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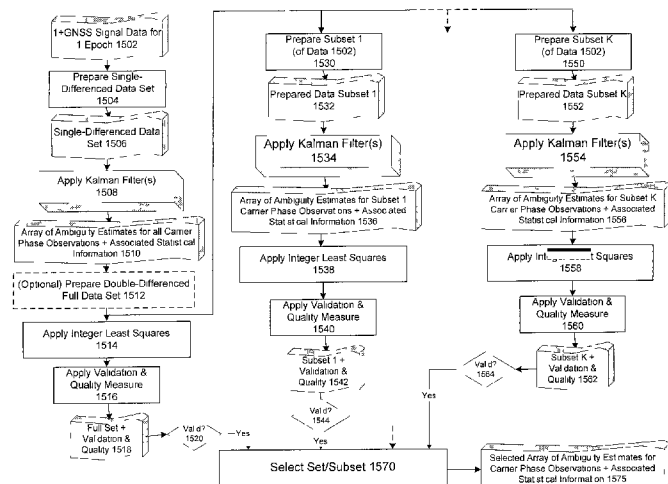
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(54) **Title:** GNSS SIGNAL PROCESSING WITH PARTIAL FIXING OF AMBIGUITIES



(57) **Abstract:** Three new methods are presented to improve floating solutions and ambiguity resolution for multiple global satellite navigation systems (GNSS), one of which may be an FDMA-based GNSS such as GLONASS: (1) modeling of the hardware-related differential clock error between two (or more) different GNSS, (2) modeling the frequency-dependent biases present in frequency-division multiple access (FDMA) GNSS, and (3) an ambiguity resolution method called Scoreboard Partial Fixing (SPF). The methods presented are independent of the number of carrier frequencies tracked for each satellite navigation system. Their application results in quicker and more reliable ambiguity resolution. The benefits of combining observations of multiple GNSS are exploited in a very efficient way, in contrast to known algorithms which often result in degraded performance with multiple GNSS. The frequency-dependent bias method has been found effective with GNSS observations from a combination of substantially dissimilar hardware, e.g., for processing signals from GNSS receivers of different manufacturers.

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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER
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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

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal , WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 753 810 B1 (YANG YUNCHUN [US] ET AL) 22 June 2004 (2004-06-22) column 9 , lines 9-30; figure 2 column 11, lines 28-51; figure 3 -----	1-7,9, 13-21, 23,27-29
X	HATCH R R : "Instantaneous ambiguity resolution" KINEMATIC SYSTEMS IN GEODESY, SURVEYING, AND REMOTE SENSING,, 1 September 1990 (1990-09-01), pages 299-308, XP009099995 the whole document ----- -/--	1-7,9, 13-21, 23,27-29

Further documents are listed in the continuation of Box C.

See patent family annex.

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication where appropriate, of the relevant passages	Relevant to claim No
X	<p>US 5 825 326 A (SEMLER JAMES RUSSELL [US] ET AL) 20 October 1998 (1998-10-20)</p> <p>column 18, line 33 - column 27, line 24; claim 2; figure IA</p> <p align="center">-----</p>	<p>1-7,9, 13-21, 23,27-29</p>
A	<p>WALSH D ET AL: "GPS AND GLONASS CARRIER PHASE AMBIGUITY RESOLUTION" PROCEEDINGS OF THE INSTITUTE OF NAVIGATION (ION) GPS, XX, XX, 17 September 1996 (1996-09-17), pages 899-907, XP009008432 the whole document</p> <p align="center">-----</p>	<p>1-29</p>

INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6753810	B1	22-06-2004	NONE
US 5825326	A	20-10-1998	NONE