



US 20070030197A1

(19) **United States**

(12) **Patent Application Publication**  
**Tsai et al.**

(10) **Pub. No.: US 2007/0030197 A1**

(43) **Pub. Date: Feb. 8, 2007**

(54) **ANTENNA STRUCTURE**

**Publication Classification**

(76) Inventors: **Feng-Chi Eddie Tsai**, Taipei Hsien (TW); **Chia-Tien Li**, Taipei Hsien (TW)

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

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

Correspondence Address:  
**NORTH AMERICA INTELLECTUAL  
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MERRIFIELD, VA 22116 (US)**

(57) **ABSTRACT**

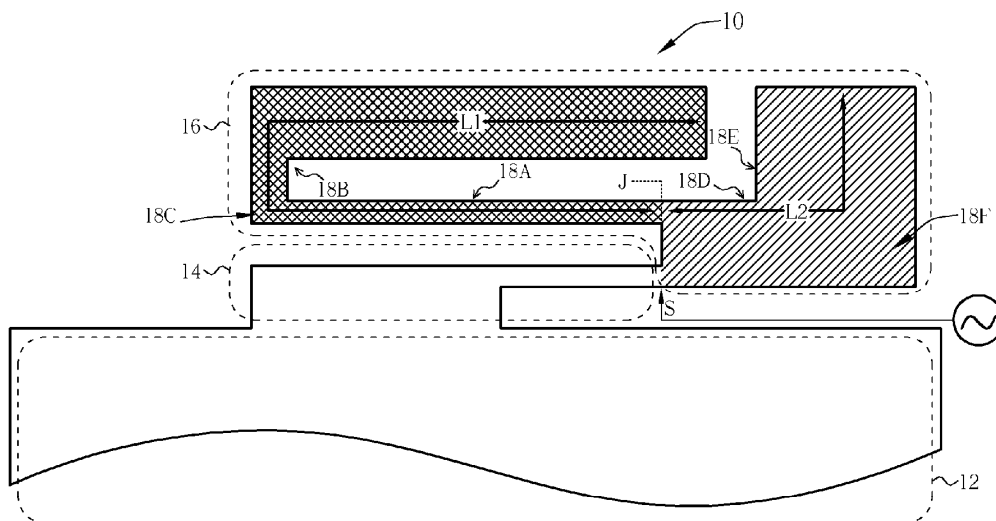
(21) Appl. No.: **11/164,364**

(22) Filed: **Nov. 21, 2005**

(30) **Foreign Application Priority Data**

Aug. 8, 2005 (TW)..... 094126825

An antenna includes a ground portion, a radiating element, and an interconnecting element connected to the ground portion and the radiating element. The radiating element includes a first radiating trace including a turning point connected to a first segment and a second segment of the first radiating trace, and a second radiating trace connected to the second segment of the first radiating trace.





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(19) **United States**

(12) **Patent Application Publication**  
**Wei**

(10) **Pub. No.: US 2007/0030198 A1**

(43) **Pub. Date: Feb. 8, 2007**

(54) **MULTIFREQUENCY H-SHAPED ANTENNA**

**Publication Classification**

(75) Inventor: **Shen-Pin Wei, Hsichih (TW)**

(51) **Int. Cl.**

**H01Q 1/38** (2006.01)

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

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(57)

**ABSTRACT**

(73) Assignee: **WISTRON NEWEB CORP., Hsichih (TW)**

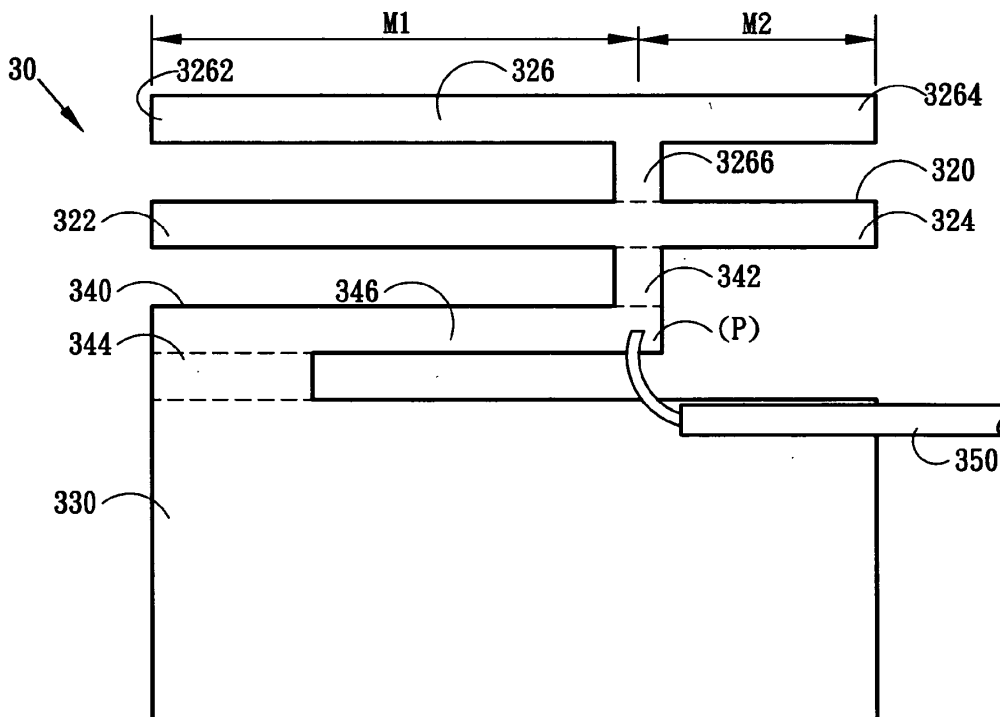
A multifrequency H-shape antenna is disclosed herein. The multifrequency H-shape antenna includes a conductive radiating element, a conductive grounding element, a conductive interconnecting element, and a coaxial cable. The conductive radiating element includes a left end, a right end, and a T construction. The conductive interconnecting element includes a first part, a second part, and a third part. The conductive interconnecting element is connected between the conductive radiating element and the conductive grounding element. The coaxial cable is electrically connected to the feeding point of the conductive interconnecting element. By using the improved construction described above, the wireless bandwidth can be increased.

(21) Appl. No.: **11/281,404**

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

(30) **Foreign Application Priority Data**

Aug. 8, 2005 (TW)..... 94213473





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(19) **United States**

(12) **Patent Application Publication**  
**Chen**

(10) **Pub. No.: US 2007/0030199 A1**

(43) **Pub. Date: Feb. 8, 2007**

(54) **MONOPOLE ANTENNAS**

**Publication Classification**

(75) Inventor: **Chih Lung Chen**, Taipei (TW)

(51) **Int. Cl.**

**H01Q 1/38** (2006.01)

**H01Q 1/10** (2006.01)

(52) **U.S. Cl.** ..... **343/700 MS; 343/901**

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**1617 BROADWAY, 3RD FLOOR**  
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(57)

**ABSTRACT**

Monopole antennas are provided. A monopole antenna transmitting radio signals within a specific frequency range includes a substrate, a ground, a first sleeve portion, a second sleeve portion, a first conductive element, a second conductive element and a cable. The first conductive element and the ground are formed on the substrate. The first and second sleeves electrically connect the ground and project from a side of the ground in a first direction. The first conductive element comprises a feed end and a connection portion adjacent to an edge of the substrate. The second conductive element connects the connection portion and projects from the edge of the substrate substantially in the first direction. The cable connects the ground and the feed end to transmit the radio signal.

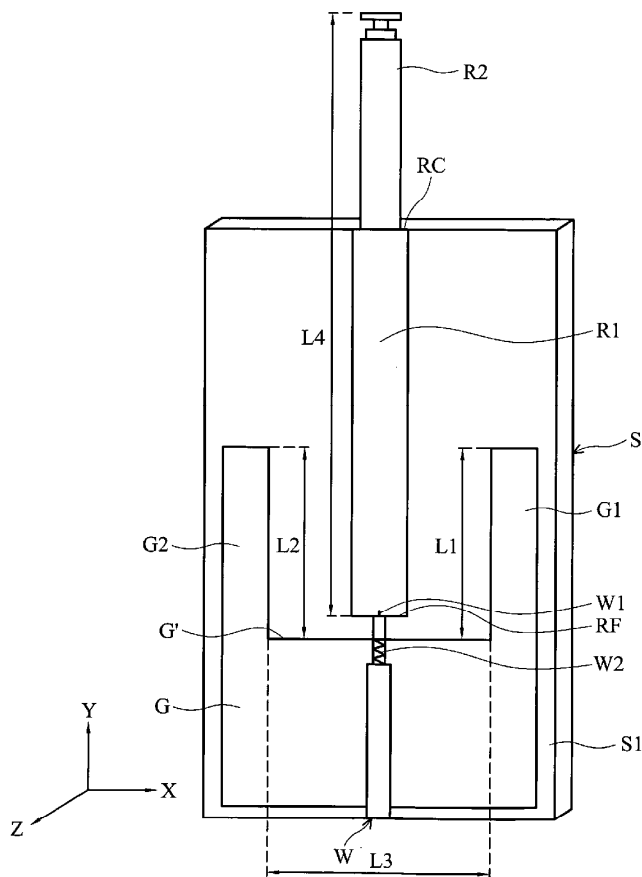
(73) Assignee: **WISTRON NEWEB CORP., TAIPEI HSIEN** (TW)

(21) Appl. No.: **11/313,867**

(22) Filed: **Dec. 20, 2005**

(30) **Foreign Application Priority Data**

Aug. 3, 2005 (TW)..... TW94126332





US 20070030200A1

(19) **United States**

(12) **Patent Application Publication**  
**Heng et al.**

(10) **Pub. No.: US 2007/0030200 A1**

(43) **Pub. Date: Feb. 8, 2007**

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

**Publication Classification**

(76) Inventors: **Chew Chwee Heng**, Singapore (SG);  
**Yung Chang Wei**, Sijihih City (TW)

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

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

Correspondence Address:

**BLANK ROME LLP**  
**600 NEW HAMPSHIRE AVENUE, N.W.**  
**WASHINGTON, DC 20037 (US)**

(57) **ABSTRACT**

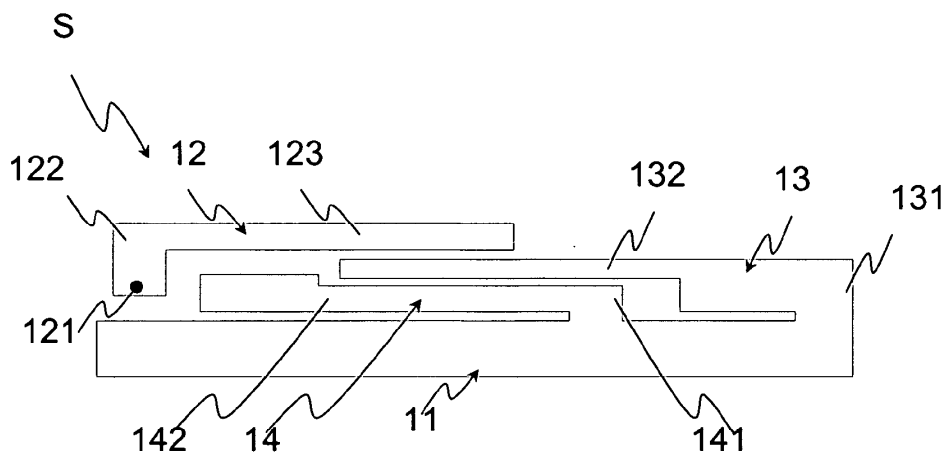
A multi-band antenna structure includes a ground plane, a first radiation metal arm, a first shorted parasitic arm and a second shorted parasitic arm. The first radiation metal arm is connected to a main transmitting antenna and has a first feed point for connecting a first feed line. The first shorted parasitic arm extends to the outside from the ground plane. The first shorted parasitic arm is between the first radiation metal arm and the ground plane for resonantly coupling the first radiation metal arm at a first band. The second shorted parasitic arm also extends to the outside from the ground plane. The second shorted parasitic arm is between the first radiation metal arm and the first shorted parasitic arm for resonantly coupling the first radiation metal arm at a second band.

(21) Appl. No.: **11/497,240**

(22) Filed: **Aug. 2, 2006**

**Related U.S. Application Data**

(60) Provisional application No. 60/705,178, filed on Aug. 4, 2005.





US 20070030201A1

(19) **United States**

(12) **Patent Application Publication**  
**Tung**

(10) **Pub. No.: US 2007/0030201 A1**

(43) **Pub. Date: Feb. 8, 2007**

(54) **ANTENNA DEVICE**

(52) **U.S. Cl.** ..... 343/702; 343/895

(75) Inventor: **Hao-Chun Tung**, Chinmen Hsien (TW)

(57) **ABSTRACT**

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**LADAS & PARRY**  
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NEW YORK, NY 10023 (US)

An antenna device is for a mobile unit to transmit/receive signals, and the mobile unit comprises a printed circuit board which is mounted with a signal processing circuit for processing the signals, the antenna device comprises an antenna body, a metal feeding line, and a ground metal layer. The antenna body is mounted on one side of the mobile unit for transmitting/receiving signals. The metal feeding line made on the upper surface of the printed circuit board, one end of the metal feeding line is connected to the antenna body and the other end of the metal feeding line is in connection with the signal processing circuit from the center part of an edge of the printed circuit board. The ground metal layer is formed on the lower surface of the printed circuit board. When the mobile unit is in transmission, as a result of the metal feeding line is fed from the center part of the edge of the printed circuit board to the signal processing circuit that the well-spread currents are generated upon the surface of the ground metal layer and the antenna device has omnidirectional antenna radiation pattern.

(73) Assignee: **BENQ CORPORATION**

(21) Appl. No.: **11/126,599**

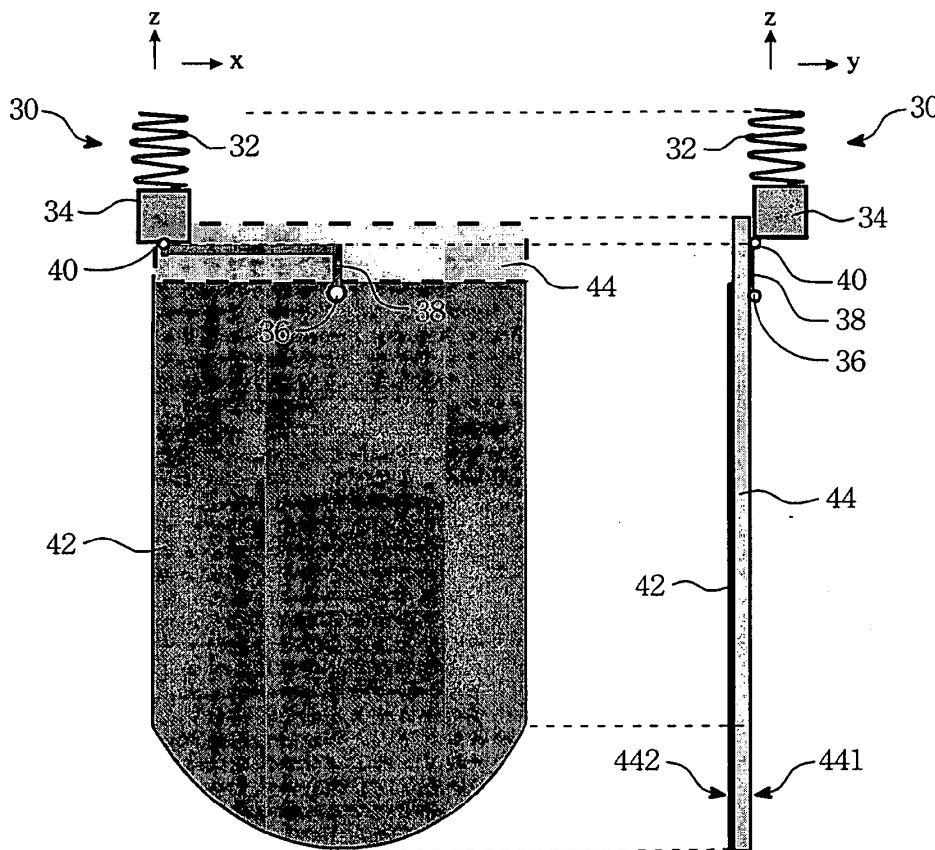
(22) Filed: **May 11, 2005**

(30) **Foreign Application Priority Data**

May 11, 2004 (TW)..... 93113144

**Publication Classification**

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





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(19) **United States**

(12) **Patent Application Publication**

Lee et al.

(10) **Pub. No.: US 2007/0030202 A1**

(43) **Pub. Date: Feb. 8, 2007**

(54) **ANTENNA APPARATUS FOR PORTABLE TERMINAL**

**Publication Classification**

(75) Inventors: **Jae-Ho Lee**, Gumi-si (KR);  
**Yeong-Moo Ryu**, Gumi-si (KR);  
**Hark-Sang Kim**, Buk-gu (KR); **Ji-Hwa Kim**, Chilgok-gun (KR)

(51) **Int. Cl.**  
**H01Q 1/24** (2006.01)  
(52) **U.S. Cl.** ..... **343/702; 343/700 MS; 343/895**

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**1300 19TH STREET, N.W.**  
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**WASHINGTON,, DC 20036 (US)**

(57) **ABSTRACT**

Provided is an antenna apparatus for a portable terminal including a first antenna pattern, and a second antenna pattern formed to correspond to the first antenna pattern, so that the second antenna provides a capacitive coupling along with the first pattern, thereby configuring a divergent type antenna with the second antenna pattern. The antenna apparatus configured in this manner comprises a pair of meander line antennas, whereby the antenna apparatus can efficiently suppress the generation of noise while being easily housed within the terminal. Furthermore, the antenna apparatus has an advantage of easily enhancing a specific absorption ratio (SAR) induced in a human body, which is an important factor for defining the function and quality of an antenna apparatus.

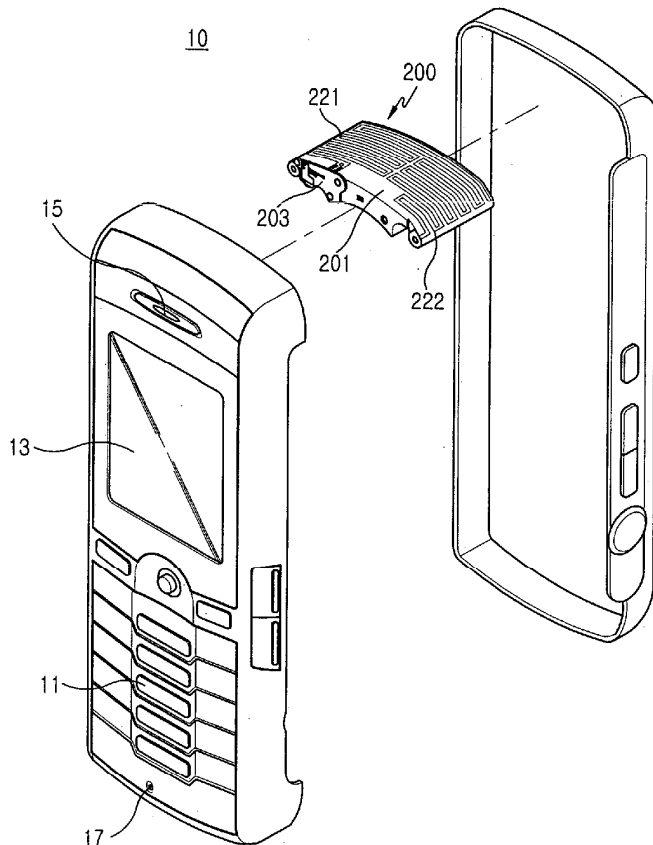
(73) Assignee: **Samsung Electronics Co., Ltd.**

(21) Appl. No.: **11/342,628**

(22) Filed: **Jan. 31, 2006**

(30) **Foreign Application Priority Data**

Aug. 4, 2005 (KR) ..... 2005-71312





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(19) **United States**  
 (12) **Patent Application Publication** (10) **Pub. No.: US 2007/0030203 A1**  
**Tsai et al.** (43) **Pub. Date: Feb. 8, 2007**

(54) **ANTENNA STRUCTURE**

**Publication Classification**

(76) Inventors: **Feng-Chi Eddie Tsai**, Taipei Hsien (TW); **Chia-Tien Li**, Taipei Hsien (TW)

(51) **Int. Cl.**  
**H01Q 1/24** (2006.01)  
 (52) **U.S. Cl.** ..... **343/702; 343/700 MS**

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(57) **ABSTRACT**

An antenna includes a substrate, a ground element, a radiating element and a feed element. The ground element is disposed on the substrate and has an opening. The radiating element is disposed on the substrate and electrically connects to the ground element. The radiating element comprises a first radiating trace and a second radiating trace. The first radiating trace includes a first segment, a second segment, and a first bended portion connected the first segment and the second segment. The second radiating trace connects to the second segment of the first radiating trace. The feed element is disposed on the substrate and electrically connects to the radiating element. The feed element and the radiating element are at the same surface of the substrate, and a part of the feed element extends and enters the opening.

(21) Appl. No.: **11/457,461**

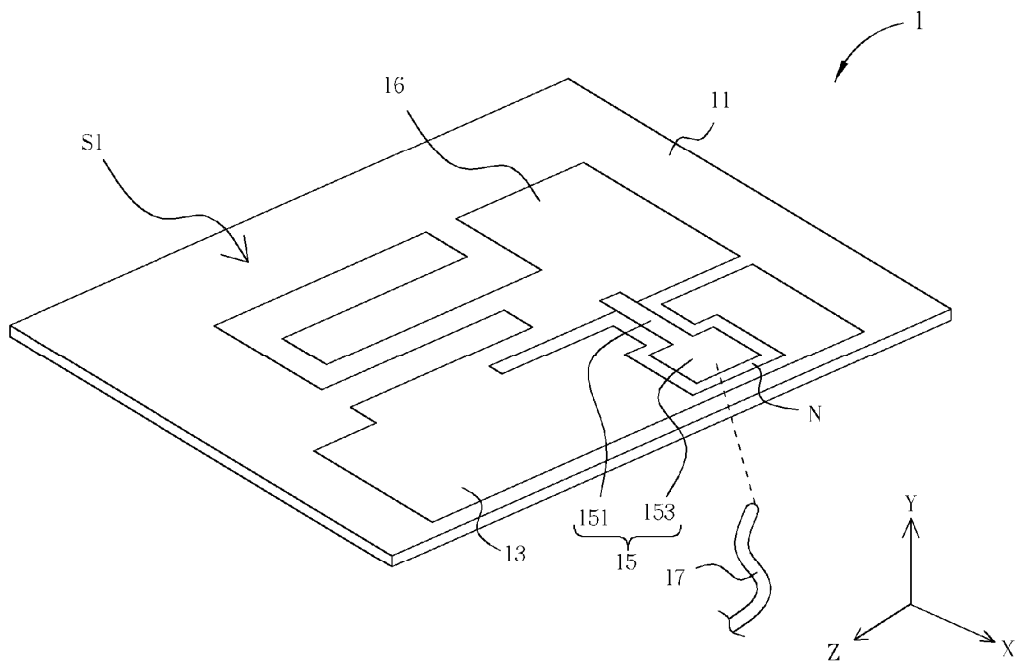
(22) Filed: **Jul. 14, 2006**

**Related U.S. Application Data**

(63) Continuation-in-part of application No. 11/164,364, filed on Nov. 21, 2005.

(30) **Foreign Application Priority Data**

Aug. 8, 2005 (TW)..... 094126825





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(19) **United States**

(12) **Patent Application Publication**  
**Heng et al.**

(10) **Pub. No.: US 2007/0030204 A1**

(43) **Pub. Date: Feb. 8, 2007**

(54) **ANTENNA GROUND STRUCTURE**

**Publication Classification**

(76) Inventors: **Chew Chwee Heng**, Singapore (SG);  
**Yung Chang Wei**, Sijihih City (TW)

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

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

Correspondence Address:  
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(57) **ABSTRACT**

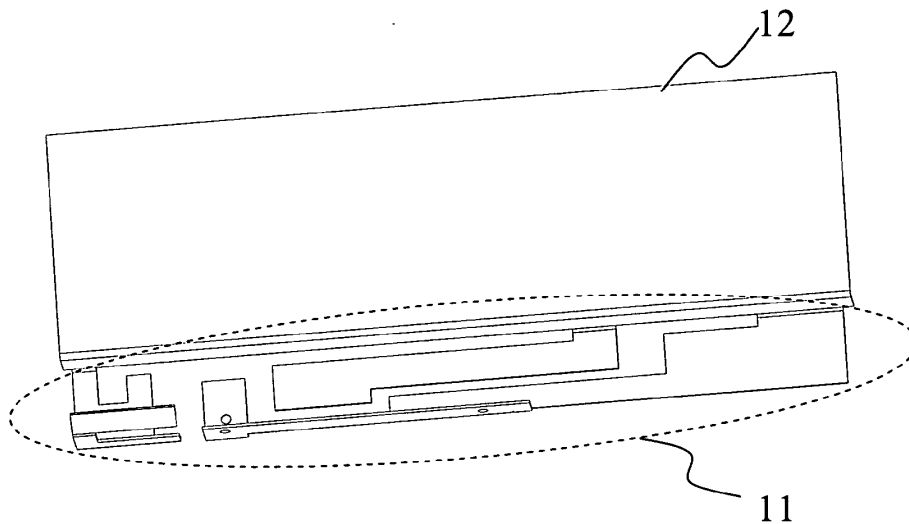
(21) Appl. No.: **11/497,239**

(22) Filed: **Aug. 2, 2006**

**Related U.S. Application Data**

(60) Provisional application No. 60/705,177, filed on Aug. 4, 2005.

An antenna ground structure, for use in an electronic apparatus includes an antenna main body and electrically conductive plastic material connecting the antenna main body is a metal frame of the electronic apparatus to provide an electrical connection between the antenna main body and the metal frame. Better electrical characteristics can be provided to the antenna main body through the antenna ground structure. The manufacturing process is further improved.







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(19) **United States**

(12) **Patent Application Publication**  
**Pan et al.**

(10) **Pub. No.: US 2007/0035446 A1**

(43) **Pub. Date: Feb. 15, 2007**

(54) **PIFA ANTENNA ARRANGEMENT FOR A PLURALITY OF MOBILE RADIO FREQUENCY BANDS**

**Publication Classification**

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

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

(76) Inventors: **Patrick Pan**, Kamp-Lintfort (DE);  
**Sheng-Gen Pan**, Kamp-Lintfort (DE)

(57) **ABSTRACT**

A small sized structure for a plurality of resonance frequency bands in a PIFA antenna system for at least two mobile frequency bands distant from each other including a ground connection and a HF power supply connection. The PIFA antenna system includes at least two antenna branches which are disposed essentially side-by-side and in parallel to each other in the form of a strip and are connected to each other at a base thereof in order to serially connect the antenna branches which extend at a predetermined distance from each other, thereby forming a slit and are provide with straight segments for producing a capacitance coupling between the branches. The ground connection is preferably arranged at the free end of one of the antenna branches, the HF power supply connection is mounted on the external edge of the branch of the PIFA antenna structure provided with the ground connection. The width of the antenna branches, the length thereof and the slit therebetween are calculated in such a way that the PIFA antenna structure is provided with two resonance frequency bands arranged at a desired distance to each other.

Correspondence Address:  
**BELL, BOYD & LLOYD, LLC**  
**P. O. BOX 1135**  
**CHICAGO, IL 60690-1135 (US)**

(21) Appl. No.: **10/562,182**

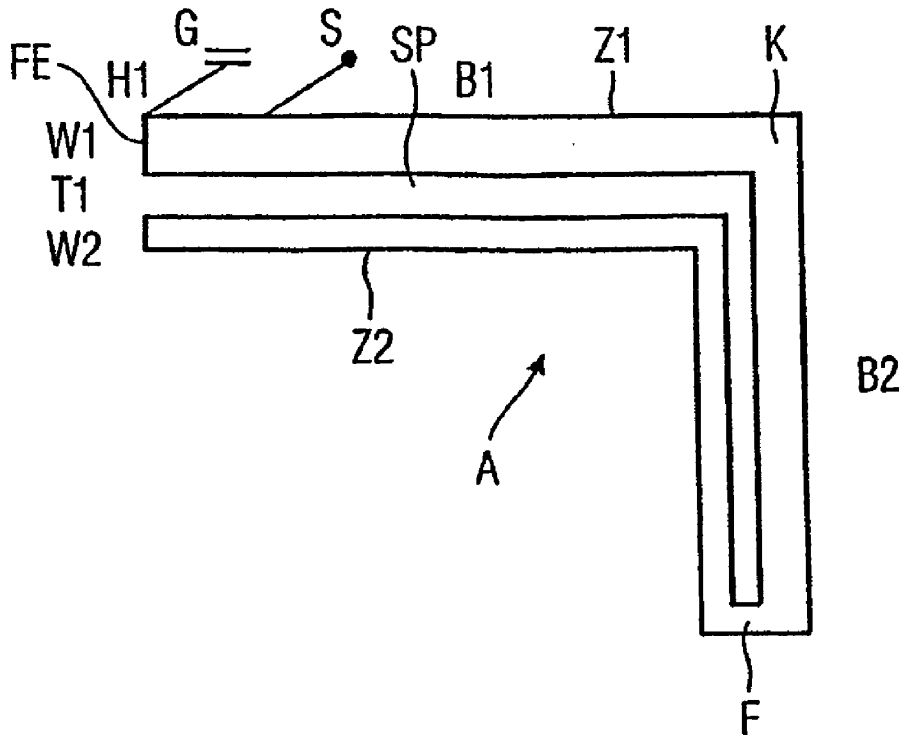
(22) PCT Filed: **May 27, 2004**

(86) PCT No.: **PCT/EP04/05751**

§ 371(c)(1),  
(2), (4) Date: **Dec. 22, 2005**

(30) **Foreign Application Priority Data**

Jun. 24, 2003 (DE)..... 103 28 361.7





US 20070035447A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0035447 A1**

**Chen et al.**

(43) **Pub. Date: Feb. 15, 2007**

(54) **FLEXIBLE ANTENNA APPARATUS AND A MANUFACTURING METHOD THEREOF**

(57) **ABSTRACT**

(76) Inventors: **Bin-Hung Chen**, Hsinchu (TW);  
**Chih-Ming Chen**, Hsinchu (TW)

Correspondence Address:  
**ROSENBERG, KLEIN & LEE**  
**3458 ELLICOTT CENTER DRIVE-SUITE 101**  
**ELLICOTT CITY, MD 21043 (US)**

(21) Appl. No.: **11/199,079**

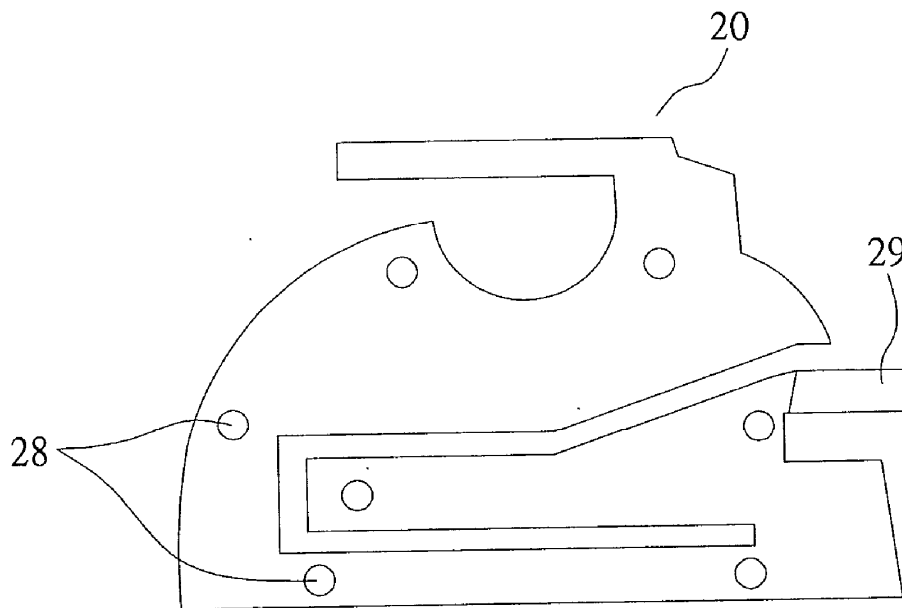
(22) Filed: **Aug. 9, 2005**

**Publication Classification**

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

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

A flexible antenna apparatus and a manufacturing method thereof are provided for wireless communication devices. The flexible antenna has a metal layer with an adhesive layer pasted onto the back surface of the metal layer, so that it can be directly pasted onto the housing of the wireless communication device. On another side of the metal layer, there is a transparent protective layer and the metal layer reserves a zone without the transparent protective layer for electrically coupling to the electrical substrate of the wireless communication device. The present flexible antenna apparatus reduces the developing time and cost of the device and the manufacturing process more convenient. The flexible antenna apparatus is suitable for all wireless communication devices and increases the flexibility of the manufacturing process by adding a holder having at least one plastic pin, or a pin.





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(19) **United States**  
 (12) **Patent Application Publication** (10) **Pub. No.: US 2007/0035450 A1**  
**Chang et al.** (43) **Pub. Date: Feb. 15, 2007**

(54) **DUAL FREQUENCY ANTENNA**

(30) **Foreign Application Priority Data**

Aug. 12, 2005 (TW)..... 094127437

(75) Inventors: **The-Nan Chang**, Taipei City (TW);  
**Hsu-Hsien Sun**, Taipei City (TW)

**Publication Classification**

Correspondence Address:  
**BACON & THOMAS, PLLC**  
**625 SLATERS LANE**  
**FOURTH FLOOR**  
**ALEXANDRIA, VA 22314**

(51) **Int. Cl.**  
**H01Q 1/38** (2006.01)  
(52) **U.S. Cl.** ..... **343/700 MS**

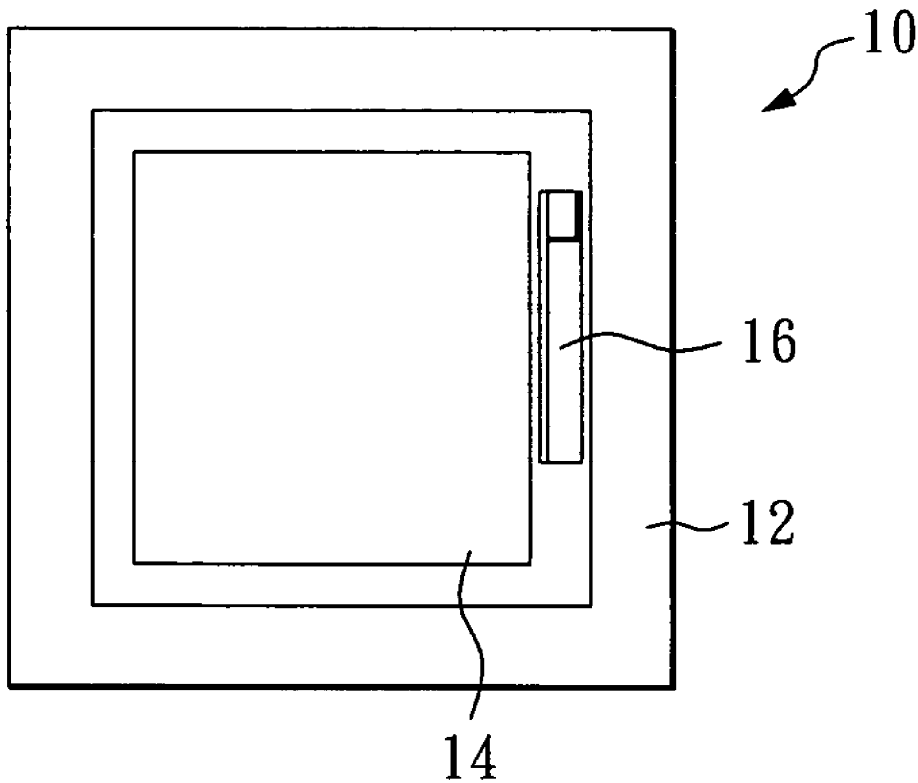
(57) **ABSTRACT**

(73) Assignee: **Tatung University**, Taipei City (TW)

The present invention relates to a dual frequency antenna, which integrates a square ring antenna and a patch antenna in order to have a compact circuit area that receives both low and high frequencies, to be used as the antenna of wireless LAN, wherein the wireless LAN is one of the following: IEEE 802.11a, IEEE 802.11b, or IEEE 802.11g.

(21) Appl. No.: **11/267,143**

(22) Filed: **Nov. 7, 2005**





US 20070035451A1

(19) **United States**

(12) **Patent Application Publication**  
**Yang et al.**

(10) **Pub. No.: US 2007/0035451 A1**

(43) **Pub. Date: Feb. 15, 2007**

(54) **PLANAR INVERTED-F ANTENNA**

**Publication Classification**

(75) Inventors: **Mei-Chin Yang**, Taipei (TW); **Fu-Ren Hsiao**, Taipei (TW); **Tsung-Wen Chiu**, Taipei (TW); **Chin-Fan Chen**, Taipei (TW)

(51) **Int. Cl.**  
**H01Q 1/38** (2006.01)  
**H01Q 1/24** (2006.01)  
(52) **U.S. Cl.** ..... **343/700 MS; 343/702**

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**BRUCE H. TROXELL**  
**SUITE 1404**  
**5205 LEESBURG PIKE**  
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(57) **ABSTRACT**

A PIFA in one embodiment includes a radiating member including a feed point, a shorting point, a first radiating element having a starting point and a terminating point coiled as a longer path terminated at an outer edge of a ground plane and being open for generating a resonance mode having a low frequency, and a second radiating element having a starting point connected to the starting point of the first radiating element, and a terminating point extended to form a shorter path terminated at the outer edge of the ground plane, the terminating points of the first and second radiating elements adjacent for generating a resonance mode having a high frequency; low and high frequency medium frequency regulators for adjusting resonance frequencies of two different resonance modes a substrate; a feed member; and a shorting member.

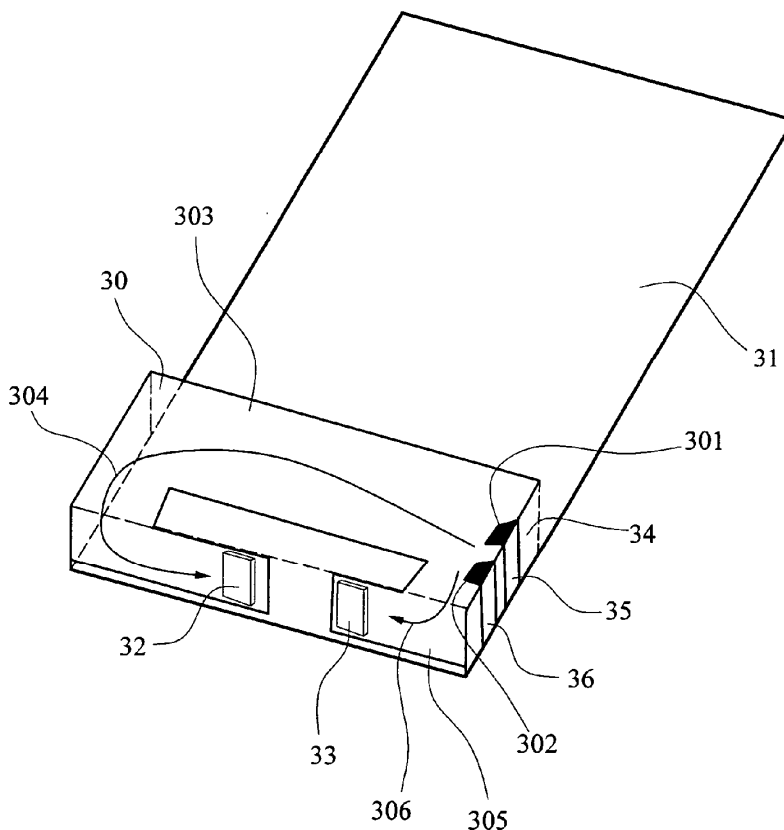
(73) Assignee: **Advanced Connectek Inc.**

(21) Appl. No.: **11/416,235**

(22) Filed: **May 3, 2006**

(30) **Foreign Application Priority Data**

Aug. 12, 2005 (TW)..... 094127532





US 20070035452A1

(19) **United States**

(12) **Patent Application Publication**  
**Lin et al.**

(10) **Pub. No.: US 2007/0035452 A1**

(43) **Pub. Date: Feb. 15, 2007**

(54) **PATCH ANTENNA HAVING A UNIVERSAL SERIAL BUS (USB) CONNECTION PORT**

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

(76) Inventors: **Hsin-Lung Lin**, Hsinchu (TW);  
**Teng-Chao Chiang**, Hsinchu (TW)

(57) **ABSTRACT**

Correspondence Address:  
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**RESTON, VA 20195 (US)**

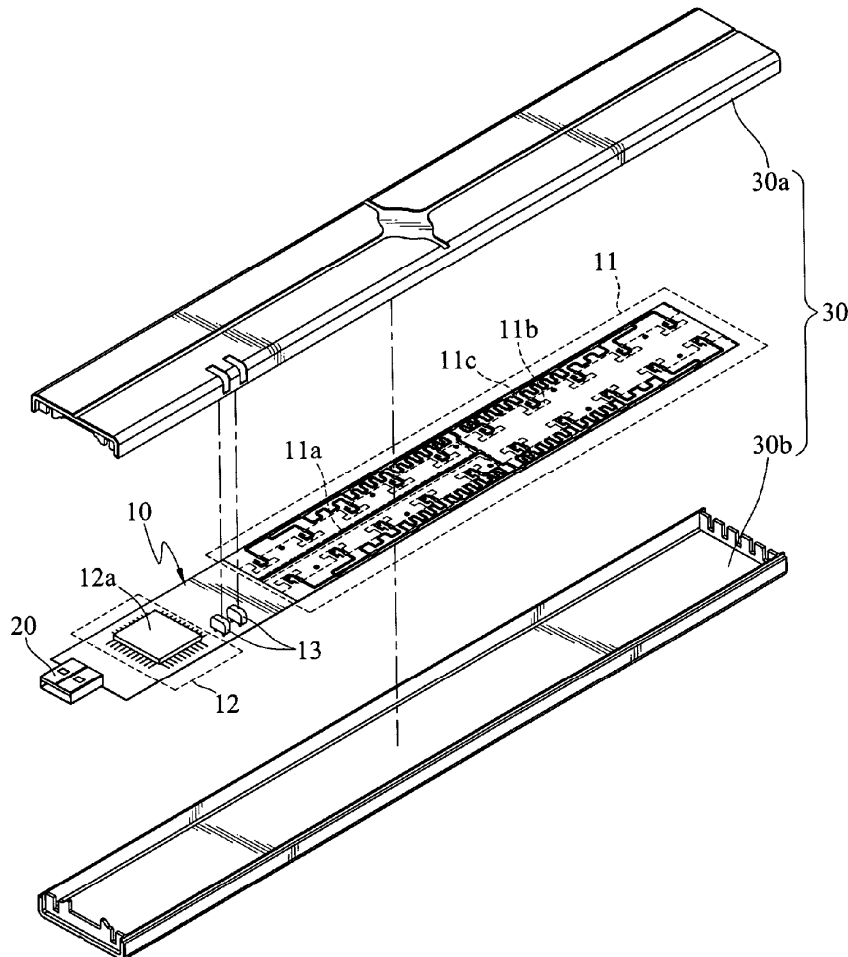
A patch antenna having a universal serial bus (USB) connection port, comprising: a substrate; an antenna module, provided on the substrate and having a signal feed-in terminal, and used to transmit or receive a radio frequency signal; a universal serial bus connection port, connected to the signal feed-in terminal of the antenna module, and used to provide the antenna module with a signal transmission interface for transmitting the radio frequency signal; a signal conversion circuit, used to convert the format of the radio frequency signal to the format compatible with the signal transmission interface.

(21) Appl. No.: **11/199,075**

(22) Filed: **Aug. 9, 2005**

**Publication Classification**

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





US 20070035453A1

(19) **United States**

(12) **Patent Application Publication**  
**Martinez et al.**

(10) **Pub. No.: US 2007/0035453 A1**

(43) **Pub. Date: Feb. 15, 2007**

(54) **WIRELESS COMMUNICATION DEVICE WITH IMPROVED ANTENNA SYSTEM**

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

(76) Inventors: **Juan M. Martinez**, Antioch, IL (US);  
**David Fisk**, Vista, CA (US); **Siu Man Wong**, Singapore (SG)

(57) **ABSTRACT**

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**MOTOROLA, INC**  
**INTELLECTUAL PROPERTY SECTION**  
**LAW DEPT**  
**8000 WEST SUNRISE BLVD**  
**FT LAUDERDAL, FL 33322 (US)**

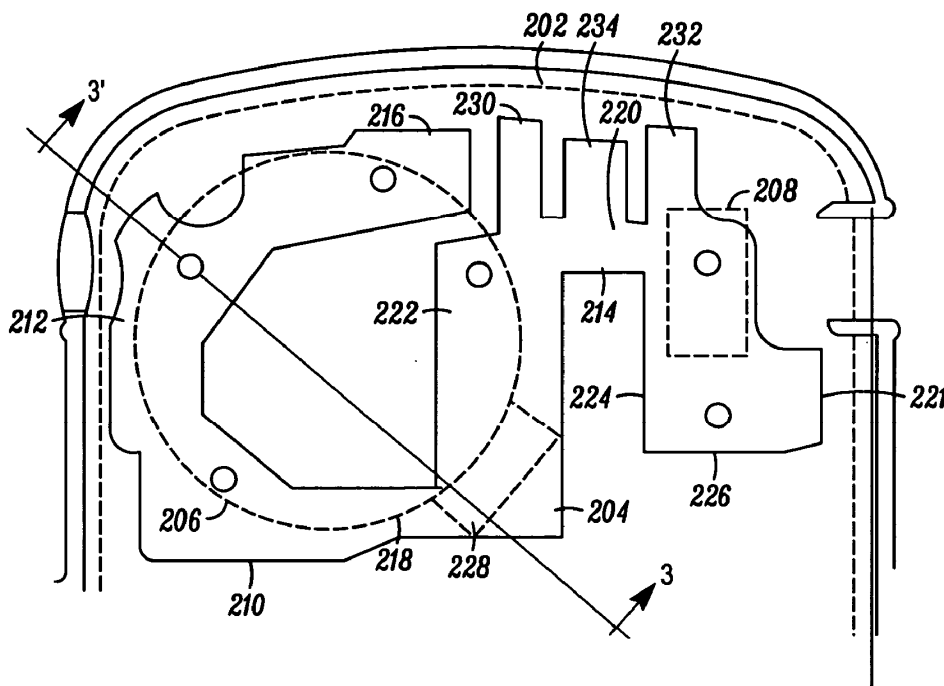
A wireless communication device (100) comprises an antenna (204) comprising a major radiating element (210) that includes a letter C shaped part (212) connected to a letter U shaped part (214). The major radiating element (210) is spaced from a ground plane (302) and one or more components (206, 208) having conductive parts are located between the major radiating element (210) and the ground plane (302). Openings (314, 316) in the ground plane (302) are located under the components (206, 208) or terminals (310) of the components (206, 208). Passive radiators (126, 700) having multiple sections (602, 604, 702, 704, 706) of different transverse dimension are located on a flip (110) of the wireless communication device (100) proximate the antenna (204).

(21) Appl. No.: **11/200,665**

(22) Filed: **Aug. 10, 2005**

**Publication Classification**

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





US 20070035455A1

(19) **United States**

(12) **Patent Application Publication**  
**Tseng**

(10) **Pub. No.: US 2007/0035455 A1**

(43) **Pub. Date: Feb. 15, 2007**

(54) **DISPLAY FRAME HAVING ANTENNA**

**Publication Classification**

(76) Inventor: **Liang-Chih Tseng**, Taipei City (TW)

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

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

Correspondence Address:

**JIANQ CHYUN INTELLECTUAL PROPERTY  
OFFICE  
7 FLOOR-1, NO. 100  
ROOSEVELT ROAD, SECTION 2  
TAIPEI 100 (TW)**

(57) **ABSTRACT**

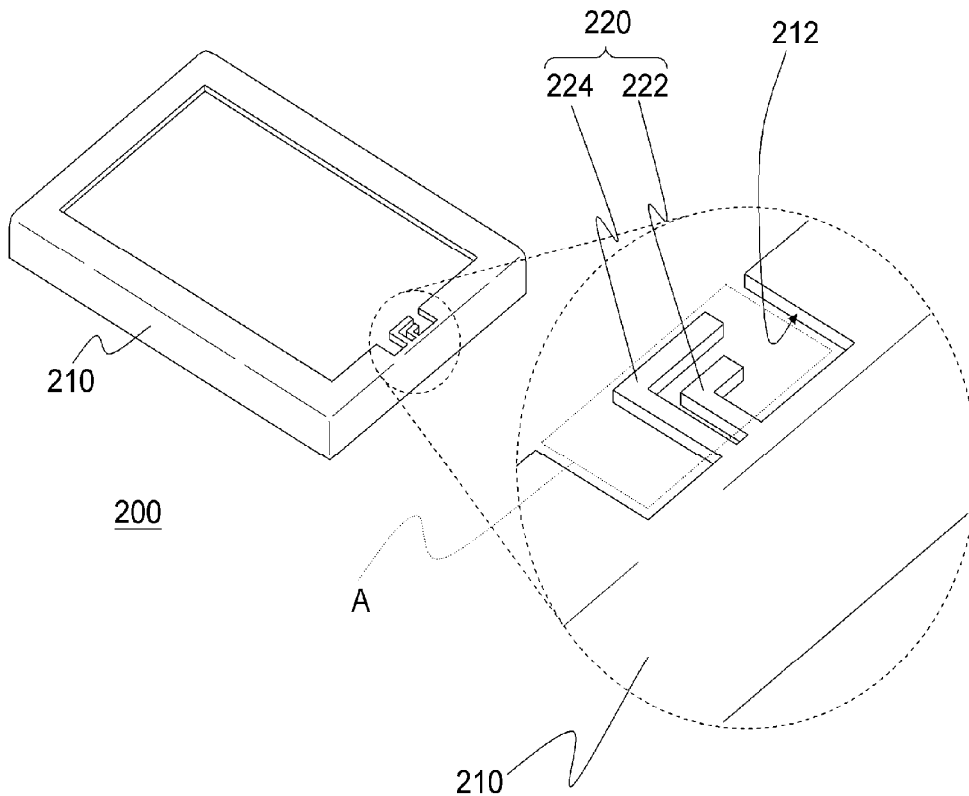
(21) Appl. No.: **11/307,164**

(22) Filed: **Jan. 26, 2006**

(30) **Foreign Application Priority Data**

Aug. 10, 2005 (TW)..... 94213642

A display frame having an antenna suitable to be set on a display module is provided. The display frame includes a metal frame and an antenna, and the antenna includes a first metal member and a second metal member. The first metal member extending from the metal frame is located inside an antenna area defined by a notch of the metal frame. The second metal member extending from the metal frame is located inside the antenna area to couple the electromagnetic energy to the first metal member.





US 20070035458A1

(19) **United States**

(12) **Patent Application Publication**  
**Ohba**

(10) **Pub. No.: US 2007/0035458 A1**

(43) **Pub. Date: Feb. 15, 2007**

(54) **ANTENNA DEVICE AND RADIO APPARATUS CAPABLE OF MULTIBAND OPERATION**

**Publication Classification**

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

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

(75) Inventor: **Isao Ohba**, Tokyo (JP)

(57) **ABSTRACT**

Correspondence Address:  
**FRISHAUF, HOLTZ, GOODMAN & CHICK, PC**  
**220 Fifth Avenue**  
**16TH Floor**  
**NEW YORK, NY 10001-7708 (US)**

An antenna device and a radio apparatus are provided. The antenna device is configured to be coupled to a feeding point of the radio apparatus. The antenna device has a first antenna element and a second antenna element. The first antenna element is configured to be an unbalanced-fed antenna fed at the feeding point to resonate at a first frequency. The second antenna element is configured to be a monopole antenna having an open end and to be fed at the feeding point. The first antenna element and the second antenna element have a common portion from the feeding point to a branching point. The second antenna element is configured to be ungrounded in a first state to resonate at a second frequency lower than the first frequency and to be grounded in a second state at a switch point between the branching point and the open end.

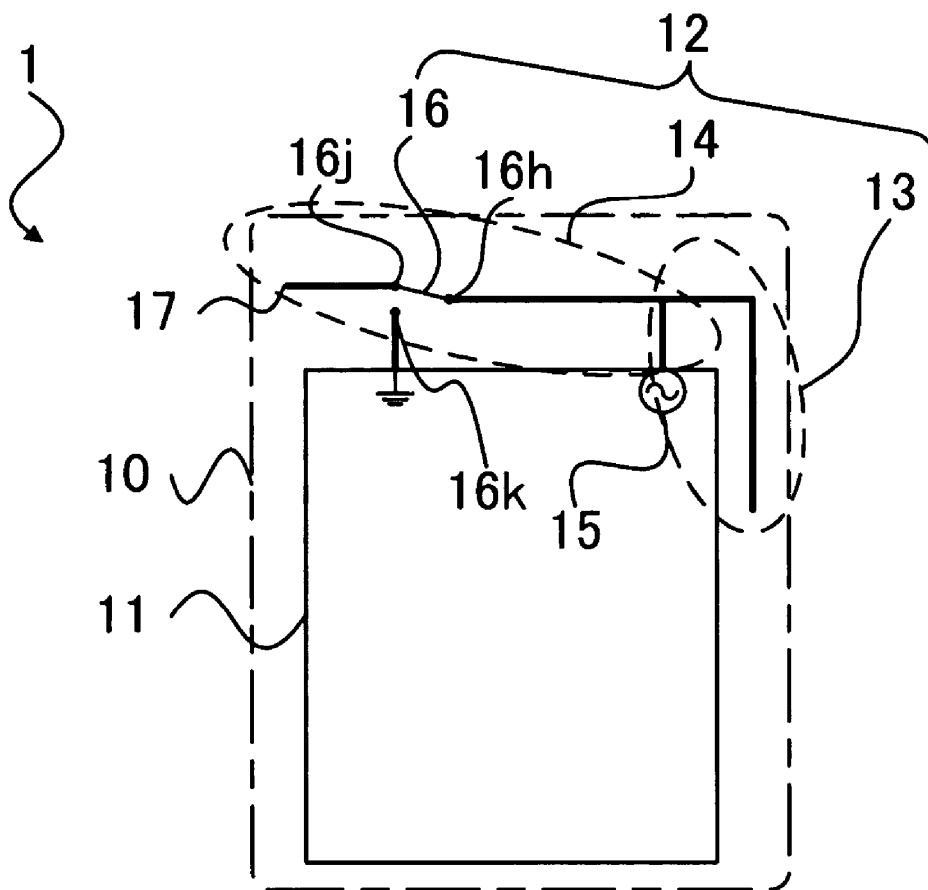
(73) Assignee: **KABUSHIKI KAISHA TOSHIBA**, Tokyo (JP)

(21) Appl. No.: **11/499,558**

(22) Filed: **Aug. 4, 2006**

(30) **Foreign Application Priority Data**

Aug. 9, 2005 (JP) ..... 2005-230298







US 20070035460A1

(19) **United States**

(12) **Patent Application Publication**  
**Blickle**

(10) **Pub. No.: US 2007/0035460 A1**

(43) **Pub. Date: Feb. 15, 2007**

(54) **HIGH-FREQUENCY MOTOR-VEHICLE ANTENNA**

**Publication Classification**

(75) Inventor: **Gunther Blickle**, Walddorfhaslach (DE)

(51) **Int. Cl.**  
**H01Q 1/32** (2006.01)

(52) **U.S. Cl.** ..... **343/713**

Correspondence Address:  
**THE FIRM OF KARL F ROSS**  
**5676 RIVERDALE AVENUE**  
**PO BOX 900**  
**RIVERDALE (BRONX), NY 10471-0900 (US)**

(57) **ABSTRACT**

(73) Assignee: **HIRSCHMANN CAR COMMUNICATION GMBH**

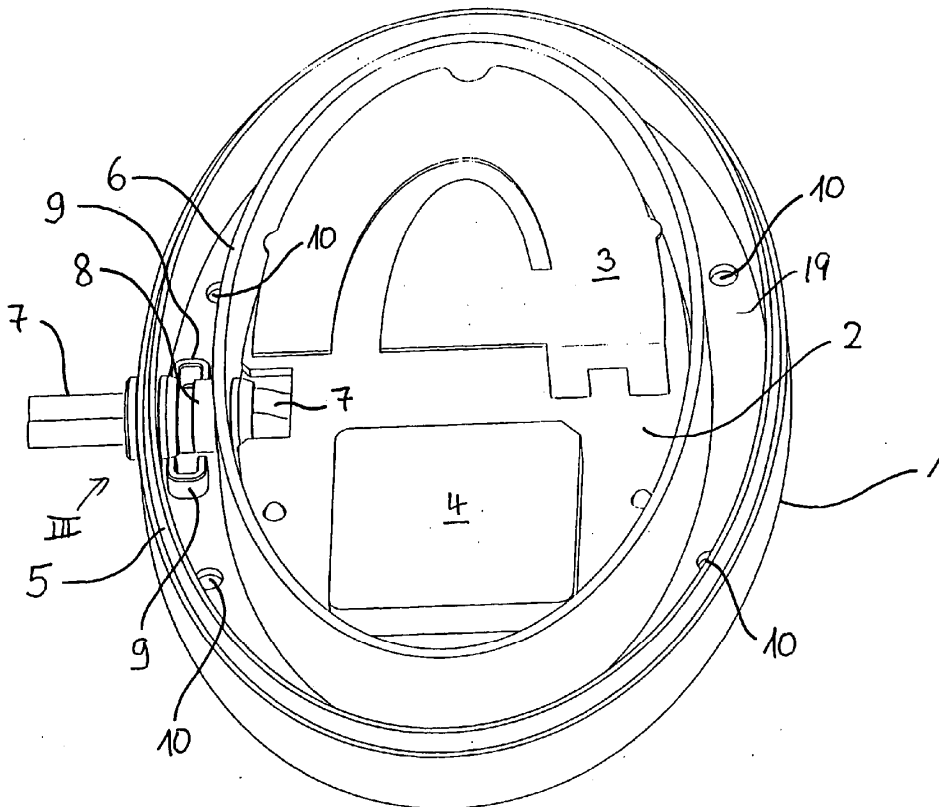
A high-frequency motor-vehicle antenna has a lower housing part adapted to be secured to the motor vehicle, at least partially dielectric, and formed with an inner and an outer annular side wall and an upper housing part formed with an inner and an outer annular side wall fittable with the respective walls of the lower part. The upper and lower housing parts are fitted together with the side walls fitting hermetically. The inner and outer side walls form aligned inner and outer throughgoing ports when the parts are fitted together. A cable extends through the ports, and a seal is integrally mounted on the cable and sealingly fits in both of the ports.

(21) Appl. No.: **11/502,588**

(22) Filed: **Aug. 10, 2006**

(30) **Foreign Application Priority Data**

Aug. 12, 2005 (DE)..... 102005038197.9





US 20070035465A1

(19) **United States**

(12) **Patent Application Publication**  
**Vainer**

(10) **Pub. No.: US 2007/0035465 A1**

(43) **Pub. Date: Feb. 15, 2007**

(54) **FLAT ANTENNA HOLDER**

(22) Filed: **Aug. 15, 2005**

(75) Inventor: **Ilan Vainer, Kfar-Sava (IL)**

**Publication Classification**

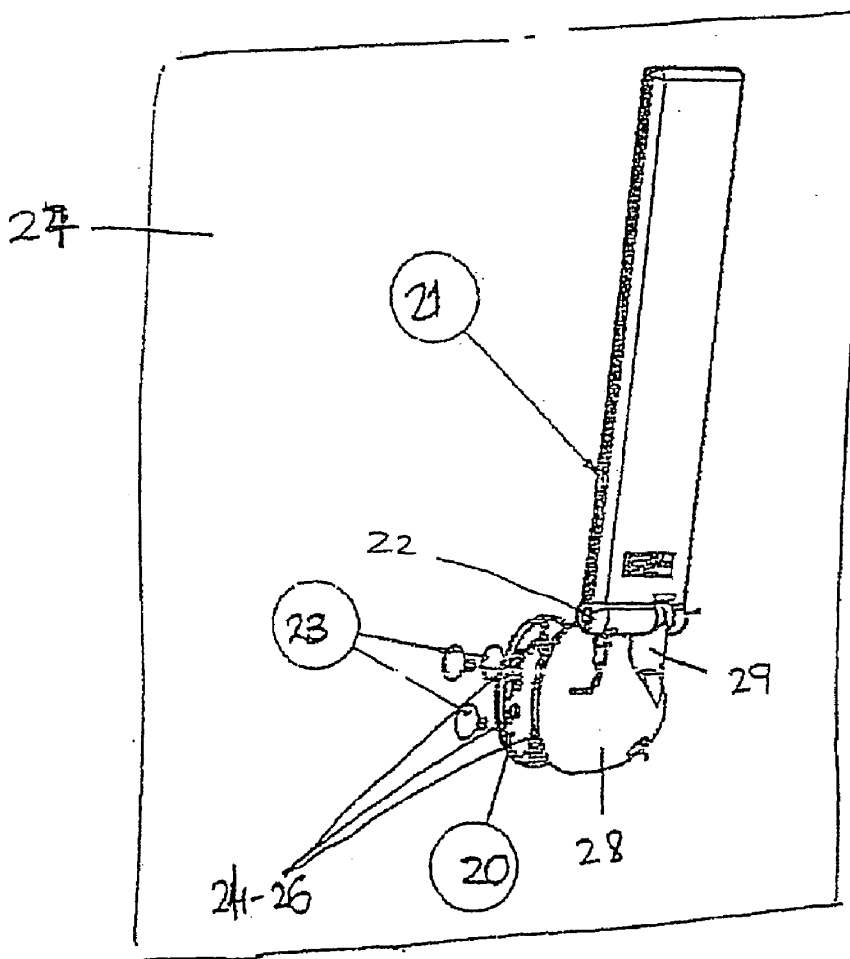
Correspondence Address:  
**PEARL COHEN ZEDEK, LLP**  
**PEARL COHEN ZEDEK LATZER, LLP**  
**1500 BROADWAY 12TH FLOOR**  
**NEW YORK, NY 10036 (US)**

(51) **Int. Cl.**  
**H01Q 1/12** (2006.01)  
(52) **U.S. Cl.** ..... **343/888; 343/906**

(57) **ABSTRACT**  
Embodiments of the invention provide a single apparatus for connecting a flat antenna to a plurality of surfaces, including vertical, horizontal or other inclined surfaces, by screws, suction components or other connectors.

(73) Assignee: **MTI WIRELESS EDGE LTD.**

(21) Appl. No.: **11/203,209**





US 20070035467A1

(19) **United States**

(12) **Patent Application Publication**

Chen et al.

(10) **Pub. No.: US 2007/0035467 A1**

(43) **Pub. Date: Feb. 15, 2007**

(54) **MONOPOLE BROADBAND ANTENNA**

**Publication Classification**

(75) Inventors: **I-Fong Chen**, Tao-Yuan City (TW);  
**Chun-Sheng Huang**, Pa-Te City (TW)

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

(52) **U.S. Cl.** ..... **343/900; 343/702**

Correspondence Address:  
**BRUCE H. TROXELL**  
**SUITE 1404**  
**5205 LEESBURG PIKE**  
**FALLS CHURCH, VA 22041 (US)**

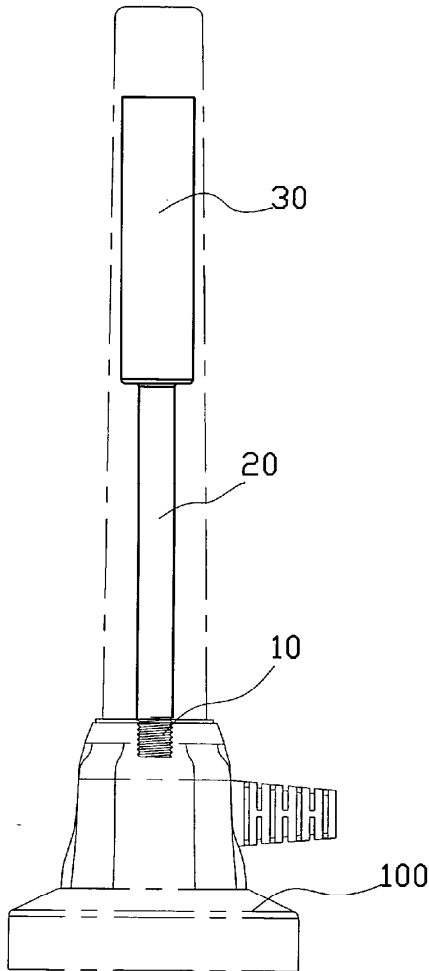
(57) **ABSTRACT**

A monopole broadband antenna including a connecting segment for connecting an antenna circuit of a set of equipment, the connecting segment is provided thereon sequentially with a shaft portion with a small diameter and a shaft portion with a large diameter in connecting with the shaft portion with the small diameter; the shaft portion with the small diameter and the shaft portion with the large diameter together form the monopole broadband antenna. The antenna can be used for equipment such as a digital TV or a Wireless Local Area Network and can get a larger rate of use of band width.

(73) Assignee: **Auden Techno Corp.**

(21) Appl. No.: **11/200,021**

(22) Filed: **Aug. 10, 2005**





US 20070040120A1

(19) **United States**

(12) **Patent Application Publication**  
**Harihara**

(10) **Pub. No.: US 2007/0040120 A1**

(43) **Pub. Date: Feb. 22, 2007**

(54) **MODULE SUBSTRATE WITH ANTENNA AND RADIO MODULE USING THE SAME**

**Publication Classification**

(51) **Int. Cl.**  
**H01L 27/14** (2006.01)

(52) **U.S. Cl.** ..... **250/338.4**

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

(57) **ABSTRACT**

Correspondence Address:  
**WOLFF LAW OFFICE, PLLC**  
**209 PROVIDENCE RD.**  
**CHAPEL HILL, NC 27514 (US)**

An object of the present invention is to further miniaturize a module substrate with an antenna while maintaining desirable characteristics. A module substrate **100** with an antenna according to the invention has a substrate body **110** and first and second radiation conductors **121** and **122** provided on one surface **111** of the substrate body **110** and being symmetrical. The first and the second radiation conductors **121** and **122** are asymmetrical with respect to a first line **B** that passes a power-supplying point **121b** of the first radiation conductor and a power-supplying point **122b** of the second radiation conductor. Therefore, the wavelength of radio waves radiated from the current flowing in one direction as viewed from the first line **B** is different from that of radio waves radiated from the current flowing in the other direction as viewed from the first line **B**. As a result, the substrate body **110** can be miniaturized while securing a broader band than the conventional module substrates.

(21) Appl. No.: **10/597,207**

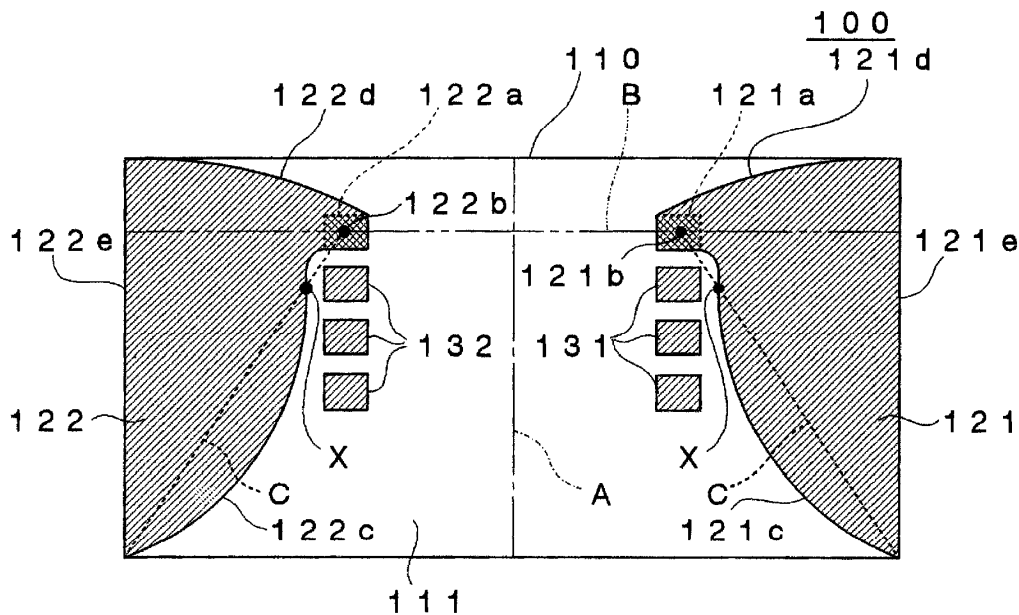
(22) PCT Filed: **Dec. 28, 2004**

(86) PCT No.: **PCT/JP04/19586**

§ 371(c)(1),  
(2), (4) Date: **Jul. 14, 2006**

(30) **Foreign Application Priority Data**

Jan. 16, 2004 (JP) ..... 2004-009792





US 20070040745A1

(19) **United States**

(12) **Patent Application Publication**  
**Chen et al.**

(10) **Pub. No.: US 2007/0040745 A1**

(43) **Pub. Date: Feb. 22, 2007**

(54) **MULTI-BAND FREQUENCY LOOP-SLOT ANTENNA**

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

(76) Inventors: **Hong-Ren Chen**, Chung Ho City (TW); **Kai Shih**, Chung Ho City (TW); **Huang-Ise Peng**, Chung Ho City (TW); **Yu-Yuan Wu**, Chung Ho City (TW)

(57) **ABSTRACT**

Correspondence Address:  
**LIN & ASSOCIATES INTELLECTUAL PROPERTY**  
**P.O. BOX 2339**  
**SARATOGA, CA 95070-0339 (US)**

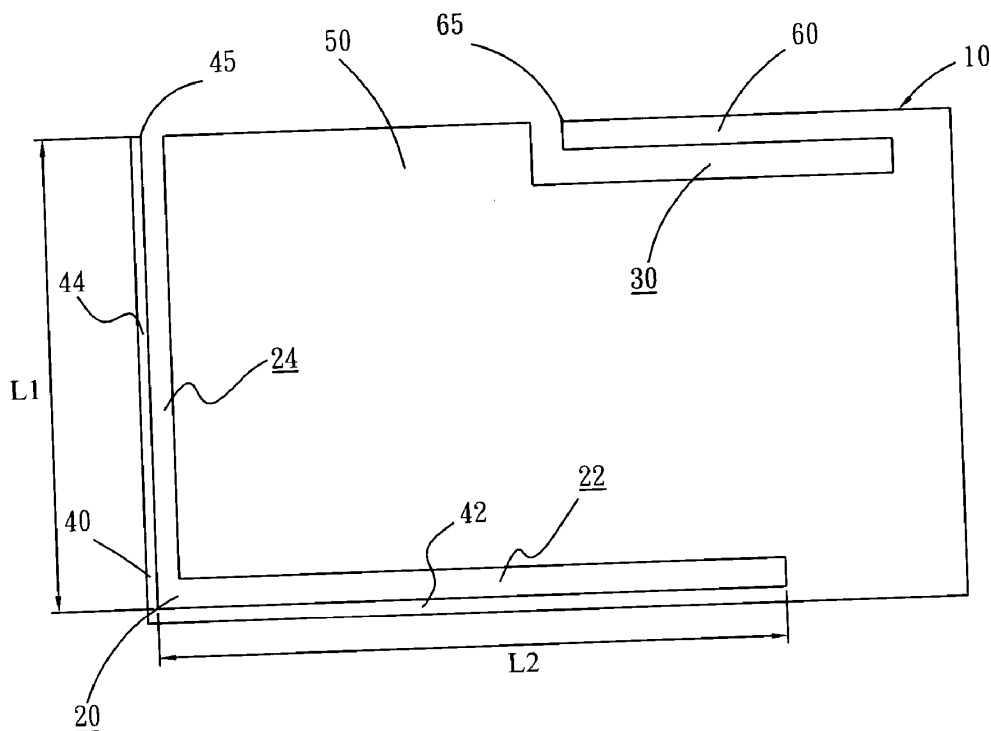
A loop-slot antenna defined by a conductive plate includes a first slot and a second slot. The first slot and the second slot divide the conductive plate into a first strip, a second strip and a patch element. The first slot is an L-shaped slot and includes a transverse slot section extending along the lower edge of the conductive plate and a longitudinal slot section extending along the left edge of the conductive plate and opening to the upper edge of the conductive plate. The first slot is operated at a first frequency. The first strip includes a transverse branch and a longitudinal branch that has a feed point. The second slot opens upward. The second strip has a free end on which a grounding point is disposed. The patch element is formed between the first and the second slots and operable at a second frequency.

(21) Appl. No.: **11/200,430**

(22) Filed: **Aug. 9, 2005**

**Publication Classification**

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





US 20070040747A1

(19) **United States**

(12) **Patent Application Publication**  
**Kinezos**

(10) **Pub. No.: US 2007/0040747 A1**

(43) **Pub. Date: Feb. 22, 2007**

(54) **MULTI-BAND ANTENNA**

(52) **U.S. Cl.** ..... **343/700 MS; 343/729; 343/702**

(75) Inventor: **Christos L. Kinezos**, Sunrise, FL (US)

(57) **ABSTRACT**

Correspondence Address:

**MOTOROLA, INC**  
**INTELLECTUAL PROPERTY SECTION**  
**LAW DEPT**  
**8000 WEST SUNRISE BLVD**  
**FT LAUDERDAL, FL 33322 (US)**

A multi-band antenna (10) includes one or more a loop portions (12) substantially defining operation in frequency ranges covering between approximately 800 McgaHertz and approximately 1.0 GigaHertz and between approximately 1.8 GigaHertz and approximately 2.0 GigaHertz, a surface plate portion (14) having a length (15) substantially defining operation in a frequency range between approximately 1.7 GigaHertz and approximately 1.9 GigaHertz, and a slot (16) within the surface plate portion having a length (17) substantially defining operation in a frequency range between 5 and 6 Gigahertz (WLAN). The antenna can further include a resonant stub (18) having a length (19) substantially defining operation in a frequency range of approximately 2.4 Gigahertz. The antenna can be a unitary radiating element having a feed element (9) and a ground port (7). Operationally, the antenna can function in 6 bands and can be independently tunable in a majority of the 6 bands.

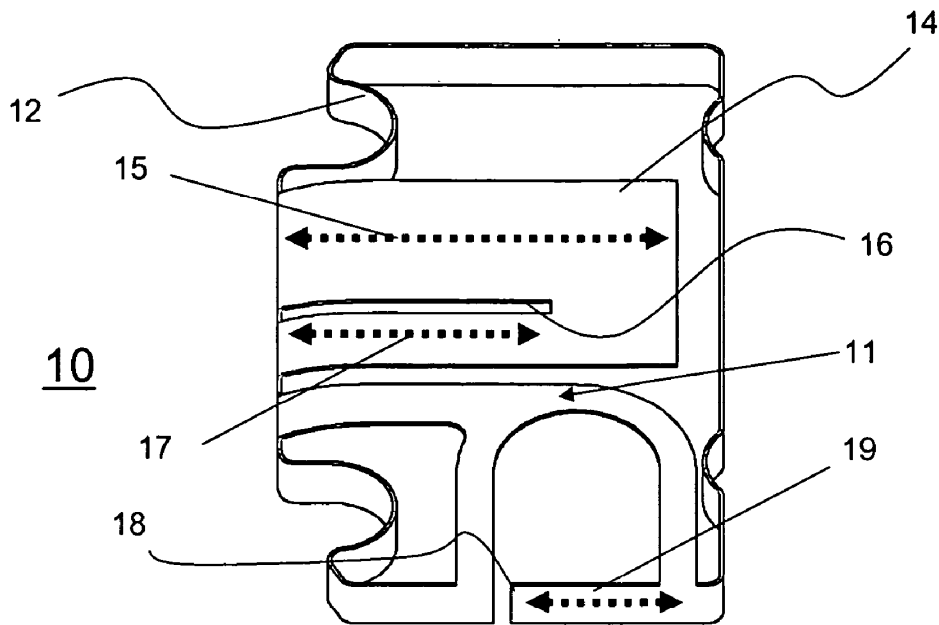
(73) Assignee: **Motorola, Inc.**, Schaumburg, IL

(21) Appl. No.: **11/208,673**

(22) Filed: **Aug. 22, 2005**

**Publication Classification**

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





US 20070040748A1

(19) **United States**

(12) **Patent Application Publication**  
**Mei**

(10) **Pub. No.: US 2007/0040748 A1**

(43) **Pub. Date: Feb. 22, 2007**

(54) **DUAL-BAND ANTENNA FOR RADIATING  
ELECTROMAGNETIC SIGNALS OF  
DIFFERENT FREQUENCIES**

**Publication Classification**

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

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

(75) **Inventor: Chia-Hao Mei, Shenzhen (CN)**

(57) **ABSTRACT**

Correspondence Address:  
**PCE INDUSTRY, INC.**  
**ATT. CHENG-JU CHIANG JEFFREY T.**  
**KNAPP**  
**458 E. LAMBERT ROAD**  
**FULLERTON, CA 92835 (US)**

A dual-band antenna for radiating electromagnetic signals of different frequencies includes a ground portion (500), a feeding part (400), and a body (100). The feeding part (400) is for feeding signals. The body (100) includes a first radiating part (110) and a second radiating part (120). The first radiating part includes a bent portion (115), a first free end (111), and a first connecting end (112). The bent portion (115) is between the first free end (111) and the first connecting end (112). The first connecting end (111) is electronically connected to the feeding part (400). The second radiating part (120) includes a second connecting end (122) and a second free end (121). The second connecting end (122) is connected to the first connecting end (112). The shorting part (200) is between the body (100) and the ground portion (500).

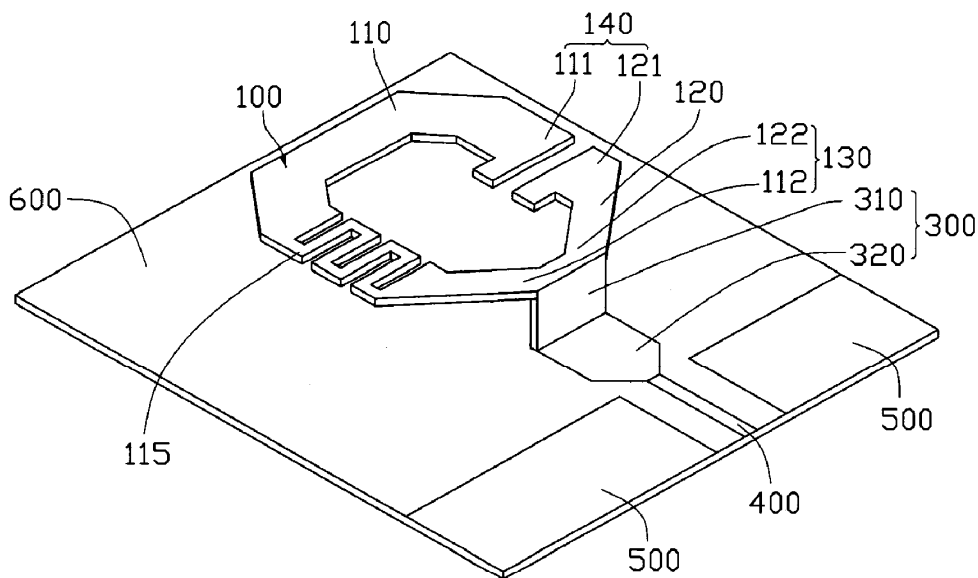
(73) **Assignee: HON HAI PRECISION INDUSTRY  
CO., LTD., TU CHENG (TW)**

(21) **Appl. No.: 11/308,575**

(22) **Filed: Apr. 8, 2006**

(30) **Foreign Application Priority Data**

Jun. 10, 2005 (CN) ..... 200510035292.3





US 20070040749A1

(19) **United States**

(12) **Patent Application Publication**

(10) **Pub. No.: US 2007/0040749 A1**

**Jeon et al.**

(43) **Pub. Date:**

**Feb. 22, 2007**

(54) **SURFACE MOUNT ANTENNA APPARATUS HAVING TRIPLE LAND STRUCTURE**

**Publication Classification**

(75) Inventors: **Chan Ik Jeon**, Suwon-si (KR); **Gun Sung Jang**, Seoul (KR)

(51) **Int. Cl.**  
*H01Q 1/38* (2006.01)  
*H01Q 1/24* (2006.01)  
(52) **U.S. Cl.** ..... **343/700 MS; 343/702**

Correspondence Address:  
**THE WEBB LAW FIRM, P.C.**  
**700 KOPPERS BUILDING**  
**436 SEVENTH AVENUE**  
**PITTSBURGH, PA 15219 (US)**

(57) **ABSTRACT**

Disclosed herein is a surface mount antenna apparatus applied to a wireless terminal. The antenna apparatus includes a printed circuit board having a ground pattern, a land structure, and an antenna. The land structure includes a non-grounded area having no ground electrode, first and second land pads formed on opposite ends of the non-grounded area to be connected to ground electrodes, and an input pad formed between the first and second land pads and separated from them. The input pad is spaced apart from the first land pad by a preset interval. The antenna includes first and second ground electrodes formed on the lower surface of a dielectric block to be connected to the first and second land pads, a feeding electrode connected to the input pad, and a radiation electrode formed on some of the side surfaces and the upper surface of the dielectric block. The radiation electrode is connected to at least one of the first and second ground electrodes and the feeding electrode.

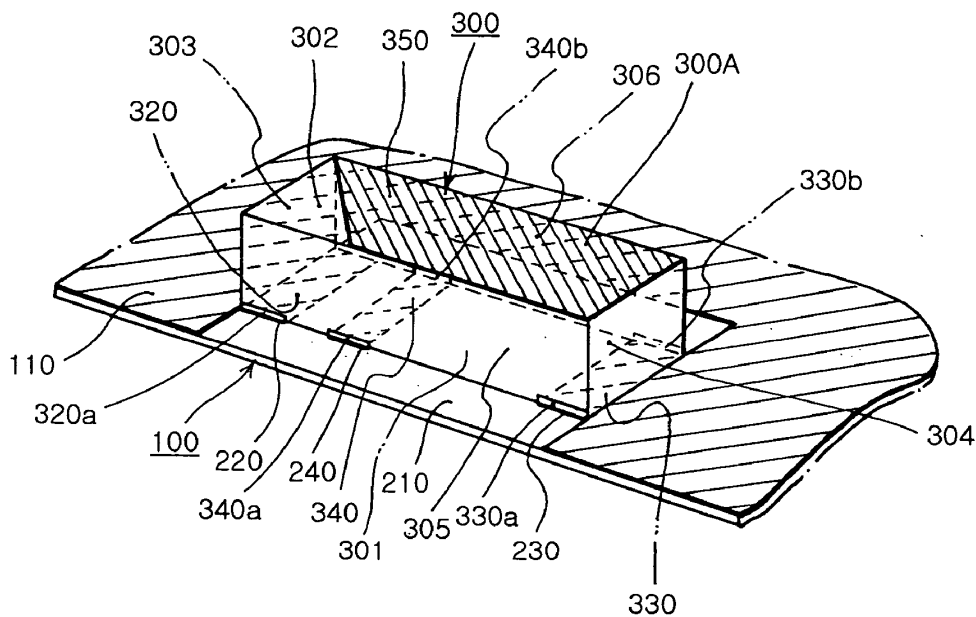
(73) Assignee: **PARTRON CO., LTD.**, Gyeonggi-do (KR)

(21) Appl. No.: **11/445,953**

(22) Filed: **Jun. 2, 2006**

(30) **Foreign Application Priority Data**

Jun. 3, 2005 (KR) ..... 10-2005-0047908







US 20070040750A1

(19) **United States**

(12) **Patent Application Publication**  
**Tai et al.**

(10) **Pub. No.: US 2007/0040750 A1**

(43) **Pub. Date: Feb. 22, 2007**

(54) **MULTI-BAND ANTENNA**

**Publication Classification**

(75) Inventors: **Lung-Sheng Tai**, Tu-Cheng (TW);  
**Po-Kang Ku**, Tu-Cheng (TW);  
**Chen-Ta Hung**, Tu-Cheng (TW);  
**Yun-Long Ke**, Tu-Cheng (TW);  
**Yao-Shien Huang**, Tu-Cheng (TW)

(51) **Int. Cl.**  
**H01Q 1/38** (2006.01)  
**H01Q 1/24** (2006.01)  
(52) **U.S. Cl.** ..... **343/700 MS; 343/702**

Correspondence Address:  
**WEI TE CHUNG**  
**FOXCONN INTERNATIONAL, INC.**  
**1650 MEMOREX DRIVE**  
**SANTA CLARA, CA 95050 (US)**

(57) **ABSTRACT**

A multi-band antenna used in an electronic device, comprising: a grounding element; a radiating element comprises a first radiating section operating at 900 MHz frequency band and a second radiating section operating at 1800 MHz frequency band; and a connecting section connecting the radiating element and the grounding element. The grounding element, the radiating element, and the connecting element locate respectively in the different plane. The whole structure of the multi-band antenna of the present invention designed combining the inner structure of the notebook or other portable electrical device. The multi-band antenna is suit to be installed in a notebook or other portable electrical device because the multi-band antenna occupies small space.

(73) Assignee: **HON HAI PRECISION IND. CO., LTD.**

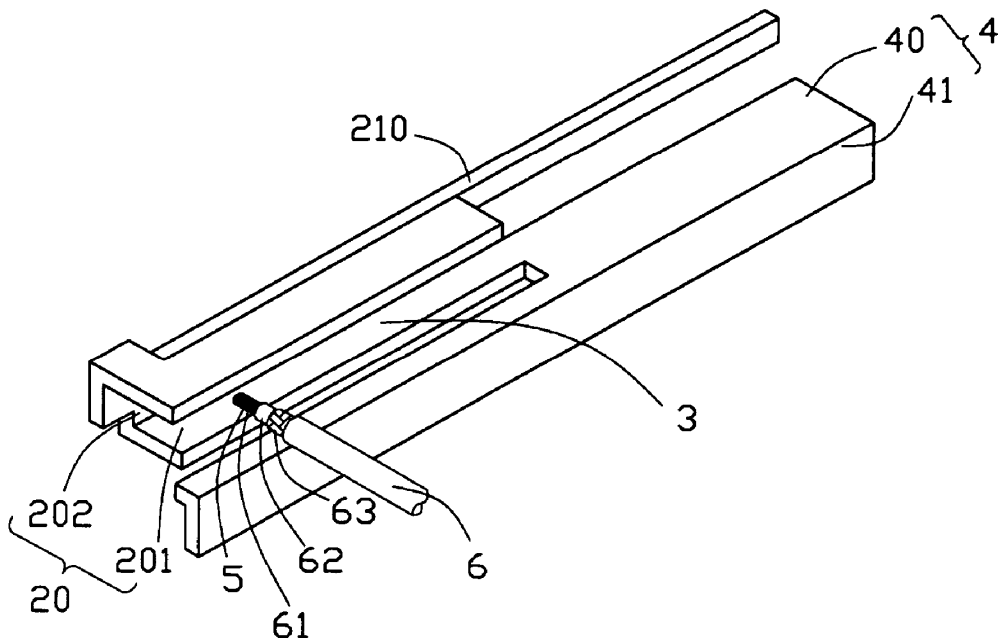
(21) Appl. No.: **11/507,834**

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

(30) **Foreign Application Priority Data**

Aug. 22, 2005 (TW)..... 94128540

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US 20070040752A1

(19) **United States**

(12) **Patent Application Publication**  
**Sinasi et al.**

(10) **Pub. No.: US 2007/0040752 A1**

(43) **Pub. Date: Feb. 22, 2007**

(54) **ANTENNA ARRANGEMENT FOR A  
CELLULAR COMMUNICATION TERMINAL**

(57) **ABSTRACT**

(75) Inventors: **Ozden Sinasi**, Copenhagen (DK);  
**Dennis Sejersgaard-Jacobsen**,  
Bronshoj (DK)

Correspondence Address:  
**HARRINGTON & SMITH, LLP**  
**4 RESEARCH DRIVE**  
**SHELTON, CT 06484-6212 (US)**

(73) Assignee: **Nokia Corporation**

(21) Appl. No.: **11/208,392**

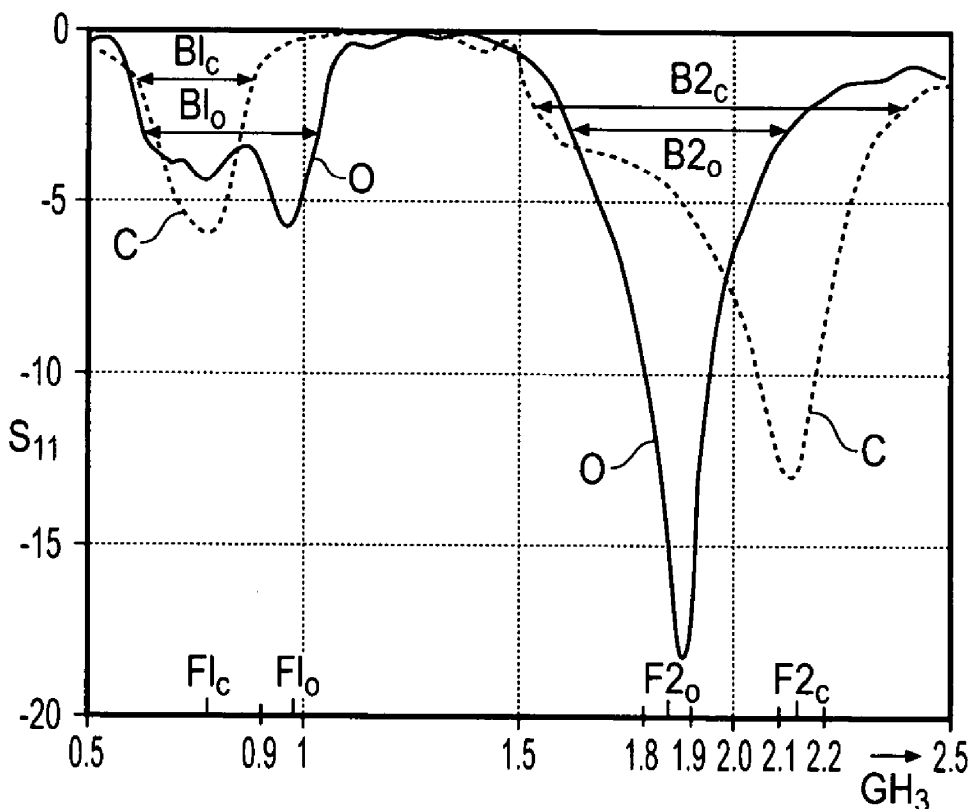
(22) Filed: **Aug. 18, 2005**

**Publication Classification**

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

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

An antenna arrangement operable to transmit/receive in a first communications band and a second communications band, including a ground plane; a first conductive element for transmitting/receiving; a second conductive element separate from the first conductive element and the ground plane and having a first portion proximal to, but separated from the first conductive element and a second portion proximal to, but separated from the ground plane; and a switch element for connecting/disconnecting the second conductive element to the ground plane, wherein, the first conductive element, when the switch element disconnects the second conductive element from the ground plane, is operable to transmit/receive in a first communications band and is inoperable to transmit/receive in a second communications band and the first conductive element, when the switch element disconnects the second conductive element from the ground plane, is operable to transmit/receive in the second communications band and inoperable to transmit/receive in the first communications band.





US 20070040754A1

(19) **United States**

(12) **Patent Application Publication**

**Liu et al.**

(10) **Pub. No.: US 2007/0040754 A1**

(43) **Pub. Date: Feb. 22, 2007**

(54) **NOTEBOOK AND ANTENNA STRUCTURE THEREOF**

**Publication Classification**

(75) Inventors: **Chih Kai Liu**, Taipei (TW); **Wei Li Cheng**, Taipei Hsien (TW)

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

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

Correspondence Address:  
**QUINTERO LAW OFFICE, PC**  
2210 MAIN STREET, SUITE 200  
SANTA MONICA, CA 90405 (US)

(57) **ABSTRACT**

An antenna structure includes a ground element, a first transmitting element and a second transmitting element. The first transmitting element transmits a first wireless signal, and comprises a first connecting portion and a first radiation portion. The first connecting portion is connected to the ground element and the first radiation portion. The second transmitting element transmits a second wireless signal and comprises a second connecting portion and a second radiation portion. The second connecting portion is connected to the ground element and the second radiation portion. The second connecting portion is shorter than the first connecting portion, and the second radiation portion is shorter than the first radiation portion.

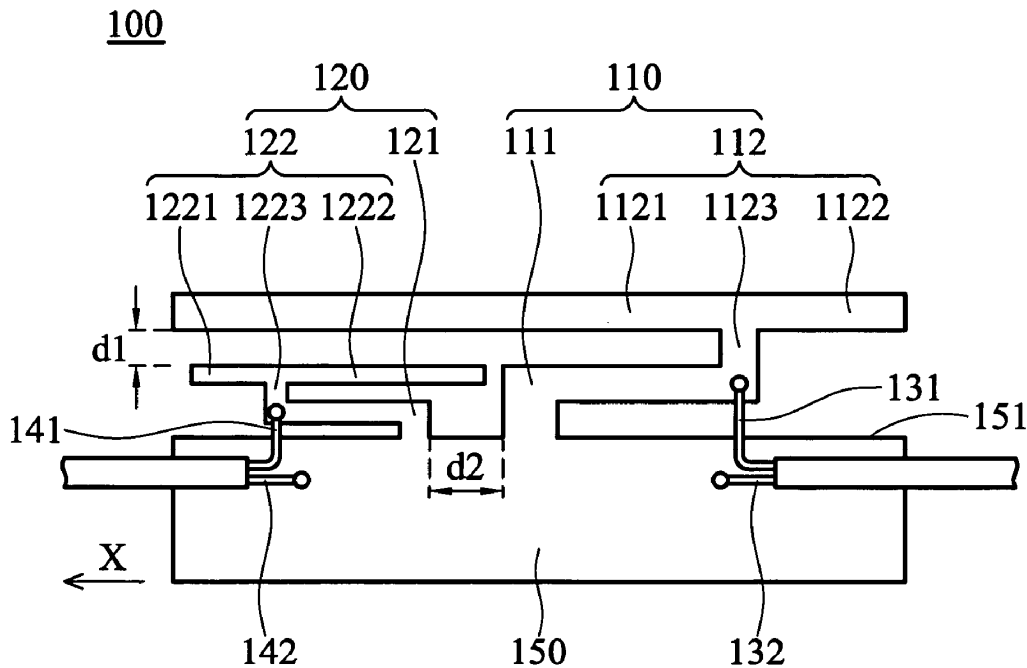
(73) Assignee: **WISTRON NEWEB CORP.**, TAIPEI HSIEN (TW)

(21) Appl. No.: **11/324,048**

(22) Filed: **Dec. 31, 2005**

(30) **Foreign Application Priority Data**

Aug. 16, 2005 (TW)..... TW94127906





US 20070040755A1

(19) **United States**

(12) **Patent Application Publication**  
NA et al.

(10) **Pub. No.: US 2007/0040755 A1**

(43) **Pub. Date: Feb. 22, 2007**

(54) **BUILT-IN ANTENNA MODULE OF WIRELESS COMMUNICATION TERMINAL**

(30) **Foreign Application Priority Data**

Aug. 18, 2005 (KR)..... 10-2005-0075841

(75) Inventors: **GI LYONG NA**, KYUNGKI-DO (KR);  
**WOOK HEE LEE**, KYUNGKI-DO (KR);  
**JAE SUK SUNG**, KYUNGKI-DO (KR)

**Publication Classification**

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

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

Correspondence Address:  
**LOWE HAUPTMAN BERNER, LLP**  
**1700 DIAGONAL ROAD**  
**SUITE 300**  
**ALEXANDRIA, VA 22314 (US)**

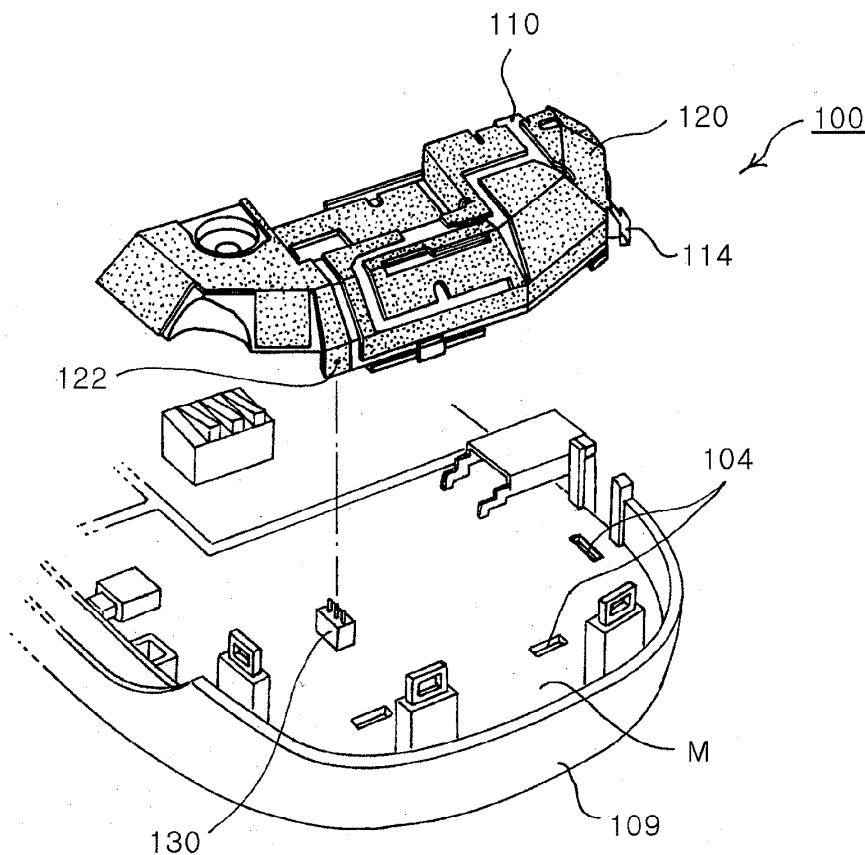
(57) **ABSTRACT**

Disclosed is a built-in antenna module of a wireless communication terminal. The built-in antenna module includes at least one base mounted on the upper surface of a substrate of a main body of the terminal; a radiator line formed in a designated pattern on the external surface of the base according to antenna characteristics; and at least one feeding terminal electrically connecting the radiator line and the substrate. The built-in antenna module simplifies a process for manufacturing the module, reduces production costs, and rapidly copes with the design change of an antenna.

(73) Assignee: **SAMSUNG ELECTRO-MECHANICS CO., LTD.**, KYUNGKI-DO (KR)

(21) Appl. No.: **11/459,111**

(22) Filed: **Jul. 21, 2006**





US 20070040756A1

(19) **United States**

(12) **Patent Application Publication**  
**Song et al.**

(10) **Pub. No.: US 2007/0040756 A1**

(43) **Pub. Date: Feb. 22, 2007**

(54) **TRANSPARENT THIN FILM ANTENNA**

**Publication Classification**

(76) Inventors: **Hyok J. Song**, Los Angeles, CA (US);  
**Tsung Yuan Hsu**, Westlake Village, CA (US);  
**Daniel F. Sievenpiper**, Santa Monica, CA (US);  
**Timothy J. Talty**, Beverly Hills, MI (US);  
**Hui-Pin Hsu**, Northridge, CA (US)

(51) **Int. Cl.**  
**H01Q 1/32** (2006.01)  
(52) **U.S. Cl.** ..... **343/713**

(57) **ABSTRACT**

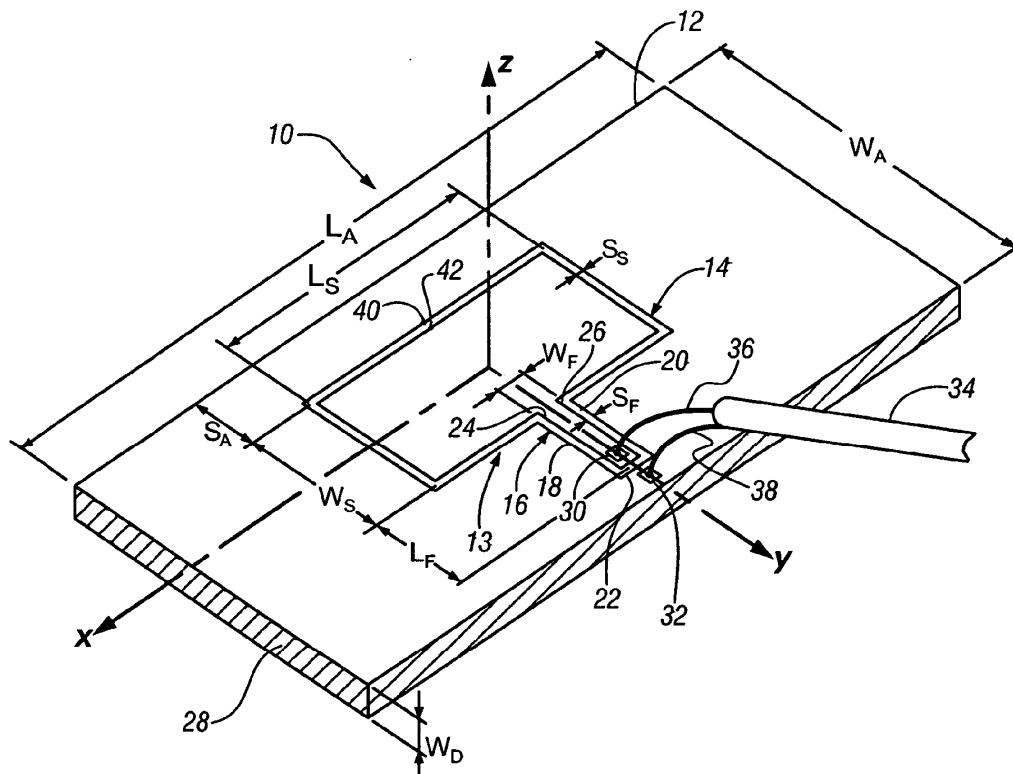
A method for improving the efficiency of antennas having transparent thin-film conductive surfaces, and antennas improved by the method are disclosed. For a selected frequency of antenna operation, values for surface current density in areas distributed over the surface of the thin-film are determined. Regions of the surface containing areas having concentrated current flow are identified based upon the determined values of current density. Antenna efficiency is improved by increasing conductivity in areas of the thin-film surface found to have concentrated current flow. The method enables the improvement of the efficiency of antennas having transparent thin-film conducting surfaces, without unnecessarily obstructing the optical view through the thin-film surfaces of the antennas.

Correspondence Address:

**GENERAL MOTORS CORPORATION**  
**LEGAL STAFF**  
**MAIL CODE 482-C23-B21**  
**P O BOX 300**  
**DETROIT, MI 48265-3000 (US)**

(21) Appl. No.: **11/207,512**

(22) Filed: **Aug. 19, 2005**





US 20070040758A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0040758 A1**

**Dwyer et al.**

(43) **Pub. Date: Feb. 22, 2007**

(54) **DIPOLE ANTENNA**

(52) **U.S. Cl.** ..... **343/792; 343/790**

(75) Inventors: **Bradley Lance Dwyer**, Forest Hill (AU); **Warwick Thomas Armstrong**, Warrandyte (AU); **Robert Andrew Daly**, Chirnside Park (AU); **Mark Anthony Mezzapica**, Mosman (AU)

(57) **ABSTRACT**

Correspondence Address:  
**BAKER & DANIELS LLP**  
111 E. WAYNE STREET  
SUITE 800  
FORT WAYNE, IN 46802 (US)

A method of manufacturing a dipole antenna comprises the steps of forming first and second radiating elements on the surface of a flexible substrate, the radiating elements including respective feed points for making operative electrical contact with a feed line including corresponding first and second feed conductors. The radiating elements are arranged on the substrate such that, in use, an input impedance of the dipole antenna is substantially matched to a characteristic impedance of the feed line over a selected frequency band. The flexible substrate is then formed into a substantially cylindrical shape. The resulting antenna comprises an integral dipole antenna member having radiating elements disposed on a surface of a substantially cylindrical substrate. The antenna avoids the need to separately manufacture the radiating elements, and subsequently to assemble the elements to form a dipole antenna. The antenna is simple to construct, has a relatively low number of mechanical and electrical joints and contacts, and may provide improved mechanical stability and electrical performance as compared with prior art antennas.

(73) Assignee: **RF INDUSTRIES PTY LTD**, North Rocks (AU)

(21) Appl. No.: **11/465,159**

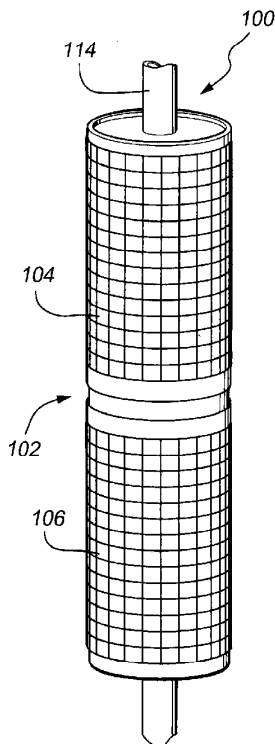
(22) Filed: **Aug. 17, 2006**

(30) **Foreign Application Priority Data**

Aug. 19, 2005 (AU)..... 2005904524

**Publication Classification**

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





US 20070040759A1

(19) **United States**  
 (12) **Patent Application Publication** (10) **Pub. No.: US 2007/0040759 A1**  
 Lee et al. (43) **Pub. Date: Feb. 22, 2007**

(54) **STUB PRINTED DIPOLE ANTENNA (SPDA) HAVING WIDE-BAND AND MULTI-BAND CHARACTERISTICS AND METHOD OF DESIGNING THE SAME**

**Publication Classification**

(51) **Int. Cl.**  
*H01Q 9/28* (2006.01)  
 (52) **U.S. Cl.** ..... 343/795

(76) Inventors: **Sung-Jun Lee**, Gyeonggi-do (KR);  
**Kwang-Chun Lee**, Daejeon (KR)

Correspondence Address:  
**LADAS & PARRY LLP**  
**224 SOUTH MICHIGAN AVENUE**  
**SUITE 1600**  
**CHICAGO, IL 60604 (US)**

(57) **ABSTRACT**

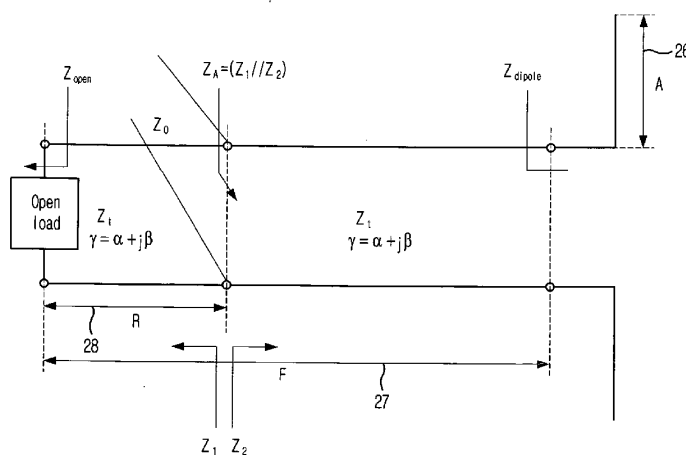
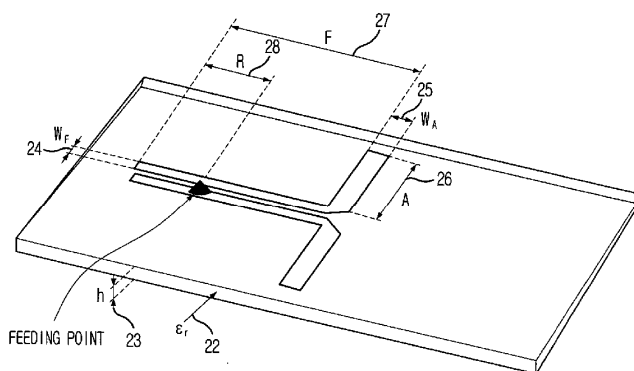
A stub printed antenna (SPDA) and a method of designing the same are provided. The SPDA include: a substrate for transmitting/receiving a signal; a parallel metal strip line disposed at both surfaces of the substrate, and each having one end connected to each of the dipole arms; a stub disposed at both surfaces of the substrate, and connected to the other end of the parallel metal strip line; a coaxial probe connected to the junction of the parallel metal strip line and the stub for feeding signals; a hole for inserting an inner conductor of the coaxial probe; and a contact for connecting to an outer conductor of the coaxial probe.

(21) Appl. No.: **11/504,512**

(22) Filed: **Aug. 15, 2006**

(30) **Foreign Application Priority Data**

Aug. 19, 2005 (KR) ..... 10-2005-0076503  
 Nov. 11, 2005 (KR) ..... 10-2005-0108100





US 20070040760A1

(19) **United States**

(12) **Patent Application Publication**  
Nagaev et al.

(10) **Pub. No.: US 2007/0040760 A1**

(43) **Pub. Date: Feb. 22, 2007**

(54) **DIRECTIONAL ANTENNA SYSTEM WITH MULTI-USE ELEMENTS**

(52) **U.S. Cl. .... 343/876; 343/812**

(76) Inventors: **Farid I. Nagaev**, St. Petersburg (RU);  
**Oleg Y. Abramov**, St. Petersburg (RU);  
**Pertti Visuri**, Fallbrook, CA (US)

(57) **ABSTRACT**

Correspondence Address:  
**PROCOPIO, CORY, HARGREAVES & SAVITCH LLP**  
530 B STREET  
SUITE 2100  
SAN DIEGO, CA 92101 (US)

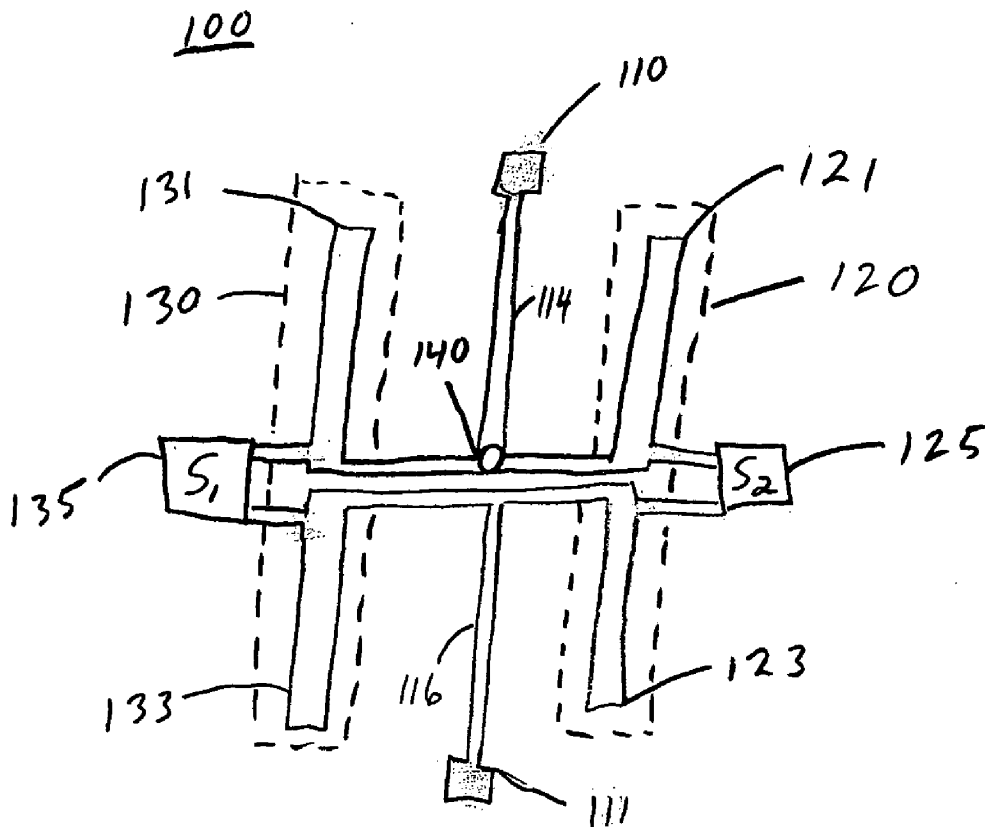
Systems and methods for a wireless communication device having a switched multi-beam antenna and methods for manufacturing the same are described. One system and method includes a plurality of antenna elements. Groups of the antenna elements cooperate to form active one or more antenna elements while other groups of the antenna elements cooperate to form a reflector for the active antenna elements. This creates a directed transmission or direction of positive gain for the antenna system. The same group of antenna elements can be switched so that other antenna elements cooperate to form the active element while another group forms a reflector for the active elements thereby providing a different direction of positive gain. The system can be used for various wireless communication protocols and at various frequency ranges.

(21) Appl. No.: **11/209,352**

(22) Filed: **Aug. 22, 2005**

**Publication Classification**

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







US 20070040761A1

(19) **United States**

(12) **Patent Application Publication**  
**Waterhouse**

(10) **Pub. No.: US 2007/0040761 A1**

(43) **Pub. Date: Feb. 22, 2007**

(54) **METHOD AND APPARATUS FOR WIDEBAND OMNI-DIRECTIONAL FOLDED BEVERAGE ANTENNA**

**Publication Classification**

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

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

(75) Inventor: **Rodney B. Waterhouse**, Columbia, MD (US)

(57) **ABSTRACT**

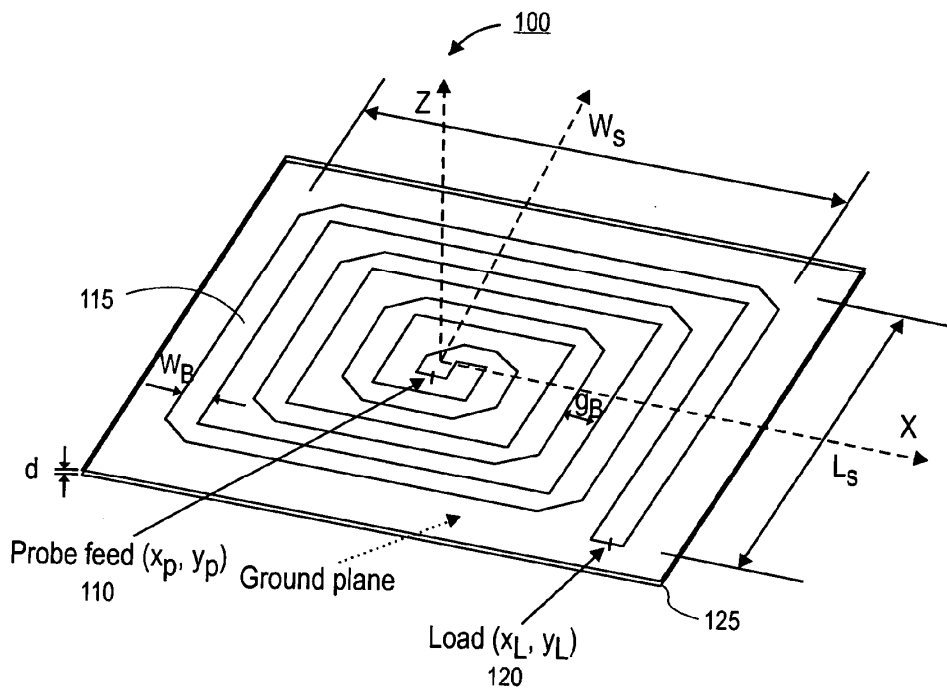
Correspondence Address:  
**Min, Hsieh & Hack, L.L.P.**  
**c/o PortfolioIP**  
**P.O. Box 52050**  
**Minneapolis, MN 55402 (US)**

An embodiment generally relates to a wave antenna. The wave antenna includes a grounded substrate and a probe feed configured to be substantially centered within the grounded substrate. The wave antenna also includes a load configured to be a linear distance from the probe feed and a conductor trace configured to connect the probe feed and the load. The pattern for the conductor trace is substantially a spiral and the radiation response of the wave antenna is substantially omni-directional.

(73) Assignee: **Pharad, LLC.**

(21) Appl. No.: **11/203,999**

(22) Filed: **Aug. 16, 2005**





US 20070041275A1

(19) **United States**

(12) **Patent Application Publication**  
**Barras et al.**

(10) **Pub. No.: US 2007/0041275 A1**

(43) **Pub. Date: Feb. 22, 2007**

(54) **WRISTWATCH WITH ANTENNA**

**Publication Classification**

(76) Inventors: **David Barras**, Schlieren (CH);  
**Jean-Philippe Rebeaud**, Cressier (CH);  
**Francois Klopfenstein**, Delemont (CH)

(51) **Int. Cl.**  
**G04B 47/06** (2006.01)  
**G04B 37/12** (2006.01)  
**H01Q 1/42** (2006.01)

(52) **U.S. Cl.** ..... **368/14**; 343/872; 368/278

Correspondence Address:  
**SUGHRUE MION, PLLC**  
**2100 PENNSYLVANIA AVENUE, N.W.**  
**SUITE 800**  
**WASHINGTON, DC 20037 (US)**

(57) **ABSTRACT**

There is disclosed a portable electronic instrument, such as a wristwatch (1), including a case (2) enclosing an electronic module (6) and a display device (5), a crystal (3) fitted onto the case (2), an electric power supply source (4) housed in the case (2) and powering the electronic module (6) and the display device (5), and an antenna (20) for receiving and/or transmitting radio-frequency signals electrically connected to the electronic module (6).

The case (2) includes an exterior body (4) including a bottom (4a) and lateral walls (4b) and a bezel element (7) fitted onto the exterior body (4) and supporting the crystal (3).

The antenna (20) rests on an outer face (7a) of the bezel element (7).

(21) Appl. No.: **10/571,198**

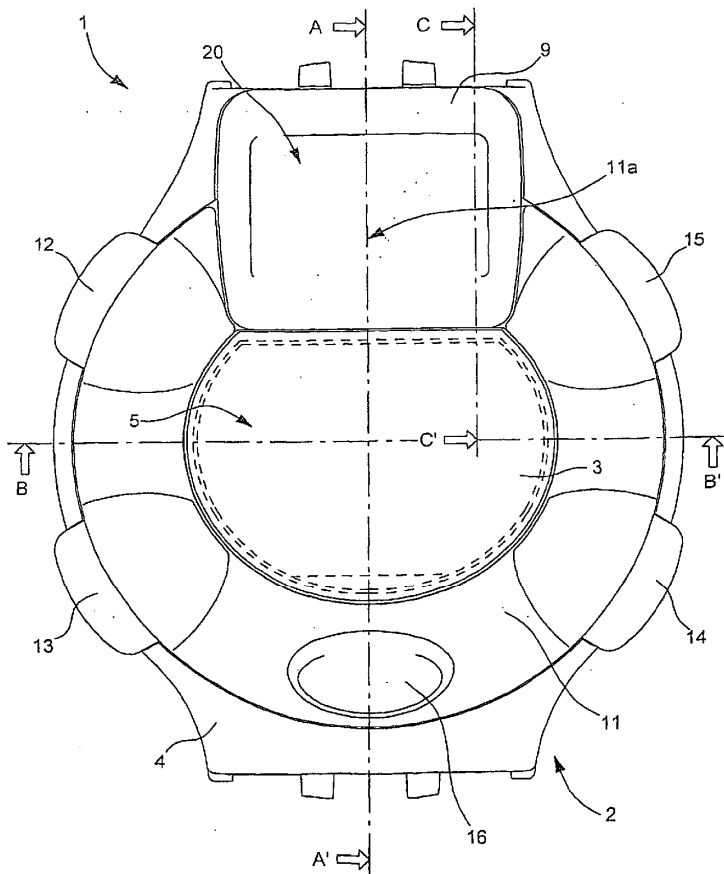
(22) PCT Filed: **Jun. 17, 2002**

(86) PCT No.: **PCT/EP02/06669**

§ 371(c)(1),  
(2), (4) Date: **Mar. 9, 2006**

(30) **Foreign Application Priority Data**

Jul. 5, 2001 (EP) ..... 01202593.8





US 20070046542A1

(19) **United States**

(12) **Patent Application Publication**  
**Andrenko et al.**

(10) **Pub. No.: US 2007/0046542 A1**

(43) **Pub. Date: Mar. 1, 2007**

(54) **PLANAR ANTENNA**

(30) **Foreign Application Priority Data**

Aug. 29, 2005 (JP) ..... 2005-247963

(75) Inventors: **Andrey Andrenko**, Kawasaki (JP);  
**Toru Maniwa**, Kawasaki (JP)

**Publication Classification**

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

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

Correspondence Address:  
**BINGHAM MCCUTCHEN LLP**  
3000 K STREET, NW  
BOX IP  
WASHINGTON, DC 20007 (US)

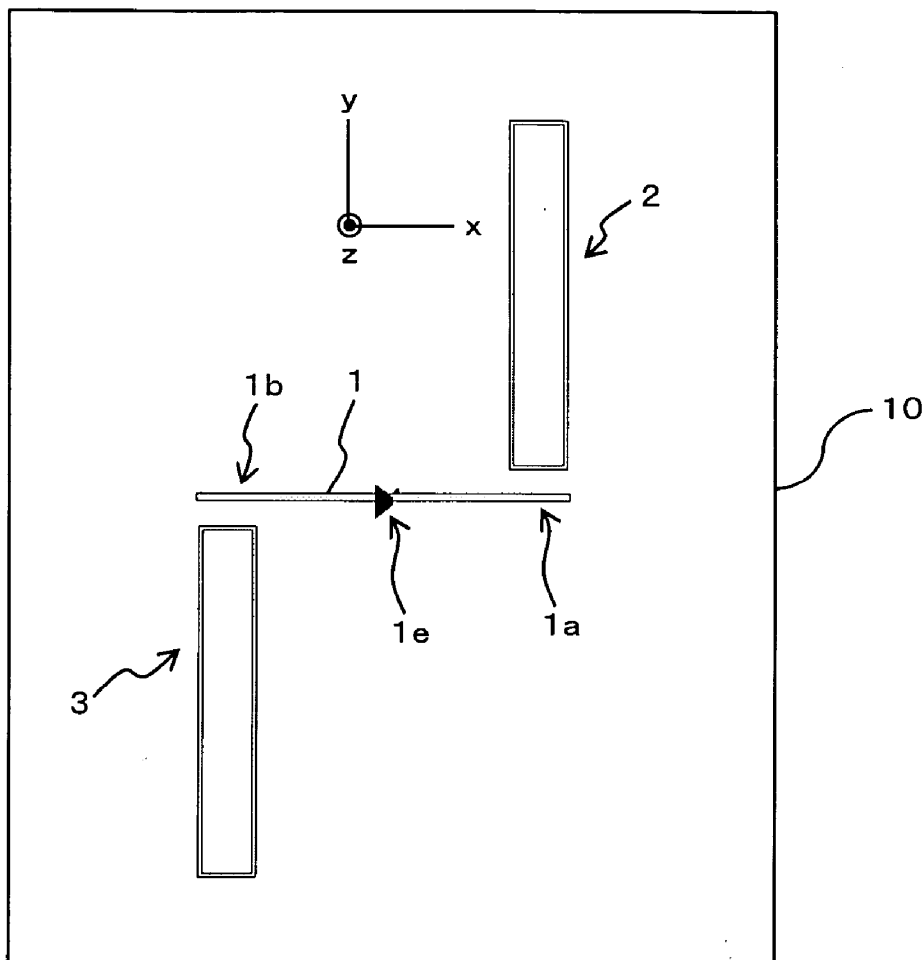
(57) **ABSTRACT**

The present planar antenna include: a linear antenna element to which electric power is to be supplied and a loop-shaped parasitic antenna element placed in the vicinity of said linear antenna element, which are provided on one side of a dielectric substrate. This simple arrangement makes it possible to provide a planar antenna with good circular polarization characteristics.

(73) Assignee: **Fujitsu Limited**

(21) Appl. No.: **11/287,234**

(22) Filed: **Nov. 28, 2005**





US 20070046543A1

(19) **United States**

(12) **Patent Application Publication**  
**Choi et al.**

(10) **Pub. No.: US 2007/0046543 A1**

(43) **Pub. Date: Mar. 1, 2007**

(54) **PIFA, RFID TAG USING THE SAME AND ANTENNA IMPEDANCE ADJUSTING METHOD THEREOF**

**Publication Classification**

(51) **Int. Cl.**  
**H01Q 1/38** (2006.01)  
(52) **U.S. Cl.** ..... **343/700 MS; 343/702**

(76) Inventors: **Won-Kyu Choi**, Gyeonggi-do (KR);  
**Nak-Seon Seong**, Daejeon (KR);  
**Cheol-Sig Pyo**, Daegu (KR); **Jong-Suk Chae**, Daejeon (KR)

(57) **ABSTRACT**

Provided are a Planar Inverted-F Antenna (PIFA), a Radio Frequency Identification (RFID) tag using the PIFA. The present invention miniaturizes the antenna by using a meander line extended from a radiating edge of a radiation antenna and adjusting a resonant frequency of the antenna, and it performs impedance matching by adjusting capacitive reactance of the antenna. Also, it can perform impedance matching by using a stub having a slot formed therein and adjusting inductive reactance and capacitive reactance of the antenna. The present invention miniaturizes the antenna by using a plurality of shorting plates for shorting the radiation patch from a grounding surface and adjusting the resonant frequency of the antenna. The present invention also provides an inexpensive PIFA antenna with an excellent radiation efficiency by forming the radiation patch in the form of metal sheet in the antenna and floating the radiation patch in the air.

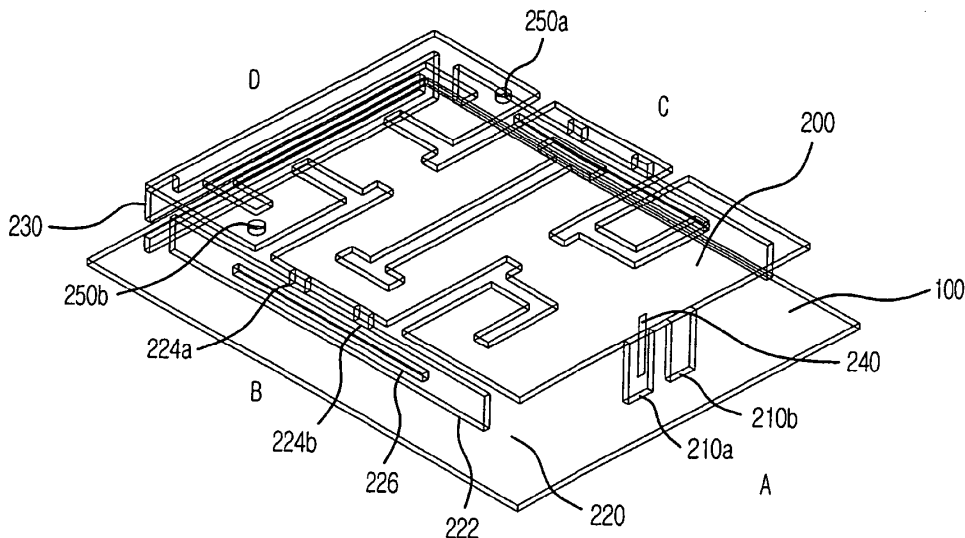
Correspondence Address:  
**BLAKELY SOKOLOFF TAYLOR & ZAFMAN**  
**12400 WILSHIRE BOULEVARD**  
**SEVENTH FLOOR**  
**LOS ANGELES, CA 90025-1030 (US)**

(21) Appl. No.: **11/297,517**

(22) Filed: **Dec. 7, 2005**

(30) **Foreign Application Priority Data**

Dec. 8, 2004 (KR) ..... 10-2004-0103087  
Jun. 9, 2005 (KR) ..... 10-2005-0049266





US 20070046544A1

(19) **United States**

(12) **Patent Application Publication**  
**MUROFUSHI et al.**

(10) **Pub. No.: US 2007/0046544 A1**

(43) **Pub. Date: Mar. 1, 2007**

(54) **COMPOSITE ANTENNA**

**Publication Classification**

(75) Inventors: **NOBUO MUROFUSHI**, Shizuoka (JP); **Kouichi Sano**, Shizuoka (JP); **Yasuhito Kiji**, Shizuoka (JP); **Yasuo Matsumoto**, Shizuoka (JP)

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

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

Correspondence Address:  
**DLA PIPER US LLP**  
**P. O. BOX 9271**  
**RESTON, VA 20195 (US)**

(57) **ABSTRACT**

(73) Assignee: **TOSHIBA TEC KABUSHIKI KAISHA**, TOKYO (JP)

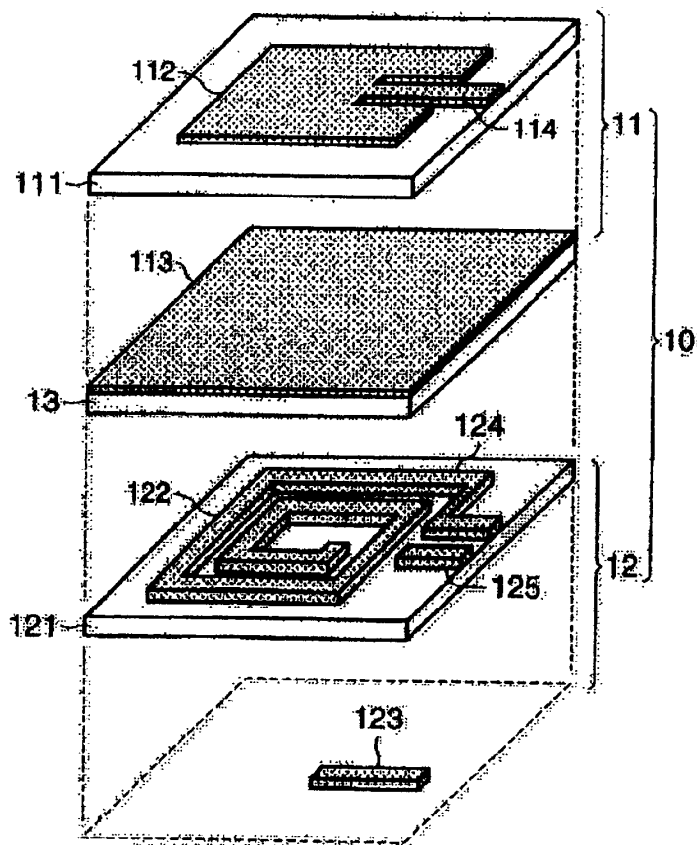
A composite antenna includes a first antenna structure and a second antenna structure integrally combined with the first antenna structure to operate under different frequency bands respectively that are used in different radio transmission systems such that the first antenna structure has a first conductive layer to operate under a first frequency band and the second antenna structure has a second conductive layer a thickness of which is thicker than that of the first conductive layer to operate under a second frequency band lower than the first frequency band.

(21) Appl. No.: **11/465,293**

(22) Filed: **Aug. 17, 2006**

(30) **Foreign Application Priority Data**

Aug. 25, 2005 (JP) ..... 2005-244301





US 20070046545A1

(19) **United States**

(12) **Patent Application Publication**  
**SUNG et al.**

(10) **Pub. No.: US 2007/0046545 A1**

(43) **Pub. Date: Mar. 1, 2007**

(54) **RESONANT FREQUENCY TUNABLE ANTENNA**

(30) **Foreign Application Priority Data**

Aug. 25, 2005 (KR)..... 10-2005-78449

(75) Inventors: **Jae Suk SUNG, YONGIN (KR); Tae Sung KIM, SEOUL (KR)**

**Publication Classification**

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

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

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**LOWE HAUPTMAN BERNER, LLP**  
**1700 DIAGONAL ROAD**  
**SUITE 300**  
**ALEXANDRIA, VA 22314 (US)**

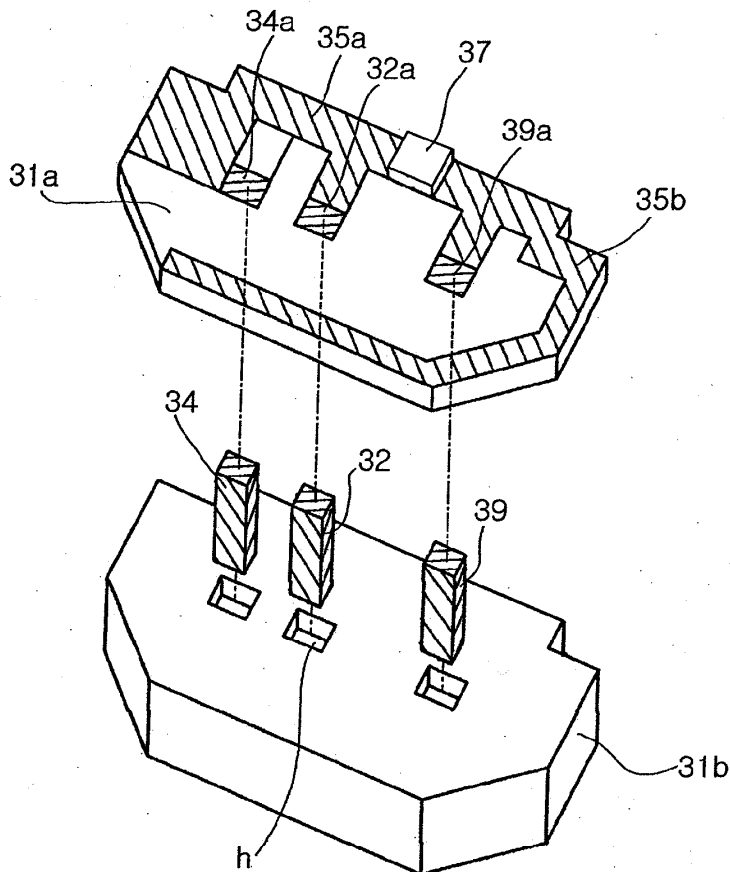
(57) **ABSTRACT**

In a resonant frequency tunable antenna, a body includes a dielectric substance and a magnetic substance. A first radiator is disposed on a first predetermined area of the body and has a feeding pin connected thereto. A second radiator is disposed on a second predetermined area of the body. Also, a switch is disposed on the body to be connected between the first and second radiators. In addition, a power supply pin is electrically connected to the switch and extends downward through the body.

(73) Assignee: **SAMSUNG ELECTRO-MECHANICS CO., LTD., KYUNGKI-DO (KR)**

(21) Appl. No.: **11/466,889**

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





US 20070046546A1

(19) **United States**

(12) **Patent Application Publication**  
**Shimoda**

(10) **Pub. No.: US 2007/0046546 A1**

(43) **Pub. Date: Mar. 1, 2007**

(54) **MONOPOLE ANTENNA**

**Publication Classification**

(75) Inventor: **Hideaki Shimoda**, Tokyo (JP)

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

Correspondence Address:  
**OLIFF & BERRIDGE, PLC**  
**P.O. BOX 19928**  
**ALEXANDRIA, VA 22320 (US)**

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

(57) **ABSTRACT**

(73) Assignee: **TDK CORPORATION**, Tokyo (JP)

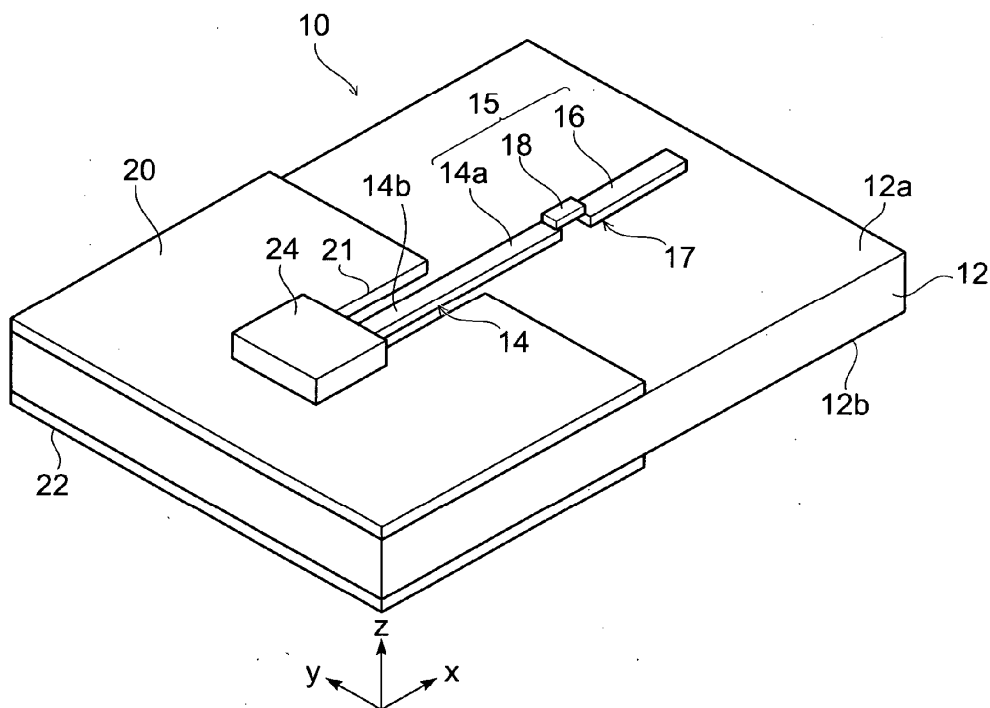
A monopole antenna comprising an antenna conductor to transmit or receive a radio wave, and an inductor either inserted in the antenna conductor or connected to an end of the antenna conductor. The inductor includes a first conductor electrically connected to the antenna conductor, and a magnetic material adjacent to the first conductor. The permeability of the magnetic material varies with a negative gradient with respect to the frequency of the radio wave.

(21) Appl. No.: **11/508,234**

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

(30) **Foreign Application Priority Data**

Aug. 31, 2005 (JP) ..... 2005-251192  
Sep. 26, 2005 (JP) ..... 2005-278295





US 20070046548A1

(19) **United States**

(12) **Patent Application Publication**  
**Pros et al.**

(10) **Pub. No.: US 2007/0046548 A1**

(43) **Pub. Date: Mar. 1, 2007**

(54) **MULTI-BAND MONOPOLE ANTENNAS FOR MOBILE COMMUNICATIONS DEVICES**

**Publication Classification**

(75) Inventors: **Jaume Anguera Pros**, Castellon (ES);  
**Carles Puente Baliarda**, Barcelona (ES)

(51) **Int. Cl.**  
**H01Q 1/24** (2006.01)  
**H01Q 1/36** (2006.01)  
(52) **U.S. Cl.** ..... **343/702; 343/895**

Correspondence Address:  
**JENKENS & GILCHRIST, PC**  
**1445 ROSS AVENUE**  
**SUITE 3200**  
**DALLAS, TX 75202 (US)**

(57) **ABSTRACT**

(73) Assignee: **FRACTUS S.A.**, Barcelona (ES)

(21) Appl. No.: **10/584,442**

(22) PCT Filed: **Jan. 28, 2005**

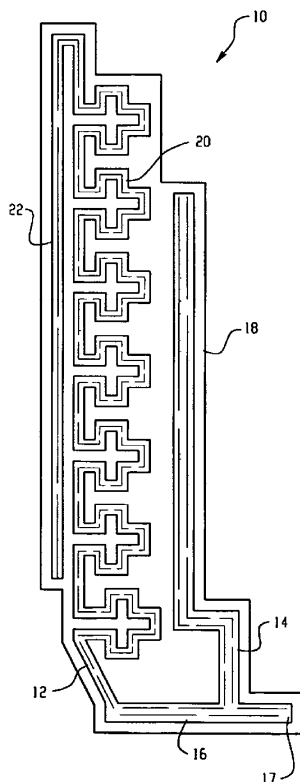
(86) PCT No.: **PCT/EP05/00880**

§ 371(c)(1),  
(2), (4) Date: **Jul. 18, 2006**

Antennas for use in mobile communication devices are disclosed. The antennas disclosed can include a substrate with a base, a top, a front side and a back side; a first conductor can be located on the first side of the antenna substrate; and a second conductor can be located on the second side of the antenna substrate. The conductors can have single or multiple branches. If a conductor is a single branch it can, for example, be a spiral conductor or a conducting plate. If a conductor has multiple branches, each branch can be set up to receive a different frequency band. A conductor with multiple branches can have a linear branch and a space-filling or grid dimension branch. A conducting plate can act as a parasitic reflector plane to tune or partially tune the resonant frequency of another conductor. The first and second conductors can be electrically connected.

**Related U.S. Application Data**

(60) Provisional application No. 60/540,450, filed on Jan. 30, 2004.







US 20070046554A1

(19) **United States**

(12) **Patent Application Publication**  
**Fukuchi**

(10) **Pub. No.: US 2007/0046554 A1**

(43) **Pub. Date: Mar. 1, 2007**

(54) **WIDEBAND ANTENNA**

**Publication Classification**

(75) Inventor: **Keisuke Fukuchi**, Hitachi (JP)

(51) **Int. Cl.**

**H01Q 13/10** (2006.01)

Correspondence Address:

**FOLEY AND LARDNER LLP**

**SUITE 500**

**3000 K STREET NW**

**WASHINGTON, DC 20007 (US)**

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

(57)

**ABSTRACT**

(73) Assignee: **HITACHI CABLE, LTD.**

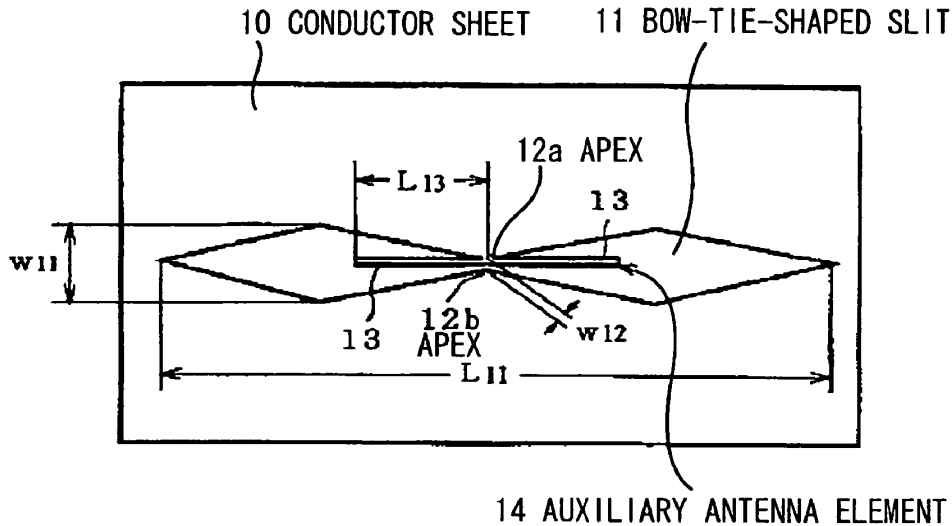
A wideband antenna has: a rectangular conductor sheet; a bow-tie-shaped slit formed in the rectangular conductor sheet, the rectangular conductor sheet having two apex portions defined by the bow-tie-shaped slit, the two apex portions being opposite to each other in the middle of the bow-tie-shaped slit; an auxiliary antenna element formed to extend along the bow-tie-shaped slit on both sides of one of the two apex portions; a power-feeding portion formed at the one of the two apex portions; and a grounding portion formed at an other of the two apex portions.

(21) Appl. No.: **11/444,538**

(22) Filed: **Jun. 1, 2006**

(30) **Foreign Application Priority Data**

Aug. 31, 2005 (JP) ..... 2005-252142







US 20070046556A1

(19) **United States**

(12) **Patent Application Publication**  
**Waterhouse**

(10) **Pub. No.: US 2007/0046556 A1**

(43) **Pub. Date: Mar. 1, 2007**

(54) **SYSTEM AND APPARATUS FOR A WIDEBAND OMNI-DIRECTIONAL ANTENNA**

**Publication Classification**

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

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

(75) Inventor: **Rodney B. Waterhouse**, Columbia, MD (US)

(57) **ABSTRACT**

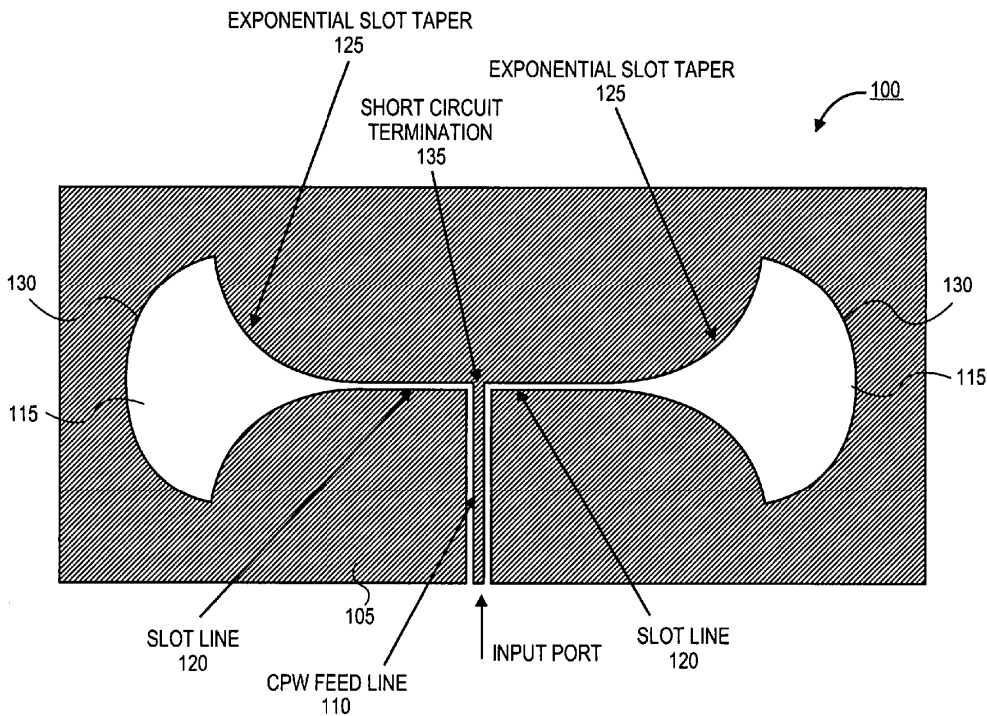
Correspondence Address:  
**Min, Hsieh & Hack, L.L.P.**  
**c/o PortfolioIP**  
**P.O. Box 52050**  
**Minneapolis, MN 55402 (US)**

Embodiments generally relate to an antenna. The antenna includes at least two slot radiators, where each slot radiator has an input port and a profile that has been defined to optimize the return loss bandwidth of the antenna. The antenna also includes a transmission line and a circuit configured to connect the transmission line and the at least two slot radiators at the respective input ports. The circuit is also configured to match the impedance of the at least two slot radiators and the co-planar waveguide.

(73) Assignee: **Pharad, LLC**

(21) Appl. No.: **11/212,722**

(22) Filed: **Aug. 29, 2005**





US 20070046557A1

(19) **United States**

(12) **Patent Application Publication**  
**Chen et al.**

(10) **Pub. No.: US 2007/0046557 A1**

(43) **Pub. Date: Mar. 1, 2007**

(54) **WIDEBAND PLANAR DIPOLE ANTENNA**

(52) **U.S. Cl. .... 343/795; 343/895**

(76) Inventors: **Oscal Tzyh-Chiang Chen**, Yonghe City (TW); **Timothy Tian-Shyi Chen**, Jhudong Township (TW); **Kuo-Yu Chen**, Tainan City (TW); **Chih-Chi Ling**, Taipei City (TW); **Min-Chin Lee**, Yuanchang Township (TW)

(57) **ABSTRACT**

Correspondence Address:  
**SINORICA, LLC**  
**528 FALLSGROVE DRIVE**  
**ROCKVILLE, MD 20850 (US)**

A wideband planar dipole antenna comprises a substrate and two antenna bodies. Metal conductor is printed on the single surface/double surfaces of the substrate to form the antenna bodies. With a dipole antenna architecture, the antenna bodies are manufactured as loop structures similar to concentric circles. The loop structures can be of rectangular or circular shapes. Loops of metal conductors with different lengths resonate to obtain similar but different frequencies. Each path of every antenna body can be finally connected with a metal conductor sheet capable of changing to any shape. Every path can interfere with adjacent paths to achieve the wideband effect. An asymmetric mechanism can be added in one of the antenna bodies. Besides letting the antenna have the resonance effect of the symmetric part, the loop path at the signal source can also be increased to enhance the receiving performance of the antenna.

(21) Appl. No.: **11/467,537**

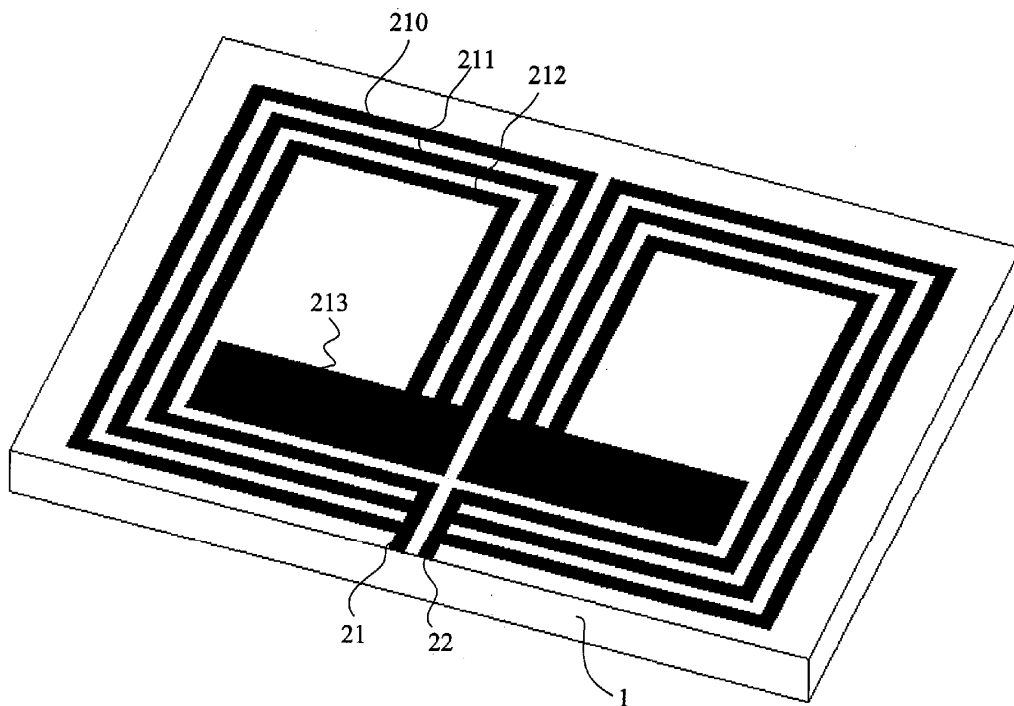
(22) Filed: **Aug. 25, 2006**

(30) **Foreign Application Priority Data**

Aug. 26, 2005 (TW)..... 94214795

**Publication Classification**

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





US 20070046558A1

(19) **United States**

(12) **Patent Application Publication**  
**Tillery**

(10) **Pub. No.: US 2007/0046558 A1**

(43) **Pub. Date: Mar. 1, 2007**

(54) **METHOD AND SYSTEM FOR INCREASING THE ISOLATION CHARACTERISTIC OF A CROSSED DIPOLE PAIR DUAL POLARIZED ANTENNA**

**Publication Classification**

(51) **Int. Cl.**  
**H01Q 21/26** (2006.01)  
(52) **U.S. Cl.** ..... **343/797; 343/798**

(75) Inventor: **James K. Tillery**, Woodstock, GA (US)

(57) **ABSTRACT**

Correspondence Address:  
**KING & SPALDING LLP**  
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A method and system for increasing an isolation characteristic of a crossed dipole pair, dual polarized antenna can include a feedback system comprising a feedback element for generating a feedback signal in response to a transmitted RF signal produced by each radiating elements of a crossed dipole pair, dual polarized antenna. The feedback element may improve the isolation characteristic of RF signals between two different polarizations. The dimensions and spacing of the feedback element relative to an antenna may provide for optimal feedback signals. The feedback element can have a length, width, and thickness wherein the length and width are usually larger than the thickness dimension. A fastening mechanism of the inventive feedback system for coupling the feedback element to the antenna can include materials that allow for high speed production of antenna arrays using with the feedback system.

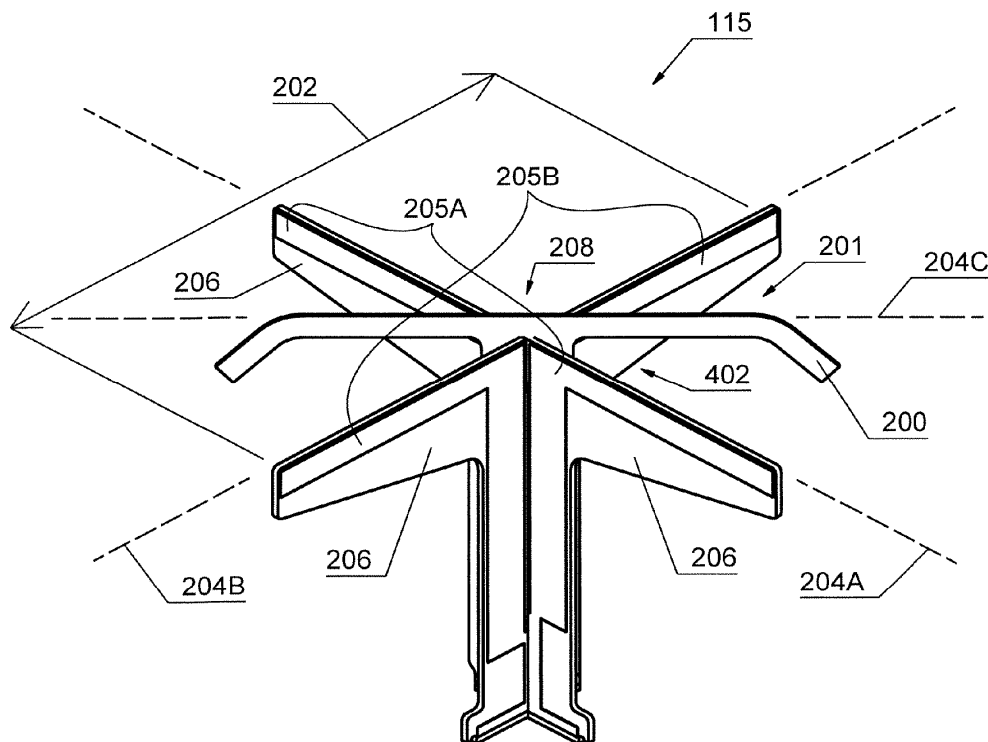
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(21) Appl. No.: **11/467,603**

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

**Related U.S. Application Data**

(60) Provisional application No. 60/711,959, filed on Aug. 26, 2005.





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**Kim**

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(43) **Pub. Date: Mar. 1, 2007**

(54) **MOBILE TERMINAL WITH INTERNAL  
ANTENNA STRUCTURE HAVING A SOUND  
RESONANCE CHAMBER**

(30) **Foreign Application Priority Data**

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**Publication Classification**

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

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

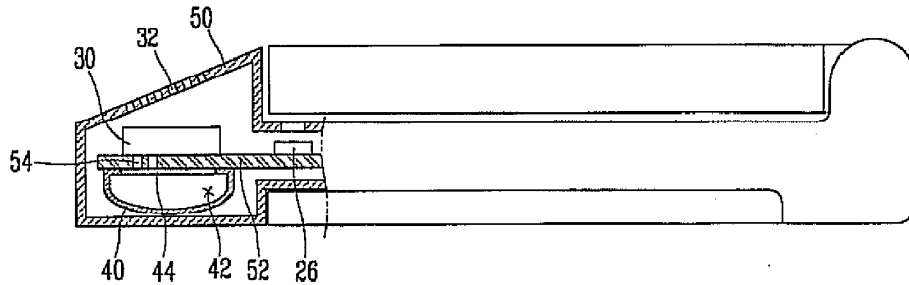
(57) **ABSTRACT**

A mobile terminal comprising a sound output unit; and an internal antenna in communication with and located behind the sound output unit, wherein the internal antenna is adapted to allow transmission and reception of radio frequency signals, and formed to have a resonance chamber therein to allow resonance of sounds generated by the sound output unit.

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

(21) Appl. No.: **11/467,124**

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





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**Yang et al.**

(10) **Pub. No.: US 2007/0049917 A1**

(43) **Pub. Date: Mar. 1, 2007**

(54) **FLOATING SLEEVE MICROWAVE ANTENNA FOR TUMOR ABLATION**

(21) Appl. No.: **11/210,063**

(22) Filed: **Aug. 23, 2005**

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**Publication Classification**

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**A61B 18/18** (2007.01)

(52) **U.S. Cl.** ..... **606/33; 607/101; 607/156**

(57) **ABSTRACT**

An antenna for microwave tumor ablation provides coaxial antenna conductors surrounded by an insulated sleeve of length and size promoting destructive interference of axial microwave energy passing inside and outside of the sleeve to limit the tail of SAR power toward the skin.

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