US 20080079635A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0079635 A1**

Rowell (43) **Pub. Date: Apr. 3, 2008**

(54) **ANTENNA SYSTEMS WITH GROUND PLANE EXTENSIONS AND METHOD FOR USE THEREOF**

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(21) Appl. No.: **11/529,777**

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

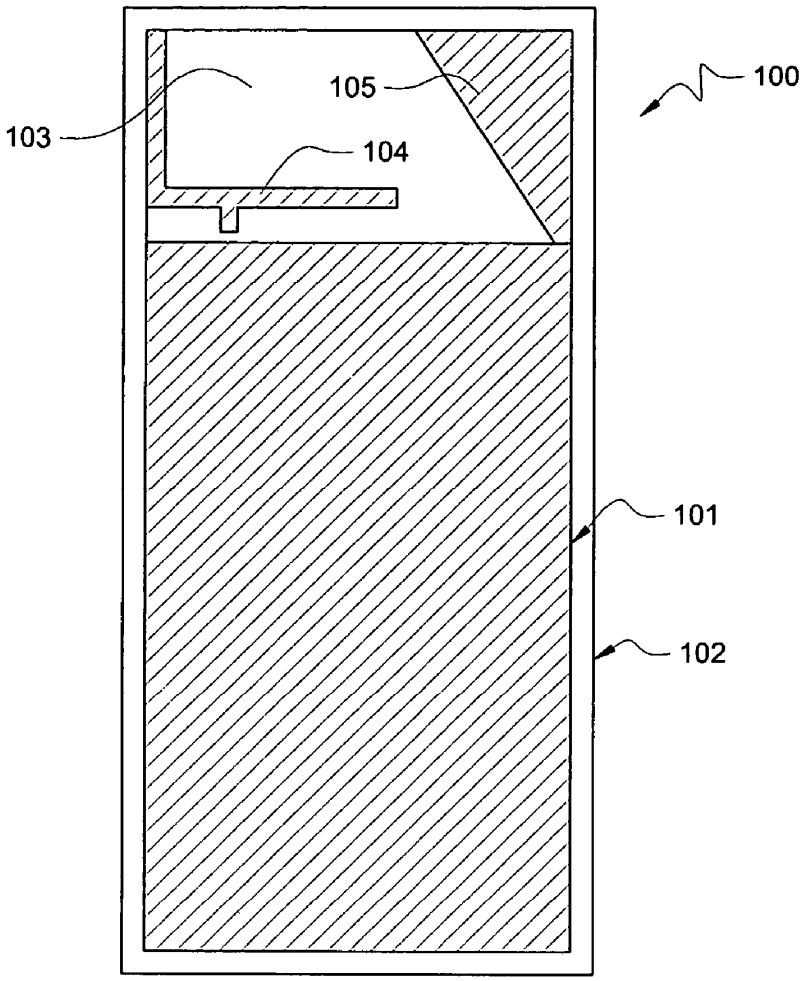
Publication Classification

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

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

(57) **ABSTRACT**

An antenna system comprising a ground plane structure on a substrate, an antenna space on the substrate adjacent to the ground plane structure, the antenna space including an ungrounded antenna therein with an associated first resonant length, an extension of the ground plane projecting into the antenna space, the ground plane extension defining a second resonant length that includes at least part of its own length and at least part of a length of the ground plane structure.



US 20080079637A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2008/0079637 A1

Okamura et al. (43) Pub. Date: Apr. 3, 2008

(54) ANTENNA APPARATUS

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(21) Appl. No.: **11/860,967**

(22) Filed: **Sep. 25, 2007**

(30) **Foreign Application Priority Data**

Sep. 28, 2006 (JP) 2006-265147

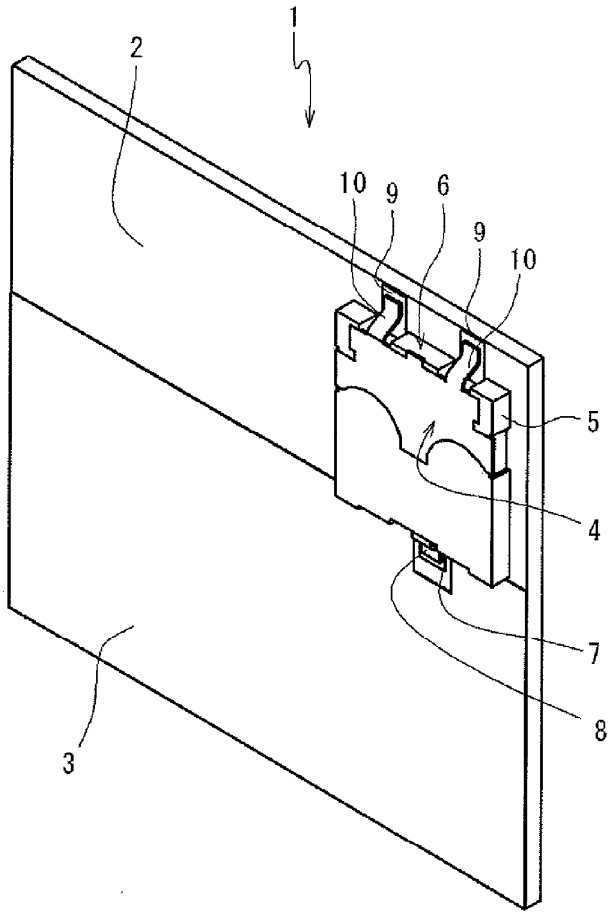
Publication Classification

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

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

(57) **ABSTRACT**

An antenna apparatus includes a radiation member and a substrate having a ground conductor. The radiation member has a plate-like shape, is made of a dielectric material, and includes a radiation conductor. The radiation member is joined to a surface of the substrate. The radiation conductor includes a feeding portion, at least a pair of notch portions, and a step. The feeding portion is exposed from a center at one end of the dielectric material and coupled to a feeding pad provided in the substrate. The notch portions are symmetrically formed. The step is formed by a bend between the feeding portion and one of the notch portions. The radiation conductor on a side of the feeding portion from the step is embedded in the dielectric material.



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(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0079639 A1**

Jen-Huan (43) **Pub. Date: Apr. 3, 2008**

(54) **NOISE-SUPRESSING ANTENNA ASSAMBLAGE**

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(21) Appl. No.: **11/672,526**

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

(30) **Foreign Application Priority Data**

Sep. 28, 2006 (TW) 95135921

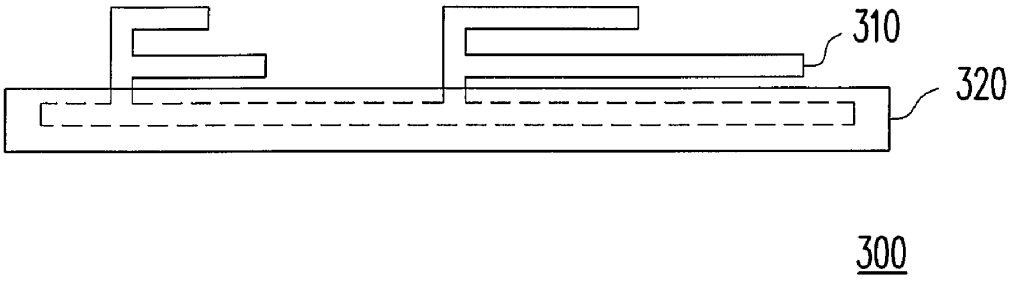
Publication Classification

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

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

(57) **ABSTRACT**

A noise-suppressing antenna assemblage applicable for being disposed within an electronic device is provided. The antenna assemblage includes an antenna and a blocking sheet. The blocking sheet is disposed on one side edge of the antenna in the transversal direction of the antenna, and forms a included angle with the antenna, which is 20 to 90 degrees. The blocking sheet is capable of efficiently blocking the electromagnetic wave noises coming from the electronic device to the antenna, due to the included angle.



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(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0079640 A1**

Yang (43) **Pub. Date: Apr. 3, 2008**

(54) **COMPACT MULTI-ELEMENT ANTENNA WITH PHASE SHIFT**

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(21) Appl. No.: **11/866,354**

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

Related U.S. Application Data

(60) Provisional application No. 60/827,846, filed on Oct. 2, 2006.

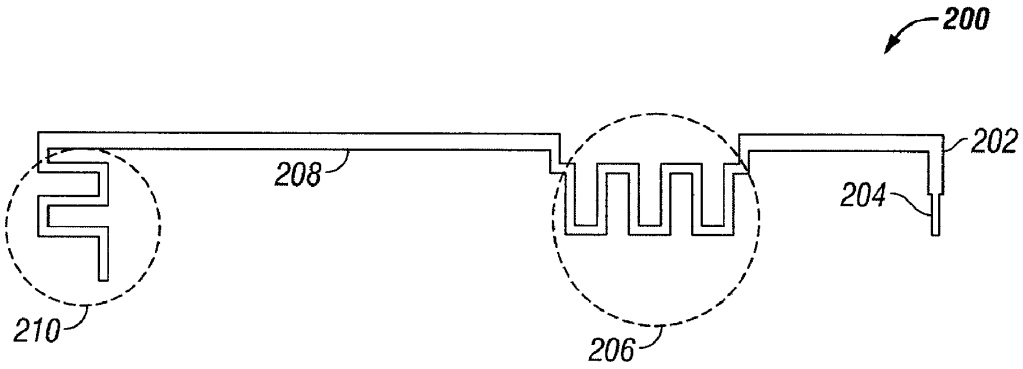
Publication Classification

(51) **Int. Cl.**
H01Q 3/30 (2006.01)
H01Q 1/24 (2006.01)

(52) **U.S. Cl.** **343/702**; 343/876

(57) **ABSTRACT**

A phased array antenna system includes a first radiation element that is made of a material and has a length selected to resonate at a desired frequency. A phase-shift element is coupled to one end of the first radiation element. A second radiation element is coupled to the end of the phase-shift element opposite the first radiation element, so that a radio signal passes through the first radiation element through the phase-shift element and through the second radiation element, the second radiation element is made of a material and has a length selected to resonate such that the first and second radiation elements cooperate to form a desired beam pattern from the antenna system.



US 20080079642A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2008/0079642 A1

Ishizuka et al. (43) Pub. Date: Apr. 3, 2008

(54) ANTENNA DEVICE AND WIRELESS COMMUNICATION APPARATUS

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(21) Appl. No.: **11/954,521**

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

Related U.S. Application Data

(63) Continuation of application No. PCT/JP2006/306701, filed on Mar. 30, 2006.

(30) **Foreign Application Priority Data**

Jun. 17, 2005 (JP) 2005-177764

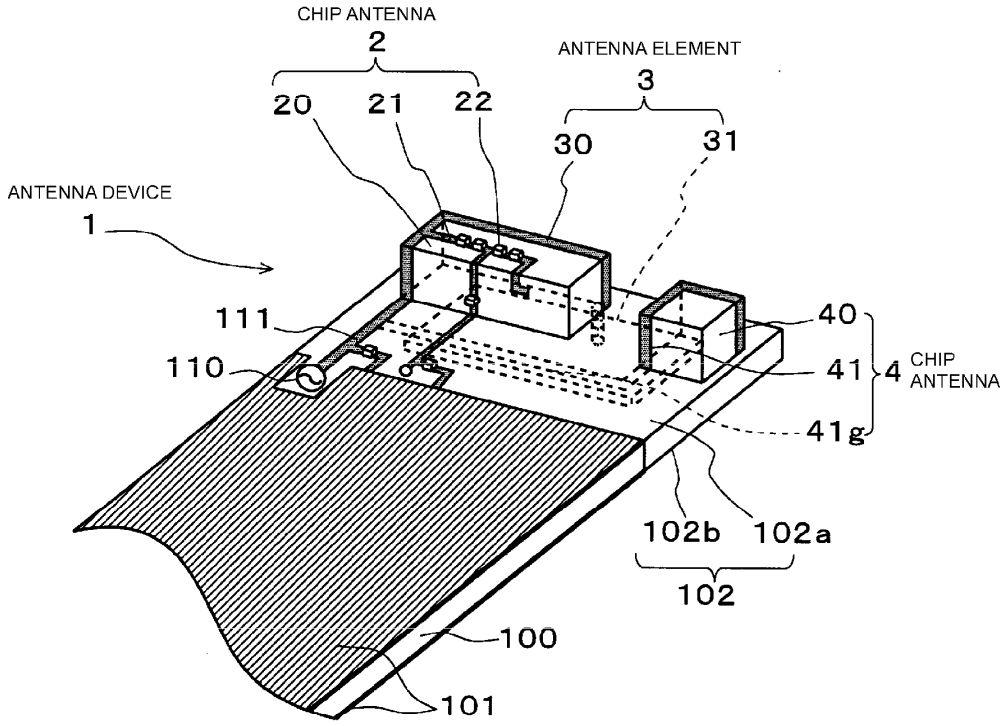
Publication Classification

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

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

(57) **ABSTRACT**

A compact and thin antenna device can be mounted in a small area of a substrate and has a multiband capability adaptable to various applications. The antenna device includes a chip antenna, an antenna element, and a chip antenna. The chip antenna is produced by forming a radiation electrode on the surface of a dielectric base, and mounting a frequency variable circuit on the radiation electrode. Thus, it becomes possible to obtain a resonant frequency f1 of the chip antenna and further to vary the resonant frequency f1. The antenna element is produced by adding an auxiliary element to an additional radiation electrode for the chip antenna. The chip antenna includes a radiation electrode on a dielectric base and a conductive pattern. Thus, a resonant frequency f2 and a resonant frequency f3 of the antenna element and the chip antenna, respectively, can be obtained.



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(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0079643 A1**

Jordan (43) **Pub. Date: Apr. 3, 2008**

(54) **LOW PROFILE ANTENNAS AND DEVICES**

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(21) Appl. No.: **11/537,616**

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

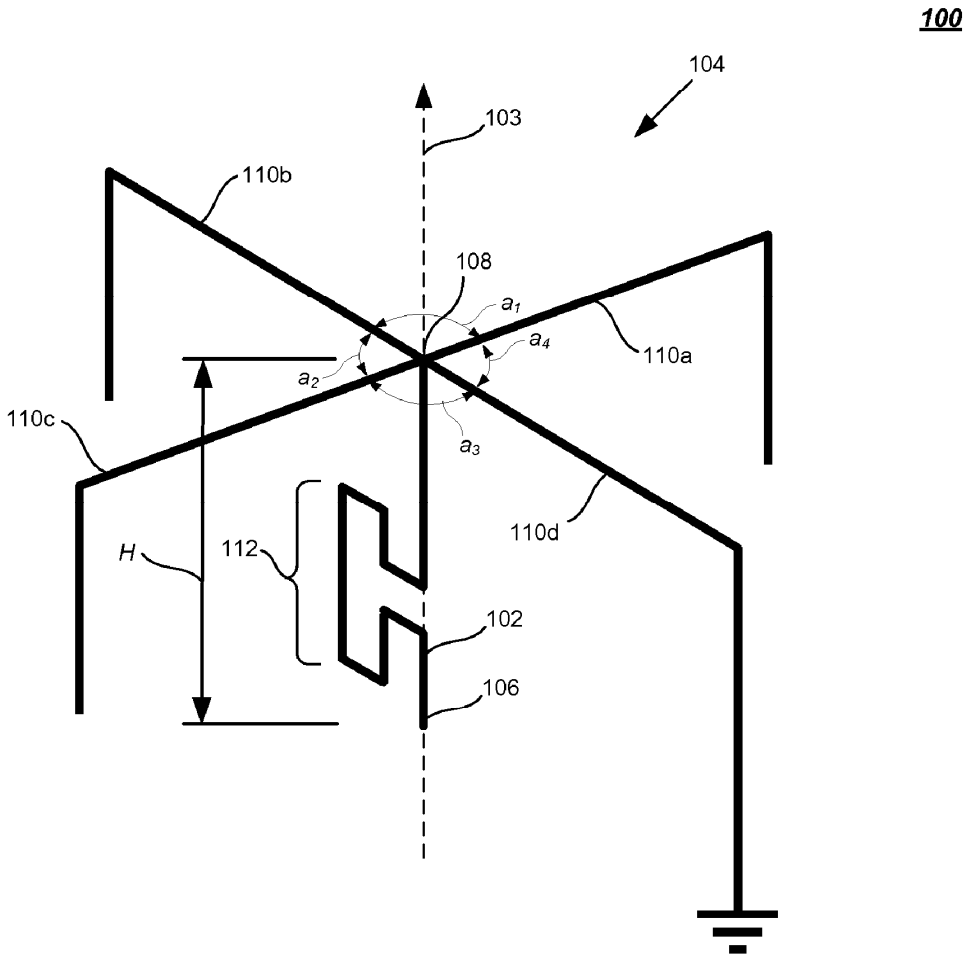
Publication Classification

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

(52) **U.S. Cl.** **343/725**; 343/742

(57) **ABSTRACT**

An apparatus includes a monopole extending substantially along an axis that may be vertical. However, the monopole may have a loop portion that deviates from the axis. Further, the apparatus includes multiple conductive elements, each having a substantially linear first segment that is coupled to the monopole. The first segments may be coplanar and/or perpendicular to the axis. Each of the conductive elements may further include a second segment that is substantially parallel to the axis. One or more of these segments may be connected to a ground potential. Also, the conductive elements may each include a third segment having a loop pattern.



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(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0079644 A1**

Cheng (43) **Pub. Date: Apr. 3, 2008**

(54) **MULTI-BAND SLOT RESONATING RING ANTENNA**

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(21) Appl. No.: **11/540,444**

(22) Filed: **Sep. 29, 2006**

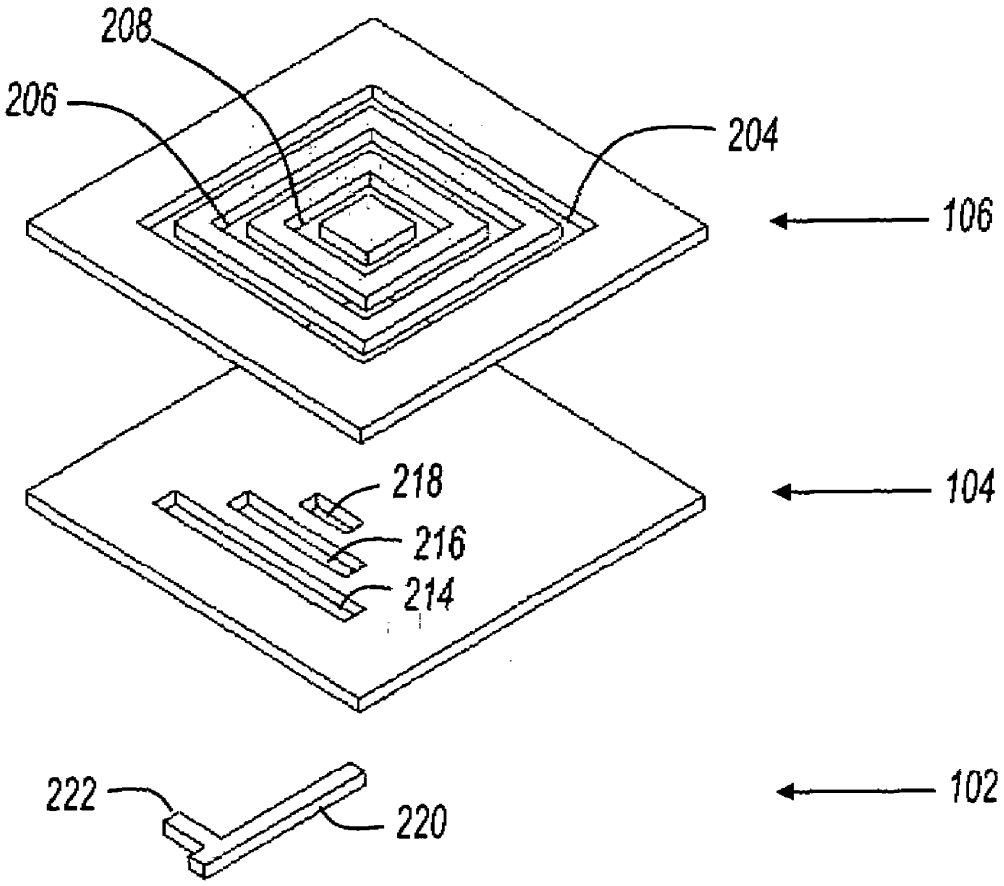
Publication Classification

(51) **Int. Cl.**
H01Q 13/12 (2006.01)

(52) **U.S. Cl.** **343/769**

(57) **ABSTRACT**

A multi-band slot resonating ring antenna (SRRA) is suitable to be manufactured on a circuit board. A first conductive plane includes concentric slots corresponding to different frequency bands. The antenna may be fed by microstrip feed lines. The antenna may also be fed by probes. A conductive layer may include coupling apertures to couple signal energy to the concentric slots.



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(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0079645 A1**

Higasa et al. (43) **Pub. Date: Apr. 3, 2008**

(54) **ANTENNA STRUCTURE HAVING STABLE PROPERTIES AND HEADSET**

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(21) Appl. No.: **11/895,254**

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

(30) **Foreign Application Priority Data**

Sep. 29, 2006 (JP) 2006-268875

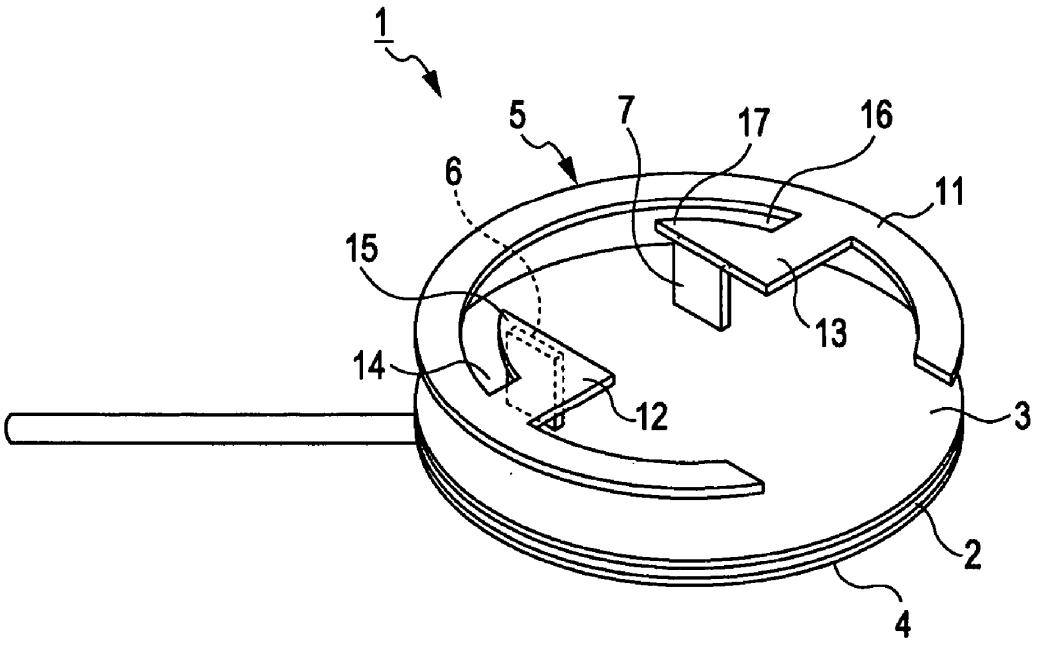
Publication Classification

(51) **Int. Cl.**
H01Q 13/10 (2006.01)
H01Q 21/00 (2006.01)

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

(57) **ABSTRACT**

An antenna structure includes a radiation conductor made of a metal plate that is supported by legs provided upright on a surface of a dielectric substrate and is spaced apart from the surface. The radiation conductor is circularly shaped such that the contour of the radiation conductor conforms to the outer periphery of the dielectric substrate and such that the radiation conductor includes an open portion. One of the legs functions as a feeding terminal and the other functions as a grounding terminal, whereby the radiation conductor operates as a dipole antenna. The radiation conductor has slots for adjusting impedance. Impedance can be adjusted by changing the length of the slots.



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(19) **United States**

(12) **Patent Application Publication**

Stuart

(10) **Pub. No.: US 2008/0079646 A1**

(43) **Pub. Date: Apr. 3, 2008**

(54) **SMALL SPHERICAL ANTENNAS**

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(73) Assignee: **Lucent Technologies Inc**

(21) Appl. No.: **11/540,442**

(22) Filed: **Sep. 29, 2006**

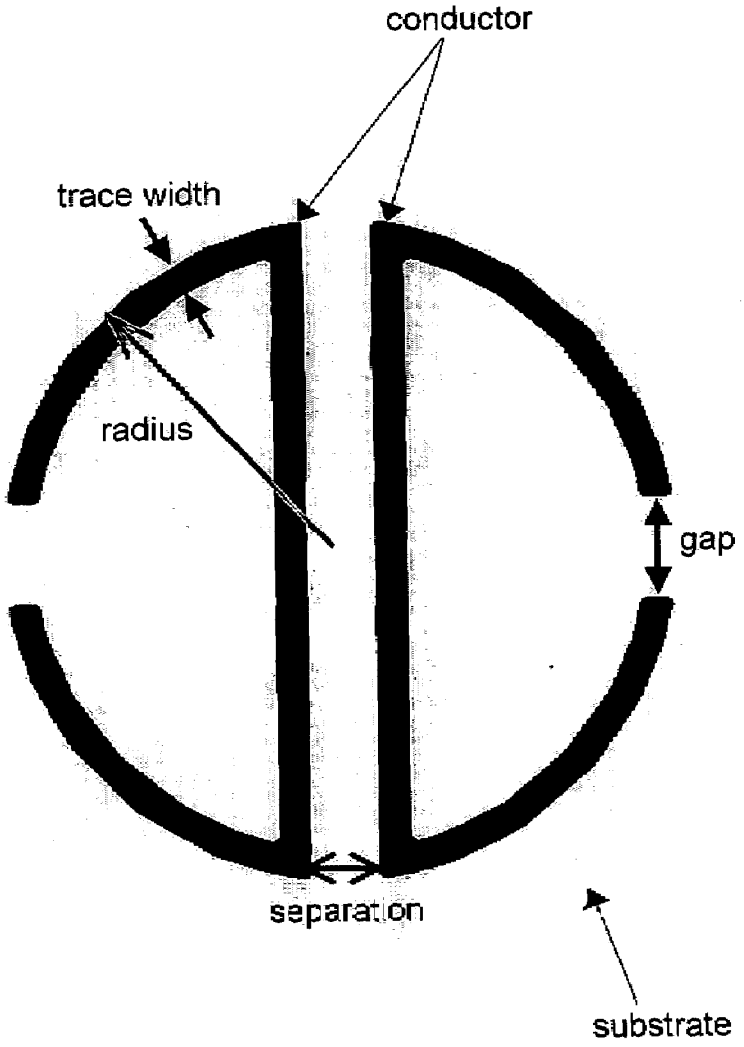
Publication Classification

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

(52) **U.S. Cl.** **343/795**

(57) **ABSTRACT**

An antenna is provided for operating within the electrically small antenna regime (i.e., ka≅0.5), and having bandwidth performance quite close to fundamental limits. The antenna of the invention, in various embodiments, is based upon spherical resonator structures that are characterized by a performance factor (Q/Q_{chu},) close to 1.5. The antenna combines a resonator structure determined according to the method of the invention with an appropriate transmission line feeding arrangement, such that the resonator effectively couples the transmission line mode to the radiating spherical harmonic mode in an impedance-matched manner.



US 20080079651A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0079651 A1**

KIM et al. (43) **Pub. Date: Apr. 3, 2008**

(54) **ANTENNA DEVICE OF A MOBILE TERMINAL**

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(21) Appl. No.: **11/780,795**

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

(30) **Foreign Application Priority Data**

Oct. 2, 2006 (KR) 10-2006-0097046

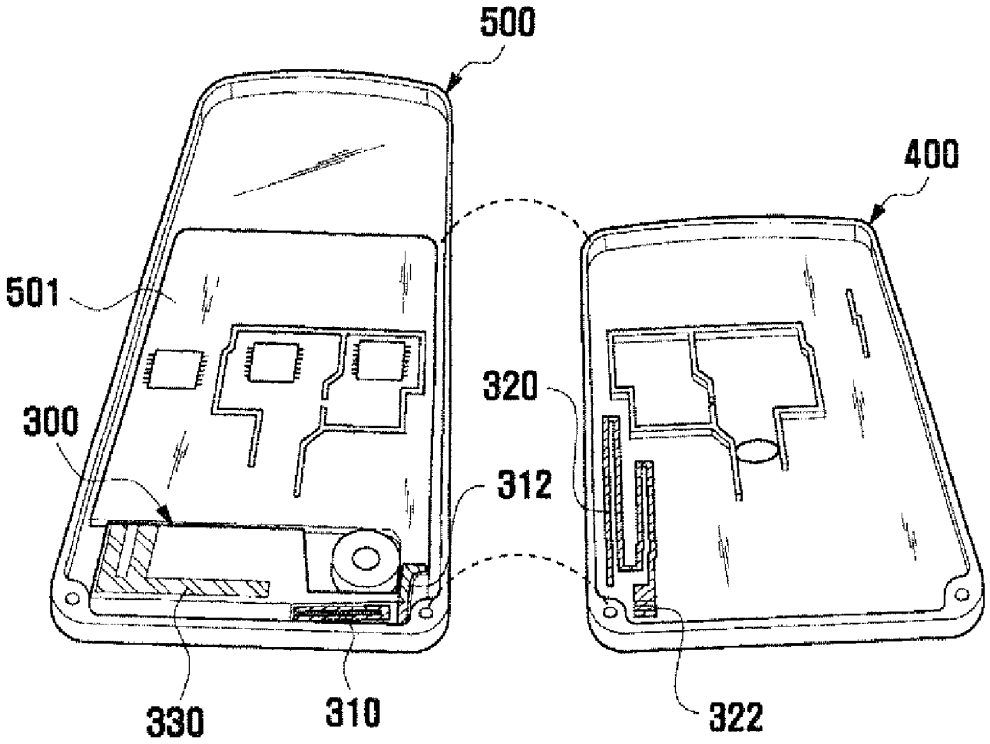
Publication Classification

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

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

(57) **ABSTRACT**

An antenna device for a mobile terminal. The antenna device includes a first antenna pattern provided within a case of the mobile terminal, and a second antenna pattern provided within the case and electrically connected to the first antenna pattern through contact with the first antenna pattern. Therefore, by forming an antenna device with an antenna pattern for use in a low frequency band, the antenna device may be conveniently used and decrease the size of the mobile terminal.



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(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2008/0081574 A1

Shih et al. (43) Pub. Date: Apr. 3, 2008

(54) EMBEDDED ANTENNA

(76) Inventors: **Kai Shih**, Tu-Cheng City (TW); **Yu-Yuan Wu**, Tu-Cheng City (TW); **Hung-Jen Chen**, Tu-Cheng City (TW); **Lan-Yung Hsiao**, Tu-Cheng City (TW)

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(21) Appl. No.: **11/528,506**

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

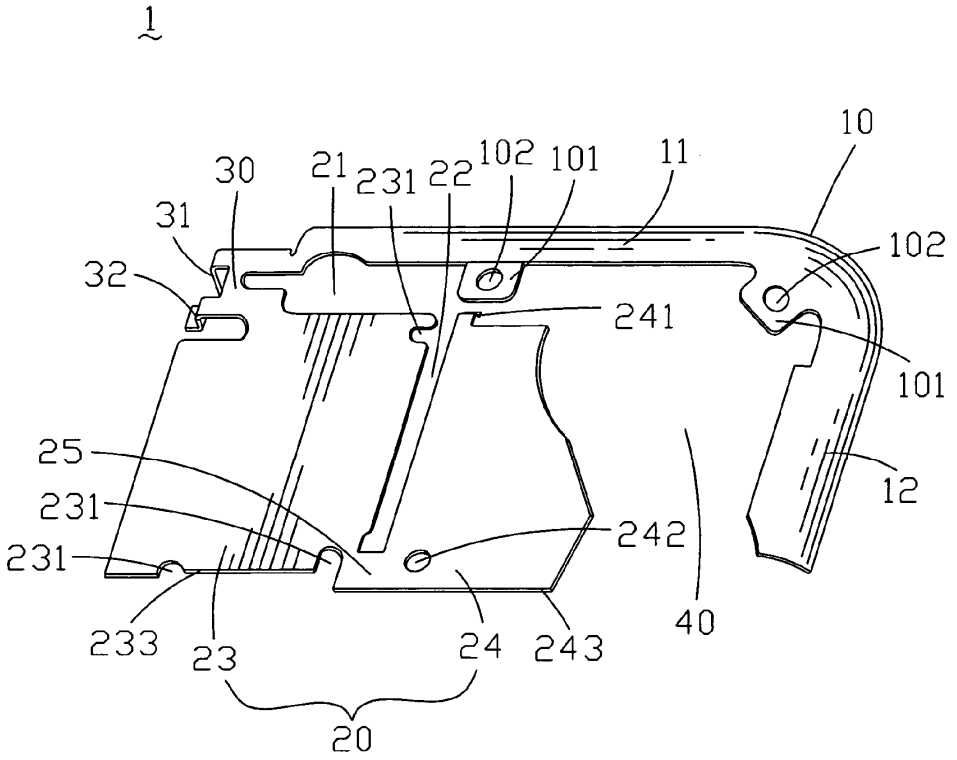
Publication Classification

(51) **Int. Cl.**
H04B 1/18 (2006.01)

(52) **U.S. Cl.** **455/187.1**

(57) **ABSTRACT**

An embedded antenna used in mobile phone includes a lower and a higher frequency portions connecting with the lower frequency portion via a first connecting portion. The lower frequency portion is a bended structure in planar inverted F antenna (PIFA) shape. The higher frequency portion is a loop antenna working in two different higher frequencies, including a first higher frequency portion and a second higher frequency portion connecting with the first one via a second connecting portion. The first connecting portion defines a feeding portion and a grounding portion. The second higher frequency portion defines another grounding portion. An electric current is formed between the first and the second higher frequency portions and can heighten the gain and the frequency band of the antenna. Additionally, a loudspeaker is disposed in a receiving space formed between the lower and higher frequency portions to save space with lowest influence to the antenna.



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(19) United States

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Cheng (43) Pub. Date: Apr. 3, 2008

(54) ANTENNA MODULE FOR MOBILE PHONE

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(21) Appl. No.: **11/783,440**

(22) Filed: **Apr. 10, 2007**

(30) **Foreign Application Priority Data**

Oct. 2, 2006 (TW) 095217636

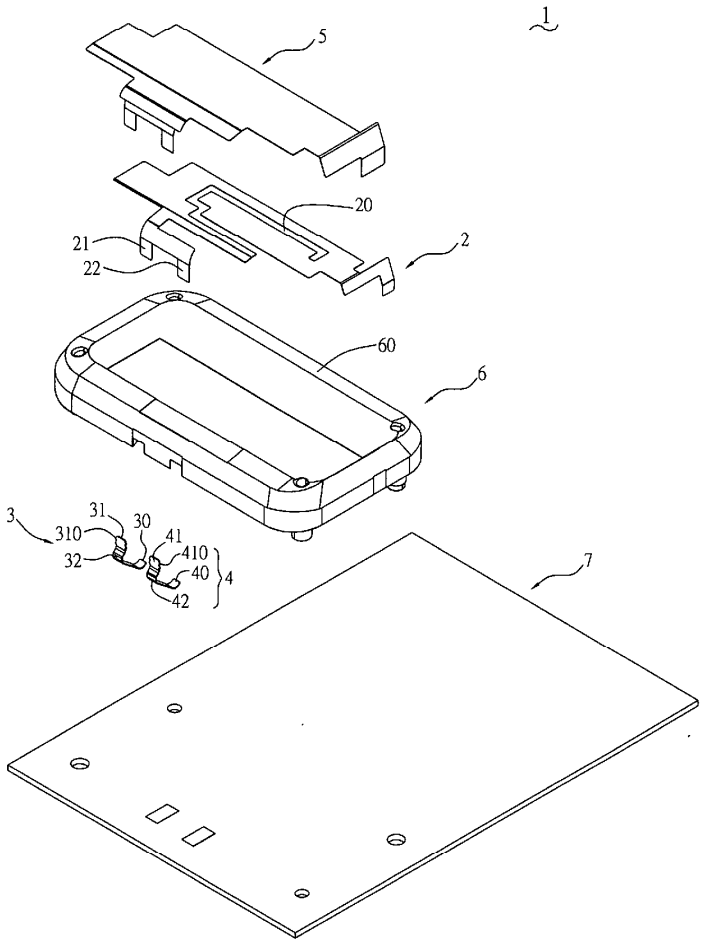
Publication Classification

(51) **Int. Cl.**
H04M 1/03 (2006.01)

(52) **U.S. Cl.** **455/550.1**

(57) **ABSTRACT**

An antenna module of mobile phone has an antenna, a feed-in terminal and a grounding terminal. The antenna includes an antenna body for receiving and radiating electromagnetic waves, a feed-in portion and a grounding portion. The feed-in portion forms a first bump array with adhesive on a surface thereon. The grounding portion forms a second bump array with adhesive on a surface thereon. The first bump array and adhesive of the feed-in portion connect with the feed-in terminal, and the second bump array and adhesive of the grounding portion connect with the grounding terminal. The first bump array and the second bump array respectively pierce oxidation coatings on surfaces of the feed-in terminal and the grounding terminal, producing contact positive pressure, electrically connecting the feed-in portion and the grounding portion with the feed-in terminal and the grounding terminal.



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(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0084353 A1**

Cheng (43) **Pub. Date: Apr. 10, 2008**

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

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

(21) Appl. No.: **11/882,038**

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

(30) **Foreign Application Priority Data**

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Oct. 31, 2006 (CN) 200610137648.9

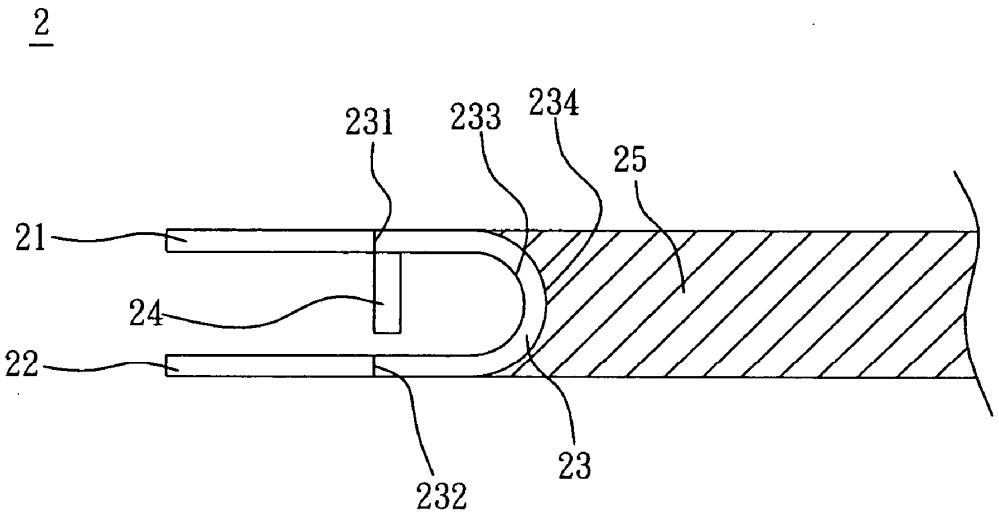
Publication Classification

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

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

(57) **ABSTRACT**

A printed antenna includes a radiating portion, a capacitance matching portion, an inductance matching portion, a feeding portion and a grounding portion. The capacitance matching portion is disposed parallel to the radiating portion. One end of the inductance matching portion is electrically connected with the radiating portion, and the other end of the inductance matching portion is electrically connected with the capacitance matching portion. The feeding portion, which is electrically connected with one inner side of the inductance matching portion, is located among the capacitance matching portion, the inductance matching portion, and the radiating portion. The feeding portion is roughly perpendicular to the radiating portion. The grounding portion is electrically connected with an outer side of the inductance matching portion. In addition, a printed antenna module including several printed antennas is also disclosed.



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(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0084354 A1**

Komoto (43) **Pub. Date: Apr. 10, 2008**

(54) **ANTENNA DEVICE AND METHOD OF MANUFACTURING THE SAME**

(76) Inventor: **Shinzo Komoto**, Okayama (JP)

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(21) Appl. No.: **11/882,169**

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

(30) **Foreign Application Priority Data**

Oct. 10, 2006 (JP) 2006-276223

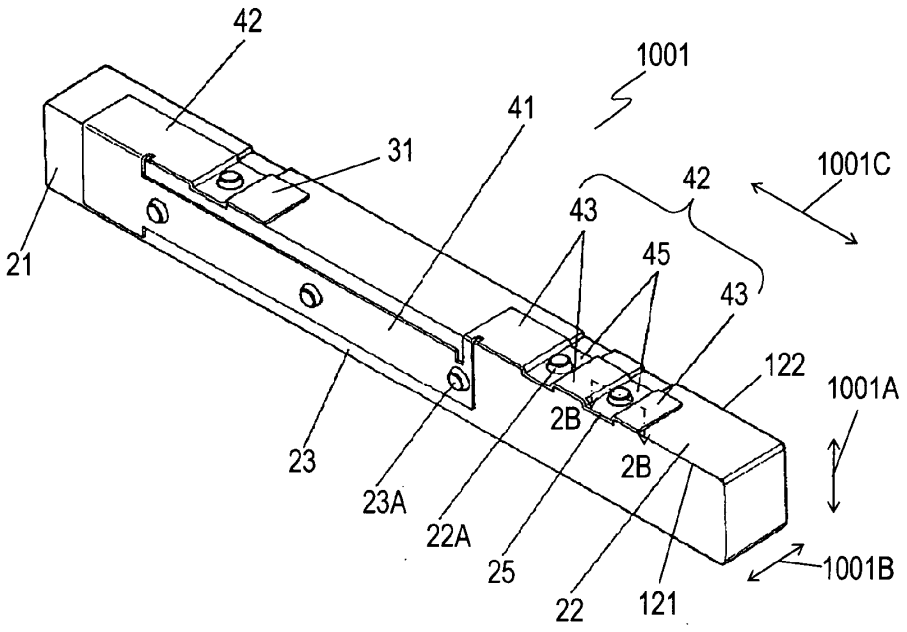
Publication Classification

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

(52) **U.S. Cl.** ..... **343/700 MS**; 29/600

(57) **ABSTRACT**

An antenna device includes an insulating base and an antenna element made of a metal plate fixed onto the base. The base has a surface having a recess therein having a bottom. A projection projects from the bottom of the recess. The antenna element has a hole in which the projection is inserted, and is fixed onto the surface of the base with the projection by swage locking. The antenna element includes a step portion provided on the bottom of the recess and a peripheral portion coupled to the step portion and provided on the surface of the base. The step portion has the hole provided therein. The projection has a height not larger than a height of the first peripheral portion of the antenna element. The antenna device has preferable antenna characteristics even while being accommodated in a small installation space.



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(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0088509 A1**

QIN (43) **Pub. Date: Apr. 17, 2008**

(54) **DUAL-BAND ANTENNA AND MIMO ANTENNA USING THE SAME**

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(21) Appl. No.: **11/616,886**

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

(30) **Foreign Application Priority Data**

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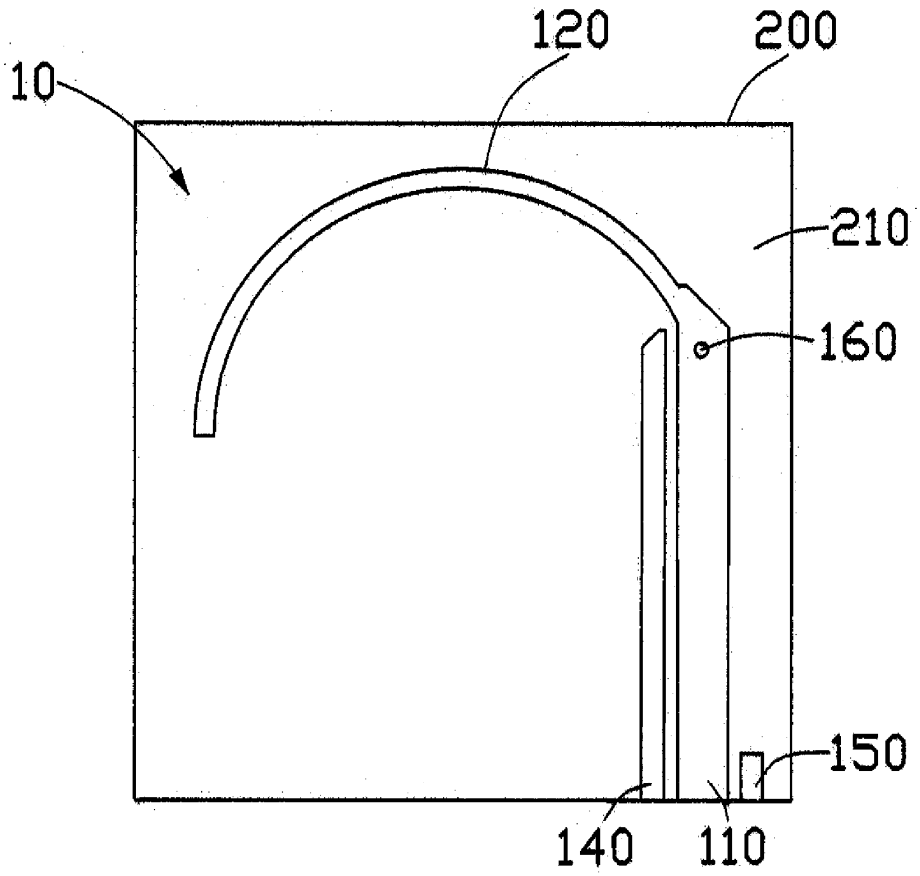
Publication Classification

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

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

(57) **ABSTRACT**

A dual-band antenna (**10**) is disposed on a substrate (**200**). The substrate includes a first surface (**210**) and a second surface (**220**). The dual-band antenna includes a feeding portion (**110**), a first radiation portion (**120**), a second radiation portion (**130**), a first grounded portion (**140**), a second grounded portion (**150**), and a connecting portion (**160**). The feeding portion is disposed on the first surface, for feeding electromagnetic signals. The first radiation portion, disposed on the first surface, is electronically connected to the feeding portion. The second radiation portion, disposed on the second surface, is electronically connected to the feeding portion. The first grounded portion is disposed on one side of the feeding portion. The second grounded portion is disposed on the other side of the feeding portion. The connecting portion is for electronically connecting the first radiation portion, the second radiation portion, and the feeding portion.



US 20080088510A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2008/0088510 A1

Murata et al. (43) Pub. Date: Apr. 17, 2008

(54) MICROSTRIP ANTENNA AND HIGH FREQUENCY SENSOR USING MICROSTRIP ANTENNA

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(21) Appl. No.: **11/664,292**

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

(86) PCT No.: **PCT/JP05/17970**

§ 371(c)(1),
(2), (4) Date: **Mar. 29, 2007**

(30) **Foreign Application Priority Data**

Sep. 30, 2004 (JP) 2004-285767
Dec. 2, 2004 (JP) 2004-349402
Mar. 25, 2005 (JP) 2005-087665
Jun. 21, 2005 (JP) 2005-180355

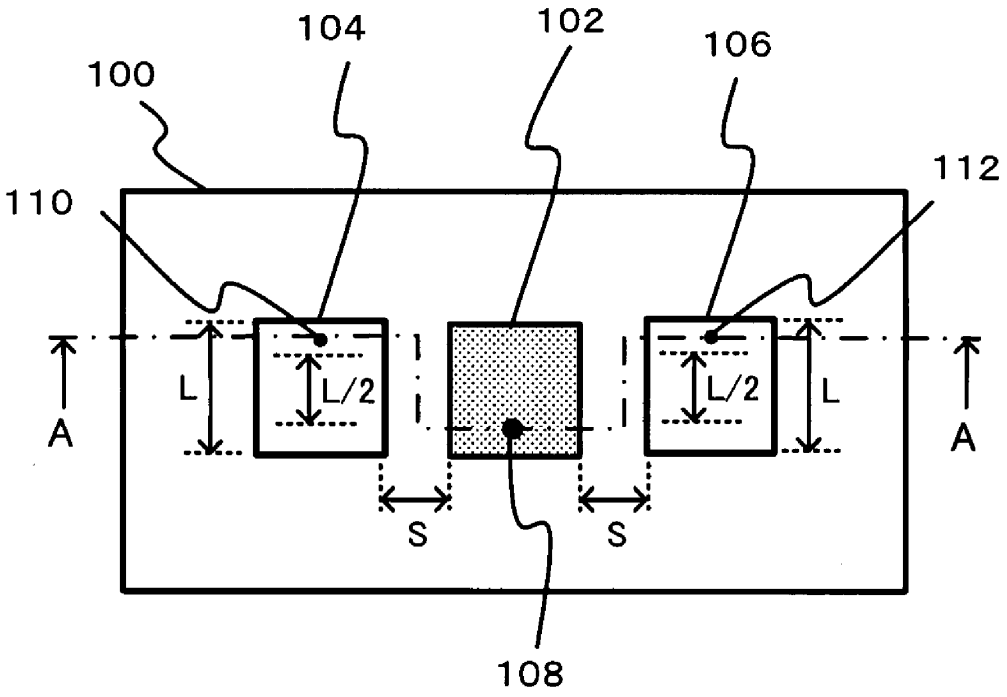
Publication Classification

(51) **Int. Cl.**
H01Q 3/00 (2006.01)
H01Q 9/04 (2006.01)

(52) **U.S. Cl.** ..... **343/700 MS**; 343/876

(57) **ABSTRACT**

A microstrip antenna has feed element **102** and parasitic elements **104, 106** on the front surface of substrate **1**. Microwave electrical power is applied to feed element **102**. Parasitic elements **104, 106** are connected via through hole type leads passing through substrate **1**, to switches upon the rear surface of substrate **1**, respectively. By actuating the switches individually, parasitic elements **104, 106** are individually switched between a grounded state and a float state. The direction of the radio beam emitted from the microstrip antenna is varied by selecting which of parasitic elements **104, 106** is grounded and floated. A microwave signal source connects to feed element **102** via an feed line **108** very much shorter than the wavelength, accordingly the transmission losses being low and the efficiency being excellent.



US 20080088511A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2008/0088511 A1

Sorvala et al. (43) Pub. Date: Apr. 17, 2008

(54) ANTENNA COMPONENT AND METHODS

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(21) Appl. No.: **11/901,611**

(22) Filed: **Sep. 17, 2007**

Related U.S. Application Data

(63) Continuation of application No. PCT/FI2005/050401, filed on Nov. 8, 2005.

(30) **Foreign Application Priority Data**

Jun. 28, 2005 (FI)..... PCT/FI2005/050247
Mar. 16, 2005 (FI)..... PCT/FI2005/050089

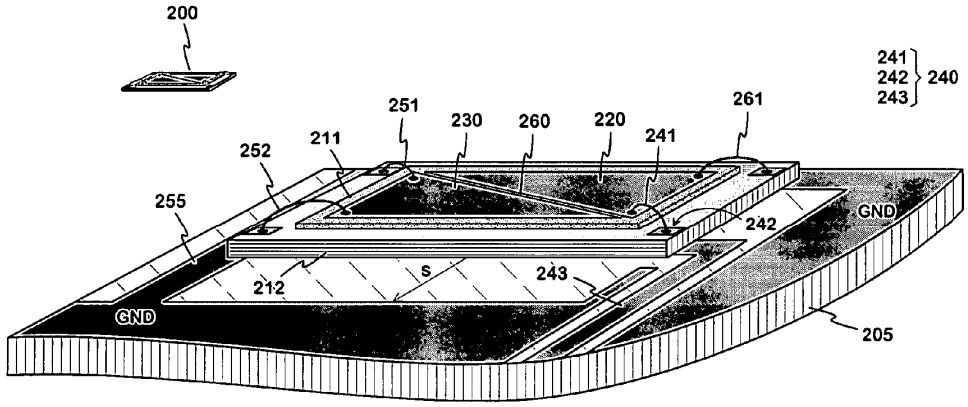
Publication Classification

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

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

(57) **ABSTRACT**

An antenna component (**200**) with a dielectric substrate and two radiating antenna elements. The elements are located on the upper surface of the substrate and there is a narrow slot (**260**) between them. The antenna feed conductor (**241**) is connected to the first antenna element (**220**), which is connected also to the ground by a short-circuit conductor (**261**). The second antenna element (**230**) is parasitic; it is galvanically connected only to the ground. The component is preferably manufactured by a semiconductor technique by growing a metal layer e.g. on a quartz substrate and removing a part of it so that the antenna elements remain. In this case the component further comprises supporting material (**212**) of the substrate chip. The antenna component is very small-sized because of the high dielectricity of the substrate to be used and mostly because the slot between the antenna elements is narrow. The efficiency of an antenna made by the component is high.



US 20080088512A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0088512 A1**

Hsu et al. (43) **Pub. Date: Apr. 17, 2008**

(54) **ANTENNA APPARATUS**

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(21) Appl. No.: **11/580,079**

(22) Filed: **Oct. 13, 2006**

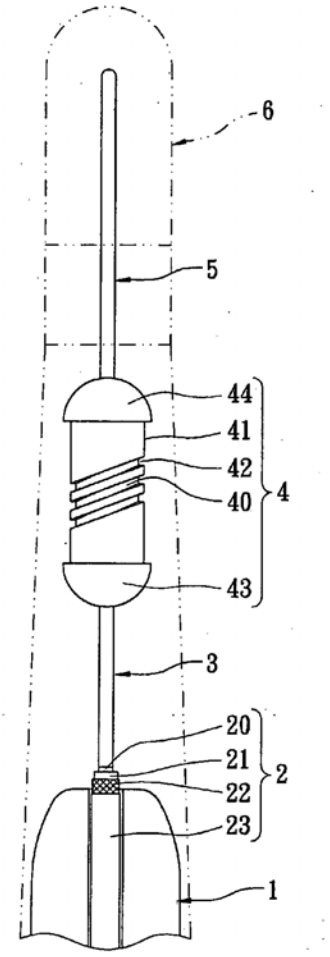
Publication Classification

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

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

(57) **ABSTRACT**

An antenna apparatus includes a hollow column, a conductive cable, a first metal wire, a column structure, and a second metal wire. The conductive cable is received in the hollow column, and the conductive cable electrically contacts the hollow column via a second conductive wire layer thereof. One side of the first metal wire is electrically connected with a first conductive wire layer of the conductive cable. The column structure has a column body, a metal layer formed on the column body, at least one spiral groove formed on the metal layer for exposing a part of the column body, and two conductive covers respectively disposed on two sides of the column body. Moreover, one of the two conductive covers is electrically connected with the other side of the first metal wire. Furthermore, one side of the second metal wire is electrically connected with the other conductive cover.



US 20080088514A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0088514 A1**

Su et al. (43) **Pub. Date: Apr. 17, 2008**

(54) **WIDEBAND OMNIDIRECTIONAL ANTENNA FOR PLUG AND PLAY DEVICE**

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(21) Appl. No.: **11/670,428**

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

(30) **Foreign Application Priority Data**

Oct. 11, 2006 (TW) 095137404

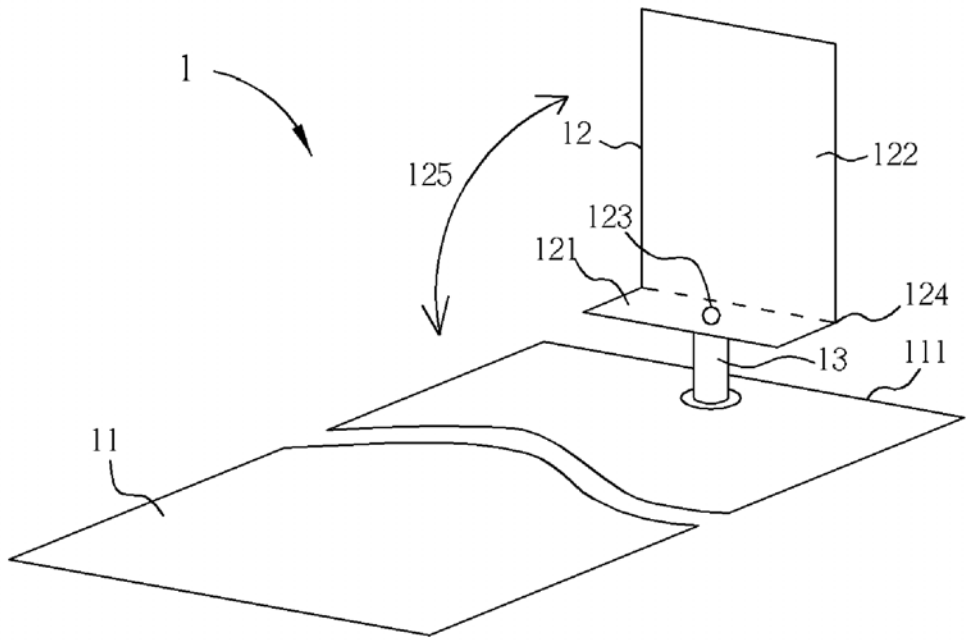
Publication Classification

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

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

(57) **ABSTRACT**

A wideband omnidirectional antenna for a plug and play device includes a system ground plane, a radiating element, a feeding element. The radiating element is installed above an edge of the system ground plane and comprises a first sub-radiating element and a second sub-radiating element. The first sub-radiating element is parallel to the system ground plane. The second sub-radiating element is electronically connected to an edge of the first sub-radiating element in a foldable manner. The second sub-radiating element is approximately perpendicular to the first sub-radiating element and extends in an upright direction above the system ground plane when in use condition, and is approximately parallel to the first sub-radiating element and extends horizontally above the system ground plane when not in use condition. The feeding element is electronically connected to a signal source and is used for transmitting signals outputted from the signal source to the radiating element.



US 20080088515A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0088515 A1**

Kuo (43) **Pub. Date: Apr. 17, 2008**

(54) **ROTATIONAL ANTENNA**

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(21) Appl. No.: **11/769,333**

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

(30) **Foreign Application Priority Data**

Oct. 17, 2006 (TW) 95218342

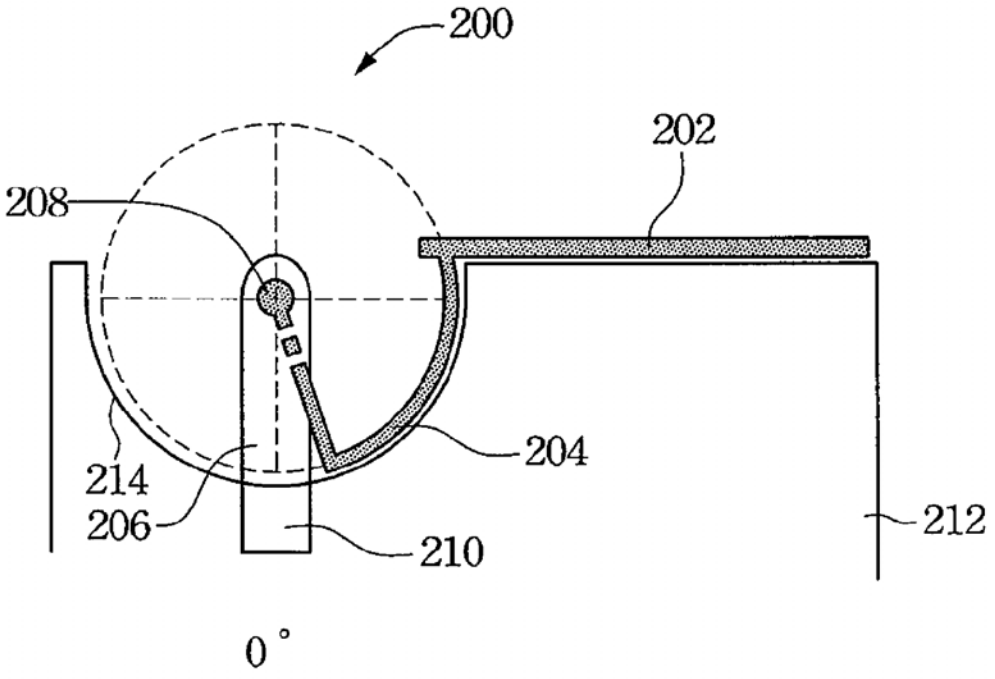
Publication Classification

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

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

(57) **ABSTRACT**

A rotational antenna is disclosed. The rotational antenna includes a radiating member and a pivot. The radiating member preferably comprises a curved portion. The pivot further includes an axle and a body. The axle is coupled to the curved portion, and the body is electrically connected to a wireless communication device. Accordingly, the pivot is disposed within the wireless communication device and hidden inside the wireless communication device. The damage of the pivot can be avoided when moving the wireless communication device.



US 20080088517A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0088517 A1**

Ansari et al. (43) **Pub. Date: Apr. 17, 2008**

(54) **TUNABLE ANTENNA SYSTEM**

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(21) Appl. No.: **11/872,700**

(22) Filed: **Oct. 15, 2007**

Related U.S. Application Data

(60) Provisional application No. 60/852,911, filed on Oct. 17, 2006.

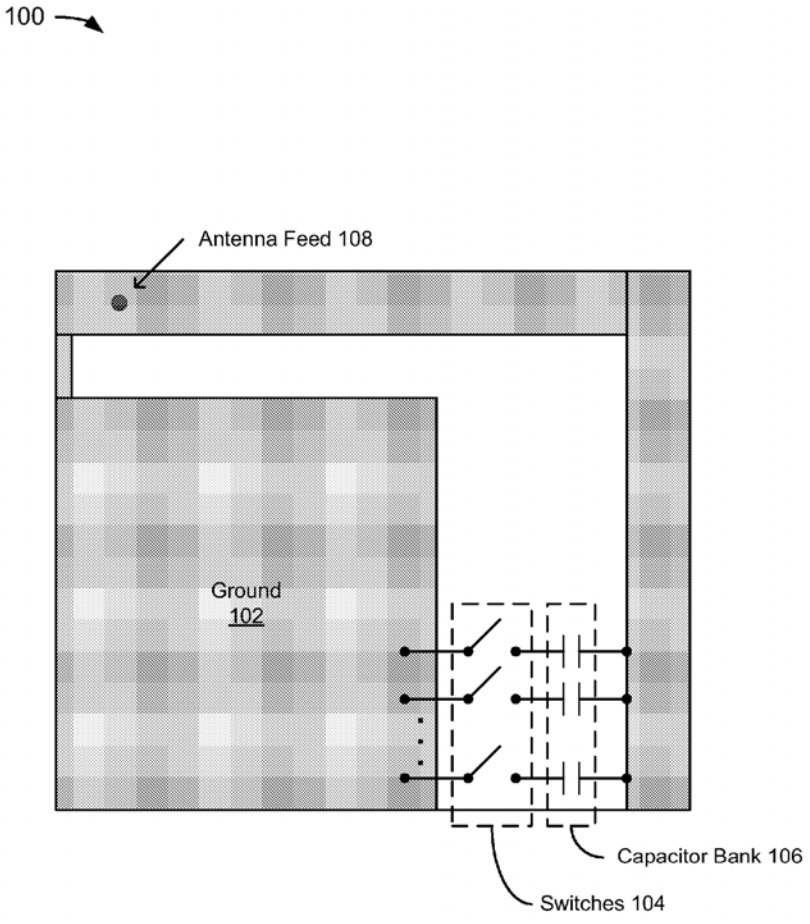
Publication Classification

(51) **Int. Cl.**
H01Q 9/00 (2006.01)
G06F 17/50 (2006.01)

(52) **U.S. Cl.** **343/745**; 716/2

(57) **ABSTRACT**

A technique for tuning an antenna may include one or more of the following: working against a ground plane, utilizing the third dimension by alternating layers on a substrate, integrating an inductive short stub in the substrate to improve port matching, and making a tuning port available for capacitive loading and resonance modification.



US 20080088521A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0088521 A1**

Le et al. (43) **Pub. Date: Apr. 17, 2008**

(54) **DIRECTED DIPOLE ANTENNA HAVING IMPROVED SECTOR POWER RATIO (SPR)**

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(21) Appl. No.: **11/999,679**

(22) Filed: **Dec. 6, 2007**

Related U.S. Application Data

(63) Continuation of application No. 11/104,986, filed on Apr. 13, 2005, and which is a continuation-in-part of application No. 10/737,214, filed on Dec. 16, 2003, now Pat. No. 6,924,776, and which is a continuation-in-part of application No. 10/703,331, filed on Nov. 7, 2003, now Pat. No. 7,283,101.

(60) Provisional application No. 60/577,138, filed on Jun. 4, 2004. Provisional application No. 60/484,688, filed on Jul. 3, 2003. Provisional application No. 60/482,689, filed on Jun. 26, 2003.

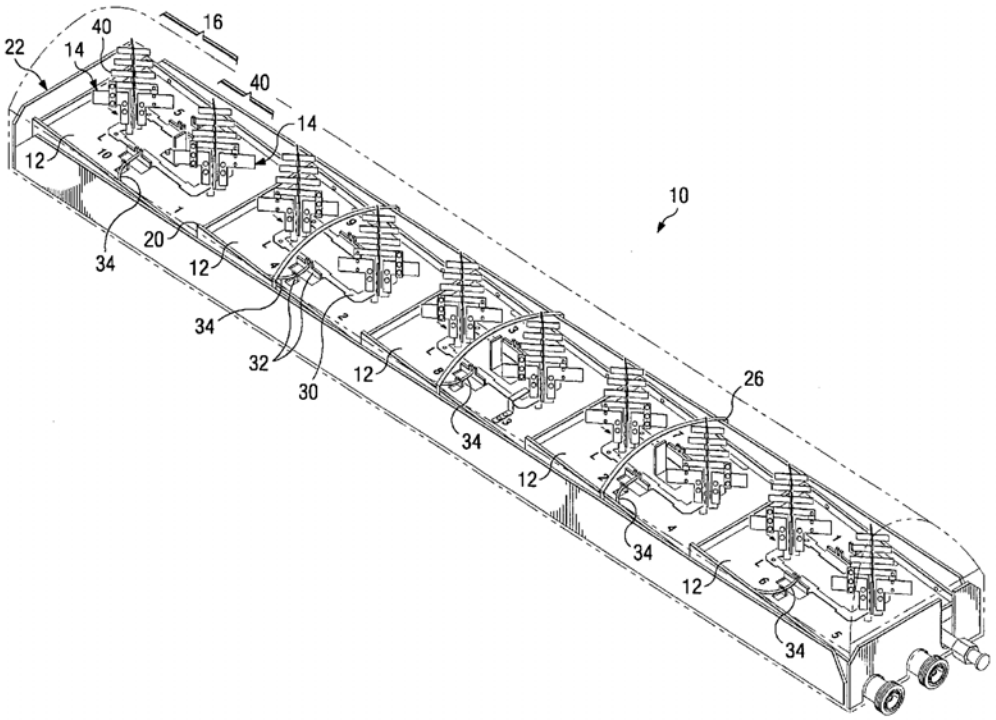
Publication Classification

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

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

(57) **ABSTRACT**

A dual polarized variable beam tilt antenna having a superior Sector Power Ratio (SPR). The antenna may have slant 45 degree dipole radiating elements including directors, and may be disposed on a plurality of tilted element trays to orient an antenna boresight downtilt. The directors may be disposed above or about the respective dipole radiating elements. The antenna has a beam front-to-side ratio exceeding 20 dB, a horizontal beam front-to-back ratio exceeding 40 dB, a high-roll off, and is operable over an expanded frequency range.



US 20080088522A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2008/0088522 A1

Huang et al. (43) Pub. Date: Apr. 17, 2008

(54) **GROUNDED SELF-COMPLEMENTARY ANTENNA FOR ELECTRONIC DEVICE**

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(21) Appl. No.: **11/802,096**

(22) Filed: **May 18, 2007**

(30) **Foreign Application Priority Data**

May 6, 2006 (TW)..... 095119922

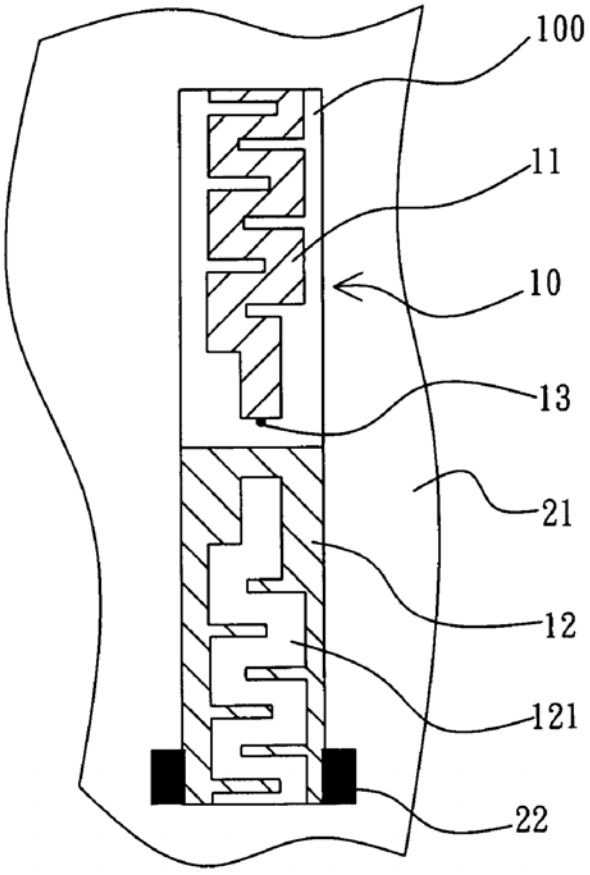
Publication Classification

(51) **Int. Cl.**
H01Q 1/48 (2006.01)
H01Q 9/04 (2006.01)

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

(57) **ABSTRACT**

A metal complementary element of a grounded self-complementary antenna for an electronic device and a metal grounding element of the electronic device contact with each other, are electrically connected to each other or are a same article so as to substantially enlarge an area of a grounding end of the self-complementary antenna to enable the self-complementary antenna to have the good radiation efficiency and the broader bandwidth such that the radio signal transmission effect of the electronic device can be elevated.



US 20080094282A1

(19) **United States**

(12) **Patent Application Publication**

(10) **Pub. No.: US 2008/0094282 A1**

(43) **Pub. Date: Apr. 24, 2008**

QIN

(54) **MULTIPLE INPUT MULTIPLE OUTPUT ANTENNA**

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(21) Appl. No.: **11/615,018**

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

(30) **Foreign Application Priority Data**

Oct. 20, 2006 (TW) 95138886

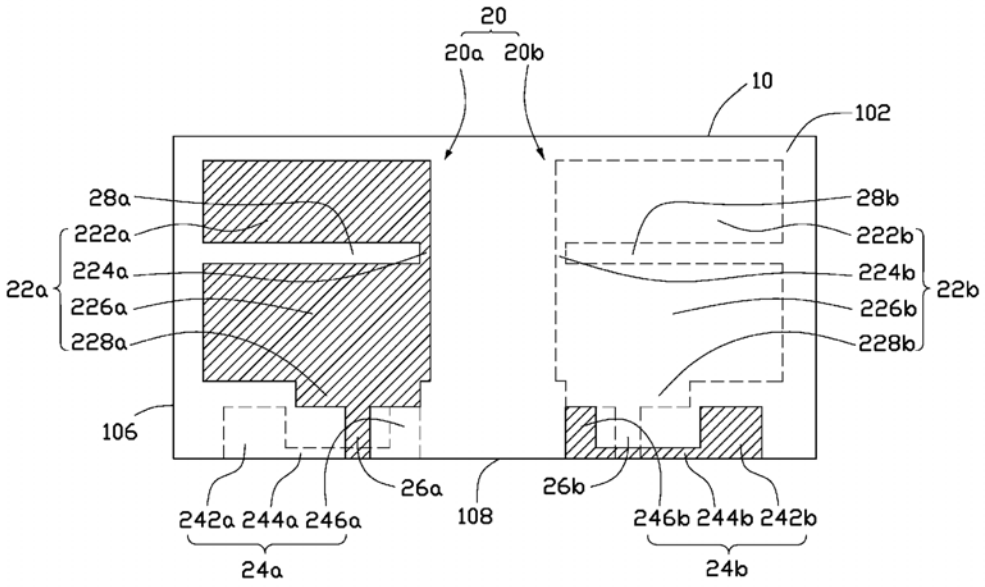
Publication Classification

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

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

(57) **ABSTRACT**

A MIMO antenna (**20**) disposed on a substrate (**10**) including a first surface (**102**) and a second surface (**104**). The MIMO antenna includes a first antenna (**20***a*) and a second antenna (**20***b*) each including a radiating body (**22***a*), a feeding portion (**26***a*) electrically connected to the radiating body, and a metallic ground plane (**24***a*). The radiating body includes a first radiating portion (**222***a*), a second radiating portion (**226***a*), and a gap (**28***a*) formed between the first radiating portion and the second radiating portion. The radiating body and the feeding portion of the first antenna and the ground plane of the second antenna are laid on the first surface of the substrate, and the radiating body and the feeding portion of the second antenna and the ground plane of the first antenna are laid on the second surface of the substrate.



US 20080094283A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0094283 A1**

Mei (43) **Pub. Date: Apr. 24, 2008**

(54) **ANTENNA AND ANTENNA ASSEMBLY THEREOF**

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(21) Appl. No.: **11/616,888**

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

(30) **Foreign Application Priority Data**

Oct. 20, 2006 (CN) 200610063215.3

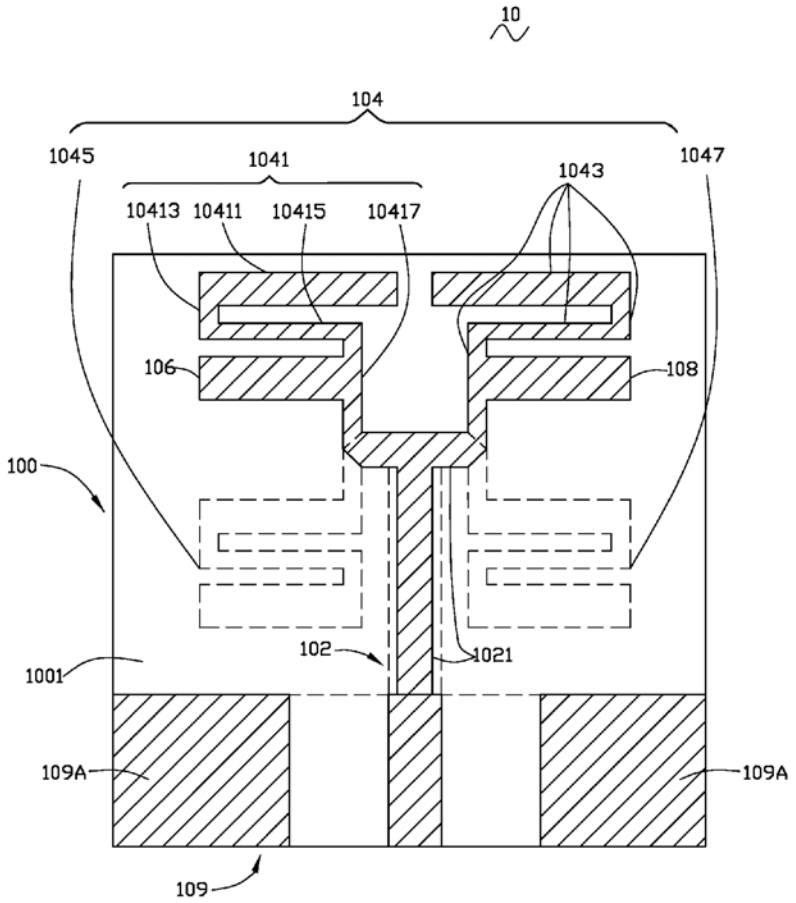
Publication Classification

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

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

(57) **ABSTRACT**

An antenna disposed on a circuit board includes a first surface, a second surface, a feeding part, a body portion, a first accessory portion, a second accessory portion, and a ground plane. The feeding part includes a first feeding segment disposed on the first surface and a second feeding segment disposed on the second surface. The body portion includes a first radiation part, a second radiation part, a third radiation part, and a fourth radiation part. The first accessory portion, the second accessory portion, the first radiation part, and the second radiation part are all disposed on the first surface. The third radiation part and the fourth radiation part are disposed on the second surface. The ground plane includes a pair of first ground parts disposed on the first surface and a second ground part disposed on the second surface.



US 20080094284A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0094284 A1**

MEI (43) **Pub. Date: Apr. 24, 2008**

(54) **ANTENNA WITH COUPLING FEEDING**

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

(21) Appl. No.: **11/617,768**

(22) Filed: **Dec. 29, 2006**

(30) **Foreign Application Priority Data**

Oct. 18, 2006 (CN) 200610063154.0

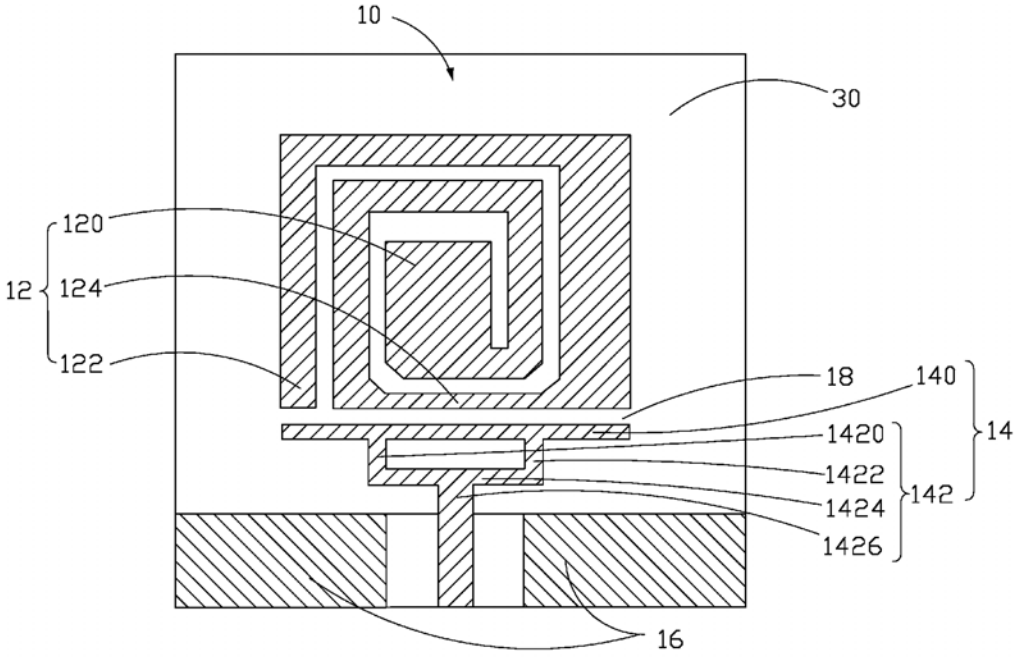
Publication Classification

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

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

(57) **ABSTRACT**

An antenna (**10**) is provided. The antenna (**10**) with coupling feeding, printed on a substrate (**30**) for transceiving electromagnetic signals. The antenna includes a radiator (**12**), a feeding portion (**14**), and a grounded portion (**16**). The radiator is for the transceiving electromagnetic signals. The feeding portion defines a gap with the radiator for coupling feeding the electromagnetic signals to the radiator via the gap. The grounded portion is disposed adjacent to the feeding portion.



US 20080094285A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0094285 A1**

Hansen (43) **Pub. Date: Apr. 24, 2008**

(54) **DISK MONOPOLE ANTENNA STRUCTURE**

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(21) Appl. No.: **11/793,119**

(22) PCT Filed: **Nov. 18, 2005**

(86) PCT No.: **PCT/EP05/56064**

§ 371(c)(1),
(2), (4) Date: **Nov. 6, 2007**

(30) **Foreign Application Priority Data**

Dec. 13, 2004 (DE)..... 10 2004 059 916.5

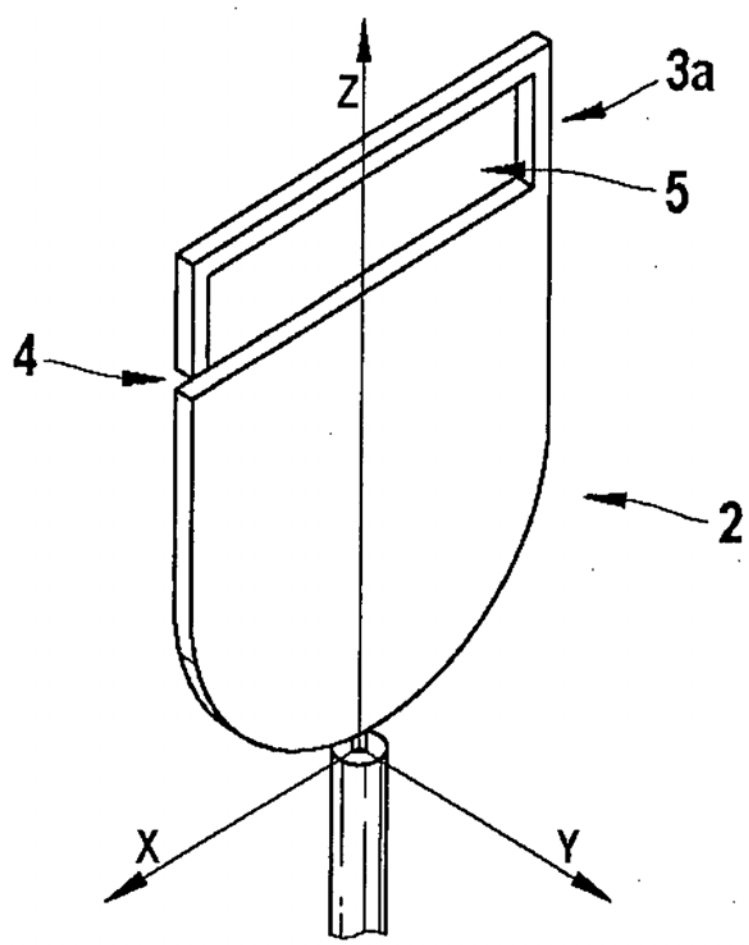
Publication Classification

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

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

(57) **ABSTRACT**

In a disk monopole antenna structure, a semicircular region is provided, as well as an oppositely disposed, second frame-type region, which faces away from the semicircular region and forms a cut-out in the antenna structure.



US 20080094287A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0094287 A1**

Rowell (43) **Pub. Date: Apr. 24, 2008**

(54) **MEANDER FEED STRUCTURE ANTENNA SYSTEMS AND METHODS**

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(73) Assignee: **Hong Kong Applied Science and Technology Research Institute Co., Ltd.**, Sha Tin (HK)

(21) Appl. No.: **11/876,457**

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

Related U.S. Application Data

(63) Continuation of application No. 11/392,234, filed on Mar. 29, 2006, now Pat. No. 7,286,090.

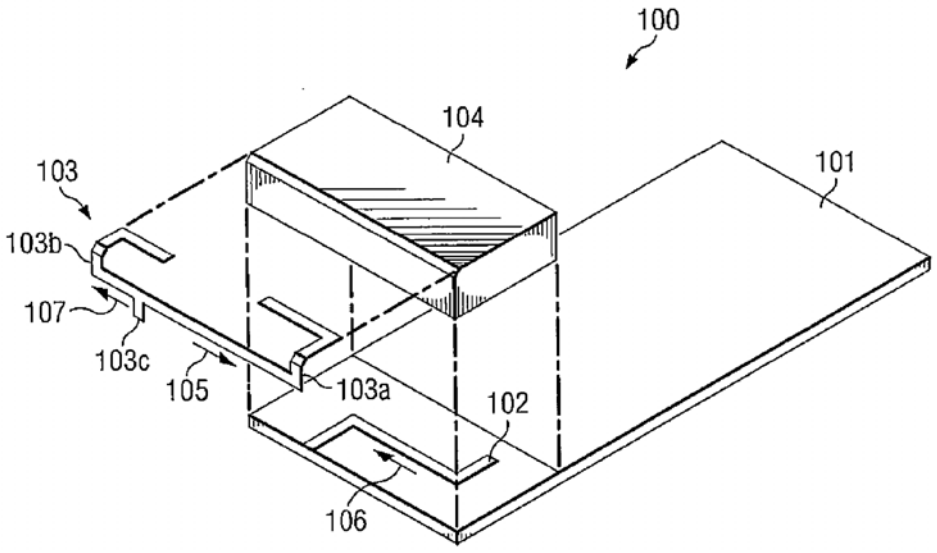
Publication Classification

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

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

(57) **ABSTRACT**

A transmitting and receiving system including an antenna element having first and second current paths, and a meander feed line connected to said first and second current paths, the meander feed line including a radiating portion parallel to the first current path, wherein a current in the radiating portion is in a direction opposite of a current in the first current path, and wherein a current in the second current path is in a direction the same as the current in said radiating portion.



US 20080094288A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0094288 A1**

Chang et al. (43) **Pub. Date: Apr. 24, 2008**

(54) **MULTI-FREQUENCY ANTENNA AND ELECTRONIC DEVICE HAVING THE SAME**

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(21) Appl. No.: **11/896,964**

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

(30) **Foreign Application Priority Data**

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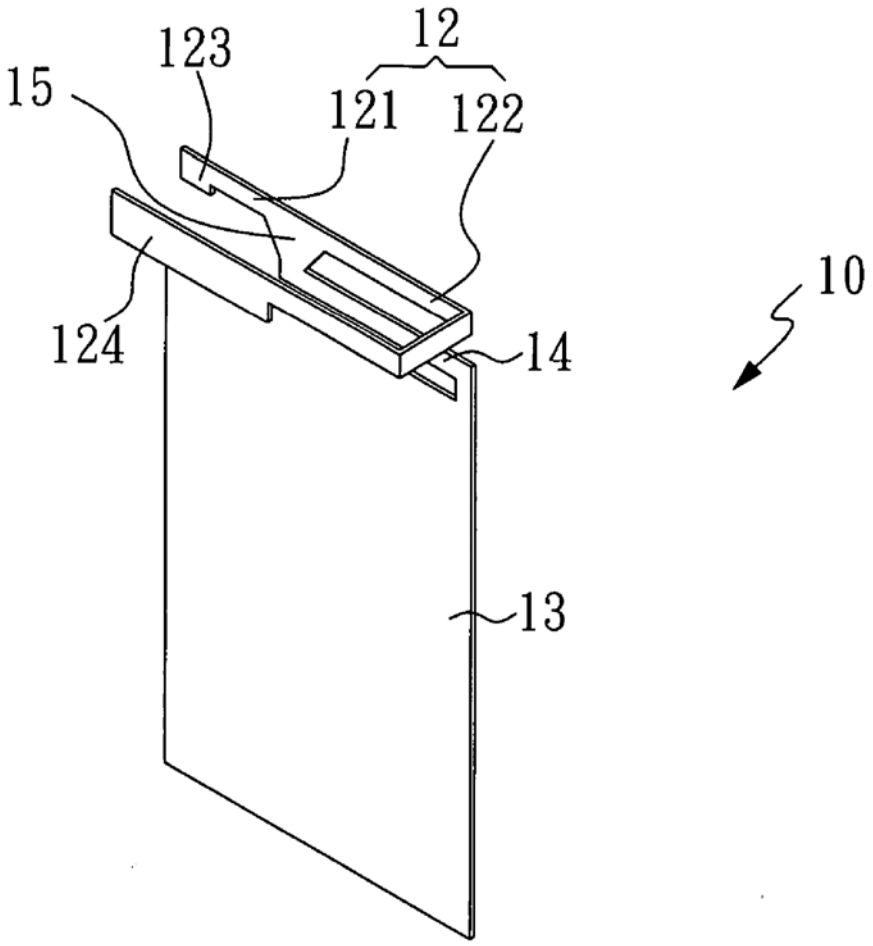
Publication Classification

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

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

(57) **ABSTRACT**

The present invention provides a multi-frequency antenna and an electronic device having the same. The multi-frequency antenna comprises a radiating element, a grounding element and a connecting element. The radiating element comprises a high-frequency radiating unit and a low-frequency radiating unit, wherein the low-frequency radiating unit is constructed by bending a horizontal plane where the high-frequency radiating unit is located in an upward manner by a certain height to form a three-dimensional structure; and the connecting element is used to connect the radiating element and the grounding element.



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(19) **United States**

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Tseng et al. (43) **Pub. Date: Apr. 24, 2008**

(54) **ANTENNA ASSEMBLY WITH IMPROVED RADIATING EFFECT**

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(21) Appl. No.: **11/906,364**

(22) Filed: **Oct. 1, 2007**

(30) **Foreign Application Priority Data**

Sep. 29, 2006 (CN) 200610096228.0

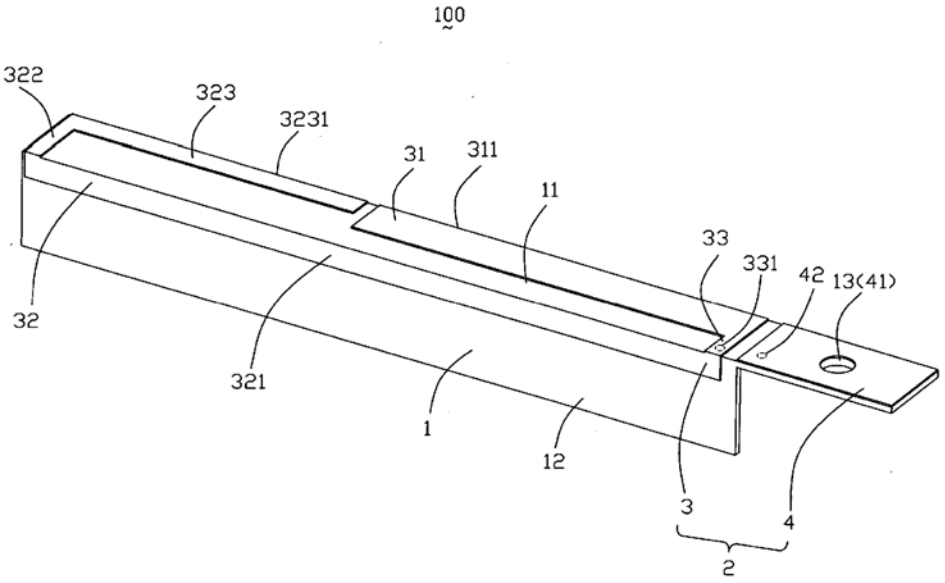
Publication Classification

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

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

(57) **ABSTRACT**

An antenna assembly includes a supporter forming two different continuous first and second surfaces, and a monopole antenna assembled on the supporter and comprising a radiating element comprising a first radiating portion, a second radiating portion respectively worked at different frequency bands, and a grounding element separated from the radiating element; wherein the first radiating portion, the radiating portion and the grounding element connecting together across the first and second surfaces to form a solid antenna.



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(19) **United States**

(12) **Patent Application Publication**

(10) **Pub. No.: US 2008/0094290 A1**

(43) **Pub. Date: Apr. 24, 2008**

Wen et al.

(54) **MOBILE WIRELESS COMMUNICATIONS DEVICE WITH MULTIPLE RF TRANSCEIVERS USING A COMMON ANTENNA AT A SAME TIME AND RELATED METHODS**

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(21) Appl. No.: **11/551,284**

(22) Filed: **Oct. 20, 2006**

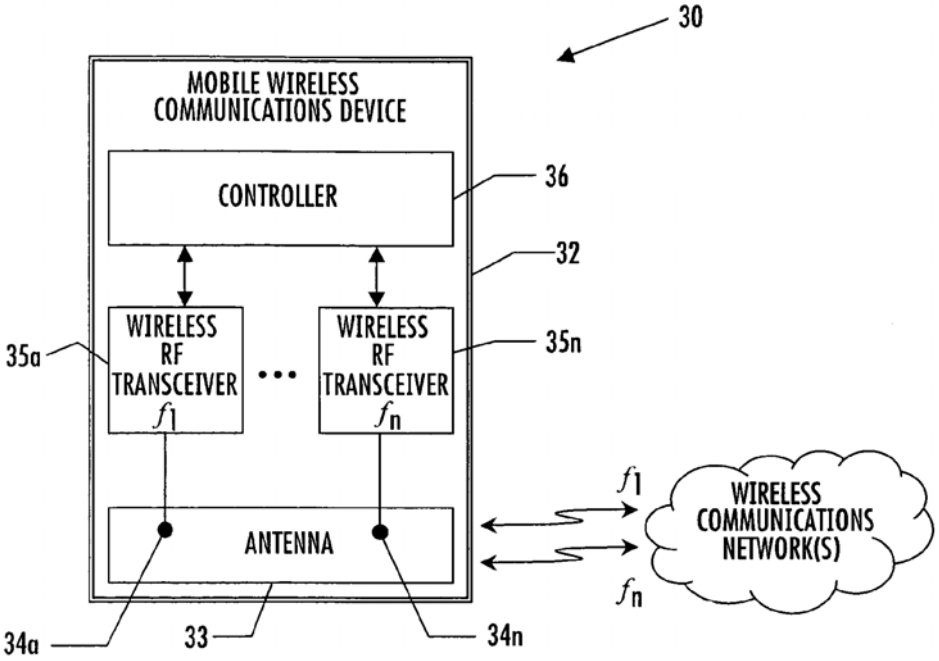
Publication Classification

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

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

(57) **ABSTRACT**

A mobile wireless communications device may include a housing and a common antenna carried by the housing and having a plurality of spaced apart signal feed points thereon. The device may further include a plurality of wireless radio frequency (RF) transceivers carried by the housing and coupled to respective ones of the signal feed points of the common antenna. Each wireless RF transceiver may also have a respective different operating frequency associated therewith. Furthermore, the device may also include a controller selectively operating at least some of the wireless RF transceivers to advantageously use the common antenna at a same time.



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(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0094291 A1**

Bystrom et al. (43) **Pub. Date: Apr. 24, 2008**

(54) **ANTENNA ARRANGEMENT FOR A PORTABLE RADIO COMMUNICATION DEVICE, AND A PORTABLE RADIO COMMUNICATION DEVICE COMPRISING SUCH AND ANTENNA ARRANGEMENT**

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(21) Appl. No.: **11/572,310**

(22) PCT Filed: **Jul. 26, 2005**

(86) PCT No.: **PCT/SE05/01183**

§ 371 (c)(1),
(2), (4) Date: **Apr. 23, 2007**

(30) **Foreign Application Priority Data**

Aug. 9, 2004 (SE) 0401993-1

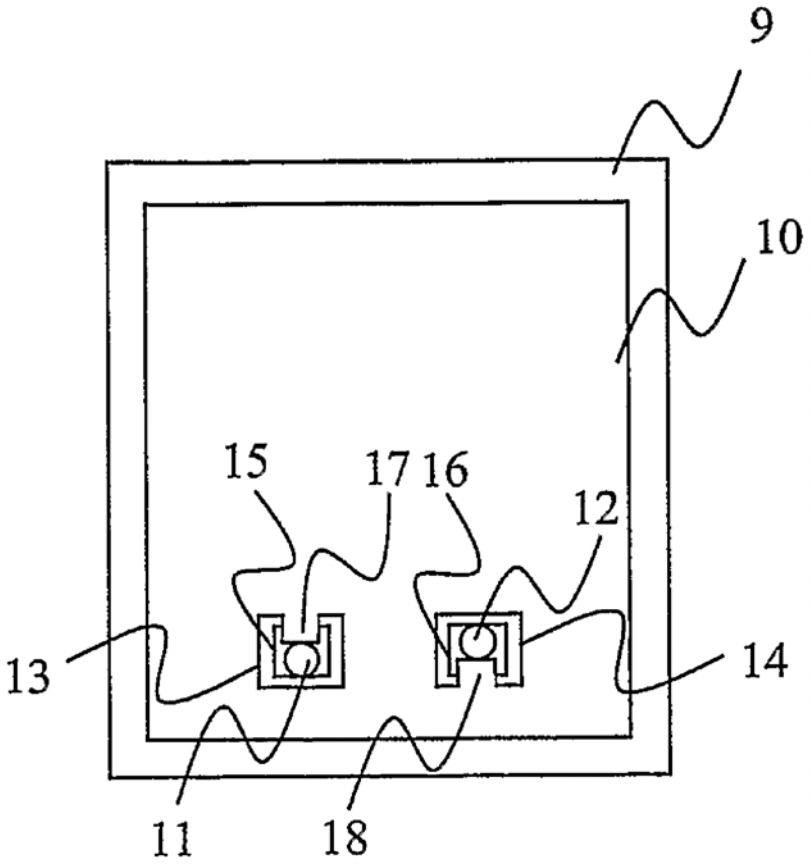
Publication Classification

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

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

(57) **ABSTRACT**

The present invention relates to an antenna arrangement for a portable radio communication device, such as a mobile phone, including RF circuitry and a portable radio communication device comprising such an antenna arrangement. The antenna arrangement is characterized in that a first connection portion (**17**; **25**) of an antenna element (**10**) extends in a first direction in a plane defined by the substantially planar antenna element (**10**) and a second connection portion (**18**; **26**) of the antenna element (**10**) extends in a second direction opposite said first direction, such that the sum of said extensions is constant.



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(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0094293 A1**

Chang et al. (43) **Pub. Date: Apr. 24, 2008**

(54) **BROADBAND ANTENNA**

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(21) Appl. No.: **11/905,009**

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

(30) **Foreign Application Priority Data**

Oct. 20, 2006 (TW) 095218592

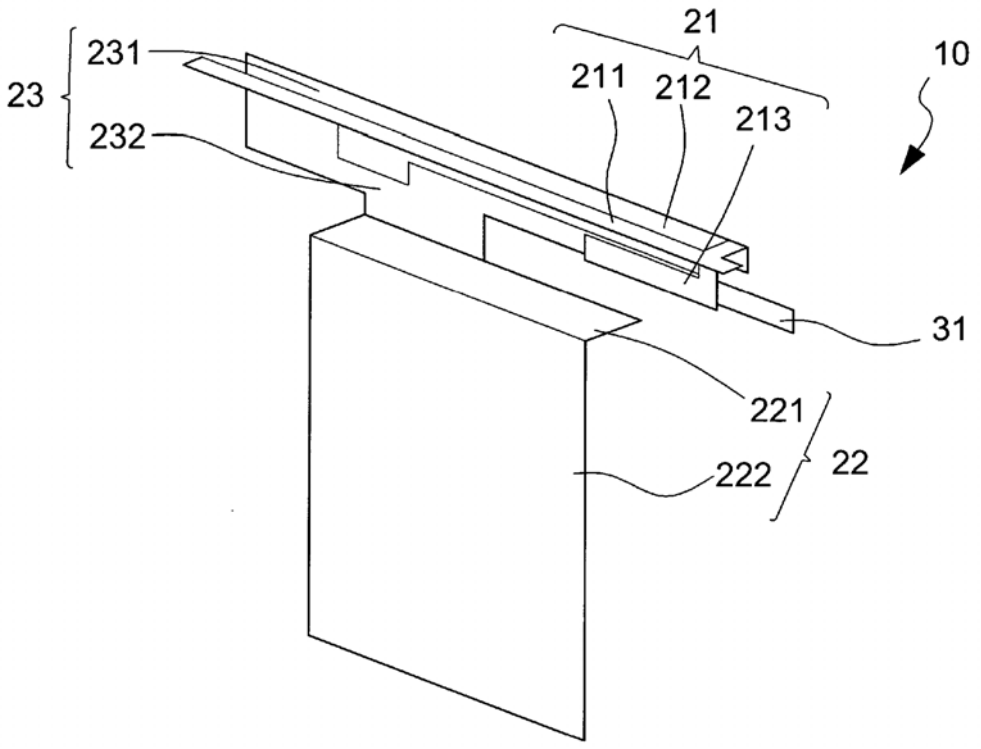
Publication Classification

(51) **Int. Cl.**
H01Q 1/22 (2006.01)

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

(57) **ABSTRACT**

A broadband antenna comprises a radiating element, a grounding element, a connecting element and a parasitic element. The connecting element comprises a first end and a second end. The first end of the connecting element is electrically connected to the radiating element, and the second end is electrically connected to the grounding element. The broadband antenna has a three dimensional structure which can reduce the entire volume. The radiating element extends extra radiation area; therefore, the broadband antenna has larger frequency bandwidth and better radiation characteristic.



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(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0094297 A1**

Petkov et al. (43) **Pub. Date: Apr. 24, 2008**

(54) **WIDEBAND FRACTAL SLOT ANTENNA**

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(21) Appl. No.: **11/552,056**

(22) Filed: **Oct. 23, 2006**

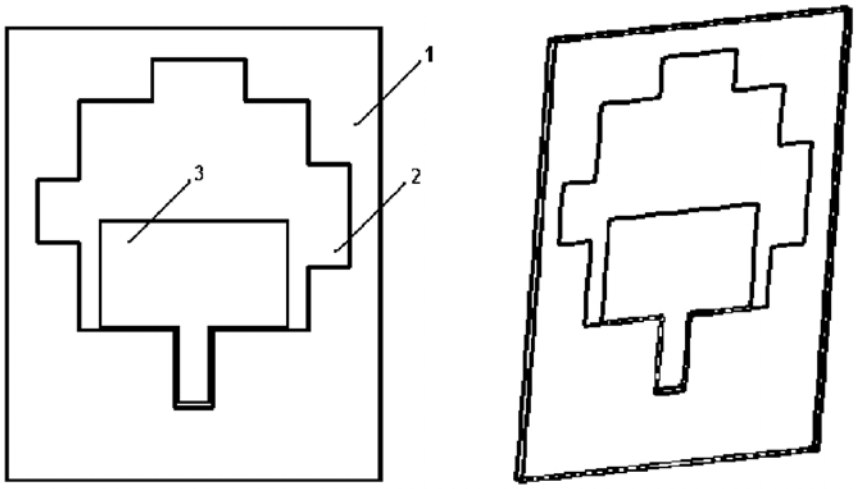
Publication Classification

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

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

(57) **ABSTRACT**

A fractal slot antenna developed for wideband communications with a reflector that increases the gain and preserves the wideband capability of the antenna. This is a typical microstrip slot antenna that is consisted from microstrip feed and radiating slot made in conductive ground. The slot shape is modified in meanings of fractal geometry. The antenna main advantage is the relatively large bandwidth and moderate efficiency. In a typical microstrip antenna the presence of reflector decreases the antenna bandwidth. Authors of this patent has discovered that applying fractalization rules in several orders to the radiating slot of the microstrip slot antennas improves their properties and particularly gain, efficiency and bandwidth in the presence of reflector. This rule will help the creation of so called "ultra wide band" antennas—with operational bandwidth more than 1-10 GHz. This antenna implementation is a recommended for WiMax, WiFi, Ultra Wideband (UWB), cell phone, GPS, DAB and various automotive implementations that need well integrated, wide bandwidth and high gain antennas.



Example of planar antenna topology

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(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0094299 A1**

WILLIAMS (43) **Pub. Date: Apr. 24, 2008**

(54) **ANTENNA ARRANGEMENT**

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(21) Appl. No.: **11/773,190**

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

(30) **Foreign Application Priority Data**

Jul. 7, 2006 (GB) 0613609.7

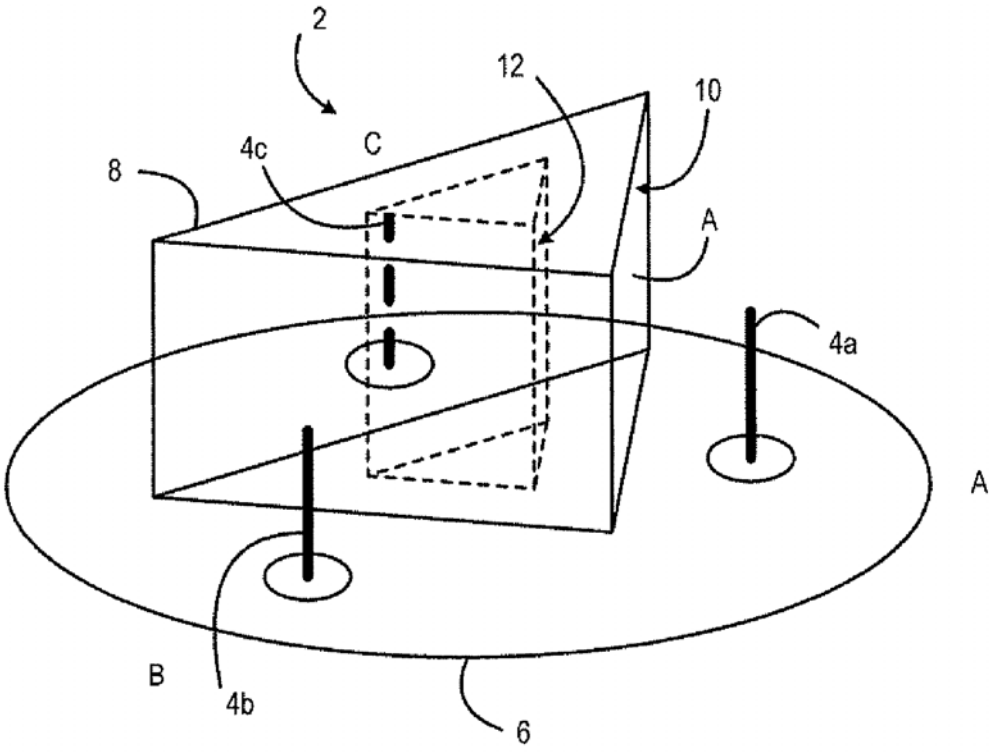
Publication Classification

(51) **Int. Cl.**
H01Q 19/10 (2006.01)
H01Q 21/00 (2006.01)

(52) **U.S. Cl.** **343/836**

(57) **ABSTRACT**

There is provided an antenna arrangement for use in an ultra-wideband network, the antenna arrangement comprising a plurality of active elements for emitting radio signals; and a reflecting structure disposed between at least two of the active elements for reflecting radio signals, the reflecting structure comprising an outer reflecting surface for reflecting radio signals in a first frequency range within a frequency band and an inner reflecting surface for reflecting radio signals having a second frequency range within the frequency band. In an alternative embodiment, the antenna arrangement comprises an active element for emitting radio signals, and a reflecting structure. The reflecting structure comprises a first surface for reflecting radio signals having a first frequency range within a frequency band, the first surface being substantially transparent to radio signals outside the first frequency range, and a second surface for reflecting radio signals passed by the first surface, the second surface reflecting radio signals having a second frequency range within the frequency band.



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(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0094303 A1**

Tseng et al. (43) **Pub. Date: Apr. 24, 2008**

(54) **PLANER INVERTED-F ANTENNA DEVICE**

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(21) Appl. No.: **11/583,123**

(22) Filed: **Oct. 19, 2006**

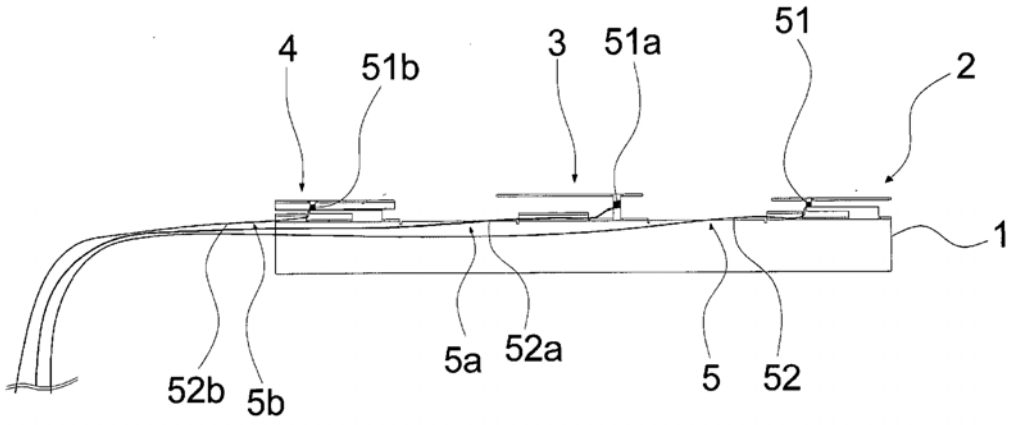
Publication Classification

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

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

(57) **ABSTRACT**

Planer inverted-F antennas are easily assembled into one device without diversity. The device diminishes interferences and polarization of the antenna to obtain high gain.



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(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2008/0094304 A1

Park et al. (43) Pub. Date: Apr. 24, 2008

(54) **ACTIVE ANTENNA CAPABLE OF WIRELESS SIGNAL TRANSMISSION AND RECEPTION AND MOBILE COMMUNICATION TERMINAL HAVING THE SAME**

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(21) Appl. No.: **11/723,098**

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

(30) **Foreign Application Priority Data**

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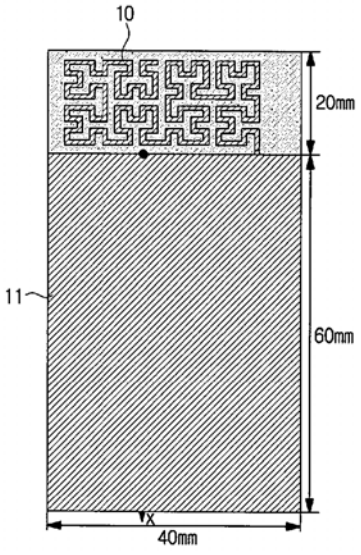
Publication Classification

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

(52) **U.S. Cl.** ..... **343/850**; 343/700 MS

(57) **ABSTRACT**

An active antenna capable of transmitting and receiving a wireless signal of a low frequency band and a mobile communication terminal having the active antenna, are provided. The active antenna includes an antenna element which transmits and receives a wireless signal, a filter which filters the wireless signal being received at the antenna element such that a wireless signal belonging to a frequency band lower than the operating frequency of the antenna element is passed, and an amplifier which amplifies the wireless signal being passed through the filter. As a result, the size of the antenna can be greatly reduced, by the use of an active antenna which receives wireless signals of low frequency bands. Additionally, a more compact mobile communication terminal can be provided, because wireless signal of both high frequency bands and low frequency bands can be transmitted and received at one antenna.



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(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0094307 A1**

Cowles (43) **Pub. Date: Apr. 24, 2008**

(54) **DUAL POLARIZED MULTIFILAR ANTENNA**

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(21) Appl. No.: **11/585,147**

(22) Filed: **Oct. 24, 2006**

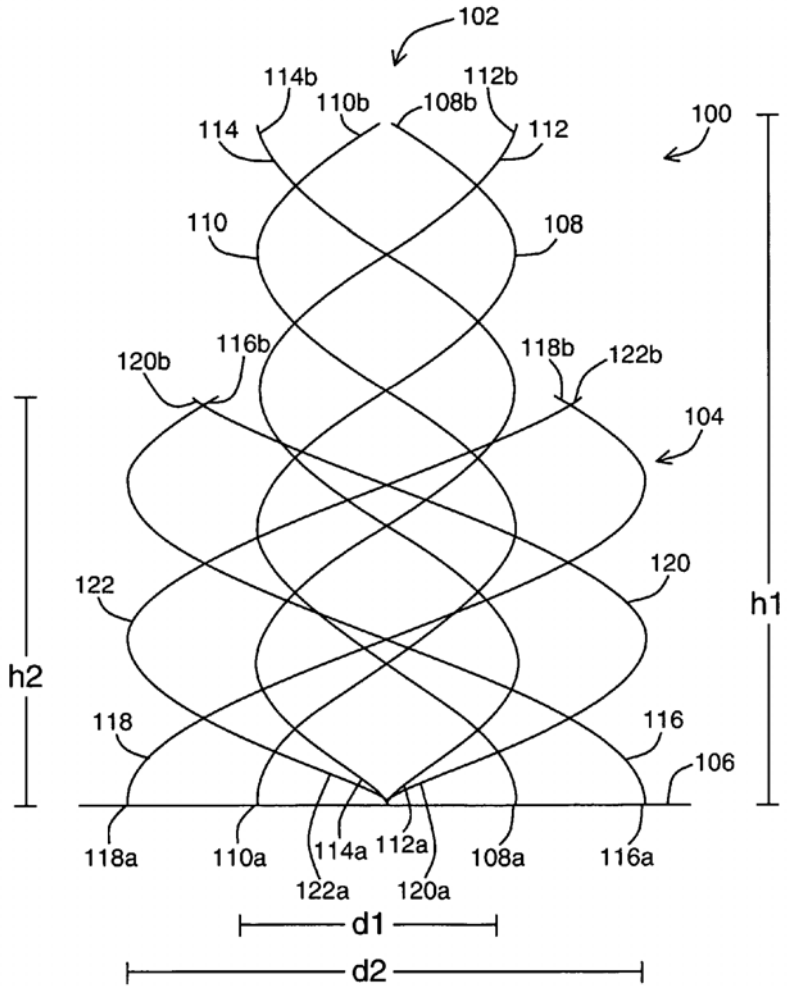
Publication Classification

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

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

(57) **ABSTRACT**

An antenna including a common ground plane, a first set of n approximately resonant elements with a length l**2** and a second set of n approximately resonant elements with a length l**1**. The first set of n approximately resonant elements are wound to form a first helix with an initial diameter d**2** and a height h**2**. The second set of n approximately resonant elements are wound in the opposite direction to the first set of n approximately resonant elements to form a second helix. The second helix is centrally disposed within the first helix, and has an initial diameter d**1** and a height h**1** where d**1** is less than d**2** and h**1** is greater than h**2**.



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(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2008/0094308 A1**

Cowles (43) **Pub. Date: Apr. 24, 2008**

(54) **DUAL POLARIZED MULTIFILAR ANTENNA**

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(21) Appl. No.: **11/875,547**

(22) Filed: **Oct. 19, 2007**

Related U.S. Application Data

(63) Continuation-in-part of application No. 11/585,147, filed on Oct. 24, 2006.

Publication Classification

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

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

(57) **ABSTRACT**

Various embodiments are described of an antenna including a common ground plane, a first set of N approximately resonant elements with a length l**2** and a second set of M approximately resonant elements with a length l**1**. The first set of N approximately resonant elements are wound to form a first helix with an initial diameter d**2** and a height h**2**. The second set of M approximately resonant elements are wound in the opposite direction to the first set of N approximately resonant elements to form a second helix. The second helix is centrally disposed within the first helix, and d**1** is less than d**2** and h**1** is greater than h**2**.