US 20070279143A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0279143 A1**

Itsuji (43) **Pub. Date: Dec. 6, 2007**

(54) **ACTIVE ANTENNA OSCILLATOR**

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(21) Appl. No.: **11/802,113**

(22) Filed: **May 21, 2007**

(30) **Foreign Application Priority Data**

May 31, 2006 (JP) 2006-150922
Nov. 1, 2006 (JP) 2006-297307

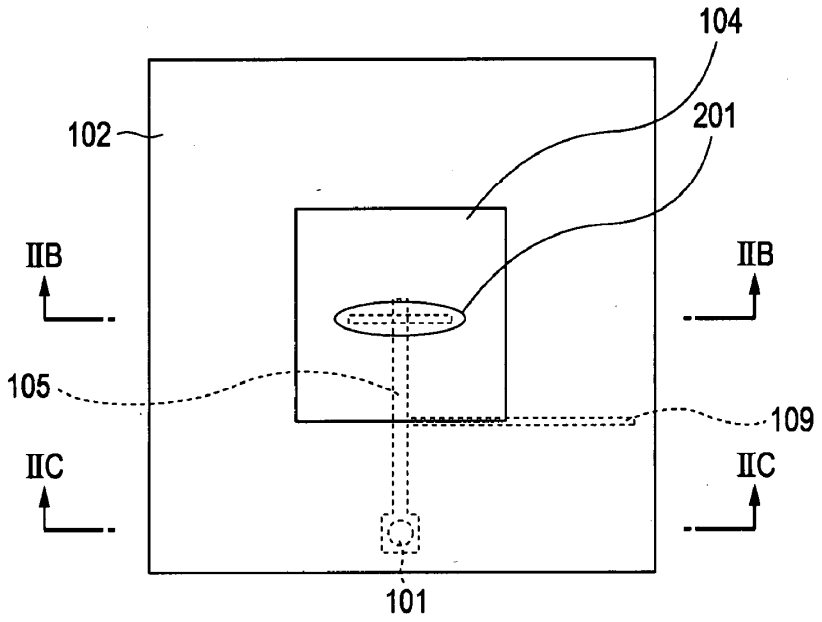
Publication Classification

(51) **Int. Cl.**
H03B 9/14 (2006.01)
H03L 7/099 (2006.01)

(52) **U.S. Cl.** ..... **331/185**; 331/107 DP

(57) **ABSTRACT**

An antenna oscillator includes a first strip line type resonator and a second resonator functioning as an antenna. The first resonator is fabricated by stacking a first conductor onto a grounding conductor with a first dielectric part including a gain part therebetween. The second resonator is fabricated by stacking a second conductor, emitting electromagnetic waves to the exterior, onto the first resonator with a second dielectric part therebetween so as to function as an antenna with the configuration between the grounding conductor and the second conductor. The first conductor and the second conductor are separated from each other in a stacking direction with the second dielectric part or the second dielectric part and the grounding conductor therebetween. The first resonator and the second resonator are electromagnetically connected together so as to form a resonance circuit that makes the electromagnetic waves resonate.



US 20070279230A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0279230 A1**

Lakeman et al. (43) **Pub. Date: Dec. 6, 2007**

(54) **SYSTEM AND METHOD FOR ATTACHING RADIOFREQUENCY IDENTIFICATION CHIPS TO METALIZED ANTENNA**

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(21) Appl. No.: **11/753,418**

(22) Filed: **May 24, 2007**

Related U.S. Application Data

(60) Provisional application No. 60/810,388, filed on Jun. 1, 2006.

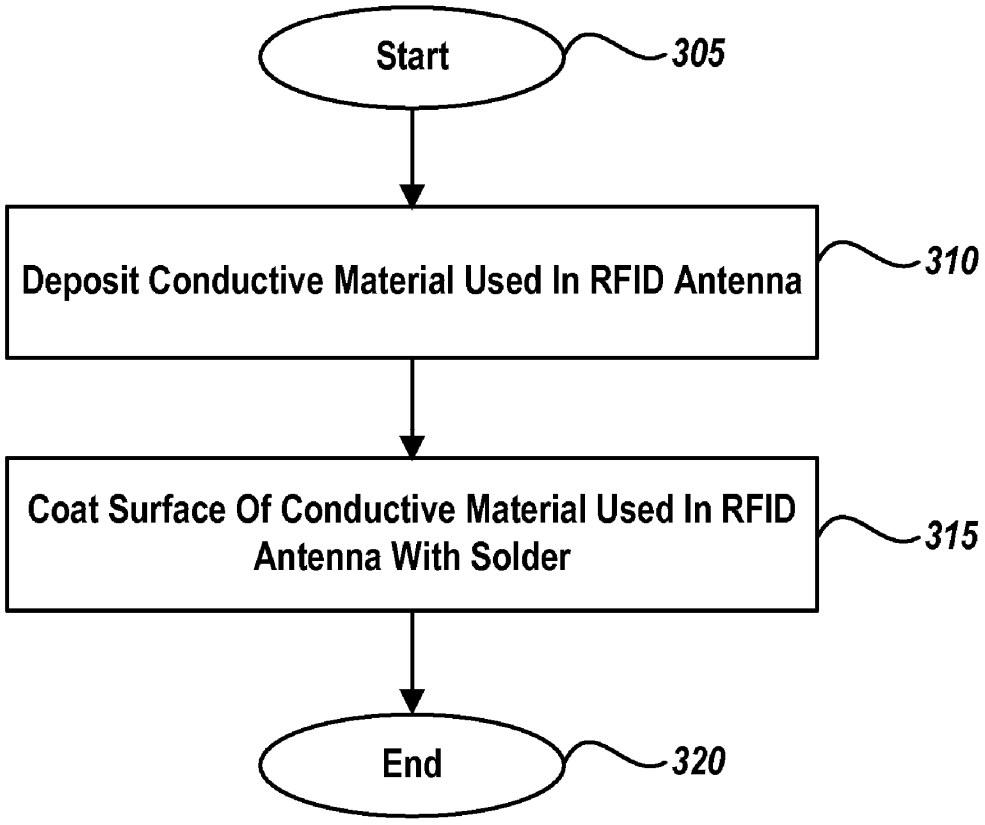
Publication Classification

(51) **Int. Cl.**
G08B 13/14 (2006.01)

(52) **U.S. Cl.** **340/572.7**; 340/572.8

(57) **ABSTRACT**

An RFID antenna that is protected from corrosion and is configured for easy attachment to an electronic chip is very advantageous. The electrically conductive RFID antenna pattern is coated with a layer of solderable material that protects the copper from corroding. The solderable material has a low melting temperature so that the solderable material can be heated to form a weld joint between a chip and the solderable material without damaging the chip.



US 20070279231A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0279231 A1**

Cheng et al. (43) **Pub. Date: Dec. 6, 2007**

(54) **ASYMMETRIC RFID TAG ANTENNA**

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(21) Appl. No.: **11/756,773**

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

Related U.S. Application Data

(60) Provisional application No. 60/810,706, filed on Jun. 5, 2006.

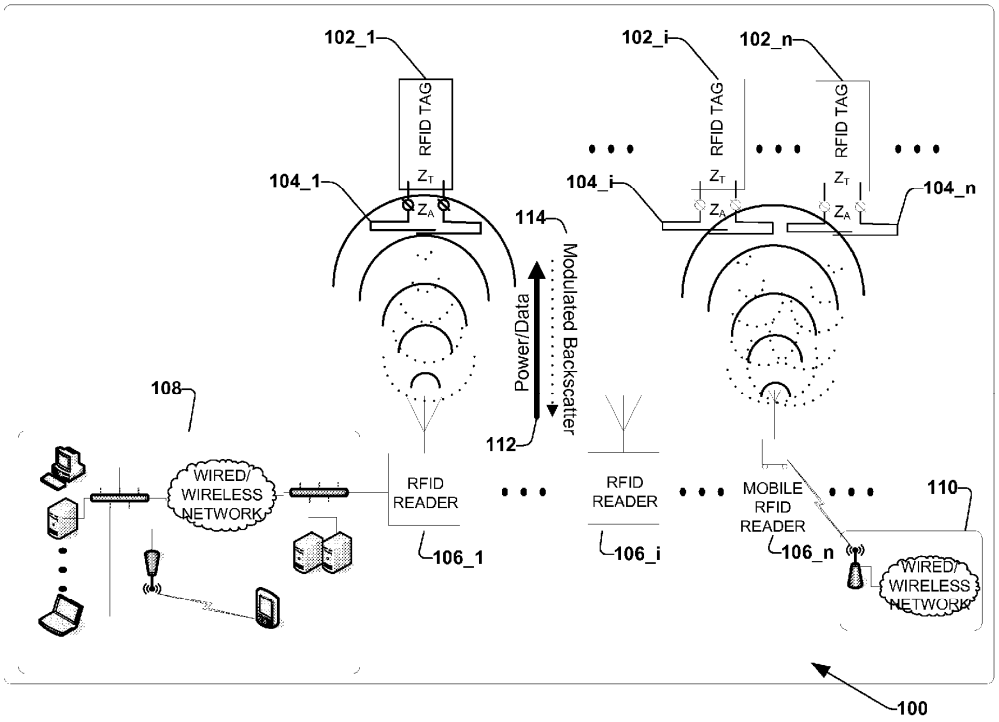
Publication Classification

(51) **Int. Cl.**
G08B 13/14 (2006.01)
H01Q 9/04 (2006.01)

(52) **U.S. Cl.** ..... **340/572.7**; 343/700 MS

(57) **ABSTRACT**

The invention provides an asymmetric UHF RFID tag antenna that variously comprises a capacitive load, a folded loop conductor and an inductive matching element, which provides a differential input for RFID tag circuitry. The design provides a small form factor while maintaining a high gain and impedance tuning properties. Various refinements and associated devices and systems using the design are provided and disclosed according to a host of optional embodiments.



US 20070279285A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0279285 A1**

Hilgers (43) **Pub. Date: Dec. 6, 2007**

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(21) Appl. No.: **10/589,838**

(22) PCT Filed: **Feb. 15, 2005**

(86) PCT No.: **PCT/IB05/50577**

§ 371(c)(1),
(2), (4) Date: **Apr. 24, 2007**

(30) **Foreign Application Priority Data**

Feb. 18, 2004 (EP) 04100635.4

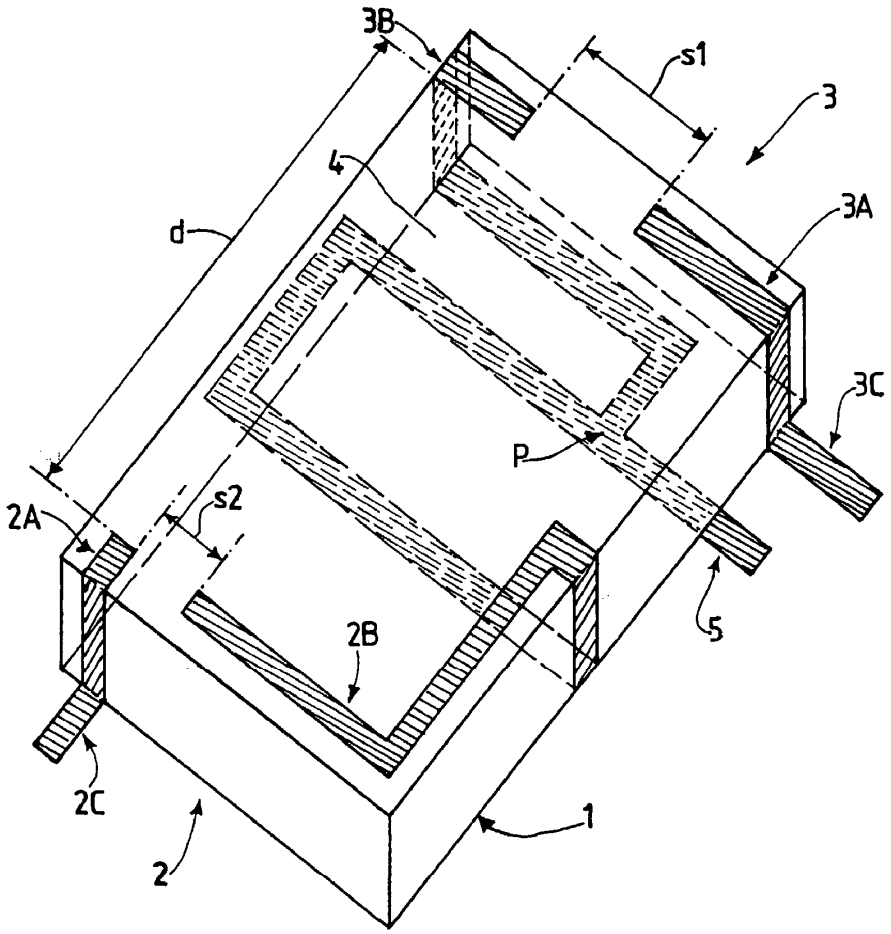
Publication Classification

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

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

(57) **ABSTRACT**

The invention relates to a dual-band antenna for preferably operation in the GSM and DCS frequency range. The dual-band antenna at the same time has the functionality of a diplexer. This makes it possible to produce wireless communication devices with one component less, which in turn reduces weight and production costs.



US 20070279286A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0279286 A1**

Coutts et al. (43) **Pub. Date: Dec. 6, 2007**

(54) **MULTI-MODE ANTENNA ARRAY**

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(21) Appl. No.: **11/422,238**

(22) Filed: **Jun. 5, 2006**

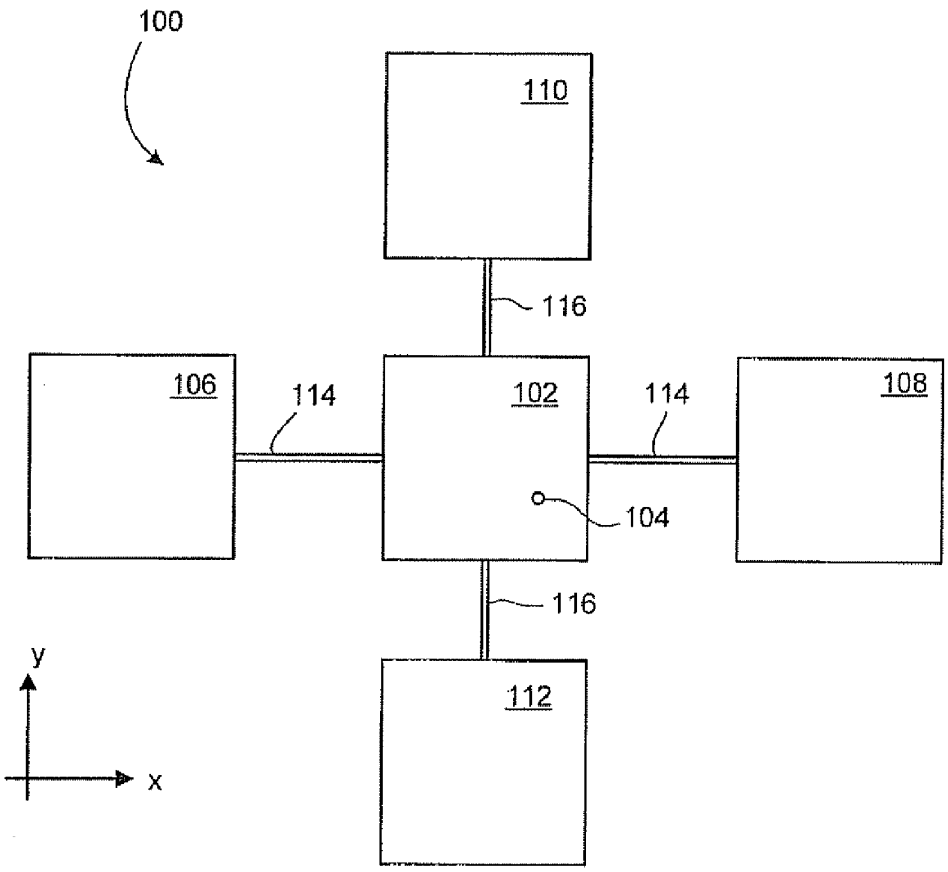
Publication Classification

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

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

(57) **ABSTRACT**

A multi-mode parasitic antenna array having two or more resonant frequencies. The multi-mode parasitic antenna array has at least two resonant modes resulting in substantially divergent radiation patterns, thereby providing the antenna with frequency dependent directivity. The array may be incorporated into a tag for an RFID system. The RFID system includes a reader capable of interrogating the tag at each of the resonant frequencies.



US 20070279287A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0279287 A1**

Castaneda et al. (43) **Pub. Date: Dec. 6, 2007**

(54) **MULTIPLE MODE RF TRANSCEIVER AND ANTENNA STRUCTURE**

(75) Inventors: **Jesus Alfonso Castaneda**, Los Angeles, CA (US); **Franco De Flaviis**, Irvine, CA (US); **Ahmadreza(Reza) Rofougaran**, Newport Coast, CA (US)

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(21) Appl. No.: **11/443,946**

(22) Filed: **May 30, 2006**

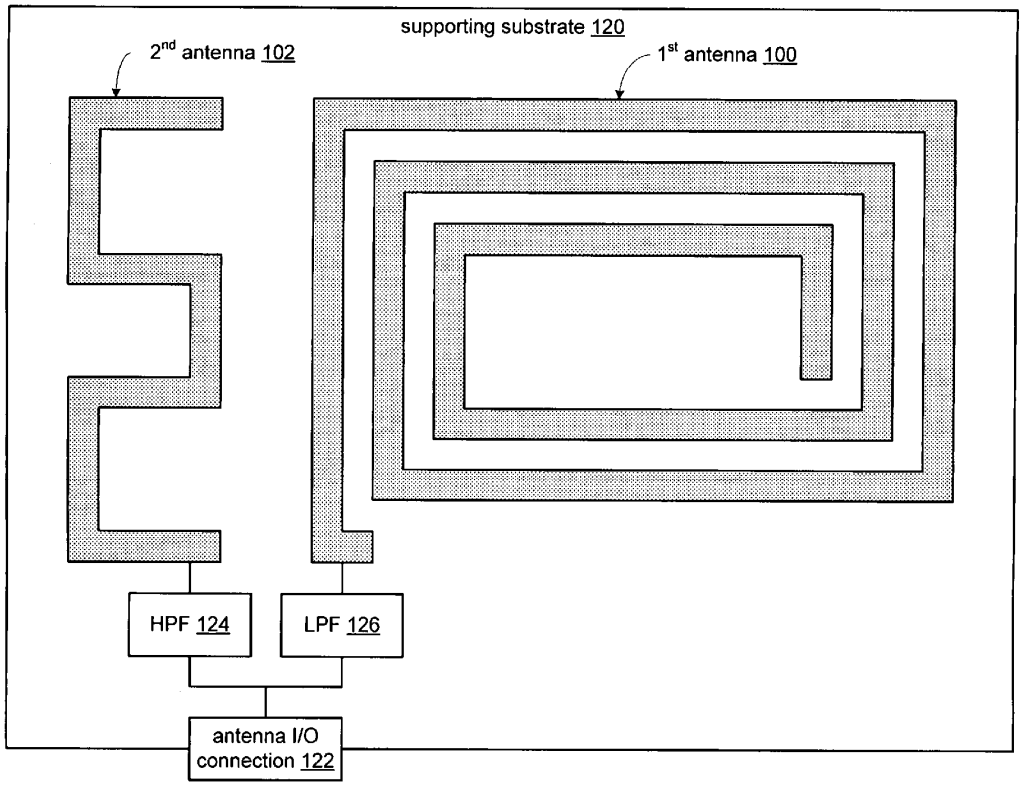
Publication Classification

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

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

(57) **ABSTRACT**

An antenna structure includes first and second antennas. The first antenna has a first geometry corresponding to a first frequency. The second antenna has a second geometry corresponding to a second frequency. The second antenna is proximal to the first antenna and utilizes electrical-magnetic properties of the first antenna to transceive signals at the second frequency.



US 20070279288A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0279288 A1**

Liu (43) **Pub. Date: Dec. 6, 2007**

(54) **ANTENNA**

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(21) Appl. No.: **11/512,290**

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

(30) **Foreign Application Priority Data**

May 30, 2006 (TW) 95119253

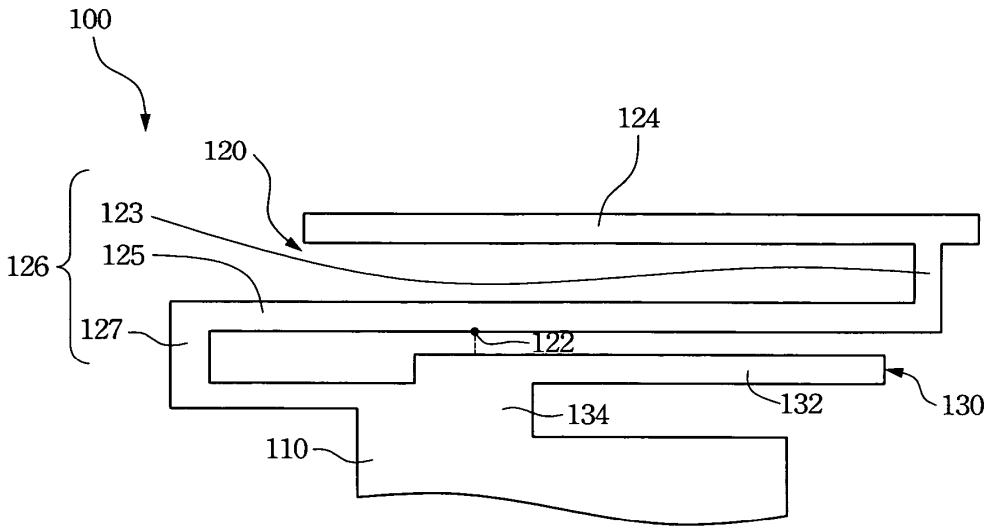
Publication Classification

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

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

(57) **ABSTRACT**

An antenna includes a grounding element, a radiating element and a coupling element. The radiating element has a radiating part and a connecting part. The connecting part connects the grounding element and the radiating part. The coupling element extends from the grounding element and is positioned between the radiating element and the grounding element.



US 20070279289A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0279289 A1**

BALIARDA et al. (43) **Pub. Date: Dec. 6, 2007**

(54) **MULTILEVEL ANTENNA**

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(21) Appl. No.: **11/550,256**

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

Related U.S. Application Data

(60) Division of application No. 11/179,257, filed on Jul. 12, 2005, which is a continuation of application No. 11/102,390, filed on Apr. 8, 2005, now Pat. No. 7,123,208, which is a continuation of application No. 10/963,080, filed on Oct. 12, 2004, now Pat. No. 7,015,868, which is a continuation of application No. 10/102,568, filed on Mar. 18, 2002, now abandoned, which is a continuation of application No. PCT/ES99/00296, filed on Sep. 20, 1999.

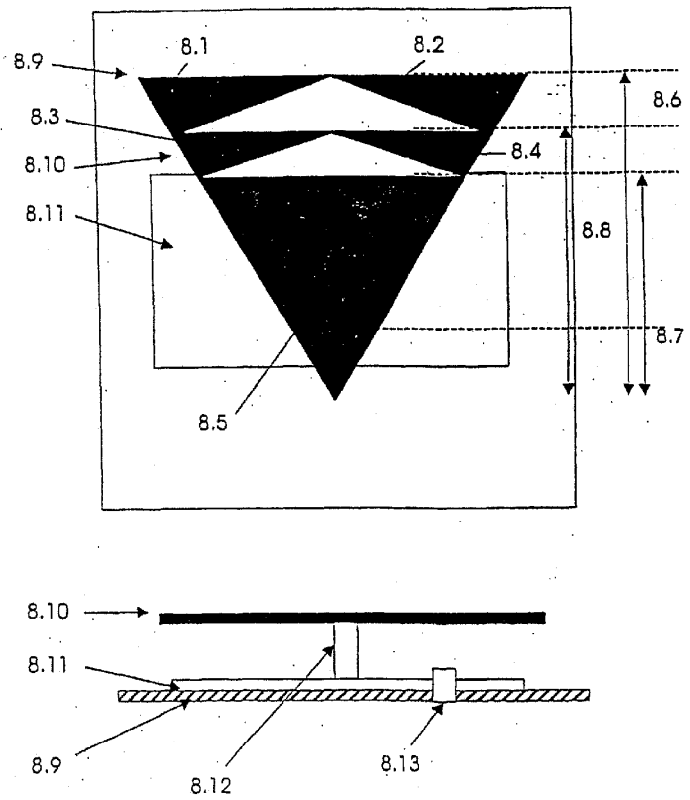
Publication Classification

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

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

(57) **ABSTRACT**

Antennae in which the corresponding radiative element contains at least one multilevel structure formed by a set of similar geometric elements (polygons or polyhedrons) electromagnetically coupled and grouped such that in the structure of the antenna can be identified each of the basic component elements. The design is such that it provides two important advantages: the antenna may operate simultaneously in several frequencies, and/or its size can be substantially reduced. Thus, a multiband radioelectric behaviour is achieved, that is, a similar behavior for different frequency bands.



US 20070279290A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0279290 A1

SHIH (43) Pub. Date: Dec. 6, 2007

(54) ULTRA-WIDEBAND ANTENNA

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(21) Appl. No.: 11/565,660

(22) Filed: Dec. 1, 2006

(30) Foreign Application Priority Data

Jun. 2, 2006 (TW) 95119630

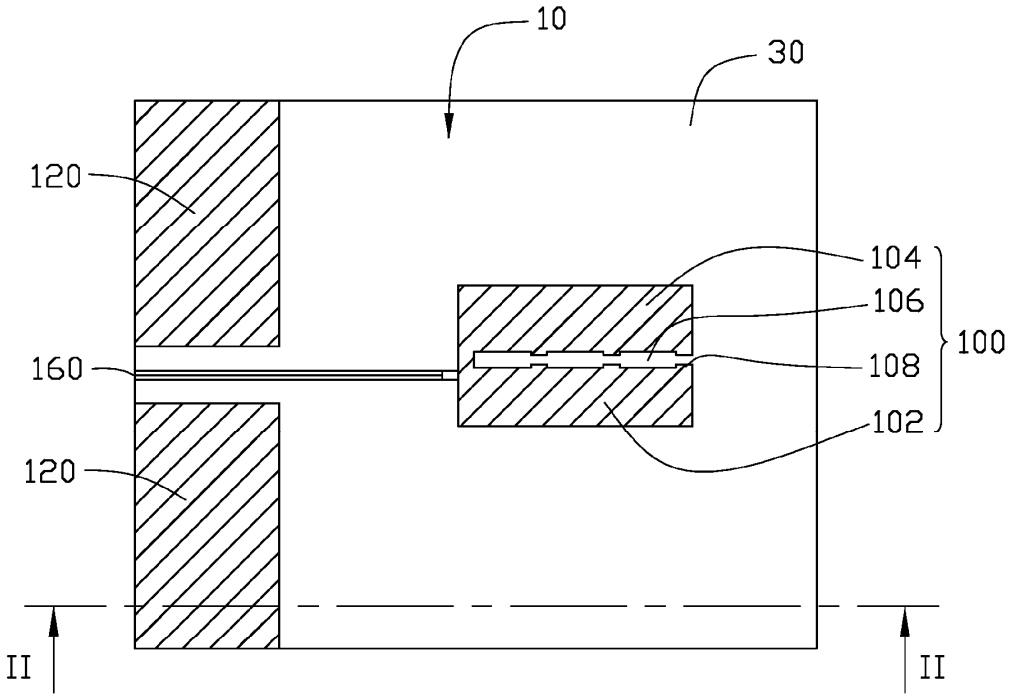
Publication Classification

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

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

(57) ABSTRACT

An ultra-wideband (UWB) antenna (**10**), disposed on a substrate (**30**), includes a body (**100**), a feeding part (**160**), and at least one first ground plane (**120**). The body, for receiving and transmitting electromagnetic signals, includes a first radiating part (**102**) and a second radiating part (**104**) connected to the first radiating part. The body defines a gap (**106**) between the first radiating part and the second radiating part. The feeding line, electrically connected to the body, feeds electromagnetic signals to the body. The at least one first ground plane is disposed on a side of the feeding part, and is grounded.



US 20070279291A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0279291 A1

Tsai et al. (43) Pub. Date: Dec. 6, 2007

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

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

(21) Appl. No.: **11/604,783**

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

(30) **Foreign Application Priority Data**

Jun. 2, 2006 (TW) 095209640

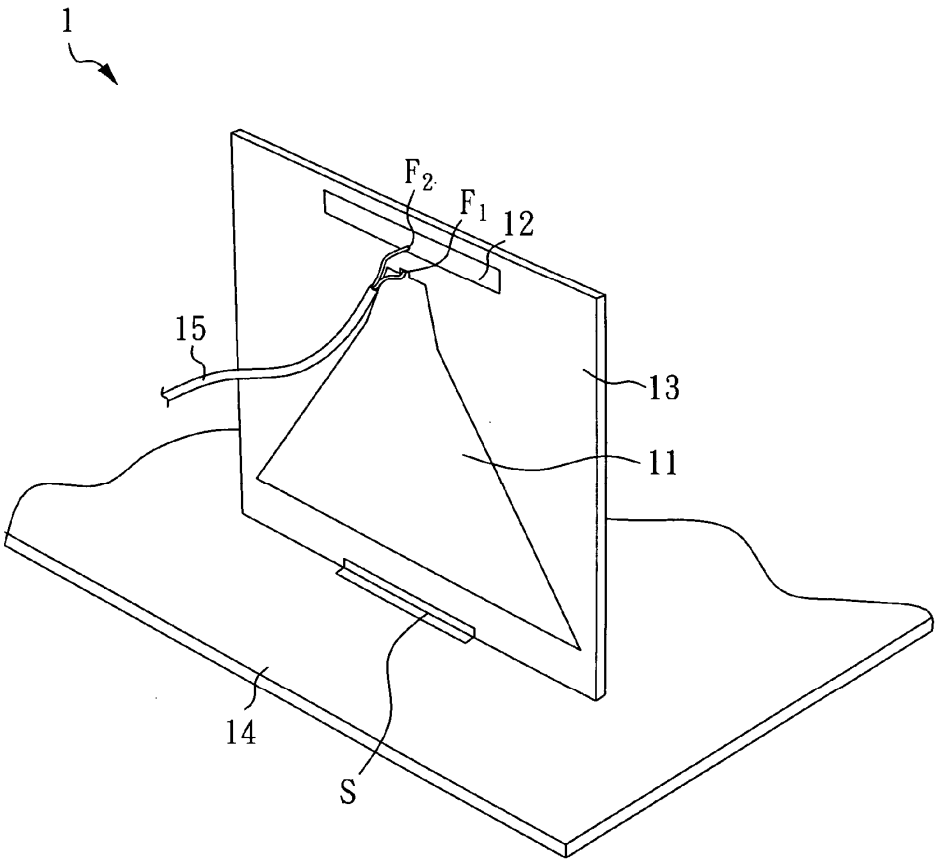
Publication Classification

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

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

(57) **ABSTRACT**

A broadband antenna and an assembly combination thereof are disclosed. The broadband antenna according to the present invention comprises a first radiation element, a second radiation element, a substrate, and a reflector. The first radiation element having a first trapezoid portion and the second radiation element are disposed on the substrate that is fixed on the reflector. The first radiation element and the second radiation element are excited so as to reflect the energy by the radiator.



US 20070279292A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0279292 A1

SHIH (43) Pub. Date: Dec. 6, 2007

(54) **PRINTED ANTENNA**

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

(21) Appl. No.: **11/614,999**

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

(30) **Foreign Application Priority Data**

Jun. 2, 2006 (TW) 95119611

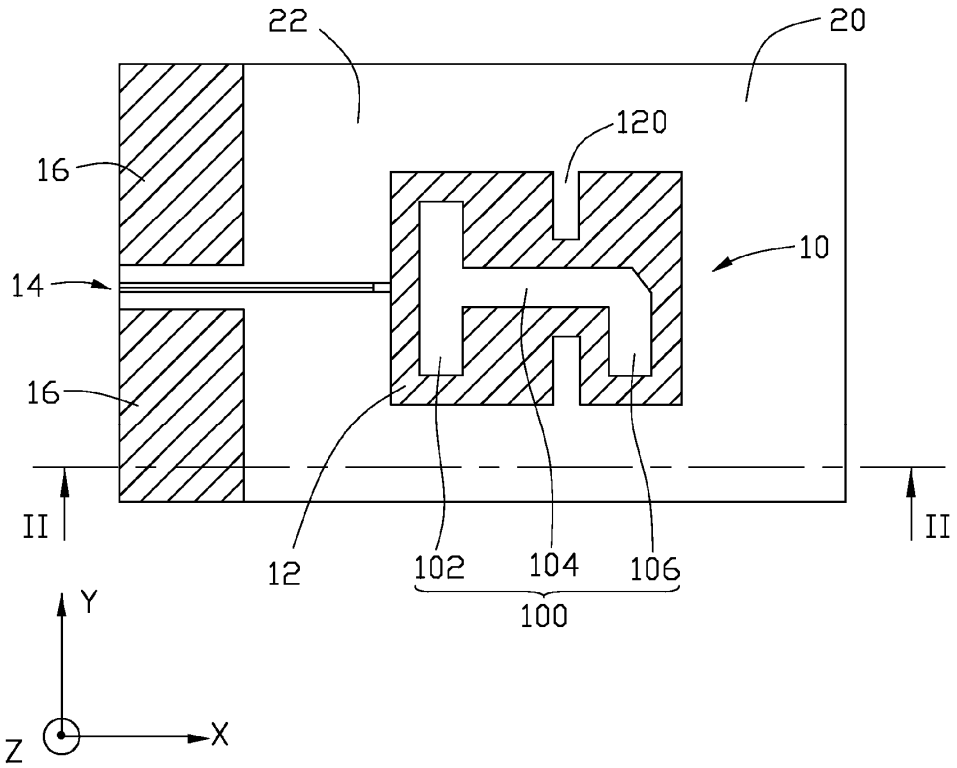
Publication Classification

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

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

(57) **ABSTRACT**

A printed antenna disposed on a substrate (**20**), includes a radiation part (**10**), a feed line (**14**), and at least one first ground part (**16**). The radiation part is for radiating and receiving electromagnetic signals, and includes a hollow portion (**100**) and a pair of openings (**120**). The hollow portion is defined in the radiation part. The openings are formed at two edges of the radiation part. The feed line for feeding the electromagnetic signals to the radiation part is electrically connected to the radiation part. The at least one first ground part for grounding is disposed at one side of the feed line.



US 20070279293A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0279293 A1**

Kanemura et al. (43) **Pub. Date: Dec. 6, 2007**

(54) **ANTENNA UNIT, WIRELESS COMMUNICATION STRUCTURE, AND ANTENNA STRUCTURE**

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(21) Appl. No.: **11/754,613**

(22) Filed: **May 29, 2007**

(30) **Foreign Application Priority Data**

May 31, 2006 (JP) 2006-151296
Apr. 25, 2007 (JP) 2007-115811

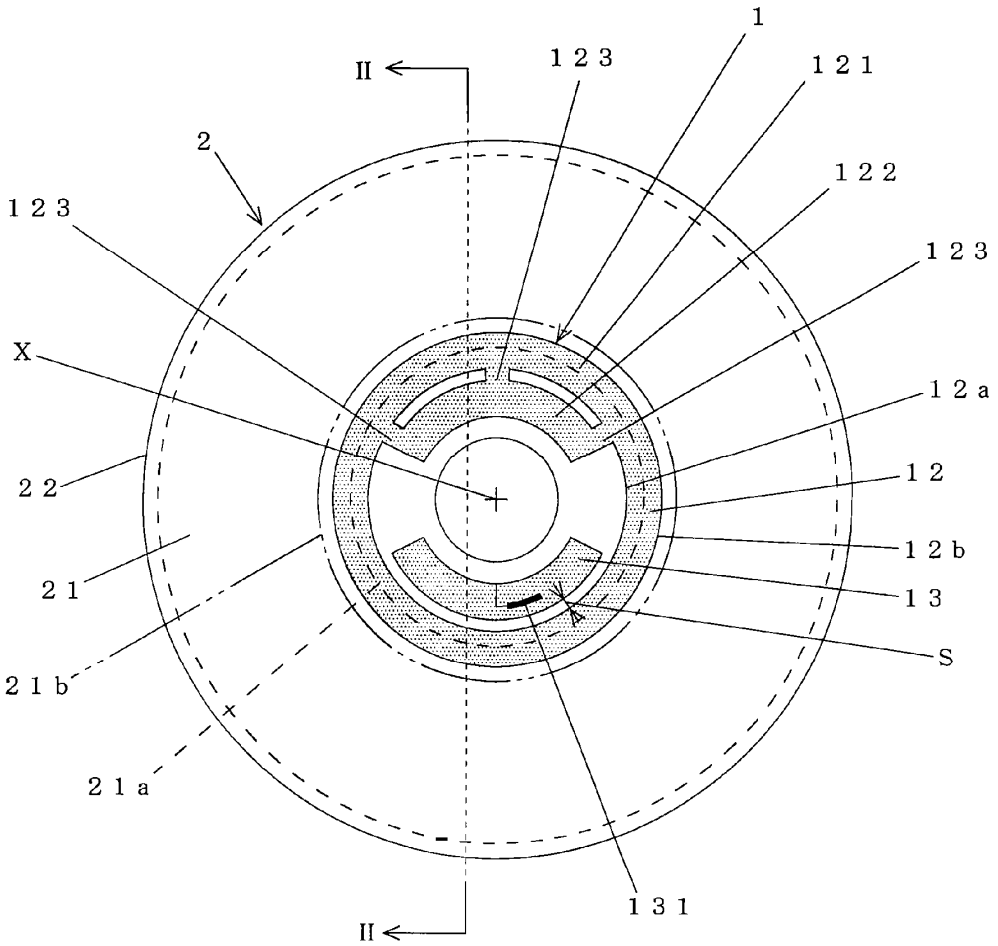
Publication Classification

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

(52) **U.S. Cl.** ..... **343/700 MS**; 343/795

(57) **ABSTRACT**

There is provided an antenna unit including a non-conductive base film, an endless conductive flat plate member attached onto one surface of the base film and having an opening in a center thereof, and an antenna attached to the one surface of the base film so as to be positioned in the opening of the conductive flat plate member with a gap formed between the antenna and an inner circumferential edge of the conductive flat plate member.



US 20070279296A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0279296 A1

Sarabandi et al. (43) Pub. Date: Dec. 6, 2007

(54) **WIDE-BAND DOUBLE-LOOP ANTENNA**

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(21) Appl. No.: **11/835,242**

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

Related U.S. Application Data

(62) Division of application No. 11/208,700, filed on Aug. 22, 2005, now Pat. No. 7,268,741.

(60) Provisional application No. 60/609,381, filed on Sep. 13, 2004.

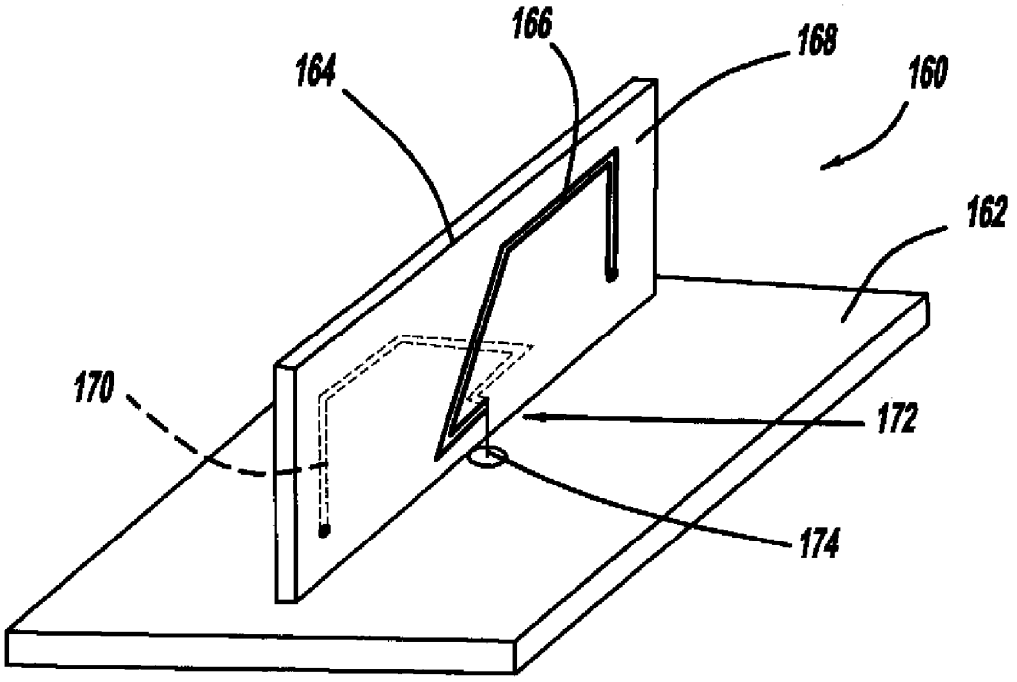
Publication Classification

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

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

(57) **ABSTRACT**

A wide-band double-loop antenna. The antenna includes a metal trace deposited on a dielectric substrate. The metal trace includes a plurality of trace legs and a cross-bar trace that define an E-shape. Two of the legs are electrically coupled to a ground plane, and the third leg is electrically coupled to a feed, such as a center conductor of a coaxial connector. An outer conductor of the connector is electrically coupled to the ground plane.



US 20070279297A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0279297 A1**

Imai (43) **Pub. Date: Dec. 6, 2007**

(54) **ANTENNA FOR REMOTE CONTROLLED TOY, ANTENNA CAP AND REMOTE CONTROLLED TOY**

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(73) Assignee: **Nikko Co., Ltd.**, Tokyo (JP)

(21) Appl. No.: **11/806,389**

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

(30) **Foreign Application Priority Data**

May 31, 2006 (JP) 2006-152924

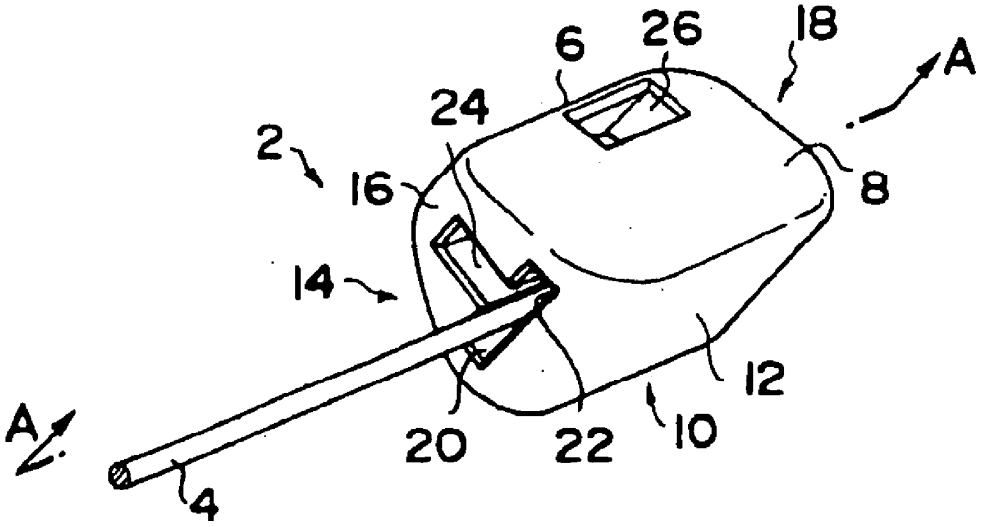
Publication Classification

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

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

(57) **ABSTRACT**

An antenna for a remote controlled toy comprises a conductor made of a metal wire and a cap portion anchored in an end of the conductor, wherein said conductor has a hook portion with a U-shaped end, a first flared portion articulated with said hook portion and provided crookedly for projecting in the perpendicular direction to said hook portion, a second flared portion articulated with the first flared portion and provided crookedly for projecting in the opposite direction from said first flared portion with regard to said hook portion, said cap portion has a T-shaped groove comprised of a horizontal groove housing said first flared portion and said second flared portion, a perpendicular groove housing said hook portion, and a hook locking part is provided inside the T-shaped groove.



US 20070279299A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0279299 A1**

Aoyama et al. (43) **Pub. Date: Dec. 6, 2007**

(54) **CHIP ANTENNA, AN ANTENNA DEVICE, AND A COMMUNICATION EQUIPMENT**

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(21) Appl. No.: **11/757,727**

(22) Filed: **Jun. 4, 2007**

(30) **Foreign Application Priority Data**

Jun. 5, 2006 (JP) 2006-155599

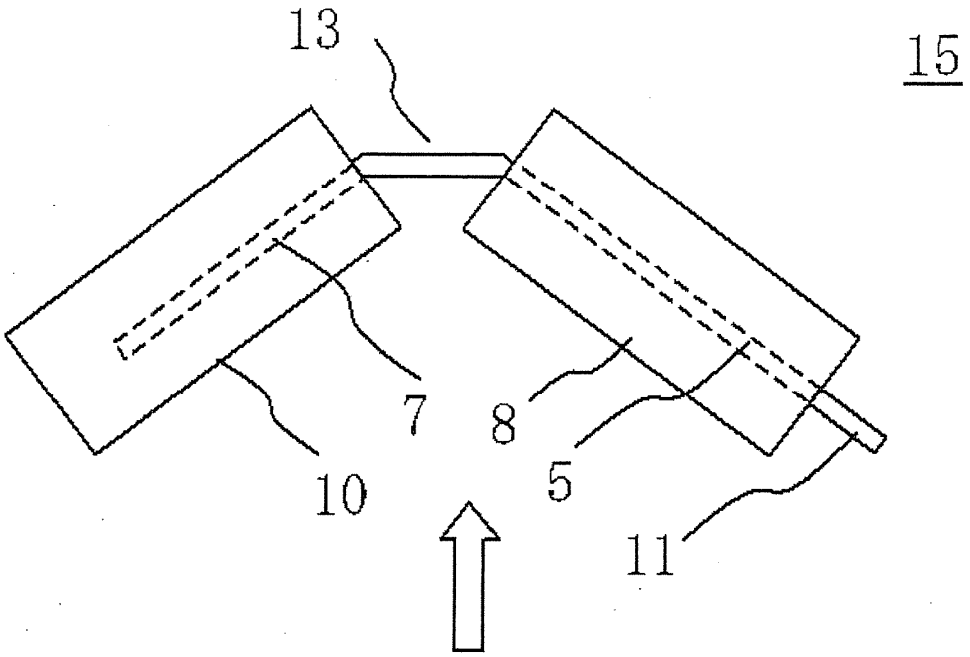
Publication Classification

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

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

(57) **ABSTRACT**

The chip antenna shown is provided with two chip antenna elements (the 1st chip antenna element **4**, the 2nd chip antenna element **2**). These chip antenna elements have the 1st magnetic base **10** and the 2nd magnetic base **8**, and linear conductors **7** and **5** formed in the core, respectively. Magnetic base **10** and magnetic base **8** are separated. In the 1st chip antenna element **4**, linear conductor **7** formed in the core of the 1st magnetic base **10** was formed to the end face of this magnetic base, and the end has protruded from said end face. On the other hand, in the 2nd chip antenna element **2**, linear conductor **5** formed in the core of the 2nd magnetic base **8** has penetrated magnetic base **8**. Furthermore, conductor **7** in the 1st chip antenna element and conductor **5** in the 2nd chip antenna element are electrically connected mutually in series by connection conductors **13** arranged among these chip antenna elements.



US 20070279304A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0279304 A1**

Chakam et al. (43) **Pub. Date: Dec. 6, 2007**

(54) **ANTENNA MODULE FOR A MOTOR VEHICLE**

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(21) Appl. No.: **11/754,055**

(22) Filed: **May 25, 2007**

(30) **Foreign Application Priority Data**

May 30, 2006 (DE)..... 10 2006 025 176.8

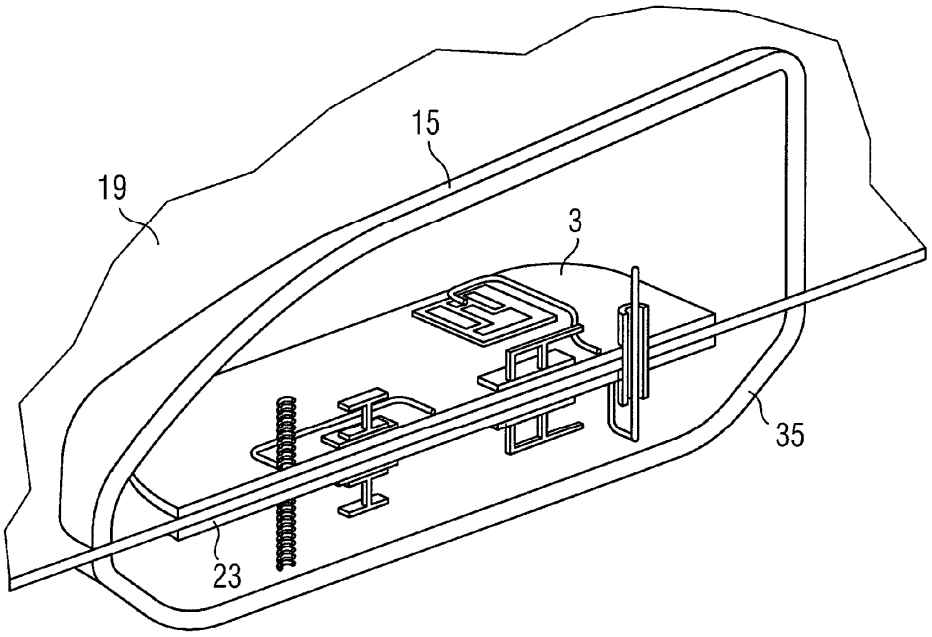
Publication Classification

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

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

(57) **ABSTRACT**

An antenna module for a motor vehicle has a first antenna device having at least one antenna **5, 7, 9, 11, 13** for the exterior of the motor vehicle, which antenna is arranged in the external area of the motor vehicle, and a second antenna device having at least one antenna **25, 27, 29, 31** for the interior of the motor vehicle, which antenna is arranged in the interior of the motor vehicle, the first antenna device and second antenna device being electrically coupled to each other for the purpose of supplying electricity to the antenna devices.



US 20070279305A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0279305 A1

OSHIMA et al. (43) Pub. Date: Dec. 6, 2007

(54) **ON-BOARD ANTENNA DEVICE**

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(21) Appl. No.: **11/755,160**

(22) Filed: **May 30, 2007**

(30) **Foreign Application Priority Data**

May 30, 2006 (JP) 2006149325

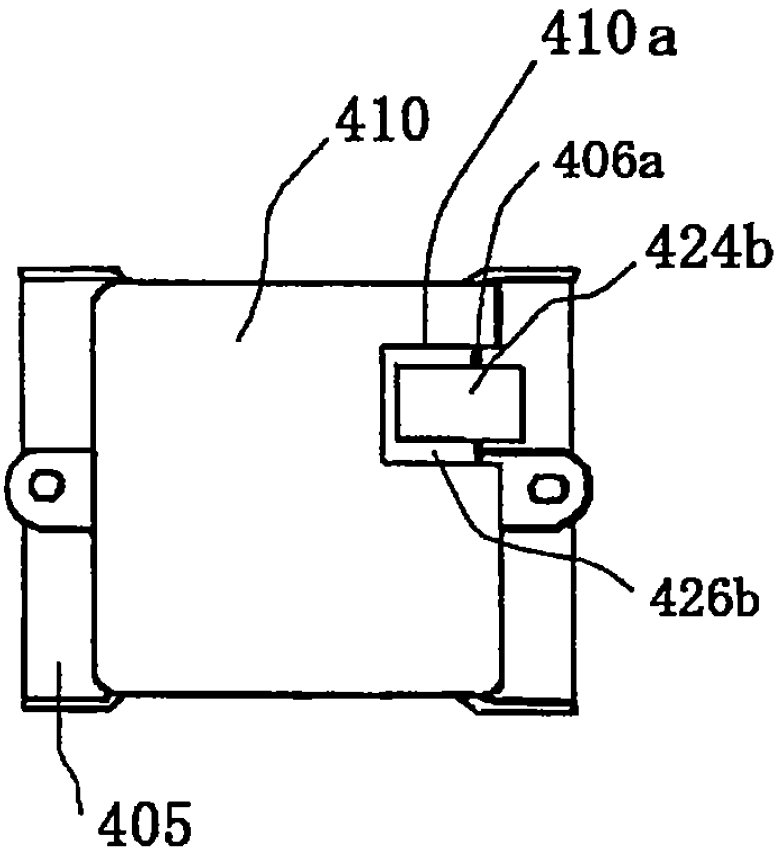
Publication Classification

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

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

(57) **ABSTRACT**

An on-board antenna device comprises: a radiation element (**302**) formed on an inner-surface of a widow glass (**51**) for a vehicle (**50**); a base plate (**305**) fixed on the inner-surface of the widow glass (**51**) so as to surround the radiation element (**302**); a circuit board (**308**) having a conductive layer in a surface (**308***a*) thereof, which is opposed to the radiation element (**302**), and a component mounting surface electrically connected to the radiation element (**302**) in the other surface (**308***b*) thereof; and a housing (**312**) assembled onto the base plate (**305**), and the circuit board (**308**) being contained therein; wherein the circuit board (**308**) has a cutout portion (**308***f*) to incorporate a connector (**324**) for a transmission line connection.



US 20070279306A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0279306 A1**

Oshima et al. (43) **Pub. Date: Dec. 6, 2007**

(54) **ON-BOARD ANTENNA DEVICE**

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(73) Assignee: **Nippon Sheet Glass Company Limited**

(21) Appl. No.: **11/805,370**

(22) Filed: **May 23, 2007**

(30) **Foreign Application Priority Data**

May 30, 2006 (JP) 2006-149,345

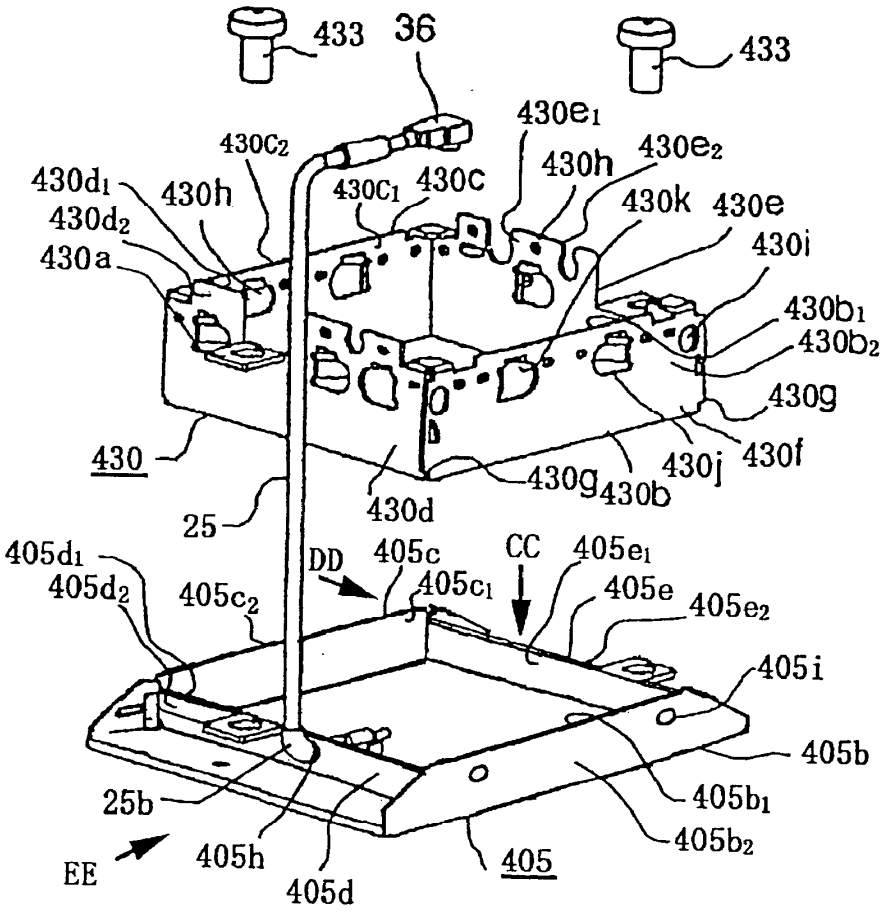
Publication Classification

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

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

(57) **ABSTRACT**

An on-board antenna device, comprises a radiation element (**22**) formed on an inner-surface of a window glass (**51**) for a vehicle (**50**), a base plate (**405**) having an opening, the base plate (**405**) being fixed on the inner-surface of the window glass (**51**) so as to surround the radiation element (**22**), and a housing (**27**) assembled onto the base plate (**405**), the housing (**27**) having an opening surrounding the radiation element, wherein the base plate has four leakage prevention walls (**405***b*, **405***c*, **405***d* and **405***e*) and each of four leakage prevention walls (**405***b*, **405***c*, **405***d* and **405***e*) has a surface substantially parallel to each of four sidewalls (**430***b*, **430***c*, **430***d* and **430***e*) of the housing (**27**).



US 20070279307A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0279307 A1

Ikeda et al. (43) Pub. Date: Dec. 6, 2007

(54) VEHICULAR ANTENNA APPARATUS

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(21) Appl. No.: **11/807,229**

(22) Filed: **May 25, 2007**

(30) **Foreign Application Priority Data**

May 30, 2006 (JP) 2006-150412

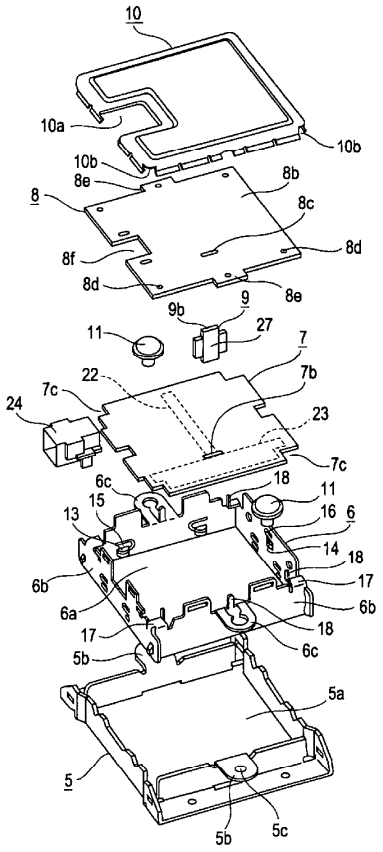
Publication Classification

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

(52) **U.S. Cl.** ..... **343/713**; 343/700 MS

(57) **ABSTRACT**

A vehicular antenna apparatus includes a radiating conductor directly patterned on a glass surface of a vehicle, a base plate fixed to the glass surface, a frame screwed to the base plate, a power feeding substrate and a circuit substrate accommodated and held in the frame, a connecting small substrate electrically connecting both substrates, and a cover attached on the top of the frame. A patterned surface of the power feeding substrate is close to and faces the glass surface, and thereby indirect power feeding can be performed. Both ends of the connecting small substrate are received in connecting holes. A power feeding pattern and a preamplifier circuit are connected via a microstrip line.



US 20070279309A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0279309 A1**

Schultheiss et al. (43) **Pub. Date: Dec. 6, 2007**

(54) **PATCH ANTENNA WITH A CERAMIC PLATE AS A COVER**

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(21) Appl. No.: **11/737,446**

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

Related U.S. Application Data

(60) Provisional application No. 60/795,618, filed on Apr. 27, 2006.

(30) **Foreign Application Priority Data**

Apr. 27, 2006 (DE)..... 10 2006 019 688.0

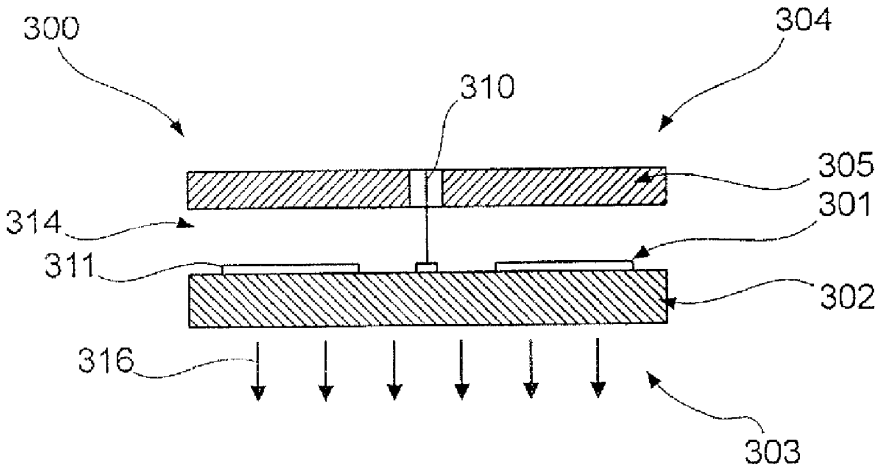
Publication Classification

(51) **Int. Cl.**
H01Q 13/00 (2006.01)
H01Q 13/02 (2006.01)

(52) **U.S. Cl.** **343/786**; 343/772

(57) **ABSTRACT**

Described is a planar antenna with a process separation device for a fill level radar. The planar antenna including a plate-shaped temperature-resistant process separation device that is arranged between the planar radiator element and the exterior of the antenna.



US 20070279311A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0279311 A1**

Kai et al. (43) **Pub. Date: Dec. 6, 2007**

(54) **CROSS DIPOLE ANTENNA AND TAG USING THE SAME**

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(73) Assignee: **FUJITSU LIMITED**

(21) Appl. No.: **11/605,284**

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

(30) **Foreign Application Priority Data**

May 30, 2006 (JP) 2006-149987

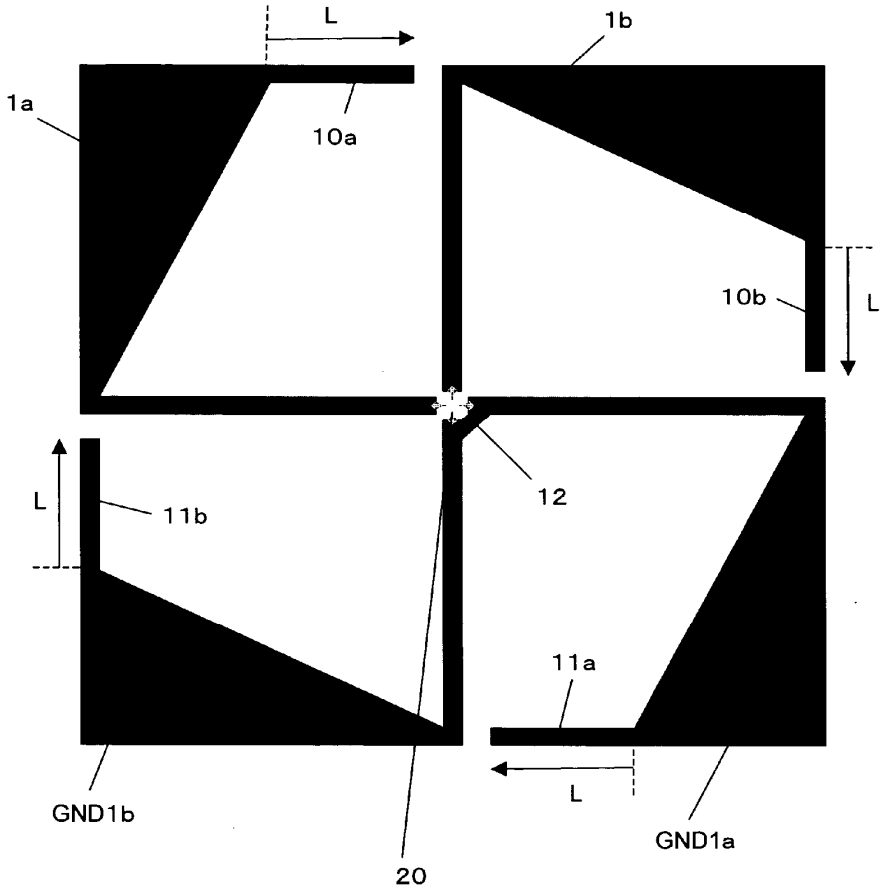
Publication Classification

(51) **Int. Cl.**
H01Q 21/26 (2006.01)

(52) **U.S. Cl.** **343/797**; 343/795

(57) **ABSTRACT**

A compact antenna structure having substantially no directivity independent of a tag direction in an RFID tag is proposed. The antenna structure includes a pair of dipole antennas is provided in a cross dipole antenna to be applied to an RFID system for communicating information between a reader/writer and the tag using a high-frequency radio signal. The above pair of dipole antennas further includes lines extending from a feed point and mutually intersecting crosswise, and also triangularly expanded lines from the bent ends of the above lines. Each total length of the above pair of dipole antennas is longer than $2/\lambda$ of a use frequency λ.



US 20070279312A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0279312 A1**

Mei et al. (43) **Pub. Date: Dec. 6, 2007**

(54) **PLANAR ANTENNA**

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(21) Appl. No.: **11/309,877**

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

(30) **Foreign Application Priority Data**

Jun. 2, 2006 (TW) 95119613

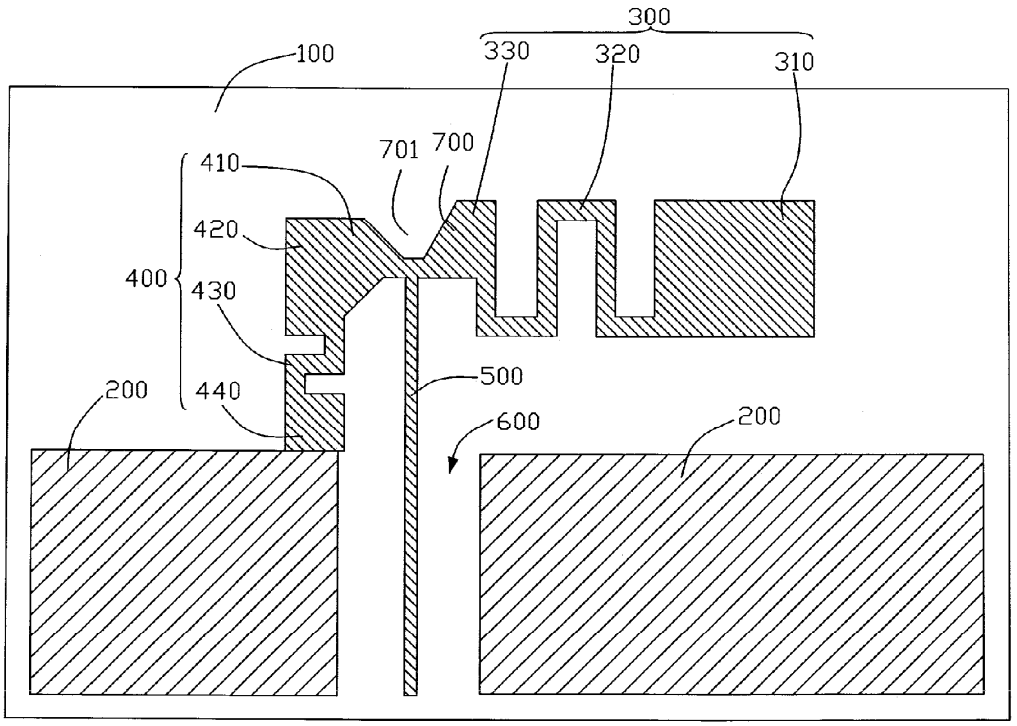
Publication Classification

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

(52) **U.S. Cl.** ..... **343/845**; 343/700 MS

(57) **ABSTRACT**

A planar antenna disposed on a substrate (**100**) includes a metallic ground plane (**200**), a radiating part (**300**), an open-short transforming part (**400**), a joint portion (**700**), and a feeding part (**500**). The metallic ground plane is laid on the substrate. The radiating part transmits and receives radio frequency (RF) signals, and includes a first bent portion (**320**) and an open end (**310**). The first bent portion is electrically connected to the open end. The open-short transforming part is electrically connected between the radiating part and the metallic ground plane, and includes a second bent portion (**430**). The joint portion connects the open-short transforming part and the radiating part, and defines a recessed portion (**701**). The feeding part is electrically connected to the joint portion, for feeding signals.



US 20070279313A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0279313 A1**

Kai et al. (43) **Pub. Date: Dec. 6, 2007**

(54) **ANTENNA AND RFID TAG WITH SAME MOUNTED**

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(21) Appl. No.: **11/826,610**

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

Related U.S. Application Data

(63) Continuation of application No. PCT/JP05/00826, filed on Jan. 24, 2005.

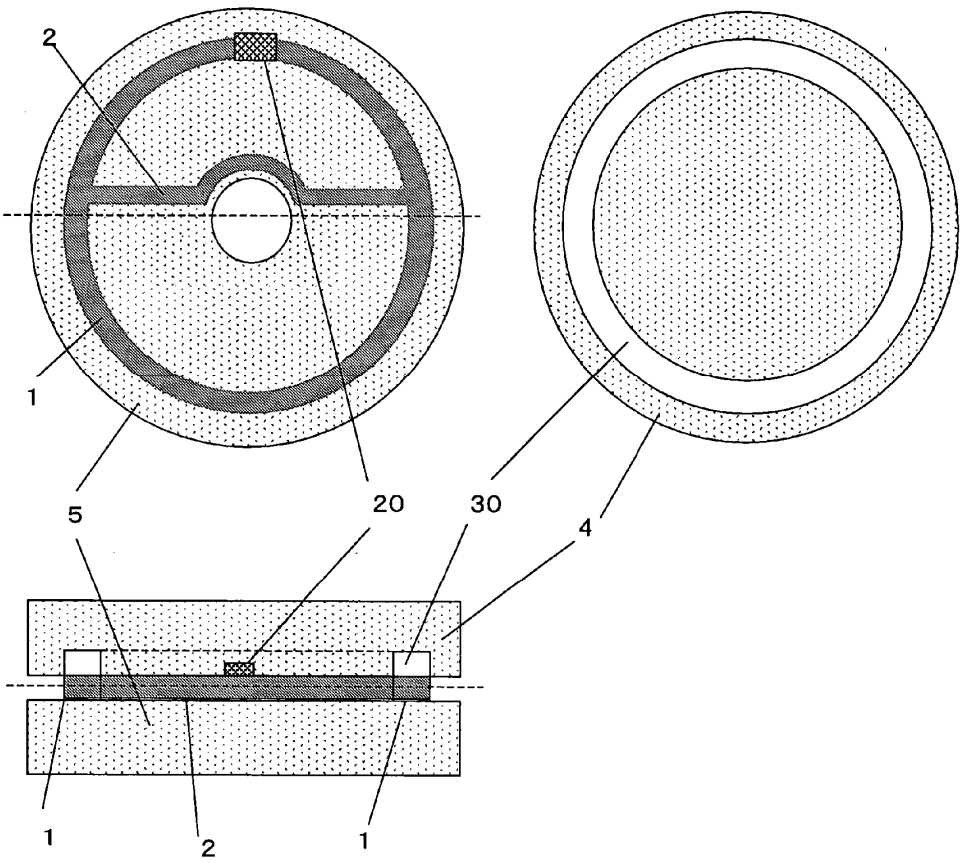
Publication Classification

(51) **Int. Cl.**
H01Q 7/00 (2006.01)
G08B 13/14 (2006.01)

(52) **U.S. Cl.** **343/866**; 340/572.7

(57) **ABSTRACT**

A tag antenna which, within a limited area, resonates with an RFID LSI chip having a capacitance component, and an RFID tag on which such a tag antenna is mounted, and which has an antenna and an LSI chip connected in parallel to the antenna are disclosed; the antenna has a feed terminal connected to the LSI chip, a loop antenna connected to the feed terminal, and a bypass conducting path which bypasses the loop of te loop antenna.



US 20070285316A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0285316 A1

Saily et al. (43) Pub. Date: Dec. 13, 2007

(54) ANTENNA ARRAY AND UNIT CELL USING AN ARTIFICIAL MAGNETIC LAYER

(75) Inventors: **Jussi Saily**, Espoo (FI); **Mikko Kaunisto**, Kirkkonummi (FI); **Sergei Tretyakov**, Espoo (FI); **Constantin Simovski**, St. Petersburg (RU)

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(73) Assignee: **Nokia Corporation**

(21) Appl. No.: **11/452,752**

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

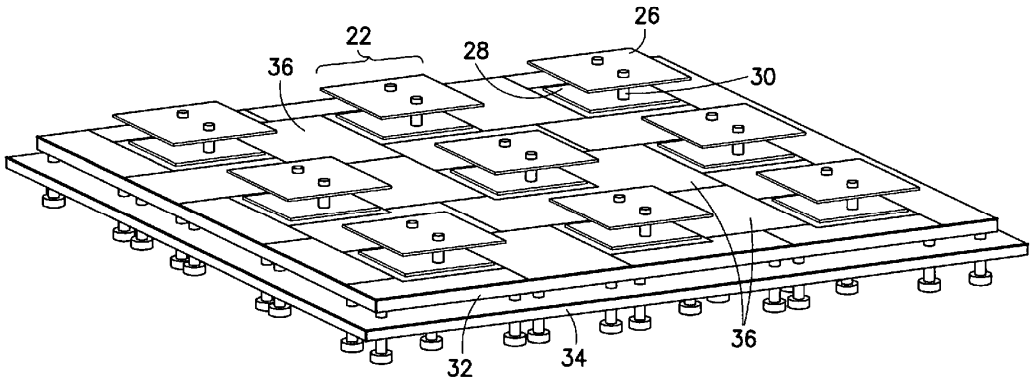
Publication Classification

(51) **Int. Cl.**
H01Q 1/38 (2006.01)
H01Q 15/24 (2006.01)

(52) **U.S. Cl.** ..... **343/700 MS**; 343/909

(57) **ABSTRACT**

An antenna array includes a plurality of antenna unit cells, a ground plane, and at least one artificial magnetic layer AML unit cell. At least one AML unit cell is disposed between at least two adjacent ones of the antenna unit cells. The AML unit cells include a pair of split ring resonators through a ring dielectric layer, and the resonators are capacitively coupled to the a ground plane of the antenna array through a capacitor dielectric layer. The resonators are orthogonal to one another and to the ground plane, and more than one pair may be defined in each AML unit cell. Magnetic energy from the antenna unit cells induces an electric field in the resonators, and the resulting magnetic field is strongly coupled to the AML unit cell to inhibit mutual coupling between radiating elements by suppression of surface wave propagation.



US 20070285317A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0285317 A1

Yu (43) Pub. Date: Dec. 13, 2007

(54) MODULIZED ANTENNA STRUCTURE

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(73) Assignee: **Compal Electronics, Inc.**

(21) Appl. No.: **11/724,132**

(22) Filed: **Mar. 14, 2007**

(30) **Foreign Application Priority Data**

Jun. 13, 2006 (TW) 095120936

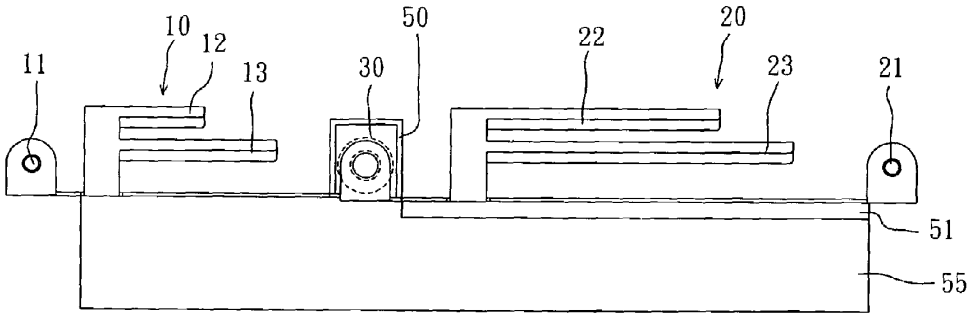
Publication Classification

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

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

(57) **ABSTRACT**

The present invention relates to a modulized antenna structure, which comprises: a first antenna module for receiving a first transmission signal in which at least one side of the first antenna module has a first opening; a second antenna module for receiving a second transmission signal in which at least one side of the second antenna module has a second opening; and a fixed component, while being assembled, with the fixed component, the first antenna module is partially overlapped with the second antenna modules and the first opening is fully overlapped with the second opening, thus the fixed component can pass through the first and second openings and be fixed on the screen of an electronic device.



US 20070285319A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0285319 A1

Ollikainen et al. (43) Pub. Date: Dec. 13, 2007

(54) ANTENNA ARRANGEMENT

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(73) Assignee: **Nokia Corporation**

(21) Appl. No.: **11/450,564**

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

Publication Classification

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

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

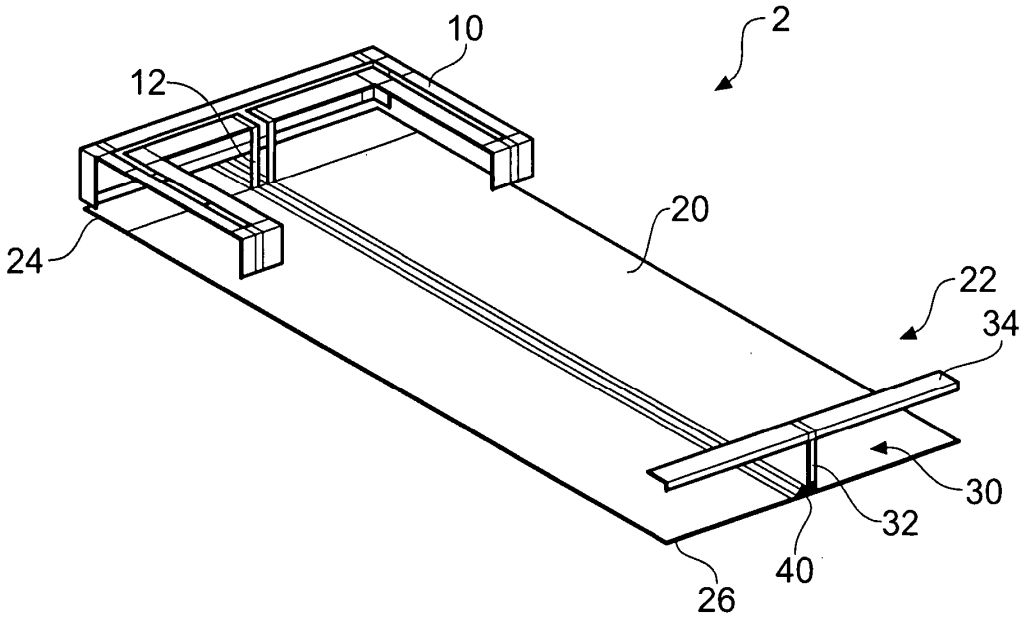
(57) **ABSTRACT**

An antenna arrangement including: a coupling element,

a conductive element; an extension element for electrically extending the conductive element and a reactive element. A method of creating an antenna arrangement including an antenna element having a first resonant frequency and a first bandwidth, a conductive element, an extension element, for electrically extending the conductive element, having a size

and an inductor 40 having an inductance value wherein the extended conductive element has a resonant mode having a second resonant frequency and a second bandwidth, the method including:

selecting the size of the extension element, the inductance value and a position of the inductor to tune the resonant mode of the extended conductive element so that the second bandwidth in the region of the first resonant frequency is larger than the first bandwidth in the region of the first resonant frequency.



US 20070285321A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0285321 A1

Chung et al. (43) Pub. Date: Dec. 13, 2007

(54) **MULTI-FREQUENCY ANTENNA WITH DUAL LOOPS**

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(73) Assignee: **ADVANCED CONNECTEK INC.**, Taipei (TW)

(21) Appl. No.: **11/696,190**

(22) Filed: **Apr. 4, 2007**

(30) **Foreign Application Priority Data**

Jun. 9, 2006 (TW) 95120597

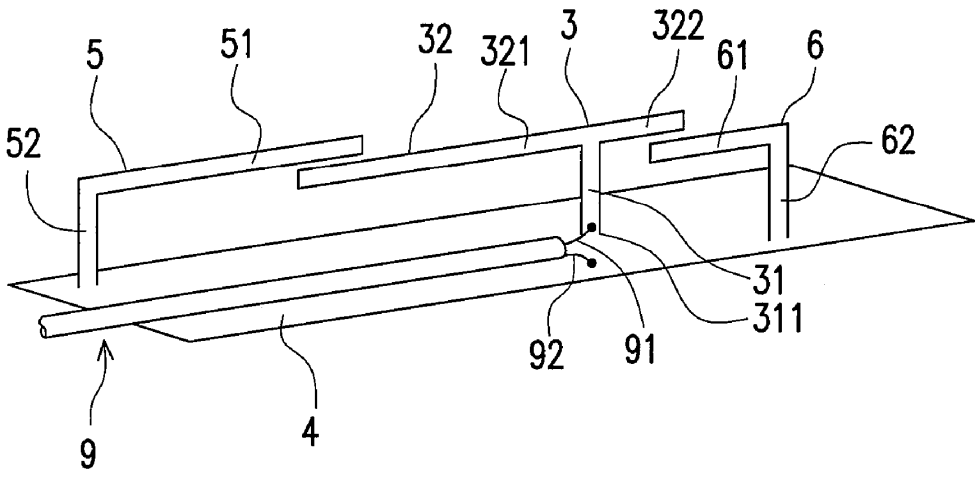
Publication Classification

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

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

(57) **ABSTRACT**

A multi-frequency antenna with dual loops is provided. The antenna includes a T-shaped radiator having a first arm and a second arm of unequal lengths as a main body, and two grounded L-shaped radiators, so as to form dual loops. Thus, the antenna can operate in a high-frequency operation mode and a low-frequency operation mode. With the dual loops, the antenna obtains enough bandwidths at high frequency, and also meets the requirements of low frequency. More specific, the antenna meets the requirements of high-frequency systems, such as DCS/PCS/UMTS and those of low-frequency systems, such as AMPS/GSM.



US 20070285323A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0285323 A1**

Funatsu et al. (43) **Pub. Date: Dec. 13, 2007**

(54) **HIGH FREQUENCY WAVE GLASS ANTENNA FOR AN AUTOMOBILE**

(75) Inventors: **Toshifumi Funatsu**, Chiyoda-ku (JP); **Akio Nagata**, Chiyoda-ku (JP)

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(73) Assignee: **Asahi Glass Company, Limited**, Chiyoda-ku (JP)

(21) Appl. No.: **11/760,943**

(22) Filed: **Jun. 11, 2007**

(30) **Foreign Application Priority Data**

Jun. 12, 2006 (JP) 2006-162171

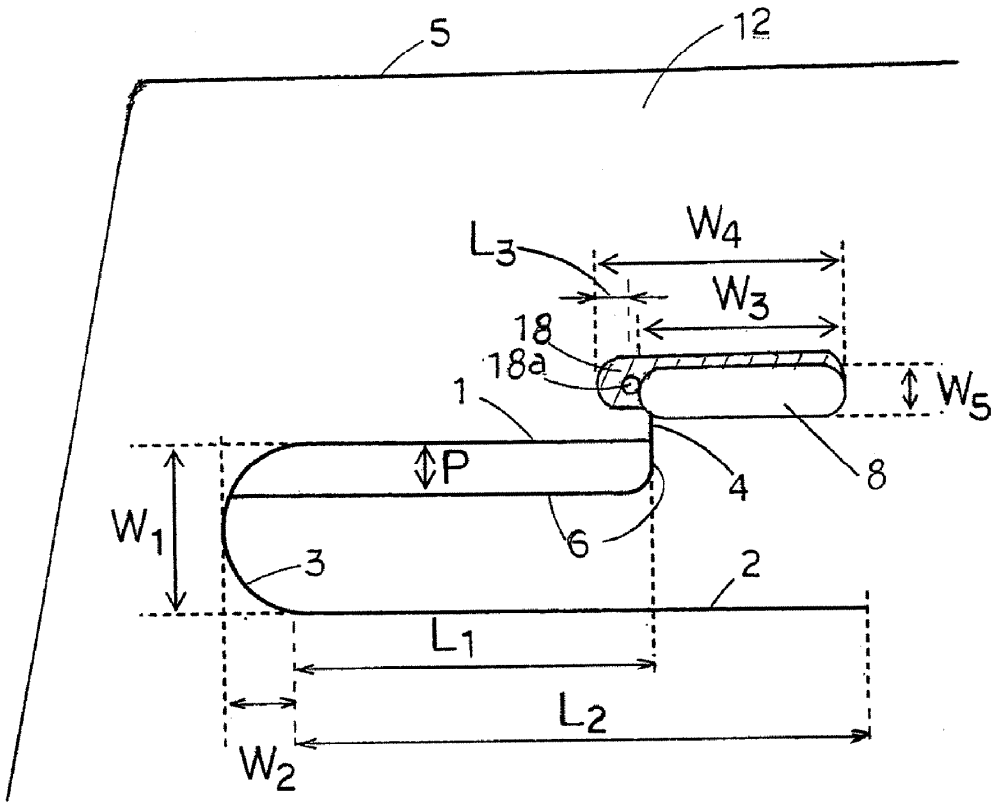
Publication Classification

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

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

(57) **ABSTRACT**

An antenna conductor includes a first antenna element **1**, a second antenna element **2**, a first connecting conductor **3** and a loop-forming element **6**; the first antenna element **1**, the second antenna element **2** and the first connecting conductor **3** form a conductor pattern in a U-character shape; the first antenna element **1** is connected to a feeding electrode **8** through a second connecting conductor **4**; and the first antenna element **1**, the first connecting conductor **3** and the loop-forming element **6** form a loop.



US 20070285324A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0285324 A1

Waterhouse et al. (43) Pub. Date: Dec. 13, 2007

(54) ANTENNA FOR EFFICIENT BODY WEARABLE APPLICATIONS

(75) Inventors: **Rodney Waterhouse**, Columbia, MD (US); **Dalma Novak**, Columbia, MD (US); **Austin Farnham**, Severna Park, MD (US)

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(21) Appl. No.: **11/451,316**

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

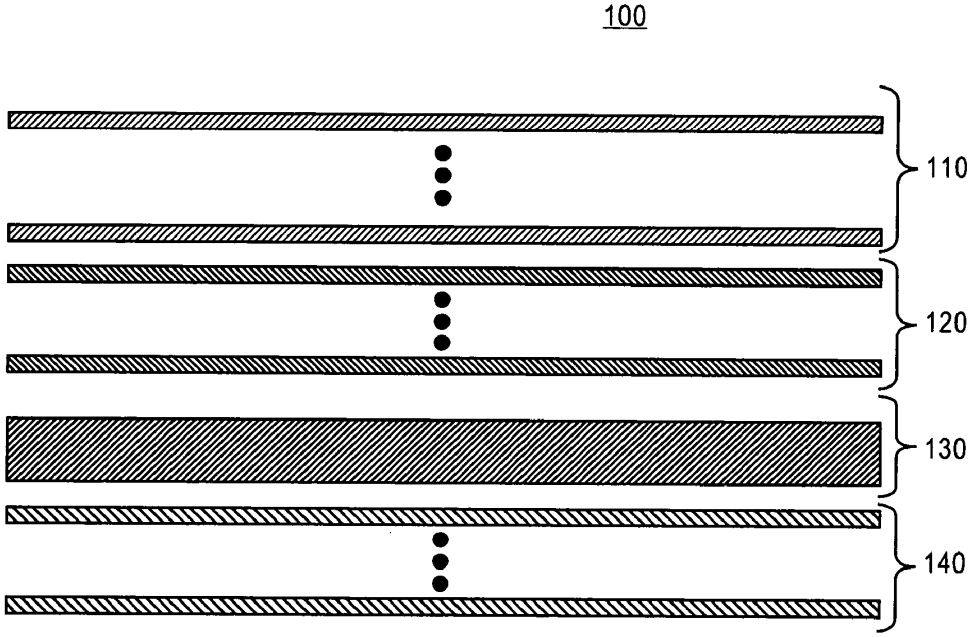
Publication Classification

(51) **Int. Cl.**
H01Q 1/12 (2006.01)

(52) **U.S. Cl.** ..... **343/718**; 343/700 MS

(57) **ABSTRACT**

Embodiments relate generally to a body wearable antenna configuration comprising of a flexible multi-layered structure. Each layer has a property that contributes to the overall response of the antenna. The properties of each layer optimized to give the best overall response of the antenna.



US 20070285328A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0285328 A1**

Mariola (43) **Pub. Date: Dec. 13, 2007**

(54) **SLOT ANTENNA FOR TELEVISION RECEPTION**

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(21) Appl. No.: **11/579,076**

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

(86) PCT No.: **PCT/EP05/51920**

§ 371(c)(1),
(2), (4) Date: **Oct. 30, 2006**

(30) **Foreign Application Priority Data**

Apr. 30, 2004 (IT) RM2004A000211

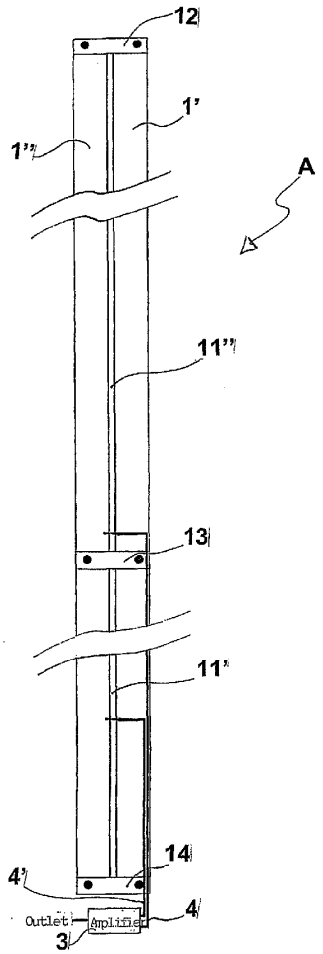
Publication Classification

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

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

(57) **ABSTRACT**

Aluminium slot antenna for receiving radio signals, in particular in the VHF and UHF bands, consisting of two flat and elongated bars fastened parallel to one another by cross-pieces that form electrical bridges. There is a connecting element for a coaxial electrical power supply cable arranged in a predetermined position between the center of the slot and one end thereof and there are fastening means to keep the antenna in a vertical position.



US 20070285330A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0285330 A1**

Sarabandi et al. (43) **Pub. Date: Dec. 13, 2007**

(54) **COUPLED SECTORIAL LOOP ANTENNA**

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(21) Appl. No.: **11/835,231**

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

Related U.S. Application Data

(62) Division of application No. 11/208,700, filed on Aug. 22, 2005, now Pat. No. 7,268,741.

(60) Provisional application No. 60/609,381, filed on Sep. 13, 2004.

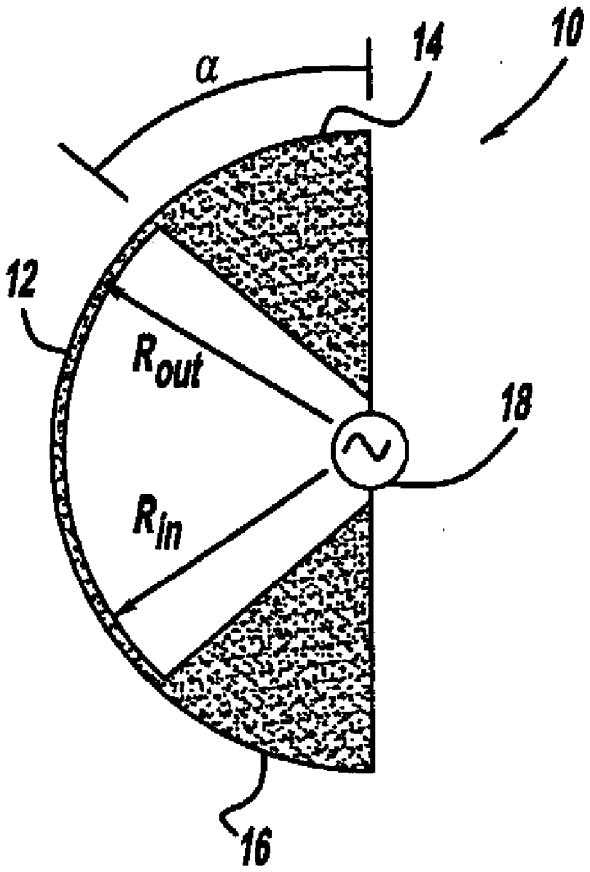
Publication Classification

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

(52) **U.S. Cl.** **343/855**; 343/850; 343/866; 343/867

(57) **ABSTRACT**

A sectorial loop antenna structure that employs a plurality of pie-slice shaped sectors where adjacent sectors are coupled together by an arch and points of the sectors are coupled to a common feed. In one embodiment, the antenna structure includes a first sectorial loop antenna having two pie-slice shaped sectors and an arch therebetween, and a second sectorial loop antenna having two pie-slice shaped sectors and an arch therebetween. In another embodiment, the antenna structure includes a first pie-slice shaped sector and a second pie-slice shaped sector having an arch therebetween.



US 20070285331A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0285331 A1**

Sarabandi et al. (43) **Pub. Date: Dec. 13, 2007**

(54) **TWO-SIDED OVERLAPPING COUPLED SECTORIAL LOOP ANTENNA**

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(73) Assignee: **EMAG Technologies, Inc.**, Ann Arbor, MI (US)

(21) Appl. No.: **11/835,250**

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

Related U.S. Application Data

(62) Division of application No. 11/208,700, filed on Aug. 22, 2005, now Pat. No. 7,268,741.

(60) Provisional application No. 60/609,381, filed on Sep. 13, 2004.

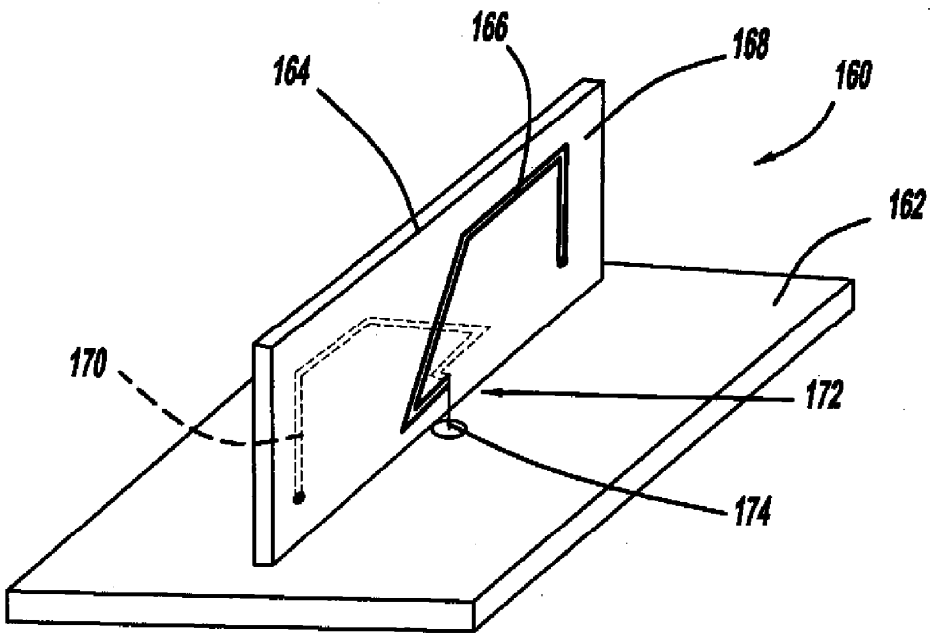
Publication Classification

(51) **Int. Cl.**
H01Q 1/38 (2006.01)
H01Q 7/00 (2006.01)

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

(57) **ABSTRACT**

A two-sided overlapping coupled sectorial loop antenna (CSLA). The CSLA includes a ground plane and a dielectric substrate mounted substantially perpendicular thereto. A first metalized trace is deposited on one side of the substrate and a second metalized trace is deposited on the other side of the substrate, where the metalized traces overlap at a center area and are coupled to a common feed at the center area. In one embodiment, the size of the CSLA is further reduced by adding inductors to the traces.



US 20070285332A1

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2007/0285332 A1

Sarabandi et al. (43) Pub. Date: Dec. 13, 2007

(54) **DUAL SLOT COUPLED SECTORIAL LOOP ANTENNA**

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(21) Appl. No.: **11/835,254**

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

Related U.S. Application Data

(62) Division of application No. 11/208,700, filed on Aug. 22, 2005, now Pat. No. 7,268,741.

(60) Provisional application No. 60/609,381, filed on Sep. 13, 2004.

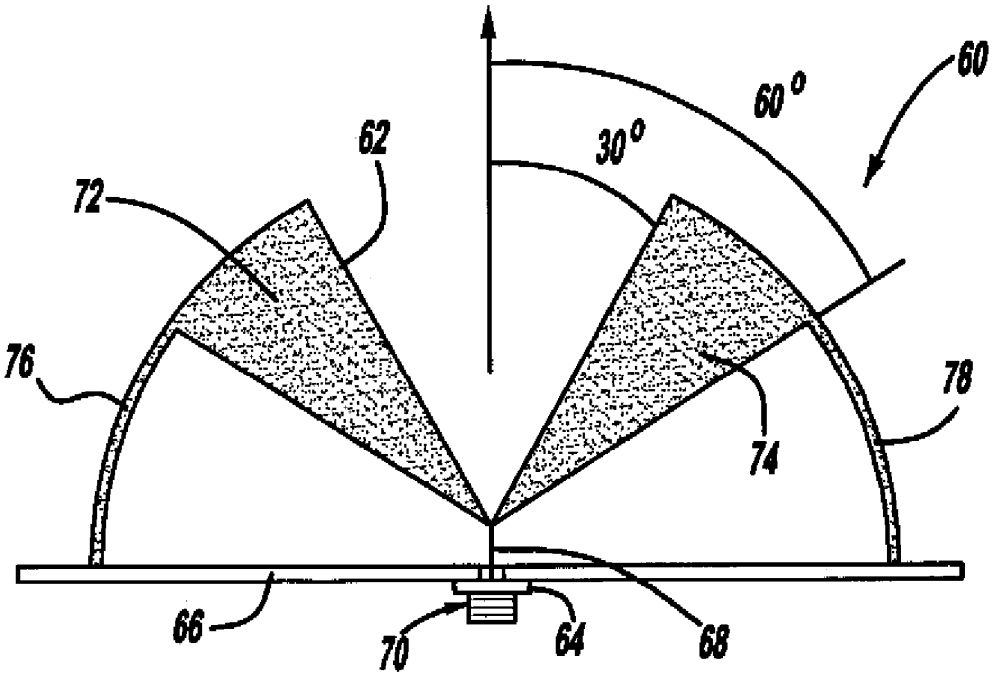
Publication Classification

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

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

(57) **ABSTRACT**

A dual-slot coupled sectorial loop antenna (CSLA). The dual-slot CSLA includes a metalized layer deposited on a dielectric substrate. Portions of the metalized layer are removed to define two pie-slice shaped sectors that are electrically isolated from the remaining portion of the metalized layer, where points of the pie-slice shaped sectors oppose each other and are electrically coupled to a common feed.



US 20070285334A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0285334 A1**

Tsutsumi et al. (43) **Pub. Date: Dec. 13, 2007**

(54) **CIRCULARLY POLARIZED ANTENNA DEVICE**

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(21) Appl. No.: **11/739,408**

(22) Filed: **Apr. 24, 2007**

(30) **Foreign Application Priority Data**

Jun. 12, 2006 (JP) 2006-162619

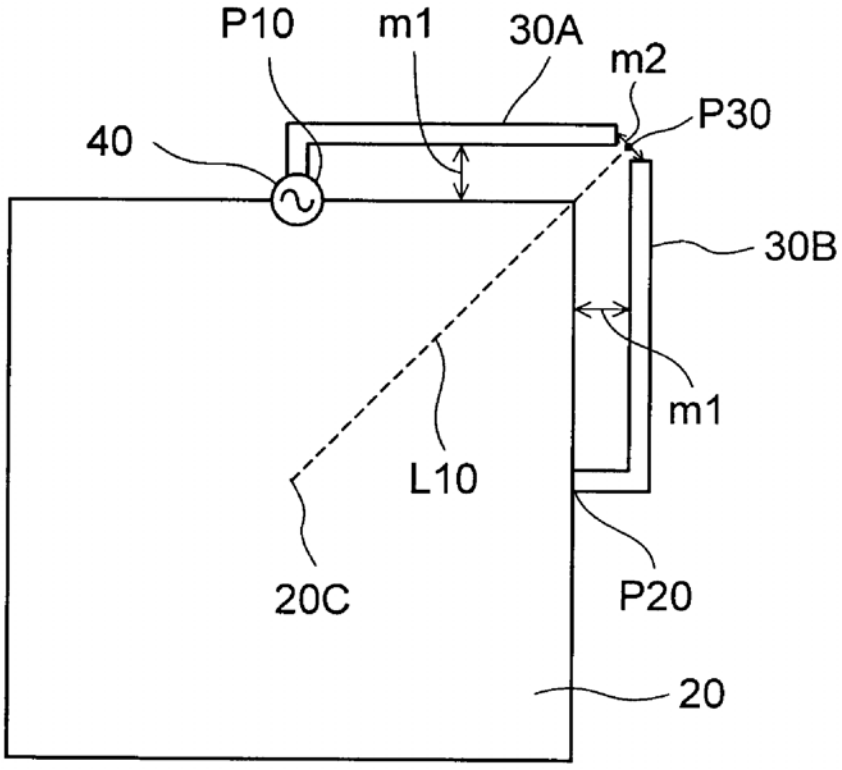
Publication Classification

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

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

(57) **ABSTRACT**

First and second monopole conductive elements are disposed so as to be approximately mutually perpendicular and so that respective open ends are adjacent, and with respect to a straight line that passes between open ends of the first and second monopole conductive elements and through a center of a conductive ground plane, a first conductive ground plane portion formed on a first monopole conductive element-side of the straight line among the conductive ground plane and the first monopole conductive element are formed so as to be approximately symmetrical to a second conductive ground plane portion formed on a second monopole conductive element-side of the straight line among the conductive ground plane and the second monopole conductive element.



10

US 20070285335A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0285335 A1**

Bungo et al. (43) **Pub. Date: Dec. 13, 2007**

(54) **ANTENNA DEVICE AND COMMUNICATION APPARATUS**

(75) Inventors: **Akihiro Bungo**, Tokyo (JP); **Takao Yokoshima**, Tokyo (JP); **Shinsuke Yukimoto**, Tokyo (JP); **Toshiaki Edamatsu**, Chichibu-gun (JP)

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(73) Assignee: **Mitsubishi Materials Corporation**, Chiyoda-ku (JP)

(21) Appl. No.: **10/596,812**

(22) PCT Filed: **Dec. 24, 2004**

(86) PCT No.: **PCT/JP04/19337**

§ 371(c)(1),
(2), (4) Date: **Jul. 19, 2007**

(30) **Foreign Application Priority Data**

Dec. 25, 2003	(JP)	2003-430022
Mar. 12, 2004	(JP)	2004-070875
Mar. 12, 2004	(JP)	2004-071513
Aug. 4, 2004	(JP)	2004-228157
Aug. 31, 2004	(JP)	2004-252435
Oct. 18, 2004	(JP)	2004-302924

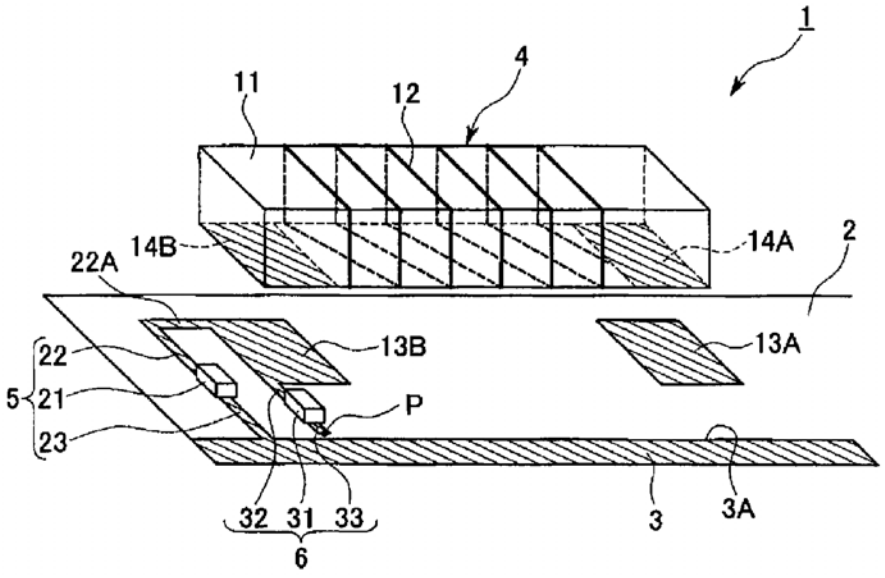
Publication Classification

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

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

(57) **ABSTRACT**

There is provided an antenna device including a substrate, an earth section which is disposed on a portion of the substrate, a feed point which is disposed on the substrate, a loading section disposed on the substrate and constructed with a line-shaped conductor pattern which is formed in a longitudinal direction of an elementary body made of a dielectric material, an inductor section which connects one end of the conductor pattern to the earth section, and a feed point which feeds a current to a connection point of the one end of the conductor pattern and the inductor section, wherein a longitudinal direction of the loading section is arranged to be parallel to an edge side of the earth section.



US 20070290925A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0290925 A1**

Dijkstra (43) **Pub. Date: Dec. 20, 2007**

(54) **COUPLING FOR PATCH ANTENNAS**

(75) Inventor: **Patrick Walter Joseph Dijkstra**, TJ Driebruggen (NL)

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(21) Appl. No.: **10/582,573**

(22) PCT Filed: **Dec. 10, 2004**

(86) PCT No.: **PCT/NL04/00860**

§ 371(c)(1),
(2), (4) Date: **Feb. 21, 2007**

(30) **Foreign Application Priority Data**

Dec. 12, 2003 (NL)..... 1025002

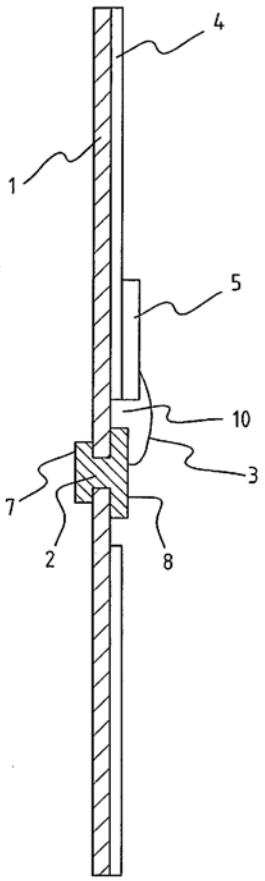
Publication Classification

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

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

(57) **ABSTRACT**

Device comprising a patch antenna, and coupling means for connecting the antenna to an electronic component, wherein the patch antenna is arranged on one side of an antenna plate, and the electronic component can be mounted on the other side of the antenna plate, wherein the coupling means comprise a metal passage through the antenna plate. This passage thus ensures the transmission of signals between the antenna and the electronic component. Such a passage is mechanically very robust and not susceptible to ageing, whereby this passage is suitable for automotive applications. This passage is generally not ideal, since it does not have the same characteristic impedance as the antenna and the electronic component, but the dimensions of the passage can be kept sufficiently small so that no disruption is encountered from this impedance mismatch.



US 20070290926A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0290926 A1**

Tseng (43) **Pub. Date: Dec. 20, 2007**

(54) **ULTRA WIDE BANDWIDTH PLANAR ANTENNA**

(75) Inventor: **Kuo-Hua Tseng**, Mei-Nung Chen (TW)

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(73) Assignee: **Universal Scientific Industrial Co., Ltd.**, Tsao-Tun Chen (TW)

(21) Appl. No.: **11/452,988**

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

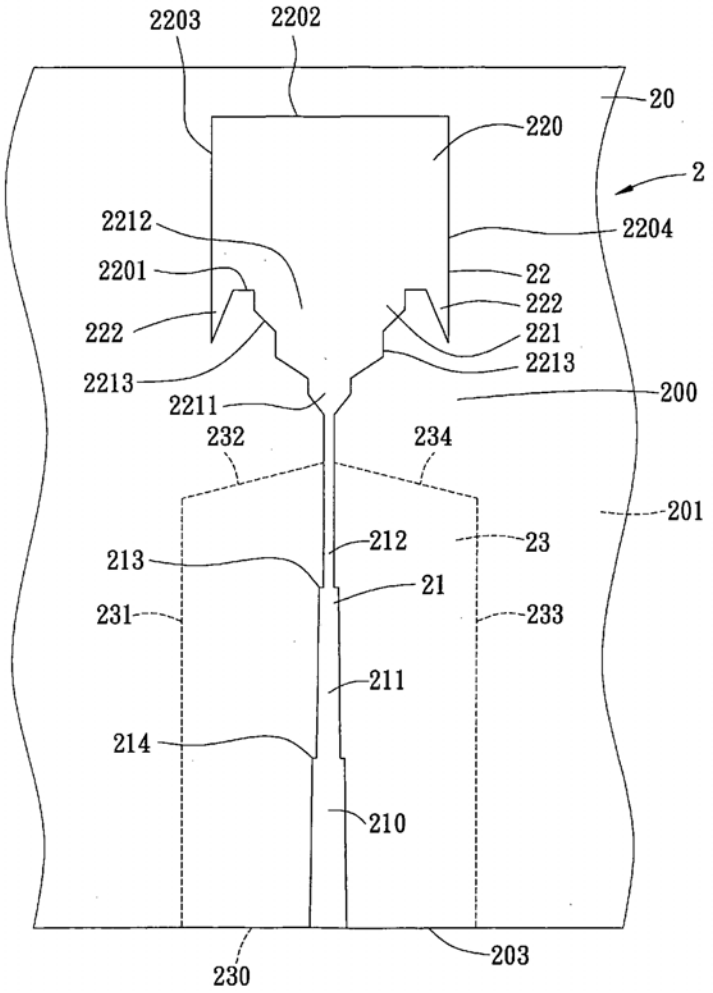
Publication Classification

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

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

(57) **ABSTRACT**

A planar antenna, which is operable within the ultra wide bandwidth, includes a dielectric substrate, a radiating element, a feeding element, and a grounding element. The dielectric substrate has opposite first and second surfaces. The radiating element is formed on the first surface of the dielectric substrate, and includes a tapered part. The tapered part has a converged end portion, and a pair of jagged sides that diverge from the converged end portion. The feeding element is formed on the first surface of the dielectric substrate, and extends from the converged end portion of the tapered part of the radiating element. The grounding element is formed on the second surface of the dielectric substrate.



US 20070290927A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0290927 A1**

Rowell et al. (43) **Pub. Date: Dec. 20, 2007**

(54) **MINIATURE BALANCED ANTENNA WITH DIFFERENTIAL FEED**

(75) Inventors: **Corbett Rowell**, Shatin (HK); **Chi Lun Mak**, Shatin (HK)

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(21) Appl. No.: **11/455,526**

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

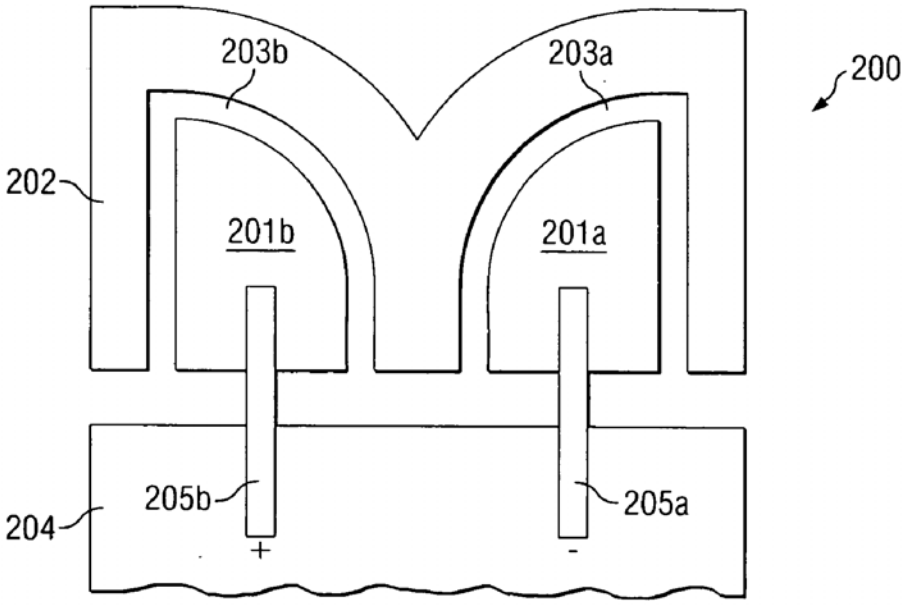
Publication Classification

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

(52) **U.S. Cl.** ..... **343/700 MS**; 343/834

(57) **ABSTRACT**

An example antenna system includes a parasitic element and a symmetrical element fed by a balanced RF signal source. The fed element is operable to couple with the parasitic element, thereby causing the parasitic element to resonate at a first frequency band. Thus, the fed element is operable to act as a balanced capacitive feed for the parasitic element. Also, the parasitic element is symmetrical with respect to a polarity of the fed element.



US 20070290928A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0290928 A1**

Chang et al. (43) **Pub. Date: Dec. 20, 2007**

(54) **BROADBAND ANTENNA**

(75) Inventors: **Chih-Chen Chang**, Banciao City (TW); **Yung-Chin Lo**, Pusin Township (TW)

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(73) Assignee: **INDUSTRIAL TECHNOLOGY RESEARCH INSTITUTE**, Hsinchu County 310 (TW)

(21) Appl. No.: **11/523,658**

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

Related U.S. Application Data

(60) Provisional application No. 60/801,382, filed on May 19, 2006.

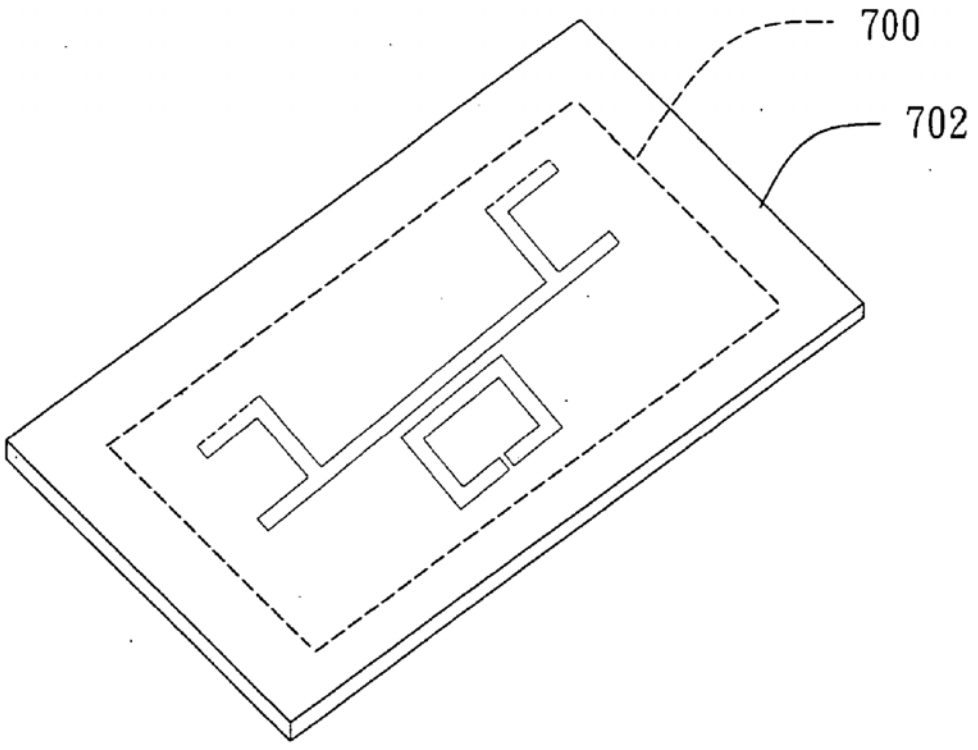
Publication Classification

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

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

(57) **ABSTRACT**

A broadband antenna includes a coupling loop and a number of radiation bodies. The coupling loop is electrically coupled to a chip and the chip records several pieces of data. The radiation bodies respectively form a number of resonance loops with the coupling loop for providing a number of resonance frequencies of the broadband antenna. The coupling loop can feed in signals for reading data in the chip according to the resonance frequencies.



US 20070290931A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0290931 A1**

Utagawa et al. (43) **Pub. Date: Dec. 20, 2007**

(54) **PLANAR ANTENNA**

(75) Inventors: **Naoaki Utagawa**, Gunma (JP); **Takashi Nozaki**, Gunma (JP); **Ichiro Tsuzuku**, Gunma (JP); **Naoki Sotoma**, Gunma (JP)

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(73) Assignee: **Yokowo Co., Ltd.**

(21) Appl. No.: **11/812,093**

(22) Filed: **Jun. 14, 2007**

(30) **Foreign Application Priority Data**

Jun. 15, 2006 (JP) ..... P. 2006-166423

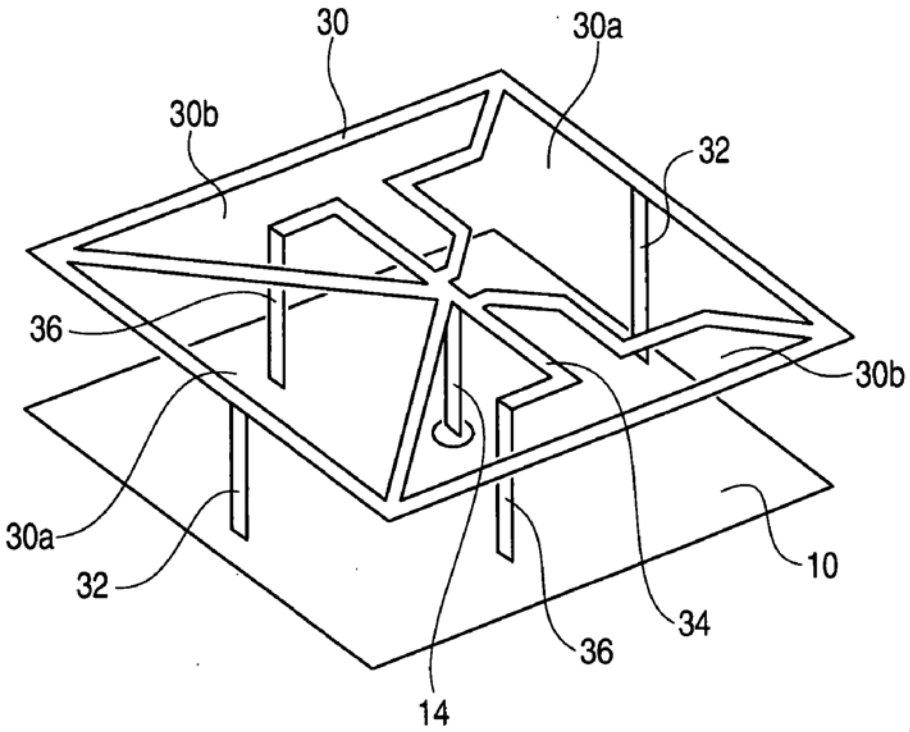
Publication Classification

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

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

(57) **ABSTRACT**

A plate member is adapted to be electrically grounded. A first radiating electrode opposes the plate member with a gap and extending parallel to the plate member. A second radiating electrode opposes the plate member with a gap and extending parallel to the plate member. A feeding pin is connected to a center part of the first radiating electrode and a center part of the second radiating electrode. The feeding pin is adapted to feed power to the first radiating electrode and the second radiating electrode. A pair of first short-circuiting pins are electrically connecting the plate member and an outer edge of the first radiating electrode at symmetrical positions relative to the feeding pin. A pair of second short-circuiting pins are electrically connecting the plate member and both ends of the second radiating electrode. The first radiating electrode is formed with blank portions which are located at such positions that are on hypothetical straight lines connecting the feeding pin and the short pins. The first radiating electrode and the second radiating electrode are flush with each other.



US 20070290933A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0290933 A1**

Yoon et al. (43) **Pub. Date: Dec. 20, 2007**

(54) **INTENNA-TYPE DIPOLE ANTENNA FOR RECEIVING BROADCAST SIGNALS IN VHF BAND**

(75) Inventors: **Ick-jae Yoon**, Yongin-si (KR); **Young-eil Kim**, Yongin-si (KR); **Yong-Jin Kim**, Yongin-si (KR)

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(73) Assignees: **Samsung Electro-Mechanics Co., Ltd.**, Suwon-si (KR); **Samsung Electronics Co., Ltd.**, Suwon-si (KR)

(21) Appl. No.: **11/606,052**

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

(30) **Foreign Application Priority Data**

Jun. 14, 2006 (KR) 10-2006-0053518

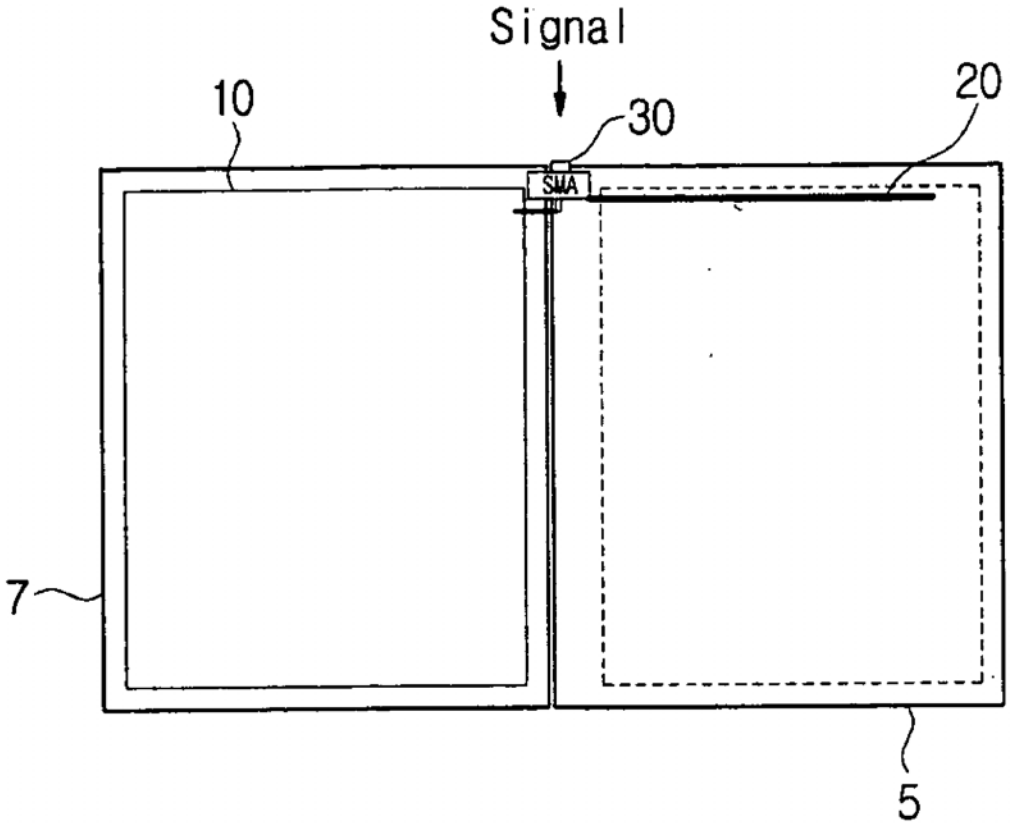
Publication Classification

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

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

(57) **ABSTRACT**

An intenna-type dipole antenna of a mobile terminal, for receiving a broadcast signal in a very high frequency (VHF) band, includes: a conducting plate which functions as one of a radiator and a ground; and a pole which functions as the other of the radiator and the ground. Accordingly, the dipole antenna can be implemented as an intenna with facilitated installation and low costs.



US 20070290934A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0290934 A1**

Nakamura et al. (43) **Pub. Date: Dec. 20, 2007**

(54) **ANTENNA DEVICE HAVING HIGH RECEPTION SENSITIVITY OVER WIDE BAND**

(75) Inventors: **Yusuke Nakamura**, Fukushima-ken (JP); **Yukio Ohtaki**, Fukushima-ken (JP)

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(73) Assignee: **ALPS ELECTRIC CO., LTD.**

(21) Appl. No.: **11/809,052**

(22) Filed: **May 30, 2007**

(30) **Foreign Application Priority Data**

Jun. 20, 2006 (JP) 2006-170373
Nov. 9, 2006 (JP) 2006-303975

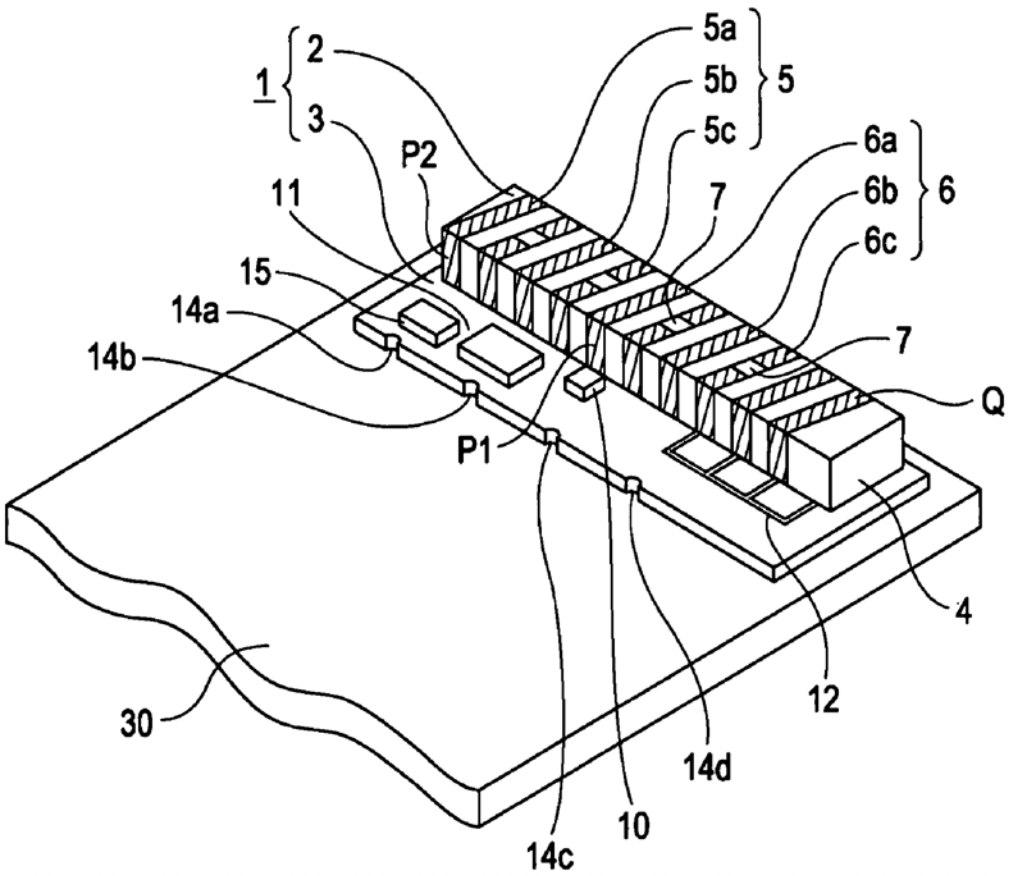
Publication Classification

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

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

(57) **ABSTRACT**

An antenna device is configured such that a chip antenna is mounted on a circuit substrate including first and second transmission lines, a high-frequency changeover switch, and a bias circuit. First ends of first and second radiation conductors that are wound around a base member of the chip antenna are connected to each other, and variable-capacitance elements are distributed in each of the radiation conductors. When an electrical connection between the input terminal and the output terminal of the high-frequency changeover switch is established, a feeding signal is supplied to the first transmission line to provide a high-band mode. When the electrical connection is disconnected, the feeding signal is supplied to the second transmission line to provide a low-band mode. In either band, a tuning voltage is supplied from the bias circuit to the variable-capacitance elements, whereby the tuning frequency of the antenna device can be changed.



US 20070290937A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0290937 A1**

Maniwa et al. (43) **Pub. Date: Dec. 20, 2007**

(54) **ANTENNA DEVICE**

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(21) Appl. No.: **11/826,728**

(22) Filed: **Jul. 18, 2007**

Related U.S. Application Data

(62) Division of application No. 11/130,245, filed on May 17, 2005, now Pat. No. 7,253,771.

(30) **Foreign Application Priority Data**

Feb. 24, 2005 (JP) 2005-048230

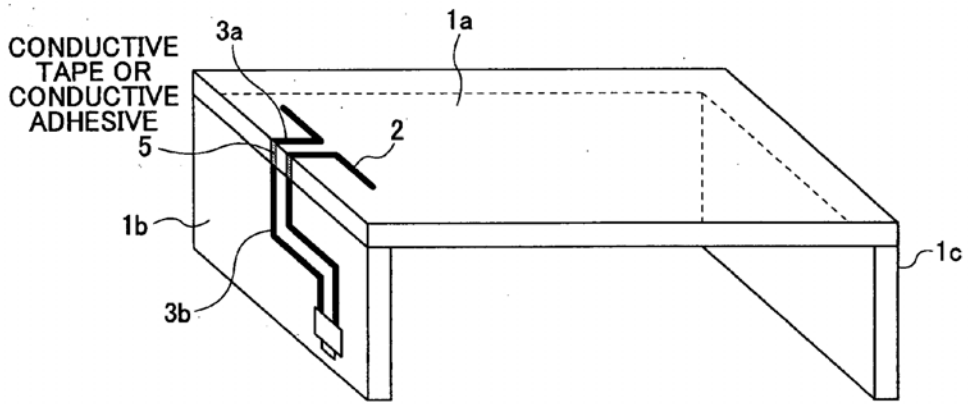
Publication Classification

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

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

(57) **ABSTRACT**

An antenna device is disclosed. An antenna such as a dipole antenna and a parallel feeder each formed of a conductor pattern are disposed on a dielectric plate. The connector is connected to the antenna through the parallel feeder. The parallel feeder has a length of an integral multiple of a half wavelength and has an even number of bending points between the connecter and the antenna.



US 20070290938A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0290938 A1**

Loyet (43) **Pub. Date: Dec. 20, 2007**

(54) **MULTI-BAND ANTENNA**

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(21) Appl. No.: **11/424,614**

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

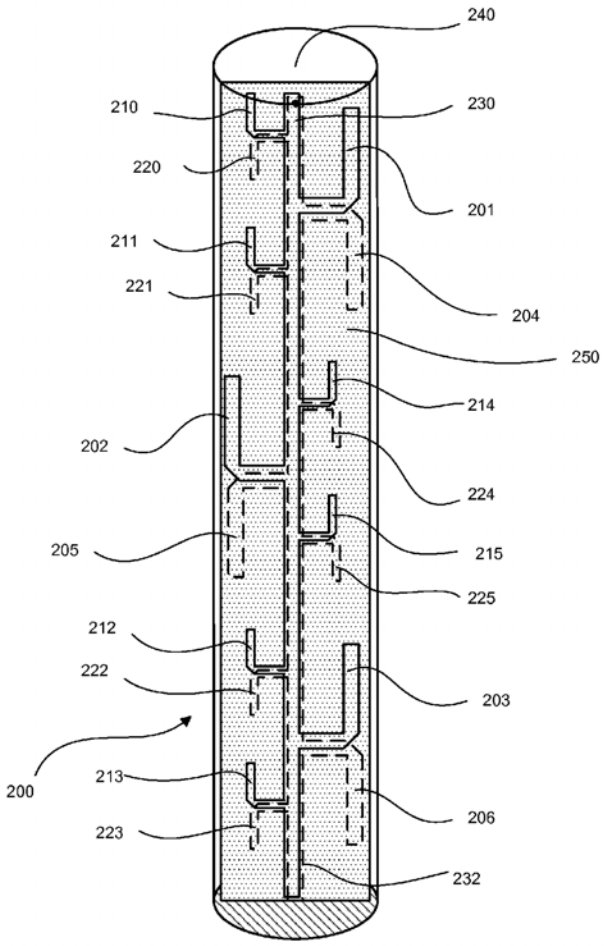
Publication Classification

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

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

(57) **ABSTRACT**

A multi-band antenna for use in a wireless communications network provides frequency support for different wireless technologies in a single structure. This substantially reduces installation costs and can be the only solution in limited space installation sites. In one instance, the multi-band antenna has two serial feedlines carrying respective anode and cathode components of RF signals. Each, comprising serial feedline is coupled to two or more different length dipole elements. Each dipole element of a given length attached to the first serial feedline has a corresponding dipole element of approximately equal length attached to the second serial feedline and oriented, with respect to the first dipole element so as to form a dipole. Thus, at least two dipoles of differing lengths are formed, enabling performance in two different bands by the antenna. The gain of the antenna for any particular band is determined by the number of dipoles corresponding to that band contained within the antenna.



US 20070290939A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0290939 A1**

Teshirogi et al. (43) **Pub. Date: Dec. 20, 2007**

(54) **LINEARLY POLARIZED ANTENNA AND RADAR APPARATUS USING THE SAME**

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(21) Appl. No.: **11/794,872**

(22) PCT Filed: **Nov. 14, 2005**

(86) PCT No.: **PCT/JP05/20858**

§ 371(c)(1),
(2), (4) Date: **Jul. 5, 2007**

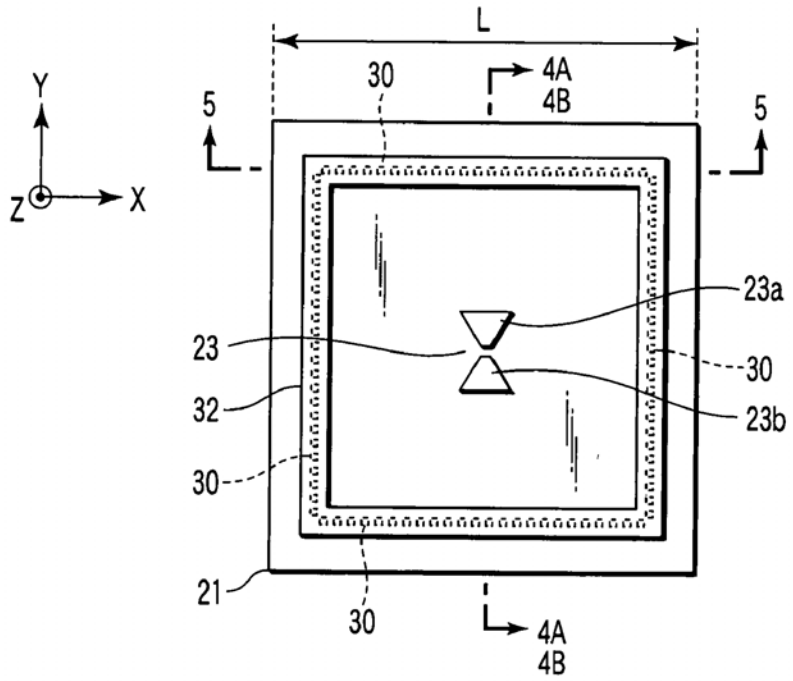
Publication Classification

(51) **Int. Cl.**
H01Q 9/16 (2006.01)
H01Q 1/38 (2006.01)

(52) **U.S. Cl.** ..... **343/795**; 343/700 MS

(57) **ABSTRACT**

A linearly polarized antenna includes a dielectric substrate, a ground conductor which is overlapped on one surface of the dielectric substrate, an antenna element made of linearly polarized, which is formed on an opposite surface of the dielectric substrate, a plurality of metal posts in which one end side of each of the plurality of metal posts is connected to the ground conductor, the plurality of metal posts piercing through the dielectric substrate along a thickness direction thereof, another end side of each of the plurality of metal posts being extended to the opposite surface of the dielectric substrate, the plurality of metal posts being provided at predetermined intervals to form a cavity so as to surround the antenna element, and a conducting rim which short-circuits the other end side of each of the plurality of metal posts along a line direction of the plurality of metal posts on the opposite surface side of the dielectric substrate, the conducting rim being provided while extended by a predetermined distance toward a direction of the antenna element, the conducting rim having, e.g., a triangular portion. In the linearly polarized antenna, generation of a surface wave is suppressed by the cavity and the conducting rim, and the antenna can be set to the desired radiation characteristic. Additionally, a frequency characteristic of an antenna gain can have a steep decline (notch) in an RR radio-wave emission prohibited band by utilizing a resonance phenomenon of the cavity. Therefore, the linearly polarized antenna is effective in decreasing radio wave interference with EESS or radio astronomy service.



US 20070290940A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0290940 A1**

Maniwa et al. (43) **Pub. Date: Dec. 20, 2007**

(54) **ANTENNA DEVICE**

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(21) Appl. No.: **11/826,729**

(22) Filed: **Jul. 18, 2007**

Related U.S. Application Data

(62) Division of application No. 11/130,245, filed on May 17, 2005, now Pat. No. 7,253,771.

(30) **Foreign Application Priority Data**

Feb. 24, 2005 (JP) 2005-048230

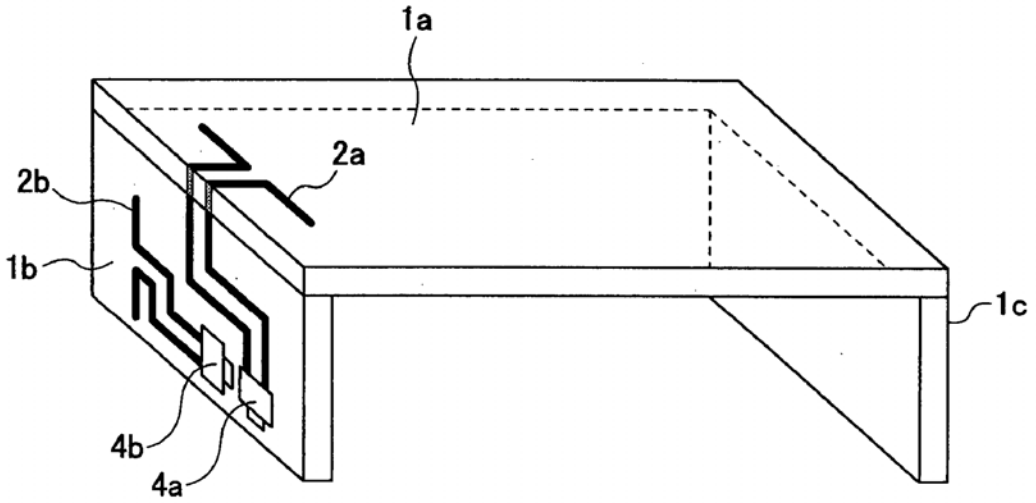
Publication Classification

(51) **Int. Cl.**
H01Q 9/16 (2006.01)
H01Q 21/00 (2006.01)

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

(57) **ABSTRACT**

An antenna device is disclosed. An antenna such as a dipole antenna and a parallel feeder each formed of a conductor pattern are disposed on a dielectric plate. The connector is connected to the antenna through the parallel feeder. The parallel feeder has a length of an integral multiple of a half wavelength and has an even number of bending points between the connecter and the antenna.



US 20070290944A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0290944 A1**

Takaki et al. (43) **Pub. Date: Dec. 20, 2007**

(54) **ANTENNA DEVICE AND MULTI-BAND TYPE WIRELESS COMMUNICATION APPARATUS USING SAME**

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(21) Appl. No.: **11/723,878**

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

(30) **Foreign Application Priority Data**

Aug. 12, 2006 (JP) 2006-220792
Apr. 10, 2006 (JP) 2006-107177

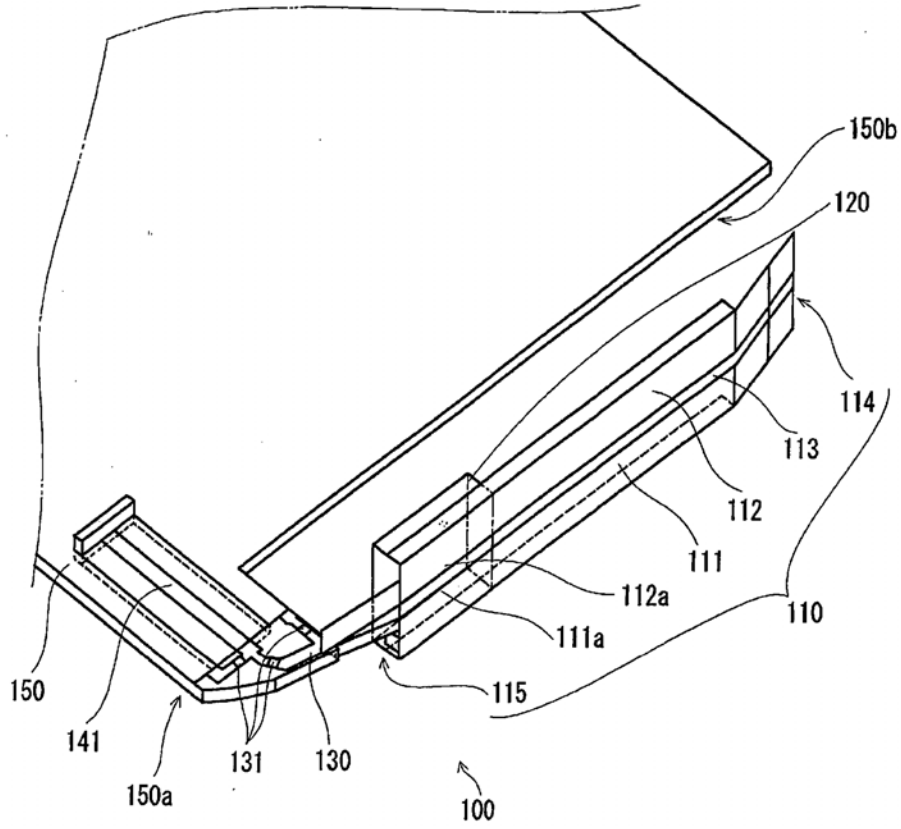
Publication Classification

(51) **Int. Cl.**
H01Q 9/30 (2006.01)
H01Q 1/12 (2006.01)

(52) **U.S. Cl.** **343/873**; 343/900

(57) **ABSTRACT**

An antenna device is provided which is capable of saving space, of operating in wide bands (in a multi-band) and of achieving an excellent gain and maintaining non-directivity of vertically polarized waves in each band. The antenna device has a conductor antenna. An end portion **111***a* on one end side of the conductor antenna is mounted as a power feeding section and an end portion **112***a* on the other end side of the conductor antenna **110** is mounted as an open end terminal. The antenna device also has a base body made of an insulating material which is coupled to one end and other end of the conductor antenna. The base band is coupled in a place where an electric field strength of the conductor antenna having a folded-back portion is increased, thus achieving the wideband and high-gain antenna device.



US 20070290945A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0290945 A1**

Gold (43) **Pub. Date: Dec. 20, 2007**

(54) **RAISING ANTENNA EFFICIENCY FOR A PORTABLE COMMUNICATION DEVICE**

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(21) Appl. No.: **10/593,997**

(22) PCT Filed: **Feb. 17, 2005**

(86) PCT No.: **PCT/EP05/01582**

§ 371(c)(1),
(2), (4) Date: **Jun. 18, 2007**

Related U.S. Application Data

(60) Provisional application No. 60/557,593, filed on Mar. 30, 2004.

(30) **Foreign Application Priority Data**

Mar. 22, 2004 (EP) 04006810.8

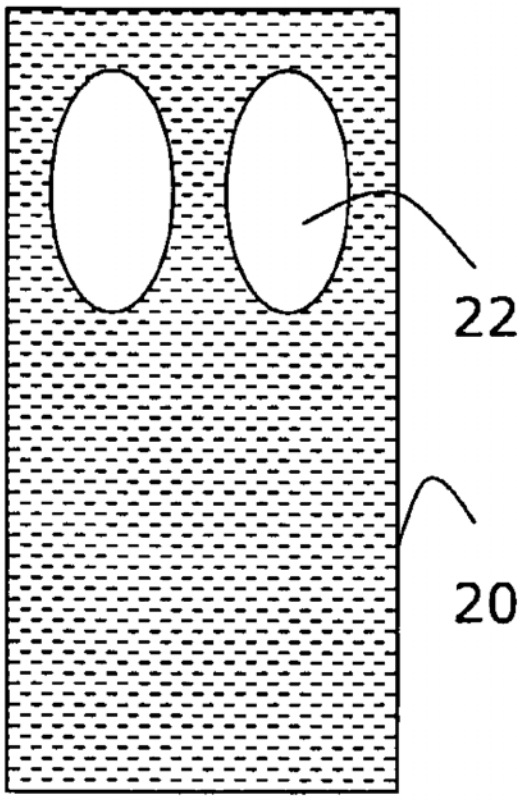
Publication Classification

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

(52) **U.S. Cl.** **343/904**

(57) **ABSTRACT**

Portable communication devices are provided that include a board for receiving electrical circuits and have a ground plane and at least one throughhole. The devices also include an antenna element on one side of the board and an acoustic element placed on the board and aligned with the through-hole. The devices further include a mesh of electrically conducting material positioned between a cover of the acoustic element and the board. The mesh can be connected to the ground plane of the board to enhance the efficiency of the antenna.



US 20070296523A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0296523 A1**

Yamakawa et al. (43) **Pub. Date: Dec. 27, 2007**

(54) **PIEZOELECTRIC FILTER, ANTENNA DUPLEXER, AND COMMUNICATIONS APPARATUS EMPLOYING PIEZOELECTRIC RESONATOR**

(76) Inventors: **Takehiko Yamakawa**, Osaka (JP); **Tomohide Kamiyama**, Osaka (JP); **Tomohiro Iwasaki**, Osaka (JP); **Hiroshi Nakatsuka**, Osaka (JP); **Keiji Onishi**, Osaka (JP)

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(21) Appl. No.: **11/812,013**

(22) Filed: **Jun. 14, 2007**

(30) **Foreign Application Priority Data**

Jun. 26, 2006 (JP) 2006-175771

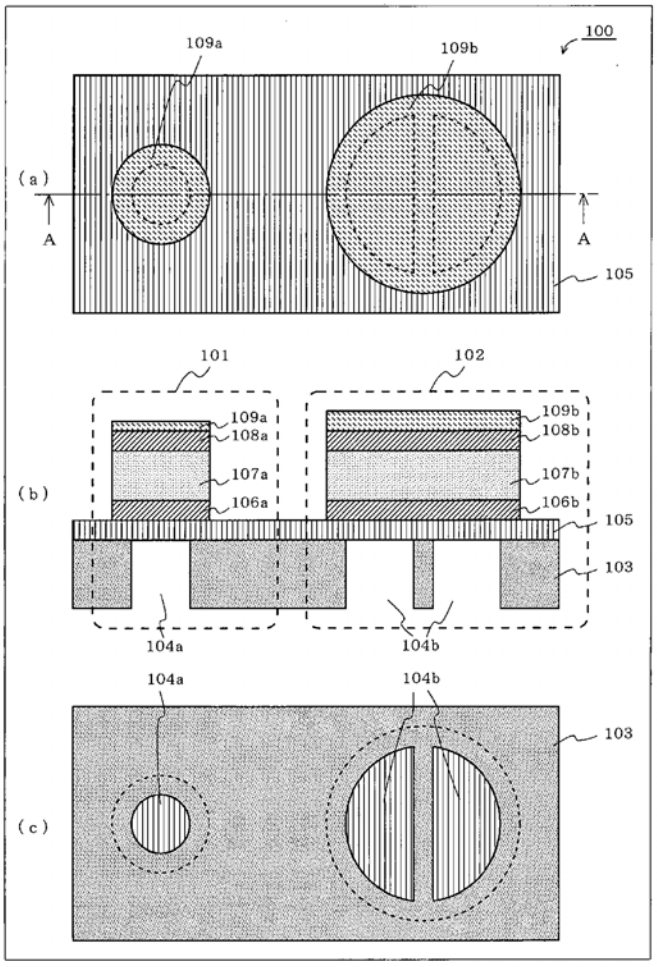
Publication Classification

(51) **Int. Cl.**
H03H 9/70 (2006.01)
H03H 9/58 (2006.01)

(52) **U.S. Cl.** **333/133**; 333/189

(57) **ABSTRACT**

A piezoelectric filter comprises a substrate and a plurality of piezoelectric resonators provided on the same substrate. Each piezoelectric resonator comprises a cavity formed in the substrate, a lower electrode formed on the substrate, covering the cavity, a piezoelectric material layer formed on the lower electrode, and an upper electrode formed on the piezoelectric material layer. At least one of the piezoelectric resonators has a cavity formed of a plurality of cells.



US 20070296594A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0296594 A1**

Copeland et al. (43) **Pub. Date: Dec. 27, 2007**

(54) **ANTENNA FOR A COMBINATION EAS/RFID TAG WITH A DETACHER**

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(21) Appl. No.: **11/666,790**

(22) PCT Filed: **Nov. 2, 2005**

(86) PCT No.: **PCT/US05/39584**

§ 371(c)(1),
(2), (4) Date: **Apr. 30, 2007**

Related U.S. Application Data

(60) Provisional application No. 60/624,402, filed on Nov. 2, 2004. Provisional application No. 60/659,288, filed on Mar. 7, 2005. Provisional application No. 60/659,380, filed on Mar. 7, 2005.

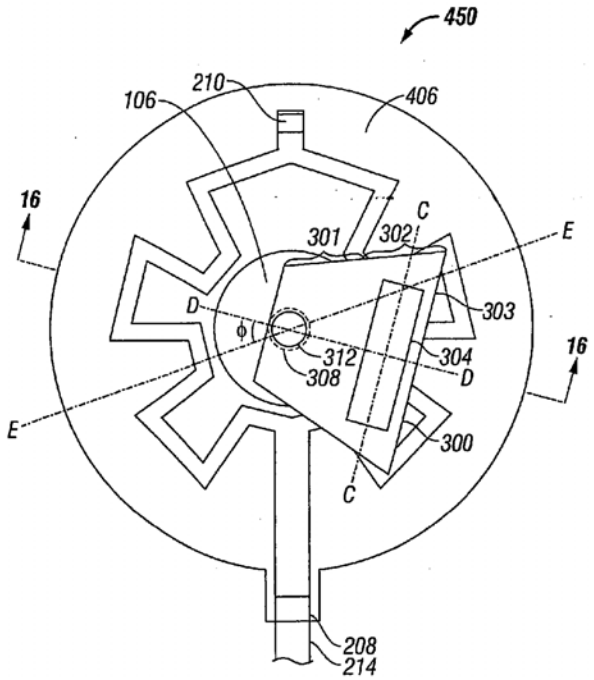
Publication Classification

(51) **Int. Cl.**
E05B 73/00 (2006.01)

(52) **U.S. Cl.** **340/572.7**

(57) **ABSTRACT**

A security device detaches a combination electronic article surveillance (EAS) and radio frequency identification (RFID) tag (EAS/RFID tag), and includes a detacher (magnet) to selectively disengage a clutch release disposed in a first portion of the combination EAS/RFID tag, a near field antenna configured to electronically read information stored in a second portion of the combination EAS/RFID tag. The antenna encircles the detacher and reads information from the second portion of the combination EAS/RFID tag at a position relative to the detacher when the second portion of the tag is disposed at any angle relative to the detacher and only when the detacher is positioned to disengage the clutch release. As long as the portion of the EAS/RFID tag containing the clutch end mechanism is located over the detaching magnet, the RFID label is in a valid detection zone regardless of its orientation relative to the antenna.



US 20070296634A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0296634 A1**

POPUGAEV et al. (43) **Pub. Date: Dec. 27, 2007**

(54) **APERTURE-COUPLED ANTENNA**

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(21) Appl. No.: **11/844,520**

(22) Filed: **Aug. 24, 2007**

Related U.S. Application Data

(63) Continuation of application No. PCT/EP2006/001056, filed on Feb. 7, 2006.

(30) **Foreign Application Priority Data**

Mar. 9, 2005 (DE)..... 102005010895.4

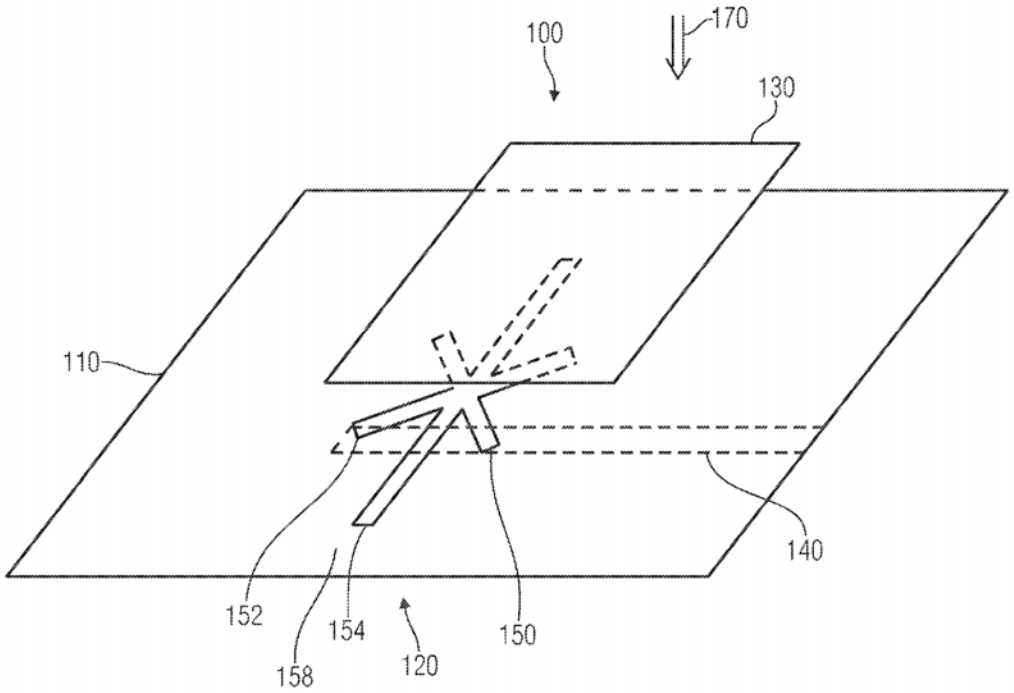
Publication Classification

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

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

(57) **ABSTRACT**

An aperture-coupled antenna has a first radiation electrode, a ground area and a wave guide which is implemented to supply energy to the antenna. The wave guide is arranged spaced apart from the ground area on a first side of the ground area, and the first radiation electrode is arranged spaced apart from the ground area on a second side of the ground area. The ground area has an aperture including a first slot in the ground area, a second slot in the ground area and a third slot in the ground area. The first slot and the second slot together form a slot in the shape of a cross. The third slot passes through an intersection of the first slot and the second slot. The wave guide and the radiation electrode are arranged such that energy can be coupled from the wave guide through the aperture to the patch.



US 20070296635A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0296635 A1**

Popugaev et al. (43) **Pub. Date: Dec. 27, 2007**

(54) **PLANAR MULTIBAND ANTENNA**

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(21) Appl. No.: **11/844,530**

(22) Filed: **Aug. 24, 2007**

Related U.S. Application Data

(63) Continuation of application No. PCT/EP06/01661, filed on Feb. 23, 2006.

(30) **Foreign Application Priority Data**

Mar. 9, 2005 (DE)..... 102005010894.6-35

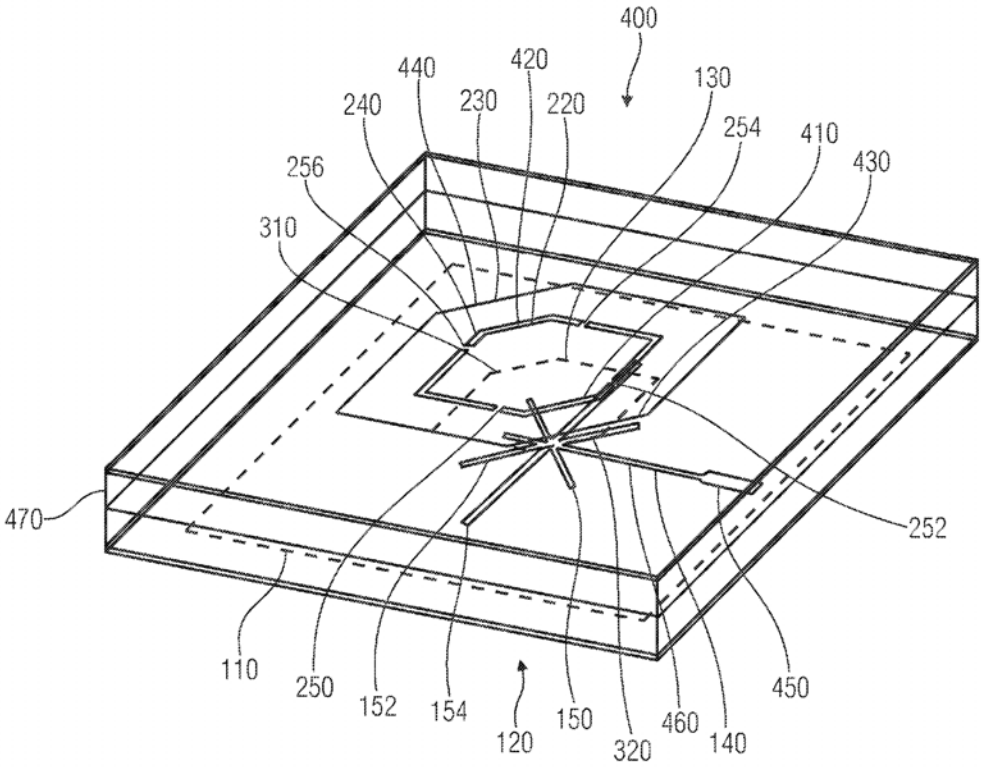
Publication Classification

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

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

(57) **ABSTRACT**

The present invention provides a planar multiband antenna having a ground area, a first radiation electrode, a second radiation electrode, a third radiation electrode and a feeder. The feeder is implemented to feed the first radiation electrode. The first radiation electrode is arranged at least partly between the ground area and the second radiation electrode and does not protrude from an external periphery of the third radiation electrode. The third radiation electrode is arranged such that it completely surrounds an external periphery of the second radiation electrode, wherein there is a gap between the second radiation electrode and the third radiation electrode.



US 20070296636A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0296636 A1**

Lee (43) **Pub. Date: Dec. 27, 2007**

(54) **METAL INVERTED F ANTENNA**

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

(21) Appl. No.: **11/473,268**

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

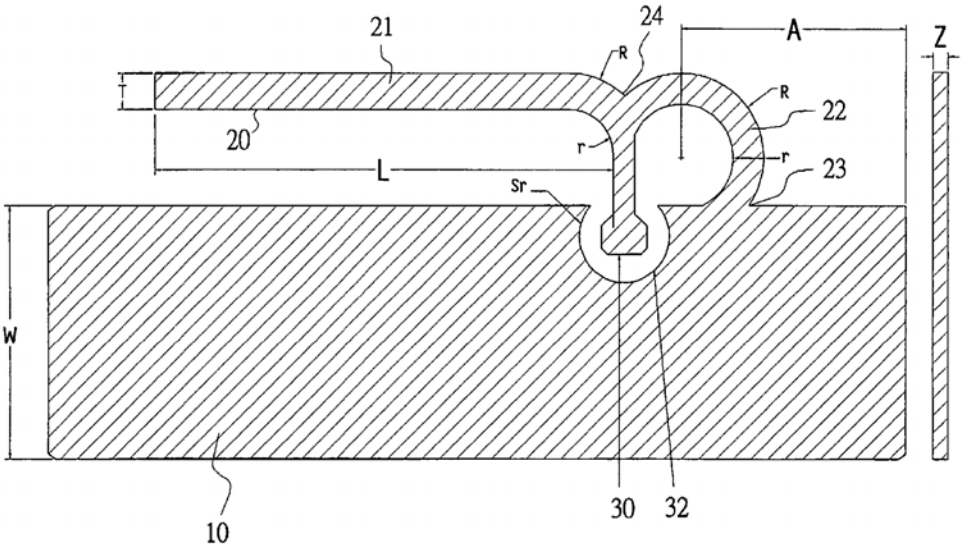
Publication Classification

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

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

(57) **ABSTRACT**

The present invention discloses an antenna structure comprising a ground plane; a radiator having a curved shape portion and a rectangular portion connected to the ground plane via a first end of the curved shape portion and grounded by a ground point of the ground plane, the rectangular portion being connected to a second end of the curved shape portion; and a feed point projected into a groove within the ground plane and connected to the second end of the curved shape portion of the radiator; and wherein the ground plane is extended over the rectangular portion of the radiator.



US 20070296638A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0296638 A1**

Kim et al. (43) **Pub. Date: Dec. 27, 2007**

(54) **MOBILE TERMINAL USING AN INTERNAL ANTENNA WITH A CONDUCTIVE LAYER**

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(73) Assignee: **LG ELECTRONICS INC.**

(21) Appl. No.: **11/758,748**

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

(30) **Foreign Application Priority Data**

Jun. 23, 2006 (KR) 10-2006-0057139

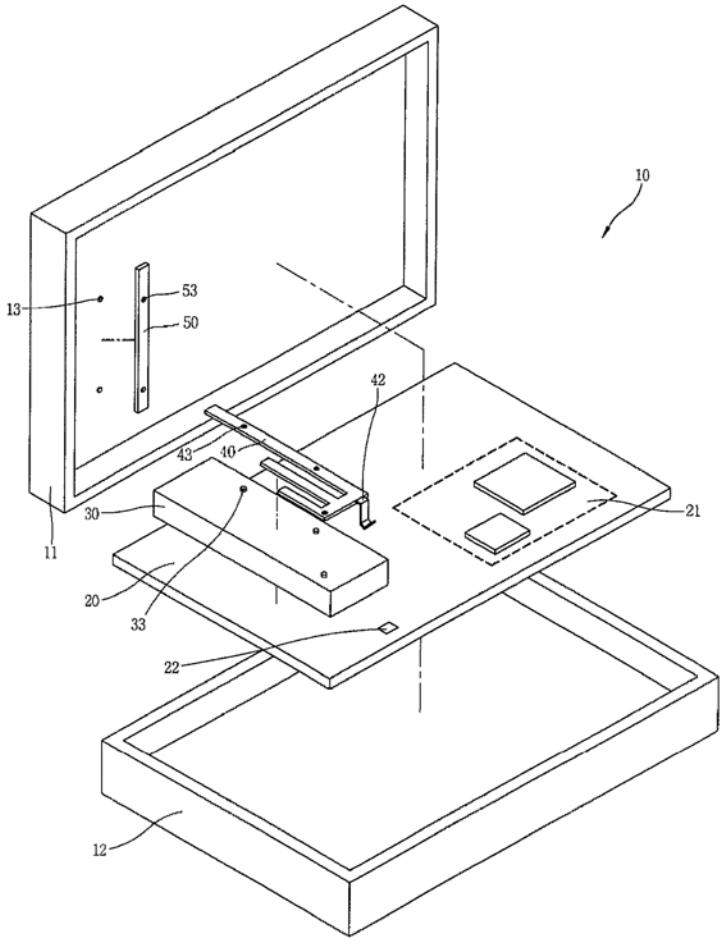
Publication Classification

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

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

(57) **ABSTRACT**

A mobile communication terminal may be made smaller by using an internal antenna and a conductive layer. The conductive layer is spaced apart from the antenna by a fixed gap, and the conductive layer may be located either internally or externally to the terminal housing. The addition of the conductive layer provides a second resonant frequency in a higher frequency band than a first resonant frequency. Because the conductive layer has a relative smaller amount of radiation and is more directly affected by a human body than the internal antenna with a relatively larger amount of radiation, the performance characteristics of the terminal can be increased by a corresponding amount.



US 20070296641A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2007/0296641 A1**

Cook (43) **Pub. Date: Dec. 27, 2007**

(54) **MULTI-BAND CIRCULAR POLARITY ELLIPTICAL HORN ANTENNA**

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(21) Appl. No.: **11/772,544**

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

Related U.S. Application Data

(63) Continuation of application No. 11/132,763, filed on May 18, 2005, now Pat. No. 7,239,285.

Publication Classification

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

(52) **U.S. Cl.** **343/786**

(57) **ABSTRACT**

A relatively low cost, easy to install and aesthetically pleasing multi-band, multi-port digital video broadcast from satellite (DVBS) elliptical horn antenna designed as part of a reflector antenna system to simultaneously receive satellite television broadcast signals with circular polarity on two frequency channels. This type antenna may be implemented with a single antenna feed horn with multiple feed horns that may be arranged separately or in one or more integral feed horn blocks. The antennas may be designed to achieve acceptable circular polarity performance over broad and multiple frequency bands through the use of oppositely sloped differential phase differential sections.