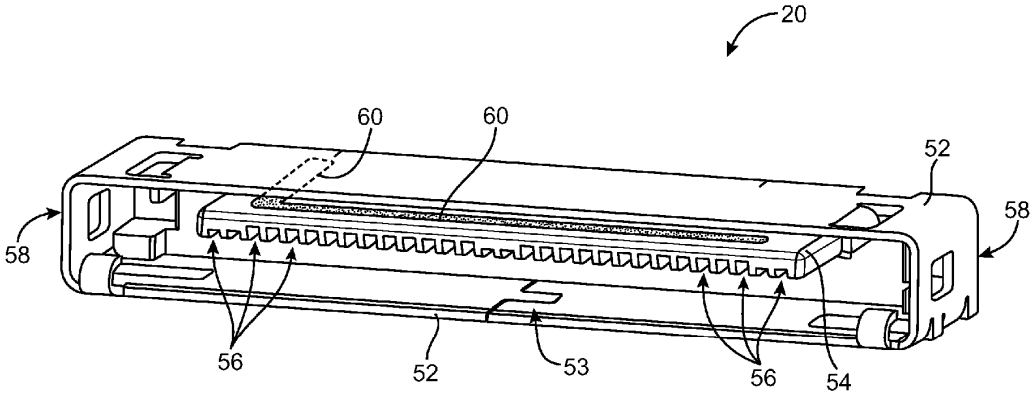
Publication Classification

(51) **Int. Cl.**
H01Q 1/50 (2006.01)
H01Q 1/24 (2006.01)

(52) **U.S. Cl.** **343/702**; 343/906

(57) **ABSTRACT**

Connectors for electronic devices are provided with embedded antennas. The connectors may be 30-pin connectors. A 30-pin connector may have a conductive shell structure that defines a cavity and a planar dielectric member that extends into the cavity and that has contact pins. An antenna may be formed from an antenna resonating element on the planar dielectric member and an antenna ground formed from the conductive shell structure. An antenna may be formed from a slot in the conductive shell. The antenna and the pins may be electrically coupled to an electronic device using a cable.



US 20110043415A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2011/0043415 A1

(43) Pub. Date: Feb. 24, 2011

CHANG

(54) **DUAL-BAND ANTENNA AND WIRELESS COMMUNICATION DEVICE USING THE SAME**

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(21) Appl. No.: **12/618,091**

(22) Filed: **Nov. 13, 2009**

(30) **Foreign Application Priority Data**

Aug. 18, 2009 (CN) 200910305716.1

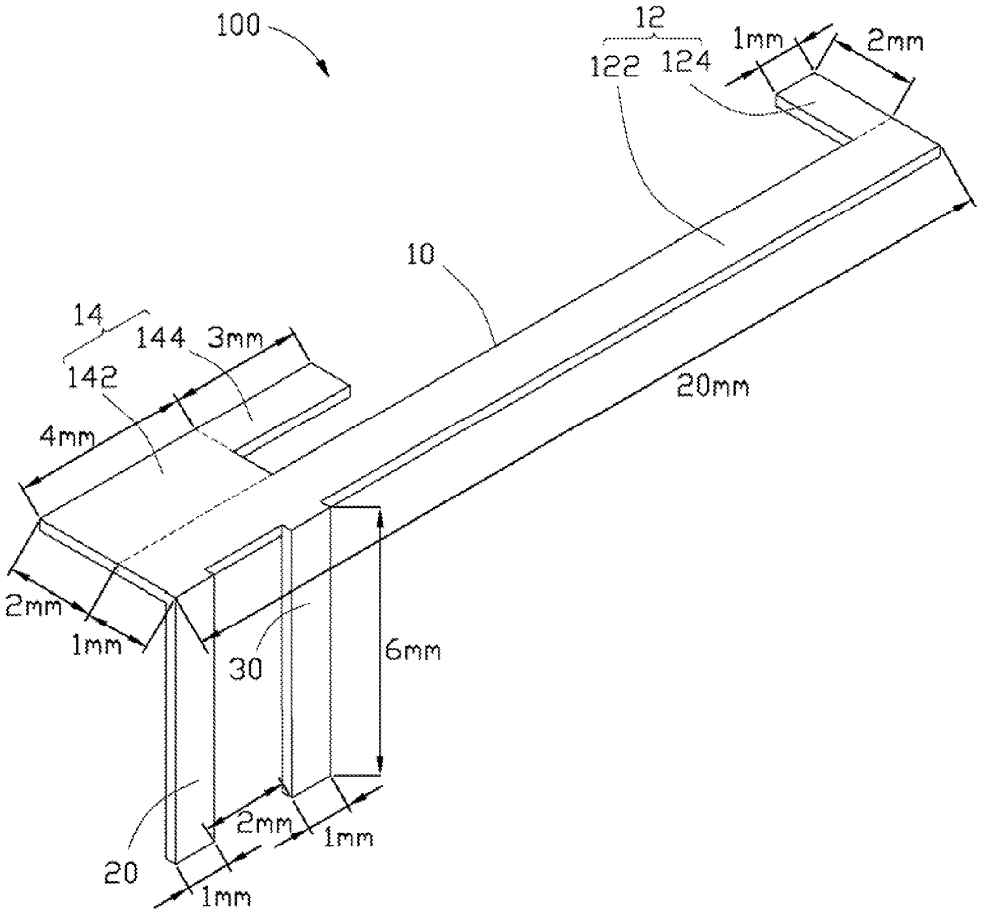
Publication Classification

(51) **Int. Cl.**
H01Q 1/36 (2006.01)
H01Q 1/24 (2006.01)
H01Q 1/48 (2006.01)

(52) **U.S. Cl.** ..... **343/702**; 343/700 MS; 343/846

(57) **ABSTRACT**

A dual-band antenna used in a wireless communication device includes a radiating body, a grounding portion, and feeding portion. The radiating body includes a first radiating portion and a second radiating portion connected to the first radiating portion. The grounding portion is connected to the first radiating portion. The feeding portion is also connected to the first radiating portion, and parallel to the grounding portion. The first radiating portion receives/sends wireless signals at a first frequency band. The second radiating portion receives/sends wireless signals at a second frequency band.



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(19) **United States**

(12) **Patent Application Publication**

Imano et al.

(10) **Pub. No.: US 2011/0043416 A1**

(43) **Pub. Date: Feb. 24, 2011**

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

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

(21) Appl. No.: **12/885,293**

(22) Filed: **Sep. 17, 2010**

Related U.S. Application Data

(62) Division of application No. 11/570,129, filed on Dec. 7, 2006, now Pat. No. 7,859,467, filed as application No. PCT/JP2005/017815 on Sep. 28, 2005.

(30) **Foreign Application Priority Data**

Sep. 28, 2004 (JP) 2004-281586
Apr. 13, 2005 (JP) 2005-116049

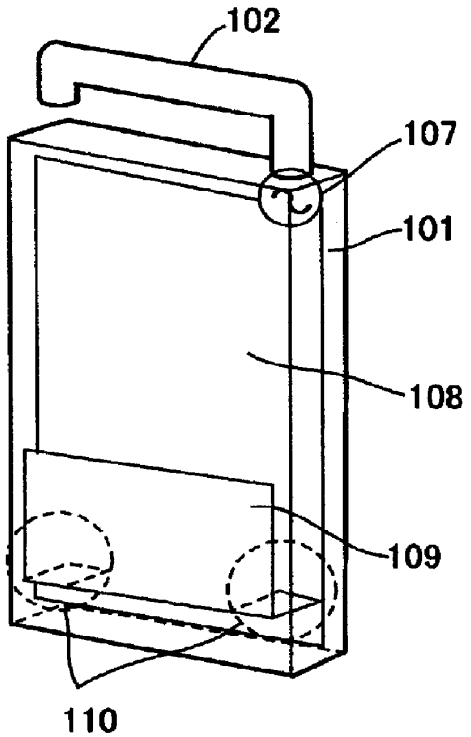
Publication Classification

(51) **Int. Cl.**
H01Q 1/48 (2006.01)
H01Q 1/24 (2006.01)

(52) **U.S. Cl.** **343/702**; 343/848

(57) **ABSTRACT**

An object of the present invention is to provide an antenna device for a radio apparatus in which the amount of energy (SAR) absorbed by a head of a human body can be reduced without lowering the power of radio waves transmitted during a call. There is provided a board **108** serving as a base plate of an antenna element, an antenna element **102** disposed in a longitudinally end portion of the board **108** through a feeding portion **107**, a conductor plate **109** disposed substantially in parallel with a main surface of the board **108** and disposed on the opposite side to a surface having a sound hole of a receiver portion, and a plurality of short-circuit conductors **110** disposed on a lower end portion of the conductor plate **109**. The conductor plate **109** is short-circuited to a lower end portion of the board **108** through the short-circuit conductors **110**.



(b)

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(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2011/0043421 A1

(43) Pub. Date: Feb. 24, 2011

Hsieh et al.

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

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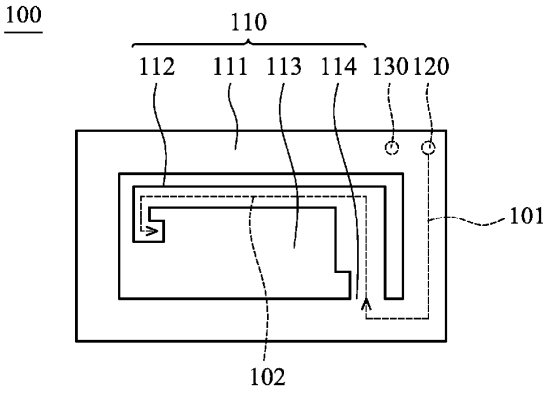
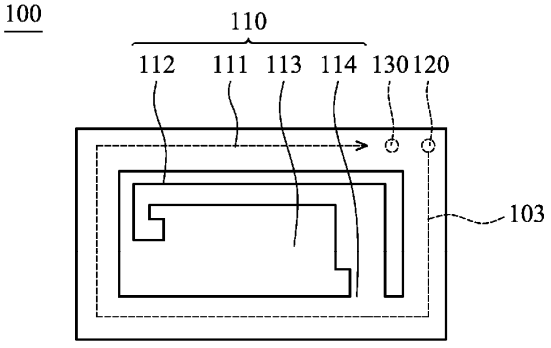
(57) **ABSTRACT**

An antenna is provided. The antenna includes a radiator, a feed conductor and a ground conductor. The radiator includes a body and a parasitic element. An aperture is formed on the body, and the body encloses the aperture. The parasitic element is connected to the body and extended into the aperture, wherein the parasitic element is connected to the body at a parasitic location. The feed conductor is connected to the body, wherein a signal, fed to the body by the feed conductor, travels on the body, and passes the parasitic location to the parasitic element. The ground conductor is connected to the body.





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(54) **INTERNAL ANTENNA PROVIDING IMPEDANCE MATCHING FOR MULTIBAND**

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(57) **ABSTRACT**

Disclosed is an internal antenna that provides impedance matching for multiple bands. The antenna includes an impedance matching part, which in turn includes a first conductive element electrically coupled to a feeding point and a second conductive element electrically coupled to a ground, and at least one radiator electrically coupled to the first conductive element, where the first conductive element and the second conductive element of the impedance matching part are separated by a particular distance to perform coupling matching and are electrically coupled at a pre-designated position. Certain aspects of the present invention can be utilized to provide wide band characteristics in designing for multi-band applications, even for high-frequency bands.