

(54) **METHODS AND APPARATUS FOR RANDOM ACCESS IN MULTI-CARRIER COMMUNICATION SYSTEMS**

(58) **Field of Classification Search**
USPC 370/342
See application file for complete search history.

(75) Inventors: **Xiaodong Li**, Kirkland, WA (US); **Titus Lo**, Bellevue, WA (US); **Kemin Li**, Bellevue, WA (US); **Haiming Huang**, Bellevue, WA (US)

(56) **References Cited**

(73) Assignee: **Neocific, Inc.**, Bellevue, WA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 149 days.

This patent is subject to a terminal disclaimer.

U.S. PATENT DOCUMENTS

4,977,593	A	12/1990	Ballance et al.	
5,991,308	A	11/1999	Fuhrmann et al.	
6,519,449	B1	2/2003	Zhang et al.	
7,995,967	B2	8/2011	Li et al.	
2010/0111017	A1*	5/2010	Um et al.	370/329

FOREIGN PATENT DOCUMENTS

KR	20050015119	A	2/2005	
KR	100585233	B1	5/2006	
KR	20060055636	A	5/2006	

OTHER PUBLICATIONS

International Search Report and Written Opinion; International Patent Application No. PCT/US05/08169; Filed Mar. 9, 2005; Applicant: Waltical Solutions, Inc.; Mailed Jun. 9, 2005; 9 pages.

(21) Appl. No.: **13/205,579**

(22) Filed: **Aug. 8, 2011**

(65) **Prior Publication Data**

US 2011/0292881 A1 Dec. 1, 2011

Related U.S. Application Data

(63) Continuation of application No. 10/583,158, filed as application No. PCT/US2005/008169 on Mar. 9, 2005, now Pat. No. 7,995,967.

(60) Provisional application No. 60/551,589, filed on Mar. 9, 2004.

(51) **Int. Cl.**
H04Q 7/216 (2006.01)

(52) **U.S. Cl.**
USPC 370/342; 370/329

* cited by examiner

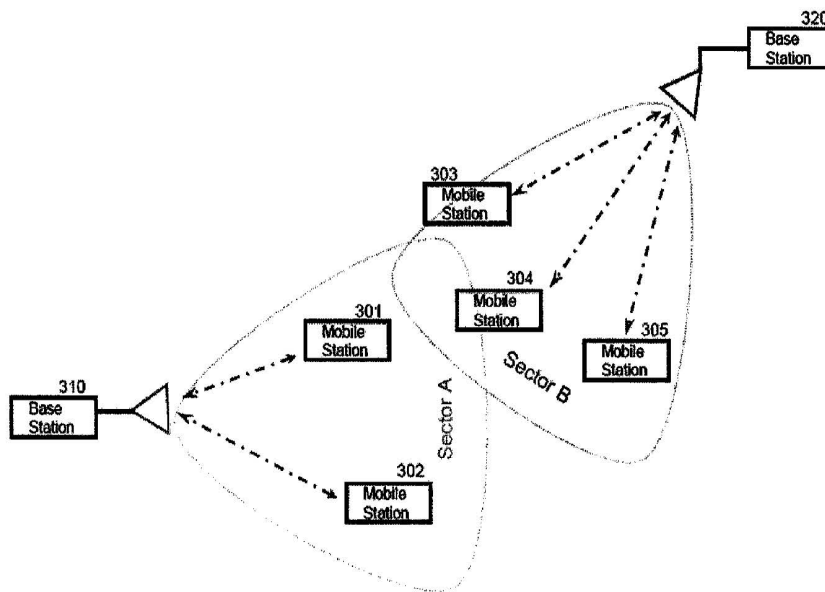
Primary Examiner — Ajibola Akinyemi

(74) *Attorney, Agent, or Firm* — Perkins Coie LLP

(57) **ABSTRACT**

Methods and apparatus in a multi-carrier cellular wireless network with random access improve receiving reliability and reduce interference of uplink signals of a random access, while improving the detection performance of a base station receiver by employing specifically configured ranging signals.

24 Claims, 8 Drawing Sheets



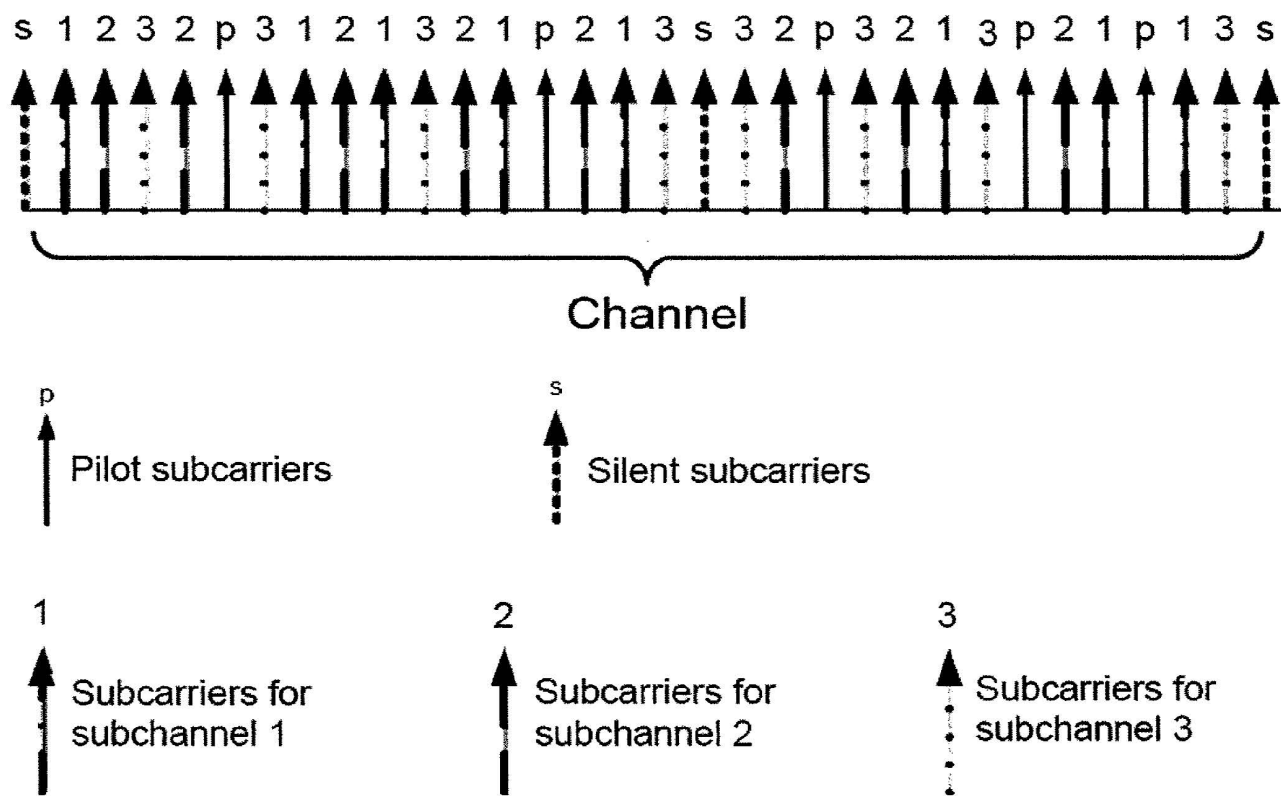


FIG. 1

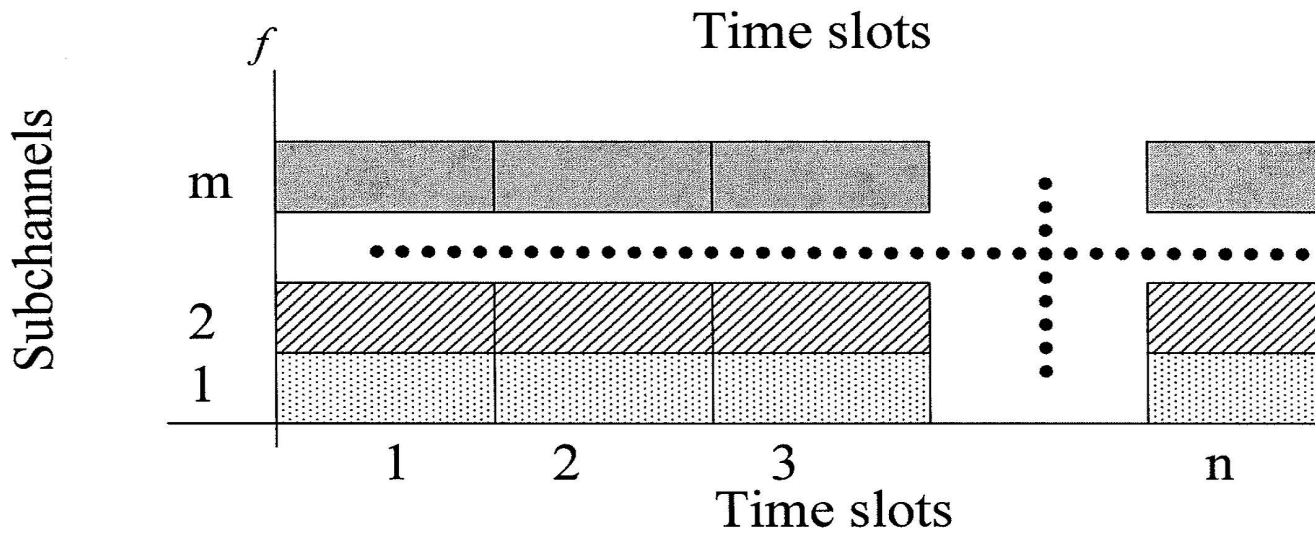


FIG. 2

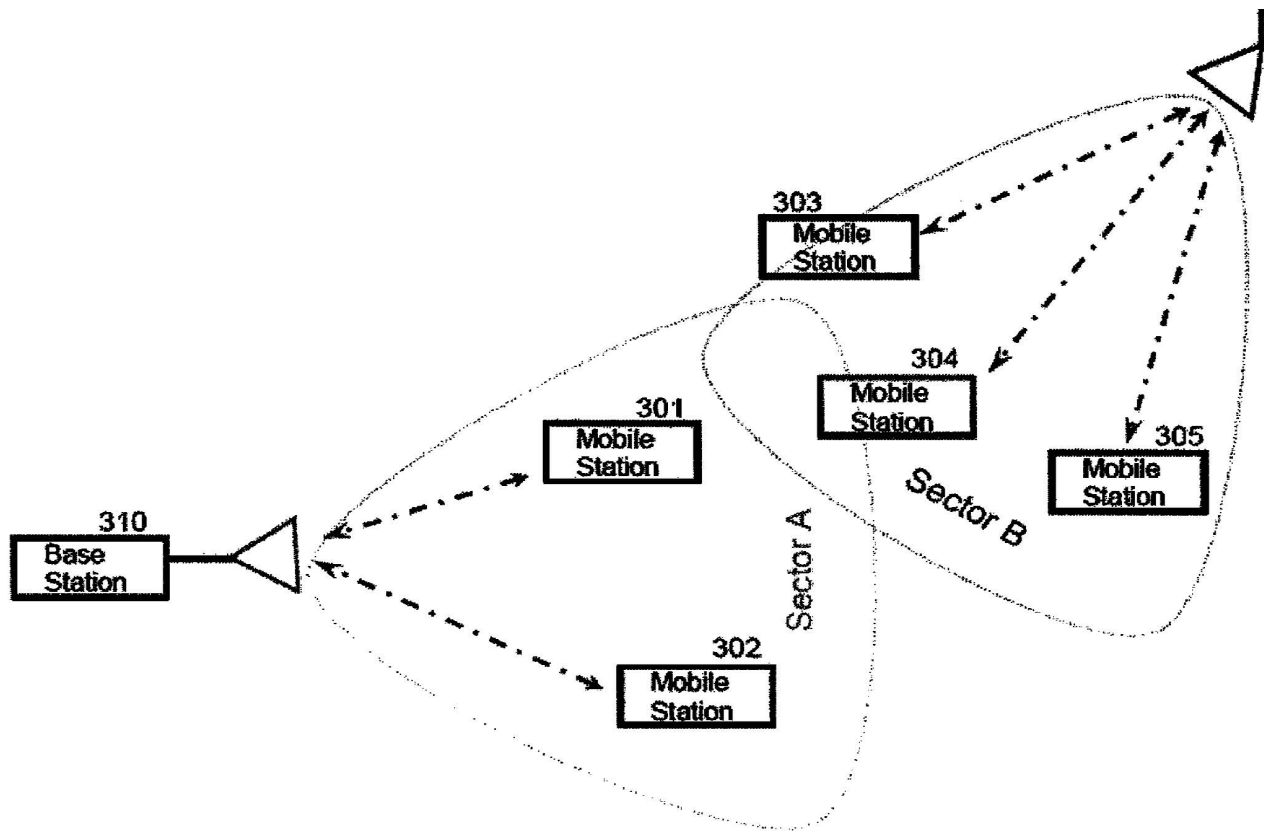


FIG. 3

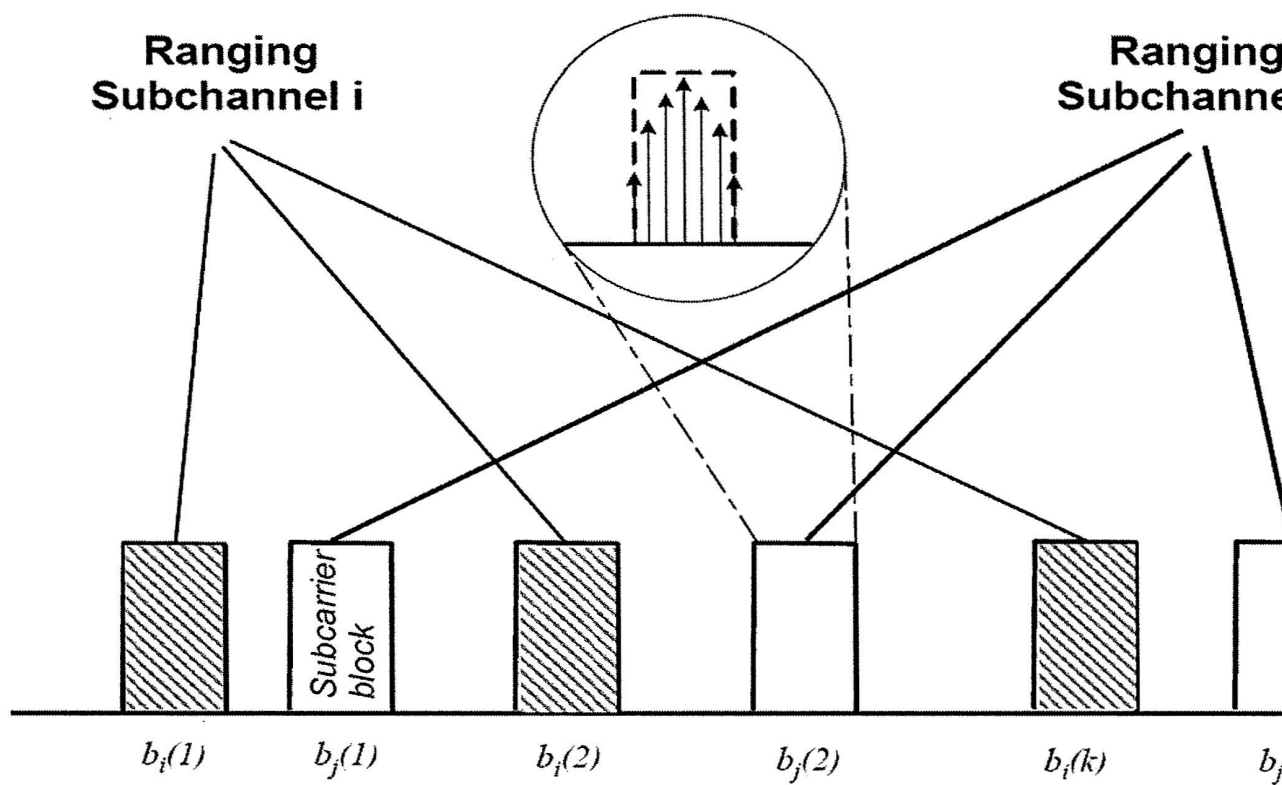


FIG. 4

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts



Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research



With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips



Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS

Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS

Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS

Sync your system to PACER to automate legal marketing.