



(51) International Patent Classification:
H01Q 1/22 (2006.01)

(21) International Application Number:
PCT/SG2010/000356

(22) International Filing Date:
22 September 2010 (22.09.2010)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
61/244,564 22 September 2009 (22.09.2009) US

(71) Applicant (for all designated States except US): **AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH** [SG/SG]; 1 Fusionopolis Way, #20-10, Connexis, Singapore 138632 (SG).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **LIU, Wei** [SG/SG]; c/o Singapore Institute of Manufacturing Technology, 71 Nayang Drive, Singapore 638075 (SG).

(74) Agent: **FOO, Moo Kwang**; Axis Intellectual Capital Pte Ltd, 21 Science Park Road, #03-01 The Aquarius, Science Park II, Singapore 117628 (SG).

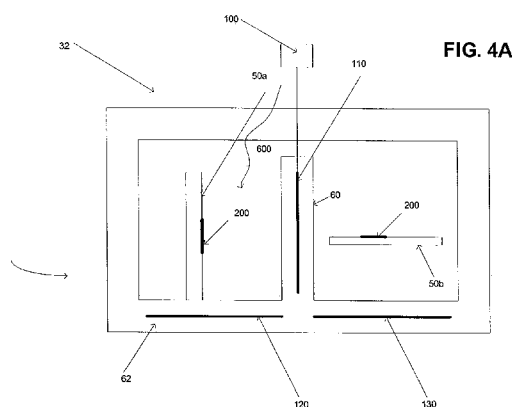
(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, 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, RO, RS, RU, 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.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(54) Title: SYSTEM, APPARATUS, AND METHOD FOR ORIENTATION INDEPENDENT RFID TAG DETECTION



(57) Abstract: A system for facilitating communication between an RFID reader and an RFID tag in a manner that is independent or substantially independent of RFID tag orientation within a spatial detection volume includes a primary antenna and at least one secondary antenna spatially disposed relative to each other such that electromagnetic coupling between the antennas occurs by way of mutual inductance. The primary and secondary antennas can be loop antennas that are disposed perpendicular to each other. The RFID reader drives the primary antenna by way of electrical coupling to a feed point. Each secondary antenna can lack a direct electrical coupling or connection to the RFID reader. The primary antenna generates a primary radiation pattern. Each secondary antenna generates a secondary radiation pattern as a result of inductive coupling to the primary radiation pattern's magnetic field. The relative spatial arrangement of the primary and secondary antennas results in the generation of an augmented radiation pattern that defines an augmented detection volume. The augmented radiation pattern provides sufficient magnetic field intensity and directional variation to enable reliable coupling to an RFID tag antenna in a manner that is independent of RFID tag antenna spatial orientation.

