



US 20080186236A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0186236 A1**

(43) **Pub. Date: Aug. 7, 2008**

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

(30) **Foreign Application Priority Data**

(76) Inventors: **Yun-Ta Chen**, Tao-Yuan City (TW); **Chien-Pang Chou**, Tao-Yuan City (TW); **Chang-Hao Hsieh**, Tao-Yuan City (TW); **Chia-I Lin**, Tao-Yuan City (TW)

Sep. 25, 2006 (TW) 095135405
Jan. 8, 2007 (TW) 096100709

Publication Classification

(51) **Int. Cl.**
H01Q 9/04 (2006.01)
(52) **U.S. Cl.** **343/700 MS**

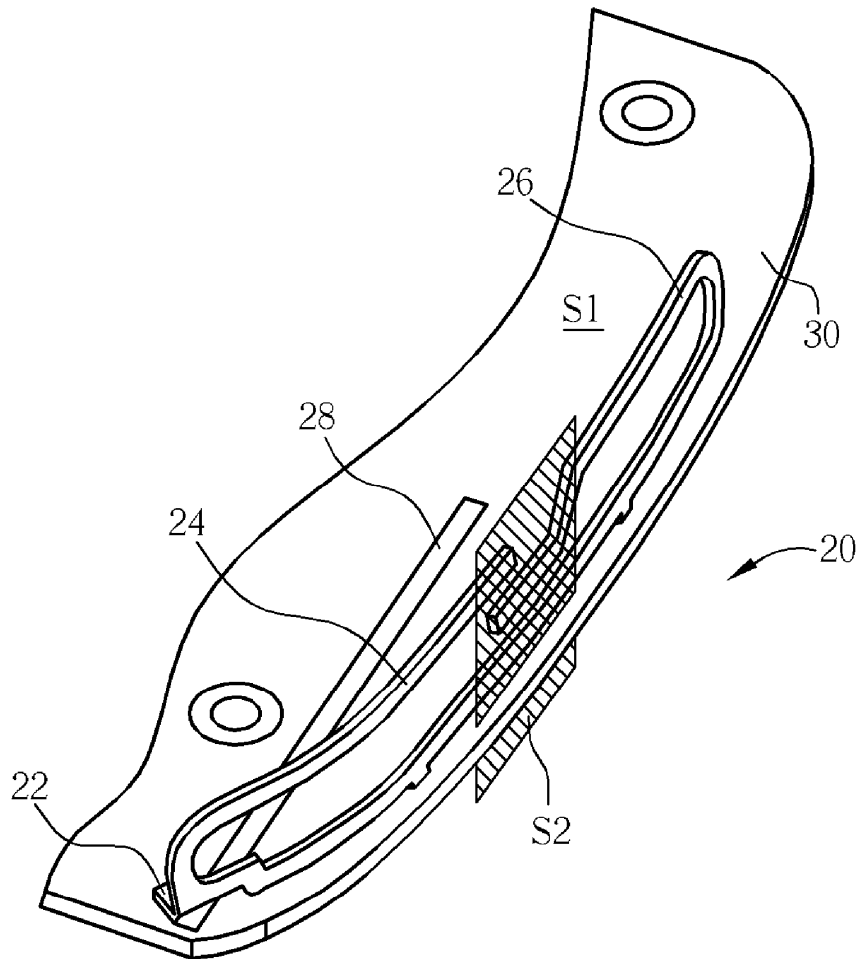
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**NORTH AMERICA INTELLECTUAL PROP-
ERTY CORPORATION**
P.O. BOX 506
MERRIFIELD, VA 22116

(57) **ABSTRACT**

A multi-band antenna includes a bent flat copper antenna forming a radiation surface to provide GSM-850/900/1800/1900 or GPS multi-band applications, and an auxiliary antenna coupled to the radiation surface provide WCDMA-2100/UMTS-2100 multi-band applications. The radiation surface and the auxiliary antenna are coupled to generate the required bandwidth for multiple radiation bands and to optimize the gain of radiation, so that the multi-band antenna can provide a broad range of services.

(21) Appl. No.: **11/854,557**

(22) Filed: **Sep. 13, 2007**





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(19) **United States**

(12) **Patent Application Publication**
Tanaka

(10) **Pub. No.: US 2008/0186237 A1**

(43) **Pub. Date: Aug. 7, 2008**

(54) **MICROSTRIP ANTENNA**

Publication Classification

(76) Inventor: **Masato Tanaka**, Tokyo (JP)

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

Correspondence Address:
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IP DOCKETING DEPT
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(52) **U.S. Cl.** **343/700 MS**

(57) **ABSTRACT**

(21) Appl. No.: **11/886,383**

A microstrip antenna comprising a dielectric substrate, a ground conductor provided on one surface thereof, a radiation conductor provided on the other surface and having an area smaller than that of the ground conductor, wherein generally flat electric circuit part having a ground surface is arranged on the surface of the radiation conductor, the ground surface of the electric circuit part is connected with the radiation conductor, and the plus terminal of the electric circuit part is inserted through a hole made through the radiation conductor, passed through the dielectric substrate out of contact with the radiation conductor, and connected with the ground conductor. Consequently, the microstrip antenna can be installed stably on any article without being impeded by the electric circuit part even if the electric circuit part is connected substantially directly and projected.

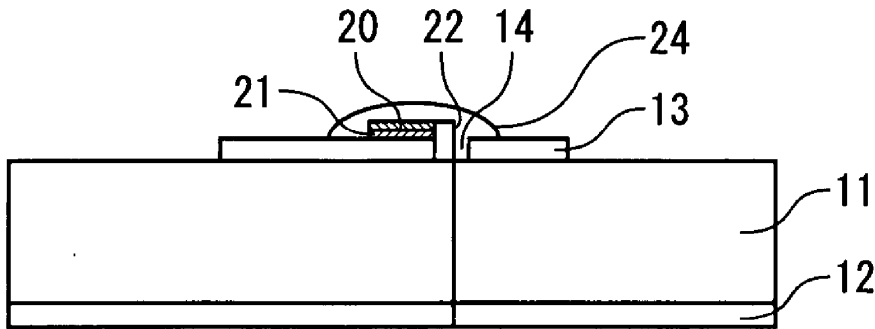
(22) PCT Filed: **Mar. 14, 2006**

(86) PCT No.: **PCT/JP06/04986**

§ 371 (c)(1),
(2), (4) Date: **Sep. 14, 2007**

(30) **Foreign Application Priority Data**

Mar. 14, 2005 (JP) 2005-070858





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(19) **United States**

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

(10) **Pub. No.: US 2008/0186238 A1**

(43) **Pub. Date: Aug. 7, 2008**

(54) **ANTENNA APPARATUS**

(30) **Foreign Application Priority Data**

(75) Inventors: **Junichi Noro**, Akita-shi (JP);
Kyuichi Sato, Oga-shi (JP)

Feb. 1, 2007 (JP) 2007-022925

Publication Classification

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

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

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

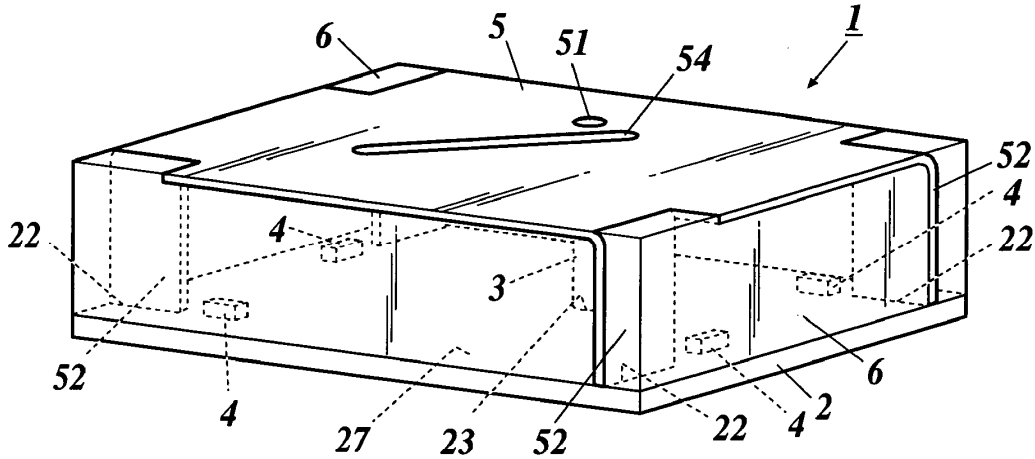
(57) **ABSTRACT**

Disclosed is an antenna apparatus including a dielectric substrate, an antenna element formed of a metallic plate which is disposed by having a predetermined space from the dielectric substrate, a plurality of leg pieces which extend toward the dielectric substrate from the antenna element, a chip capacitor which is electrically connected to the leg pieces and the dielectric substrate and an insert member made of resin which is inserted between the dielectric substrate and the antenna element.

(73) Assignee: **Mitsumi Electric Co. Ltd.**,
Tama-shi (JP)

(21) Appl. No.: **12/011,354**

(22) Filed: **Jan. 25, 2008**





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(19) **United States**

(12) **Patent Application Publication**
Itsuji

(10) **Pub. No.: US 2008/0186239 A1**

(43) **Pub. Date: Aug. 7, 2008**

(54) **ANTENNA DEVICE**

Publication Classification

(75) Inventor: **Takeaki Itsuji, Hiratsuka-shi (JP)**

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

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

Correspondence Address:
FITZPATRICK CELLA HARPER & SCINTO
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NEW YORK, NY 10112

(57) **ABSTRACT**

An antenna device for operating in a predetermined frequency band has a resonator section, a semiconductor section and an antenna section. The resonator section includes a first conductor section, a dielectric section, and a second conductor section for specifying a reference potential against each section which is arranged so as to oppose the first conductor section through the dielectric section. A semiconductor section is arranged so as to be sandwiched between the first conductor section and the second conductor section. The antenna section uses the second conductor section as a grounding conductor, is substantially spherical, makes at least its surface electroconductive, and is arranged on the first conductor section.

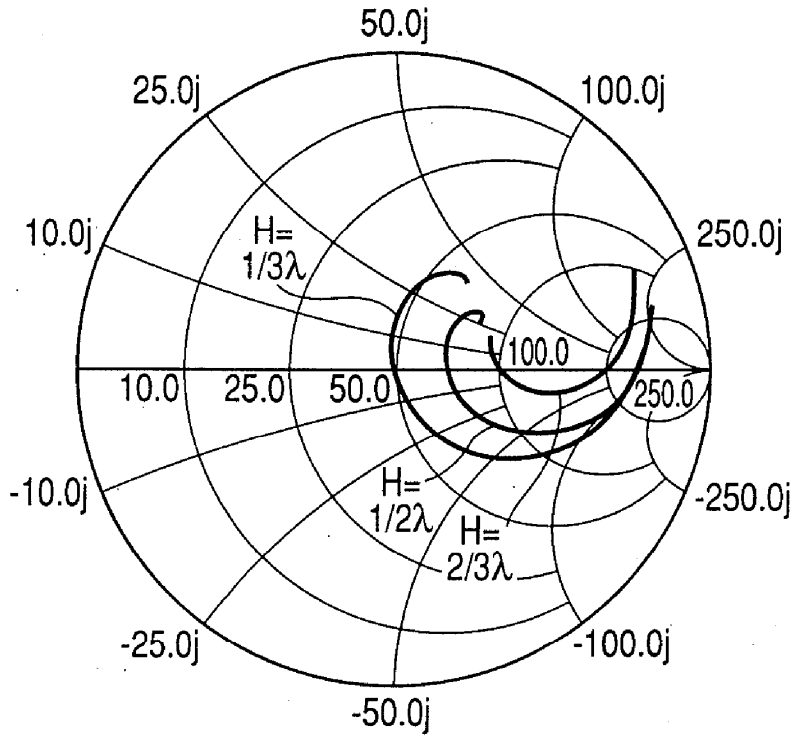
(73) Assignee: **CANON KABUSHIKI KAISHA,**
Tokyo (JP)

(21) Appl. No.: **12/023,863**

(22) Filed: **Jan. 31, 2008**

(30) **Foreign Application Priority Data**

Feb. 1, 2007 (JP) 2007-0235969(PAT.)





US 20080186243A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0186243 A1**

(43) **Pub. Date: Aug. 7, 2008**

(54) **VSWR IMPROVEMENT FOR BICONE ANTENNAS**

Publication Classification

(75) Inventors: **Donald N. Black**, Cumming, GA (US); **John D. Voss**, Cumming, GA (US); **Terence D. Newbury**, Hoschton, GA (US)

(51) **Int. Cl.**
H01Q 13/04 (2006.01)
H01Q 13/02 (2006.01)

(52) **U.S. Cl.** **343/773; 343/772**

Correspondence Address:
KING & SPALDING LLP
1180 PEACHTREE STREET
ATLANTA, GA 30309-3521

(57) **ABSTRACT**

A broadband bicone antenna system supports improved VSWR operation of a high-impedance bicone antenna having a reduced aperture size, high input impedance at the central vertex of the cones, one or more pattern tuning filters associated with the cones, and input filtering for frequency selective impedance matching. Pattern tuning filters can improve the radiation pattern at different frequencies by controlling the electrical length of the antenna in response to the frequency components of the associated wideband signal. Impedance matching input filters can improve the signal matching to couple radio frequency energy into the antenna system from a feed line. Mutual tuning of the pattern tuning filters; the impedance matching input filters; and the impedance of the bicone antenna itself can improve the overall voltage standing wave ratio (VSWR) performance of the bicone antenna system over a broad range of operating frequencies.

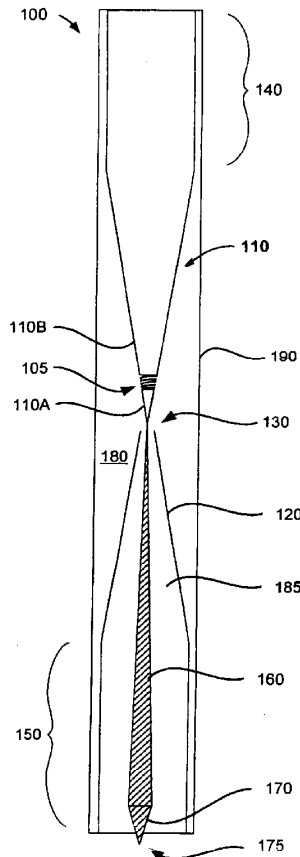
(73) Assignee: **EMS Technologies**, Norcross, GA (US)

(21) Appl. No.: **12/012,879**

(22) Filed: **Feb. 6, 2008**

Related U.S. Application Data

(60) Provisional application No. 60/899,806, filed on Feb. 6, 2007, provisional application No. 60/899,813, filed on Feb. 6, 2007.





US 20080186244A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0186244 A1**

(43) **Pub. Date: Aug. 7, 2008**

(54) **FREQUENCY CONTROL OF ELECTRICAL LENGTH FOR BICONE ANTENNAS**

Publication Classification

(75) Inventors: **Donald N. Black**, Cumming, GA (US); **John D. Voss**, Cumming, GA (US); **Terence D. Newbury**, Hoschton, GA (US); **Michael G. Guler**, Dawsonville, GA (US)

(51) **Int. Cl.**
H01Q 13/04 (2006.01)

(52) **U.S. Cl.** **343/773**

(57) **ABSTRACT**

Correspondence Address:
KING & SPALDING LLP
1180 PEACHTREE STREET
ATLANTA, GA 30309-3521

A broadband bicone antenna supports frequency selective control of electrical length. Frequency selective control of the electrical length of an antenna can provide an antenna exhibiting two or more different electrical lengths where use of each length depends upon the operating frequencies of the signals. The electrical length of the bicone antenna may be reduced in response to higher operating frequencies. Such reduction in electrical length at higher frequencies can provide improved antenna radiation patterns for the antenna. Further, the electrical length of the bicone antenna may be increased in response to low frequency operation. Such increase in electrical length may improve VSWR performance at lower frequencies. Simultaneous operation of the bicone antenna at varied electrical lengths for varied frequency bands can provide improved broadband performance of the antenna.

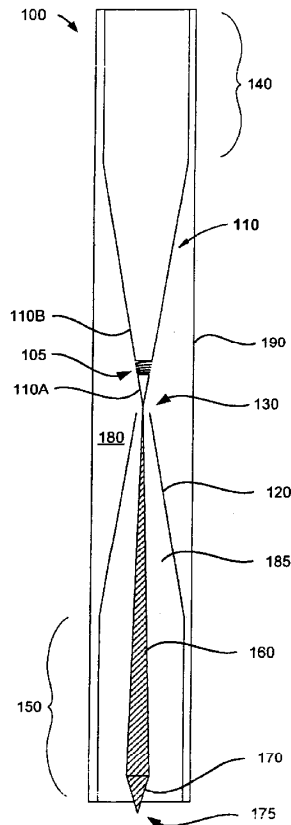
(73) Assignee: **EMS Technologies**, Norcross, GA (US)

(21) Appl. No.: **12/012,880**

(22) Filed: **Feb. 6, 2008**

Related U.S. Application Data

(60) Provisional application No. 60/899,806, filed on Feb. 6, 2007, provisional application No. 60/899,813, filed on Feb. 6, 2007.





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(19) **United States**

(12) **Patent Application Publication**
Deloche

(10) **Pub. No.: US 2008/0191029 A1**

(43) **Pub. Date: Aug. 14, 2008**

(54) **METHOD FOR MANUFACTURING A SMART CARD, A THUS MANUFACTURED SMART CARD, AND A METHOD FOR MANUFACTURING A WIRED ANTENNA**

(86) PCT No.: **PCT/IB2006/001073**

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

(30) **Foreign Application Priority Data**

(75) Inventor: **Manuel Deloche**, Meudon (FR)

May 4, 2005 (EP) 05290981.9

Publication Classification

Correspondence Address:

OSHA LIANG L.L.P.
1221 MCKINNEY STREET, SUITE 2800
HOUSTON, TX 77010

(51) **Int. Cl.**
G06K 19/067 (2006.01)
H01Q 17/00 (2006.01)

(52) **U.S. Cl.** **235/492; 29/601**

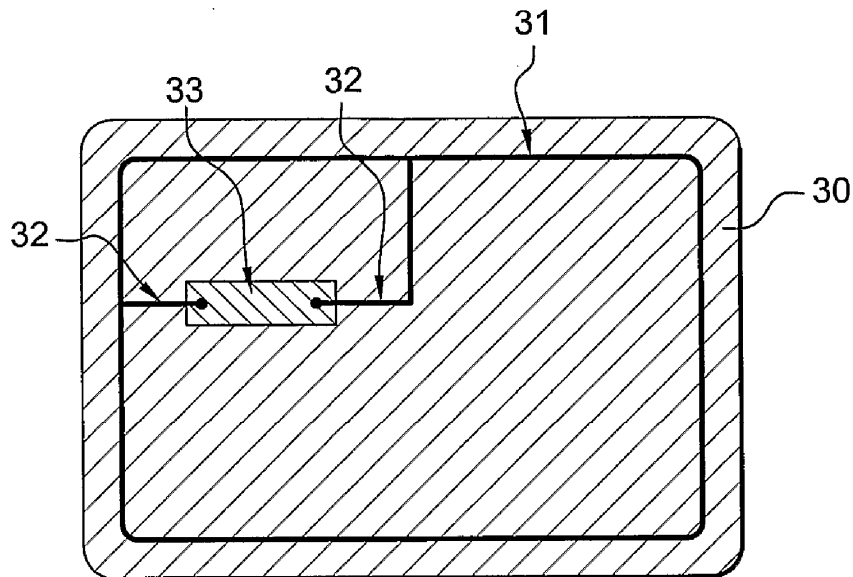
(73) Assignee: **AXALTO SA**, Meudon (FR)

(57) **ABSTRACT**

(21) Appl. No.: **11/913,541**

In general, the invention relates to a method for manufacturing a wired antenna on a plastic sheet forming an inlet for smart card. The method includes affixing a wired antenna onto the plastic sheet, and affixing at least one metallic plate onto both ends of the wired antenna.

(22) PCT Filed: **Apr. 28, 2006**





US 20080191940A1

(19) **United States**

(12) **Patent Application Publication**
Haskell

(10) **Pub. No.: US 2008/0191940 A1**

(43) **Pub. Date: Aug. 14, 2008**

(54) **ELECTRICALLY STEERABLE PHASED
ARRAY ANTENNA SYSTEM**

Publication Classification

(75) Inventor: **Philip Edward Haskell**, Hampshire
(GB)

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

(52) **U.S. Cl.** **342/373**

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**MCDONNELL BOEHNEN HULBERT & BERG-
HOFF LLP**
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CHICAGO, IL 60606

(57) **ABSTRACT**

An electrically steerable phased array antenna system includes an array of antenna elements and a corporate feed network having an inner region for input of two input signals A and B. The corporate feed network has two outer regions and generating vector combinations of respective input signals and other input signal fractions. Each outer region has a splitting and combining network providing the vector combinations as signals to antenna elements connected predominantly peripherally to itself. Each splitting and combining network has input signal connections from the inner region disposed peripherally of the corporate feed network. Each consists of splitters and adding/subtracting elements implemented as hybrid couplers some of which have re-entrant or meandered track sections. Hybrid meandered track sections have multiple widths for signal weighting. The corporate feed network is configured to avoid track cross-overs.

(73) Assignee: **QINETIQ LIMITED**

(21) Appl. No.: **11/914,083**

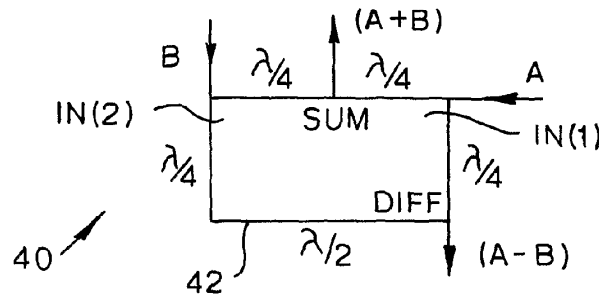
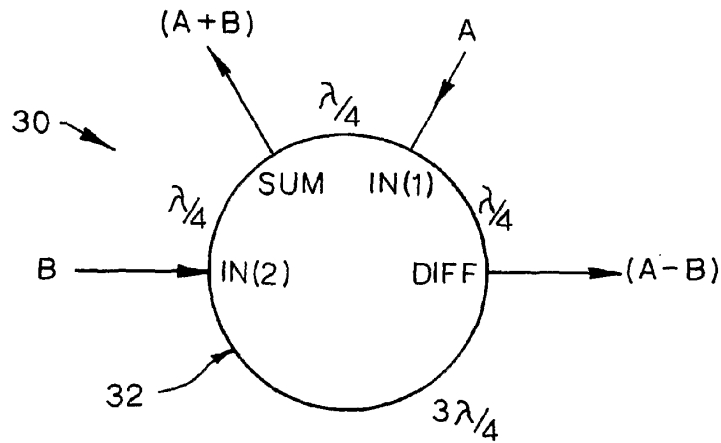
(22) PCT Filed: **May 5, 2006**

(86) PCT No.: **PCT/GB2006/001645**

§ 371 (c)(1),
(2), (4) Date: **Nov. 9, 2007**

(30) **Foreign Application Priority Data**

May 12, 2005 (GB) 0509647.4





US 20080191943A1

(19) **United States**

(12) **Patent Application Publication**
Wu

(10) **Pub. No.: US 2008/0191943 A1**

(43) **Pub. Date: Aug. 14, 2008**

(54) **ANTENNA DEVICE HAVING MEMBRANE STRUCTURE**

Publication Classification

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

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

(57) **ABSTRACT**

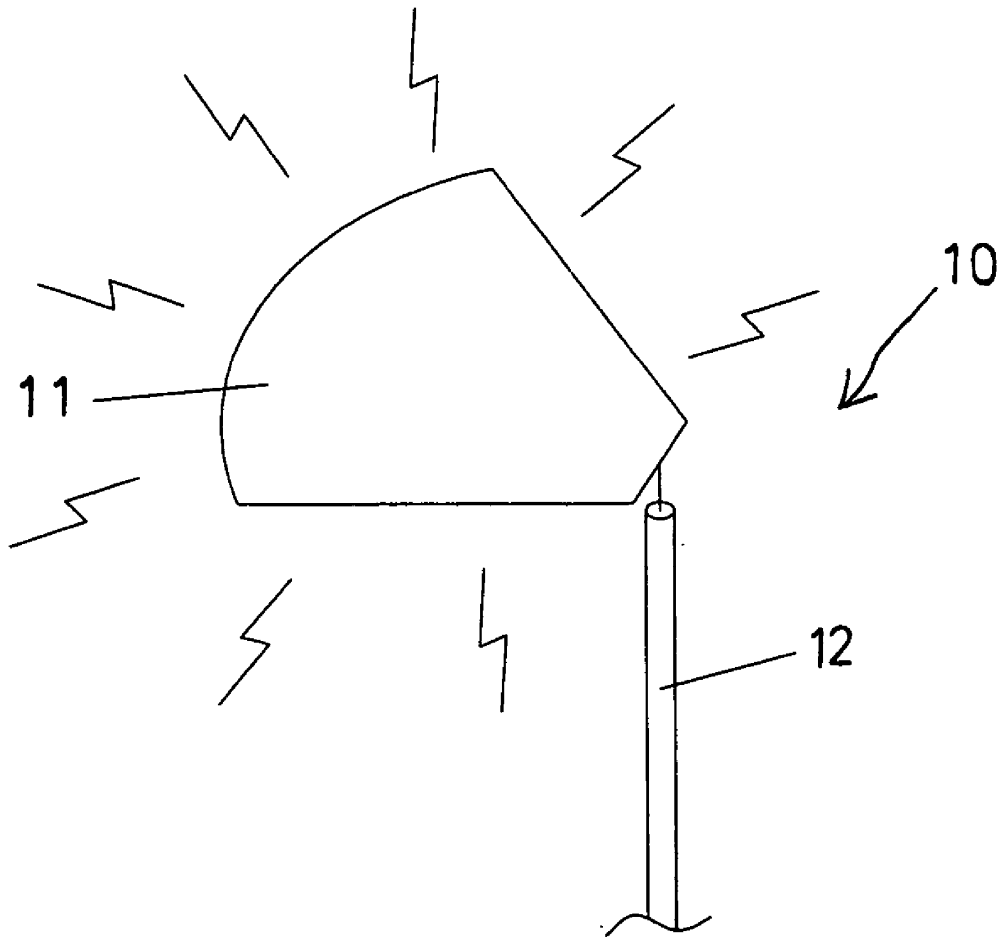
(76) Inventor: **Hsin Heng Wu**, Chonli City (TW)

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90 JOHN STREET, SUITE 309
NEW YORK, NY 10038

An antenna device includes a membrane, and a conductor wire coupled to the membrane for electrically coupling the membrane to various electric facilities or telecommunication apparatus, the membrane is preferably made of metallic reflective material that may be applied onto the typical compact discs and that includes a conductivity and dielectric coefficient for facilitating a signal receiving and transmitting effect to the antenna device. The membrane may include a flexible structure and attachable onto various objects to conform the outer contours of the objects.

(21) Appl. No.: **11/264,843**

(22) Filed: **Nov. 1, 2005**





US 20080191945A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0191945 A1**

(43) **Pub. Date: Aug. 14, 2008**

(54) **ANTENNA, AND RADIO-FREQUENCY IDENTIFICATION TAG**

(30) **Foreign Application Priority Data**

Jul. 22, 2005 (JP) 2005-212450
Jan. 16, 2006 (JP) 2006-007800

(76) Inventors: **Kazunari Taki**, Nagoya-shi (JP);
Yasumitsu Miyazaki, Kani-shi (JP)

Publication Classification

Correspondence Address:
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THE WARNER, SUITE 1300, 1299 PENNSYLVANIA AVE, NW
WASHINGTON, DC 20004-2400 (US)

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

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

(57) **ABSTRACT**

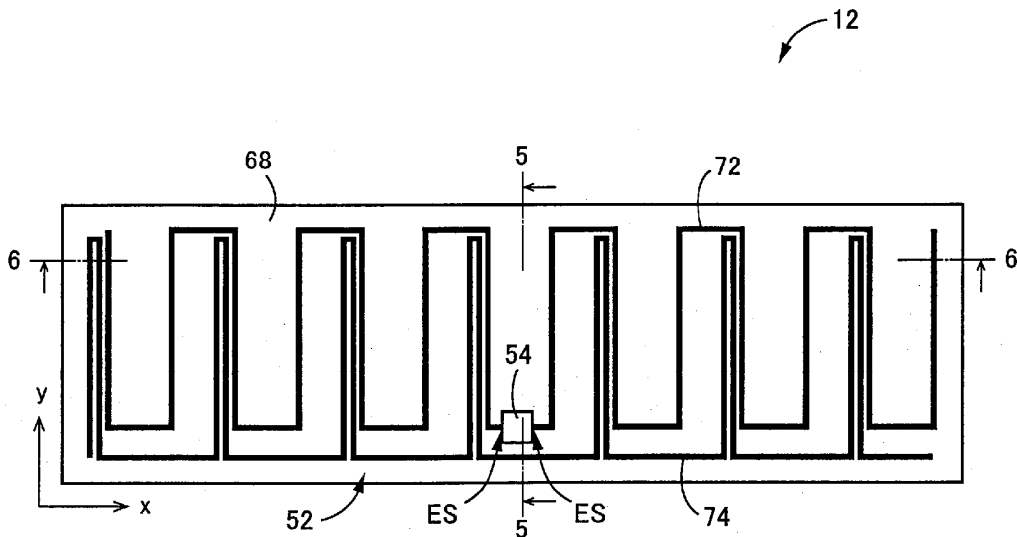
An antenna connected to a circuit portion and configured to effect transmission and reception of information by radio communication, the antenna including a driven meander line portion which has a feed section connected to the circuit portion and which is a line conductor formed in a meandering pattern, and a parasitic meander line portion which does not have a feed section connected to the circuit portion and which is a line conductor formed in a meandering pattern and positioned relative to the driven meander line portion, so as to influence an input impedance of the driven meander line portion. Also disclosed is a radio-frequency identification tag including the antenna.

(21) Appl. No.: **12/018,184**

(22) Filed: **Jan. 22, 2008**

Related U.S. Application Data

(63) Continuation-in-part of application No. PCT/JP2006/310593, filed on May 26, 2006.





US 20080191947A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0191947 A1**

(43) **Pub. Date: Aug. 14, 2008**

(54) **PORTABLE COMMUNICATION DEVICE
ANTENNA ARRANGEMENT**

Publication Classification

(75) Inventors: **Jan-Willem Zweer**, Wezep (NL);
Emst Hupkes, Kampen (NL)

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

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

Correspondence Address:
HARRITY SNYDER, L.L.P.
11350 RANDOM HILLS ROAD, SUITE 600
FAIRFAX, VA 22030

(57) **ABSTRACT**

(73) Assignee: **SONY ERICSSON MOBILE
COMMUNICATIONS AB**, Lund
(SE)

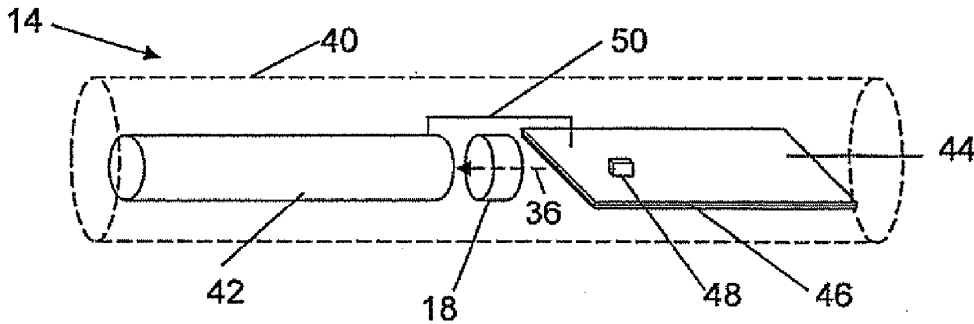
A portable communication device is provided, which includes a radio communication unit, an antenna exciter element for connection to the radio communication unit and ground and at least one further antenna element provided on one side of the antenna exciter element. The further antenna elements comprise a first mass block of electrically conducting material including components provided for the operation of the portable communication device. The mass block is dimensioned for operating in a frequency band in which communication is desired when being excited by the antenna exciter element and each mass block and the antenna exciter element extend in three dimensions.

(21) Appl. No.: **11/681,320**

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

Related U.S. Application Data

(60) Provisional application No. 60/887,913, filed on Feb. 2, 2007.





US 20080191948A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0191948 A1**

(43) **Pub. Date: Aug. 14, 2008**

(54) **ANTENNA FOR ELECTRONIC PRODUCT AND METHOD FOR FABRICATING THE SAME**

(30) **Foreign Application Priority Data**

Jan. 19, 2007 (CN) 200710073005.7

Publication Classification

(75) Inventors: **TSENG-HSIANG HU**, Tu-Cheng (TW); **LI-KUANG TAN**, Tu-Cheng (TW); **YEU-LIH LIN**, Tu-Cheng (TW)

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

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

(57) **ABSTRACT**

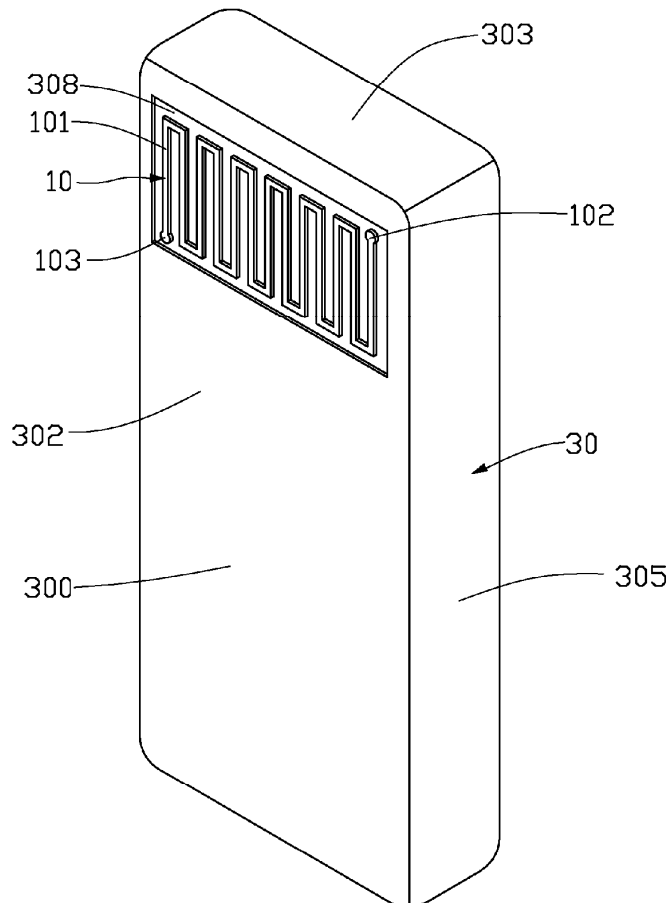
Correspondence Address:
PCE INDUSTRY, INC.
ATT. CHENG-JU CHIANG
458 E. LAMBERT ROAD
FULLERTON, CA 92835

An antenna device (10) of a consumer electronic product is formed on an outer surface (302) of a shell (30) of the electronic product. The shell of the consumer electronic product is adapted for forming an enclosure of an electronic product. The antenna device extends on a planar plane and is integrally formed with and is coated on the outer surface of the shell. A method for making the antenna device includes: (A) providing a consumer electronic product having a shell for forming the antenna device on an outer surface thereof, the shell being adapted for enclosing components of the consumer electronic product therein; (B) coating a copper layer on the outer surface of the shell of the electronic product; (C) forming circuitry out of the copper layer to form the antenna device.

(73) Assignee: **FOXCONN TECHNOLOGY CO., LTD.**, Tu-Cheng (TW)

(21) Appl. No.: **11/690,043**

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





US 20080191957A1

(19) **United States**

(12) **Patent Application Publication**
Chang

(10) **Pub. No.: US 2008/0191957 A1**

(43) **Pub. Date: Aug. 14, 2008**

(54) **U SHAPE THREE DIMENSIONAL
MULTI-FREQUENCY ANTENNA**

(52) **U.S. Cl. 343/845**

(76) **Inventor: Pao-Sui Chang, Taoyan Hsien
(TW)**

(57) **ABSTRACT**

Correspondence Address:
PAO-SUI CHANG
235 Chung-Ho, Box 8-24
Taipei

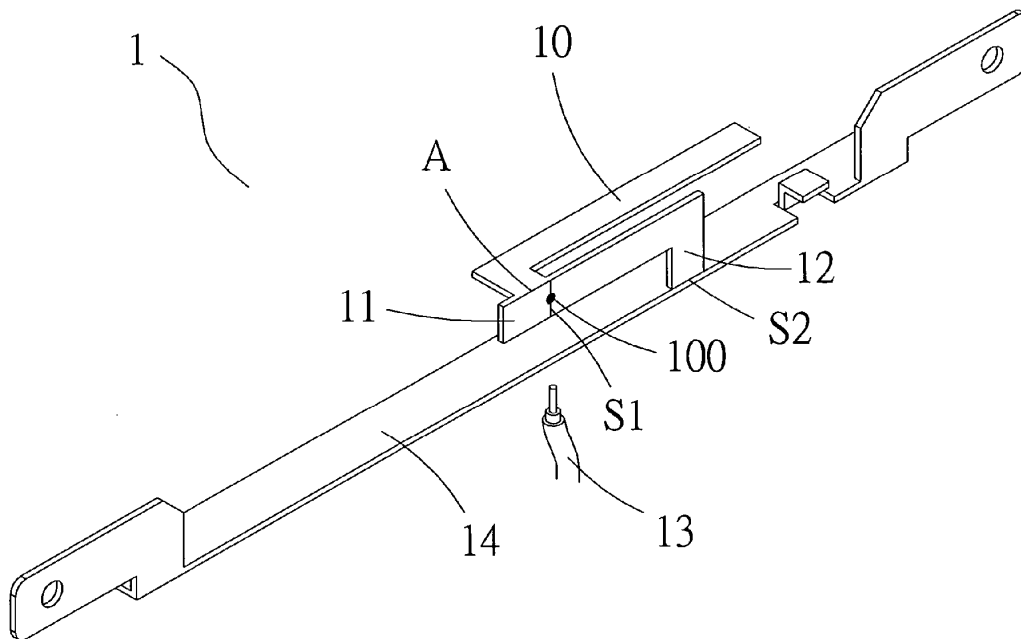
A U shape three dimensional multi-frequency antenna, comprises a first radiation body having an L shape; a second radiation body being connected to the first radiation body; one end of the second radiation body being vertically connected to the first radiation body; a connecting portion connected to the second radiation body at one end thereof as an integral body; a connection of the connecting portion and the second radiation body being formed as a signal feeding point; a signal feeding wire being connected to the signal feeding point at one end thereof; another end of the signal feeding wire serving for being installed with an antenna receiver; and a grounding path connected to another end of the connecting portion; a potential of the grounding path being identical to the antenna receiver.

(21) **Appl. No.: 11/704,836**

(22) **Filed: Feb. 9, 2007**

Publication Classification

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





US 20080198073A1

(19) **United States**

(12) **Patent Application Publication**
Yeh

(10) **Pub. No.: US 2008/0198073 A1**

(43) **Pub. Date: Aug. 21, 2008**

(54) **METHOD FOR ADJUSTING A PCB ANTENNA
AND A STRUCTURE THEREOF**

Publication Classification

(75) Inventor: **Ming-Hao Yeh, Zhubei City (TW)**

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

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

Correspondence Address:
REED SMITH LLP
3110 FAIRVIEW PARK DRIVE, SUITE 1400
FALLS CHURCH, VA 22042

(57) **ABSTRACT**

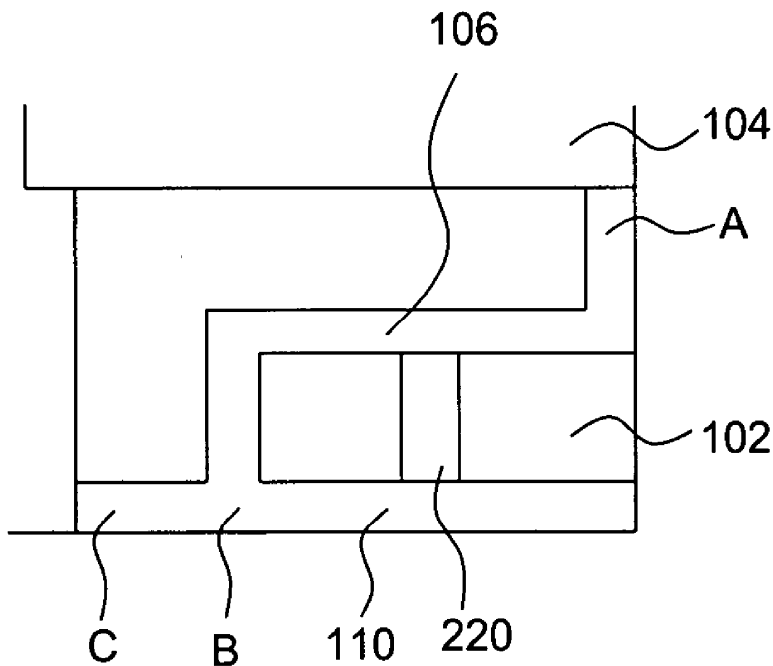
(73) Assignee: **MediaTek Inc.**

A PCB antenna, comprising: a substrate; a radiator, patterned on the substrate, having a branch point; a ground on the substrate; a short path, patterned on the substrate, having two ends where one end is connected to the ground and the other end is connected to the branch point of the radiator; and at least one passive element coupled between the radiator and the short path, is disclosed. The resonant frequency and/or the input impedance of the PCB antenna can be adjusted according to a distance between the passive element and the branch point of the radiator.

(21) Appl. No.: **11/707,148**

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

200





US 20080198075A1

(19) **United States**

(12) **Patent Application Publication**
Yoshioka

(10) **Pub. No.: US 2008/0198075 A1**
(43) **Pub. Date: Aug. 21, 2008**

(54) **BROADBAND ANTENNA UNIT COMPRISING A FOLDED PLATE-SHAPED MONOPOLE ANTENNA PORTION AND AN EXTENDING PORTION**

Publication Classification

(51) **Int. Cl.**
H01Q 9/04 (2006.01)
(52) **U.S. Cl.** **343/700 MS**
(57) **ABSTRACT**

(75) **Inventor:** **Hiroki Yoshioka, Tokyo (JP)**

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

(73) **Assignee:** **Mitsumi Electric Co. Ltd., Tama-shi (JP)**

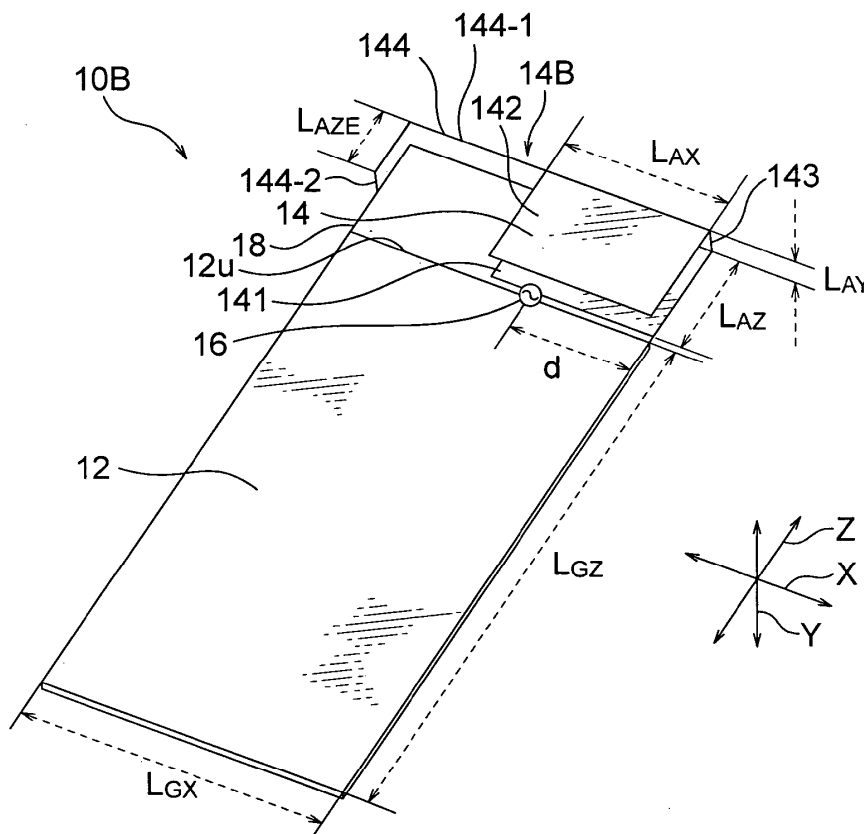
(21) **Appl. No.:** **12/069,332**

(22) **Filed:** **Feb. 8, 2008**

(30) **Foreign Application Priority Data**

Feb. 20, 2007 (JP) 2007-38737
Jul. 31, 2007 (JP) 2007-200132

In a broadband antenna unit including a ground plate, an antenna element disposed in the vicinity of an end of the ground plate, and a dielectric substrate for mounting the antenna element therein, the antenna element includes a folded plate-shaped monopole antenna portion having a U-shape in cross section and an extending portion extending from the folded plate-shaped monopole antenna portion. The antenna element is disposed on the side of one side edge of the ground plate. The broadband antenna unit has a feeding point between the ground plate and the antenna element that is disposed at a feeding position apart from the one side by a predetermined distance. A ratio between a width of the ground plate and the predetermined distance is substantially 5:2 when a ratio between the width of the ground plate and a width of the folded plate-shaped monopole antenna portion is 2:1.





US 20080198082A1

(19) **United States**

(12) **Patent Application Publication**
Soler Castany et al.

(10) **Pub. No.: US 2008/0198082 A1**
(43) **Pub. Date: Aug. 21, 2008**

(54) **ANTENNA DIVERSITY SYSTEM AND SLOT ANTENNA COMPONENT**

(75) Inventors: **Jordi Soler Castany**, Barcelona (ES); **Josep Mumbru Forn**, Barcelona (ES); **Carles Puente Baliarda**, Barcelona (ES)

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(73) Assignee: **Fractus, S.A.**, Sant Cugat del Valles (ES)

(21) Appl. No.: **11/914,178**

(22) PCT Filed: **May 12, 2006**

(86) PCT No.: **PCT/EP06/62285**

§ 371 (c)(1),
(2), (4) Date: **Nov. 12, 2007**

Related U.S. Application Data

(60) Provisional application No. 60/680,693, filed on May 13, 2005, provisional application No. 60/778,323, filed on Mar. 2, 2006.

(30) **Foreign Application Priority Data**

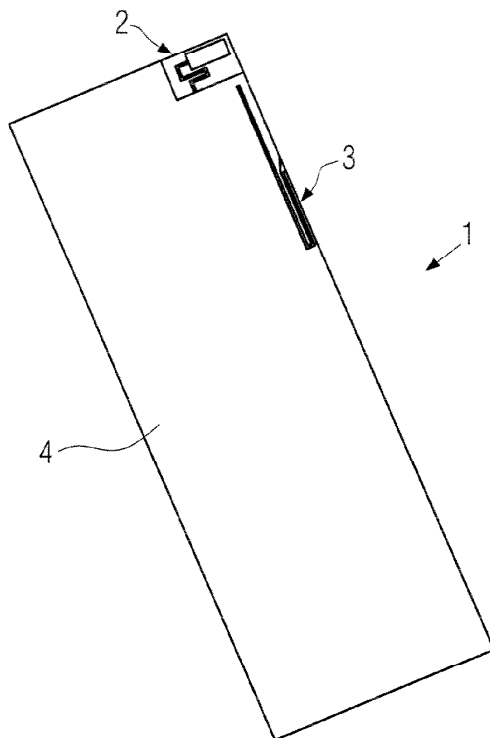
May 13, 2005 (EP) 05104026.9
Feb. 27, 2006 (EP) 06110437.8

Publication Classification

(51) **Int. Cl.**
H01Q 21/28 (2006.01)
H01Q 13/10 (2006.01)
H01Q 1/38 (2006.01)
(52) **U.S. Cl. 343/770; 343/893; 343/767; 343/700 MS**

(57) **ABSTRACT**

The present invention refers to an antenna diversity system comprising at least a first antenna and a second antenna wherein the first antenna substantially behaves as an electric current source or as a magnetic current source, and the second antenna substantially behaves as an electric current source or as a magnetic current source and a corresponding wireless device. Further the invention relates to an SMT-type slot-antenna component comprising at least one conductive surface or sheet of metal in which the pattern of a slot is created, at least one contact terminal accessible from the exterior of said component to electrically connect the conductive surface included in the slot-antenna component with the ground plane of a circuit board such as a printed circuit board and a corresponding wireless device.





US 20080198084A1

(19) **United States**

(12) **Patent Application Publication**
Yeap

(10) **Pub. No.: US 2008/0198084 A1**
(43) **Pub. Date: Aug. 21, 2008**

(54) **ASYMMETRIC DIPOLE ANTENNA**

Publication Classification

(75) **Inventor: Siew Bee Yeap, Penang (MY)**

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

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

(57) **ABSTRACT**

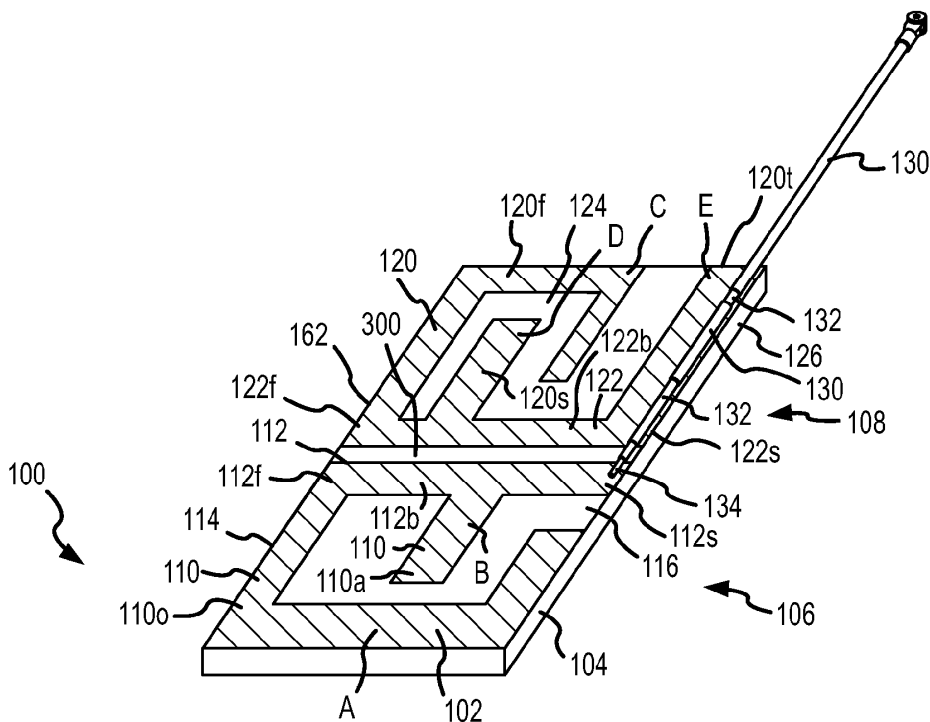
Correspondence Address:
HOLLAND & HART, LLP
P.O BOX 8749
DENVER, CO 80201

A multiple frequency dipole antenna is provided. The antenna includes a plurality of conductive traces on a substrate (flexible or rigid). One conductive trace comprises the radiating portion and includes a plurality of radiating arms asymmetrically arranged. The other conductive trace comprises the ground portion and includes a plurality of ground arms. Radio frequency power is supply using, for example, a coaxial cable feed. The outer conductor of the coaxial cable feed is attached ground portion (either substantially parallel or perpendicular to a portion of the ground arms. The central conductor of the cable traverses a gap between the radiating portion and ground portion and is coupled to the radiating portion distal from the radiating arms.

(73) **Assignee: Laird Technologies, Inc., Lincoln, NE (US)**

(21) **Appl. No.: 11/676,364**

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





US 20080198085A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0198085 A1**
(43) **Pub. Date: Aug. 21, 2008**

(54) **ANTENNA**

(76) Inventors: **Cheng-Hsuan HSU**, Hsin-Tien City (TW); **Chia-Wen Hsu**, Hsin-Tien City (TW); **Tsung-Wen Chiu**, Hsin-Tien City (TW); **Fu-Ren Hsiao**, Hsin-Tien City (TW)

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(21) Appl. No.: **12/028,966**

(22) Filed: **Feb. 11, 2008**

(30) **Foreign Application Priority Data**

Feb. 15, 2007 (TW) 096105848

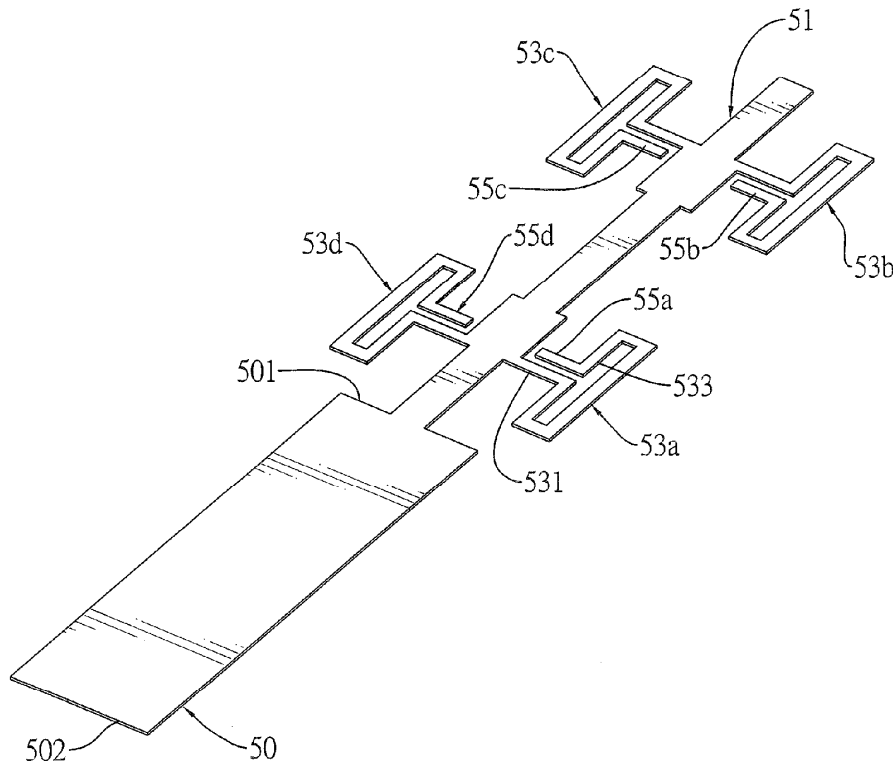
Publication Classification

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

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

(57) **ABSTRACT**

An antenna is formed integrally into one piece and has a ground plane, a feeding strip and two pairs of radiating patches. The feeding strip is connected integrally to the ground plane. The pairs of the radiating patches are formed symmetrically and integrally on the feeding strip. The antenna formed integrally into one piece simplifies the manufacture of the antenna lowers the manufacturing cost of the antenna.





US 20080198087A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0198087 A1**
(43) **Pub. Date: Aug. 21, 2008**

(54) **DUAL-BAND ANTENNA**

Publication Classification

(75) Inventors: **Yu-Chiang Cheng**, Taipei City (TW); **Ping-Cheng Chang**, Chaozhou Township (TW); **Cheng-Zeng Chou**, Sinying City (TW)

(51) **Int. Cl.**
H01Q 1/48 (2006.01)
(52) **U.S. Cl.** **343/845**
(57) **ABSTRACT**

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SEATTLE, WA 98125

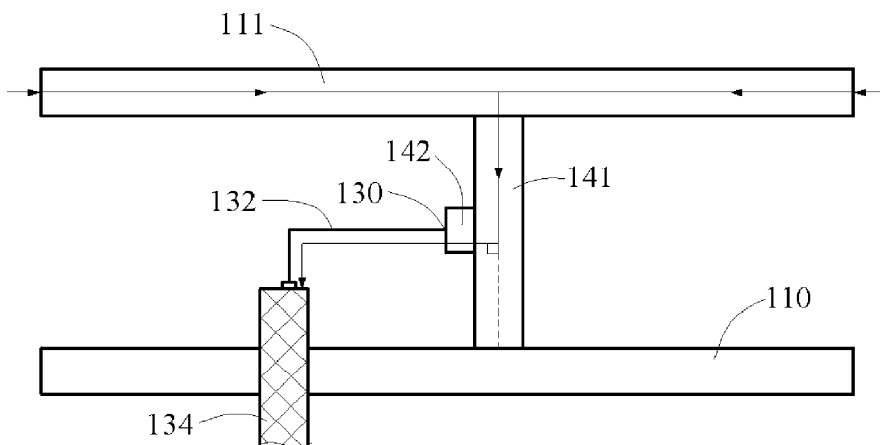
(73) Assignee: **Mitac Technology Corp.**, Hsin-Chu Hsien (TW)

(21) Appl. No.: **11/676,181**

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

A dual-band antenna is provided, which includes a signal resonance unit, a grounding unit, a connection unit, and a signal line. The grounding unit is disposed opposite to the signal resonance unit. The connection unit has a first connection element and a second connection element, wherein one end of the first connection element is connected to the signal resonance unit and the other end of the first connection element is connected to the grounding unit, while one end of the second connection element is connected to one side of the first connection element. The signal line has a signal feeding end and a circuit connection end, wherein the signal feeding end is electrically connected to the second connection element, and the circuit connection end is electrically connected to a wireless circuit device.

100





US 20080198088A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0198088 A1**
(43) **Pub. Date: Aug. 21, 2008**

(54) **COUPLING ANTENNA**

Publication Classification

(76) Inventors: **Sheng-Chih LIN**, Hsin-Tien City (TW); **Yi-Wei TSENG**, Hsin-Tien City (TW); **Tsung-Wen CHIU**, Hsin-Tien City (TW); **Fu-Ren HSIAO**, Hsin-Tien City (TW)

(51) **Int. Cl.**
H01Q 1/38 (2006.01)
H01Q 1/50 (2006.01)
(52) **U.S. Cl.** **343/850; 343/700 MS**

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Alexandria, VA 22314

(57) **ABSTRACT**

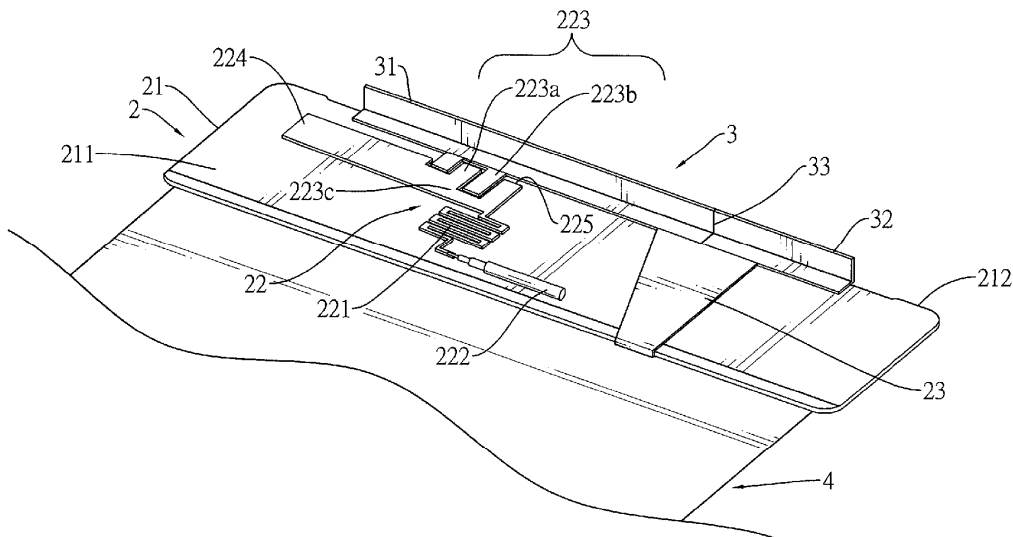
(21) Appl. No.: **12/028,606**

(22) Filed: **Feb. 8, 2008**

(30) **Foreign Application Priority Data**

Feb. 15, 2007 (TW) 096105851

A coupling antenna has a ground plane, a main radiating assembly and a secondary radiating assembly. The main radiating assembly is mounted on the ground plane and has a substrate, a feeding-and-coupling assembly and a shorting member. The feeding-and-coupling assembly has a feeding member, a coupling member and an extension member. The second radiating assembly is mounted on the ground plane, is connected to the main radiating assembly and has a first radiating patch and a second radiating patch. With the extension member and the first and second radiating patches, operating bandwidth of the coupling antenna is improved.





US 20080198089A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0198089 A1**

(43) **Pub. Date: Aug. 21, 2008**

(54) **COUPLING ANTENNA**

Publication Classification

(75) Inventors: **Chih-Jen Hsiao**, Hsin-Tien City (TW); **Po-Yuan Liao**, Hsin-Tien City (TW); **Tsung-Wen Chiu**, Hsin-Tien City (TW); **Fu-Ren Hsiao**, Hsin-Tien City (TW)

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

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

Correspondence Address:
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(57) **ABSTRACT**

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

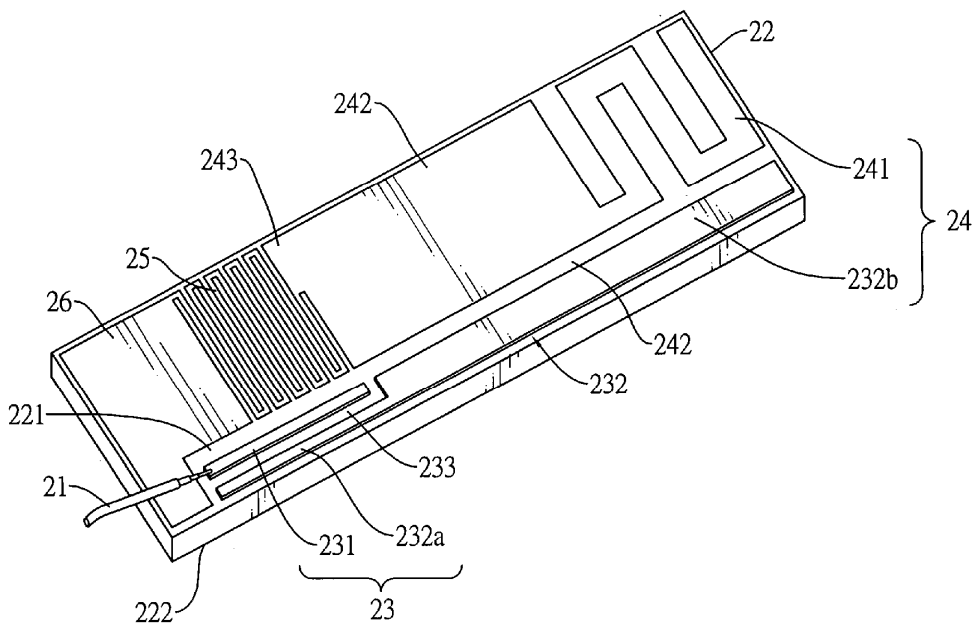
A coupling antenna has a substrate, an inducting conductor, a ground plane, a first coupling member and a second coupling member. The inducting conductor is mounted on the substrate. The ground plane is formed on and protrudes from the inducting conductor and is mounted on the substrate. The first coupling member is mounted on the substrate and is connected to a feeding cable. The second coupling member is mounted on the substrate and is connected to the first coupling member. The coupling antenna with the first coupling member, the second coupling member and the inducting conductor has a wide bandwidth and a small size.

(21) Appl. No.: **12/069,145**

(22) Filed: **Feb. 7, 2008**

(30) **Foreign Application Priority Data**

Feb. 15, 2007 (TW) 096105853





US 20080204323A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0204323 A1**

(43) **Pub. Date: Aug. 28, 2008**

(54) **ANTENNA DEVICE**

Publication Classification

(76) Inventors: **Akihiko Iguchi**, Osaka (JP); **Yuki Satoh**, Osaka (JP)

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

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

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(57) **ABSTRACT**

An antenna device includes a grounding board having an edge, and an antenna provided on the grounding board. The antenna includes a dielectric block having a top surface, a bottom surface, and a side surface, a radiator electrode provided on the top surface, a short-circuit electrode provided on the side surface. The radiator electrode includes a short-circuited end connected to the second end of the short-circuit electrode, and a portion extending from the short-circuited end and along the outer periphery of the top surface of the dielectric block. The portion of the radiator electrode has an open end located at the first side of the dielectric block. The side surface of the dielectric block is substantially flush with the edge of the grounding board. This antenna device improves radiation characteristics of the chip antenna and allowing a communication device to have a small size.

(21) Appl. No.: **10/587,599**

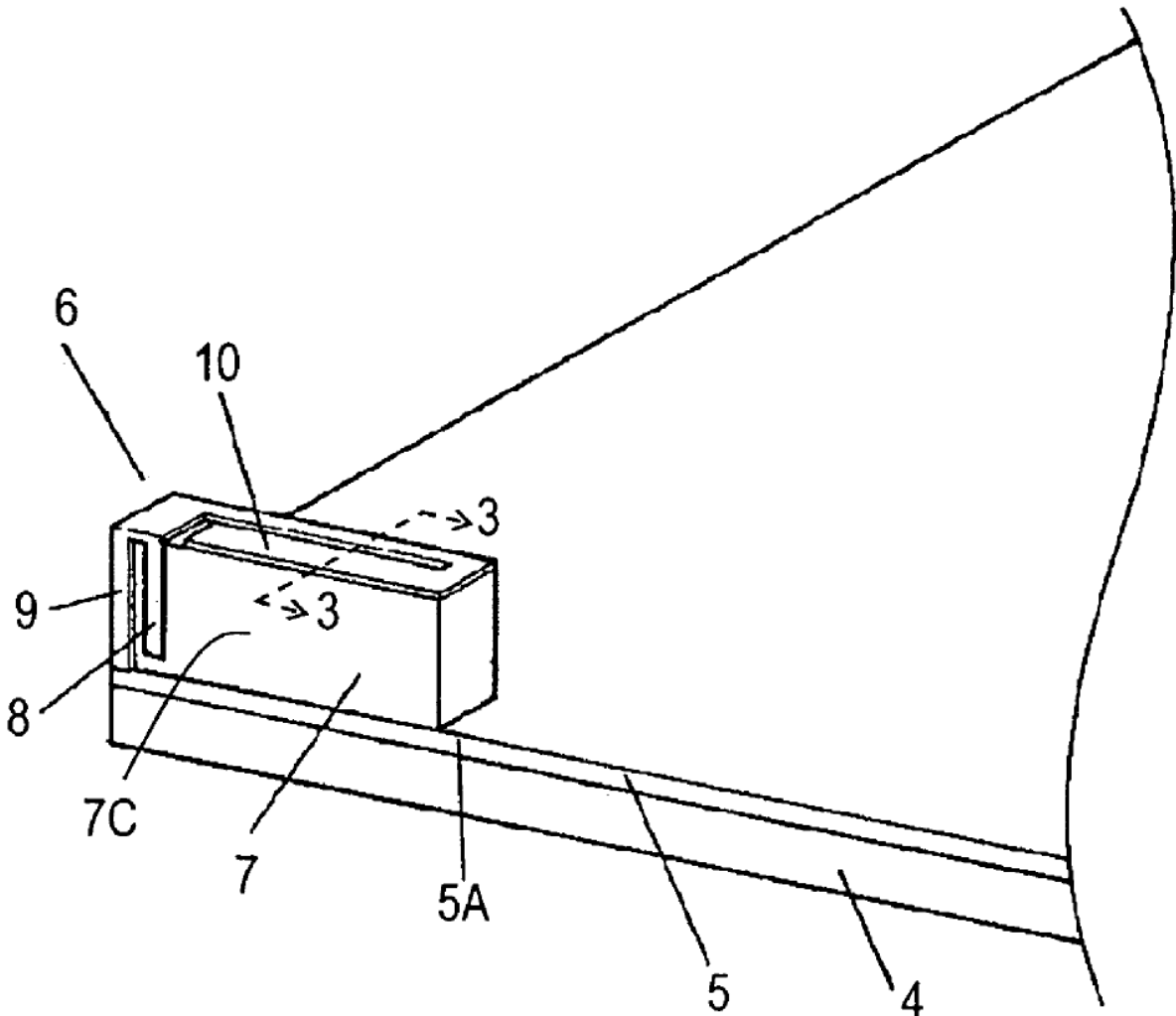
(22) PCT Filed: **Jan. 19, 2006**

(86) PCT No.: **PCT/JP2006/300691**

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

(30) **Foreign Application Priority Data**

Jan. 26, 2005 (JP) 2005-018061





US 20080204324A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0204324 A1**

(43) **Pub. Date: Aug. 28, 2008**

(54) **PATCH ANTENNA AND METHOD FOR PRODUCING A PATCH ANTENNA**

Publication Classification

(75) Inventors: **Yasuyuki Okamura**, Osaka (JP);
Kazuhiro Kitatani, Osaka (JP)

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

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

(73) Assignee: **OSAKA UNIVERSITY**, Suita-shi (JP)

(57) **ABSTRACT**

(21) Appl. No.: **11/572,697**

In the present invention, a patch antenna wherein electric waves in two frequency bands can be transmitted and received is provided with smaller dimensions and a lower cost than in the conventional arts. The patch antenna has a radiation electrode and a ground conductor disposed to oppose each other, and has dielectrics in the gap between the radiation electrode and the ground conductor. The radiation electrode and the ground conductor are made of a material being excellent in electric conductivity. The radiation electrode is rectangular in a plan view. A power supplying part is disposed at a position having substantially the same distance from the opposing two sides of the radiation electrode. The thickness of the dielectrics differs with a boundary located at the position of distance a from one terminal side of the radiation electrode in the longer-side direction of the radiation electrode.

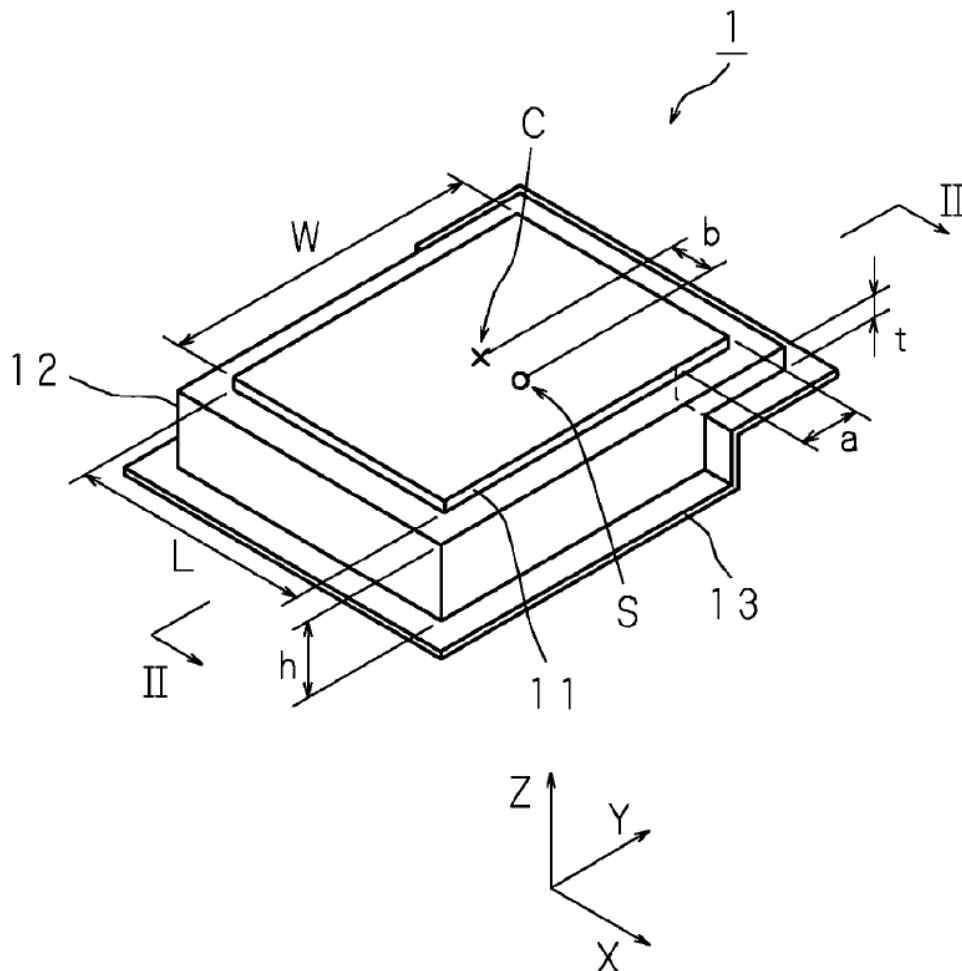
(22) PCT Filed: **Jul. 25, 2005**

(86) PCT No.: **PCT/JP05/13598**

§ 371 (c)(1),
(2), (4) Date: **Jan. 25, 2007**

(30) **Foreign Application Priority Data**

Jul. 28, 2004 (JP) 2004-220909





US 20080204325A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0204325 A1**

(43) **Pub. Date: Aug. 28, 2008**

(54) **ANTENNA APPARATUS**

(22) Filed: **Oct. 16, 2006**

(75) Inventors: **Masahiro Yanagi**, Shinagawa (JP);
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Hideki Iwata, Shinagawa (JP);
Takashi Yuba, Shinagawa (JP);
Masahiro Kaneko, Shinagawa (JP);
Yuriko Segawa, Shinagawa (JP);
Takashi Arita, Shinagawa (JP)

(30) **Foreign Application Priority Data**

Mar. 30, 2006 (JP) 2006-094459

Publication Classification

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

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

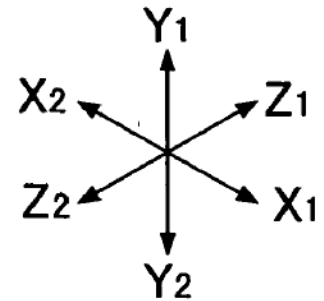
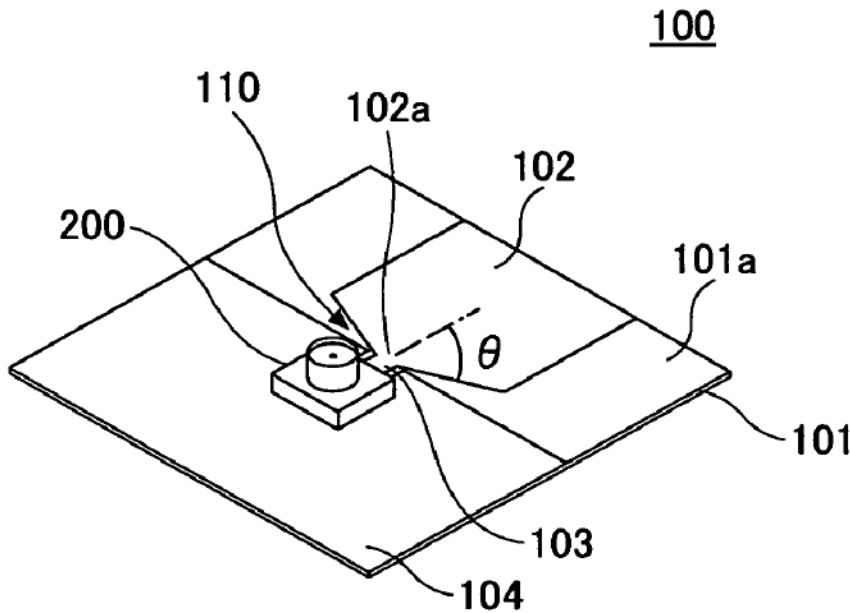
(57) **ABSTRACT**

A disclosed antenna apparatus includes a base made of a dielectric material; an antenna element pattern formed on a surface of the base; a ground pattern formed in a position adjacent to and opposite to the antenna element pattern on the same surface of the base; and a surface-mounted coaxial connector mounted on the ground pattern in a position close to a feeding point of the antenna element pattern.

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

(21) Appl. No.: **11/580,910**





US 20080204326A1

(19) **United States**

(12) **Patent Application Publication**

Zeinolabedin Rafi et al.

(10) **Pub. No.: US 2008/0204326 A1**

(43) **Pub. Date: Aug. 28, 2008**

(54) **PATCH ANTENNA**

Publication Classification

(76) Inventors: **Gholamreza Zeinolabedin Rafi,**
Kitchener (CA); **Safieddin**
Safavi-Naeni, Waterloo (CA);
Alastair Malarky, Petersburg (CA)

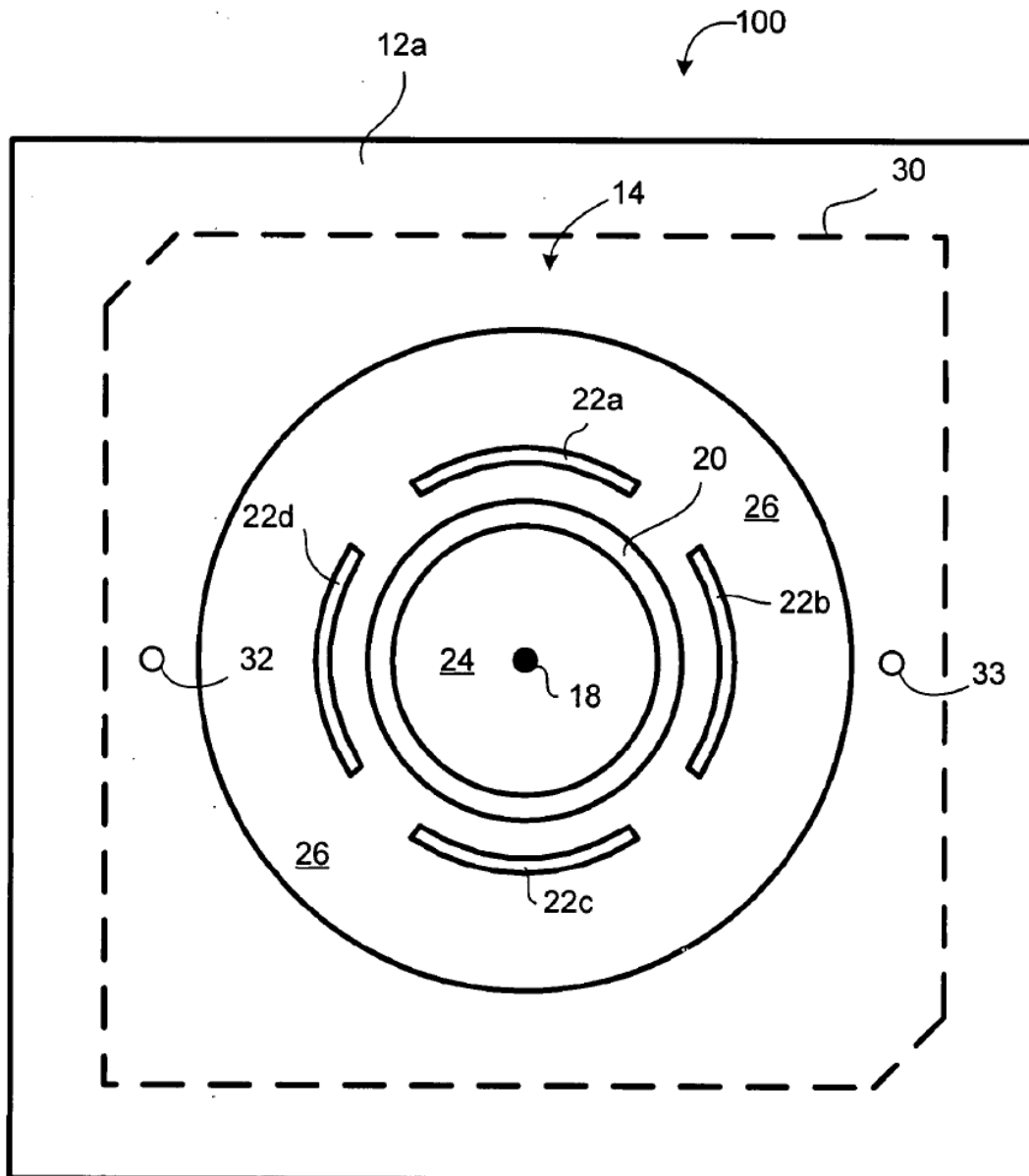
(51) **Int. Cl.**
H01Q 13/10 (2006.01)
(52) **U.S. Cl.** **343/700 MS**
(57) **ABSTRACT**

Correspondence Address:
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A patch antenna for achieving a vertically-polarized radiation pattern is described. The patch antenna includes a closed-curve slot within which a signal feed point is located. Parasitic slots are disposed outside or inside the closed-curve slot. In one embodiment, the closed-curve slot is a ring slot and the parasitic slots are arc slots having a common center point with the ring slot. The antenna may further include a lower patch capable of producing a different radiation pattern with different polarization and at a different frequency band, to result in a dual-band antenna. The dual-band antenna may operate in the 5.9 GHz DSRC and 1.575 GHz GPS bands.

(21) Appl. No.: **11/710,379**

(22) Filed: **Feb. 23, 2007**





US 20080204329A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0204329 A1**

(43) **Pub. Date: Aug. 28, 2008**

(54) **ANTENNA, AND RADIO-FREQUENCY IDENTIFICATION TAG**

Publication Classification

(75) Inventors: **Kazunari Taki**, Nagoya-shi (JP);
Yasumitsu Miyazaki, Kani-shi (JP)

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

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

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(57) **ABSTRACT**

An antenna connected to a circuit portion and configured to effect transmission and reception of information by radio communication, the antenna including a driven meander line portion which has a feed section connected to the circuit portion and which is a line conductor formed in a meandering pattern, and a parasitic meander line portion which does not have a feed section connected to the circuit portion and which is a line conductor formed in a meandering pattern, the parasitic meander line portion being positioned relative to the driven meander line portion, so as to influence an input impedance of the driven meander line portion, wherein the driven and parasitic line portions have respective extensions of the line conductors formed at respective opposite longitudinal ends of the antenna. Also disclosed in a transponder in the form of a radio-frequency identification tag including the antenna and capable of radio communication with an interrogator.

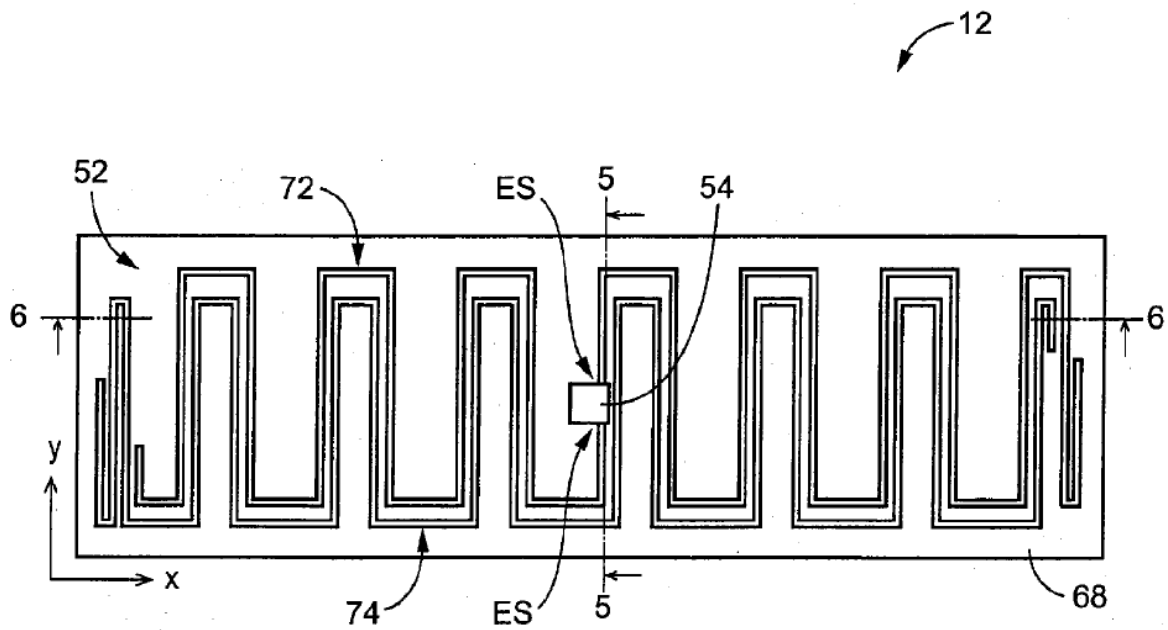
(73) Assignees: **Yasumitsu Miyazaki**, Kani-shi (JP); **BROTHER KOGYO KABUSHIKI KAISHA**, Nagoya-shi (JP)

(21) Appl. No.: **12/032,737**

(22) Filed: **Feb. 18, 2008**

(30) **Foreign Application Priority Data**

Feb. 27, 2007 (JP) 2007-048018





US 20080204337A1

(19) **United States**

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

(10) **Pub. No.: US 2008/0204337 A1**

(43) **Pub. Date: Aug. 28, 2008**

(54) **PORTABLE ANTENNA DEVICE**

Publication Classification

(75) Inventors: **Akira Takaoka**, Okazaki-city (JP);
Noriaki Okada, Chiryu-city (JP)

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

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(52) **U.S. Cl.** **343/722; 343/895**

(73) Assignees: **NIPPON SOKEN, INC.**,
Nishio-city (JP); **DENSO**
CORPORATION, Kariya-city (JP)

(57) **ABSTRACT**

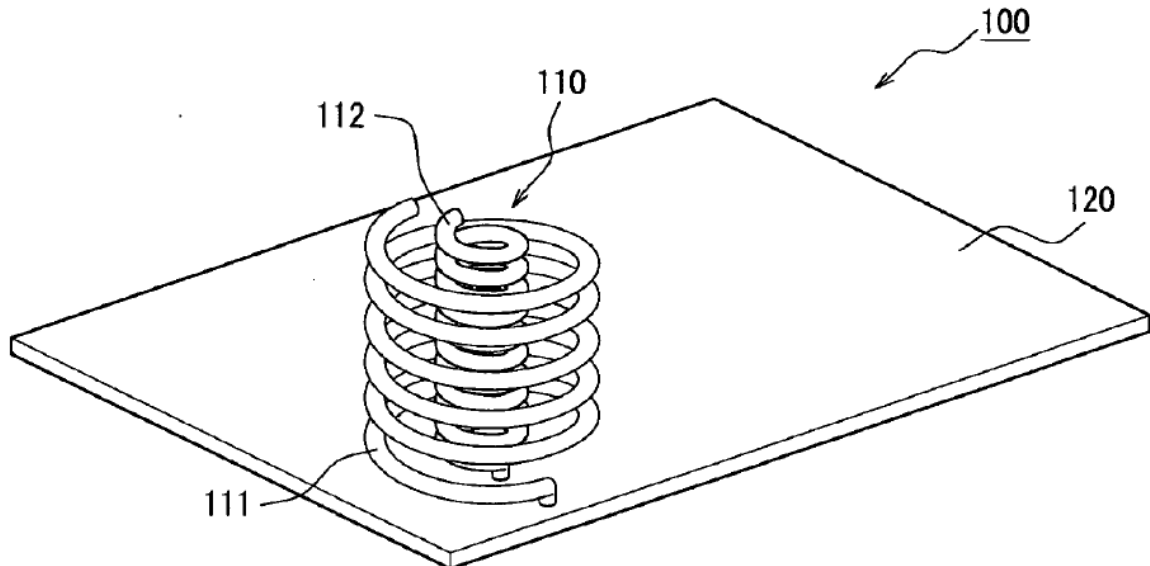
(21) Appl. No.: **12/068,486**

A portable antenna device includes a circuit board having a ground pattern, an antenna including a spirally wound external element and a spirally wound internal element coaxially disposed inside the external element at a distance from the first element so that one of the external and internal elements forms a signal wire and the other forms a ground wire. The circuit board includes plural passive elements each of which has a different impedance and a switch unit that selectively connects the antenna with the ground via one of the passive elements to provide a resonance characteristic of radio wave that has a frequency deference from a resonance characteristic provided by any other passive element.

(22) Filed: **Feb. 7, 2008**

(30) **Foreign Application Priority Data**

Feb. 22, 2007 (JP) 2007-42620





US 20080204340A1

(19) **United States**

(12) **Patent Application Publication**

Kim et al.

(10) **Pub. No.: US 2008/0204340 A1**

(43) **Pub. Date: Aug. 28, 2008**

(54) **MULTI-BAND ANTENNA AND MOBILE COMMUNICATION TERMINAL HAVING THE SAME**

(75) Inventors: **Hyun Hak Kim**, Gyeonggi-do (KR); **Jong Kweon Park**, Daejeon (KR); **Jung Nam Lee**, Daejeon (KR); **Jae Chan Lee**, Gyeonggi-do (KR)

Correspondence Address:
LOWE HAUPTMAN HAM & BERNER, LLP
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(73) Assignee: **SAMSUNG ELECTRO-MECHANICS CO., LTD.**, Gyeonggi-do (KR)

(21) Appl. No.: **12/026,373**

(22) Filed: **Feb. 5, 2008**

(30) **Foreign Application Priority Data**

Feb. 28, 2007 (KR) 10-2007-0020302

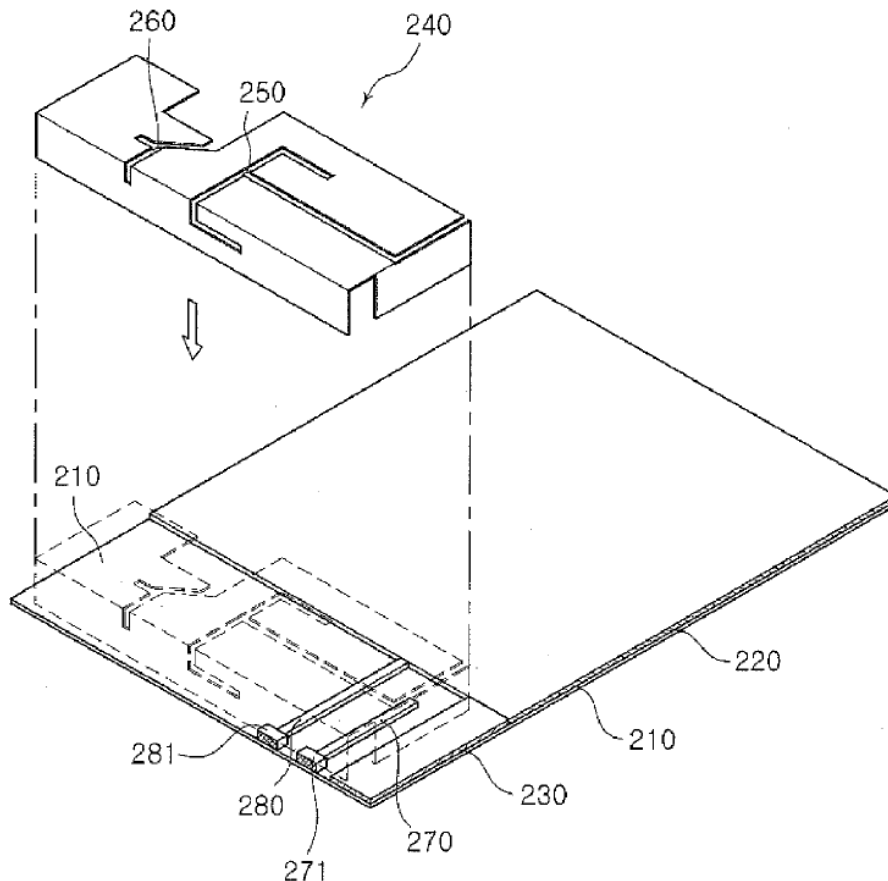
Publication Classification

(51) **Int. Cl.**
H01Q 13/10 (2006.01)
H01Q 1/38 (2006.01)
(52) **U.S. Cl.** **343/770; 343/700 MS**

(57) **ABSTRACT**

There is provided a mobile communication terminal including: a dielectric substrate; a ground surface formed on a first area of the dielectric substrate; a radiation part disposed on a second area where the ground surface is not formed, at a predetermined distance from the dielectric substrate, the radiation part having first and second slots formed thereon; a feeding line formed on the second area of the dielectric substrate and having one end connected to the radiation part; a ground line disposed on the second area of the dielectric substrate at a predetermined distance from the feeding line and having one end connected to the radiation part and another end connected to the ground surface; and a matching ground surface formed on the second area of the dielectric substrate, the matching ground surface disposed in a superimposed relationship with a portion of the radiation part and extending from the ground surface to be capacitively coupled to the radiation part.

200





US 20080204344A1

(19) **United States**
(12) **Patent Application Publication**
SABBAH

(10) **Pub. No.: US 2008/0204344 A1**
(43) **Pub. Date: Aug. 28, 2008**

(54) **CONTACTLESS LABEL WITH Y-SHAPED OMNIDIRECTIONAL ANTENNA**

(75) Inventor: **Elias SABBAH, Mougins (FR)**

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(73) Assignee: **ASK S.A.**

(21) Appl. No.: **11/246,187**

(22) Filed: **Oct. 11, 2005**

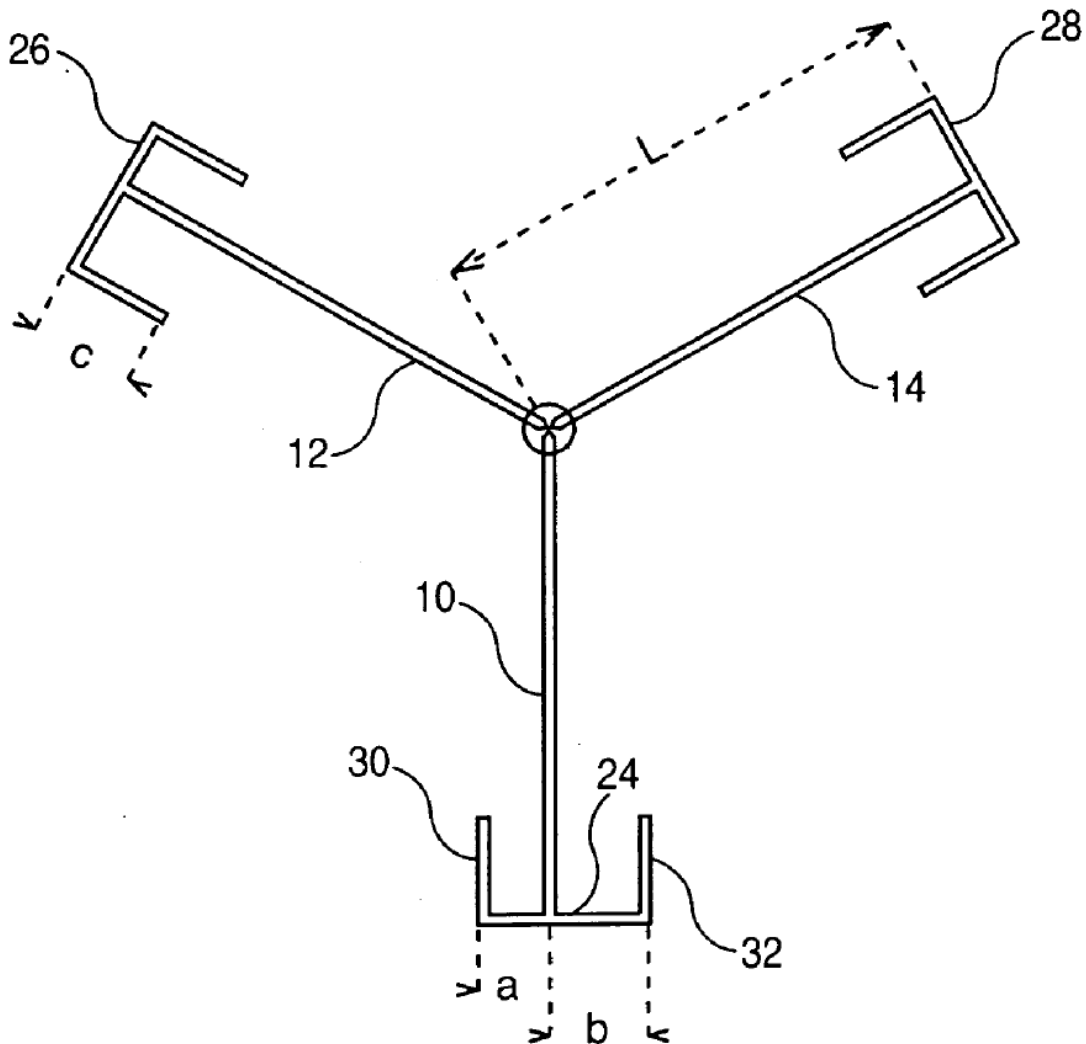
(30) **Foreign Application Priority Data**

Oct. 12, 2004 (FR) 0410757

Publication Classification

(51) **Int. Cl.**
H01Q 9/16 (2006.01)
H02H 7/00 (2006.01)
G08B 13/14 (2006.01)
(52) **U.S. Cl.** **343/793; 361/56; 340/572.7**
(57) **ABSTRACT**

Contactless label designed to ensure the traceability of an object featuring a microcircuit (16) and a Y-shaped dipole antenna connected to the microcircuit, which contains information necessary for tracing the object, which can be read with a reader through the exchange of ultra high frequency (UHF) electromagnetic waves. The antenna includes three main wires, a first main wire (10), a second main wire (12) forming a dipole with the first main wire and a third main wire (14) forming a second dipole with the first main wire. The angle between the first and second main wires is equal to the angle between the first and the third main wires and the angle between the second main wire and the third main wire is between 60° and 180°. Each of the main wires features a secondary wire (24, 26, or 28) at its end perpendicular to the main wire.





US 20080204346A1

(19) **United States**

(12) **Patent Application Publication**
Tawata

(10) **Pub. No.: US 2008/0204346 A1**

(43) **Pub. Date: Aug. 28, 2008**

(54) **ANTENNA ADJUSTING METHOD AND ANTENNA DEVICE**

(30) **Foreign Application Priority Data**

Feb. 22, 2007 (JP) 2007-042034

(75) Inventor: **Masatake Tawata**, Ritto-shi (JP)

Publication Classification

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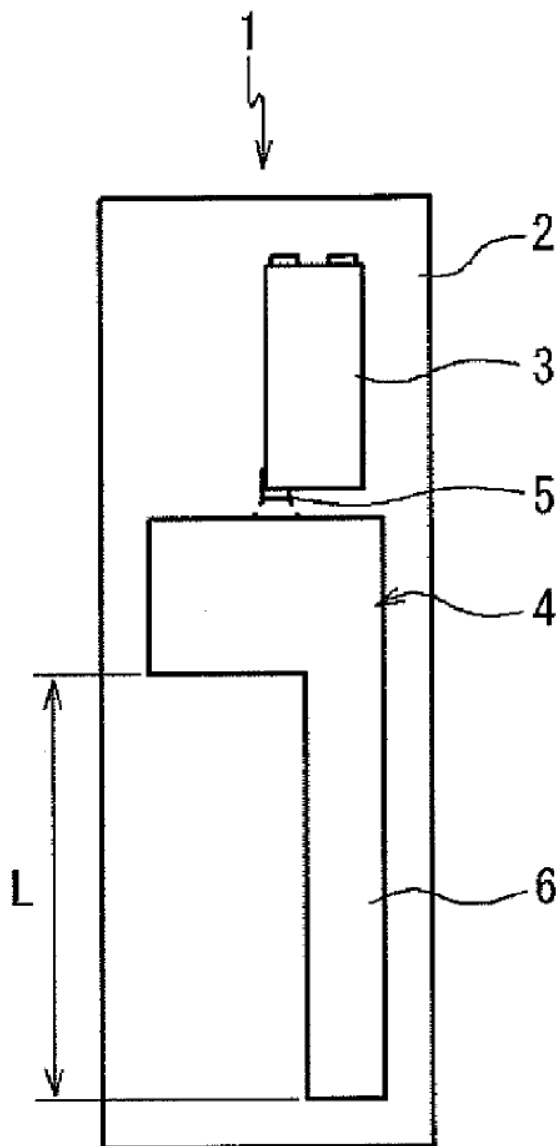
(57) **ABSTRACT**

An antenna adjusting method is disclosed wherein a frequency characteristic of an antenna device is adjusted by changing a shape of a reflecting conductor in the antenna device. The antenna device includes a radiator, which is formed by a metal or a metal and a dielectric material to radiate an electromagnetic wave, and a plate-shape reflecting conductor which forms a doubled wavelength of the electromagnetic wave by reflecting the electromagnetic wave radiated from the radiator.

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(54) **INCREASING ISOLATION BETWEEN
MULTIPLE ANTENNAS WITH A GROUNDED
MEANDER LINE STRUCTURE**

Publication Classification

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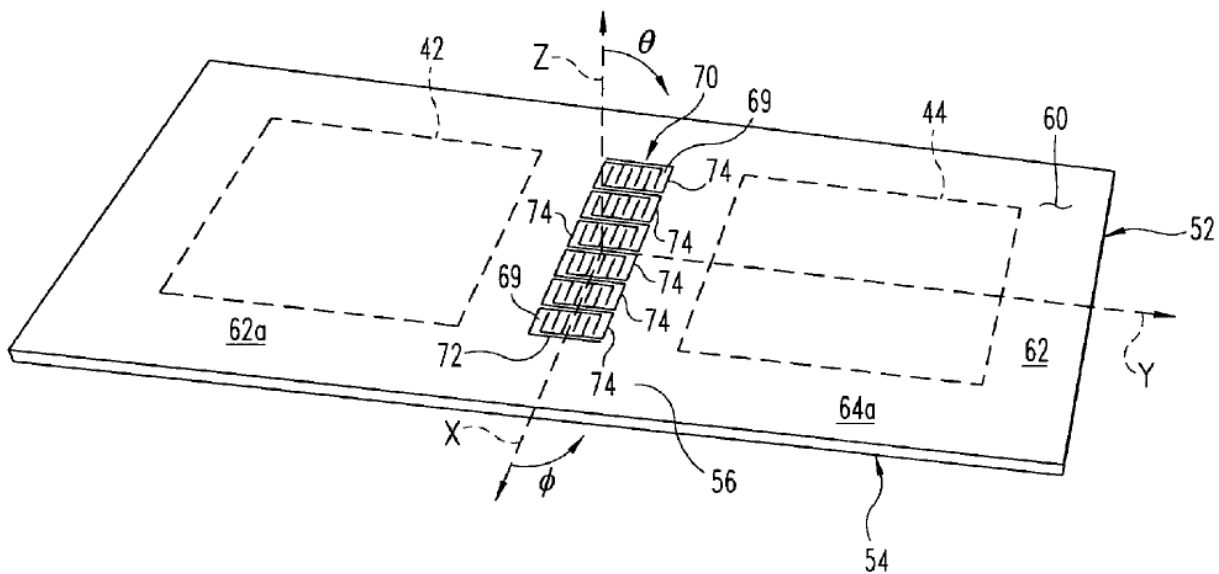
(57) **ABSTRACT**

A wireless communication device includes multiple antennas spaced apart from each other. Also included is a dielectric substrate with electrically conductive ground areas along the substrate opposite the antennas. Signal coupling is decreased between the antennas by connecting the ground areas together with an isolation structure. In one nonlimiting form, this structure includes an electrically conductive meander line structure.

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(57) **ABSTRACT**

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An antenna arrangement for a communication device is provided that may include a monopole antenna element having a bottom side joined to a first lateral side and joined to a second lateral side. The bottom side may be joined to each lateral side at an angle less than 90 degrees for forming an antenna element area defined at least by the bottom side and the first and second lateral sides. The antenna element area may include a central part arcuate around a longitudinal axis in a conical fashion, so that at least a part of the bottom side is provided half a turn around the longitudinal axis.

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

