

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
18 February 2021 (18.02.2021)



(10) International Publication Number
WO 2021/030370 A1

(51) International Patent Classification:

H01Q 1/22 (2006.01) H01L 23/00 (2006.01)
H01Q 21/00 (2006.01)

Patent Department, 6155 El Camino Real, Carlsbad, California 92009 (US).

(21) International Application Number:

PCT/US2020/045806

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(22) International Filing Date:

11 August 2020 (11.08.2020)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

16/538,197 12 August 2019 (12.08.2019) US

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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, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, IT, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, 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, RW, SD, SL, ST, SZ, TZ,

(54) Title: INTEGRATED STRUCTURES WITH ANTENNA ELEMENTS AND IC CHIPS EMPLOYING EDGE CONTACT CONNECTIONS

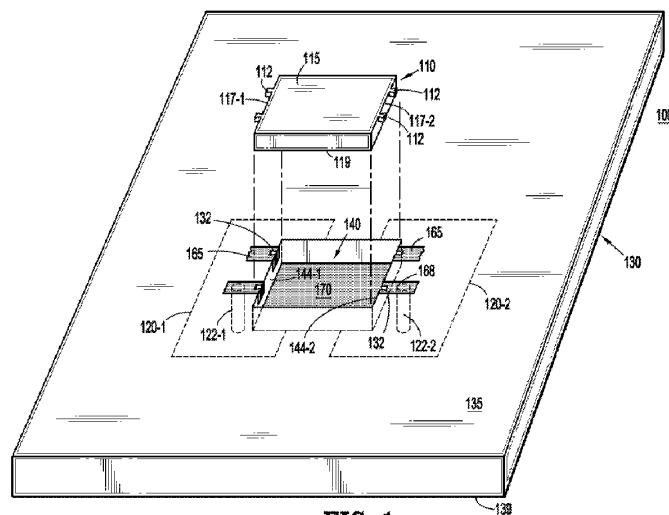


FIG. 1

(57) Abstract: Disclosed is an antenna apparatus including a substrate having a cavity in a first outer surface thereof. The substrate has a sidewall defining a portion of the cavity, and a first edge contact is formed at the sidewall. An IC chip is disposed within the cavity and has a side surface facing the sidewall and a second edge contact formed on the side surface electrically connected to the first edge contact. An antenna element, disposed at a second outer surface of the substrate opposite the first outer surface, is electrically connected to RF circuitry within the IC chip through a conductive via extending within the substrate.

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UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, 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, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

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