



(51) **International Patent Classification:**
G06F 11/14 (2006.01) **H04L 29/08** (2006.01)
G06F 17/30 (2006.01)

Söderkulla (FI). **HONKOLA, Jukka** [FI/FI]; Salmintie 5 A, FI-02140 Espoo (FI).

(21) **International Application Number:**
PCT/FI2009/050732

(74) **Agent:** **NOKIA CORPORATION**; IPR Department, Virpi Tognetty, Keilalahdentie 4, FI-02150 Espoo (FI).

(22) **International Filing Date:**
11 September 2009 (11.09.2009)

(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, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(25) **Filing Language:** English

(26) **Publication Language:** English

(30) **Priority Data:**
12/347,018 31 December 2008 (31.12.2008) US

(71) **Applicant** (for all designated States except US): **NOKIA CORPORATION** [FI/FI]; Keilalahdentie 4, FI-02150 Espoo (FI).

(72) **Inventors; and**

(75) **Inventors/Applicants** (for US only): **BOLDYREV, Sergey** [RU/FI]; Tasbyntie 6 C 12, FI-01150 Söderkulla (FI). **OLIVER, Ian** [GB/FI]; Hitåvägen 153, FI-01150

(84) **Designated States** (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE,

[Continued on next page]

(54) **Title:** METHOD, APPARATUS, AND COMPUTER PROGRAM PRODUCT FOR DETERMINING DATA SIGNATURES IN A DYNAMIC DISTRIBUTED DEVICE NETWORK

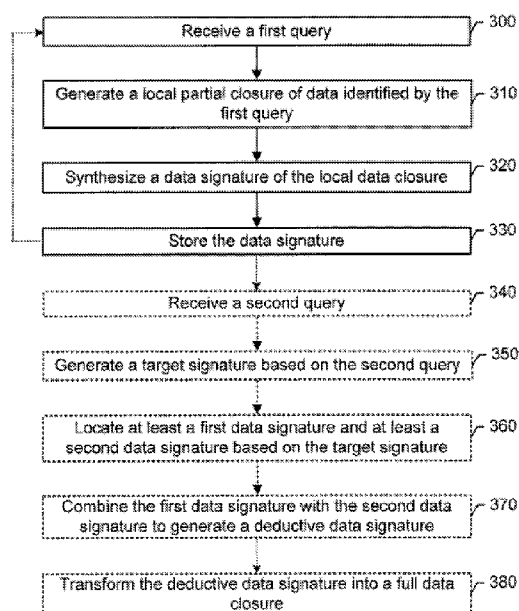


FIG. 3

(57) **Abstract:** An apparatus for determining data signatures in a dynamic distributed device network may include a processor. The processor may be configured to receive a first query (300) and generate a local partial closure of the data identified by the first query (310). The processor may be further configured to synthesize a data signature of the local partial closure (320). In this regard, the data signature may be an irreducible polynomial expression and the data signature may be orthogonal to remote data signatures generated from partial closures. Further, the processor may be configured to store the data signature in an information store (330) within a dynamic distributed device network. Associated methods and computer program products may also be provided.



ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, **Published:**

MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM,

TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, — *with international search report (Art. 21(3))*

ML, MR, NE, SN, TD, TG).