



US 20100164808A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0164808 A1**

(43) **Pub. Date: Jul. 1, 2010**

(54) **MULTI-BAND HAC COMPATIBLE ANTENNA MODULE**

Publication Classification

(76) Inventors: **Daniel CHANG**, Pa-Te City (TW);
Chia-Lun TANG, Pa-Te City (TW);
Yan-Wen ZHAO, Chengdu (CN);
Jianliang SHEN, Chengdu (CN)

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

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

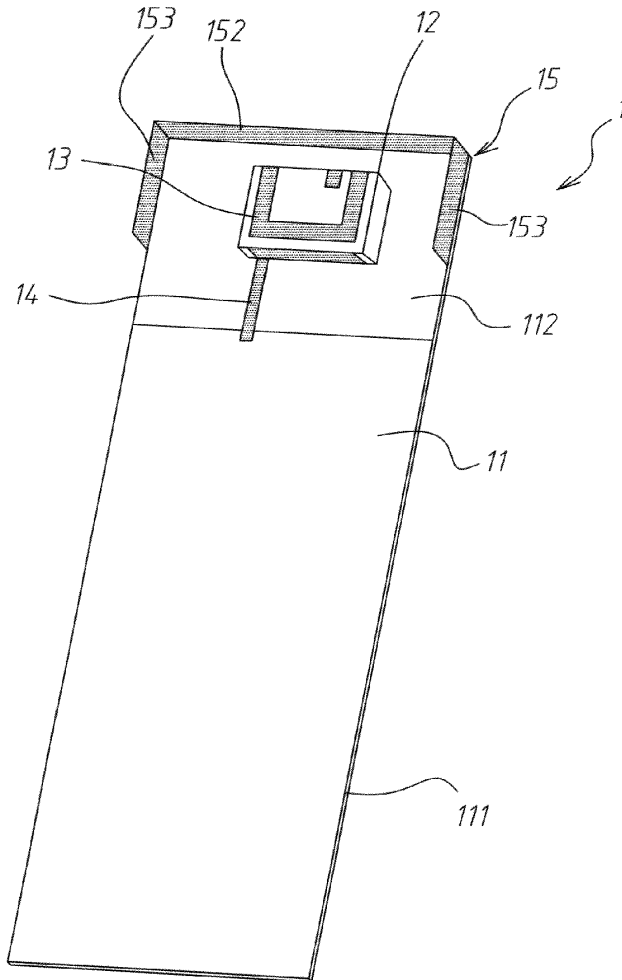
(57) **ABSTRACT**

A multi-band HAC compatible antenna module having a metal shield arranged around the built-in antenna for resonant coupling with the antenna to lower electromagnetic interference and to improve hearing aids compatibility characteristic. When compared with a reference antenna without metal shield, the multi-band HAC compatible antenna module shows 3 dB-4 dB HAC improvement in GSM850 and GSM900, and 1 dB HAC improvement in DCS and PCS bands.

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(21) Appl. No.: **12/344,718**

(22) Filed: **Dec. 29, 2008**





US 20100164809A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0164809 A1**

(43) **Pub. Date: Jul. 1, 2010**

(54) **CIRCULAR POLARIZATION ANTENNA
STRUCTURE WITH A DUAL-LAYER
CERAMIC AND METHOD FOR
MANUFACTURING THE SAME**

Publication Classification

(51) **Int. Cl.**
H01Q 1/38 (2006.01)
H01P 11/00 (2006.01)

(75) **Inventors:** **TA-FU CHENG**, MIAOLI
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WANG**, HSINCHU COUNTY
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HSINCHU CITY (TW)

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

(57) **ABSTRACT**

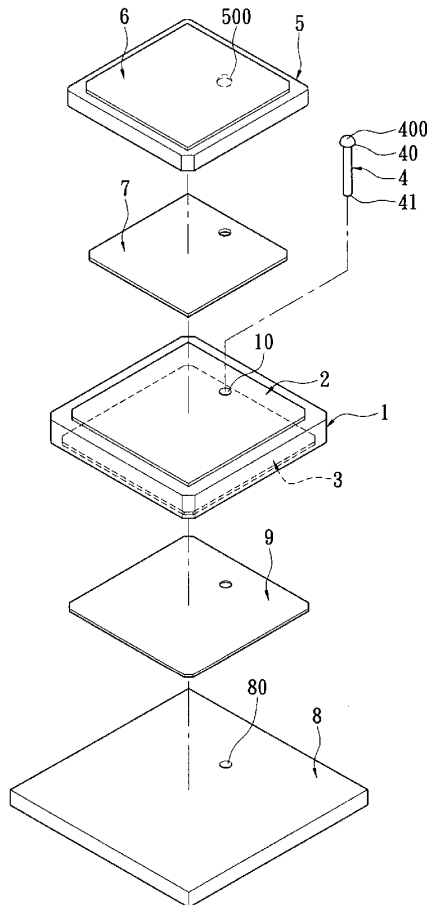
A circular polarization antenna structure with a dual-layer ceramic includes a first hard dielectric body, a first metal layer, a grounding layer, an antenna feed pin, a second hard dielectric body, a second metal layer and an adhesive element. The first metal layer and the grounding layer dispose on a top surface and a bottom surface of the first hard dielectric body. The antenna feed pin passes through the through hole of the first hard dielectric body, the top side of the antenna feed pin is fixed on the top surface of the first hard dielectric body, and the bottom side of the antenna feed pin extends outwards from the bottom surface of the first hard dielectric body. The second hard dielectric body disposes above the top side of the first hard dielectric body. The second metal layer disposes on the top surface of the second hard dielectric body.

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(73) **Assignee:** **INPAQ TECHNOLOGY CO.,
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(21) **Appl. No.:** **12/345,969**

(22) **Filed:** **Dec. 30, 2008**





US 20100164811A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0164811 A1**

(43) **Pub. Date: Jul. 1, 2010**

(54) **SOLID ANTENNA**

(30) **Foreign Application Priority Data**

(75) Inventors: **Shih-Chieh Cheng, Hsinchu (TW);
Kuo Chang Lo, Hsinchu (TW)**

Dec. 29, 2008 (TW) 97151300

Publication Classification

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

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

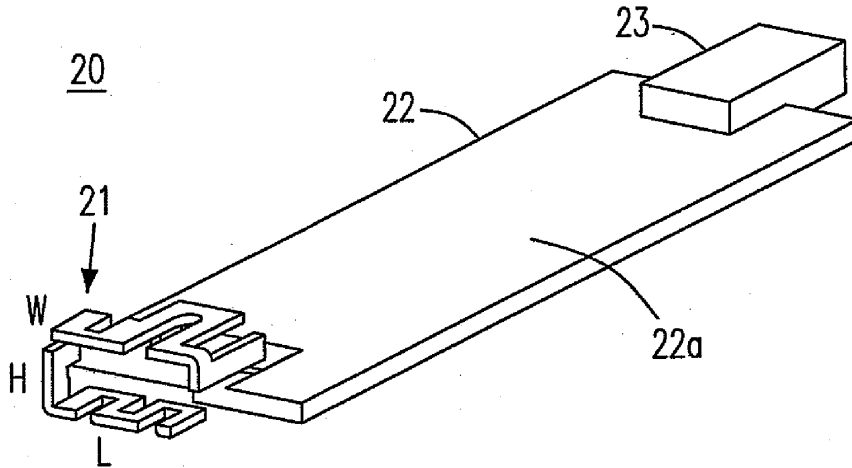
(57) **ABSTRACT**

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

A solid antenna is provided in the present invention. The solid antenna configured on a substrate having an electronic circuit disposed thereon, including: an antenna body having at least one bending portion and a signal feed-in portion by which the antenna body is electrically connected to the electronic circuit and secured to the substrate, wherein the at least one bending portion is configured to be across the substrate.

(21) Appl. No.: **12/644,795**

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





US 20100164816A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0164816 A1**

(43) **Pub. Date: Jul. 1, 2010**

(54) **ANTENNA STRUCTURE OF RECTANGULAR LOOP ANTENNA**

(86) PCT No.: **PCT/JP2008/055883**

(75) Inventors: **Hiroshi Kuribayashi**,
Utsunomiya-shi, (JP); **Satoru Komatsu**,
Utsunomiya-shi, (JP); **Hideaki Oshima**,
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§ 371 (c)(1),
(2), (4) Date: **Sep. 25, 2009**

(30) **Foreign Application Priority Data**

Mar. 27, 2007 (JP) 2007-082171

Publication Classification

Correspondence Address:
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(51) **Int. Cl.**
H01Q 1/32 (2006.01)
H01Q 7/00 (2006.01)

(52) **U.S. Cl.** **343/713; 343/866**

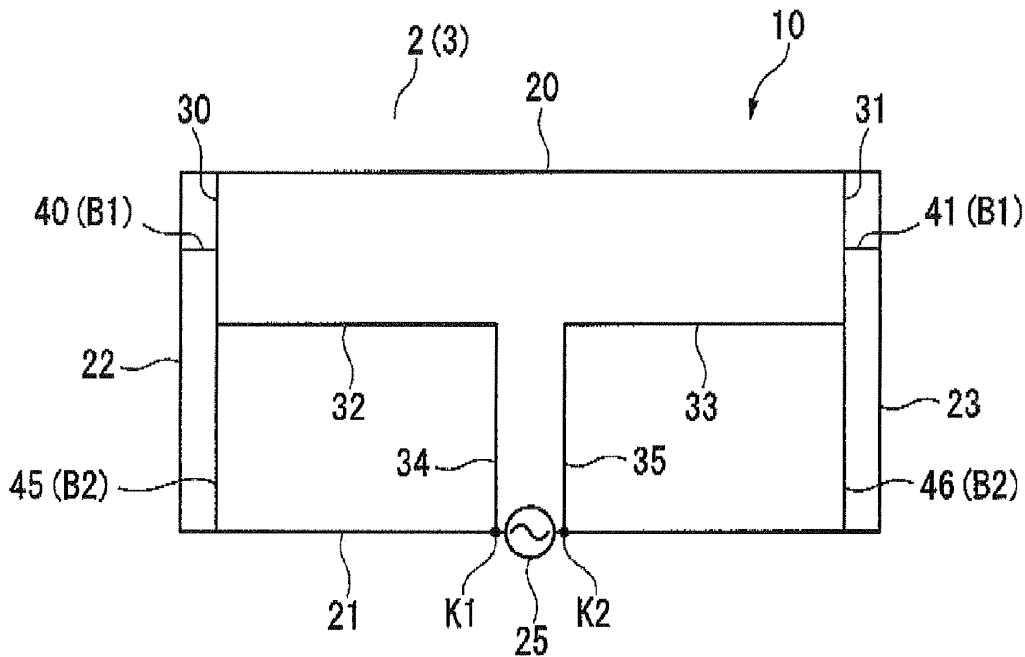
(57) **ABSTRACT**

(73) Assignees: **HONDA MOTOR CO., LTD.**,
Tokyo (JP); **NIPPON SHEET GLASS COMPANY, LIMITED**,
Minato-ku, Tokyo (JP)

An antenna structure of a rectangular loop antenna that is provided on a window glass of a vehicle, includes: another loop portion that is provided inside a rectangular loop portion of the rectangular loop antenna and has a path partially shared with the rectangular loop portion; and a bypass unit that connects the path of the another loop portion and the path of the rectangular loop portion which is not shared with the path of the another loop portion.

(21) Appl. No.: **12/593,223**

(22) PCT Filed: **Mar. 27, 2008**





US 20100164819A1

(19) **United States**

(12) **Patent Application Publication**
Quddus

(10) **Pub. No.: US 2010/0164819 A1**

(43) **Pub. Date: Jul. 1, 2010**

(54) **MULTIBAND ANTENNA INCLUDING
ANTENNA ELEMENTS CONNECTED BY A
CHOKING CIRCUIT**

(52) **U.S. CL. 343/722**

(57) **ABSTRACT**

(76) **Inventor: Momin Quddus, Camarillo, CA
(US)**

Multiband antennas are disclosed that incorporate a high frequency antenna element connected to a low frequency antenna element by a choking circuit. The choking circuit couples the high frequency antenna element to the low frequency antenna at a low frequency band and decouples the high frequency antenna element at a high frequency band. The connection created by the choking circuit can be a direct connection or can be an indirect connection via coupling elements that are capacitively coupled to the high frequency antenna element and/or the low frequency element to increase the bandwidth of the multiband antenna. One embodiment includes a high frequency antenna element including a feed, and a low frequency antenna element connected to the high frequency antenna element via a choking circuit. In addition, the choking circuit is configured to couple the low frequency antenna element to the high frequency antenna element in a low frequency band and decouple the high frequency antenna element from the low frequency antenna element in a high frequency band.

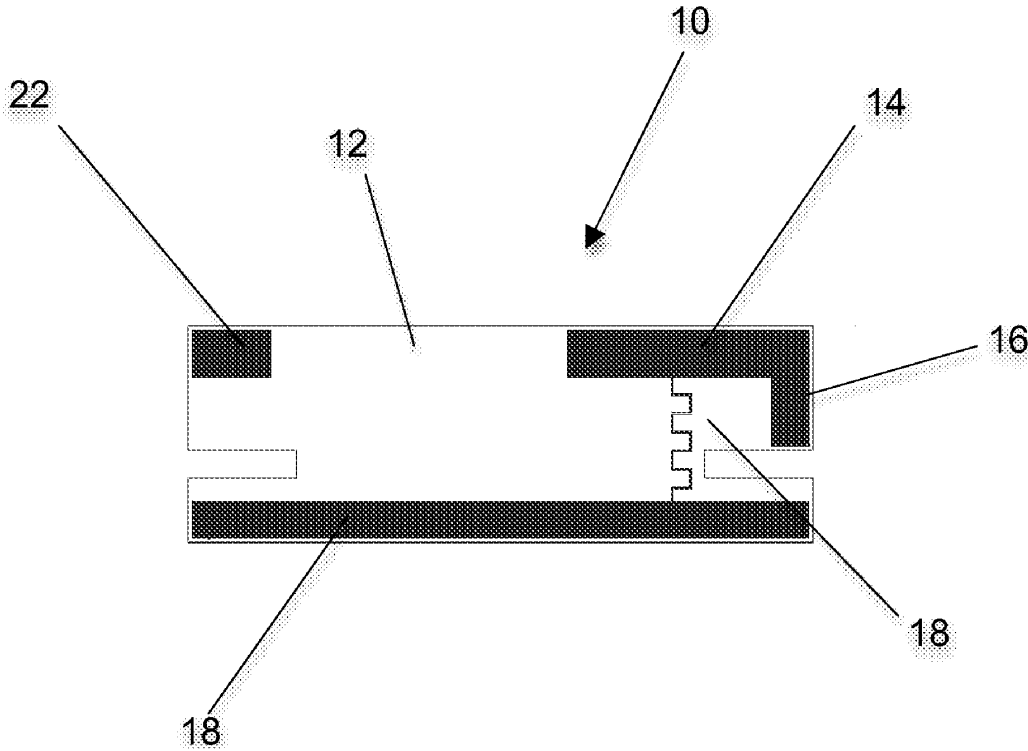
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(21) **Appl. No.: 12/345,492**

(22) **Filed: Dec. 29, 2008**

Publication Classification

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





US 20100164820A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0164820 A1**

(43) **Pub. Date: Jul. 1, 2010**

(54) **ANTENNA**

Nov. 27, 2007 (JP) 2007-306655

(76) Inventors: **Mayumi Matsunaga, Ehime (JP);**
Yasuhiro Yokota, Ehime (JP)

Publication Classification

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(51) **Int. Cl.**
H01Q 7/00 (2006.01)
H01Q 1/36 (2006.01)

(52) **U.S. Cl.** **343/729; 343/866; 343/867**

(21) Appl. No.: **12/602,126**

(57) **ABSTRACT**

(22) PCT Filed: **Feb. 29, 2008**

Disclosed is an antenna which has a simple structure and a small null angle, and which can achieve communication using a circularly-polarized wave.

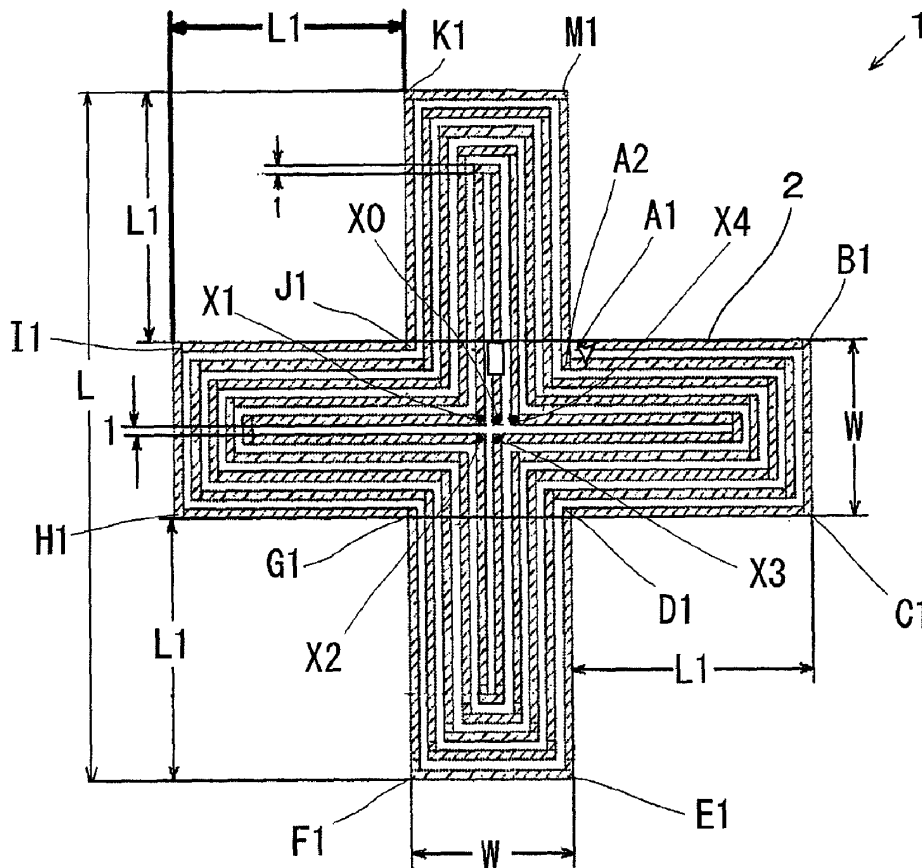
(86) PCT No.: **PCT/JP2008/000401**

§ 371 (c)(1),
(2), (4) Date: **Nov. 27, 2009**

The antenna includes a conductive wire which is arranged in loops in such a way as to form a cross shape. The part at which two line portions projecting outward from the center portion define a right angle is included in the loop path of the conductive wire. This part allows the antenna to transmit and receive an electromagnetic wave in all directions and have a circular polarization characteristic.

(30) **Foreign Application Priority Data**

May 31, 2007 (JP) 2007-144379





US 20100164821A1

(19) **United States**

(12) **Patent Application Publication**
Huang

(10) **Pub. No.: US 2010/0164821 A1**

(43) **Pub. Date: Jul. 1, 2010**

(54) **MULTI-BAND ANTENNA**

Publication Classification

(75) Inventor: **Chih-Yung Huang**, Taichung County (TW)

(51) **Int. Cl.**
H01Q 13/10 (2006.01)
H01Q 1/36 (2006.01)
H01Q 1/48 (2006.01)

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(52) **U.S. Cl.** **343/767; 343/700 MS; 343/846**

(57) **ABSTRACT**

(73) Assignee: **Arcadyan Technology Corp.**, Hsinchu (TW)

A multi-band antenna is provided. The multi-band antenna includes a grounding element, a connecting element, a first radiating element and a second radiating element. The connecting element is connected to the grounding element and extends along a second direction. The first radiating element is connected to the connecting element and extends along the first direction, wherein the first radiating element, the grounding element and the connecting element are disposed on a first plane and have a resonating slot thereamong. The second radiating element is connected to the first radiating element and extends along a second plane to reach a specific distance, and then turns to be extended on a third plane parallel to the first plane, wherein the first plane and the third plane have a resonating region therebetween.

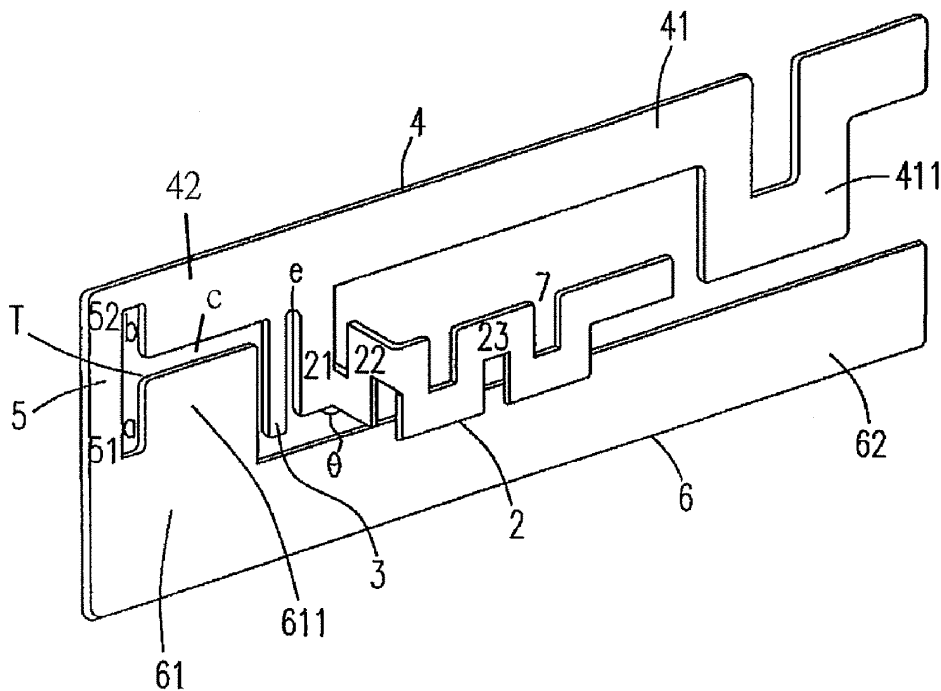
(21) Appl. No.: **12/646,808**

(22) Filed: **Dec. 23, 2009**

(30) **Foreign Application Priority Data**

Dec. 26, 2008 (TW) 097151132

1





US 20100164824A1

(19) **United States**

(12) **Patent Application Publication**
LEE

(10) **Pub. No.: US 2010/0164824 A1**

(43) **Pub. Date: Jul. 1, 2010**

(54) **DIPOLE ANTENNA**

Publication Classification

(76) Inventor: **Chang-Jung LEE**, Taoyuan County (TW)

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

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

(57) **ABSTRACT**

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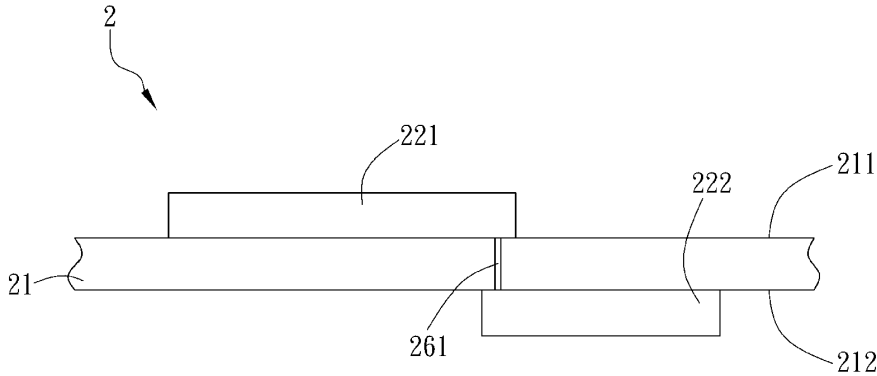
A dipole antenna includes a substrate, a first conductive slice and a second conductive slice. The substrate has a first surface and a second surface and a first conductive hole. The second surface is disposed opposite to the first surface, and the first conductive hole passes through the first surface to the second surface. The first conductive slice is disposed on the first surface and has a feeding point. The second conductive slice is disposed on the second surface and has a ground point. The first conductive slice and the second conductive slice are disposed interlacedly and electrically connected to each other via the first conductive hole. The total length of the first conductive slice, the second conductive slice and the first conductive hole has to match the operating frequency of the dipole antenna.

(21) Appl. No.: **12/563,313**

(22) Filed: **Sep. 21, 2009**

(30) **Foreign Application Priority Data**

Dec. 25, 2008 (TW) 097150709





US 20100164825A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0164825 A1**

(43) **Pub. Date: Jul. 1, 2010**

(54) **DIPOLE ANTENNA**

Publication Classification

(76) Inventors: **Chang-Jung LEE**, Taoyuan County (TW); **Jian-Jhih Du**, Taipei City (TW)

(51) **Int. Cl.**
H01Q 9/28 (2006.01)
H01Q 9/16 (2006.01)
(52) **U.S. Cl.** **343/795; 343/822; 343/807**

(57) **ABSTRACT**

Correspondence Address:
Muncy, Geissler, Olds & Lowe, PLLC
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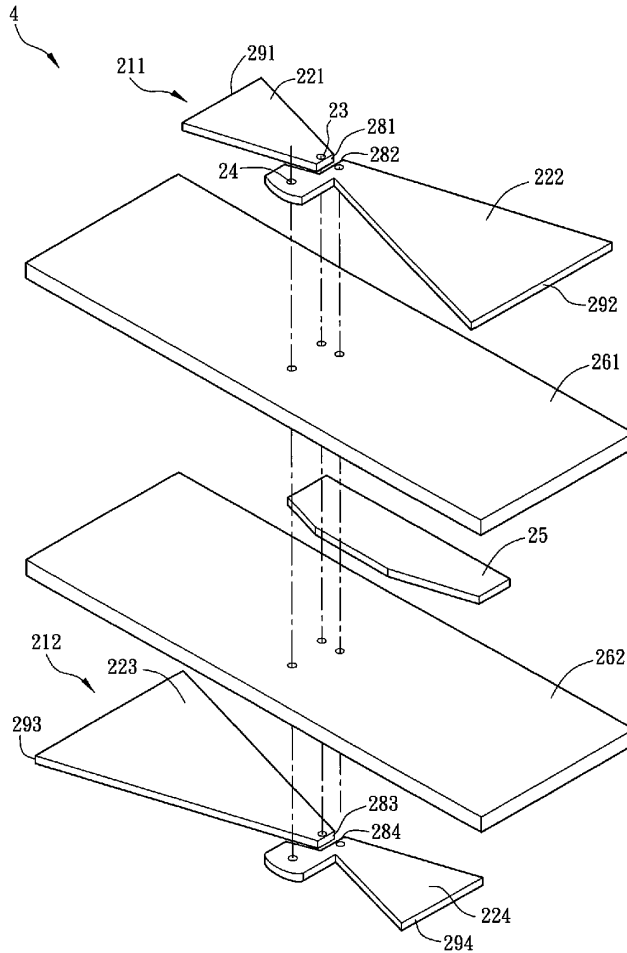
A dipole antenna includes a first radiating body and a second radiating body. The first radiating body has a first radiating part and a second radiating part. The area of the second radiating part is larger than that of the first radiating part. The second radiating body is disposed opposite to the first radiating body and has a third radiating part and a fourth radiating part. The area of the third radiating part is larger than that of the first radiating part. The area of the second radiating part is larger than that of the fourth radiating part. The first radiating part or the third radiating part has a feeding point. The second radiating part or the fourth radiating part has a ground point. The first radiating part is electrically connected to the third radiating part. The second radiating part is electrically connected to the fourth radiating part.

(21) Appl. No.: **12/647,288**

(22) Filed: **Dec. 24, 2009**

(30) **Foreign Application Priority Data**

Dec. 25, 2008 (TW) 097150710





US 20100164827A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0164827 A1**

(43) **Pub. Date: Jul. 1, 2010**

(54) **DIELECTRIC ANTENNA**

Publication Classification

(75) Inventors: **Tetsuya MIYAGAWA,**
Nishinomiya-City (JP); **Kouji Yano,**
Nishinomiya-City (JP)

(51) **Int. Cl.**
H01Q 1/36 (2006.01)
H01Q 1/00 (2006.01)

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(52) **U.S. Cl.** **343/843; 343/700 MS; 343/907**

(73) Assignee: **Furuno Electric Company,**
Limited, Nishinomiya-City (JP)

(57) **ABSTRACT**

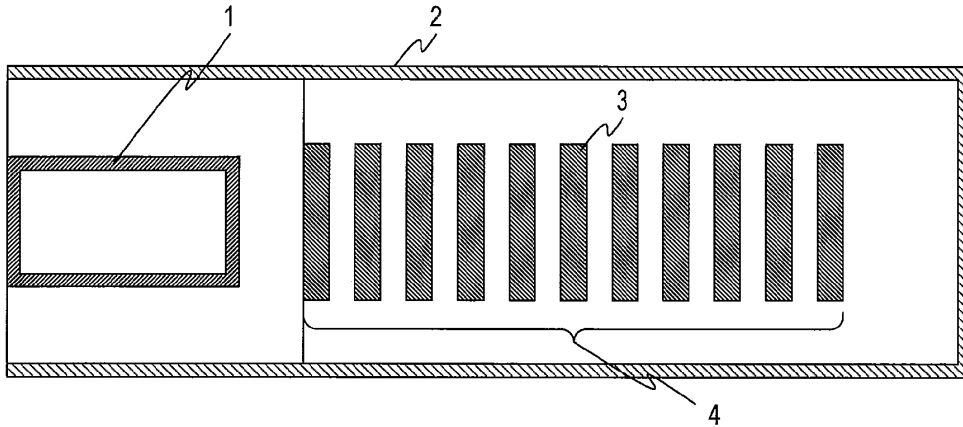
This disclosure provides a dielectric antenna including an antenna element for radiating electromagnetic waves at a predetermined frequency in a predetermined direction, and a dielectric member arranged in the radiating direction of the electromagnetic waves radiated from the antenna element. The dielectric member includes two or more dielectric layer portions each extending in a direction perpendicular to the radiating direction of the electromagnetic waves. The two or more dielectric layer portions are arranged at predetermined intervals in the radiating direction of the electromagnetic waves.

(21) Appl. No.: **12/615,688**

(22) Filed: **Nov. 10, 2009**

(30) **Foreign Application Priority Data**

Dec. 26, 2008 (JP) 2008-334579





US 20100164828A1

(19) **United States**

(12) **Patent Application Publication**
Huang

(10) **Pub. No.: US 2010/0164828 A1**

(43) **Pub. Date: Jul. 1, 2010**

(54) **MINIFIED DUAL-BAND PRINTED MONOPOLE ANTENNA**

(30) **Foreign Application Priority Data**

Dec. 30, 2008 (TW) 097151420

(75) Inventor: **Chih-Yung Huang**, Taichung County (TW)

Publication Classification

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(51) **Int. Cl.**
H01Q 5/01 (2006.01)
H01Q 1/36 (2006.01)
H01Q 21/00 (2006.01)
H01Q 1/48 (2006.01)
H01Q 9/00 (2006.01)

(52) **U.S. Cl.** **343/843; 343/700 MS; 343/893; 343/846**

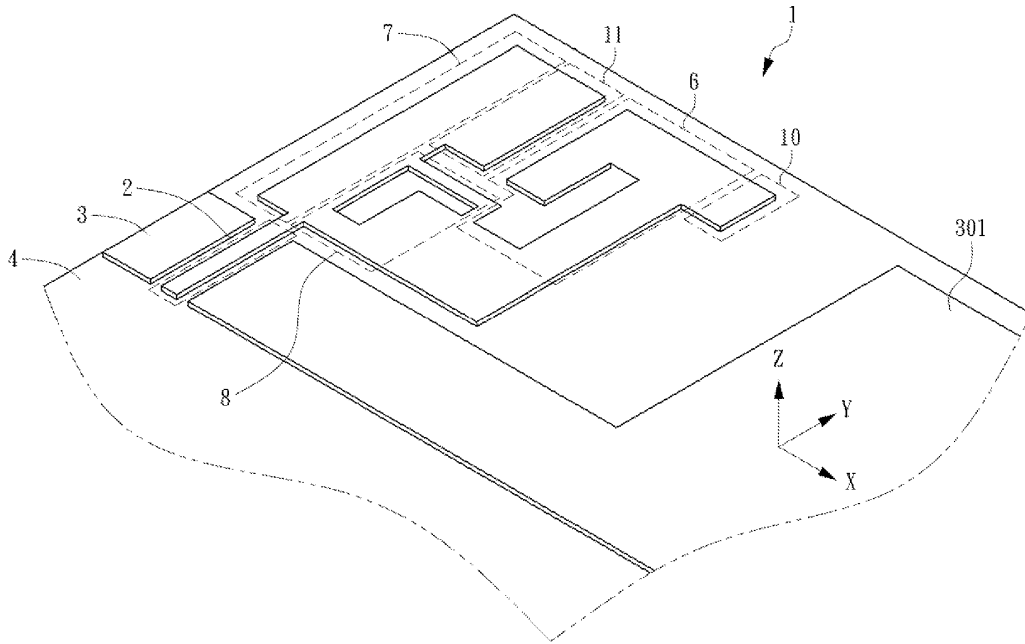
(73) Assignee: **ARCADYAN TECHNOLOGY CORPORATION**, Hsinchu City (TW)

(57) **ABSTRACT**

(21) Appl. No.: **12/645,785**

A dual-band printed monopole antenna is disclosed. The antenna is in a rectangular structure and comprising: a first radiating unit; a second radiating unit; a matching unit; a first matching unit; a second matching unit; a signal feed-in terminal, and a feed-in signal grounding terminal, whereby its size is effectively minified so as to meet the demand for the application of the minified modern wireless apparatus.

(22) Filed: **Dec. 23, 2009**





US 20100164830A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0164830 A1**

(43) **Pub. Date: Jul. 1, 2010**

(54) **SINGLE BAND ANTENNA AND ANTENNA MODULE**

(30) **Foreign Application Priority Data**

Dec. 30, 2008 (TW) 097151468

(76) Inventors: **Chih-Yung Huang**, Taichung County (TW); **Kuo-Chang Lo**, Miaoli County (TW)

Publication Classification

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

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

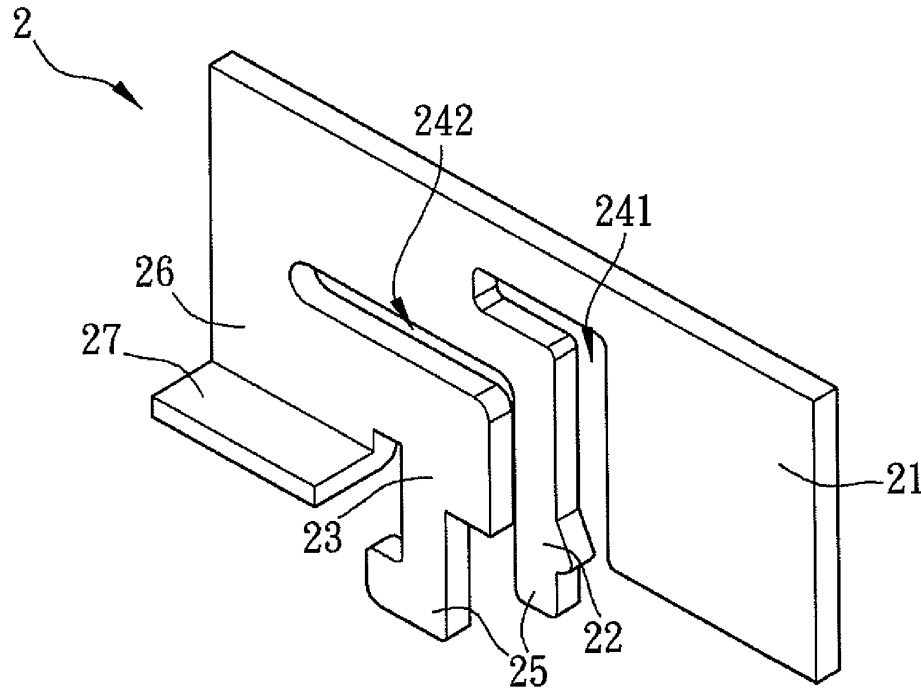
Correspondence Address:
Muncy, Geissler, Olds & Lowe, PLLC
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FAIRFAX, VA 22033 (US)

(57) **ABSTRACT**

A single band antenna includes a radiating part, a feeding part and a grounding part. The feeding part is connected with the radiating part. A first separating slot exists between the radiating part and the feeding part. The grounding part is connected with the feeding part. A second separating slot exists between the feeding part and the grounding part. Each of the first separating slot and second separating slot has at least one bend.

(21) Appl. No.: **12/649,045**

(22) Filed: **Dec. 29, 2009**





US 20100164831A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0164831 A1**

(43) **Pub. Date: Jul. 1, 2010**

(54) **HOOKED TURNSTILE ANTENNA FOR NAVIGATION AND COMMUNICATION**

Publication Classification

(76) Inventors: **Mark L. Rentz**, Torrance, CA (US); **Liza C. Ma**, Redondo Beach, CA (US)

(51) **Int. Cl.**
H01Q 1/50 (2006.01)
H01Q 1/48 (2006.01)

(52) **U.S. Cl.** **343/852; 343/848**

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Palo Alto, CA 94306 (US)

(57) **ABSTRACT**

An antenna includes a first antenna element and a second antenna element, wherein the first antenna element and the second antenna element are both configured in a hook shape. The antenna also includes a first impedance matching circuit coupled to the first antenna element, wherein the first impedance matching circuit includes a first plurality of filters and a second impedance matching circuit coupled to the second antenna element, wherein the second impedance matching circuit includes a second plurality of filters.

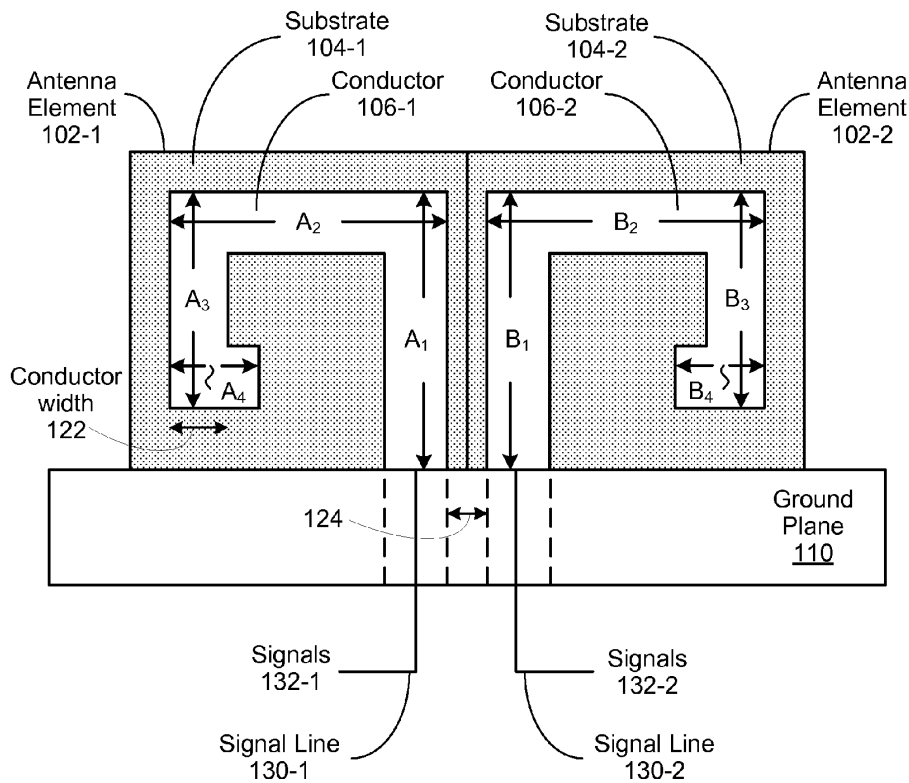
(21) Appl. No.: **12/392,037**

(22) Filed: **Feb. 24, 2009**

Related U.S. Application Data

(60) Provisional application No. 61/142,058, filed on Dec. 31, 2008.

100 ↘





US 20100164832A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0164832 A1**

(43) **Pub. Date: Jul. 1, 2010**

(54) **ANTENNA DEVICE**

(30) **Foreign Application Priority Data**

(75) Inventors: **Tiao-Hsing Tsai**, Yunghe City
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Township (TW); **Chao-Hsu Wu**,
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Fang, Pingtung City (TW);
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Township (TW)

Dec. 31, 2008 (TW) 097151670

Publication Classification

(51) **Int. Cl.**
H01Q 21/00 (2006.01)
H01Q 1/48 (2006.01)
H01Q 1/36 (2006.01)
(52) **U.S. Cl.** **343/893**; 343/846; 343/700 MS

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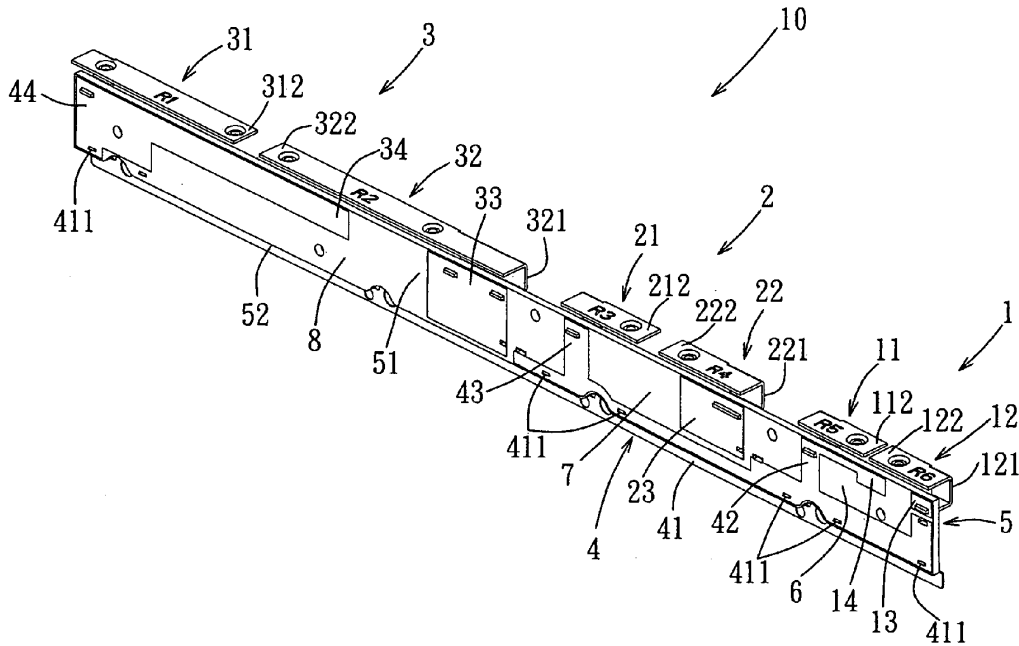
(57) **ABSTRACT**

An antenna device includes a grounding element and an antenna. The antenna includes a feeding element, first and second radiating elements, and a parasitic element. The first radiating element is coupled to the grounding element. The second radiating element is coupled to the feeding element, and is disposed proximate to the first radiating element, and cooperates with the grounding element and the first radiating element to define an area thereamong. The parasitic element is disposed in the area and extends from the grounding element.

(73) Assignee: **Quanta Computer Inc.**

(21) Appl. No.: **12/430,953**

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





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(19) **United States**

(12) **Patent Application Publication**
KNUDSEN

(10) **Pub. No.: US 2010/0171667 A1**

(43) **Pub. Date: Jul. 8, 2010**

(54) **MINIATURE PATCH ANTENNA**

(52) **U.S. CL.** 343/702; 343/700 MS; 343/787

(76) **Inventor:** Ove **KNUDSEN**, Smorum (DK)

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(57) **ABSTRACT**

The invention relates to a patch antenna for a small size, low-power device adapted for transmitting or receiving electromagnetic radiation in a predefined frequency range. The invention further relates to a method of driving a patch antenna and to the use of a patch antenna. The object of the present invention is to provide a patch antenna suitable for a small size, low power device. The problem is solved in that the antenna comprises at least one patch comprising an electrically conductive material and having an upper and lower face, the at least one patch being supported on its lower face by an intermediate material comprising a material having a negative magnetic permeability and/or a negative electrical permittivity, at least over a part of the predefined frequency range. The present invention provides an alternative scheme for manufacturing a patch antenna for a small size, low power device. The invention may e.g. be used for establishing a wireless interface in a portable communication device.

(21) **Appl. No.:** 12/413,381

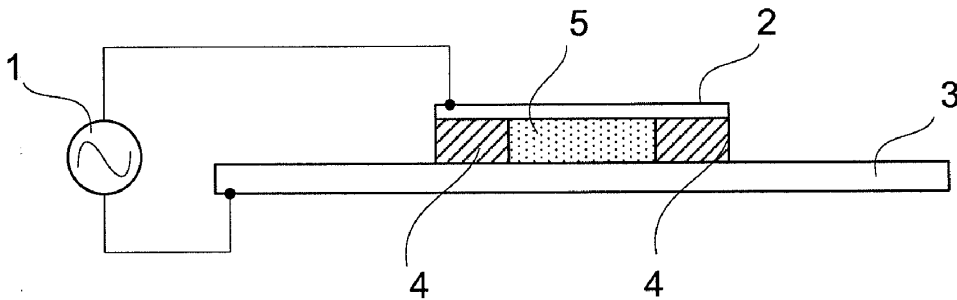
(22) **Filed:** Mar. 27, 2009

(30) **Foreign Application Priority Data**

Jan. 8, 2009 (EP) EP 09 150234

Publication Classification

(51) **Int. Cl.**
H01Q 1/38 (2006.01)
H01Q 1/00 (2006.01)
H01Q 1/24 (2006.01)





US 20100171672A1

(19) **United States**

(12) **Patent Application Publication**
Huang

(10) **Pub. No.: US 2010/0171672 A1**

(43) **Pub. Date: Jul. 8, 2010**

(54) **LOOP ANTENNA FOR WIRELESS NETWORK**

Publication Classification

(76) Inventor: **Hsiao-Ting Huang**, Taichung
County (TW)

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

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

Correspondence Address:
**NORTH AMERICA INTELLECTUAL PROP-
ERTY CORPORATION**
P.O. BOX 506
MERRIFIELD, VA 22116 (US)

(57) **ABSTRACT**

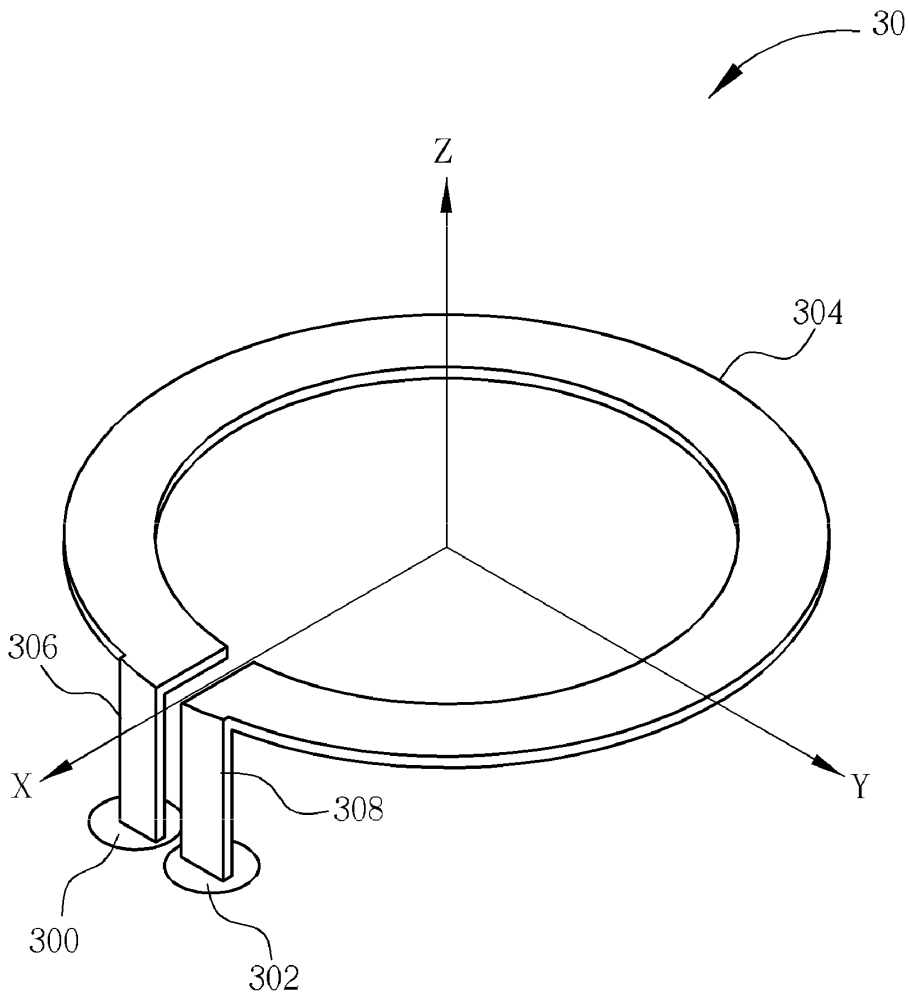
To improve vertical efficiency, the present invention provides a loop antenna for a wireless network, which includes a feeding terminal for receiving a feeding signal, a shorting-to-ground terminal for providing grounding, a metal bar formed on a first plane and surrounding a center point, a first metal arm formed on a second plane associated with the first plane and coupled between an terminal of the metal bar and the feeding terminal, and a second metal arm formed on a third plane associated with the first plane and coupled between another terminal of the metal bar and the shorting-to-ground terminal.

(21) Appl. No.: **12/479,841**

(22) Filed: **Jun. 7, 2009**

(30) **Foreign Application Priority Data**

Jan. 6, 2009 (TW) 098100156





US 20100171676A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0171676 A1**

(43) **Pub. Date: Jul. 8, 2010**

(54) **ANTENNA ELEMENT**

Publication Classification

(75) Inventors: **Kazuya Tani**, Osaka-shi (JP);
Yoshio Koyanagi, Yokohama-shi (JP)

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

(52) **U.S. Cl.** **343/803**

(57) **ABSTRACT**

Correspondence Address:
Christensen O'Connor Johnson Kindness PLLC
1420 Fifth Avenue, Suite 2800
Seattle, WA 98101-2347 (US)

It is made possible to realize both miniaturization and a wider band in an antenna element. An antenna element includes a first conductor wire part 11A; a second conductor wire part 11B crossing the first conductor wire part 11A and connected; a third conductor wire part 11C crossing the second conductor wire part 11B and connected, and parallel to the first conductor wire part 11A; a fourth conductor wire part 11D crossing the third conductor wire part 11C and connected; and a first conductor flat plate 12 connected to one or two of the first conductor wire part 11A, the second conductor wire part 11B, the third conductor wire part 11C, and the fourth wire part 11D and disposed in the area surrounded by any three of the first conductor wire part 11A, the second conductor wire part 11B, the third conductor wire part 11C, and the fourth wire part 11D. An end part of the first conductor flat plate 12 is parallel with the first conductor 11A not connected to the first conductor flat plate 12.

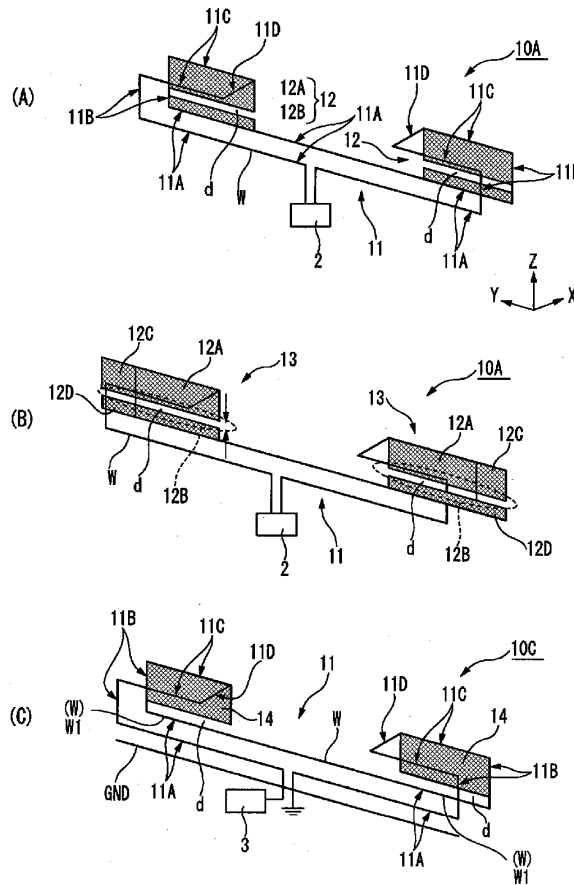
(73) Assignee: **PANASONIC CORPORATION**,
Kadoma-shi, Osaka (JP)

(21) Appl. No.: **12/676,008**

(22) PCT Filed: **Sep. 6, 2007**

(86) PCT No.: **PCT/JP2007/067433**

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





US 20100176993A1

(19) **United States**

(12) **Patent Application Publication**
Pedersen

(10) **Pub. No.: US 2010/0176993 A1**

(43) **Pub. Date: Jul. 15, 2010**

(54) **COMMUNICATIONS UNIT WITH A BUILT-IN ANTENNA**

Publication Classification

(76) Inventor: **Gert Frølund Pedersen**, Storvorde (DK)

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

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

Correspondence Address:
Altera Law Group, LLC
220 S 6 St Suite 1700
Minneapolis, MN 55402 (US)

(57) **ABSTRACT**

(21) Appl. No.: **12/063,068**

In a communications unit, such as a headset or a hearing aid, of the wireless type, a metal layer (3) is adhered or secured to its battery (1) by means of a double adhesive tape or spacers (2), so that the battery and the metal layer are capacitively connected to each other. The metal layer (3) is connected electrically to the transmit and receive circuit of the communications unit, which is mounted on a printed circuit board whose ground parts constitute a ground plane. Hereby, a patch antenna is provided, which, although it has small dimensions, has a good directional characteristic, which additionally provides the advantage that radiation from the antenna is directed away from a user's head. A communications unit constructed in this manner is useful in connection with a Bluetooth communications connection.

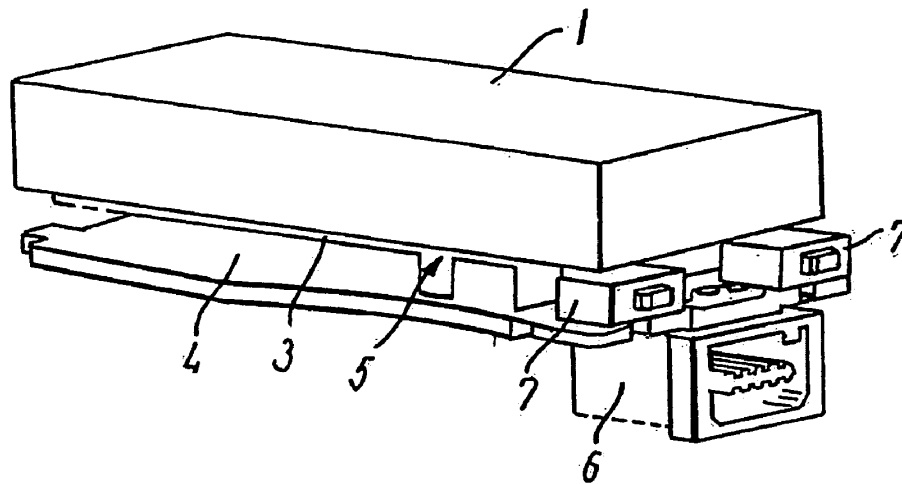
(22) PCT Filed: **Aug. 11, 2006**

(86) PCT No.: **PCT/DK06/00443**

§ 371 (c)(1),
(2), (4) Date: **Mar. 23, 2010**

(30) **Foreign Application Priority Data**

Aug. 12, 2005 (DK) PA 2005-01133





US 20100176994A1

(19) **United States**

(12) **Patent Application Publication**
CHANG

(10) **Pub. No.: US 2010/0176994 A1**

(43) **Pub. Date: Jul. 15, 2010**

(54) **ANTENNA HOLDER FRAME ASSEMBLY FOR NOTEBOOK COMPUTER**

Publication Classification

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

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

(57) **ABSTRACT**

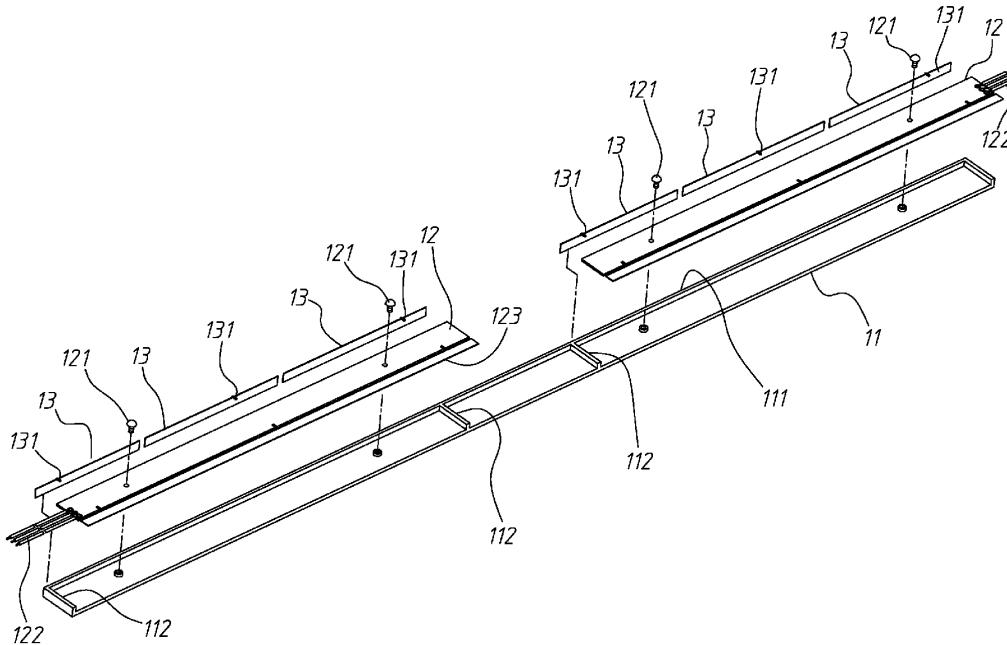
(76) Inventor: **Chih-Wei CHANG**, Pa-Te City (TW)

Correspondence Address:
Guice Patents PLLC
12647 Galveston Court #302
Manassas, VA 20112 (US)

An antenna holder frame assembly includes a narrow elongated holder frame mounted on the top side of a display screen of a notebook computer, a plurality of circuit boards fixedly mounted in the holder frame, each circuit board providing a ground plane and having a signal bus line electrically connected to a motherboard in the notebook computer, and a plurality of strip antennas of different operating bands embedded in the front edge of the holder frame and electrically connected with the respective feed-in terminal to the circuit boards for allowing the receiving signal to be transmitted to the motherboard through one associating circuit board.

(21) Appl. No.: **12/352,646**

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





US 20100176998A1

(19) **United States**

(12) **Patent Application Publication**
Sorvala

(10) **Pub. No.: US 2010/0176998 A1**

(43) **Pub. Date: Jul. 15, 2010**

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

Publication Classification

(76) Inventor: **Juha Sorvala, Oulu (FI)**

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

Correspondence Address:
GAZDZINSKI & ASSOCIATES, PC
16644 WEST BERNARDO DRIVE, SUITE 201
SAN DIEGO, CA 92127 (US)

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

(21) Appl. No.: **12/661,394**

(57) **ABSTRACT**

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

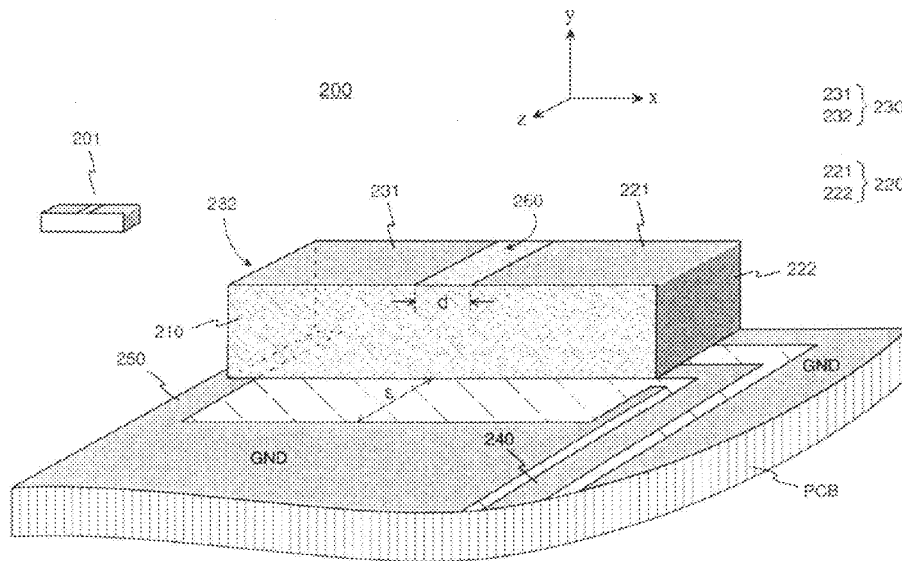
Related U.S. Application Data

(63) Continuation of application No. 11/648,431, filed on Dec. 28, 2006, now Pat. No. 7,679,565, which is a continuation of application No. PCT/FI05/50089, filed on Mar. 16, 2005.

A chip component with dielectric substrate and plurality of radiating antenna elements on the surface thereof. In one embodiment, two (2) substantially symmetric elements are used, each covering an opposite head and upper surface portion of the device. The surface between the elements comprises a slot. The chip is mounted on a circuit board (e.g., PCB) whose conductor pattern is part of the antenna. No ground plane is used under the chip or its sides to a certain distance. One of the antenna elements is coupled to the feed conductor on the PCB and to the ground plane, while the parasitic element is coupled only to the ground plane. The parasitic element is fed through coupling over the slot, and both elements resonate at the operating frequency. The antenna can be tuned and matched without discrete components, is substantially omni-directional, and has low substrate losses due to simple field image.

(30) **Foreign Application Priority Data**

Jun. 28, 2004 (FI) 20040892





US 20100177002A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0177002 A1**

(43) **Pub. Date: Jul. 15, 2010**

(54) **DIPOLE ANTENNA**

(30) **Foreign Application Priority Data**

(75) Inventors: **Chang-Jung Lee**, Taoyuan County (TW); **Jian-Jhih Du**, Taipei City (TW)

Jan. 10, 2009 (TW) 098100862

Publication Classification

Correspondence Address:
RABIN & Berdo, PC
1101 14TH STREET, NW, SUITE 500
WASHINGTON, DC 20005 (US)

(51) **Int. Cl.**
H01Q 9/28 (2006.01)
H01Q 1/48 (2006.01)
(52) **U.S. Cl.** **343/795; 343/807; 343/846**

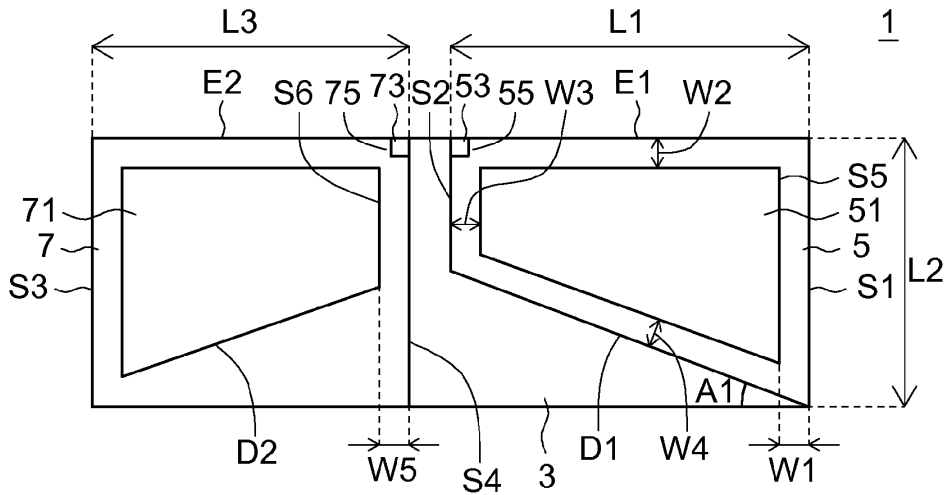
(57) **ABSTRACT**

The antenna includes a substrate, a radiation part and a ground part. The radiation part is disposed on the substrate. The outside frame of the radiation part is similar to D-type. The radiation part has at least a hole inside. The ground part is also disposed on the substrate. The ground part has at least a hole inside. Positions of a feeding terminal and a ground terminal of the antenna are not limited to center regions of the sides of the radiation part and the ground part.

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

(21) Appl. No.: **12/648,664**

(22) Filed: **Dec. 29, 2009**





US 20100177004A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0177004 A1**

(43) **Pub. Date: Jul. 15, 2010**

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

Publication Classification

(75) Inventors: **Han-Jung Shih, (US); Chao-Hua Lu, (US)**

(51) **Int. Cl.**
H01Q 5/01 (2006.01)
H01Q 1/36 (2006.01)
H01Q 1/48 (2006.01)

Correspondence Address:
TUNG & ASSOCIATES/RANDY W. TUNG, ESQ.
838 W. LONG LAKE RD., SUITE 120
BLOOMFIELD HILLS, MI 48302 (US)

(52) **U.S. Cl. 343/843; 343/700 MS; 343/848**

(57) **ABSTRACT**

(73) Assignee: **Realtek Semiconductor Corp.**

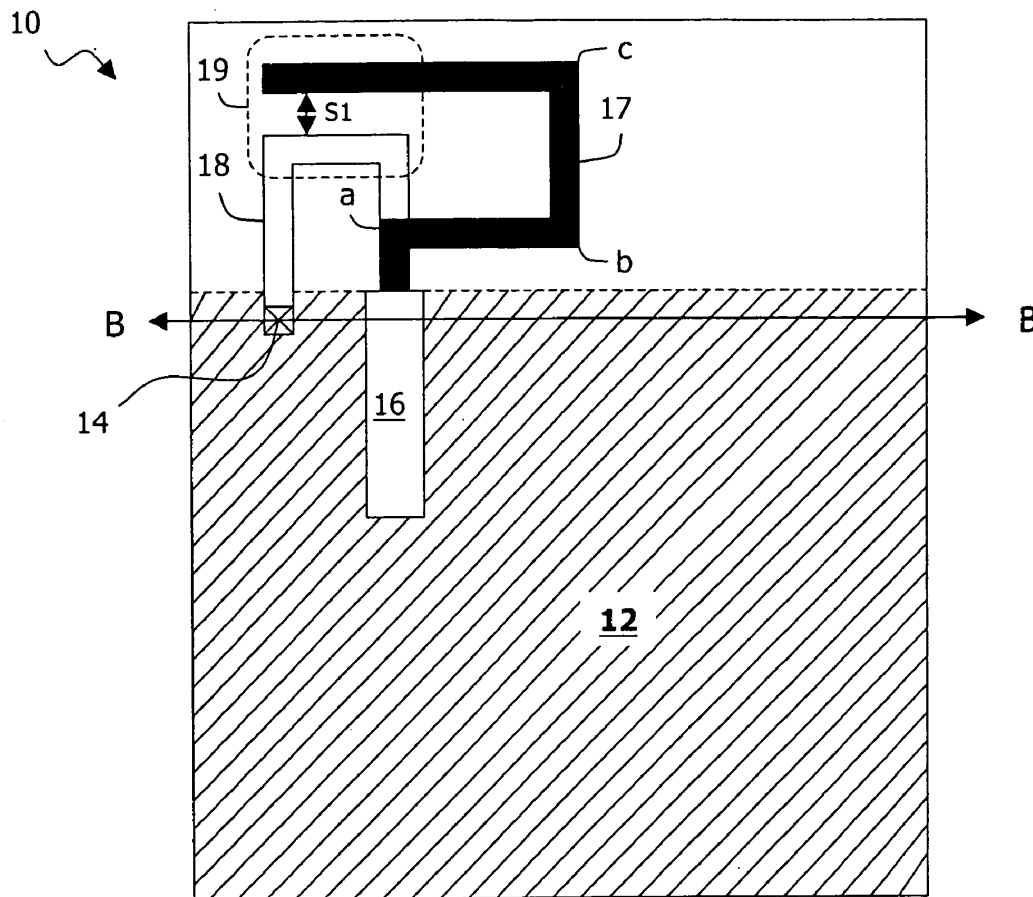
The present invention discloses a multi-band printed antenna, comprising: a grounding plane; and an antenna part, including a shorted arm electrically connected to the grounding plane, a folded arm connected to the shorted arm, and a feeding arm connected to the folded arm, feeding arm being for providing signals to the folded arm and shorted arm; wherein the folded arm includes at least one turning corner and provides at least two resonant frequencies according to the turning corner and the total length of the folded arm.

(21) Appl. No.: **12/657,080**

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

(30) **Foreign Application Priority Data**

Jan. 13, 2009 (TW) 098101102





US 20100177005A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0177005 A1**

(43) **Pub. Date: Jul. 15, 2010**

(54) **MULTI-BAND ANTENNA**

Publication Classification

(75) Inventors: **Lan-Yung Hsiao**, Taipei Hsien (TW); **Pei-Fen Wu**, Taipei Hsien (TW); **Yu-Yuan Wu**, Taipei Hsien (TW)

(51) **Int. Cl.**
H01Q 1/38 (2006.01)
H01Q 1/48 (2006.01)
(52) **U.S. Cl.** **343/845; 343/700 MS**

(57) **ABSTRACT**

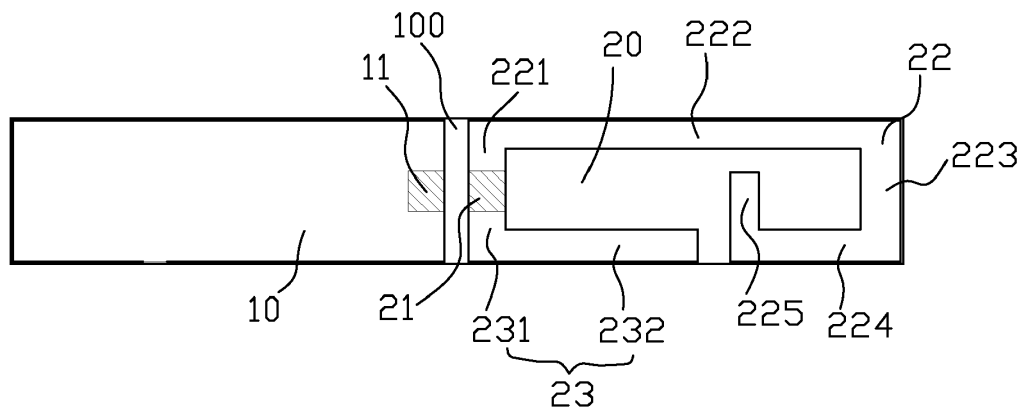
Correspondence Address:
WPAT, PC
INTELLECTUAL PROPERTY ATTORNEYS
2030 MAIN STREET, SUITE 1300
IRVINE, CA 92614 (US)

A multi-band antenna includes a first radiating portion, a second radiating portion extending perpendicularly from the first radiating portion, a third radiating portion extending perpendicularly from the second radiating portion and located at a same side concerning the second radiating portion with the first radiating portion, a fourth radiating portion extending perpendicularly from the third radiating portion and located at a same side concerning the third radiating portion with the second radiating portion, a fifth radiating portion extending from the fourth radiating portion towards the second radiating portion and spaced from the second radiating portion, a sixth radiating portion aligned with the first radiating portion with a feeding portion connected therebetween, a seventh radiating portion extending towards the fourth radiating portion from the sixth radiating portion, and a grounding portion spaced from the first radiating portion and the sixth radiating portion and having a grounding point.

(73) Assignee: **CHENG UEI PRECISION INDUSTRY CO., LTD.**, Taipei Hsien (TW)

(21) Appl. No.: **12/354,705**

(22) Filed: **Jan. 15, 2009**





US 20100177006A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0177006 A1**

(43) **Pub. Date: Jul. 15, 2010**

(54) **ANTENNA**

Publication Classification

(75) Inventors: **Chien-Hung Lin**, Taipei Hsien (TW); **Hung-Jen Chen**, Taipei Hsien (TW); **Yu-Yuan Wu**, Taipei Hsien (TW)

(51) **Int. Cl.**
H01Q 1/36 (2006.01)
H01Q 1/50 (2006.01)
H01Q 1/48 (2006.01)
(52) **U.S. Cl.** **343/845**; 343/895; 343/860

Correspondence Address:
WPAT, PC
INTELLECTUAL PROPERTY ATTORNEYS
2030 MAIN STREET, SUITE 1300
IRVINE, CA 92614 (US)

(57) **ABSTRACT**

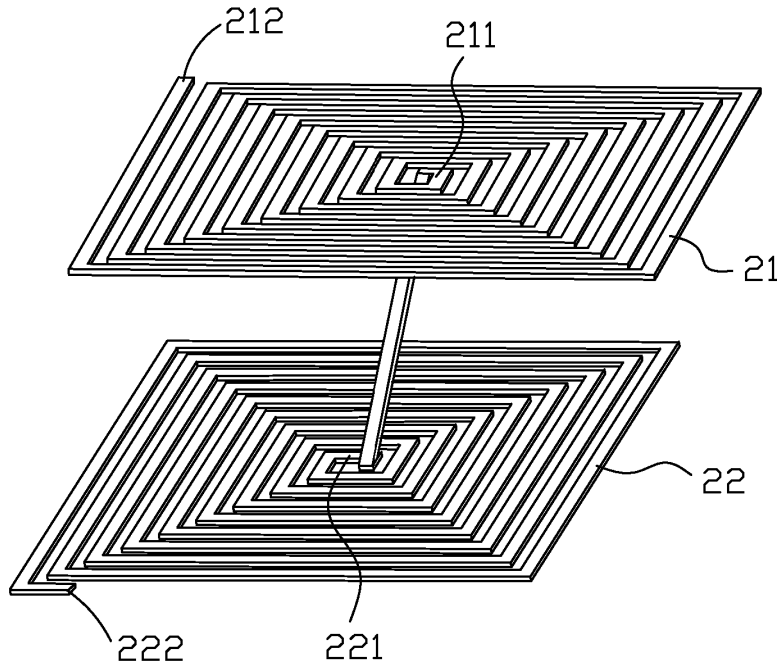
An antenna connected with a matching circuit is mounted in a portable electronic device for receiving radio frequency band. The antenna includes a flat-plate coil with a shape thereof depending on a receiving space of the portable electronic device, a feeding portion defined at one free end of the coil for connecting with the matching circuit, and a grounding portion defined at the other free end of the coil. Accordingly, the antenna can be received in the portable electronic device with a small-occupied space, and is convenient for a user to listen to broadcast at random.

(73) Assignee: **Cheng Uei Precision Industry Co., Ltd.**, Taipei Hsien (TW)

(21) Appl. No.: **12/354,729**

(22) Filed: **Jan. 15, 2009**

2





US 20100177007A1

(19) **United States**

(12) **Patent Application Publication**
WU

(10) **Pub. No.: US 2010/0177007 A1**

(43) **Pub. Date: Jul. 15, 2010**

(54) **ANTENNA MODULE AND METHOD FOR MAKING THE SAME**

(22) Filed: **Jul. 24, 2009**

(75) Inventor: **SHANG WU**, Shenzhen City (CN)

(30) **Foreign Application Priority Data**

Jan. 15, 2009 (CN) 200910300188.0

Correspondence Address:
PCE INDUSTRY, INC.
ATT. Steven Reiss
288 SOUTH MAYO AVENUE
CITY OF INDUSTRY, CA 91789 (US)

Publication Classification

(51) **Int. Cl.**
H01Q 1/40 (2006.01)
B29C 45/16 (2006.01)

(52) **U.S. Cl.** **343/873; 264/104**

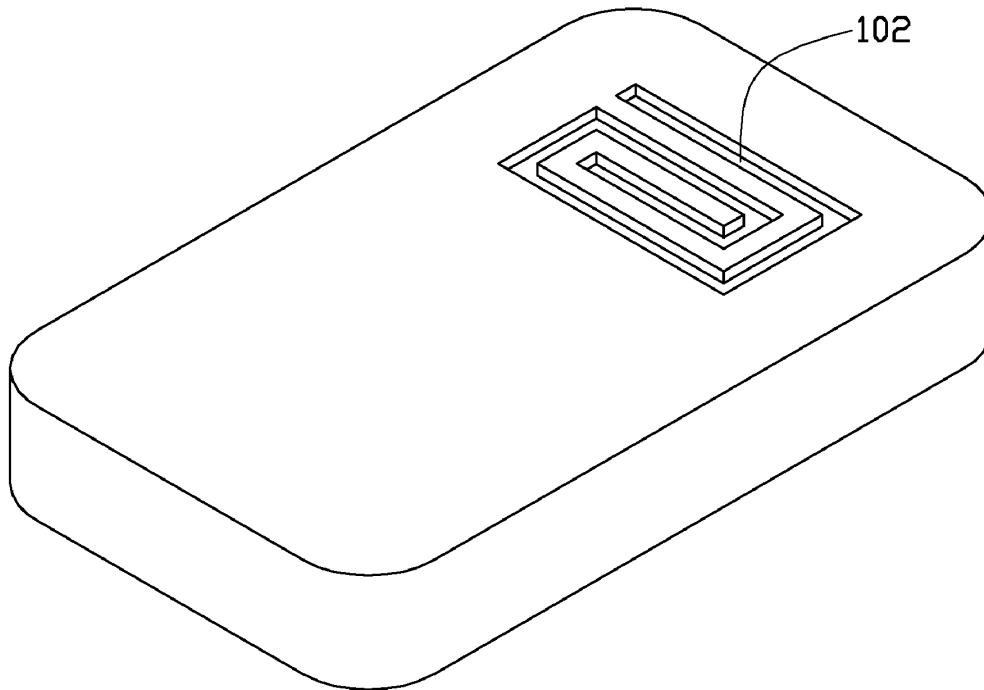
(73) Assignees: **SHENZHEN FUTAIHONG PRECISION INDUSTRY CO., LTD.**, ShenZhen City (CN); **FIH (HONG KONG) LIMITED**, Kowloon (HK)

(57) **ABSTRACT**

An antenna module includes a carrier made of non-conductive resin and an antenna layer made of conductive material attached to the carrier. The invention also discloses a method for making the antenna module.

(21) Appl. No.: **12/509,057**

100





US 20100177013A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0177013 A1**

(43) **Pub. Date: Jul. 15, 2010**

(54) **MIXED ANTENNA**

(30) **Foreign Application Priority Data**

(75) Inventors: **Thibaut Wirth**, Moirans (FR);
Sylvain Perrot, Voiron (FR); **Cyril Decroze**, Pierre Buffiere (FR)

Mar. 20, 2007 (FR) 07 53933

Publication Classification

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

(51) **Int. Cl.**
H01Q 21/00 (2006.01)
H01Q 9/04 (2006.01)

(73) Assignee: **TRIXELL**, Moirans (FR)

(52) **U.S. Cl.** **343/893; 343/700 MS**

(21) Appl. No.: **12/531,991**

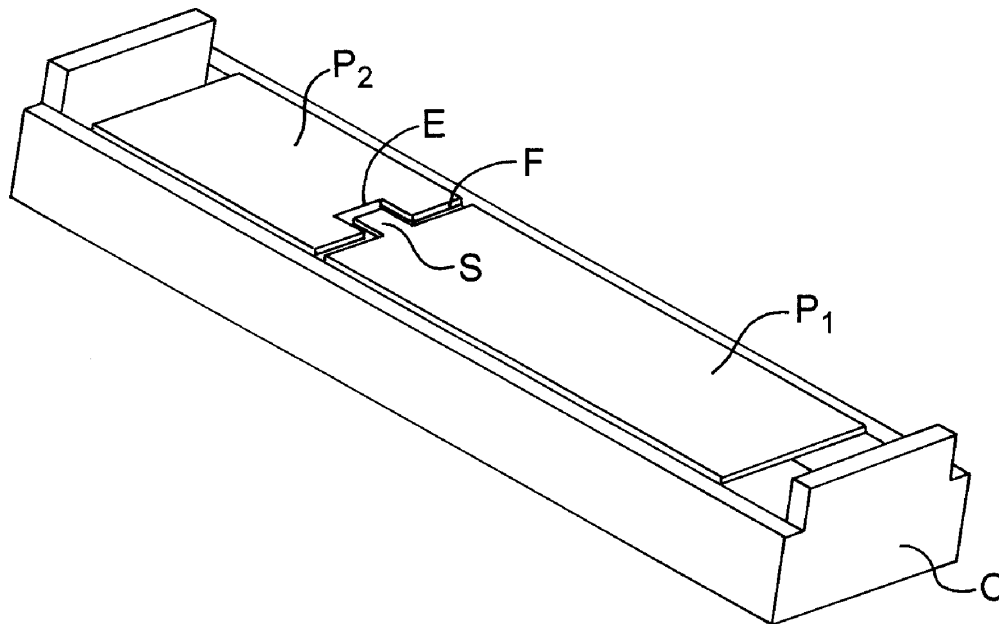
(22) PCT Filed: **Mar. 11, 2008**

(86) PCT No.: **PCT/EP2008/052865**

§ 371 (c)(1),
(2), (4) Date: **Feb. 25, 2010**

(57) **ABSTRACT**

The present invention relates to a mixed antenna. The antenna comprises a wire-plate antenna and a PIFA antenna, a first antenna being connectable to an electric generator and the second antenna being coupled to the first by capacitive coupling.





US 20100177014A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0177014 A1**

(43) **Pub. Date: Jul. 15, 2010**

(54) **STRUCTURE OF A SQUARE QUADRIFILAR
HELICAL ANTENNA**

(75) Inventors: **Sang Bo Min**, Seoul (KR); **Jong
Won Yu**, Daejeon (KR); **Moon Que
Lee**, Seoul (KR)

Correspondence Address:
LRK Patent Law Firm
1952 Gallows Rd, Suite 200
Vienna, VA 22182 (US)

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

(21) Appl. No.: **12/530,684**

(22) PCT Filed: **Mar. 12, 2008**

(86) PCT No.: **PCT/KR08/01404**

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

(30) **Foreign Application Priority Data**

Mar. 13, 2007 (KR) 10-2007-24502

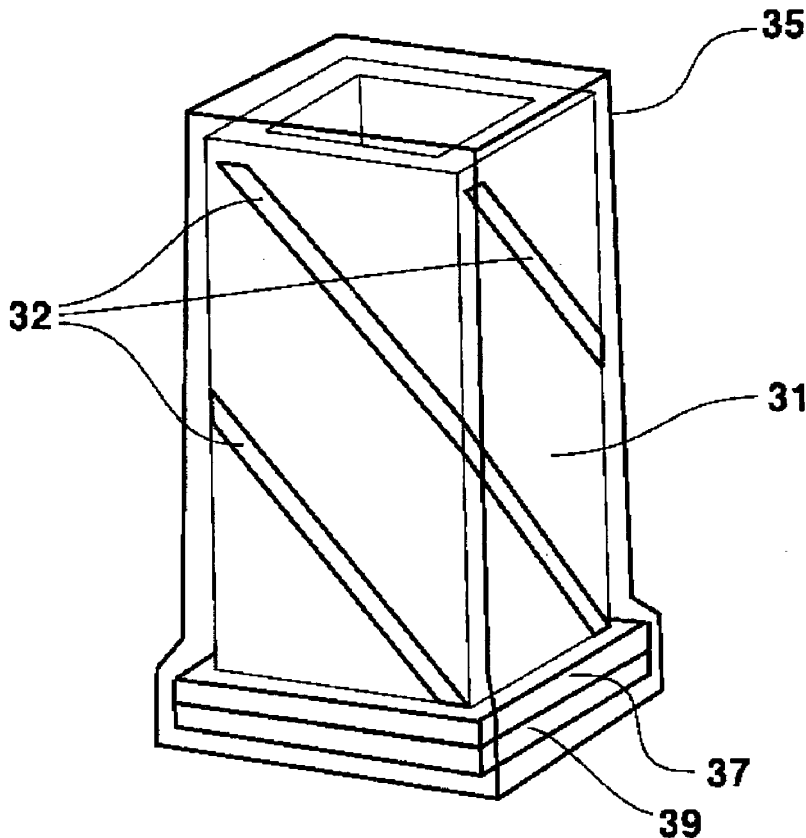
Publication Classification

(51) **Int. Cl.**
H01Q 1/36 (2006.01)
H01Q 11/08 (2006.01)

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

(57) **ABSTRACT**

Disclosed herein is the structure of a Square Quadrifilar Helical antenna (S-QHA). The structure of the S-QHA includes a square column, four radiation elements, and a feed network. The four radiation elements are formed on the square column. The feed network is disposed at the top or bottom of the square column, and feeds signals to the radiation elements at a phase difference of 90 degrees in a clockwise or counter-clockwise direction. As a result, the S-QHA according to the present invention can receive circularly polarized signals.





US 20100177015A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0177015 A1**

(43) **Pub. Date: Jul. 15, 2010**

(54) **ANTENNA AND AN ANTENNA FEED STRUCTURE**

(30) **Foreign Application Priority Data**

(76) Inventors: **Oliver Paul Leisten**, Northampton (GB); **Andrew Robert Christie**, Northampton (GB); **Thomas Alan Clupper**, Landenberg, PA (US); **John J. Squires**, Elkton, MA (US)

Jun. 21, 2005 (GB) GB0512652.9
Jun. 1, 2006 (GB) GB0610823.7

Publication Classification

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

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

Correspondence Address:
JOHN BRUCKNER PC
P.O. BOX 17569
SUGAR LAND, TX 77496-7569 (US)

(57) **ABSTRACT**

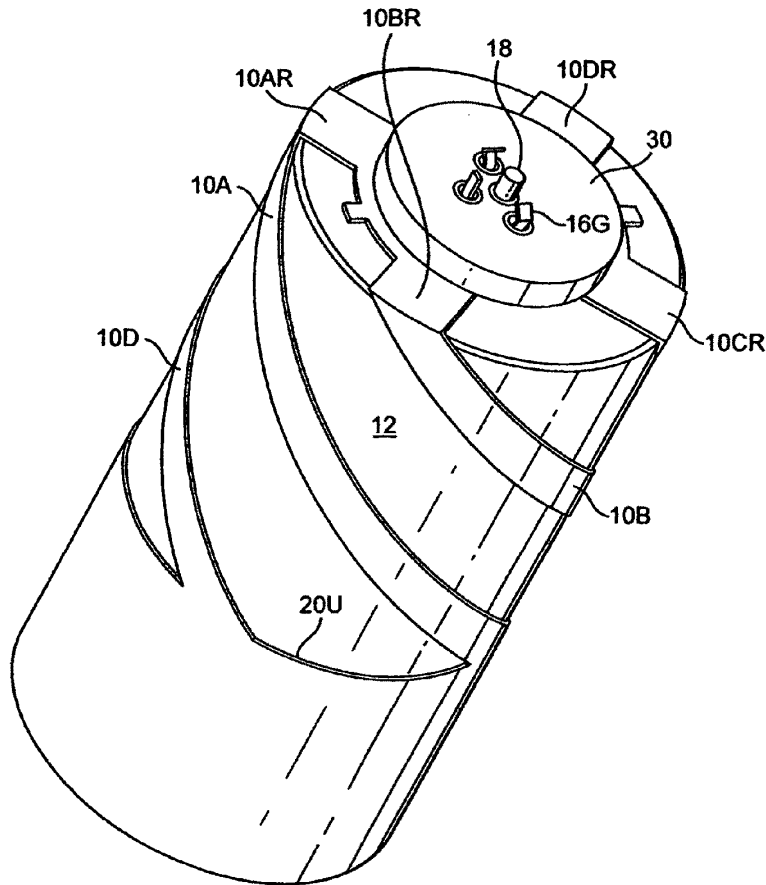
(21) Appl. No.: **12/661,296**

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

Related U.S. Application Data

(63) Continuation of application No. 11/472,586, filed on Jun. 21, 2006, now abandoned.

A dielectrically-loaded helical antenna has a cylindrical ceramic core bearing metallised helical antenna elements which are coupled to a coaxial feeder structure passing axially through the core. Secured to the end face of the core is an impedance matching section in the form of a laminate board. The matching section embodies a shunt capacitance and a series inductance.





US 20100177991A1

(19) **United States**

(12) **Patent Application Publication**
Chen

(10) **Pub. No.: US 2010/0177991 A1**

(43) **Pub. Date: Jul. 15, 2010**

(54) **PACKAGING MATERIAL HAVING RADIO FREQUENCY IDENTIFICATION FUNCTION AND BAG STRUCTURE USING THE SAME**

Publication Classification

(51) **Int. Cl.**
B65D 30/08 (2006.01)
B32B 3/30 (2006.01)
(52) **U.S. Cl.** **383/109; 428/172**

(75) Inventor: **Yung-Shun Chen**, Chung Li City (TW)

(57) **ABSTRACT**

Correspondence Address:
BACON & THOMAS, PLLC
625 SLATERS LANE, FOURTH FLOOR
ALEXANDRIA, VA 22314-1176 (US)

The present invention is to provide a packaging material having a radio frequency identification (RFID) function and a bag structure using the same, wherein the packaging material comprises a surface material having an inner surface covered with a metal layer (such as aluminum foil), the metal layer has a slot with a width considerably smaller than a length thereof, and two longer side edges of the slot are connected to two feed-in ends of a radio frequency identification (RFID) chip, respectively, so as to form a slot antenna on the metal layer and enable the RFID chip to receive signals of electro-magnetic waves through the slot antenna. Therefore, the packaging material having the RFID function can be easily and speedily manufactured by forming the slot on the metal layer and installing the RFID chip to the corresponding positions of the metal layer.

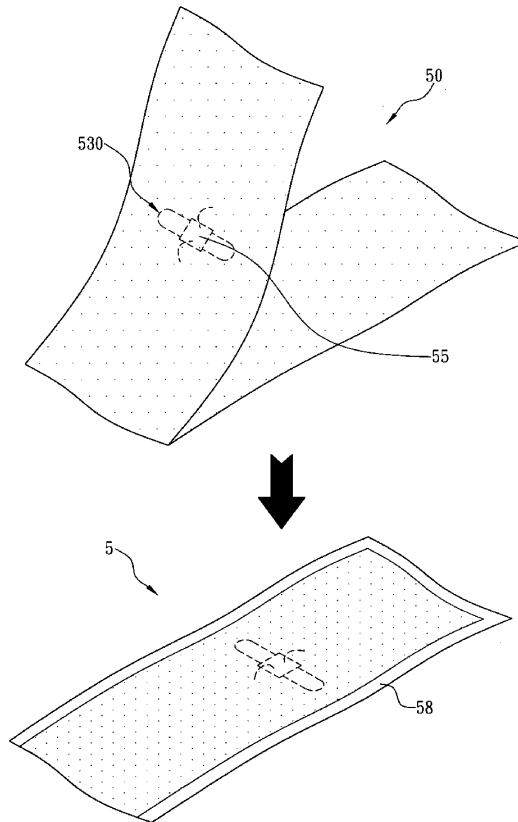
(73) Assignee: **Taiwan Lamination Industries, Inc.**, Chung Li City (TW)

(21) Appl. No.: **12/654,729**

(22) Filed: **Dec. 30, 2009**

(30) **Foreign Application Priority Data**

Jan. 13, 2009 (TW) 098100991





US 20100182202A1

(19) **United States**

(12) **Patent Application Publication**
SHIH

(10) **Pub. No.: US 2010/0182202 A1**

(43) **Pub. Date: Jul. 22, 2010**

(54) **MULTIBAND ANTENNA**

(30) **Foreign Application Priority Data**

(75) Inventor: **YEN-YI SHIH, Tu-Cheng (TW)**

Jan. 16, 2009 (CN) 200910300236.6

Publication Classification

Correspondence Address:

PCE INDUSTRY, INC.

ATT. Steven Reiss

288 SOUTH MAYO AVENUE

CITY OF INDUSTRY, CA 91789 (US)

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

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

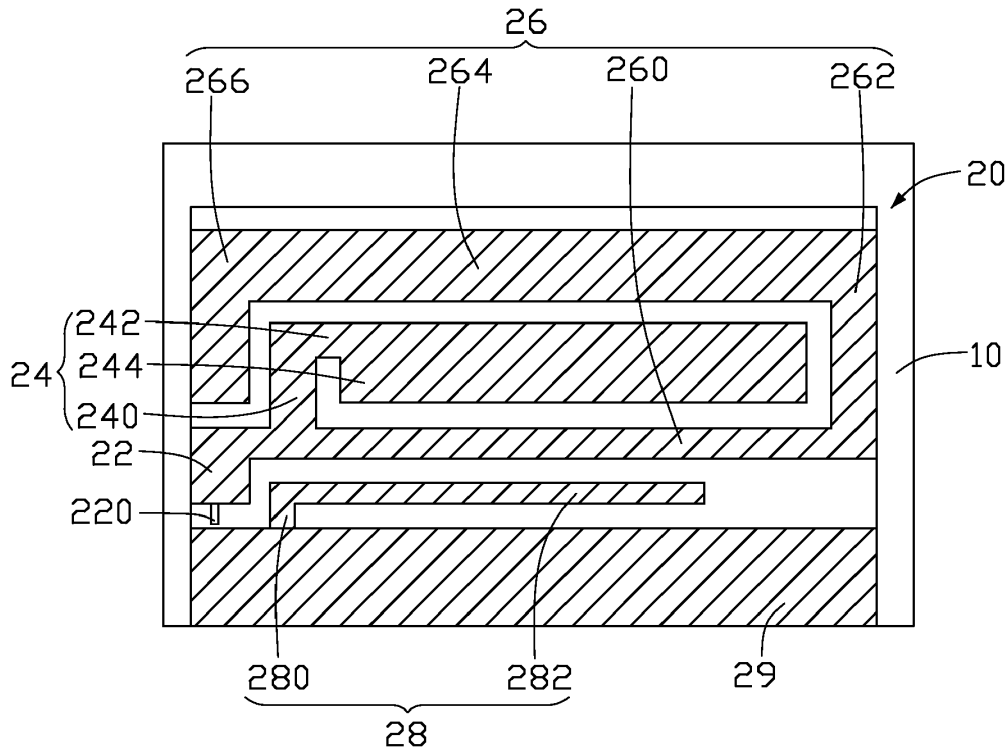
(57) **ABSTRACT**

A multiband antenna is located on a substrate and comprises a first radiator, a second radiator, a feeding portion, a grounding portion and a third radiator. The first radiator transmits at least two frequency band signals. The second radiator is connected to the first radiator, and is arranged so as to surround the first radiator. The feeding portion feeds electromagnetic signals to the first radiator and the second radiator. The third radiator is located between the grounding portion and the second radiator, and electrically connected to the grounding portion.

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

(21) Appl. No.: **12/422,211**

(22) Filed: **Apr. 10, 2009**





US 20100182203A1

(19) **United States**

(12) **Patent Application Publication**
See

(10) **Pub. No.: US 2010/0182203 A1**

(43) **Pub. Date: Jul. 22, 2010**

(54) **BROADBAND ANTENNA FOR WIRELESS COMMUNICATIONS**

Publication Classification

(75) Inventor: **Shie Ping Terence See, Singapore (SG)**

(51) **Int. Cl.**
H01Q 1/38 (2006.01)
H01P 11/00 (2006.01)

Correspondence Address:
AXIS INTELLECTUAL CAPITAL PTE., LTD.
21/21A DUXTON ROAD
SINGAPORE 089487 (SG)

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

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

(57) **ABSTRACT**

(21) Appl. No.: **12/452,188**

An antenna formable on a ground plane for wireless communications is disclosed. The antenna has a first structure spatially displaced from a ground plane. The antenna also has a second structure coupled to the first structure and extending away from the ground plane. The antenna further has a third structure configured for disposing at least a portion of the first structure between the third structure and the ground plane, the third structure being grounded to the ground plane and being spatially displaced from the second structure, the second structure and the third structure being inter-configured for electromagnetic coupling therebetween for forming a magnetic loop. More specifically, electromagnetic field generated by the first structure and the second structure electromagnetically couples the third structure for inducing generation of broadband electromagnetic waves from the first, second and third structures.

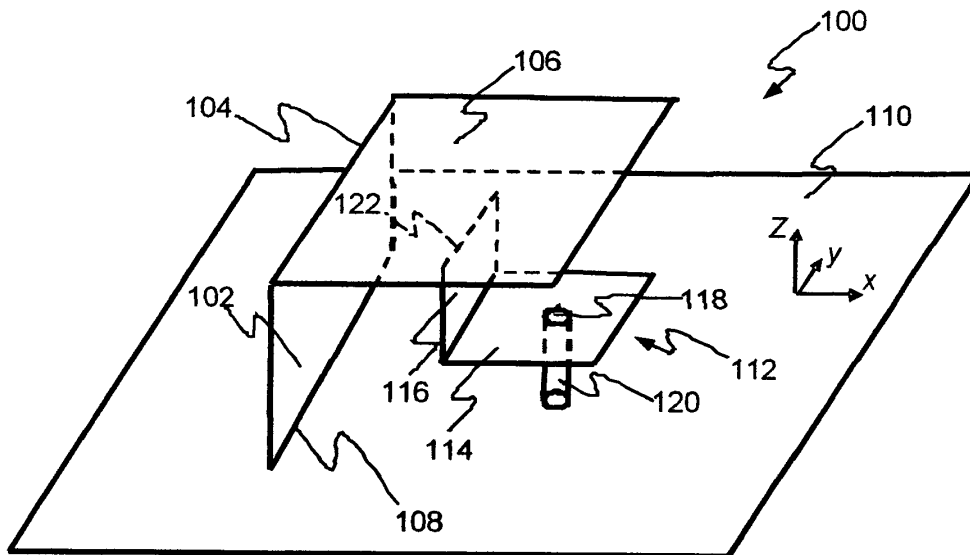
(22) PCT Filed: **Jun. 19, 2008**

(86) PCT No.: **PCT/SG2008/156429**

§ 371 (c)(1),
(2), (4) Date: **Feb. 11, 2010**

Related U.S. Application Data

(60) Provisional application No. 60/929,245, filed on Jun. 19, 2007.





US 20100182205A1

(19) **United States**

(12) **Patent Application Publication**
Chiang

(10) **Pub. No.: US 2010/0182205 A1**

(43) **Pub. Date: Jul. 22, 2010**

(54) **ELECTRONIC DEVICE ANTENNA WITH
QUARTERED RECTANGULAR CAVITY**

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

(76) **Inventor: Bing Chiang, Cupertino, CA (US)**

(57) **ABSTRACT**

Correspondence Address:

Treyz Law Group

870 Market Street, Suite 984

SAN FRANCISCO, CA 94102 (US)

Antennas for electronic devices such as portable computers are provided. An antenna may be formed from a conductive cavity and an antenna probe that serves as an antenna feed. The conductive cavity may have the shape of a quartered rectangular cavity and may have first and second side walls, top and bottom walls, and first and second openings. The first and second openings may be planar in shape and may meet at a right angle along an axis. The antenna probe may be disposed along the axis. The axis at which the first and second openings of the cavity meet may be located at the corner of an electronic device housing. The portable computer may have upper and lower housing portions that meet at a gasket. The gasket may be placed adjacent to the cavity face openings so that radio-frequency signals may enter and exit the cavity through the gasket.

(21) **Appl. No.: 12/356,496**

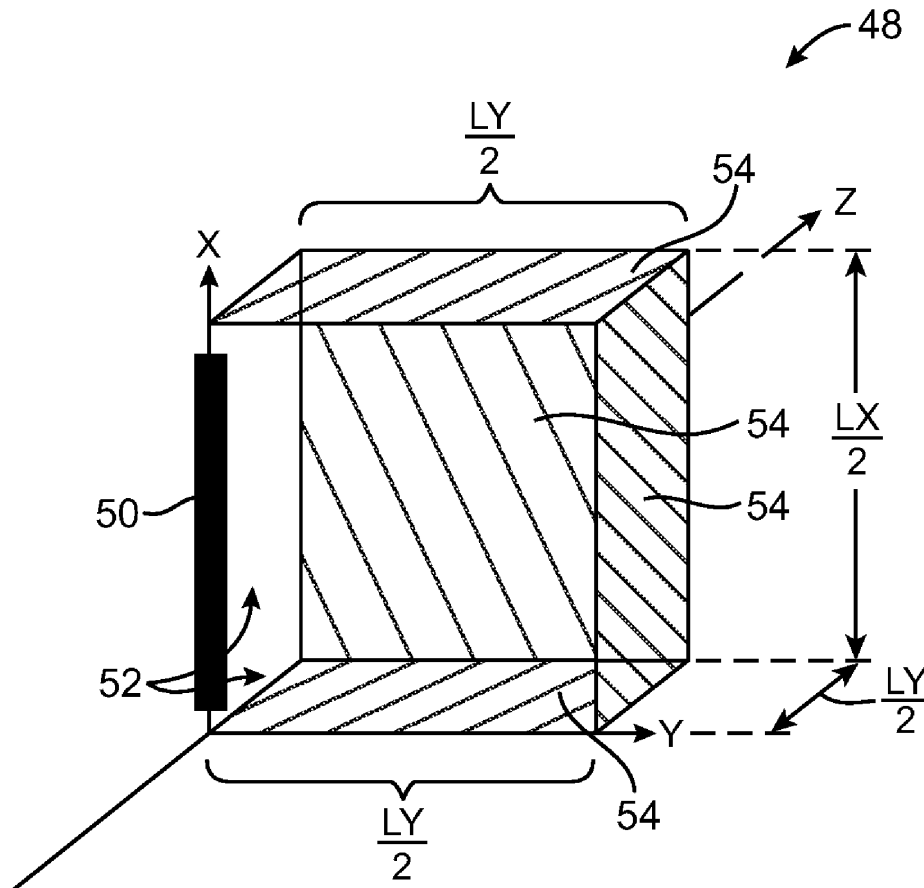
(22) **Filed: Jan. 20, 2009**

Publication Classification

(51) **Int. Cl.**

H01Q 1/36 (2006.01)

H01Q 1/22 (2006.01)





US 20100182210A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0182210 A1**

(43) **Pub. Date: Jul. 22, 2010**

(54) **ULTRA-WIDEBAND ANTENNA HAVING A BAND NOTCH CHARACTERISTIC**

Apr. 26, 2005 (KR) 10-2005*0034430

Publication Classification

(76) Inventors: **Byung-Hoon Ryou**, Seoul (KR);
Won-Mo Sung, Gyeonggi-do (KR);
Jae-Hoon Choi, Seoul (KR);
Woo-Young Choi, Seoul (KR);
Yang-Woon Roh, Gyeonggi-do (KR)

(51) **Int. Cl.**
H01Q 9/04 (2006.01)
H01Q 1/00 (2006.01)

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

(57) **ABSTRACT**

Correspondence Address:
BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP
1279 OAKMEAD PARKWAY
SUNNYVALE, CA 94085-4040 (US)

The present invention discloses an antenna for ultra-wide-band (UWB) communication having a band-stop characteristic. According to an embodiment of the present invention, the UWB antenna is a patch antenna employing microstrip feeding. In order to expand a bandwidth at a low frequency band, a stub is formed in a radiating element. Furthermore, since steps are formed in a ground plane, an antenna characteristic at an intermediate frequency band can be improved and a UWB characteristic can be obtained. According to another embodiment of the present invention, the UWB antenna is a patch antenna employing microstrip feeding and has a recess formed in the ground plane, thereby implementing the UWB characteristic. The antenna of the present invention has an inverse U-shaped slot formed in the radiating element, thus implementing the band-stop characteristic at the UWB band. In addition, the antenna of the present invention has includes a ground plane having a small area and has omnidirectional radiating patterns accordingly.

(21) Appl. No.: **11/909,795**

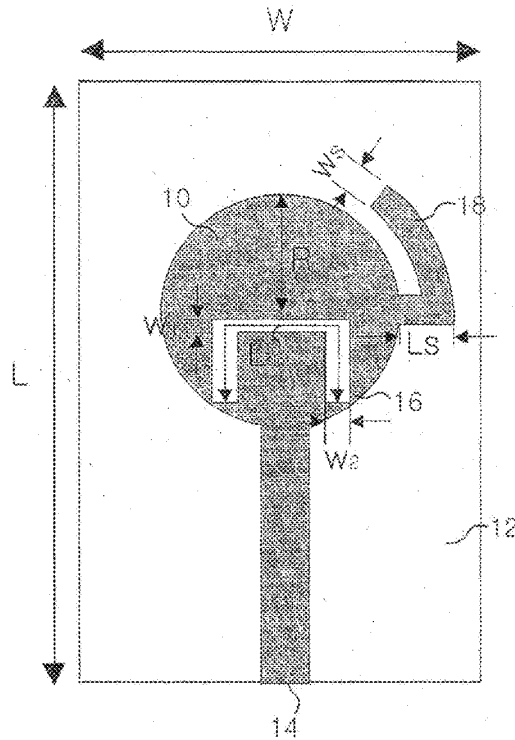
(22) PCT Filed: **Apr. 25, 2006**

(86) PCT No.: **PCT/KR06/01545**

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

(30) **Foreign Application Priority Data**

Apr. 26, 2005 (KR) 10-2005-0034429





US 20100182212A1

(19) **United States**

(12) **Patent Application Publication**
Lin

(10) **Pub. No.: US 2010/0182212 A1**

(43) **Pub. Date: Jul. 22, 2010**

(54) **COPLANAR WAVEGUIDE FED PLANAR LOG-PERIODIC ANTENNA**

(30) **Foreign Application Priority Data**

Jan. 17, 2009 (TW) 098101765

(75) **Inventor: Yi-Cheng Lin, Taipei (TW)**

Publication Classification

Correspondence Address:
EDWARDS ANGELL PALMER & DODGE LLP
P.O. BOX 55874
BOSTON, MA 02205 (US)

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

(52) **U.S. Cl.** **343/792.5**

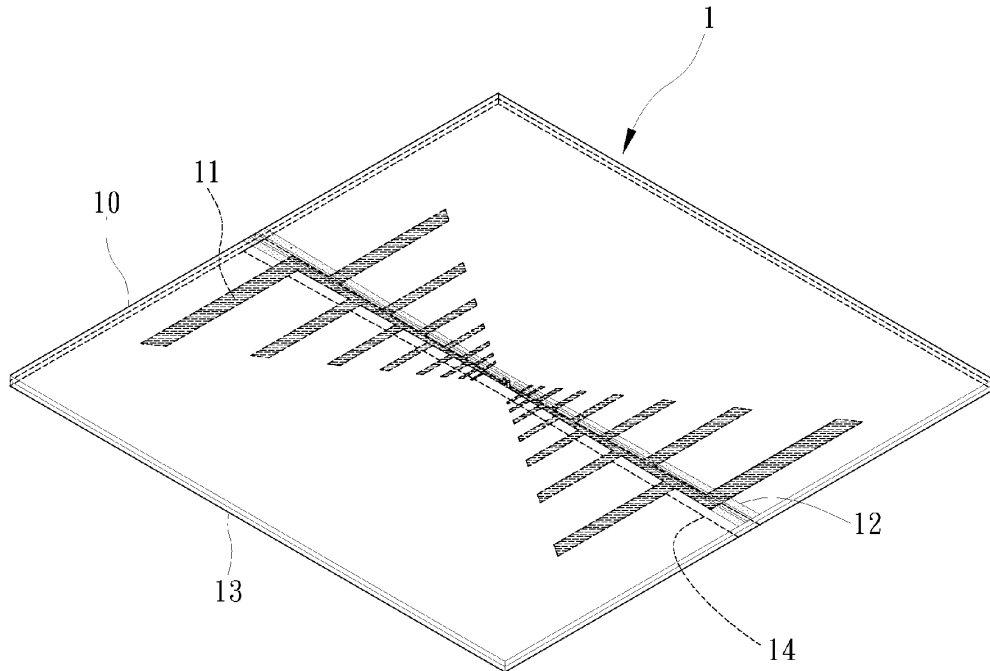
(57) **ABSTRACT**

A CPW fed planar log-periodic antenna is provided. The antenna includes: an upper substrate; a planar log-periodic antenna structure formed beneath the upper substrate; a CPW-fed structure formed on the upper substrate for feeding energy into the planar log-periodic antenna structure; a lower substrate disposed beneath the upper substrate; and a wire structure formed beneath the lower substrate. The antenna of the present invention features efficient reduction of cross polarized radiation and thereby enhancing the performance.

(73) **Assignee: NATIONAL TAIWAN UNIVERSITY, Taipei (TW)**

(21) **Appl. No.: 12/408,071**

(22) **Filed: Mar. 20, 2009**





US 20100182215A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0182215 A1**

(43) **Pub. Date: Jul. 22, 2010**

(54) **MULTI-BAND ANTENNA**

Publication Classification

(75) Inventors: **Lan-Yung Hsiao**, Taipei Hsien (TW); **Pei-Fen Wu**, Taipei Hsien (TW); **Yu-Yuan Wu**, Taipei Hsien (TW)

(51) **Int. Cl.**
H01Q 1/48 (2006.01)
(52) **U.S. Cl.** **343/846**

(57) **ABSTRACT**

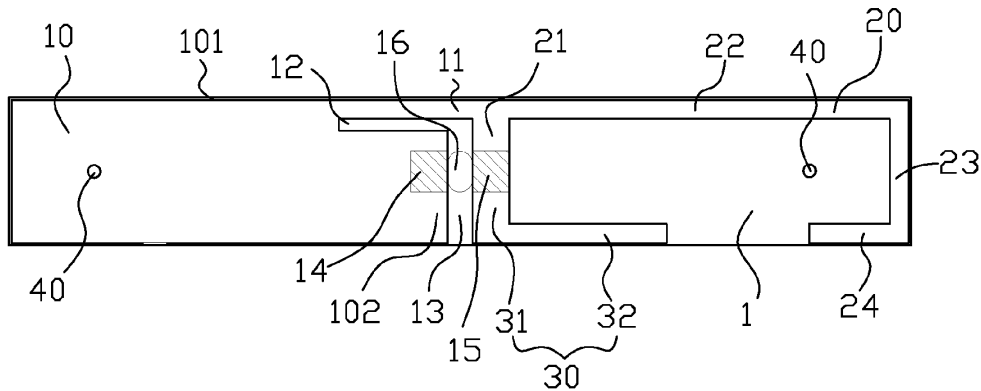
Correspondence Address:
WPAT, PC
INTELLECTUAL PROPERTY ATTORNEYS
2030 MAIN STREET, SUITE 1300
IRVINE, CA 92614 (US)

A multi-band antenna includes a first radiating portion, a second radiating portion extending perpendicularly from the first radiating portion, a third radiating portion extending perpendicularly from the second radiating portion and located at a same side with respect to the second radiating portion as the first radiating portion, a fourth radiating portion extending perpendicularly from the third radiating portion towards the first radiating portion, a fifth radiating portion in alignment with the first radiating portion, with a feeding portion connecting with the first radiating portion and the fifth radiating portion, a sixth radiating portion extending perpendicularly towards the fourth radiating portion from the fifth radiating portion and spaced away from the fourth radiating portion, and a grounding portion spaced from the first radiating portion, the feeding portion and the fifth radiating portion with a grounding area disposed thereon, and connected with the first radiating portion by a connecting portion.

(73) Assignee: **CHENG UEI PRECISION INDUSTRY CO., LTD.**, Taipei Hsien (TW)

(21) Appl. No.: **12/354,952**

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





US 20100184493A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0184493 A1**

(43) **Pub. Date: Jul. 22, 2010**

(54) **MOBILE PHONE**

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

(76) Inventors: **Chien-Hung LIN**, Tu-Cheng City (TW); **Hung-Jen Chen**, Tu-Cheng City (TW); **Yu-Yuan Wu**, Tu-Cheng City (TW)

(57) **ABSTRACT**

A mobile phone has a housing and an antenna assembly configured in the housing. The housing has a front portion, a rear portion, a top portion, a bottom portion and a side portion. The antenna assembly has a telecommunication antenna operating as at least one wireless telecommunication band, a short range antenna operating as at least one wireless short range communication band, a first broadcast receiving antenna operating at first broadcast band and a second broadcast receiving antenna operating at second broadcast band. The first broadcast band is lower than the second broadcast band. Each of the antennas is configured in at least one of the portions of the housing. The mobile phone operates at diverse wireless communication systems by using the antennas. The antennas are dispersed in the mobile phone for reducing electromagnetic interference and size of the mobile phone.

Correspondence Address:
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4000 Legato Road, Suite 310
FAIRFAX, VA 22033 (US)

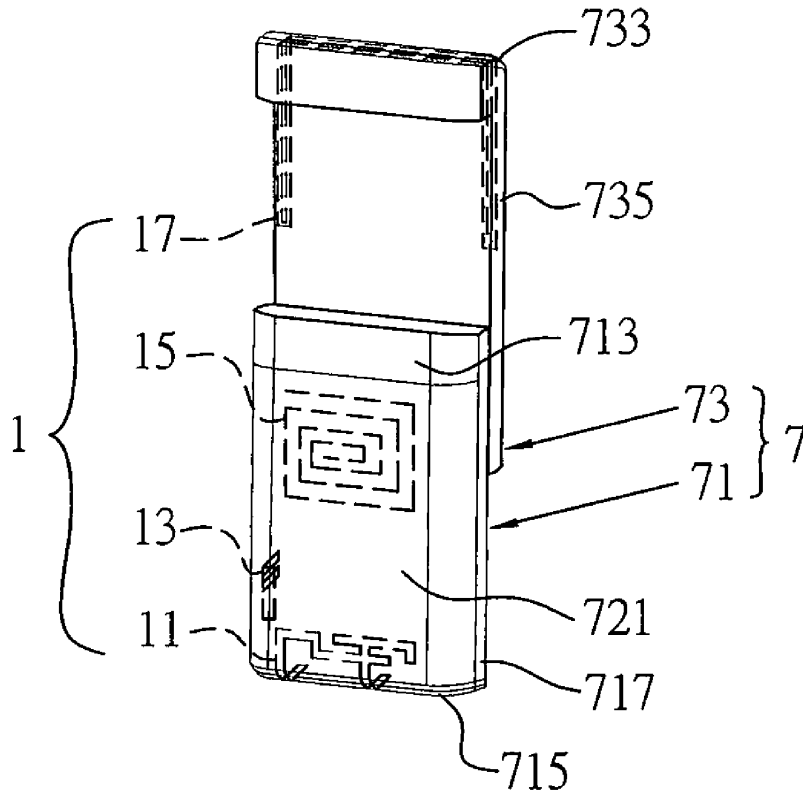
(21) Appl. No.: **12/357,757**

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

Publication Classification

(51) **Int. Cl.**
H04M 1/02 (2006.01)

300





US 20100188292A1

(19) **United States**

(12) **Patent Application Publication**
Rutfors

(10) **Pub. No.: US 2010/0188292 A1**

(43) **Pub. Date: Jul. 29, 2010**

(54) **ANTENNA**

(30) **Foreign Application Priority Data**

(76) Inventor: **Tomas Rutfors, Holmsund (SE)**

Sep. 4, 2006 (SE) 0601815-4

Publication Classification

Correspondence Address:

Mark P Stone
50 Broadway
Hawthorne, NY 10532 (US)

(51) **Int. Cl.**
H01Q 1/38 (2006.01)
H01Q 1/36 (2006.01)

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

(57) **ABSTRACT**

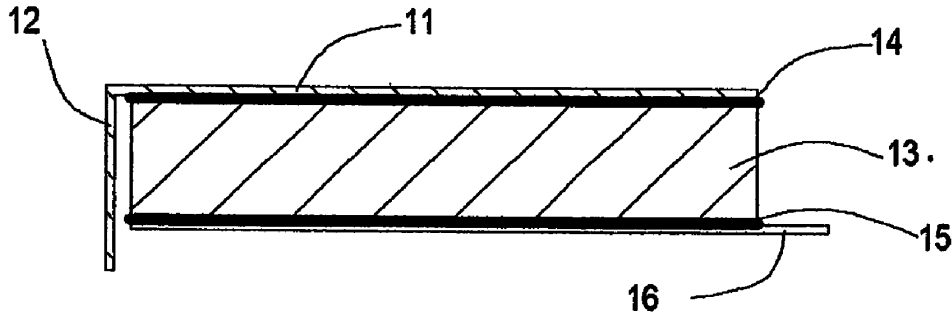
(21) Appl. No.: **12/310,633**

(22) PCT Filed: **Sep. 3, 2007**

(86) PCT No.: **PCT/SE2007/000767**

§ 371 (c)(1),
(2), (4) Date: **Feb. 27, 2009**

Antenna that offer simple mounting and possibility for modification, where the antenna element of electrical conductive material have a spacer of electrical insulator applied by adhesive and where the spacer also have adhesive intended for mounting on substrate of for example printed circuit board. The antenna offer big possibility to design antennas for different communication bands and different sizes without need for customisation of either carrier or printed circuit board.





US 20100188293A1

(19) **United States**

(12) **Patent Application Publication**
Ni

(10) **Pub. No.: US 2010/0188293 A1**

(43) **Pub. Date: Jul. 29, 2010**

(54) **PLANE ANTENNA**

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

(75) **Inventor: Chin-Wei Ni, Taipei City (TW)**

(57) **ABSTRACT**

Correspondence Address:
WPAT, PC
INTELLECTUAL PROPERTY ATTORNEYS
7225 BEVERLY ST.
ANNANDALE, VA 22003 (US)

A wireless internet with a plane antenna, the plane antenna comprising: a plane, an import antenna, a plurality of radiator and an export antenna. The plane has an edge; the import antenna is located the plane, the import antenna has a first import line and a second import line, a point of the first import antenna connects with the edge, and the point is perpendicular to the edge, the second import line and the first import connect with each other to have an included angle; the plurality of radiator has a preview arrangement method to connect with the plane, each radiator has a first conducting wire, a sharp part, a first protruding fringe, a fillister, a second protruding fringe and a second conducting wire; the export antenna is located the plane, the export antenna has a first export antenna and a second export antenna, the second export line and the first export line connect with each other to have the included angle. Wherein the second import line and the second export line connect with different the first conducting wire of the radiator.

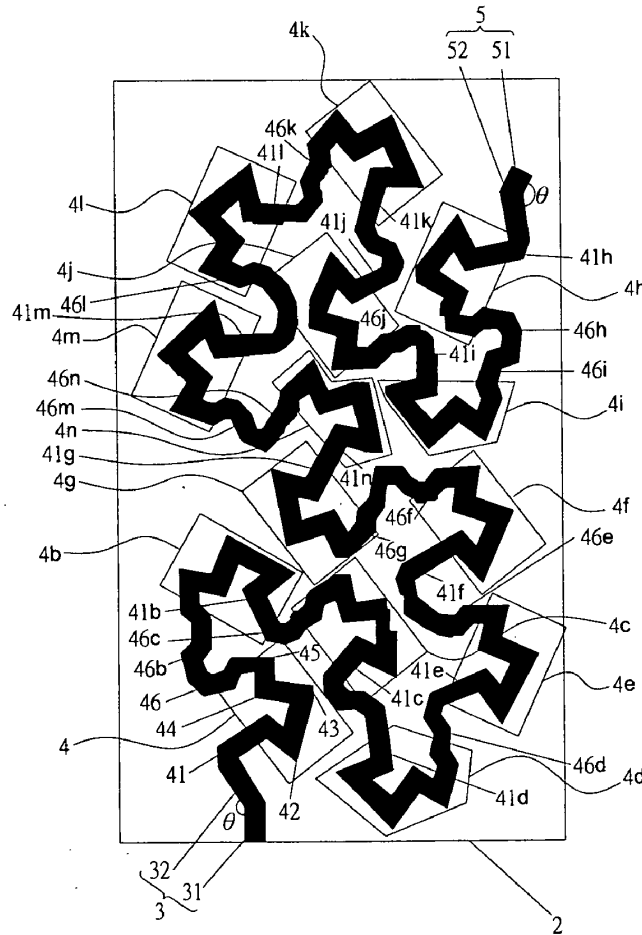
(73) **Assignee: SERCOMM CORPORATION,**
Taipei City (TW)

(21) **Appl. No.: 12/360,632**

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

Publication Classification

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





US 20100188294A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0188294 A1**

(43) **Pub. Date: Jul. 29, 2010**

(54) **PLANAR ANTENNA**

Publication Classification

(75) Inventors: **Shyh-Jong Chung**, Guanxi Township (TW); **Sy-Been Wang**, Zhubei City (TW); **Ching-Wei Ling**, Xinhua Township (TW)

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

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

(57) **ABSTRACT**

Correspondence Address:
WPAT, PC
2030 Main Street, Suite 1300
Irvine, CA 92614 (US)

The present invention discloses a planar antenna including a substrate, a ground plane and a feed line. The ground plane is disposed on one side of the substrate. The ground plane includes a hollow portion. The feed line disposed on another side of the substrate and corresponding to the hollow portion for feeding a signal. The present invention also discloses a planar antenna including a substrate, a ground plane and a feed line. The ground plane is disposed on one side of the substrate. The ground plane includes a first hollow portion and a second hollow portion. The feed line is disposed on another side of the substrate and having a first branch feed portion and a second branch feed portion for feeding a signal, and the first branch feed portion and the second branch feed portion are aligned with the first hollow portion and the second hollow portion respectively.

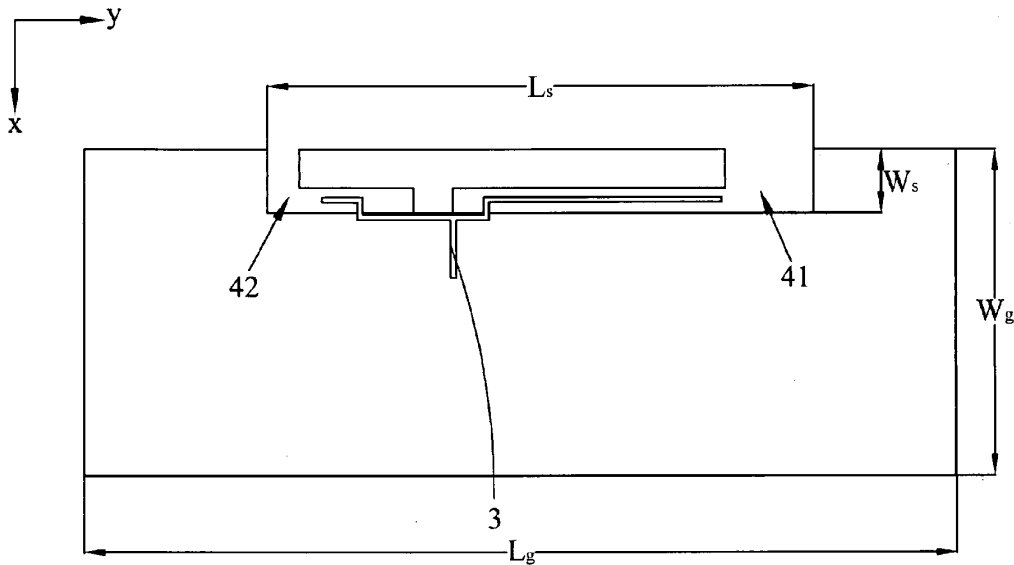
(73) Assignee: **NATIONAL CHIAO TUNG UNIVERSITY**, Hsinchu (TW)

(21) Appl. No.: **12/510,618**

(22) Filed: **Jul. 28, 2009**

(30) **Foreign Application Priority Data**

Jan. 23, 2009 (TW) 098103116





US 20100188295A1

(19) **United States**

(12) **Patent Application Publication**
Sun

(10) **Pub. No.: US 2010/0188295 A1**

(43) **Pub. Date: Jul. 29, 2010**

(54) **ELECTRONIC DEVICE AND ANTENNA MODULE**

Publication Classification

(75) Inventor: **Rong-Cheng Sun**, Taipei Hsien (TW)

(51) **Int. Cl.**
H01Q 5/00 (2006.01)
H01Q 1/38 (2006.01)
H01Q 1/24 (2006.01)

Correspondence Address:
BACON & THOMAS, PLLC
625 SLATERS LANE, FOURTH FLOOR
ALEXANDRIA, VA 22314-1176 (US)

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

(57) **ABSTRACT**

(73) Assignee: **Wistron Corporation**, Taipei Hsien (TW)

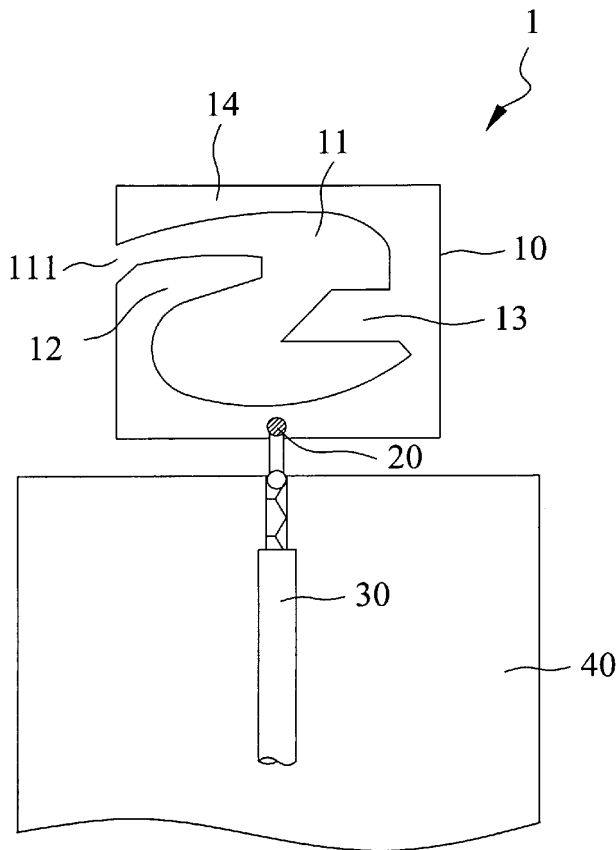
An antenna module for wireless signal transmission of an electronic device is disclosed. The antenna module comprises a main body and a feed point. The main body is a rectangular metal sheet and comprises a hollow portion. The hollow portion extends inwardly from one side of the main body. The main body may be separated by the hollow portion to form a first radiating portion, a second radiating portion, and a third radiating portion. The feed point is connected to a feed line, and is used for feeding an electrical signal to the main body, such that the first radiating portion forms a first current path, the second radiating portion forms a second current path, and the third radiating portion combined with the second radiating portion forms a third current path so as to generate different operating bands.

(21) Appl. No.: **12/591,766**

(22) Filed: **Dec. 1, 2009**

(30) **Foreign Application Priority Data**

Jan. 23, 2009 (TW) 098102776





US 20100188297A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0188297 A1**

(43) **Pub. Date: Jul. 29, 2010**

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

Publication Classification

(75) Inventors: **Huang-Chih Chen**, Taipei Hsien (TW); **Jung-Jinn Chen**, Taipei (TW)

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

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

(57) **ABSTRACT**

Correspondence Address:
QUINTERO LAW OFFICE, PC
615 Hampton Dr, Suite A202
Venice, CA 90291 (US)

An antenna is provided. The antenna includes a signal line, a ground line, a first radiation element and a second radiation element. The first radiation element is electrically connected to the signal line. The first radiation element includes a first U-shaped section and a first extension section. The signal line is connected to an end of the first U-shaped section, and the first extension section is connected to the other end thereof. The first U-shaped section includes a first notch toward a first direction. The second radiation element is electrically connected to the ground line. The second radiation element includes a second U-shaped section and a second extension section. The ground line is connected to an end of the second U-shaped section, and the second extension section is connected to the other end thereof. The second U-shaped section includes a second notch toward the first direction.

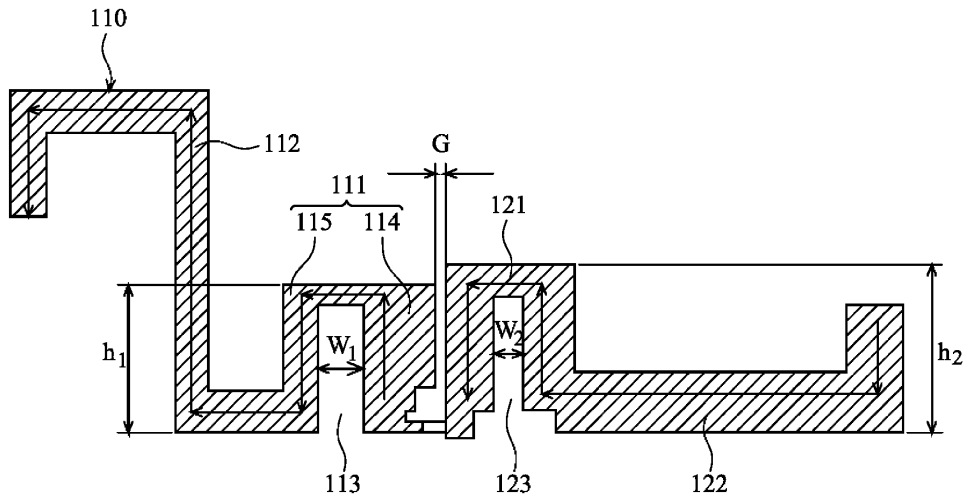
(73) Assignee: **WISTRON NEWEB CORP.**, Taipei Hsien (TW)

(21) Appl. No.: **12/431,582**

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

(30) **Foreign Application Priority Data**

Jan. 23, 2009 (TW) TW98102829





US 20100188298A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0188298 A1**

(43) **Pub. Date: Jul. 29, 2010**

(54) **ANTENNA DEVICE**

Publication Classification

(75) Inventors: **Yuichiro Suzuki**, Kanagawa (JP);
Hideo Nakanisi, Kanagawa (JP);
Masashi Koshi, Ishikawa (JP)

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

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

Correspondence Address:
Christensen O'Connor Johnson Kindness PLLC
1420 Fifth Avenue, Suite 2800
Seattle, WA 98101-2347 (US)

(57) **ABSTRACT**

A challenge to be met by the present invention is to provide an antenna device that saves space while using a plate-like inverted F-shaped antenna.

(73) Assignee: **PANASONIC CORPORATION**,
Kadoma-shi, Osaka (JP)

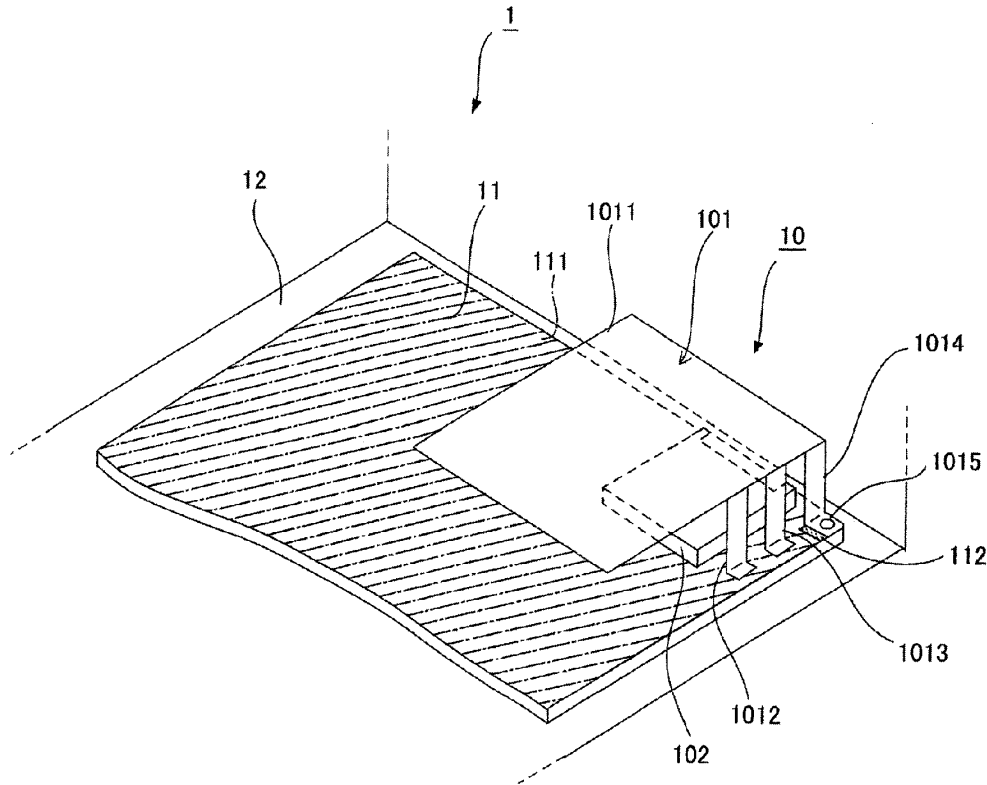
An external memory connector (102) is interposed between a radiating element (1011) and a ground pattern (111). Space of a circuit board (11) can thereby be saved. Further, a feeding section (1014), a first short circuit section (1013), and a second short circuit section (1012) of the plate-like inverted F-shaped antenna element (101) are aligned to each other. A layout minimizing waste thus becomes possible on the occasion of designing of a housing case (12) and the circuit board (11), thereby contributing space saving.

(21) Appl. No.: **12/602,487**

(22) PCT Filed: **May 31, 2007**

(86) PCT No.: **PCT/JP2007/061132**

§ 371 (c)(1),
(2), (4) Date: **Nov. 30, 2009**





US 20100188302A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0188302 A1**

(43) **Pub. Date: Jul. 29, 2010**

(54) **MULTIPLE BAND ANTENNA**

Publication Classification

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

(51) **Int. Cl.**
H01Q 5/00 (2006.01)
H01Q 1/00 (2006.01)
(52) **U.S. Cl.** **343/722**

Correspondence Address:
**BLAKELY SOKOLOFF TAYLOR & ZAFMAN
LLP**
1279 OAKMEAD PARKWAY
SUNNYVALE, CA 94085-4040 (US)

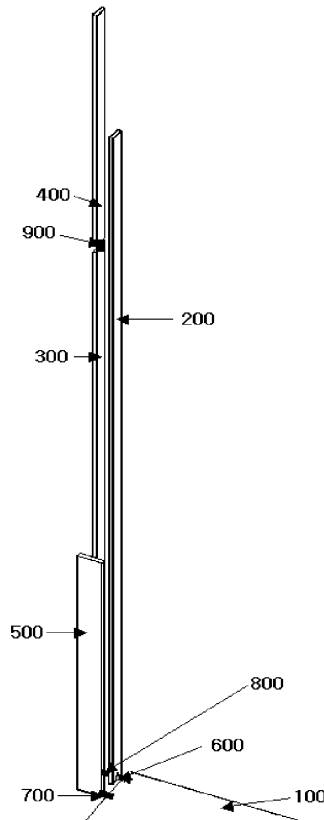
(57) **ABSTRACT**

The present invention provides a multiple band antenna, including a first radiation element adapted to resonate at a first resonant frequency band by employing a resonant length, which is reduced by a coupling effect with a neighboring radiation element, a power feed unit coupled to one lower side of the first radiation element, a first inductor coupled in series to the other lower side of the first radiation element, a second radiation element adapted to face the first radiator to thereby obtain the coupling effect, wherein the second radiation element has a predetermined lower portion coupled to the first inductor, a second inductor having one end coupled in series to a predetermined upper portion of the second radiation element, and a third radiation element coupled to the other end of the second inductor, wherein the third radiation element operates as one radiation element together with the second radiation element and resonates at a second frequency band.

(21) Appl. No.: **12/527,394**
(22) PCT Filed: **Feb. 1, 2008**
(86) PCT No.: **PCT/KR2008/000612**
§ 371 (c)(1),
(2), (4) Date: **Mar. 12, 2010**

(30) **Foreign Application Priority Data**

Feb. 14, 2007 (KR) 10-2007-0015316





US 20100188303A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0188303 A1**

(43) **Pub. Date: Jul. 29, 2010**

(54) **COUPLED MULTIBAND ANTENNA**

Publication Classification

(75) Inventors: **BOON PING KOH, PETALING JAYA (MY); SOOLIAM OOI, PLANTATION, FL (US)**

(51) **Int. Cl.**
H01Q 21/00 (2006.01)
H01Q 1/22 (2006.01)
(52) **U.S. Cl.** **343/725; 343/702**

Correspondence Address:
MOTOROLA, INC.
1303 EAST ALGONQUIN ROAD, IL01/3RD
SCHAUMBURG, IL 60196

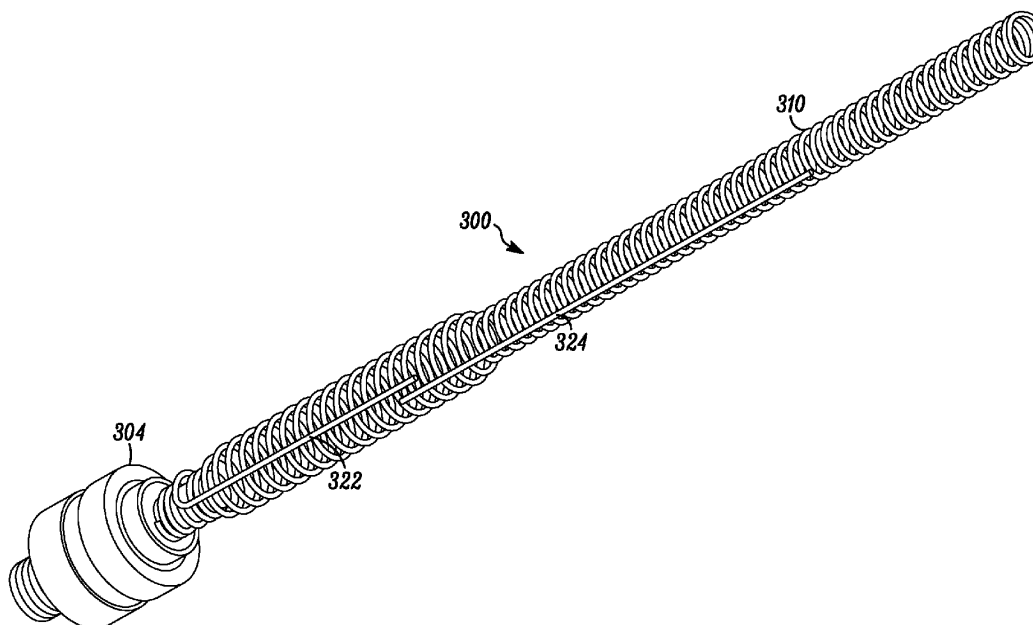
(57) **ABSTRACT**

Free space antenna structures are presented in which multiple radiating elements are disposed proximate to each other. In a structure containing two radiating elements, the radiating element of shorter wavelength is split into a monopole and a dipole that are electrically, but not physically, coupled to each other. The monopole has a length of $\lambda/4$ and is attached to the same feed as the longer wavelength radiating element. The dipole has a length of $\lambda/4$ and is attached to the same feed as the longer wavelength radiating element. Non-conductive shields prevent contact between the monopole, dipole, and longer wavelength radiating element. The longer wavelength radiating element is formed in a helix outside of which the dipole, and perhaps monopole, is disposed.

(73) Assignee: **MOTOROLA, INC., SCHAUMBURG, IL (US)**

(21) Appl. No.: **12/360,937**

(22) Filed: **Jan. 28, 2009**





US 20100188306A1

(19) **United States**

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

(10) **Pub. No.: US 2010/0188306 A1**

(43) **Pub. Date: Jul. 29, 2010**

(54) **THIN SLOT ANTENNA HAVING CAVITY, ANTENNA POWER FEEDING METHOD, AND RFID TAG DEVICE USING THE ANTENNA AND THE METHOD**

(30) **Foreign Application Priority Data**

Sep. 5, 2006 (JP) 2006-239685

Publication Classification

(76) Inventors: **Hitoshi Kitayoshi**, Sendai-shi (JP);
Kunio Sawaya, Sendai-shi (JP)

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

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

(57) **ABSTRACT**

Correspondence Address:
YOUNG & THOMPSON
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Provided are a highly efficient thin slot antenna having a cavity, and a RFID tag device. The thin slot antenna can be attached to curved surfaces of a human body, things and the like, and furthermore, has relatively freely deformable flexible characteristics, and has an extremely small characteristic change due to deformation and that due to bodies to be attached to. A bag-like body having a cavity (12) is formed by using a conductor foil of aluminum or the like or a foil deposited with a conductive metal such as aluminum and by forming the foil in bag shape. A relatively soft dielectric sheet (13) is put in the cavity (12), and a slot (14) is arranged at the width direction center position on one surface of the bag-like body, in the longitudinal direction.

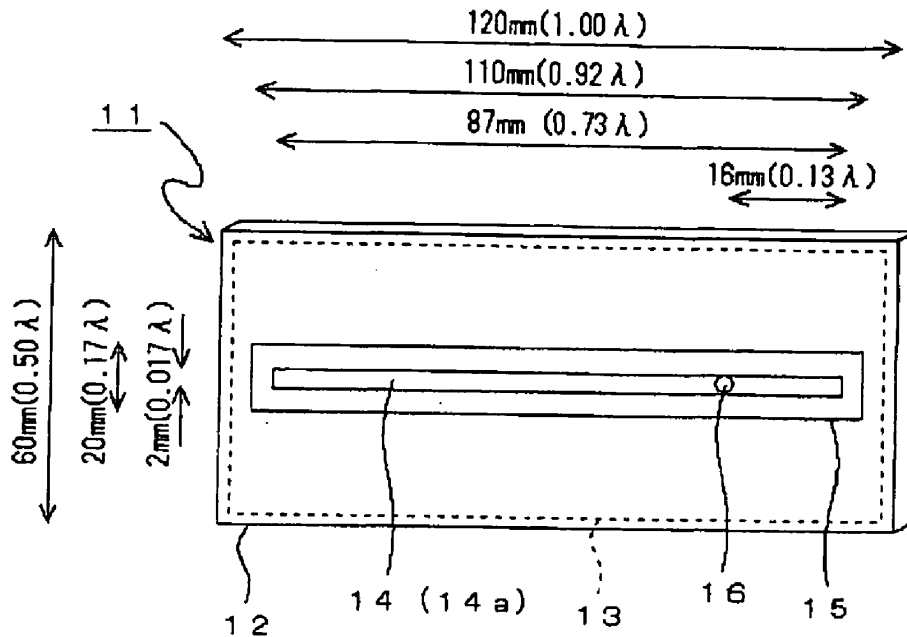
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(54) **COMPACT CIRCULARLY POLARIZED
OMNI-DIRECTIONAL ANTENNA**

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(57) **ABSTRACT**

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Antennas that can transceive signals in an elliptically-polarized, omni-directional manner are described. In an example embodiment, an antenna comprises two elements proximally located to each other at a predetermined distance, such that two orthogonally-polarized omni-directional electromagnetic waves are transceived. In a further example, the two elements are supported by an internal printed circuit, the printed circuit including conductors configured to supply a feed to the elements, which may be contained within a radome. Alternate embodiments comprise a plurality of elements of varying lengths.

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