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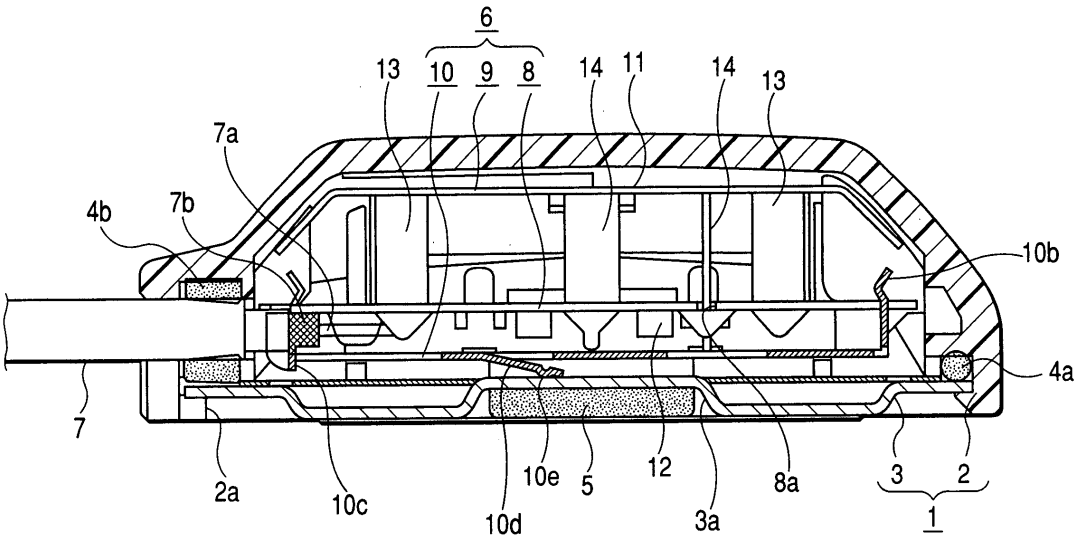
(54) Antenna device

(57) A case has a synthesized resin radome that houses and covers an antenna unit, and a metal cover that covers a bottom opening of the radome. A shield case and the metal cover facing each other are connected to each other by a tongue piece. The antenna unit includes a circuit board that has a wiring pattern and a semiconductor component mounted on a lower surface thereof, the shield case that covers the lower surface of the circuit board and is connected to an outer conductor of a coaxial cable, a radiating conductor plate that is substantially disposed in parallel with an upper surface of the circuit board by a predetermined gap, and feeding pieces that extend from the radiating conductor plate and are connected to the wiring pattern. The antenna unit in the case is connected to an external circuit through the coaxial cable.

FIG. 1



EP 1 699 109 A3

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EUROPEAN SEARCH REPORT

Application Number
EP 06 00 2675

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X Y	US 5 757 327 A (YAJIMA ET AL) 26 May 1998 (1998-05-26) * columns 2,7,9,17; figures 1-29 * * column 18; figures 2,28,29 *	1 2-5	INV. H01Q1/32 H01Q1/50 H01Q9/04
X Y	US 5 585 809 A (YAJIMA ET AL) 17 December 1996 (1996-12-17) * the whole document *	1 2-5	
Y	EP 1 102 347 A (NOKIA CORPORATION) 23 May 2001 (2001-05-23) * paragraphs [0019] - [0022]; claim 3.4; figures 4-6 *	2-4	
Y	US 5 635 942 A (KUSHIHI YUICHI [JP] ET AL) 3 June 1997 (1997-06-03) * column 1, lines 37-50 * * column 3, lines 40-51; figures 2,4 *	5	
A	US 6 049 469 A (HOOD, III ET AL) 11 April 2000 (2000-04-11) * the whole document *	2-4	TECHNICAL FIELDS SEARCHED (IPC) H01Q
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A	WO 02/49148 A2 (ATHEROS COMM INC [US]) 20 June 2002 (2002-06-20) * page 23, line 10 - page 31, line 23; figures 10-17 *	5	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	31 October 2006	Fredj, Aziz

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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A : technological background
O : non-written disclosure
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T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

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Application Number
EP 06 00 2675

CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☒ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

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☐ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

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LACK OF UNITY OF INVENTION
SHEET B

Application Number
EP 06 00 2675

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 2-4

   directed to electrically connecting a shielding cover to a metallic plate

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2. claim: 5

   directed to manufacturing method of matal plate antenna

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 06 00 2675

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
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31-10-2006

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For more details about this annex : see Official Journal of the European Patent Office, No. 12/82