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(54) Title: WIRELESS ANTENNA FOR EMITTING CONICAL RADIATION

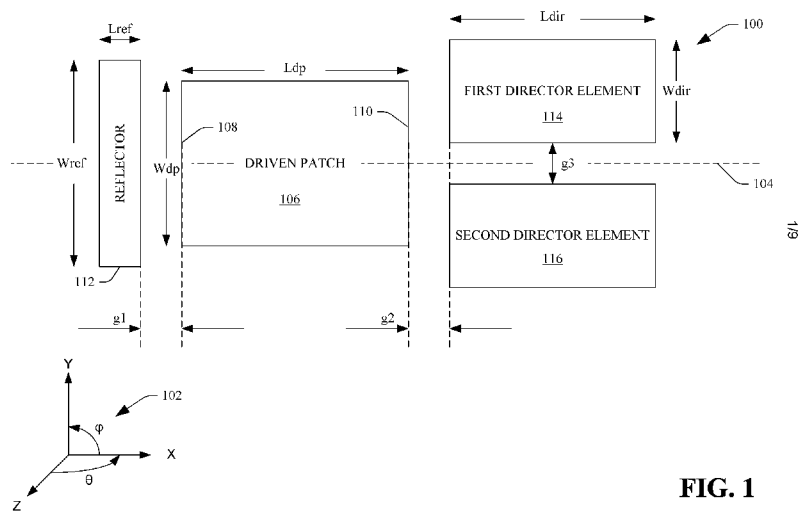




FIG. 1

(57) Abstract: An antenna described herein includes a driven patch that is configured to emit radiation in a broadside direction in response to receiving excitation current, wherein the driven patch has a first radiating edge and a second radiating edge that are approximately parallel to one another. The antenna also includes a reflector element that is configured to reflect radiation emitted from the first radiating edge in a quasi-endfire direction. The antenna can also include two director elements that are configured to direct radiation emitted from the second radiating edge of the driven patch in a quasi-endfire direction.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2009/064486

A. CLASSIFICATION OF SUBJECT MATTER		
<i>H01Q 13/08(2006.01)i, H01Q 13/00(2006.01)i</i>		
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 13/08; H01Q 1/380; H01Q 19/300; H01Q 21/20; H01Q 25/00; H01Q 3/44; H01Q 9/28		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Korean utility models and applications for utility models Japanese utility models and applications for utility models		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) eKOMPASS(KIPO internal) & Keywords: antenna, patch, drive*, reflect*, direct*, yagi, uda		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	JP 2003-258548 A (NIPPON TELEGR & TELEPH CORP) 12 September 2003 See the abstract; figure 7; paragraph 4; and claims 1-5	1-5, 11-14 6, 8-10, 15
X Y	GRAY, DEREK et al. "Electrically Steerable Yagi-Uda Microstrip Patch Antenna Array," IEEE Trans. Antennas Propagat., vol. 46, no. 5, pp. 605-608, May 1998 See the abstract; figures 1, 2; page 606	1-5, 11-14 6, 8-10, 15
X Y	US 5220335 A (HUANG, JOHN) 15 June 1993 See the abstract; figures 1, 2, 5, 6; column 3 line 10 - column 5 line 37, column 6 line 33 - column 7 line 43; and claims 1-7	1-5, 11, 12 6, 8-10, 13-15
Y A	US 2007-0152903 A1 (LIN, TENG-CHI et al.) 05 July 2007 See abstract; figures 1A-4; paragraphs 14-30; and claims 14-18	6, 8-10, 13-15 1-5, 11, 12
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> 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 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 "&" document member of the same patent family		
Date of the actual completion of the international search 14 JUNE 2010 (14.06.2010)		Date of mailing of the international search report 15 JUNE 2010 (15.06.2010)
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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2009/064486**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.: 7
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:
The claim 7 is too unclear to make meaningful search possible because the claim 7 is missing in this application.

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:

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 fee, this Authority did not invite payment of any additional fee.
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.:

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.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2009/064486

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JP 2006-074697 A (RICOH CO LTD) 16 March 2006 See the abstract; figures 1-7; paragraphs 24-72; and claims 1-11 * The claim 7 is missing in this application.	1-6,8-15

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2009/064486

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP 2003-258548 A	12.09.2003	JP 3699408 B2	28.09.2005
US 5220335 A	15.06.1993	None	
US 2007-0152903 A1	05.07.2007	US 7477204 B2	13.01.2009
JP 2006-074697 A	16.03.2006	None	