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[Continued on next page]

(54) Title: SYSTEMS AND METHODS FOR IP AND VOIP DEVICE LOCATION DETERMINATION

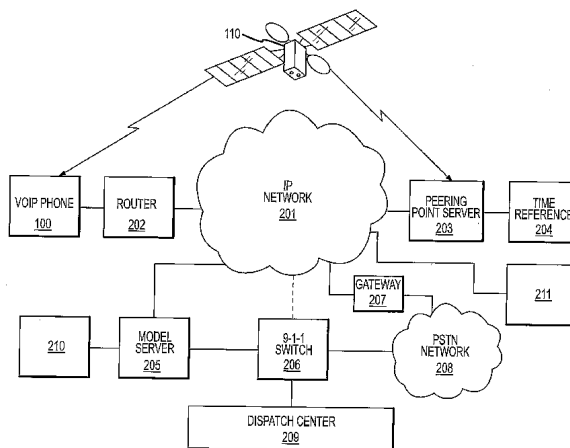


FIG.2

(57) Abstract: A method and system for precise position determination of general Internet Protocol (IP) network-connected devices. A method enables use of remote intelligence located at strategic network points to distribute relevant assistance data to IP devices with embedded receivers. Assistance is tailored to provide physical timing, frequency and real time signal status data using general broadband communication protocols. Relevant assistance data enables several complementary forms of signal processing gain critical to acquire and measure weakened or distorted in-building Global Navigation Satellite Services (GNSS) signals and to ultimately extract corresponding pseudo-range time components. A method to assemble sets of GNSS measurements that are observed over long periods of time while using standard satellite navigation methods, and once compiled, convert using standard methods each pseudo-range into usable path distances used to calculate a precise geographic position to a known degree of accuracy.



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## INTERNATIONAL SEARCH REPORT

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<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC(8) - H04M 11/04 (2007.10) USPC - 455/404.2 According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) IPC(8) - H04M 11/04 (2007.10) USPC - 455/404.2 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 practicable, search terms used) Database: MicroPatent		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X --- Y	US 2005/0014482 A1 (HOLLAND et al) 20 January 2005 (20.01.2005) entire document	1-35, 37-64, 80-87, 89-98, 101 ----- 36, 88, 99, 100
Y	US 6,084,547 A (SANDERFORD et al) 4 July 2000 (04.07.2000) entire document	36, 88, 99, 100
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/>		
* 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 12 October 2007		Date of mailing of the international search report <b>07 JAN 2008</b>
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201		Authorized officer: Blaine R. Copenheaver PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

**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:

See Extra Sheet (page 10)

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 additional fees, this Authority did not invite payment of additional fees.
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.:  
1- 64, 80-101

**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.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claims 1- 64 and 80-101, drawn to a method, system and apparatus for determining position of a device connected to a network relative to a fixed coordinate system.

Group II, claims 65-68 and 78, drawn to a method of determining and verifying a position of a device attached to a computer network.

Group III, claims 69-71, drawn to a method of selecting a process of determining the position of a device connected to a computer network relative to a fixed coordinate system.

Group IV, claims 72-77, drawn to a method of presenting a located call from an IP device connected to an IP network to an emergency services dispatch center.

Group V, claim 79, drawn to a method for determining position of a first device connected to a network relative to a fixed coordinate system.

Group VI, claims 102-104, drawn to an apparatus and method for use in determining position of a device connected to a network using signals from a satellite-based positioning system.

Group VII, claims 105 and 106, drawn to a method, system and apparatus for determining position of a device connected to an asynchronous network relative to a fixed coordinate system.

The inventions listed as Groups I through VII do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: the special technical feature of the Group I invention is to calibrate time/frequency reference(s) of the device to time/frequency reference(s) of a positioning system as claimed therein, is not present in the invention of Groups II-VII; the special technical feature of the Group II invention is gathering a first set of information regarding attachment of a device to a network indicative of an attachment to a network at a determined position and calculating a position of the device based at least in part on an at least one signal received by the device from a positioning system as claimed therein, is not present in the invention of Groups I and III-VII; the special technical feature of the Group III invention is selecting between, based on a quality level of signals from a positioning system, a first process where a time reference of the positioning system is obtained over a computer network and a second process where the time reference of the positioning system is obtained from the positioning system as claimed therein is not present in the invention of Groups I, II and IV - VII; the special technical feature of the Group IV invention is transmitting a location of an IP device - connected to an emergency services network attached to a public-switched-telephone-network (PSTN) - from the emergency services network to an emergency services dispatch center as claimed therein, is not present in the invention of Groups I-III and V - VII; the special technical feature of the Group V invention is estimating position of the first device relative to a fixed coordinate system based at least in part on a first at least one signal received from a positioning system at the first device and a second at least one signal received from the positioning system at a second device as claimed therein, is not present in the invention of Groups I-IV and VI-VII; the special technical feature of the Group VI invention is combinatively using first information derived from a first signal and second information derived from a second signal to determine a position of a device free from any determination of a position of a device based on signals from a satellite-based positioning system at a first time or a position of a device based on signals from a satellite-based positioning system at a second time as claimed therein is not present in the invention of Groups I-V and VII; and the special technical feature of the Group VII invention is a structure for receiving a first set of information across an asynchronous network corresponding to a plurality of signals received at the device from a satellite based positioning system as claimed therein, is not present in the invention of Groups I-VI.

Since none of the special technical features of the Group I through VII inventions is found in more than one of the inventions, unity of invention is lacking.