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(12) **United States Patent**
Schmidt

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(54) **LOCAL POSITIONING SYSTEM**

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(52) **U.S. Cl.** **342/357.14**; 342/463; 342/464

(58) **Field of Classification Search** 342/357.14, 342/357.1, 450, 457, 463, 464
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,032,247 A * 2/2000 Asghar et al. 712/35
6,246,376 B1 * 6/2001 Bork et al. 342/357.13
6,313,787 B1 * 11/2001 King et al. 342/357.1
6,329,948 B1 * 12/2001 Ishikawa 342/357.14
6,424,297 B2 * 7/2002 Tamura et al. 342/357.14
6,768,909 B1 * 7/2004 Irvin 455/456.1
2002/0019698 A1 * 2/2002 Vilppula et al. 342/357.08
2002/0025828 A1 * 2/2002 Turetzky et al. 455/456
2003/0005214 A1 * 1/2003 Chan 711/104
2003/0078037 A1 * 4/2003 Auckland et al. 455/422
2003/0085837 A1 * 5/2003 Abraham 342/357.15

OTHER PUBLICATIONS

M.V. Clark et al., Outdoor IEEE 802.11 cellular networks: radio link performance, IEEE International Conference on Communications, vol. 1, p. 512-516, Apr./May 2002.*
IEEE Std 802.11, 1999 Edition, Part 11: Wireless LAN Medium Access Control (MAC) and Physical Layer (PHY) Specifications p. 1 and 148, 1999.*
A. Ward, Getting Connected (Global Networking), Communicate, Sep. 2001.*

* cited by examiner

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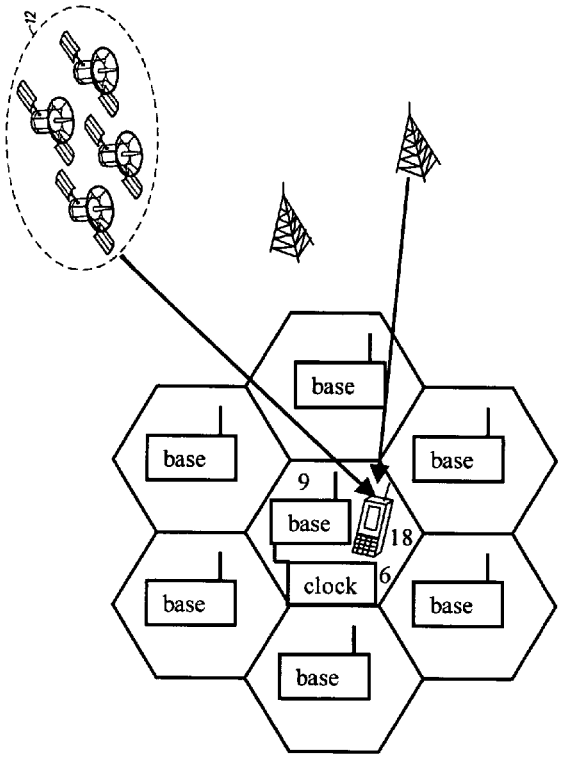
(57) **ABSTRACT**

A method to determine position of a user includes sniffing for one or more earth-based media; and if the one or more earth-based media exists, using an earth-based positioning system (PS) receiver associated with one of the media and otherwise using a satellite-based PS receiver.

19 Claims, 6 Drawing Sheets