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- (81) **Designated States (unless otherwise indicated, for every kind of national protection available):** AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
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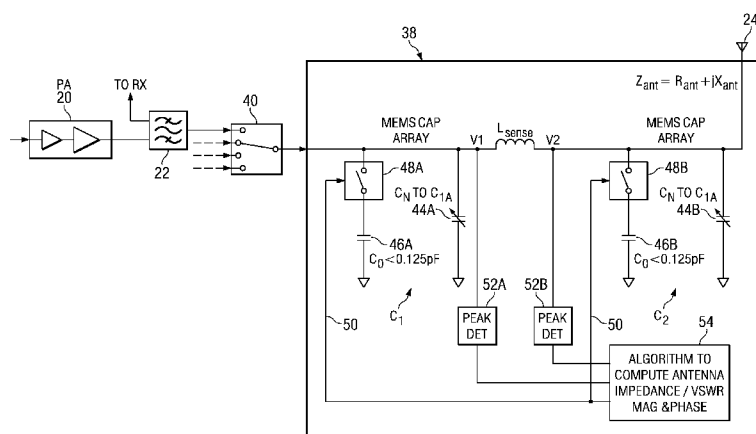
(54) **Title:** RF IMPEDANCE DETECTION USING TWO POINT VOLTAGE SAMPLING

FIG. 2

(57) **Abstract:** An adaptive impedance matching module (38) having an adjustable impedance matching network with an input for receiving an RF power source and an output to be connected to an antenna (24), and first and second voltage measurement devices (52A, 52B) configured to sense a voltage at respective first and second nodes (V1, V2) on the impedance matching network. A network adjuster circuit is provided to switch the impedance matching network between a first state where first and second voltages are sensed on the respective first and second nodes and a second state where third and fourth voltages are sensed on the respective first and second nodes. Processing circuitry is provided which determines the matched load impedance based upon the first, second, third and fourth sensed voltages and including matching adjustment circuitry (44A, 44B) configured to adjust the matching impedance in the event the matched load impedance differs from a target load impedance by more than a predetermined amount.

**Declarations under Rule 4.17:**

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))
- 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))

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## INTERNATIONAL SEARCH REPORT

International application No.  
**PCT/US2012/031891****A. CLASSIFICATION OF SUBJECT MATTER*****H03H 7/38(2006.01)i, H04B 1/40(2006.01)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)

H03H 7/38; H01Q 1/50; H04B 1/46; H03C 1/62; H04B 1/18

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) &amp; Keywords: , ,

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category* | Citation of document, with indication, where appropriate, of the relevant passages                                               | Relevant to claim No. |
|-----------|----------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| A         | US 2010-0182216 A1 (SCHMIDHAMMER EDGAR) 22 July 2010<br>See paragraphs [0007]-[0010], [0112]-[0114]; claims 38,40; figures 3a-3b | 1-23                  |
| A         | US 2009-0258614 A1 (WALKER BRIAN) 15 October 2009<br>See paragraphs [0024]-[0026]; claims 1,12                                   | 1-23                  |
| A         | US 6862432 B1 (HONG JOO KIM) 01 March 2005<br>See column 2, lines 41-67; claims 5,11                                             | 1-23                  |
| A         | US 2003-0052832 A1 (NICOLAOS G. ALEXOPOULOS et al.) 20 March 2003<br>See paragraphs [0009]-[0010]                                | 1-23                  |



Further documents are listed in the continuation of Box C.



See patent family annex.

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

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"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

"&amp;" document member of the same patent family

Date of the actual completion of the international search

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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

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