

EXHIBIT A



US007502791B2

(12) **United States Patent**
Sjøgren et al.

(10) **Patent No.:** **US 7,502,791 B2**
(45) **Date of Patent:** **Mar. 10, 2009**

(54) **DATABASE CONSTRAINT ENFORCER**

(75) Inventors: **Bjørn-Harald Sjøgren**, Ski (NO);
Jan-Thore Bjørnemyr, Hamar (NO)

(73) Assignee: **Norsync Technology A/S**, Oslo (NO)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 204 days.

(21) Appl. No.: **10/720,262**

(22) Filed: **Nov. 25, 2003**

(65) **Prior Publication Data**

US 2004/0107200 A1 Jun. 3, 2004

Related U.S. Application Data

(60) Provisional application No. 60/428,937, filed on Nov. 26, 2002.

(51) **Int. Cl.**
G06F 17/30 (2006.01)

(52) **U.S. Cl.** **707/8; 707/2; 707/3; 707/9**

(58) **Field of Classification Search** **707/8, 707/9, 2, 3**

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,933,848	A *	6/1990	Haderle et al.	707/201
4,947,320	A *	8/1990	Crus et al.	707/201
5,386,557	A *	1/1995	Boykin et al.	707/1
5,408,657	A *	4/1995	Bigelow et al.	707/100
5,706,494	A *	1/1998	Cochrane et al.	707/2
5,899,993	A *	5/1999	Jenkins, Jr.	707/9
6,047,285	A *	4/2000	Jacobs et al.	707/4
6,105,025	A *	8/2000	Jacobs et al.	707/8

6,453,314	B1 *	9/2002	Chan et al.	707/3
7,272,589	B1 *	9/2007	Guay et al.	707/2
2003/0140028	A1	7/2003	Sjøgren	

FOREIGN PATENT DOCUMENTS

EP 0351210 1/1990

OTHER PUBLICATIONS

“Referential Integrity Impementation Details and advantages” IBM, Technical Disclosure Bulletin, IBM Corp New York, Mar. 1, 1995, pp. 477-487.

Date C.J. “referential Integrity” Conference on Very Large Databases, Cannes, Sep. 9-11, 1981 IEEE US vol CONF 7 pp. 2-12 XP00745022.

EP search report, listing above, dated Sep. 6, 2004.

* cited by examiner

Primary Examiner—Tim T Vo

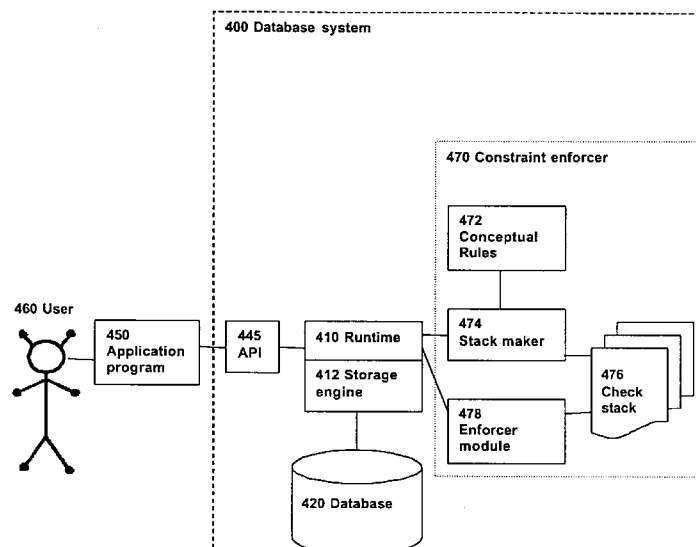
Assistant Examiner—Mahesh H Dwivedi

(74) *Attorney, Agent, or Firm*—Birch, Stewart, Kolasch & Birch, LLP

(57) **ABSTRACT**

A transaction based constraint enforcer for a database system is arranged to delay constraint checks until the end of a transaction by creating a check stack during the course of the transaction and executing entries on the check stack at the end of the transaction. A stack maker module is arranged for creating and updating said check stack. The stack maker module is operatively connected to a runtime module in the database system and arranged to receive data from said runtime module. An enforcer module is arranged to receive check data from the check stack, to process the check data received from the check stack, and to provide resulting data to the runtime module. The invention also relates to a method for enforcing a set of constraints that governs the integrity of information stored in a database system, and a database system which includes the constraint enforcer.

12 Claims, 4 Drawing Sheets



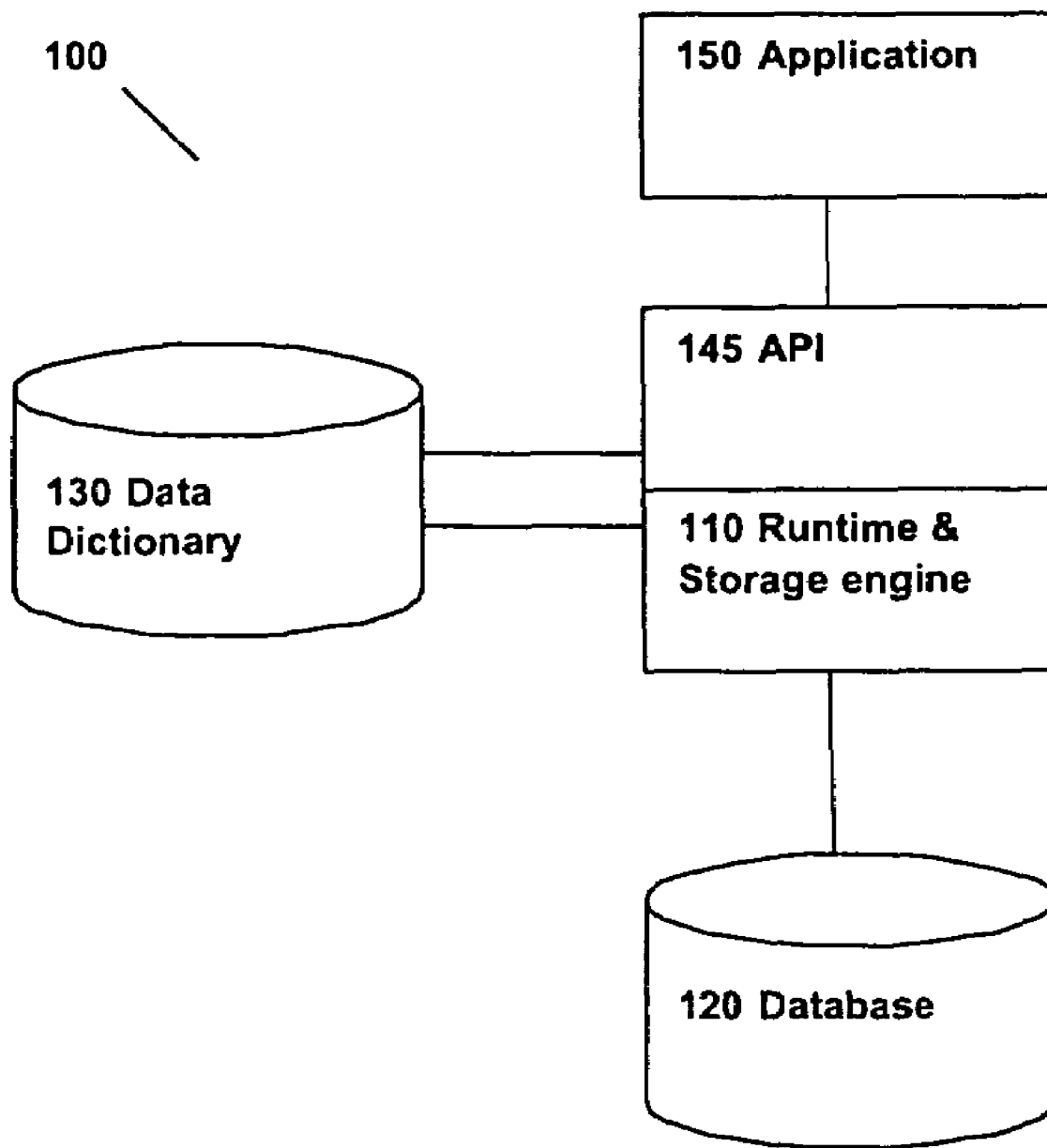


Fig. 1

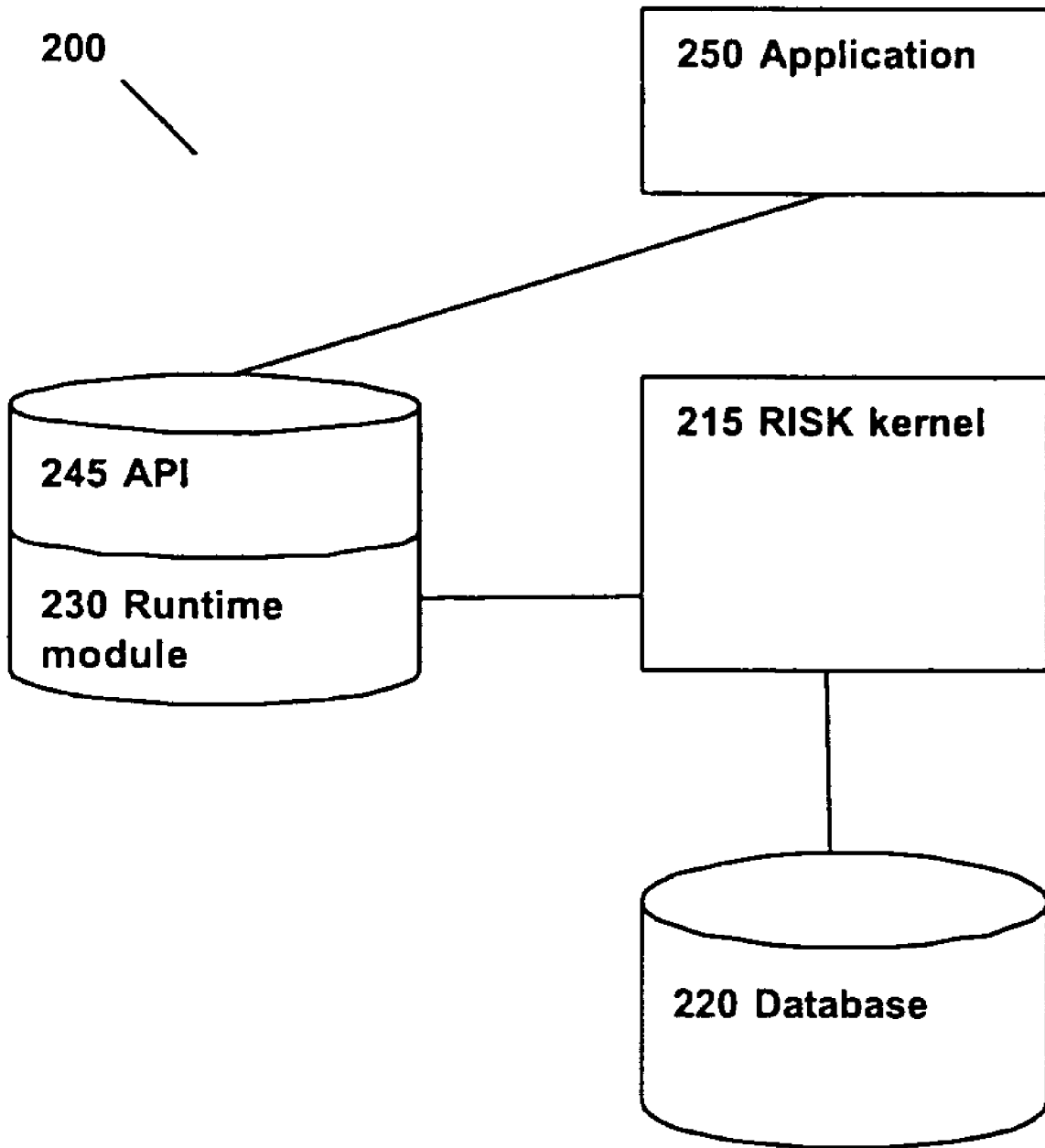


Fig. 2

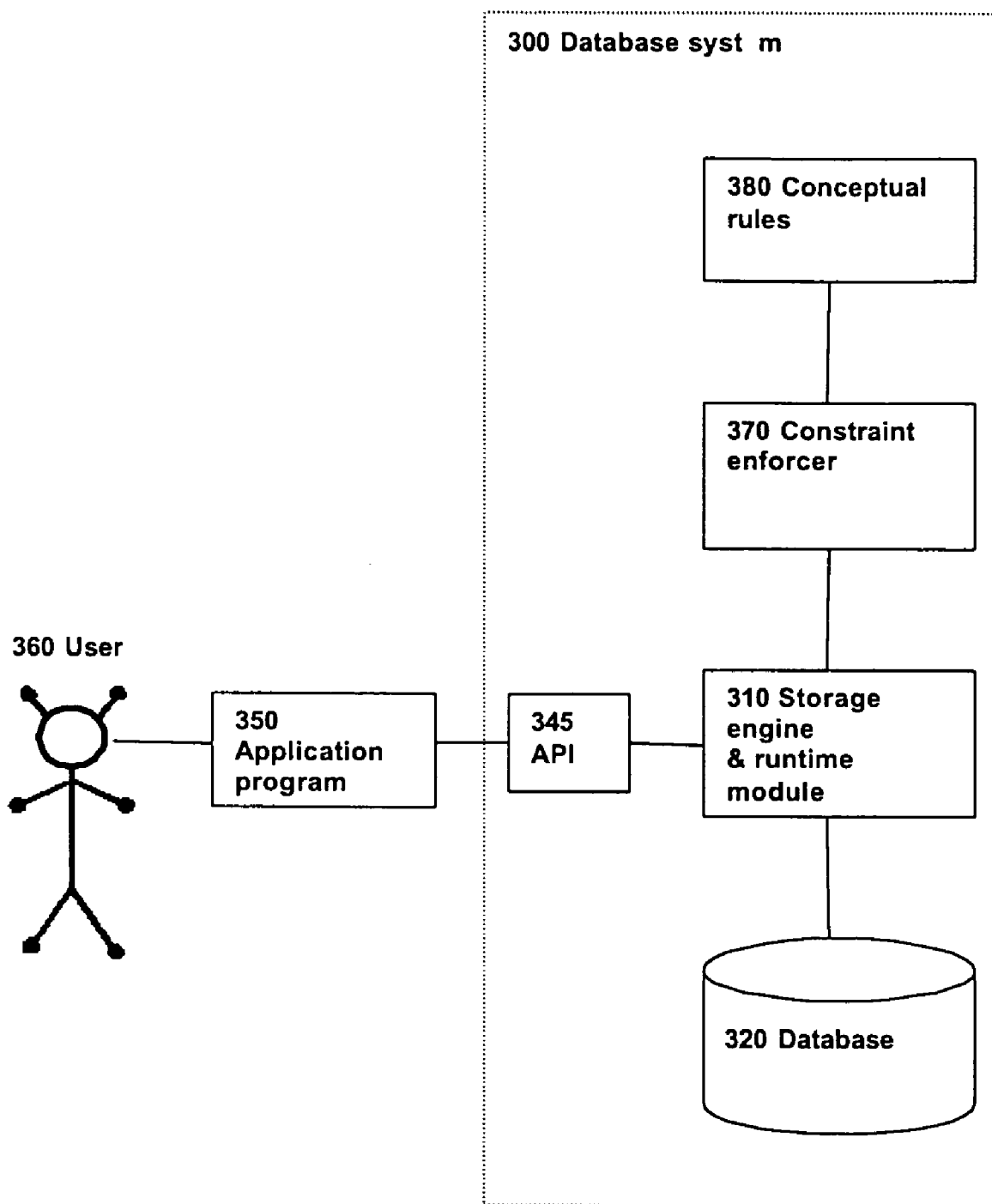


Fig. 3

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.