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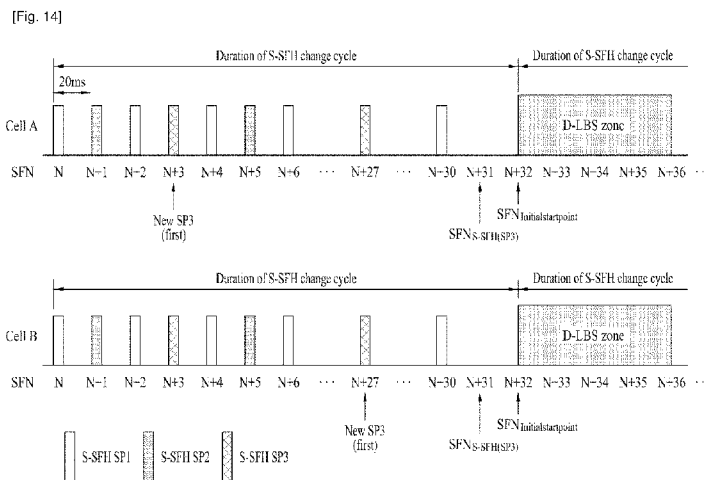
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(54) **Title:** METHOD AND BASE STATION FOR TRANSMITTING LOCATION MEASUREMENT REFERENCE SIGNAL, AND METHOD AND USER EQUIPMENT FOR RECEIVING LOCATION MEASUREMENT REFERENCE SIGNAL



(57) **Abstract:** A method and a base station (BS) for transmitting a location measurement reference signal, and a method and a user equipment (UE) for receiving a location measurement reference signal are disclosed. The UE and the BS determine a transmission time of D-LBS zone configuration information configured to transmit an LBS location beacon on the basis of an S-SFH change cycle. In addition, the UE and the BS determine a transmission start point of the D-LBS zone transmitted according to the configuration information, using the transmission time of the configuration information.

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A. CLASSIFICATION OF SUBJECT MATTER**H04J 11/00(2006.01)i, H04B 7/26(2006.01)i, H04W 64/00(2009.01)i, H04W 4/02(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)

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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: reference signal, location, measurement, base station, user equipment, TDOA

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2010-0195566 A1 (KRISHNAMURTHY, SANDEEP H. et al.) 05 August 2010 See the abstract; paragraphs [66]-[77]; figures 4 and 8.	1-14
A	US 6654609 B2 (KIM, DONG-HUN) 25 November 2003 See the abstract; column 3, line 36 - column 4, line 33; figure 2.	1-14
A	US 2004-0266457 A1 (DUPRAY, DENNIS J.) 30 December 2004 See the abstract; paragraphs [252]-[270]; figure 5.	1-14

 Further documents are listed in the continuation of Box C. See patent family annex.

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2010-0195566 A1	05.08.2010	US 2011-0149868 A1	23.06.2011
		US 2011-0149903 A1	23.06.2011
		US 7940740 B2	10.05.2011
US 6654609 B2	25.11.2003	JP 2001-189958 A	10.07.2001
		JP 3733287 B2	11.01.2006
		KR 10-0329644 B1	21.03.2002
		KR 10-2001-0053883 A	02.07.2001
		US 2001-0041570 A1	15.11.2001
US 2004-0266457 A1	30.12.2004	AU 2001-66674 A1	17.12.2001
		CA 2265875 A1	12.03.1998
		CA 2265875 C	16.01.2007
		GB 2337386 A	17.11.1999
		GB 2354129 A	14.03.2001
		GB 2354387 A	21.03.2001
		GB 2384952 A	06.08.2003
		GB 2405292 A	23.02.2005
		US 2001-0022558 A1	20.09.2001
		US 2003-0146871 A1	07.08.2003
		US 2003-0222819 A1	04.12.2003
		US 2003-0222820 A1	04.12.2003
		US 2004-0198386 A1	07.10.2004
		US 2006-0025158 A1	02.02.2006
		US 2006-0276201 A1	07.12.2006
		US 2007-0287473 A1	13.12.2007
		US 2008-0113672 A1	15.05.2008
		US 2008-0133126 A1	05.06.2008
		US 2008-0167049 A1	10.07.2008
		US 2010-0234045 A1	16.09.2010
		US 6236365 B1	22.05.2001
		US 6249252 B1	19.06.2001
		US 6952181 B2	04.10.2005
		US 7274332 B1	25.09.2007
		US 7298327 B2	20.11.2007
		US 7525484 B2	28.04.2009
		US 7714778 B2	11.05.2010
		US 7764231 B1	27.07.2010
		US 7812766 B2	12.10.2010
		US 7903029 B2	08.03.2011
		US 8032153 B2	04.10.2011
		US 8082096 B2	20.12.2011
		US 8135413 B2	13.03.2012
WO 01-95642 A2	13.12.2001		
WO 01-95642 A3	13.12.2001		
WO 98-10307 A1	12.03.1998		
WO 98-10538 A1	12.03.1998		