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[Continued on next page]

(54) Title: MODULAR TYPE CELLULAR ANTENNA ASSEMBLY

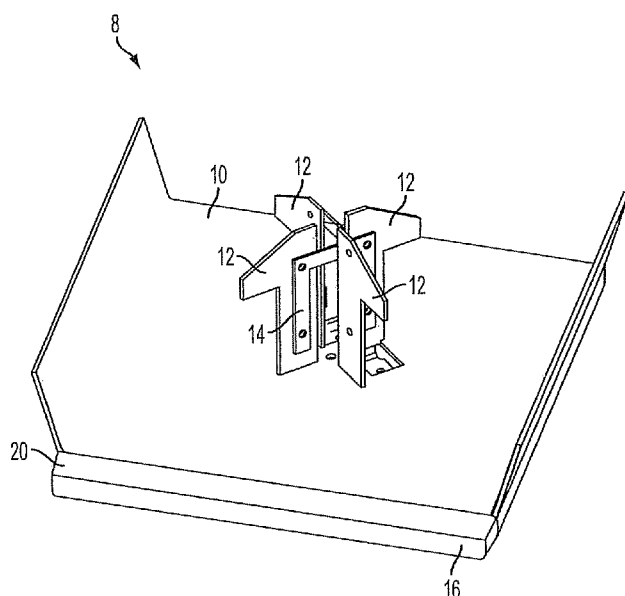


FIG. 1A

(57) Abstract: A individually formed radiating unit, an antenna array, and an antenna assembly are provided. The individually formed radiating unit (8) includes a reflector (10), at least one radiating element (12) integrated into a first side of the reflector (10), and a housing disposed on a second side of the reflector (10). The housing forms a chamber (16) for housing a feed network.



— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

(88) Date of publication of the international search report:

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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER

INV. H01Q1/24 H01Q15/14 H01Q21/00 H01Q21/08 H01Q21/26
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H01Q G01S

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EP0-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2004/091041 A1 (KATHREIN WERKE KG [DE]; GOETTL MAXIMILIAN [DE]; BERGER STEFAN [DE]) 21 October 2004 (2004-10-21)	1,3,5,6, 8-13, 16-19
Y	page 11, line 24 - page 13, line 31; figures 2-4	2,20,22, 23
	page 17, line 7 - page 20, line 17; figures 6-8	
X	US 7 142 821 B1 (MOHUCHY WOLODYMYR [US] ET AL) 28 November 2006 (2006-11-28)	1-4, 9-12, 16-19
	column 2, line 32 - column 4, line 47; figures 1-3,6-8	
X	EP 1 328 042 A1 (EADS DEUTSCHLAND GMBH [DE]) 16 July 2003 (2003-07-16)	1,4,5, 7-12
	paragraph [0032] - paragraph [0037]; figures 1-4	
	----- -/-	

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

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Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DE 20 2009 001821 U1 (KATHREIN WERKE KG [DE]) 16 April 2009 (2009-04-16) paragraph [0036] - paragraph [0050]; figure 1 -----	1-7,9
X	US 2007/229380 A1 (OOTA MASAHIKO [JP] ET AL) 4 October 2007 (2007-10-04) paragraph [0077] - paragraph [0081]; figures 4,5,7 -----	1
Y	US 6 067 053 A (RUNYON DONALD L [US] ET AL) 23 May 2000 (2000-05-23) column 22, line 30 - line 56; figures 2,7a-c -----	2
Y	DE 10 2007 033817 B3 (KATHREIN WERKE KG [DE]) 18 December 2008 (2008-12-18) figure 1 -----	20,22
Y	EP 2 058 901 A1 (ALCATEL LUCENT [FR]) 13 May 2009 (2009-05-13) paragraph [0013]; figure 1 -----	23

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2010/047157

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-13, 16-20, 22, 23

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-13, 16-20, 22, 23

An individually formed modular radiating unit comprising: a reflector; at least one radiating element integrated into a first side of the reflector; and a housing disposed on a second side of the reflector, wherein the housing forms a chamber for housing a feed network; whereupon the housing forms a double chamber, the double chamber including a first chamber and a second chamber, wherein the first chamber and the second chamber are side-by-side.

2. claims: 14, 15

An antenna array comprising: a plurality of individually formed radiating units assembled together end to end, wherein each individually formed radiating unit includes: a reflector; at least one radiating element integrated into a first side of the reflector; a housing disposed on a second side of the reflector, wherein the housing forms a chamber for housing a feed network; whereupon it further comprises at least first and second dielectric sheets locating on opposing sides of the feed network, and wherein at least one of the first or second dielectric sheets include at least one sub-sheet formed from a first dielectric material, and at least one sub-sheet formed from a second dielectric material, wherein the sub-sheet formed from the first dielectric material slides relative to the sub-sheet formed from the second dielectric material.

3. claim: 21

An antenna assembly comprising: an antenna array formed from a plurality of individually formed radiating units assembled together end to end; and a support structure mounted to a first side of the antenna array, wherein each individually formed radiating unit includes: a reflector; at least one radiating element integrated into a first side of the reflector; and a housing disposed on a second side of the reflector, wherein the housing forms a chamber for housing a feed network; whereupon it further comprises a flexible membrane covering at least a portion of the radome cover or the antenna array.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2010/047157

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