

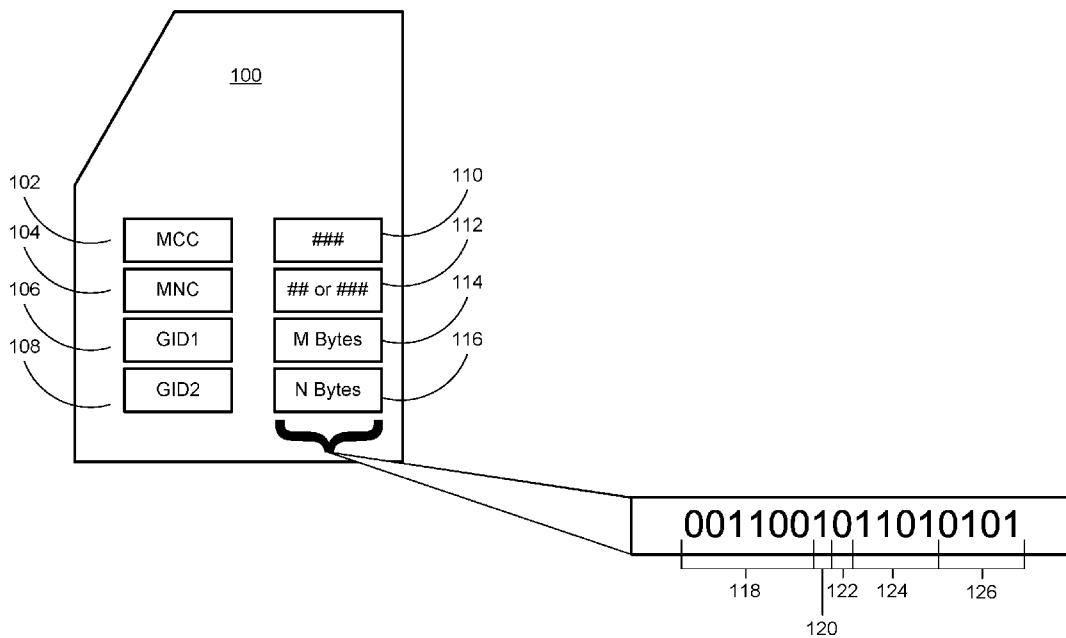


- (51) International Patent Classification:
H04L 29/06 (2006.01) *H04W 8/18* (2009.01)
- (21) International Application Number:
PCT/US2017/023540
- (22) International Filing Date:
22 March 2017 (22.03.2017)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
15/084,967 30 March 2016 (30.03.2016) US
- (71) Applicant: T-MOBILE USA, INC. [US/US]; 12920 SE 38th Street, Bellevue, Washington 98006-1350 (US).

- (72) Inventor: KOVACEVIC, Amela; c/o T-Mobile USA, Inc., 12920 SE 38th Street, Bellevue, Washington 98006-1350 (US).
- (74) Agent: PECK, Robert C. et al.; Lee & Hayes PLLC, 601 West Riverside, Ste 1400, Spokane, Washington 99201 (US).
- (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, 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, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(54) Title: ADVANCED DEVICE LOCKING CRITERIA

FIG. 1



(57) Abstract: Systems and methods for providing additional control over user equipment (UE) using standardized features of a subscriber identity module (SIM) is provided. The UE can impose SIMLocking criteria based on subscriber related attributes (such as rate plan, prepay, postpay, etc.). The SIM module can comprise multiple unique entries and one value for each entry. One or more entries on the SIM can be subdivided to provide additional values with each value made up of a subset of bits from a particular entry. Thus, a single entry can provide a plurality of values to make up a SIM configuration. The SIM configuration can be compared to a UE SIMLock configuration with the same, or similar, entries to determine if the SIM is compatible for use with the UE. The SIM configuration can be updated dynamically to reflect changes in the account associated with the UE or the SIM.



(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, 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))*

(88) Date of publication of the international search report:

23 August 2018 (23.08.2018)

A. CLASSIFICATION OF SUBJECT MATTER**H04L 29/06(2006.01)i, H04W 8/18(2009.01)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)

H04L 29/06; G06F 21/24; H04Q 7/38; H04L 9/32; H04W 8/00; H04M 1/66; H04B 1/38; H04W 8/18

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) & Keywords: UE SIMLock configuration value, group of bits, GID1 entry, GID2 entry, prepaid account, brand, rate plan, SIM configuration

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2008-0003980 A1 (JOEL D. VOSS et al.) 03 January 2008 See paragraphs [0007], [0022], [0026], [0032], [0040], [0045], [0050]-[0053]; claim 5; and figure 1.	15-20
A		1-14
Y	US 2008-0090614 A1 (ALAN E. SICHER et al.) 17 April 2008 See paragraphs [0002], [0007], [0009]-[0010], [0025]; and figure 1.	15-20
A	US 2010-0015949 A1 (PAUL BRADLEY) 21 January 2010 See paragraphs [0010], [0012], [0014], [0043]-[0044].	1-20
A	US 2010-0299748 A1 (MIKAEL JOHANSSON et al.) 25 November 2010 See paragraphs [0039], [0042], [0045], [0051]; and figure 2.	1-20
A	US 2012-0077496 A1 (ARUN MATHIAS et al.) 29 March 2012 See paragraphs [0026], [0034], [0064], [0080]; and figure 1.	1-20

 Further documents are listed in the continuation of Box C. 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 another 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

08 June 2017 (08.06.2017)

Date of mailing of the international search report

22 June 2017 (22.06.2017)

Name and mailing address of the ISA/KR

International Application Division

Korean Intellectual Property Office

189 Cheongsa-ro, Seo-gu, Daejeon, 35208, Republic of Korea



Facsimile No. +82-42-481-8578

Authorized officer

KIM, Seong Woo

Telephone No. +82-42-481-3348



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2017/023540

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2008-0003980 A1	03/01/2008	None	
US 2008-0090614 A1	17/04/2008	US 8050705 B2	01/11/2011
US 2010-0015949 A1	21/01/2010	EP 1937015 A1	25/06/2008
		EP 2098092 A1	09/09/2009
		US 8345640 B2	01/01/2013
		WO 2008-078175 A1	03/07/2008
US 2010-0299748 A1	25/11/2010	EP 2071898 A1	17/06/2009
		WO 2009-074460 A1	18/06/2009
US 2012-0077496 A1	29/03/2012	CN 102143575 A	03/08/2011
		CN 102143575 B	10/12/2014
		EP 2510725 A1	17/10/2012
		EP 2524528 A2	21/11/2012
		JP 2013-517680 A	16/05/2013
		JP 2013-526106 A	20/06/2013
		JP 5438846 B2	12/03/2014
		JP 5603996 B2	08/10/2014
		KR 10-1356317 B1	28/01/2014
		KR 10-1511415 B1	10/04/2015
		US 2011-0177811 A1	21/07/2011
		US 8805365 B2	12/08/2014
		US 8914025 B2	16/12/2014
		WO 2011-087533 A2	21/07/2011
		WO 2011-087533 A3	10/11/2011
		WO 2012-097044 A1	19/07/2012