

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
25 August 2011 (25.08.2011)

(10) International Publication Number
WO 2011/103186 A3

- (51) **International Patent Classification:**
H04W 52/02 (2009.01) H04B 7/26 (2006.01)
H04J 11/00 (2006.01)
- (21) **International Application Number:**
PCT/US2011/025078
- (22) **International Filing Date:**
16 February 2011 (16.02.2011)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
61/305,071 16 February 2010 (16.02.2010) US
- (71) **Applicant (for all designated States except US):** ZTE (USA) INC. [US/US]; 9920 Pacific Heights Blvd., Suite 400, San Diego, CA 92121 (US).
- (72) **Inventor; and**
- (75) **Inventor/Applicant (for US only):** ZHANG, Wenfeng [CN/US]; 3608 Thorp Springs Drive, Plano, TX 75025 (US).
- (74) **Agents:** KIM, Richard, C. et al.; Morrison & Foerster LLP, 12531 High Bluff Drive, Suite 100, San Diego, CA 92130-2040 (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, 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, RS, 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))
- 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))

(88) **Date of publication of the international search report:**
22 December 2011

(15) Information about Correction:

[Continued on next page]

(54) **Title:** METHODS AND APPARATUS FOR NETWORK ENERGY SAVINGS IN A WIRELESS COMMUNICATION SYSTEM

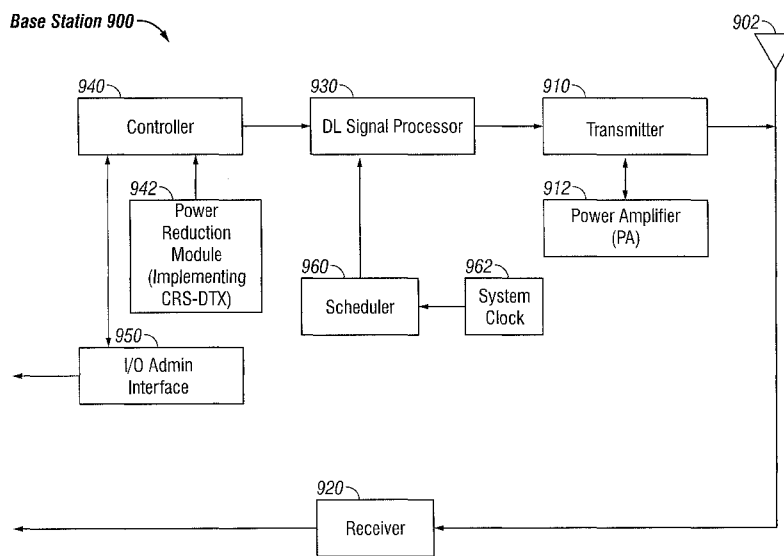


FIG. 9

(57) **Abstract:** Disclosed herein are methods and apparatus for network energy savings in a wireless communication system, such as the 3GPP LTE system. Particularly, one such method reduces power consumption in a base station by selectively muting or disabling downlink transmissions of certain control signal symbols in one or more subframes or frames. The disclosed methods and apparatus can apply independently or in combination in both FDD and TDD systems.

WO 2011/103186 A3

Previous Correction:
see Notice of 10 November 2011

A. CLASSIFICATION OF SUBJECT MATTER***H04W 52/02(2009.01)i, H04J 11/00(2006.01)i, H04B 7/26(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)

H04W 52/02

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:LTE, power saving, muting, dormant

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	JUI-HUNG YEU et al. `Comparative Analysis of Energy-Saving Techniques in 3GP P and 3GPP2 Systems.` IEEE TRANSACTIONS ON VEHICULAR TECHNOLOGY, VOL. 58, NO. 1, JANUARY 2009. See Abstract;page 436, left column, line 7 - page440, left column, line 2.	1-30
A	XIAO, Y., `Energy saving mechanism in the IEEE 802.16e wireless MAN,` Commun ications Letters, IEEE , vol.9, no.7, pp. 595- 597, July 2005 See Abstract;page 595, right column, line 3 - line 30.	1-30

 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 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

10 OCTOBER 2011 (10.10.2011)

Date of mailing of the international search report

26 OCTOBER 2011 (26.10.2011)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
Government Complex-Daejeon, 189 Cheongsu-ro,
Seo-gu, Daejeon 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

Lee Seoung Young

Telephone No. 82-42-481-8591



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2011/025078Patent document
cited in search reportPublication
datePatent family
member(s)Publication
date

None