US 20130021207A1

(19) **United States**

(12) **Patent Application Publication**

(10) **Pub. No.: US 2013/0021207 A1**

(43) **Pub. Date: Jan. 24, 2013**

Lee

(54) **COPLANAR-WAVEGUIDE FED MONOPOLE ANTENNA**

(76) Inventor: **Youn M. Lee**, Clifton, VA (US)

(21) Appl. No.: **13/184,692**

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

Publication Classification

(51) **Int. Cl.**

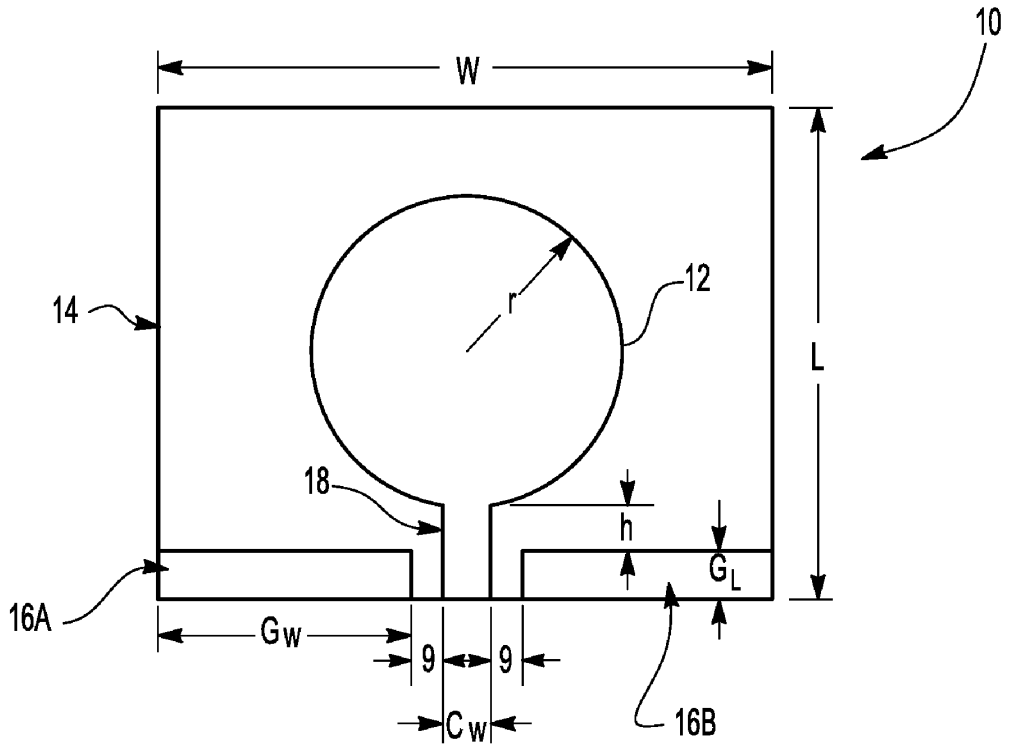
H01Q 9/06 (2006.01)

H01P 11/00 (2006.01)

(52) **U.S. Cl.** ..... **343/700 MS**; 29/401.1

(57) **ABSTRACT**

A planar monopole antenna is provided that includes a dielectric substrate with an electrically conductive antenna element adhered to the substrate surface. A coplanar waveguide is also adhered to the surface of the dielectric substrate in electrical communication with the antenna element. A microwave absorber layer is adhered to an opposing rearward surface of the dielectric substrate. The resultant antenna operates at a reduced return loss and lowers operating frequency compared to an antenna lacking the microwave absorber layer. As a result, an otherwise nonultrawideband antenna is operated as an ultrawideband antenna without increasing the dimensions of the antenna elements through resort to adherence of a microwave absorber layer to the rearward surface of the substrate.



US 20130021208A1

(19) **United States**

(12) **Patent Application Publication**

Seok et al.

(10) **Pub. No.: US 2013/0021208 A1**

(43) **Pub. Date: Jan. 24, 2013**

(54) **LOOP ANTENNA**

(75) Inventors: **Eunyoung Seok**, Plano, TX (US); **Brian P. Ginsburg**, Allen, TX (US); **Baher Haroun**, Allen, TX (US); **Srinath Ramaswamy**, Murphy, TX (US); **Vijay B. Rentala**, Plano, TX (US)

(73) Assignee: **Texas Instruments Incorporated**, Dallas, TX (US)

(21) Appl. No.: **13/189,135**

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

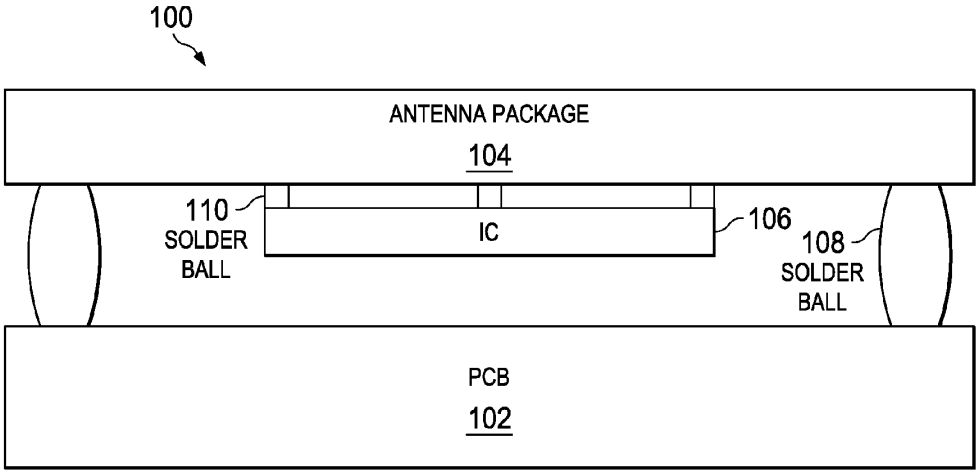
Publication Classification

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

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

(57) **ABSTRACT**

A loop antenna is provided. The apparatus comprises a substrate, a first metallization layer, and a second metallization layer. The substrate has first and second feed terminals and a ground terminal. The first metallization layer is disposed over the substrate and includes a first window conductive region, a first conductive region, a second conductive region, and a third conductive region. The first conductive region is disposed over and is in electrical contact with the first feed terminal; it is also is substantially circular and located within the first window region. The second conductive region is disposed over and is in electrical contact with the second feed terminal; it is also substantially circular and is located within the first window region. The a third conductive region is disposed over and is in electrical contact with the ground terminal, and the third conductive region substantially surrounds the first window region. The second metallization layer is disposed over and is in electrical contact with the first, second, and third conductive regions of the first metallization layer, and the second metallization layer includes a second window region that is at least partially aligned with the first window region.



US 20130021209A1

(19) **United States**

(12) **Patent Application Publication**

Fan et al.

(10) **Pub. No.: US 2013/0021209 A1**

(43) **Pub. Date: Jan. 24, 2013**

(54) **WIDEBAND ANTENNA**

(76) Inventors: **Wen-Chuan Fan**, Hsinchu (TW); **Yi-Feng Wu**, Hsinchu (TW); **Wei-Hung Ruan**, Hsinchu (TW)

(21) Appl. No.: **13/253,990**

(22) Filed: **Oct. 6, 2011**

(30) **Foreign Application Priority Data**

Jul. 20, 2011 (TW) 100125591

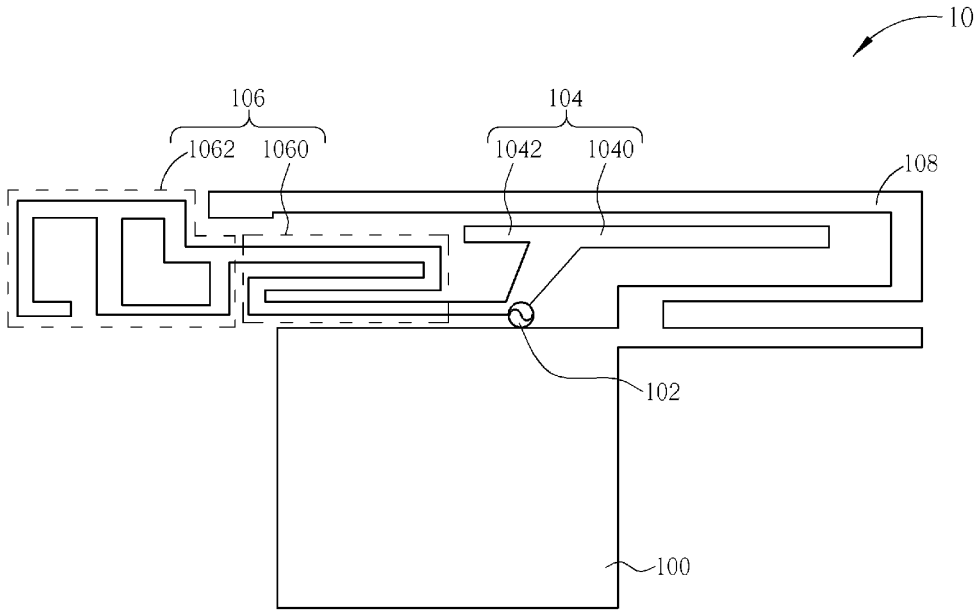
Publication Classification

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

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

(57) **ABSTRACT**

A wideband antenna includes a grounding element; a feed-in terminal; a first radiating unit, electrically connected to the feed-in terminal and extending from the feed-in terminal toward a first direction; a second radiating unit, electrically connected to the feed-in terminal, extending from the feed-in terminal toward a second direction, and including a meander-shaped element; and a third radiating unit, electrically connected to the grounding element, extending from the grounding element toward the first radiating unit and the second radiating unit, and having one segment parallel to the meander-shaped element, for coupling the meander-shaped element.



US 20130021211A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2013/0021211 A1

(43) Pub. Date: Jan. 24, 2013

KOMAKI et al.

(54) ANTENNA AND MOBILE COMMUNICATION APPARATUS

(75) Inventors: **Kunihiro KOMAKI**, Kyoto-fu (JP); **Tsuyoshi MUKAI**, Kyoto-fu (JP); **Masayuki ATOKAWA**, Kyoto-fu (JP)

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

(21) Appl. No.: **13/619,316**

(22) Filed: **Sep. 14, 2012**

Related U.S. Application Data

(63) Continuation of application No. PCT/JP2011/069690, filed on Aug. 31, 2011.

(30) **Foreign Application Priority Data**

Sep. 8, 2010 (JP) 2010-200997

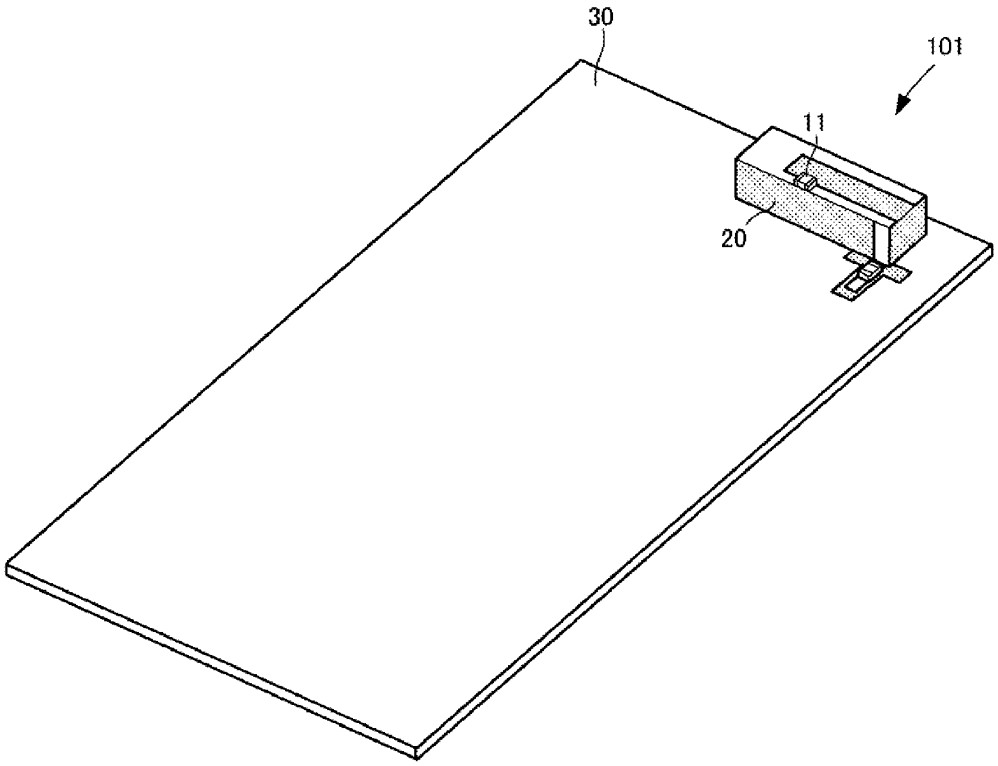
Publication Classification

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

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

(57) **ABSTRACT**

This disclosure provides an antenna and mobile communication apparatus including an antenna, where the antenna includes a base member and a radiation electrode provided on the base member. The radiation electrode includes a feeding portion and an open end, and at least one phase control element provided between the feeding portion and the open end. With the length of the lengthwise direction of the base member taken as L, and with the wavelength on the base member of the usable frequency range taken as λ, $L<\lambda/5$. Through this configuration, it is possible to configure an antenna that can be disposed within a limited amount of space and that can obtain high radiation efficiency, and a mobile communication apparatus that includes the antenna and thus has high communication capabilities.



US 20130021212A1

(19) **United States**

(12) **Patent Application Publication**

LAI et al.

(10) **Pub. No.: US 2013/0021212 A1**

(43) **Pub. Date: Jan. 24, 2013**

(54) **EXTERNAL CASING STRUCTURE FOR PROVIDING AN ANTENNA FUNCTION**

(75) Inventors: **CHE-YI LAI**, NEW TAIPEI CITY (TW); **JIA-WEI CHANG**, NEW TAIPEI CITY (TW); **CHI-KANG HSIA**, NEW TAIPEI CITY (TW); **WEN-CHIN YAO**, NEW TAIPEI CITY (TW)

(73) Assignee: **SILITECH TECHNOLOGY CORPORATION**, NEW TAIPEI CITY (TW)

(21) Appl. No.: **13/236,879**

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

(30) **Foreign Application Priority Data**

Jul. 18, 2011 (TW) 100213152

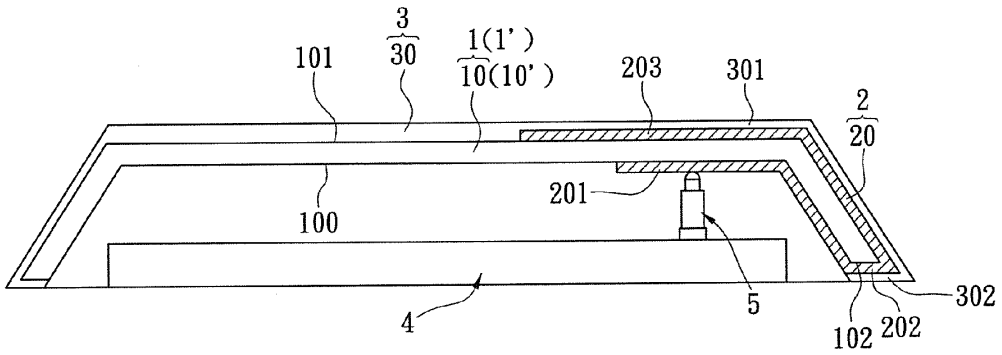
Publication Classification

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

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

(57) **ABSTRACT**

An external casing structure for providing an antenna function includes a metal casing unit, an antenna unit, and an appearance decoration unit. The metal casing unit includes at least one metal casing. The antenna unit includes at least one antenna layer disposed on the metal casing, and the antenna layer is extended from the inner surface of the metal casing to the outer surface of the metal casing. The appearance decoration unit includes at least one appearance decoration layer disposed on the outer surface of the metal casing, and one part of the antenna layer is covered with the appearance decoration layer.



US 20130021216A1

(19) **United States**

(12) **Patent Application Publication**

Harper

(10) **Pub. No.: US 2013/0021216 A1**

(43) **Pub. Date: Jan. 24, 2013**

(54) **DIELECTRIC CHIP ANTENNAS**

(76) Inventor: **Marc Harper**, Cambridge, (GB)

(21) Appl. No.: **13/636,921**

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

(86) PCT No.: **PCT/GB2011/050564**

§ 371 (c)(1),
(2), (4) Date: **Sep. 24, 2012**

(30) **Foreign Application Priority Data**

Mar. 26, 2010 (GB) 1005121.7

Publication Classification

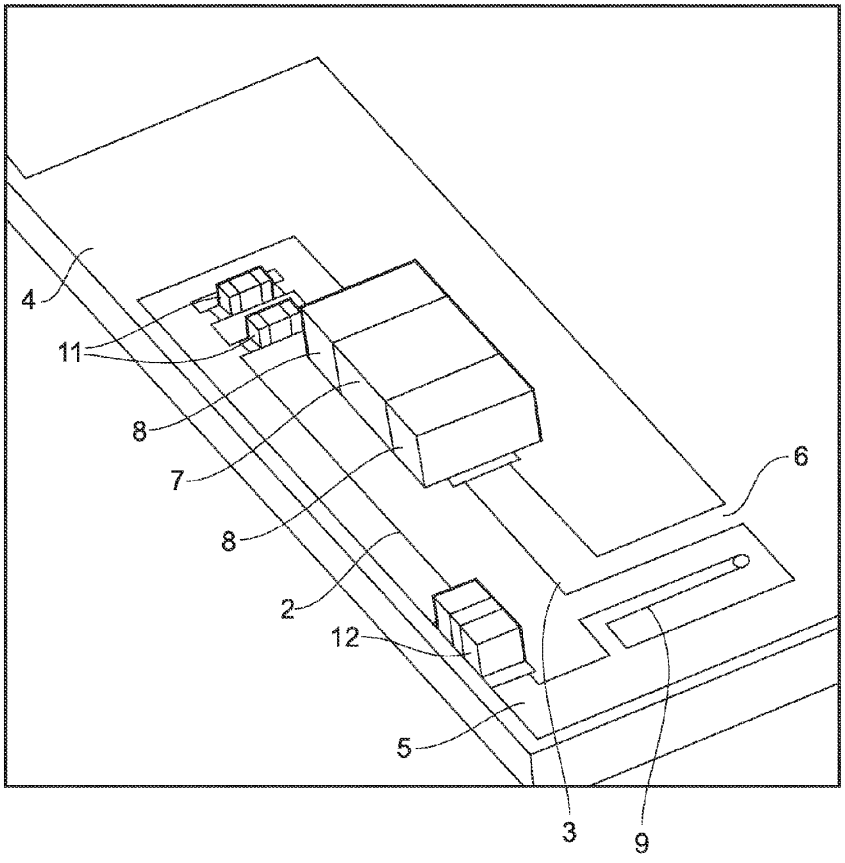
(51) **Int. Cl.**

H01Q 5/01 (2006.01)
H01Q 7/00 (2006.01)
H01Q 9/04 (2006.01)

(52) **U.S. Cl.** ..... **343/788**; 343/700 MS

(57) **ABSTRACT**

There is disclosed an antenna arrangement having a parasitic conductive loop (**1**) and at least one active radiating element (**9**). The conductive loop (**1**) comprises first and second electrically conductive passive radiating elements (**2**, **3**) each with first and second ends. The first ends of the passive radiating elements are each connected to ground, and the second ends of the radiating elements are each connected respectively to mutually discrete metalized surface regions (**8**) of a dielectric block (**7**). The at least one active radiating element (**9**) is not conductively connected to the passive radiating elements (**2**, **3**). The passive radiating elements (**2**, **3**) are configured to be fed parasitically by the at least one active radiating element (**9**). The antenna arrangement has excellent resistance to detuning and can be located in different regions of a PCB substrate without significantly affecting performance. Further, the antenna is small in size and may be arranged for dual band operation.



US 20130021217A1

(19) **United States**

(12) **Patent Application Publication**

TSAI et al.

(10) **Pub. No.: US 2013/0021217 A1**

(43) **Pub. Date: Jan. 24, 2013**

(54) **FLUIDIC DIPOLE ANTENNA**

(75) Inventors: **WEN-KAI TSAI**, New Taipei (TW); **HSIN-KUO DAI**, New Taipei (TW); **YU-MIN WANG**, New Taipei (TW)

(73) Assignee: **HON HAI PRECISION INDUSTRY CO., LTD.**, New Taipei (TW)

(21) Appl. No.: **13/554,171**

(22) Filed: **Jul. 20, 2012**

(30) **Foreign Application Priority Data**

Jul. 20, 2011 (TW) 100125564

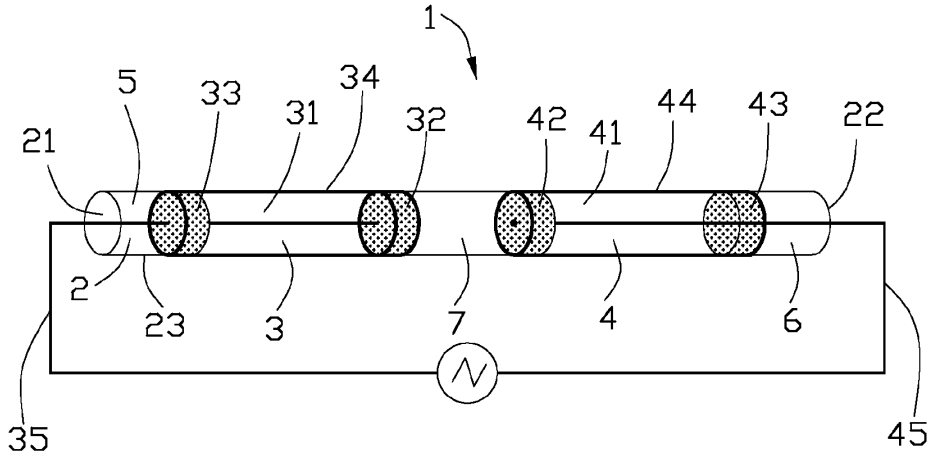
Publication Classification

(51) **Int. Cl.**
H01Q 9/28 (2006.01)

(52) **U.S. Cl.** **343/807**

(57) **ABSTRACT**

An antenna comprises: a closed and insulating receiving housing; a radiating portion received in the receiving housing and including a liquid metal; a grounding portion received in the receiving housing and including a liquid metal; a pair of wires respectively connected to the radiating portion and the grounding portion and extending out of the receiving housing; and two air chambers respectively located on the ends of the radiating portion and the grounding portion.



US 20130024592A1

(19) **United States**

(12) **Patent Application Publication**

LEE

(10) **Pub. No.: US 2013/0024592 A1**

(43) **Pub. Date: Jan. 24, 2013**

(54) **DOCKING STATION FOR COMMUNICATION TERMINAL**

(75) Inventor: **Dong Jun LEE**, Suwon-si (KR)

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

(21) Appl. No.: **13/551,081**

(22) Filed: **Jul. 17, 2012**

(30) **Foreign Application Priority Data**

Jul. 20, 2011 (KR) 10-2011-0071803
Oct. 24, 2011 (KR) 10-2011-0105822

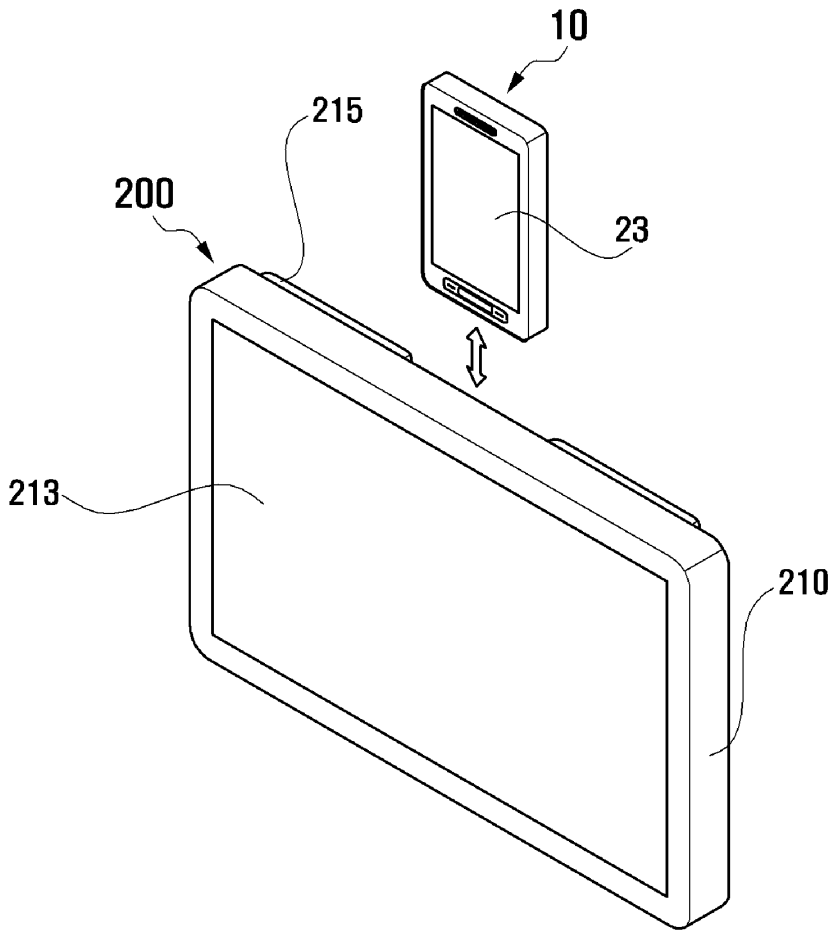
Publication Classification

(51) **Int. Cl.**
G06F 13/00 (2006.01)

(52) **U.S. Cl.** **710/303**

(57) **ABSTRACT**

A docking station for a communication terminal having an antenna for a radio communication is provided. The docking station includes a docking unit, a fastening unit, and a pattern unit. The docking unit is configured to be joined to the communication terminal and to provide an interface with the communication terminal. The fastening unit is coupled with the docking unit, configured to fixedly hold the communication terminal, and electrically coupled to the antenna through an electromagnetic field created in the antenna when the antenna operates. The pattern unit is disposed on the docking unit so as to be extended from the fastening unit, and configured to perform the radio communication together with the antenna by being electrically coupled to the antenna through the fastening unit when the antenna operates.



US 20130027254A1

(19) **United States**

(12) **Patent Application Publication**

Korva et al.

(10) **Pub. No.: US 2013/0027254 A1**

(43) **Pub. Date: Jan. 31, 2013**

(54) **MULTIBAND SLOT LOOP ANTENNA APPARATUS AND METHODS**

(76) Inventors: **Heikki Korva**, Tupos (FI); **Petteri Annamaa**, Oulunsalo (FI)

(21) Appl. No.: **13/190,363**

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

Publication Classification

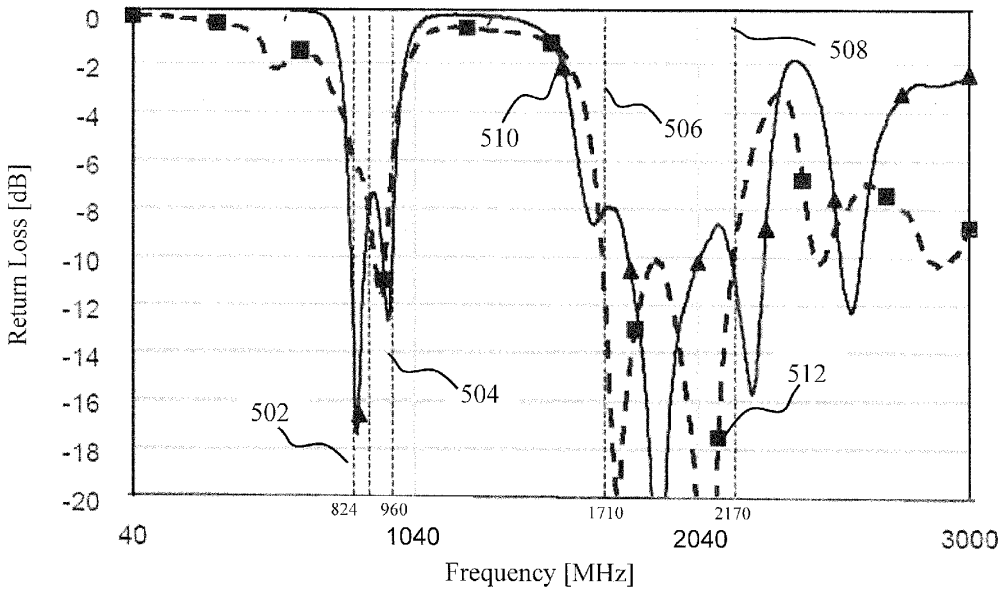
(51) **Int. Cl.**

H01Q 1/24	(2006.01)
H01Q 1/00	(2006.01)
H01Q 7/00	(2006.01)
H01Q 5/00	(2006.01)

(52) **U.S. Cl.** ..... **343/702**; 343/700 MS; 343/722; 343/866

(57) **ABSTRACT**

A multiband slot loop antenna apparatus, and methods of tuning and utilizing the same. In one embodiment, the antenna configuration is used within a handheld mobile device (e.g., cellular telephone or smartphone). The antenna comprises two radiating structures: a ring or loop structure substantially enveloping an outside perimeter of the device enclosure, and a tuning structure disposed inside the enclosure. The ring structure is grounded to the ground plane of the device so as to create a virtual portion and an operating portion. The tuning structure is spaced from the ground plane, and includes a plurality of radiator branches effecting antenna operation in various frequency bands; e.g., at least one lower frequency band and three upper frequency bands. On one implementation, a second lower frequency band radiator is effected using a reactive matched circuit coupled between a device feed and a radiator branch.



US 20130027260A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2013/0027260 A1

(43) Pub. Date: Jan. 31, 2013

JEON et al.

(54) **ANTENNA FEEDING STRUCTURE AND ANTENNA**

(71) Applicant: **Radina Co., Ltd**, Seoul (KR)

(72) Inventors: **Sin-Hyung JEON**, Seoul (KR); **Hyeng-Cheul CHOI**, Seoul (KR); **Jae-Seok LEE**, Seoul (KR); **Oul CHO**, Suwon-si (KR)

(73) Assignee: **RADINA CO., LTD**, Seoul (KR)

(21) Appl. No.: **13/645,530**

(22) Filed: **Oct. 5, 2012**

Related U.S. Application Data

(63) Continuation of application No. PCT/KR2011/002420, filed on Apr. 6, 2011.

(30) **Foreign Application Priority Data**

Apr. 6, 2010 (KR) 10-2010-0031243
May 7, 2010 (KR) 10-2010-0042963
Apr. 6, 2011 (KR) 10-2011-0031505

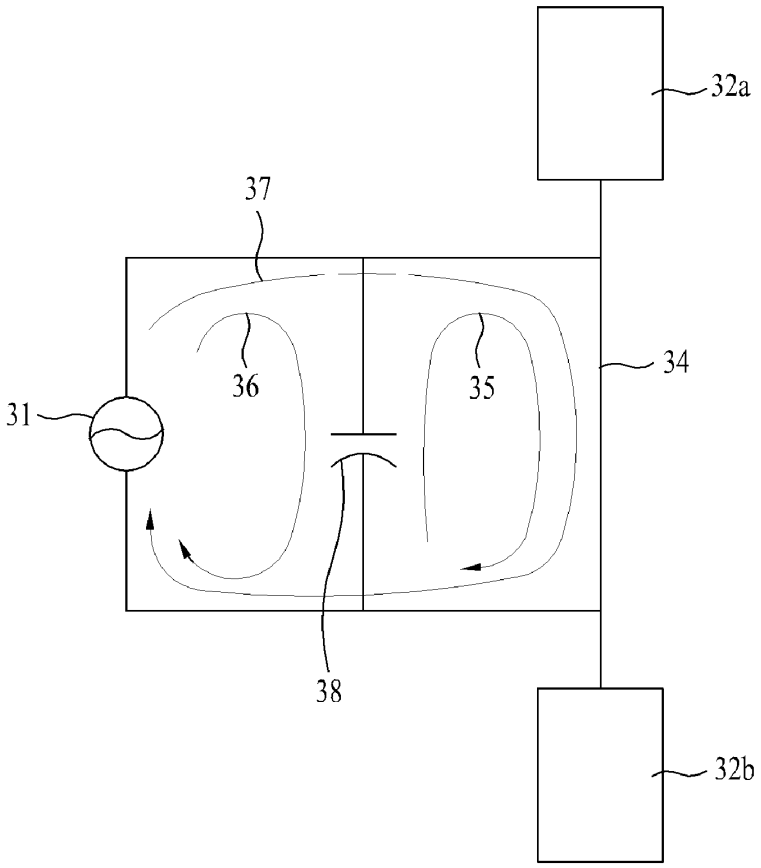
Publication Classification

(51) **Int. Cl.**
H03H 7/00 (2006.01)
H01Q 1/50 (2006.01)

(52) **U.S. Cl.** **343/749**; 333/100

(57) **ABSTRACT**

The disclosure provides an antenna feeding structure having a low frequency loop, an intermediate frequency loop, and a high frequency loop, and generates resonance between the inductance of the intermediate frequency loop itself and a capacitive element in the intermediate frequency loop, wherein the antenna feeding structure is configured to be able to adjust the resonance frequency using the area of the loop and the value of the capacitive element, thereby allowing the antenna to have a broadband characteristic, and further, making it possible to easily design an antenna having a desired band.



US 20130027266A1

(19) **United States**

(12) **Patent Application Publication**

Chen et al.

(10) **Pub. No.: US 2013/0027266 A1**

(43) **Pub. Date: Jan. 31, 2013**

(54) **UNSYMMETRICAL DIPOLE ANTENNA**

(76) Inventors: **I-Shan Chen**, Hsinchu (TW); **Jia-Fong Wu**, Hsinchu (TW); **Chia-Hong Lin**, Hsinchu (TW); **Cheng-Hsiung Hsu**, Hsinchu (TW); **Chao-Chun Lin**, Hsinchu (TW)

(21) Appl. No.: **13/304,698**

(22) Filed: **Nov. 28, 2011**

(30) **Foreign Application Priority Data**

Jul. 29, 2011 (TW) 100126987

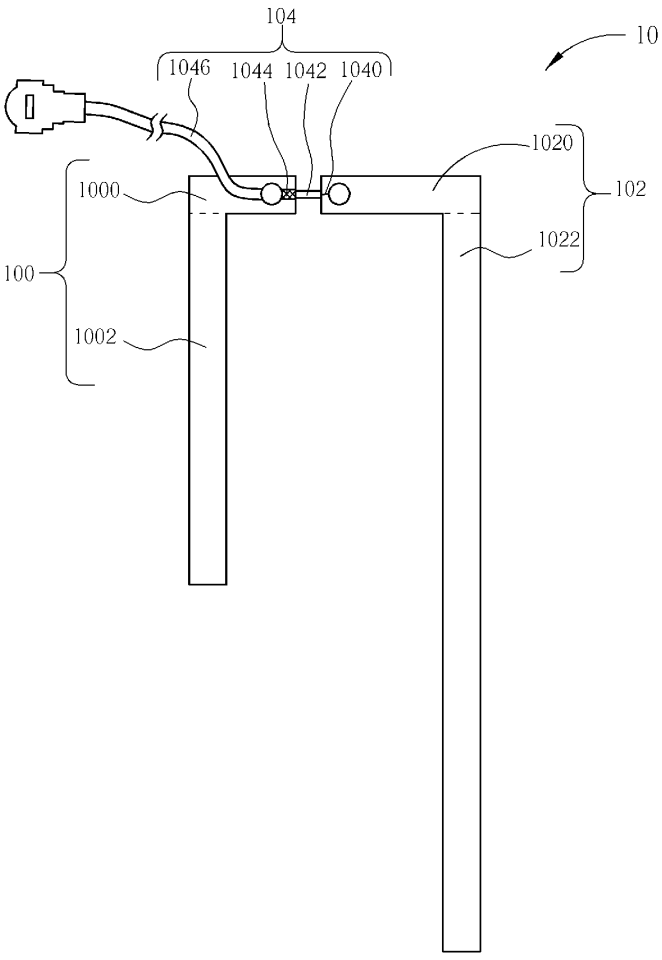
Publication Classification

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

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

(57) **ABSTRACT**

An unsymmetrical dipole antenna includes a grounding element, a radiating element, and a feed-in wire. The grounding element includes a first short side metal plane and a first long side metal plane. The radiating element includes a second short side metal plane and a second long side metal plane. The feed-in wire includes a metal wire, coupled to the second short side metal plane for transmitting a feed-in signal; an insulation layer, covering the metal wire; a metal weave, covering the insulation layer, having one terminal coupled to the first short side metal plane of the grounding element, and another terminal coupled to a system ground of the wireless communication device; and a protective layer, covering the metal weave. A size of the grounding element and a size of the radiating element are irrelative.



US 20130027268A1

(19) **United States**

(12) **Patent Application Publication**

OHNO et al.

(10) **Pub. No.: US 2013/0027268 A1**

(43) **Pub. Date: Jan. 31, 2013**

(54) **ANTENNA APPARATUS INCLUDING DIPOLE ANTENNA AND PARASITIC ELEMENT ARRAYS FOR FORMING PSEUDO-SLOT OPENINGS**

(71) Applicant: **PANASONIC CORPORATION**, Osaka (JP)

(72) Inventors: **Takeshi OHNO**, Osaka (JP); **Sotaro SHINKAI**, Osaka (JP)

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

(21) Appl. No.: **13/645,835**

(22) Filed: **Oct. 5, 2012**

Related U.S. Application Data

(63) Continuation of application No. PCT/JP2012/001026, filed on Feb. 16, 2012.

(30) **Foreign Application Priority Data**

Jun. 2, 2011 (JP) 2011-123934

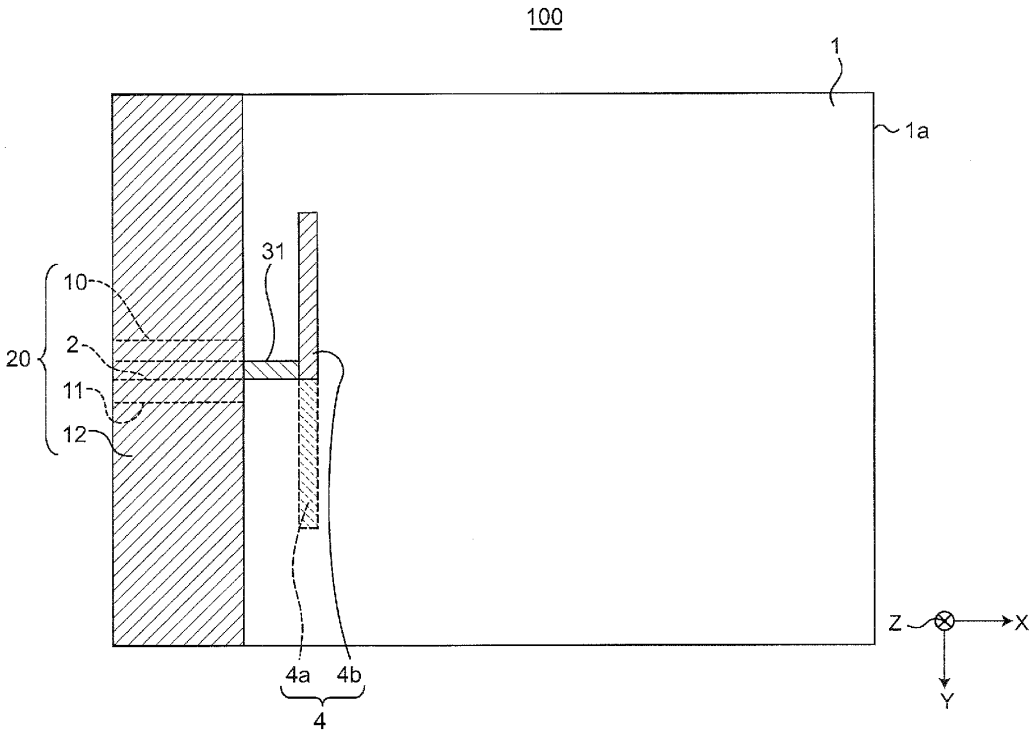
Publication Classification

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

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

(57) **ABSTRACT**

In each parasitic element array, each of parasitic elements has a strip shape substantially parallel to a longitudinal direction of a dipole antenna, and the parasitic elements are formed at predetermined intervals. For example, the interval is set to be equal to or smaller than ⅛ of a wavelength λ of a high-frequency signal to be fed to a feeder line. The parasitic element arrays are arranged so as to form a plurality of pseudo-slot openings that allow a radio wave from the dipole antenna to propagate therethrough as magnetic currents.



US 20130027270A1

(19) **United States**

(12) **Patent Application Publication**

von Arbin et al.

(10) **Pub. No.: US 2013/0027270 A1**

(43) **Pub. Date: Jan. 31, 2013**

(54) **METAL COVERS FOR RADIO COMMUNICATION DEVICES**

(71) Applicants: **Axel von Arbin**, Taby (SE); **Per Erlandsson**, Stockholm (SE)

(72) Inventors: **Axel von Arbin**, Taby (SE); **Per Erlandsson**, Stockholm (SE)

(21) Appl. No.: **13/633,650**

(22) Filed: **Oct. 2, 2012**

Related U.S. Application Data

(63) Continuation of application No. PCT/SE2011/050477, filed on Apr. 19, 2011.

(30) **Foreign Application Priority Data**

Apr. 29, 2010 (EP) 10161409.7

Publication Classification

(51) **Int. Cl.**

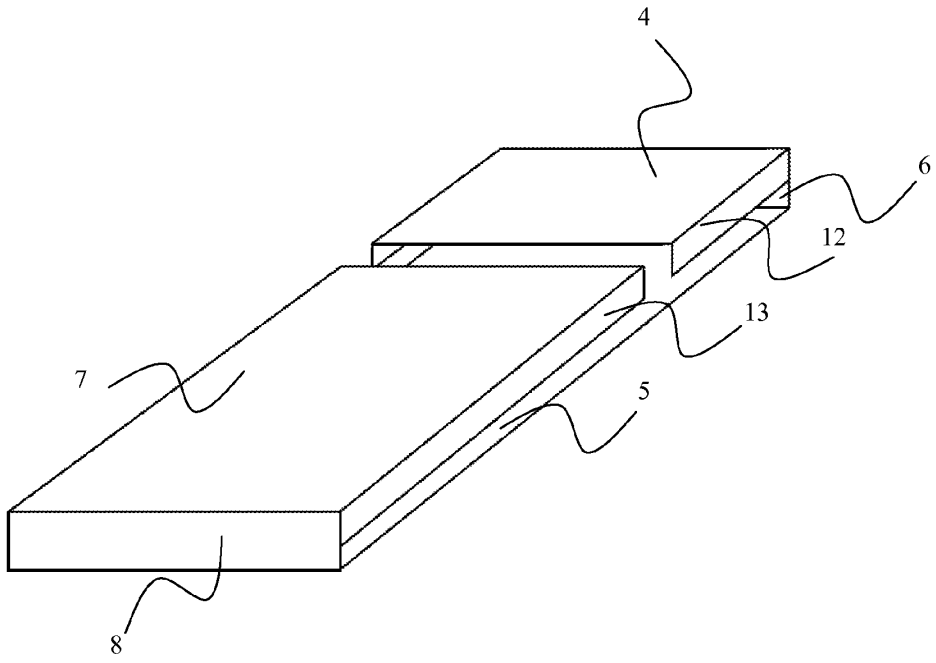
H01Q 1/42 (2006.01)

H01Q 1/52 (2006.01)

(52) **U.S. Cl.** **343/841**; 343/872

(57) **ABSTRACT**

An exemplary embodiment of an antenna system includes a metal cover for a radio communication device and a complementary antenna. The metal cover includes front side part, a first back side part connected to the front side part through a top side part, and a second back side part connected to the front side part through a bottom side part. The bottom and top side parts are positioned at opposite ends of the front side part. The first and second back side parts are positioned essentially coplanar and distanced from each other by a gap. The front side part comprises a recess at the bottom side part and/or at the top side part in which recess the complementary antenna is positioned in.



US 20130033399A1

(19) **United States**

(12) **Patent Application Publication**

Huang et al.

(10) **Pub. No.: US 2013/0033399 A1**

(43) **Pub. Date: Feb. 7, 2013**

(54) **DUAL BAND ANTENNA**

(75) Inventors: **Chih-Yung Huang**, Taichung City (TW); **Kuo-Chang Lo**, Miaoli Country (TW)

(73) Assignee: **ARCADYAN TECHNOLOGY CORP.**, Hsinchu City (TW)

(21) Appl. No.: **13/311,504**

(22) Filed: **Dec. 5, 2011**

(30) **Foreign Application Priority Data**

Aug. 2, 2011 (TW) 100127475

Publication Classification

(51) **Int. Cl.**

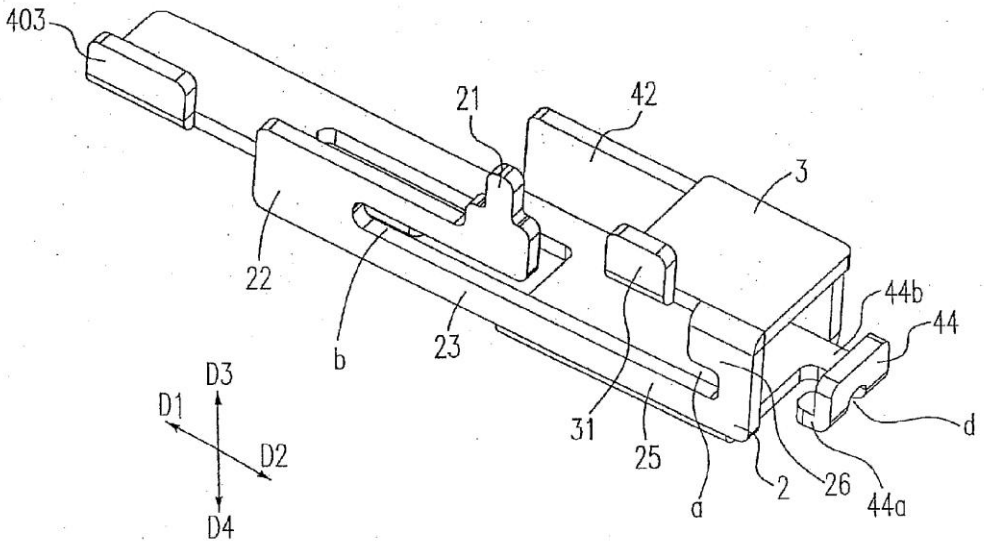
H01Q 9/04 (2006.01)

H01Q 5/00 (2006.01)

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

(57) **ABSTRACT**

A dual band antenna is provided. The dual band antenna includes a grounding portion, a connecting portion, a feeding portion, a radiating portion, a first radiating portion and a second radiating portion. The connecting portion is vertically connected to the grounding portion. The feeding portion has a first end and a second end, wherein the first end is connected to the connecting portion and the second end has a feeding end. The radiating portion is parallel to the grounding portion and vertically connected to the connecting portion. The first radiating portion has a third end and a fourth end, wherein the third end is connected to the radiating portion and the fourth end extends toward the radiating portion. The second radiating portion is vertically connected to the radiating portion.



US 20130033400A1

(19) **United States**

(12) **Patent Application Publication**

Chiang

(10) **Pub. No.: US 2013/0033400 A1**

(43) **Pub. Date: Feb. 7, 2013**

(54) **ANTENNA APPARATUS HAVING SENSING COMPONENT COUPLED TO FIRST ANTENNA COMPONENT TO ADDITIONALLY ACT AS SECOND ANTENNA COMPONENT AND RELATED SIGNAL PROCESSING DEVICE**

(76) Inventor: **Hung-Chung Chiang**, Taipei City (TW)

(21) Appl. No.: **13/563,757**

(22) Filed: **Aug. 1, 2012**

(30) **Foreign Application Priority Data**

Aug. 2, 2011 (TW) 100127394
Jul. 31, 2012 (TW) 101127593

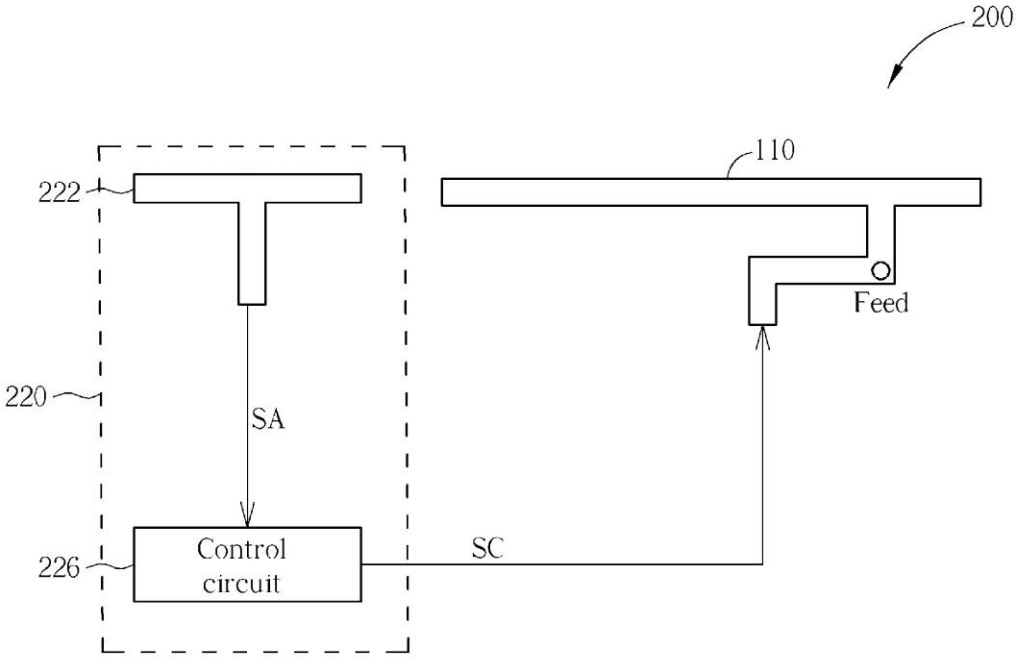
Publication Classification

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

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

(57) **ABSTRACT**

An antenna apparatus includes a first antenna component and a first sensing component. The first antenna component has at least one first mode. The sensing component is a front-end component of a sensing device, wherein the sensing component is further coupled to the first antenna component to act as a second antenna component having a second mode.



US 20130033401A1

(19) **United States**

(12) **Patent Application Publication**

KIM et al.

(10) **Pub. No.: US 2013/0033401 A1**

(43) **Pub. Date: Feb. 7, 2013**

(54) **MOBILE TERMINAL**

(75) Inventors: **Moonpyeong KIM**, Seoul (KR); **Jongwun KIM**, Seoul (KR)

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

(21) Appl. No.: **13/494,413**

(22) Filed: **Jun. 12, 2012**

(30) **Foreign Application Priority Data**

Aug. 3, 2011 (KR) 10-2011-0077242

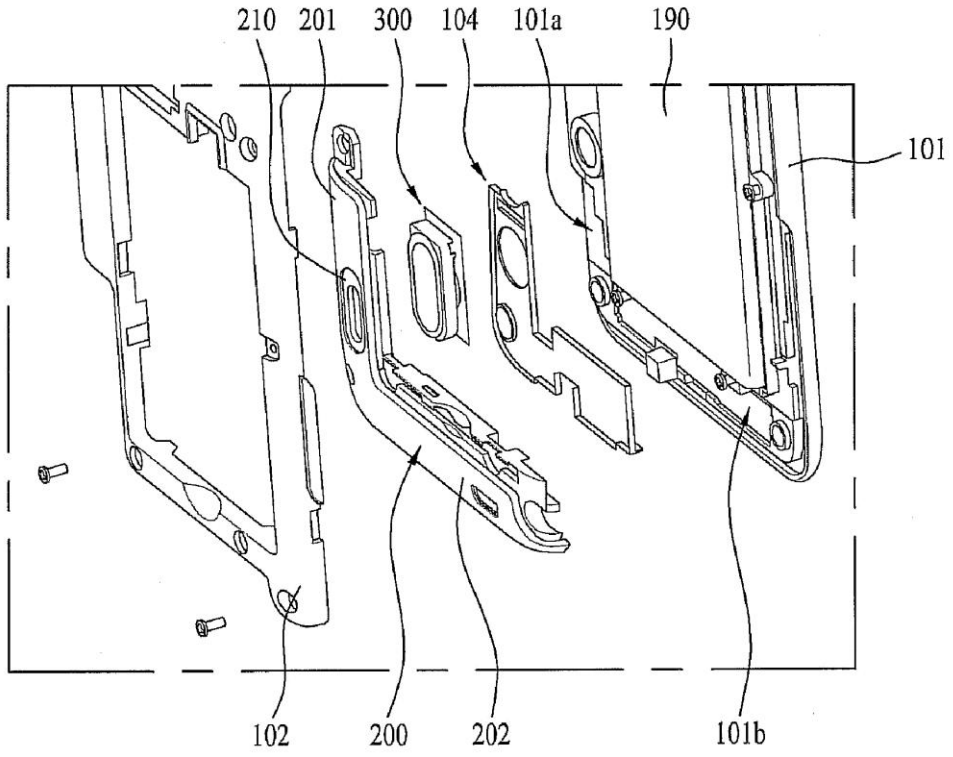
Publication Classification

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

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

(57) **ABSTRACT**

A mobile terminal is disclosed. The mobile terminal may include a front case, a rear case installed to a rear of the front case, an antenna module provided to the rear of the front case, the antenna module including a first region provided at a first edge portion of the front case and a second region provided at a second edge portion of the front case and a speaker provided between the first region of the antenna module and the front case to output sound to a space between the antenna module and the front case.



US 20130033403A1

(19) **United States**

(12) **Patent Application Publication**

OH

(10) **Pub. No.: US 2013/0033403 A1**

(43) **Pub. Date: Feb. 7, 2013**

(54) **ANTENNA AND MOBILE TERMINAL INCLUDING THE SAME**

(76) Inventor: **SangBae OH**, Seoul (KR)

(21) Appl. No.: **13/292,911**

(22) Filed: **Nov. 9, 2011**

(30) **Foreign Application Priority Data**

Aug. 2, 2011 (KR) 10-2011-0077069

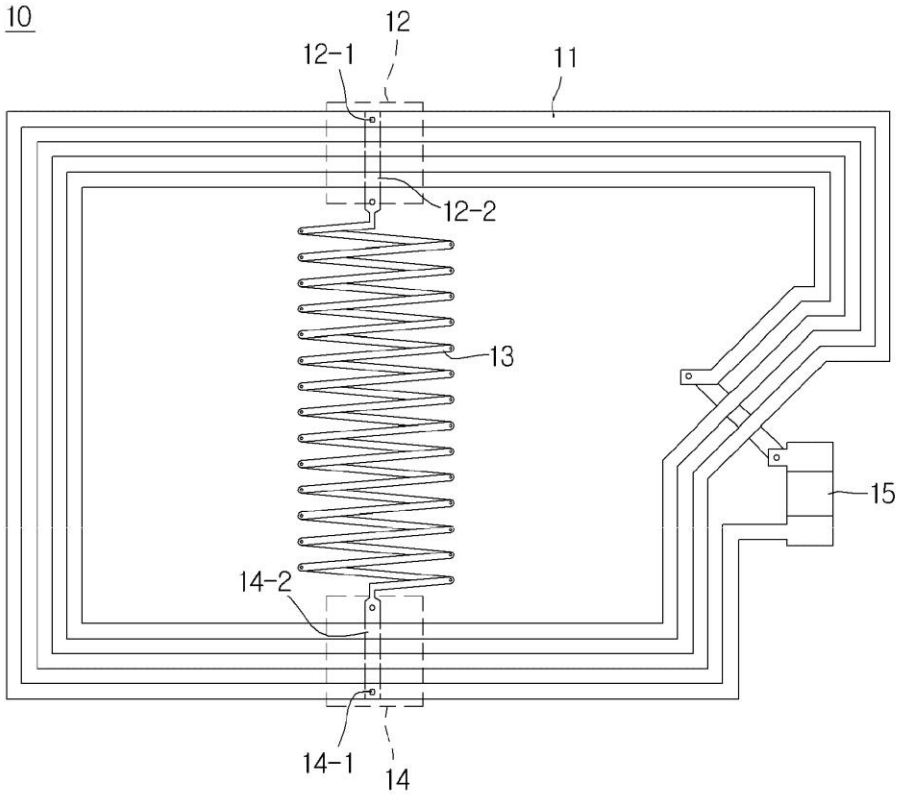
Publication Classification

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

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

(57) **ABSTRACT**

Provided are an antenna and a mobile terminal including the antenna. The antenna includes a loop antenna, a solenoid, and a plurality of connections. The loop antenna is installed on a mobile terminal. The solenoid is connected in parallel to the loop antenna, and receives power. The connections connect the loop antenna to the solenoid. Accordingly, the degree of freedom of an antenna shape and a recognition distance of the antenna are improved.



US 20130033410A1

(19) **United States**

(12) **Patent Application Publication**

Wong et al.

(10) **Pub. No.: US 2013/0033410 A1**

(43) **Pub. Date: Feb. 7, 2013**

(54) **COMMUNICATION ELECTRONIC DEVICE AND ANTENNA STRUCTURE THEREIN**

(76) Inventors: **Kin-Lu Wong**, New Taipei City (TW); **Fang-Hsien Chu**, New Taipei City (TW)

(21) Appl. No.: **13/329,317**

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

(30) **Foreign Application Priority Data**

Aug. 5, 2011 (TW) 100128027

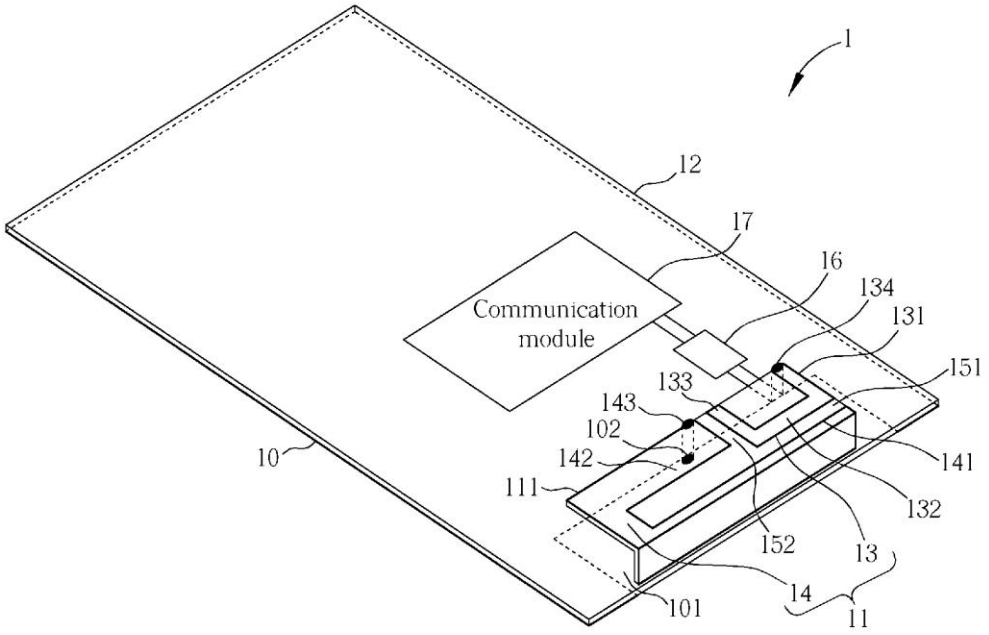
Publication Classification

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

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

(57) **ABSTRACT**

A communication electronic device includes an antenna structure at least having a grounding element and an antenna element. One edge of the grounding element has a notch, and the antenna element is disposed in the notch of the grounding element. The antenna element includes a feeding portion and a shorting portion, wherein the feeding portion at least includes a first segment, a second segment, and a third segment. There is a first coupling gap between the second segment of the feeding portion and a first shorting segment of the shorting portion which includes an open end of the shorting portion. There is a second coupling gap between the third segment of the feeding portion and a second shorting segment of a shorting portion which includes the shorting end of the shorting portion.



US 20130033411A1

(19) **United States**

(12) **Patent Application Publication**

TSAI et al.

(10) **Pub. No.: US 2013/0033411 A1**

(43) **Pub. Date: Feb. 7, 2013**

(54) **ANTENNA ASSEMBLY TO REDUCE SPECIFIC ABSORPTION RATE**

(76) Inventors: **Tiao-Hsing TSAI**, New Taipei City (TW); **Chi-Yin Fang**, Pingtung City (TW); **I-Ping Yen**, New Taipei City (TW); **Chao-Hsu Wu**, Luzhu Township (TW); **Chun-Yuan Wang**, Tainan City (TW)

(21) Appl. No.: **13/421,890**

(22) Filed: **Mar. 16, 2012**

(30) **Foreign Application Priority Data**

Aug. 2, 2011 (TW) 100127391

Publication Classification

(51) **Int. Cl.**

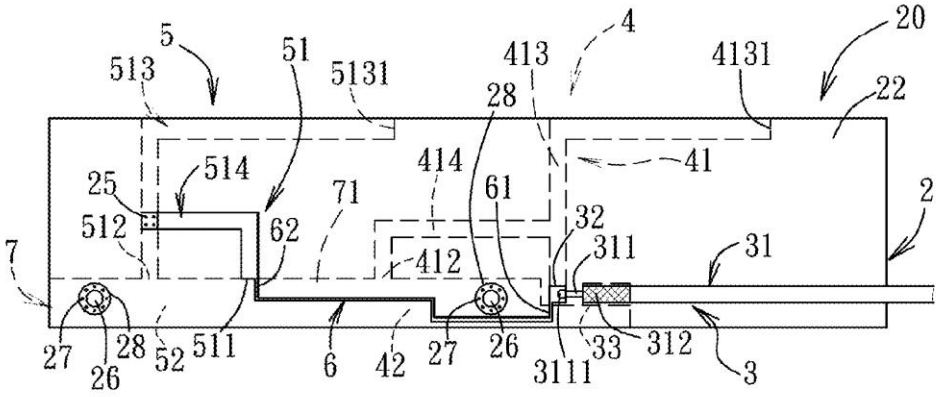
H01Q 1/50 (2006.01)

H01Q 1/48 (2006.01)

(52) **U.S. Cl.** **343/848**; 343/905

(57) **ABSTRACT**

An antenna assembly includes first and second antennas each generating a resonant mode to cover an operating bandwidth, and a transmission line. The first includes a first radiation unit with a feed-in portion coupled to a first feed portion in contact with a core wire of a coaxial cable and a first grounding portion. The second antenna includes a second radiation unit with a second feed-in portion coupled to a second feed portion in contact with a conductive shielding layer of the coaxial cable and a second grounding portion. The transmission line includes first and second connecting portions coupled respectively to the second feed portion of the second feed-in portion. When a signal within the operating bandwidth is transmitted through the coaxial cable, the energy of the signal is distributed among the first and second antennas.



US 20130033413A1

(19) **United States**

(12) **Patent Application Publication**

Du et al.

(10) **Pub. No.: US 2013/0033413 A1**

(43) **Pub. Date: Feb. 7, 2013**

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

(75) Inventors: **Jian-Jhih Du**, Taipei City (TW); **Kuo-Chang Lo**, Miaoli County (TW); **Chih-Yung Huang**, Taichung City (TW)

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

(21) Appl. No.: **13/557,397**

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

(30) **Foreign Application Priority Data**

Aug. 4, 2011 (TW) 100127804

Publication Classification

(51) **Int. Cl.**

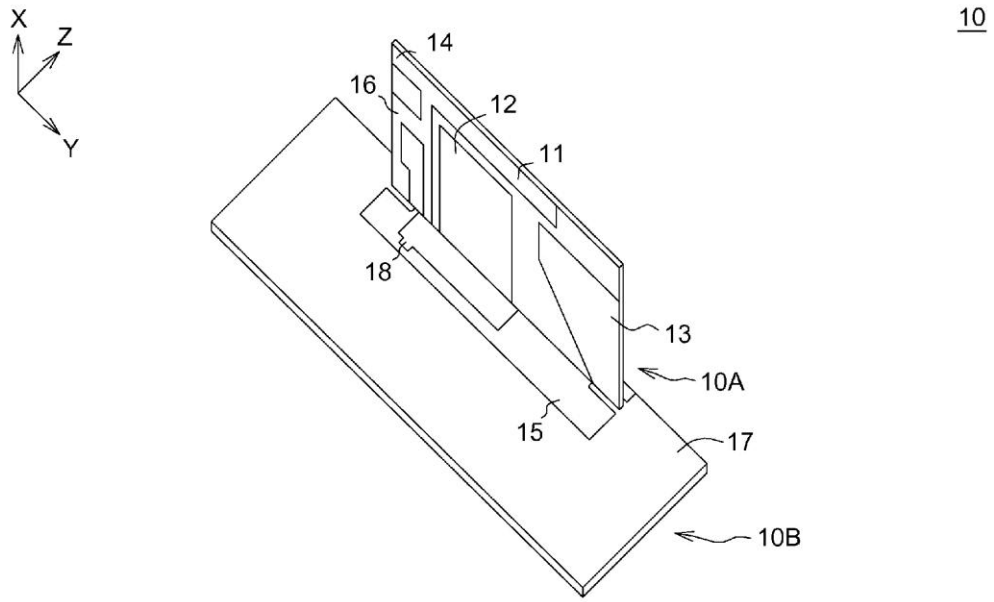
H01Q 1/38 (2006.01)

H01Q 1/50 (2006.01)

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

(57) **ABSTRACT**

A multi-band inverted-F antenna including a ground plane, a signal feeding circuit, first, second and third main radiation parts is provided. The signal feeding circuit is electrically isolated from the ground plane and receives/transmits wireless signals. The first and the second main radiation part are both physically and electrically connected to the signal feeding circuit, and generate first and second frequency band operation modes for the inverted-F antenna, respectively. The third main radiation part is electrically isolated from the signal feeding circuit, the first and the second main radiation parts, and generates a third frequency band operation mode for the inverted-F antenna via to signal coupling between the first and the third main radiation parts and/or signal coupling between the second and the third main radiation parts.



US 20130035048A1

(19) **United States**

(12) **Patent Application Publication**

Chee et al.

(10) **Pub. No.: US 2013/0035048 A1**

(43) **Pub. Date: Feb. 7, 2013**

(54) **RADIO FREQUENCY FRONT END SYSTEM WITH AN INTEGRATED TRANSMIT/RECEIVE SWITCH**

(76) Inventors: **Yuen Hui Chee**, Redwood City, CA (US); **Albert Chia-Wen Jerng**, Los Gatos, CA (US)

(21) Appl. No.: **13/204,544**

(22) Filed: **Aug. 5, 2011**

Publication Classification

(51) **Int. Cl.**

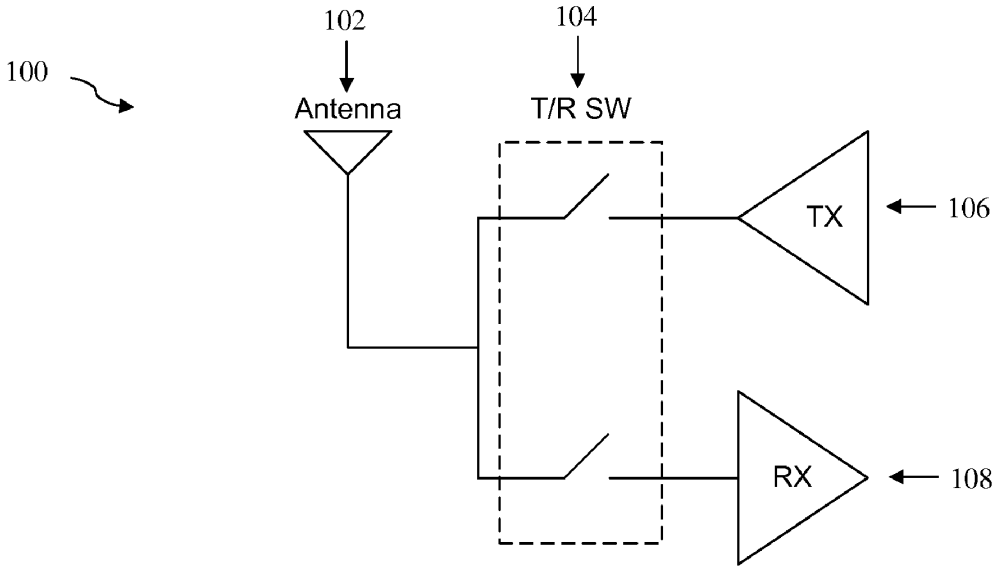
H04W 88/02 (2009.01)

H01F 41/00 (2006.01)

(52) **U.S. Cl.** **455/83**; 29/601

(57) **ABSTRACT**

A Radio Frequency (RF) front end system and method are disclosed. The RF front end system comprises an antenna, a matching network coupled to the antenna, a power amplifier (PA) coupled to the matching network via a port on a transmit path, a low noise amplifier (LNA) coupled to the matching network via the port on a receive path and at least one transmit/receive switch (T/R SW) coupled between the port and at least one of the PA and LNA.



US 20130035050A1

(19) **United States**

(12) **Patent Application Publication**

Gao et al.

(10) **Pub. No.: US 2013/0035050 A1**

(43) **Pub. Date: Feb. 7, 2013**

(54) **ANTENNA AND RECEIVER CIRCUIT**

(75) Inventors: **Yuan Gao**, Singapore (SG); **Nair Murli**, Singapore (SG); **Yuanjin Zheng**, Singapore (SG)

(73) Assignee: **Agency for Science, Technology and Research**, Singapore (SG)

(21) Appl. No.: **13/521,888**

(22) PCT Filed: **Jan. 13, 2010**

(86) PCT No.: **PCT/SG10/00007**

§ 371 (c)(1),
(2), (4) Date: **Oct. 8, 2012**

Publication Classification

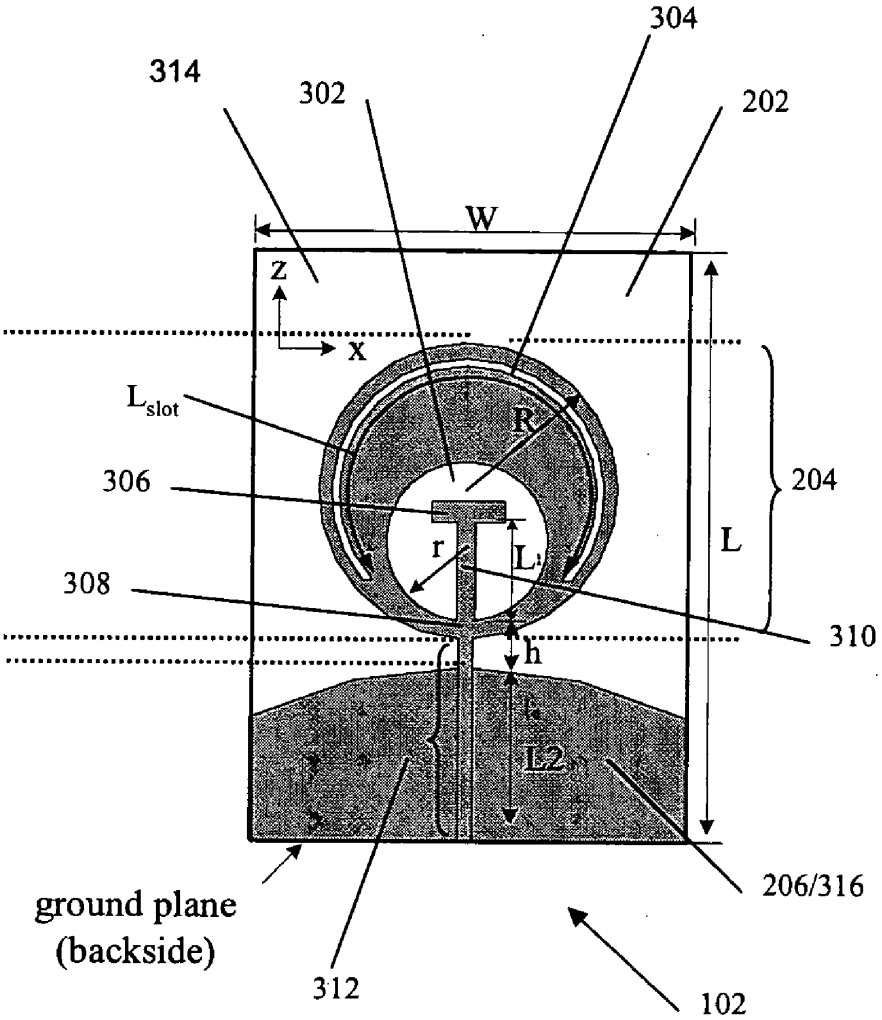
(51) **Int. Cl.**

H04B 1/06	(2006.01)
H04B 1/18	(2006.01)
H01Q 13/10	(2006.01)

(52) **U.S. Cl.** **455/193.1**; 343/770; 455/269

(57) **ABSTRACT**

According to one aspect of the invention, there is provided an antenna including: a substrate; a conductive layer formed on a portion of a top surface of the substrate; a first slot formed within the conductive layer; a conductive stub disposed within the first slot, the conductive stub tuned to reject a first frequency band; and a second slot formed within the conductive layer, the second slot tuned to reject a second frequency band.



US 20130035052A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2013/0035052 A1

(43) Pub. Date: Feb. 7, 2013

Musselman

(54) **CIRCULAR ANTENNA ARRAY FOR SATELLITE COMMUNICATION INTERFERENCE REJECTION**

(75) Inventor: **Randall Lee Musselman**, Colorado Springs, CO (US)

(73) Assignee: **Government of the United States, as represented by the Secretary of the Air Force**, Wright-Patterson AFB, OH (US)

(21) Appl. No.: **13/563,088**

(22) Filed: **Jul. 31, 2012**

Related U.S. Application Data

(60) Provisional application No. 61/513,822, filed on Aug. 1, 2011.

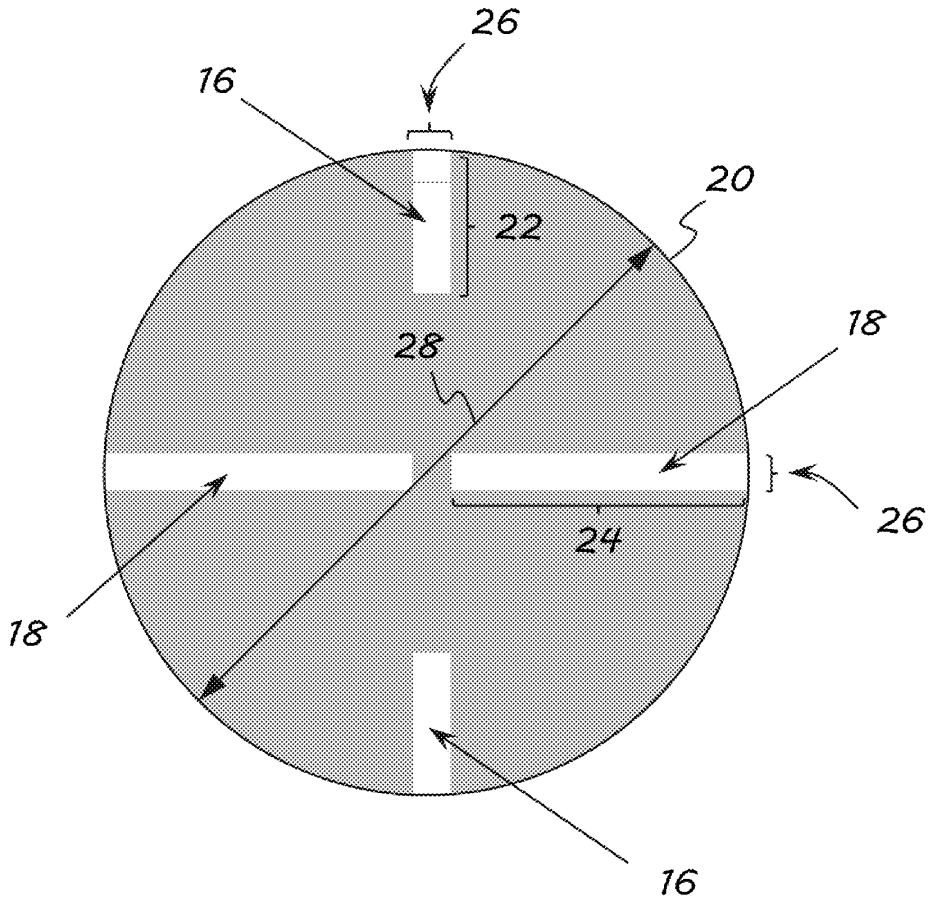
Publication Classification

(51) **Int. Cl.**
H04B 1/10 (2006.01)

(52) **U.S. Cl.** **455/278.1**

(57) **ABSTRACT**

An antenna array system and method is provided for reducing interference from a source moving relative to the antenna array system. The antenna array system includes a receiver and a plurality of antenna array elements arranged in a planar array. Each of the plurality of antenna array elements is in electrical communication with the receiver and in a locationally fixed position relative to the receiver. The plurality of antenna array elements receives a desired signal and interference from the source moving relative to the antenna array system. The receiver is configured to detect a presence of the interference. In response to the detection of the presence of the interference, the receiver is further configured to steer a deep antenna-pattern null in a direction of the interference.



US 20130037617A1

(19) **United States**

(12) **Patent Application Publication**

Weakley et al.

(10) **Pub. No.: US 2013/0037617 A1**

(43) **Pub. Date: Feb. 14, 2013**

(54) **RFID TAG SYSTEM**

(71) Applicant: **United Technologies Corporation**, Hartford, CT (US)

(72) Inventors: **Thomas Craig Weakley**, Simpsonville, SC (US); **Andrew F. Geib**, Glastonbury, CT (US); **Kevin Donahue**, Cherry Hill, NJ (US); **Dale R. Masslon**, Tolland, CT (US)

(73) Assignee: **UNITED TECHNOLOGIES CORPORATION**, Hartford, CT (US)

(21) Appl. No.: **13/632,584**

(22) Filed: **Oct. 1, 2012**

Related U.S. Application Data

(63) Continuation-in-part of application No. 13/149,391, filed on May 31, 2011.

Publication Classification

(51) **Int. Cl.**

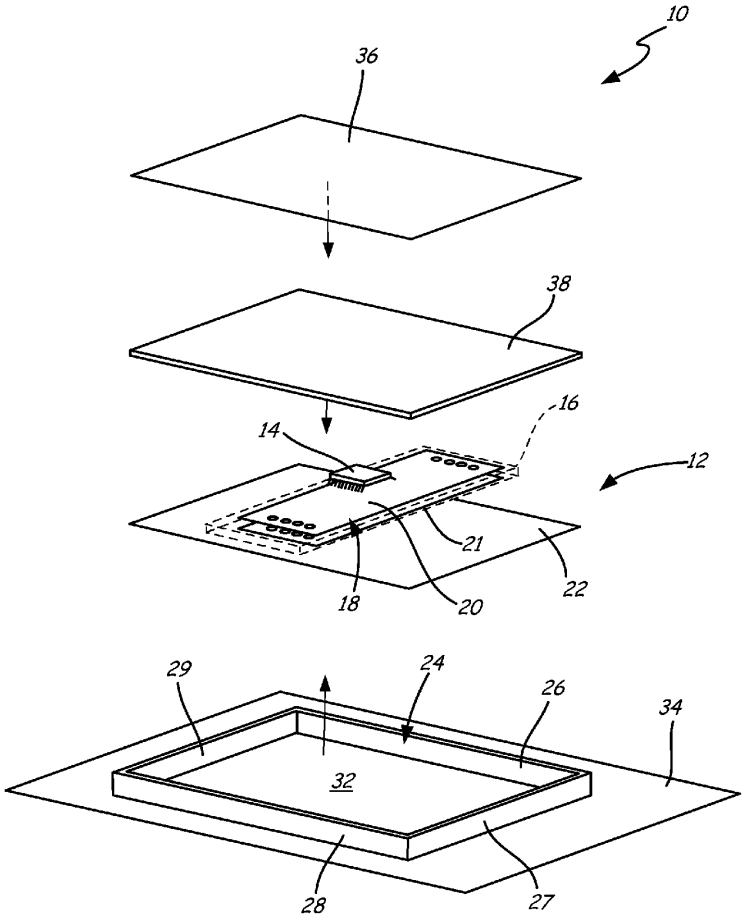
G06K 19/077 (2006.01)

G06K 19/073 (2006.01)

(52) **U.S. Cl.** **235/492**

(57) **ABSTRACT**

An identification system for machinery or equipment, such as an aircraft engine, includes a name plate, a mounting bracket for mounting the name plate, a housing, and an RFID tag positioned within the housing between the name plate and the mounting bracket. The RFID tag includes an integrated circuit and an antenna such as a patch antenna.



US 20130038278A1

(19) United States

(12) Patent Application Publication

PARK et al.

(10) Pub. No.: US 2013/0038278 A1

(43) Pub. Date: Feb. 14, 2013

(54) **PORTABLE TERMINAL HAVING A WIRELESS CHARGER COIL AND AN ANTENNA ELEMENT ON THE SAME PLANE**

(75) Inventors: **Jin-Hyoung PARK**, Wonju-si (KR); **Ki-Hyun KIM**, Suwon-si (KR); **Kil-Soo KO**, Suwon-si (KR); **Se-Ho PARK**, Suwon-si (KR); **Sung-Kweon PARK**, Seongnam-si (KR)

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

(21) Appl. No.: **13/312,359**

(22) Filed: **Dec. 6, 2011**

(30) **Foreign Application Priority Data**

Aug. 8, 2011 (KR) 10-2011-0078611

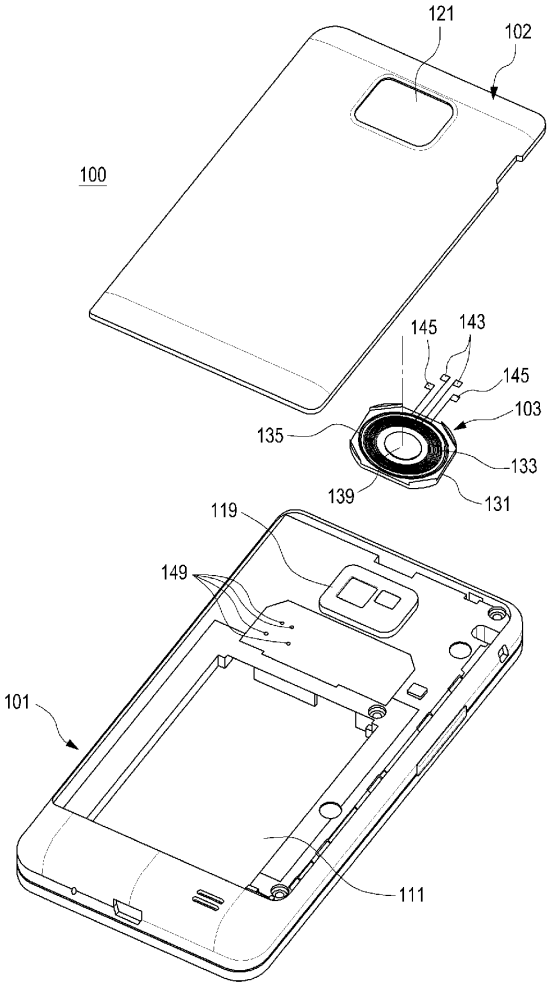
Publication Classification

(51) **Int. Cl.**
H02J 7/00 (2006.01)

(52) **U.S. Cl.** **320/108**

(57) **ABSTRACT**

A portable terminal having a wireless charger coil and an antenna element on the same plane is provided, in which a shielding member is attached to an inner surface of an external part, a first coil is attached to one surface of the shielding member, facing the inner surface of the external part, and a second coil is attached to the one surface of the shielding member, surrounding the first coil on the same plane.



US 20130038491A1

(19) **United States**

(12) **Patent Application Publication**

Li et al.

(10) **Pub. No.: US 2013/0038491 A1**

(43) **Pub. Date: Feb. 14, 2013**

(54) **COMMUNICATION DEVICE AND METHOD FOR ENHANCEING IMPEDANCE BANDWIDTH OF ANTENNA THEREOF**

(75) Inventors: **Wei-Yu Li**, Yilan County (TW); **Hung-Hsuan Lin**, Hsinchu County (TW); **Ta-Chun Pu**, Kaohsiung City (TW); **Chun-Yih Wu**, Taipei City (TW)

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

(21) Appl. No.: **13/419,433**

(22) Filed: **Mar. 14, 2012**

(30) **Foreign Application Priority Data**

Aug. 13, 2011 (TW) 100131333
Oct. 26, 2011 (TW) 100138922

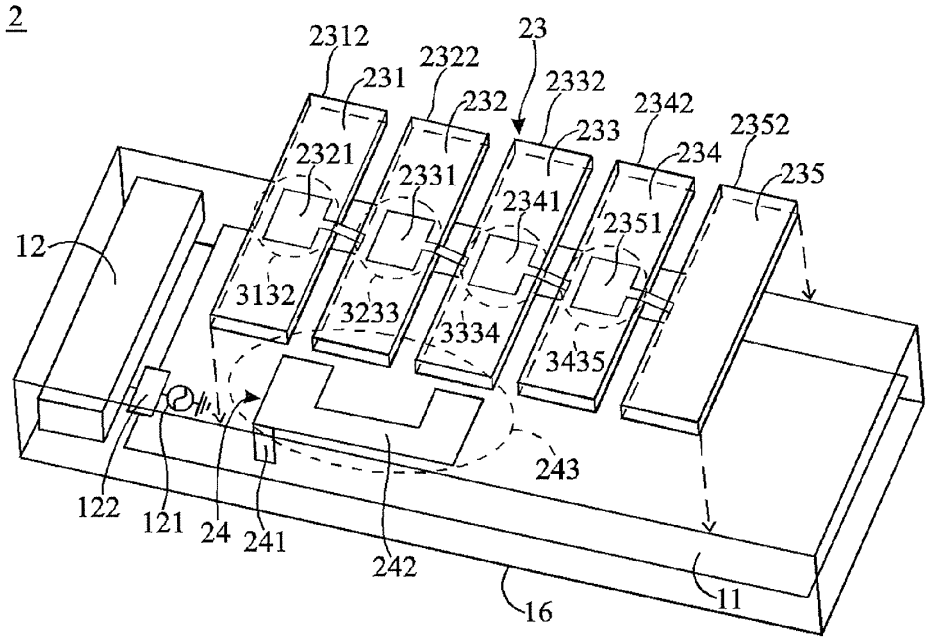
Publication Classification

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

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

(57) **ABSTRACT**

A communication device and a method for enhancing impedance bandwidth of an antenna are provided. The communication device includes at least one ground, at least one antenna, a current-drawing conductor structure, and at least one coupling conductor structure. The antenna is electrically connected to the ground through a source and generates at least one operating frequency band for transmitting or receiving electromagnetic signals of at least one communication band. The current-drawing conductor structure includes a plurality of conductor elements, where there is at least one mutual coupling portion formed between neighboring conductor elements. The coupling conductor structure has a first conductor portion and a second conductor portion. One end of the first conductor portion is electrically connected to the ground, and another end thereof is electrically connected to the second conductor portion. There is at least one coupling portion formed between the second conductor portion and the current-drawing conductor structure.



US 20130038492A1

(19) **United States**

(12) **Patent Application Publication**

ABE

(10) **Pub. No.: US 2013/0038492 A1**

(43) **Pub. Date: Feb. 14, 2013**

(54) **PATCH ANTENNA DEVICE AND RADIO WAVE RECEIVER**

(75) Inventor: **Kazuaki ABE**, Iruma-shi (JP)

(73) Assignee: **CASIO COMPUTER CO., LTD**, Tokyo (JP)

(21) Appl. No.: **13/570,723**

(22) Filed: **Aug. 9, 2012**

(30) **Foreign Application Priority Data**

Aug. 12, 2011 (JP) 2011-176529

Publication Classification

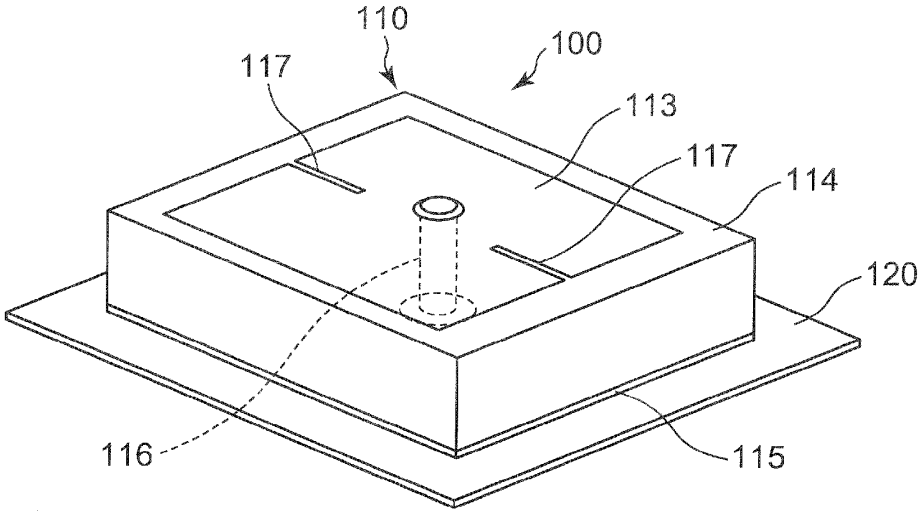
(51) **Int. Cl.**
H01Q 1/38 (2006.01)

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

(57) **ABSTRACT**

A patch antenna device of the present invention includes a rectangular dielectric plate, a planar emission electrode, a grounding electrode and a power supply member. The planar emission electrode is provided with a slit at each position corresponding to each short side of the rectangular dielectric plate and both slits extend toward an opposing short side each other and arranged symmetrically. A power supply position of the power supply member is deviated from a center of the planar emission electrode so as to obtain circular polarization characteristics.

As a result a patch antenna device having a high gain and circular polarization characteristics can be realized by a simple structure.



US 20130038494A1

(19) **United States**

(12) **Patent Application Publication**

Kuonanoja

(10) **Pub. No.: US 2013/0038494 A1**

(43) **Pub. Date: Feb. 14, 2013**

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

(76) Inventor: **Reetta Kuonanoja**, Oulu (FI)

(21) Appl. No.: **13/505,734**

(22) PCT Filed: **Oct. 20, 2010**

(86) PCT No.: **PCT/FI2010/050821**

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

(30) **Foreign Application Priority Data**

Nov. 3, 2009 (FI) 20096134

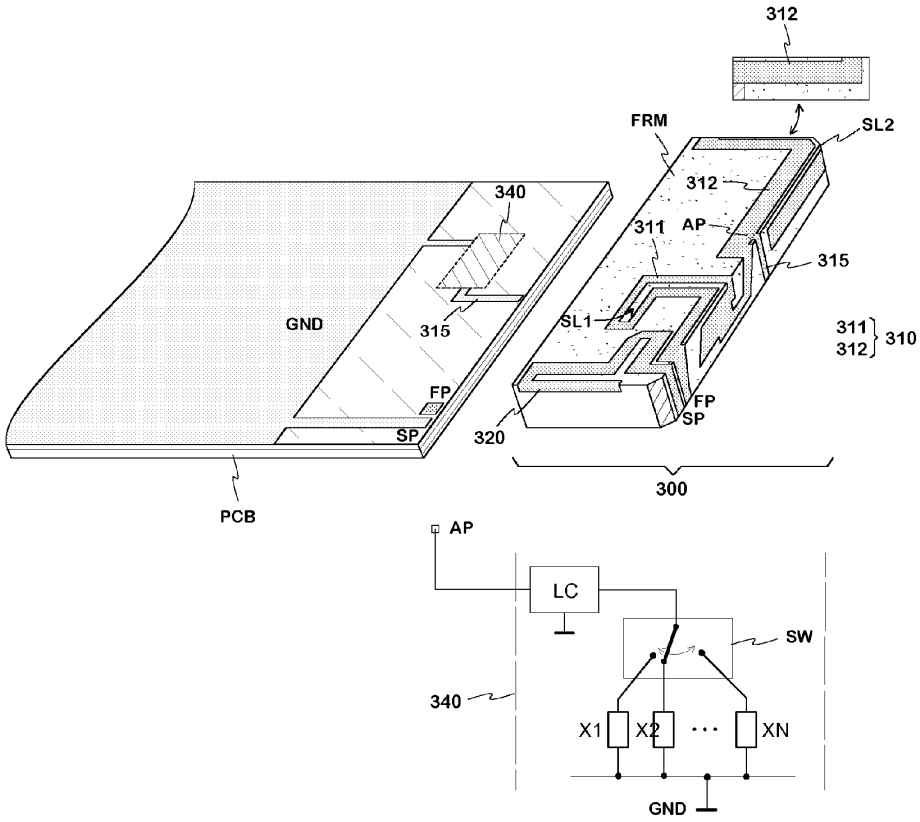
Publication Classification

(51) **Int. Cl.**
H01Q 1/50 (2006.01)
H01Q 13/10 (2006.01)

(52) **U.S. Cl.** **343/746**; 343/745

(57) **ABSTRACT**

An adjustable monopole antenna apparatus and methods. In one embodiment, the antenna apparatus is intended for mobile terminals. In an exemplary implementation, there is an adjusting point is provided, from which a conductor is branched to an adjusting circuit. The adjusting circuit comprises a switch and alternative reactive elements connected to ground, selectable by the switch. When a reactive element is changed, the electric length and resonance frequency of the radiator change, and the corresponding operating band shifts. If the antenna is configured as a dual-band antenna, the above-mentioned operating band is the lower band. One or more higher operating bands are based e.g. on radiating slots implemented by the same radiator conductor. The operating band of the exemplary embodiment of the antenna below the frequency 1 GHz can be shifted in a wider range than in the corresponding known antennas.



US 20130038495A1

(19) **United States**

(12) **Patent Application Publication**

Benzel et al.

(10) **Pub. No.: US 2013/0038495 A1**

(43) **Pub. Date: Feb. 14, 2013**

(54) **BROAD BAND ANTENNAS AND FEED METHODS**

(75) Inventors: **David M. Benzel**, Livermore, CA (US); **Richard E. Twogood**, San Diego, CA (US)

(73) Assignee: **Lawrence Livermore National Security, LLC.**, Livermore, CA (US)

(21) Appl. No.: **13/572,234**

(22) Filed: **Aug. 10, 2012**

Related U.S. Application Data

(60) Provisional application No. 61/521,966, filed on Aug. 10, 2011.

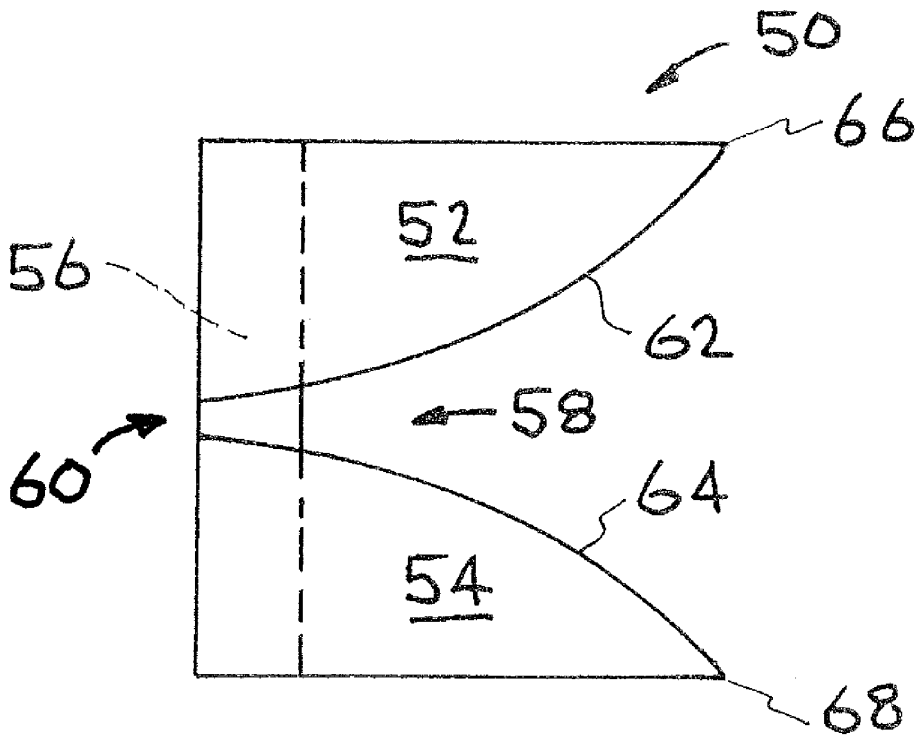
Publication Classification

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

(52) **U.S. Cl.** **343/770**; 343/767

(57) **ABSTRACT**

Two or more Vivaldi antennas, consisting of two plates each, each with the antenna's natural impedance of approximately 100 ohms, are placed in parallel to achieve a 50 ohm impedance in the case of two antennas or other impedances (100/n ohms) for more than two antennas. A single Vivaldi antenna plate (half Vivaldi antenna) over a ground plane can also be used to achieve a 50 ohm impedance, or two or more single plates over a ground plane to achieve other impedances. Unbalanced 50 ohm transmission lines, e.g. coaxial cables, can be used to directly feed, the dual Vivaldi (four plate) antenna in a center fed angled center departure, or more desirably, a center fed offset departure configuration.



US 20130038497A1

(19) **United States**

(12) **Patent Application Publication**

Chae et al.

(10) **Pub. No.: US 2013/0038497 A1**

(43) **Pub. Date: Feb. 14, 2013**

(54) **ANTENNA AND METHOD FOR MANUFACTURING SAME**

(75) Inventors: **JungHoon Chae**, Suwon (KR); **JungMin Kim**, Suwon (KR)

(73) Assignees: **AAC TECHNOLOGIES HOLDINGS INC.**, CAYMAN ISLANDS (GB); **AAC ACOUSTIC TECHNOLOGIES (SHENZHEN) CO., LTD.**, Shenzhen (CN)

(21) Appl. No.: **13/548,751**

(22) Filed: **Jul. 13, 2012**

(30) **Foreign Application Priority Data**

Aug. 11, 2011 (CN) 201110229755.5

Publication Classification

(51) **Int. Cl.**

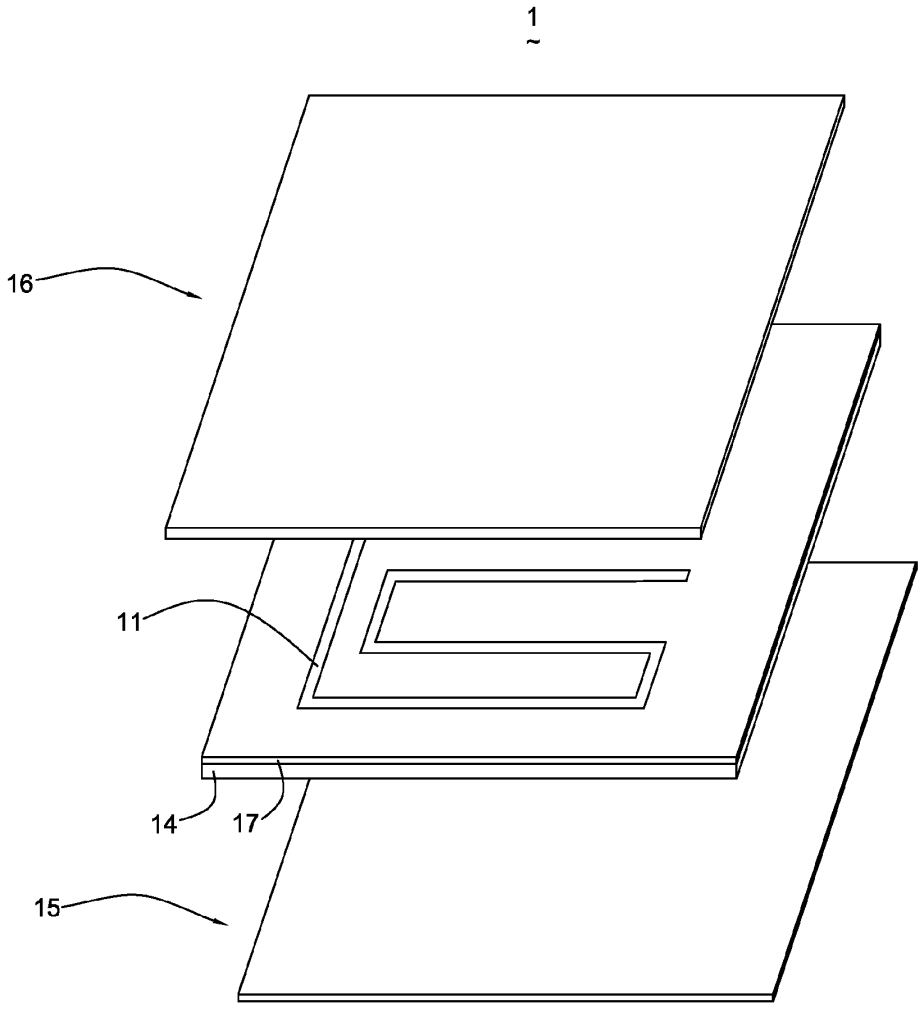
H01Q 1/00 (2006.01)

H01P 11/00 (2006.01)

(52) **U.S. Cl.** **343/787**; 29/600

(57) **ABSTRACT**

A method for manufacturing an antenna is disclosed, and the method includes the steps of: providing a wire and a stamping tool, stamping the wire into a flat antenna pattern by the stamping tool, providing a ferrite plate with the antenna pattern attached to the ferrite plate.



US 20130038499A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2013/0038499 A1

(43) Pub. Date: Feb. 14, 2013

Zhang

(54) **DIPOLE ANTENNA AND MOBILE COMMUNICATION TERMINAL**

(75) Inventor: **Haixia Zhang**, Shenzhen (CN)

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

(21) Appl. No.: **13/634,283**

(22) PCT Filed: **Sep. 14, 2010**

(86) PCT No.: **PCT/CN2010/076888**

§ 371 (c)(1),
(2), (4) Date: **Sep. 12, 2012**

(30) **Foreign Application Priority Data**

May 4, 2010 (CN) 201020186342.4

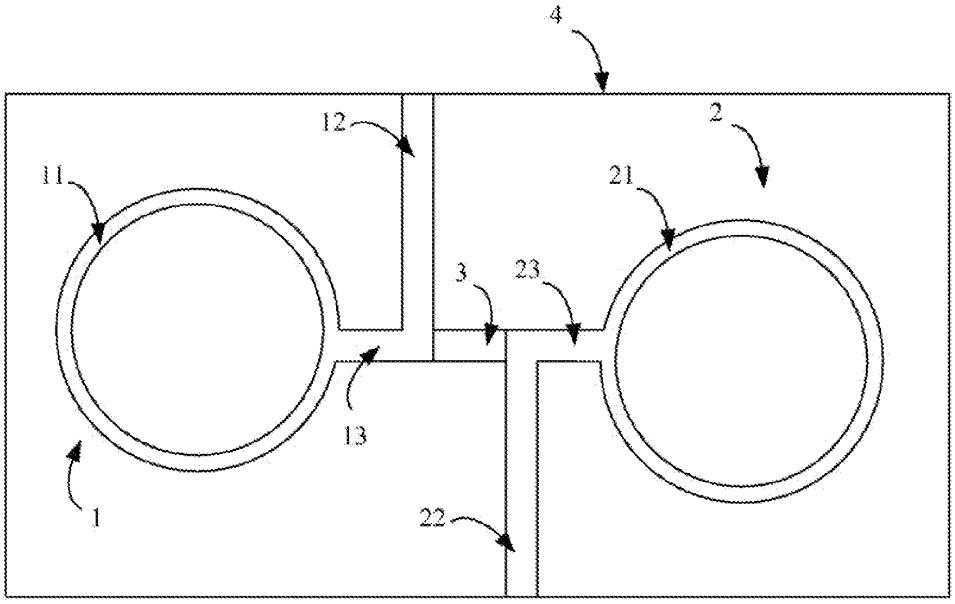
Publication Classification

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

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

(57) **ABSTRACT**

The invention provides a dipole antenna and mobile communication terminal. The dipole antenna comprises a first vibrator, a second vibrator, a feed terminal and a dielectric slab, the first vibrator and the second vibrator being provided anti-symmetrically on the dielectric slab, wherein the first vibrator comprises a first resonant ring configured to transmit and receive radio signals in a GSM900 band and a first antenna arm configured to transmit and receive radio signals in a DCS1800 band, the first antenna arm being connected to the first resonant ring; the second vibrator comprises a second resonant ring configured to transmit and receive radio signals in the GSM900 band and a second antenna arm configured to transmit and receive radio signals in the DCS1800 band, the second antenna arm being connected to the second resonant ring; the first antenna arm is connected to the second antenna arm through the feed terminal.



US 20130038500A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2013/0038500 A1

(43) Pub. Date: Feb. 14, 2013

Kaikkonen et al.

(54) **SWITCHING ARRANGEMENT FOR AN ANTENNA DEVICE**

(71) Applicants: **Andrei Kaikkonen**, Jarfalla (SE); **Ermin Pasalic**, Akersberga (SE); **Peter Lindberg**, Uppsala (SE); **Stefan Irmscher**, Sollentuna (SE); **Axel von Arbin**, Taby (SE)

(72) Inventors: **Andrei Kaikkonen**, Jarfalla (SE); **Ermin Pasalic**, Akersberga (SE); **Peter Lindberg**, Uppsala (SE); **Stefan Irmscher**, Sollentuna (SE); **Axel von Arbin**, Taby (SE)

(21) Appl. No.: **13/654,004**

(22) Filed: **Oct. 17, 2012**

Related U.S. Application Data

(63) Continuation-in-part of application No. PCT/EP2010/057758, filed on Jun. 3, 2010.

Publication Classification

(51) **Int. Cl.**

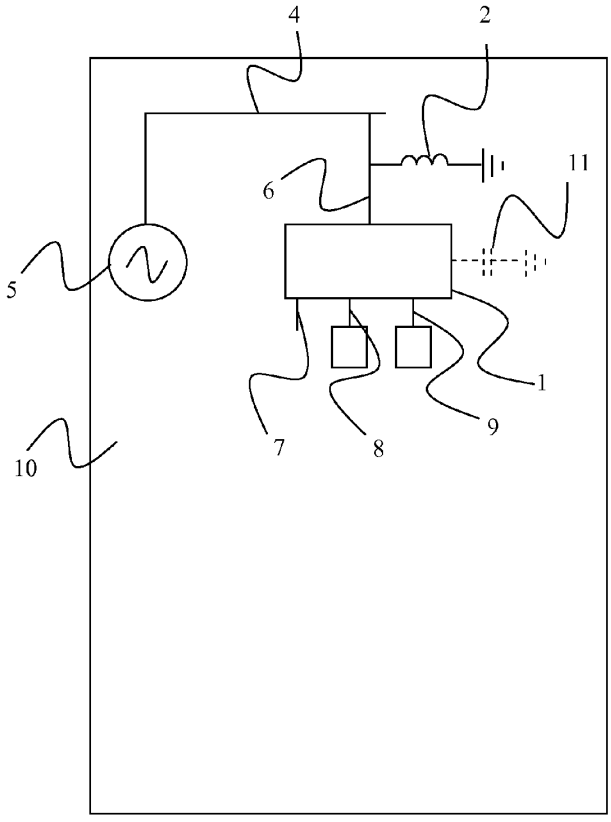
H01Q 1/50 (2006.01)

H01P 5/12 (2006.01)

(52) **U.S. Cl.** **343/852**; 333/101

(57) **ABSTRACT**

Exemplary embodiments are disclosed of switching arrangements for antenna devices. Exemplary embodiments are also disclosed of antenna arrangements and portable radio communication devices including such switching arrangements. An exemplary embodiment includes a switching arrangement for an antenna device operational in at least two frequency bands. In this example, the switching arrangement generally includes a switching device that is switchable into at least a first state and a second state. The switching device includes at least a first port, a second port, and a third port. The first port is connectable to an antenna device. The second port is connected to the first port in the first state. The third port is connected to the first port in the second state. The switching arrangement includes an inductor connected between the first port and ground.



US 20130038501A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2013/0038501 A1

(43) Pub. Date: Feb. 14, 2013

KATO et al.

(54) ANTENNA MODULE

(75) Inventors: **Noboru KATO**, Nagaokakyo-shi (JP); **Jun SASAKI**, Nagaokakyo-shi (JP); **Satoshi ISHINO**, Nagaokakyo-shi (JP); **Katsumi TANIGUCHI**, Nagaokakyo-shi (JP)

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

(21) Appl. No.: **13/368,358**

(22) Filed: **Feb. 8, 2012**

Related U.S. Application Data

(63) Continuation of application No. PCT/JP2010/064041, filed on Aug. 20, 2010.

(30) **Foreign Application Priority Data**

Aug. 20, 2009 (JP) 2009-190898

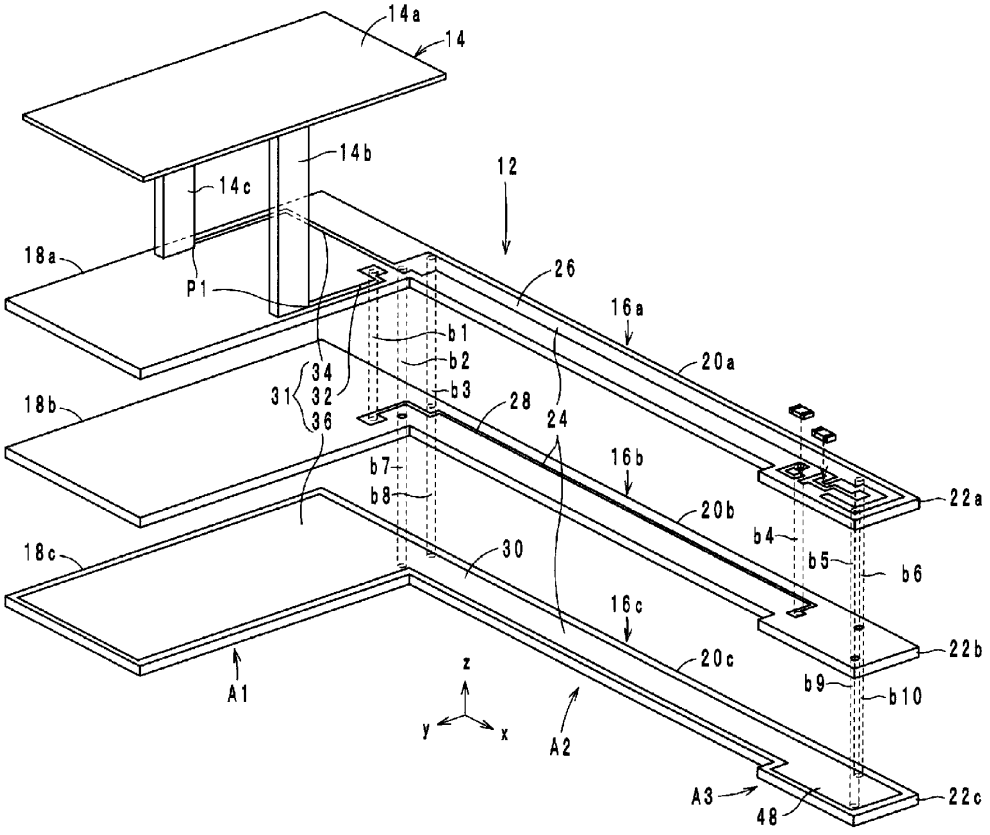
Publication Classification

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

(52) **U.S. Cl.** **343/860**

(57) **ABSTRACT**

In an antenna module, a main portion includes a plurality of insulating sheets made of a flexible material and laminated on each other. An antenna configured to transmit/receive a high-frequency signal is disposed in the main portion. A connection portion is disposed in the main portion and is connected to an electronic device that inputs/outputs the high-frequency signal. A signal transmission line is disposed in the main portion and has a strip line structure or a microstrip line structure to transmit the high-frequency signal. An impedance matching circuit is disposed in the main portion and between the antenna and end of a signal transmission line facing in a negative x direction. An impedance matching circuit is disposed in the main portion and between the connection portion and an end of the signal transmission line facing in a positive x direction.



US 20130038502A1

(19) **United States**

(12) **Patent Application Publication**

ERDEM

(10) **Pub. No.: US 2013/0038502 A1**

(43) **Pub. Date: Feb. 14, 2013**

(54) **CONTROLLER FOR A RADIO CIRCUIT**

(75) Inventor: **Aykut ERDEM**, Caen (FR)

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

(21) Appl. No.: **13/556,803**

(22) Filed: **Jul. 24, 2012**

(30) **Foreign Application Priority Data**

Aug. 11, 2011 (EP) 11290371.1

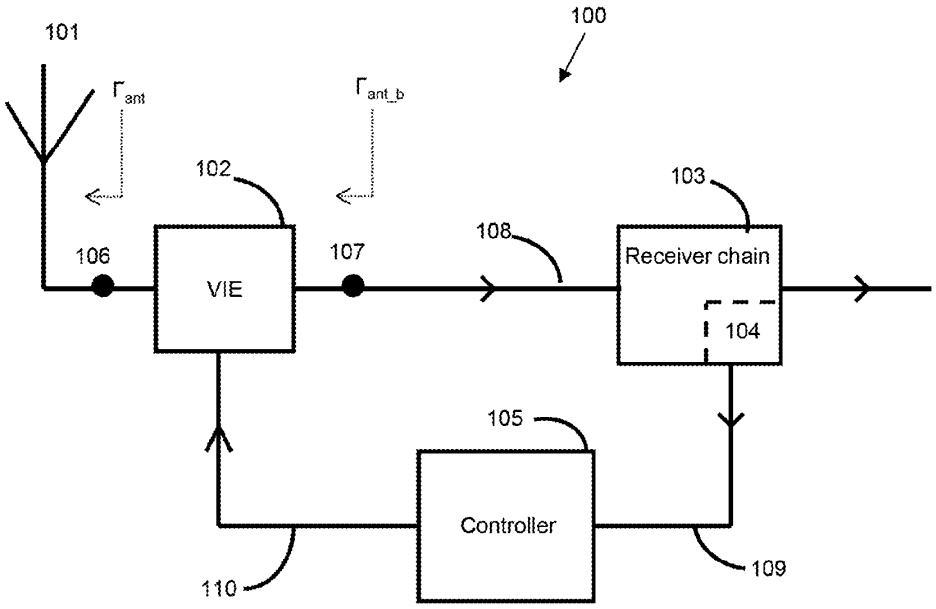
Publication Classification

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

(52) **U.S. Cl.** **343/861**

(57) **ABSTRACT**

The invention relates to a controller for a radio circuit. The radio circuit comprises at least one variable impedance element coupled between an antenna and a received signal quality indicator generator. The controller is configured to receive a received signal quality indicator from the received signal quality indicator generator and to provide a control signal to the at least one variable impedance element. The control signal comprises a command to modify the impedance of the variable impedance element in accordance with the value of the received signal quality indicator.



US 20130038504A1

(19) **United States**

(12) **Patent Application Publication**

Livingston

(10) **Pub. No.: US 2013/0038504 A1**

(43) **Pub. Date: Feb. 14, 2013**

(54) **CONTINUOUS CURRENT ROD ANTENNA**

(76) Inventor: **Stanley W. Livingston**, Fullertton, CA (US)

(21) Appl. No.: **13/205,533**

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

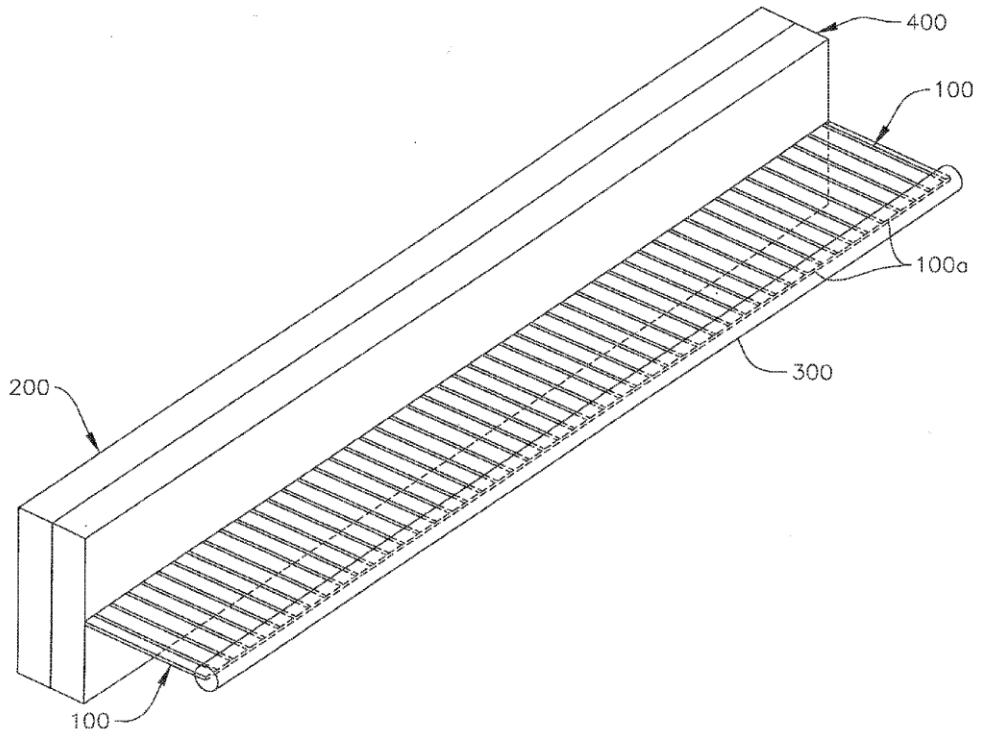
Publication Classification

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

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

(57) **ABSTRACT**

A Continuous Current Rod Antenna that may be positioned in close proximity to a conductive backplane and has extremely tight lattices which stabilize the radiation impedance and allows dense UR modules packaging. The Continuous Current Rod Antenna offers lower profile packaging, with higher gain over larger bandwidths than other collinear array techniques.



US 20130038507A1

(19) **United States**

(12) **Patent Application Publication**

HAMABE

(10) **Pub. No.: US 2013/0038507 A1**

(43) **Pub. Date: Feb. 14, 2013**

(54) **ANTENNA APPARATUS HAVING FIRST AND SECOND ANTENNA ELEMENTS FED BY FIRST AND SECOND FEEDER CIRCUITS CONNECTED TO SEPARATE GROUND CONDUCTORS**

(71) Applicant: **PANASONIC CORPORATION**, Osaka (JP)

(72) Inventor: **Taichi HAMABE**, Hyogo (JP)

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

(21) Appl. No.: **13/654,738**

(22) Filed: **Oct. 18, 2012**

Related U.S. Application Data

(63) Continuation of application No. PCT/JP2011/006864, filed on Dec. 8, 2011.

(30) **Foreign Application Priority Data**

Mar. 16, 2011 (JP) 2011-057496

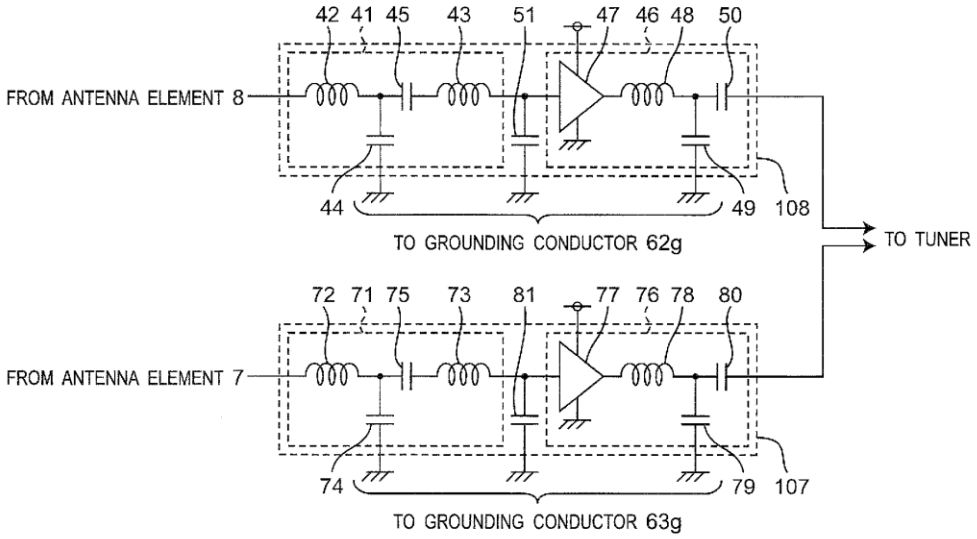
Publication Classification

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

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

(57) **ABSTRACT**

An antenna element is connected to a feeder circuit, and an antenna element is connected to a feeder circuit. The grounding terminal of the feeder circuit is grounded by being connected to a grounding conductor. The grounding terminal of the feeder circuit is grounded by being connected to a grounding conductor. Grounding conductors interpose therebetween the first portion of the antenna element, and grounding conductors interpose therebetween the third portion of the antenna element. The grounding conductors are mutually electrically connected by jumper conductors.



US 20130038560A1

(19) **United States**

(12) **Patent Application Publication**

SATO et al.

(10) **Pub. No.: US 2013/0038560 A1**

(43) **Pub. Date: Feb. 14, 2013**

(54) **WIRELESS DEVICE**

(71) Applicants: **Koichi SATO**, Tokyo (JP); **Makoto TABATA**, Tokyo (JP)

(72) Inventors: **Koichi SATO**, Tokyo (JP); **Makoto TABATA**, Tokyo (JP)

(21) Appl. No.: **13/654,145**

(22) Filed: **Oct. 17, 2012**

Related U.S. Application Data

(63) Continuation of application No. 12/556,766, filed on Sep. 10, 2009.

(30) **Foreign Application Priority Data**

Mar. 30, 2009 (JP) 2009-082341

Publication Classification

(51) **Int. Cl.**
G06F 3/041 (2006.01)

(52) **U.S. Cl.** **345/173**

(57) **ABSTRACT**

A wireless device includes: a casing having a first face; a display configured to be visible from the first face; a touch sensor formed by a transparent material and mounted in the casing with respect to the display as a part of the first face; a substrate mounted to a side opposite to the first face with respect to the display; and an antenna element including: a first portion built in the casing, connected to a feeding point included in the substrate, and located within a first range occupied by the touch sensor when viewed from a direction perpendicular to the first face; and a second portion located within a second range other than the first range.

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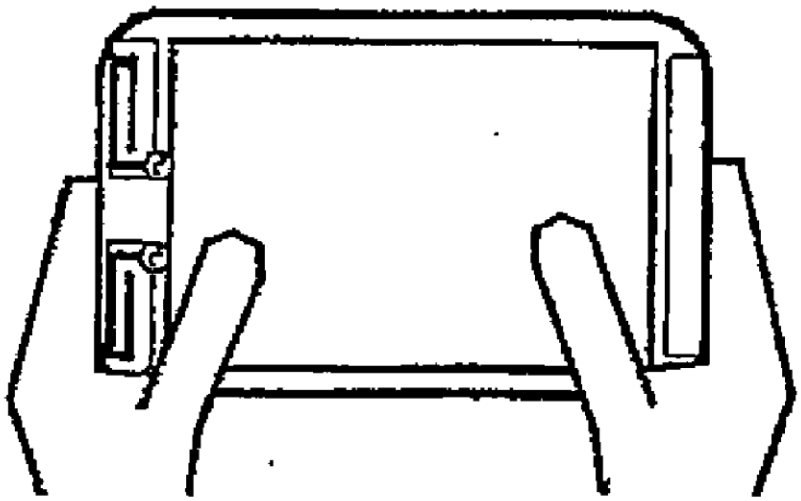


US 20130044030A1

(19) **United States**

(12) **Patent Application Publication**

Oh

(10) **Pub. No.: US 2013/0044030 A1**

(43) **Pub. Date: Feb. 21, 2013**

(54) **DUAL RADIATOR MONOPOLE ANTENNA**

(76) Inventor: **Sung Hoon Oh**, Sunnyvale, CA (US)

(21) Appl. No.: **13/212,316**

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

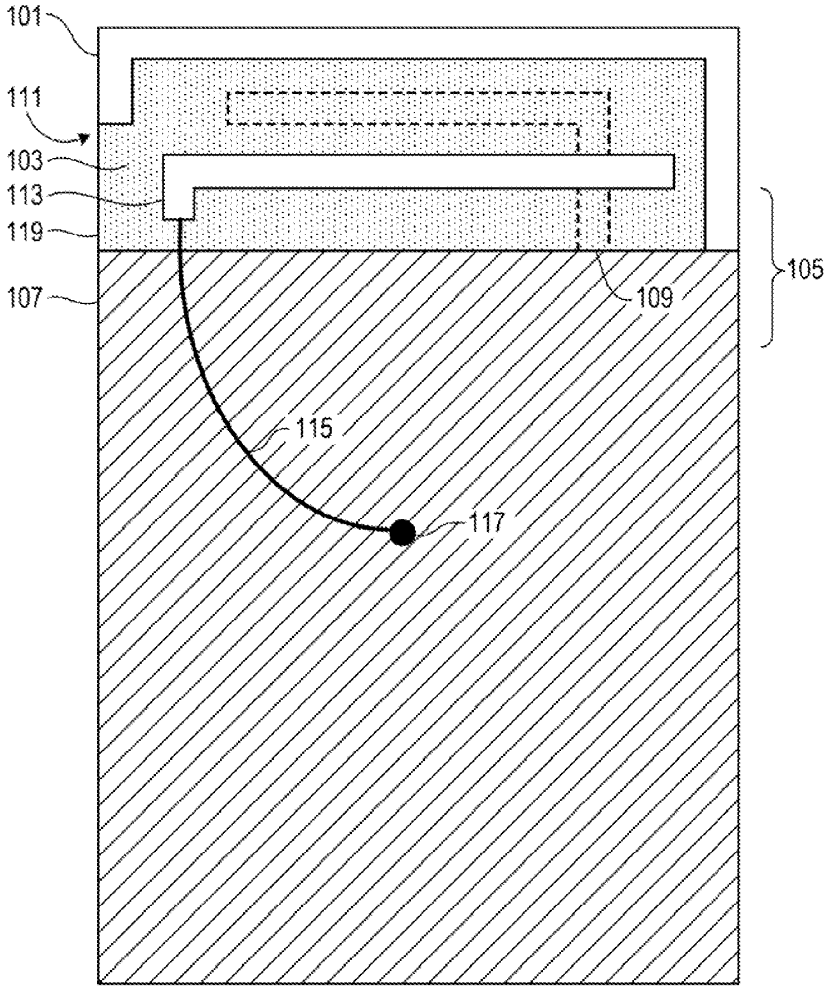
Publication Classification

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

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

(57) **ABSTRACT**

A dual radiator monopole antenna. An elongated low-band ground-coupled arm is disposed on a first surface of a printed circuit board. This arm is electrically connected to and spaced apart from a ground plane. An elongated high-band ground-coupled arm is disposed on a second surface of the printed circuit board, and like the low-band arm is electrically connected to and spaced apart from the ground plane. The high-band arm is oriented parallel to, and laterally displaced from, the low-hand ground-coupled ann. An elongated feed arm is disposed on the first surface of the printed circuit board, oriented parallel the ground-coupled arms and laterally displaced from them. A conductor in electrical feed connection with the feed arm extends from the feed arm across a portion of the ground plane.



US 20130044031A1

(19) **United States**

(12) **Patent Application Publication**

HSU et al.

(10) **Pub. No.: US 2013/0044031 A1**

(43) **Pub. Date: Feb. 21, 2013**

(54) **ANTENNA MODULE**

(76) Inventors: **Chien-Ming HSU**, Taipei (TW); **Chiuan-Jian Huang**, Taipei (TW)

(21) Appl. No.: **13/568,956**

(22) Filed: **Aug. 7, 2012**

Related U.S. Application Data

(60) Provisional application No. 61/524,044, filed on Aug. 16, 2011.

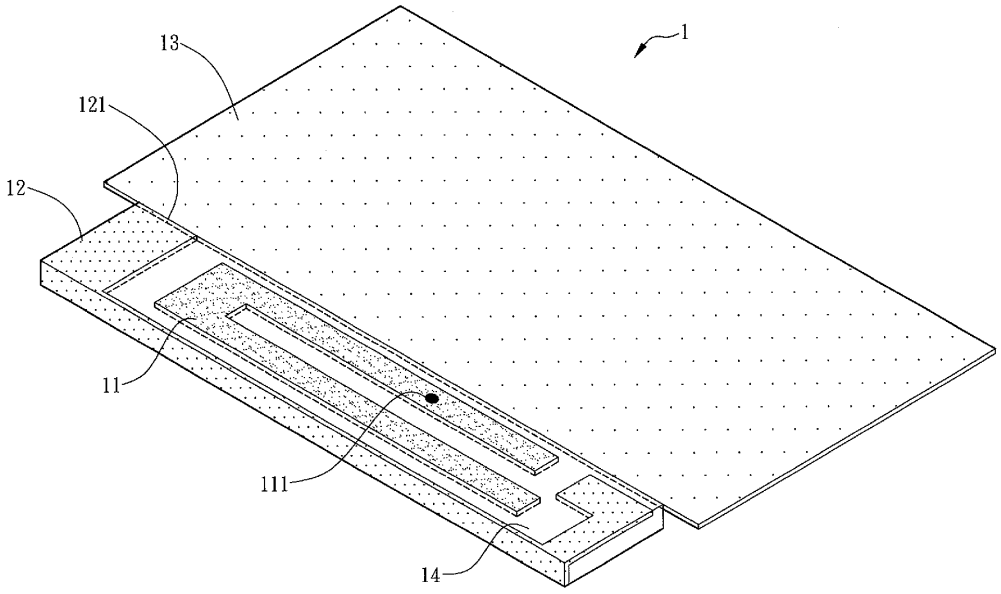
Publication Classification

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

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

(57) **ABSTRACT**

An antenna module is disclosed. The antenna module comprises a first conductive unit, a second conductive unit and a third conductive unit. The first conductive unit has a feeding point. The second conductive unit is disconnected with the first conductive unit electrically. The third conductive unit is disposed adjacent to the first conductive unit and electrically connected with the second conductive unit.



US 20130044036A1

(19) **United States**

(12) **Patent Application Publication**

Kuonanoja

(10) **Pub. No.: US 2013/0044036 A1**

(43) **Pub. Date: Feb. 21, 2013**

(54) **MIMO ANTENNA AND METHODS**

(76) Inventor: **Reetta Kuonanoja**, Oulu (FI)

(21) Appl. No.: **13/511,643**

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

(86) PCT No.: **PCT/FI2010/050926**

§ 371 (c)(1),
(2), (4) Date: **Sep. 25, 2012**

(30) **Foreign Application Priority Data**

Nov. 27, 2009 (FI) 20096251

Publication Classification

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

(52) **U.S. Cl.** **343/810**; 343/893

(57) **ABSTRACT**

An antenna structure that provides spatial multiplexing capabilities. In one embodiment, the antenna comprises two antenna components with a substrate and radiator, the components being located on opposite sides of the circuit board of a radio device. Each antenna component operates in combination with the ground plane of the radio device to form a partial antenna, the operating band of which is below the frequency of 1 GHz. The ground plane and the feed points of the partial antennas are arranged so that the 'dipole axes' of the partial antennas have clearly different directions at the frequencies of said operating band.