



- (51) International Patent Classification:
G01S 19/33 (2010.01)
- (21) International Application Number:
PCT/KR2012/000260
- (22) International Filing Date:
11 January 2012 (11.01.2012)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
10-2011-0009572 31 January 2011 (31.01.2011) KR
- (71) Applicant (for all designated States except US):
AGENCY FOR DEFENSE DEVELOPMENT [KR/KR];
Bugyuseong daero 488 beon gil, (Sunam dong 111) Yos-
eong, Daejeon 305-152 (KR).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **KIM, Cheonjoong**
[KR/KR]; 107-805, Hanareum Apt., Wolpyeong 2-dong,
Seo-gu, Daejeon 302-753 (KR). **PARK, Heongwon**
[KR/KR]; 205-501, Beodeunae Apt., Taepyeong-dong,
Jung-gu, Daejeon 301-150 (KR). **KIM, Hyunseok**
[KR/KR]; 710-101, Banseok maeul 7 Danji Apt., Banseok-
dong, Yuseong-gu, Daejeon 305-750 (KR).
- (74) Agent: **WONJON P.C.**; 8th Floor, Poonglim Bldg., 124,
Teheran-ro, Yeoksam-dong, Gangnam-gu, Seoul 135-784
(KR).

- (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, 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, QA, RO, RS, RU, RW, 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, RW, 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).

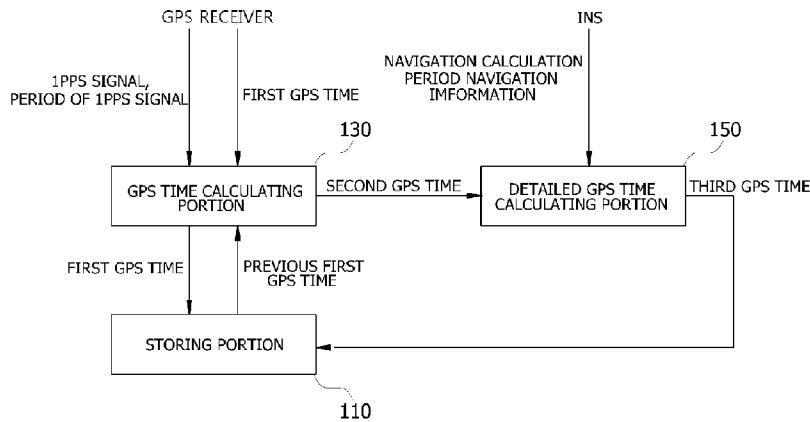
Published:

- 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))

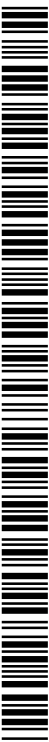
- (88) Date of publication of the international search report:
1 November 2012

(54) Title: APPARATUS AND METHOD FOR GENERATING GPS TIME

[Fig. 1]



(57) Abstract: Disclosed therein is an apparatus for generating a GPS (Global Positioning System) time that includes: a storing portion for storing a first GPS time corresponding to a 1PPS (Pulse Per Second) signal generated from a GPS receiver for synchronization with an INS (Inertial Navigation System); and a GPS time calculating portion for, upon reception of the 1PPS signal from the GPS receiver, adding a previous first GPS time stored in the storing portion and a period of the 1PPS signal to compute a second GPS time, and storing the first GPS time corresponding to the received 1PPS signal in the storing portion, thereby generating an accurate GPS time at a generation point of the 1PPS signal.



A. CLASSIFICATION OF SUBJECT MATTER*G01S 19/33(2010.01)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)

G01S 19/33; H04B 7/26; H04L 7/00; H04B 17/00; G01S 19/01; H04W 56/00; H04L 7/02; G01S 19/13; H04B 7/04

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: GPS, navigation, time, synchronization

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KR 10-0636385 B1 (ELECTRONICS AND TELECOMMUNICATIONS RESEARCH INSTITUTE) 19 October 2006	1,2,9,10,13
A	See abstract, fig. 2, and claims 1-7.	3-8,11,12
A	KR 10-2004-0106981 A (CHO, YONG BEOM) 20 December 2004 See abstract, fig. 5, and claims 1-3.	1-13
A	KR 10-2008-0051307 A (ELECTRONICS AND TELECOMMUNICATIONS RESEARCH INSTITUTE) 11 June 2008 See abstract, fig. 2, and claims 1-10.	1-13
A	KR 10-2008-0090125 A (SAMSUNG ELECTRONICS CO., LTD.) 8 October 2008 See abstract, fig. 1, and claims 1-14.	1-13

 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

22 AUGUST 2012 (22.08.2012)

Date of mailing of the international search report

05 SEPTEMBER 2012 (05.09.2012)

Name and mailing address of the ISA/KR

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

Facsimile No. 82-42-472-7140

Authorized officer

YU, Jin Tae

Telephone No. 82-42-481-8542



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2012/000260

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

- 1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

- 2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

- 3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

- Group I, claims 1-5 and 9-13 are directed to an apparatus, a method, and a computer-readable record medium for generating a GPS time.
- Group II, claims 6 and 7 are directed to an apparatus for time-synchronizing the navigation information.
- Group III, claim 8 is directed to a system for evaluating an integrated navigation system.

- 1. As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
- 2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
- 3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

- 4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR2012/000260

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
KR 10-0636385 B1	19.10.2006	None	
KR 10-2004-0106981 A	20.12.2004	None	
KR 10-2008-0051307 A	11.06.2008	None	
KR 10-2008-0090125 A	08.10.2008	US 2009-0168808 A1 US 7876790 B2	02.07.2009 25.01.2011