

EXHIBIT A



US006363377B1

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

(10) **Patent No.:** **US 6,363,377 B1**
(45) **Date of Patent:** **Mar. 26, 2002**

(54) **SEARCH DATA PROCESSOR**

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(73) Assignee: **Sarnoff Corporation**, Princeton, NJ (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/218,570**

(22) Filed: **Dec. 22, 1998**

Related U.S. Application Data

(60) Provisional application No. 60/094,694, filed on Jul. 30, 1998.

(51) **Int. Cl.**⁷ **G06F 17/30**

(52) **U.S. Cl.** **707/4; 707/5; 345/327**

(58) **Field of Search** **707/4, 5; 345/327**

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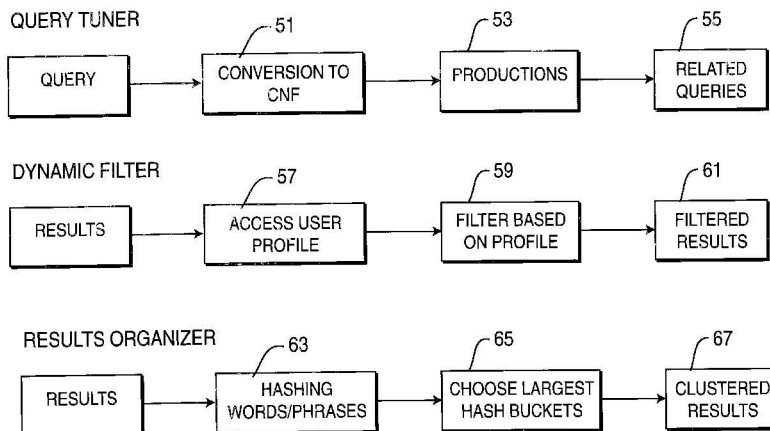
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(57) **ABSTRACT**

A tool to be used with a search engine for a information management system includes methods for refining, filtering, and organizing search queries and search results. A query tuner in the tool allows a user to automatically reformulate a query in order to find a reasonable number of matching documents from the search engine by selectively modifying individual search terms to be weaker or stronger and concurrently requesting a plurality of searches, each with a respectively different modified query. The tool also uses a dynamic filter which employs a dynamic set of record tokens to restrict the results of an arbitrary search query to selectively include or exclude records which correspond to the set of record tokens. The tool also includes a results organizer which aids the user in understanding and visualizing a large number of matching documents returned in response to a search query by clustering like items returned from the search. The query tuner, dynamic filter and results organizer may be used individually or in conjunction. The searched information management system may be consolidated or distributed and may span a global information network such as the Internet.

14 Claims, 11 Drawing Sheets



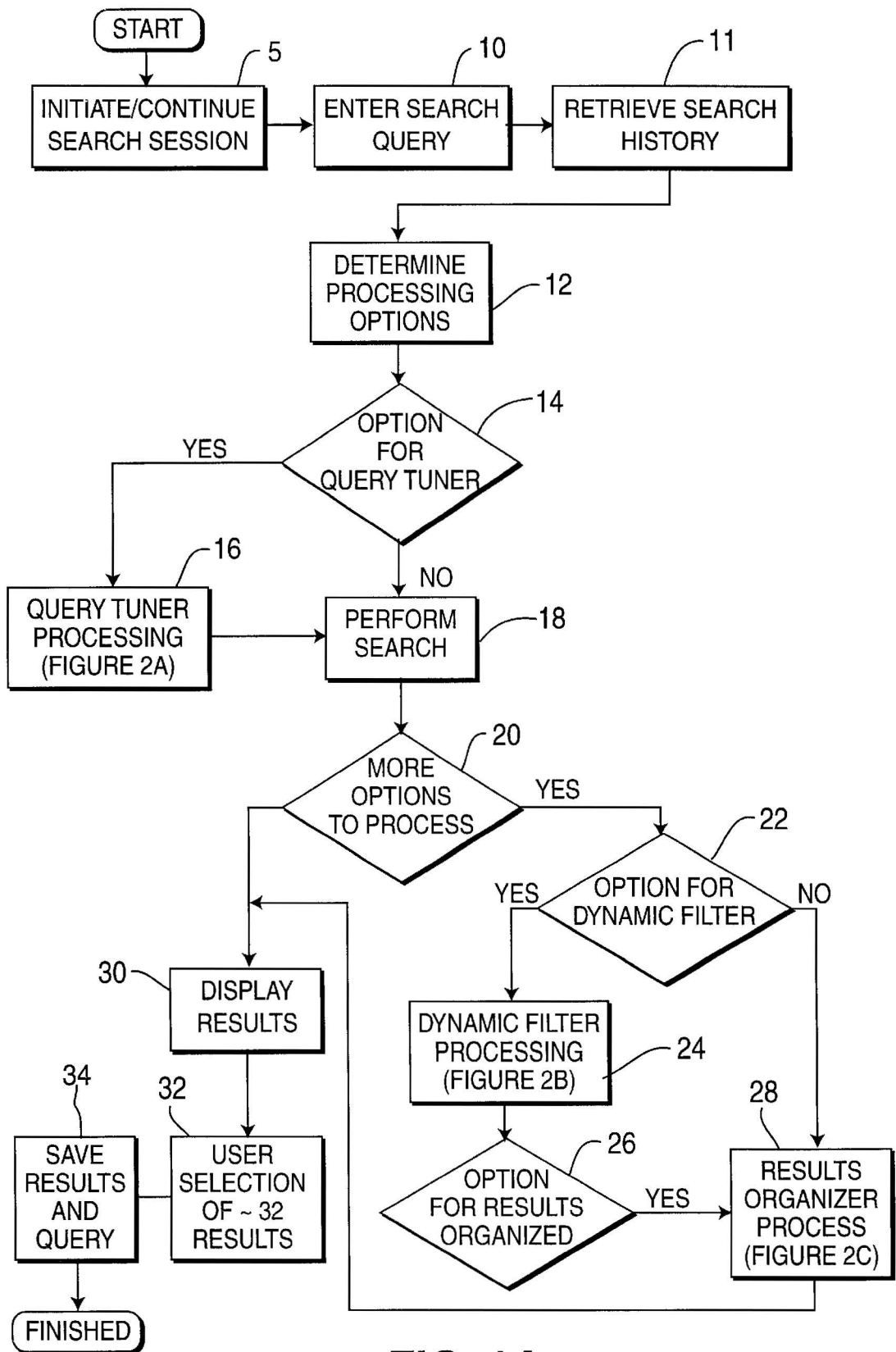


FIG. 1A

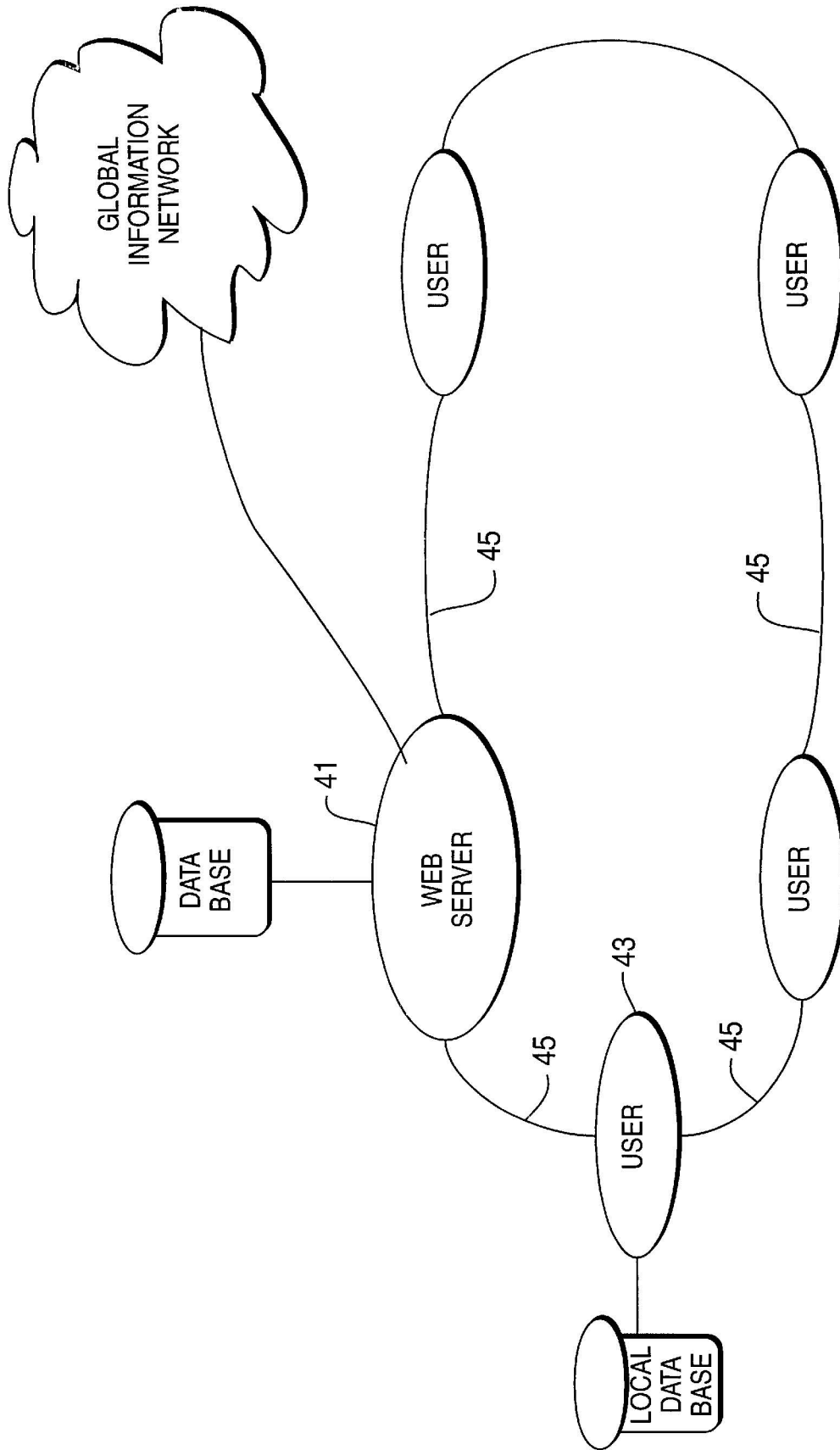


FIG. 1B

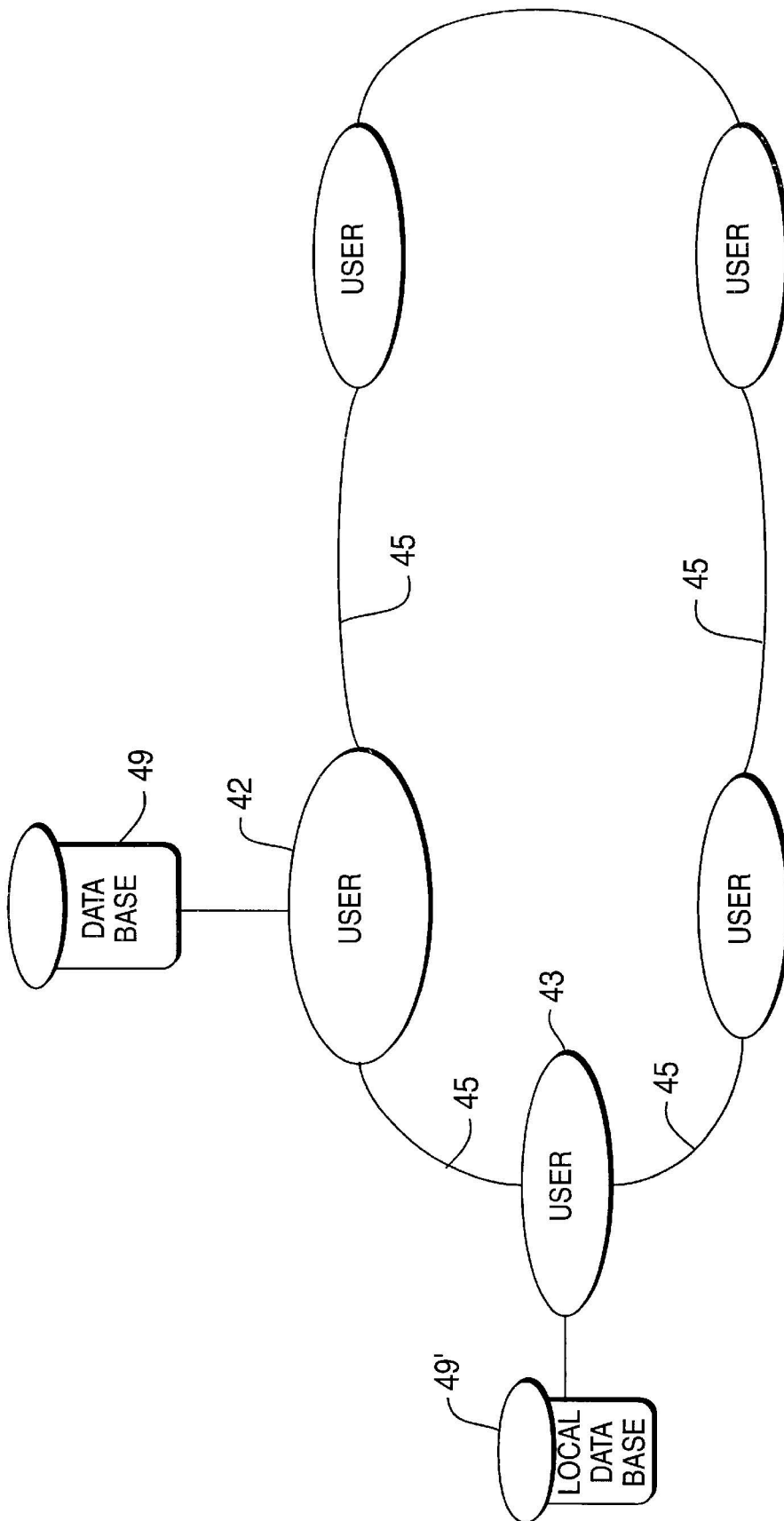


FIG. 1C

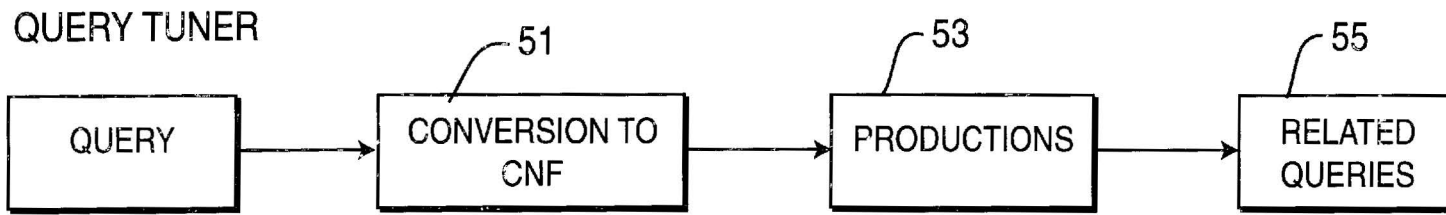


FIG. 2A

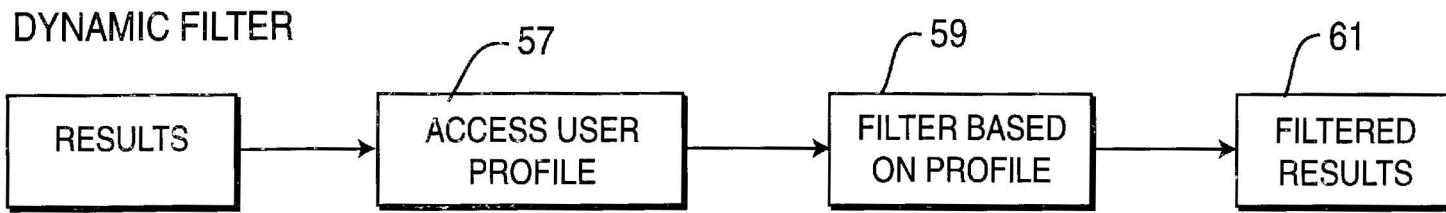


FIG. 2B

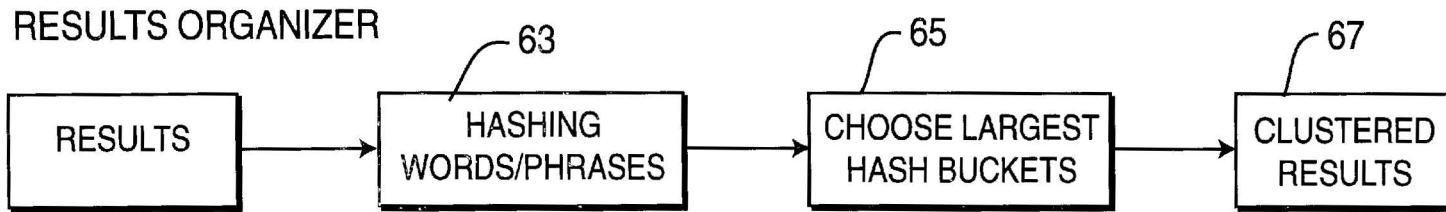


FIG. 2C

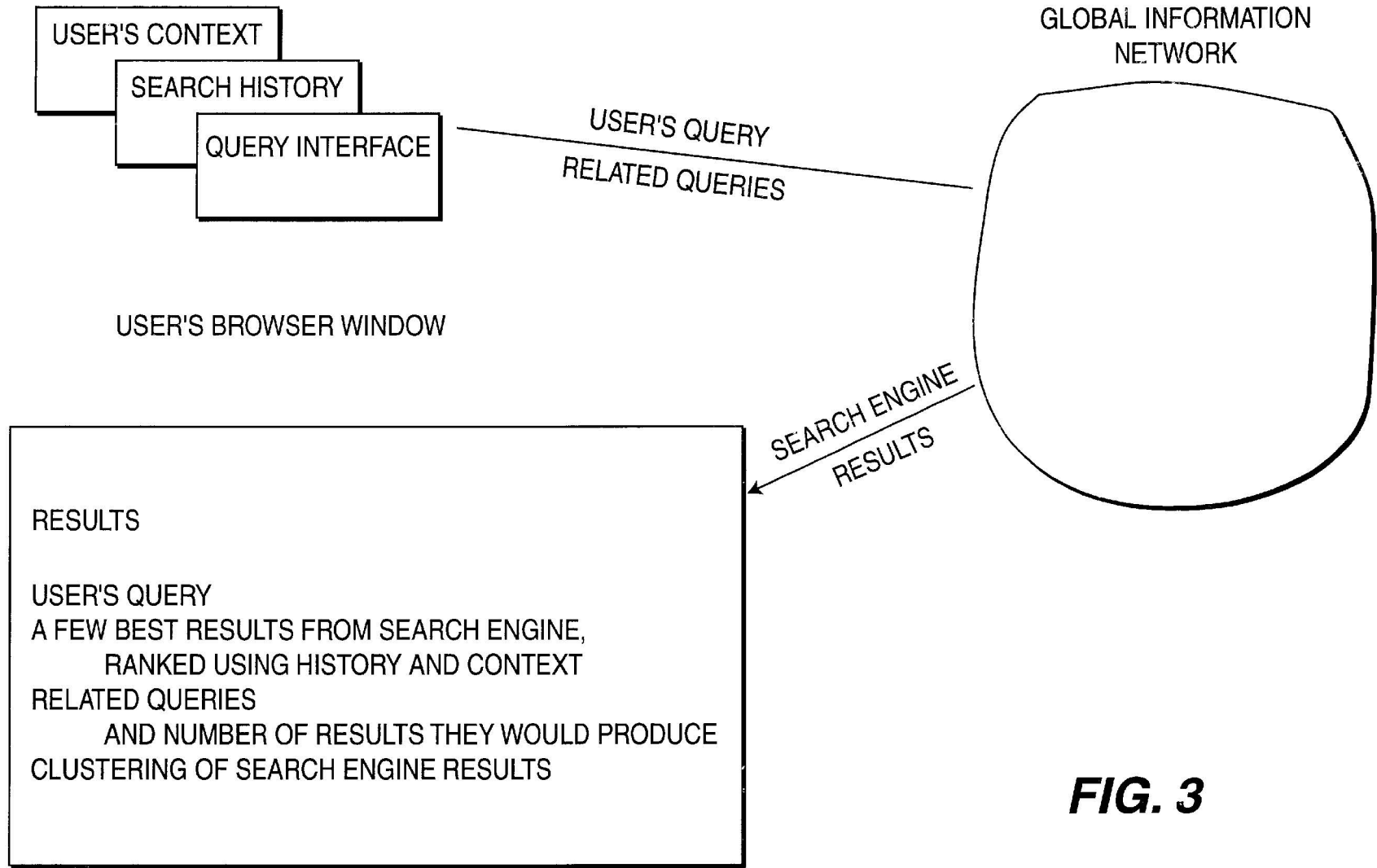


FIG. 3

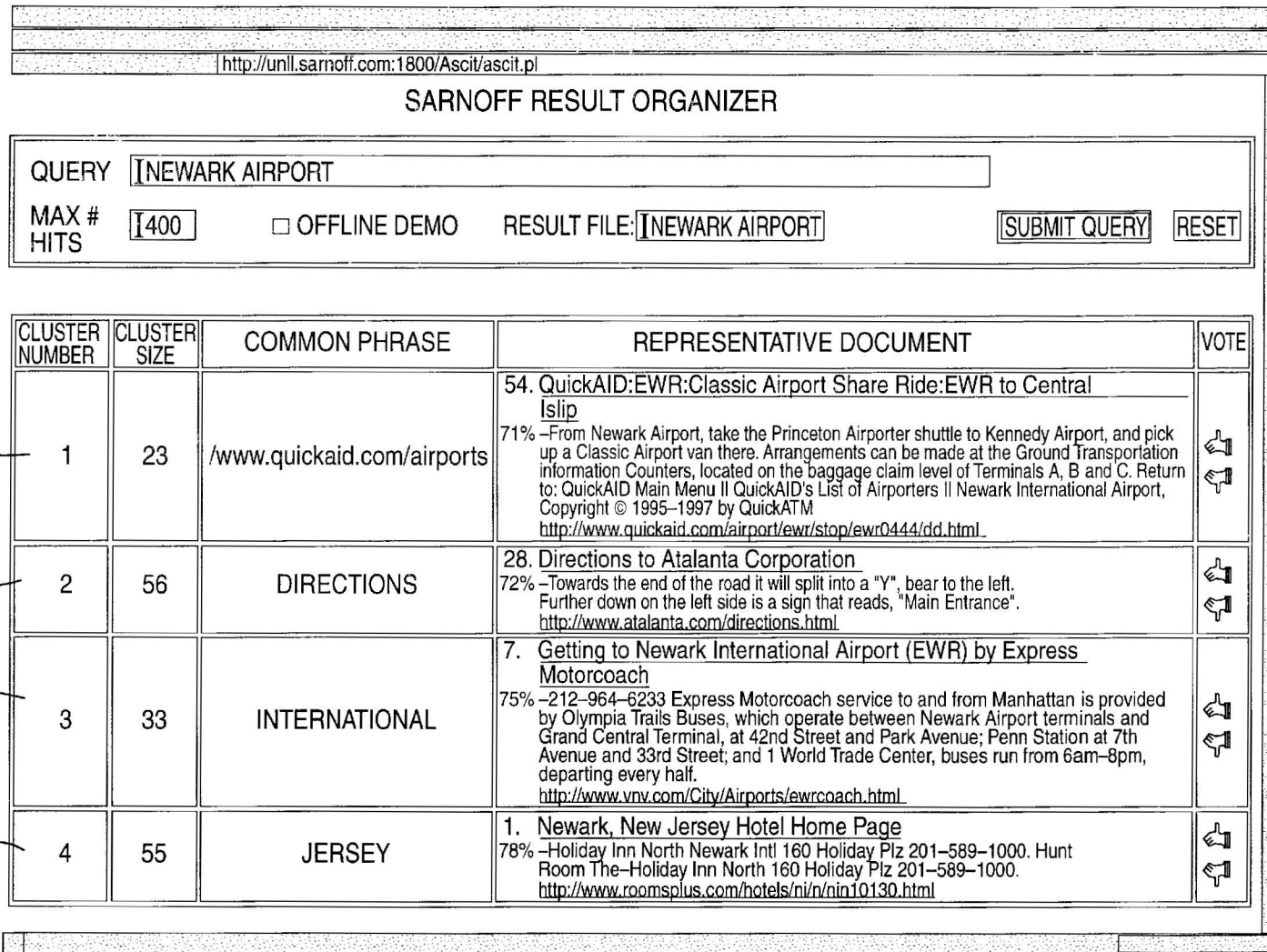


FIG. 4

A SAMPLE IMPLEMENTATION OF THE RESULTS ORGANIZER.

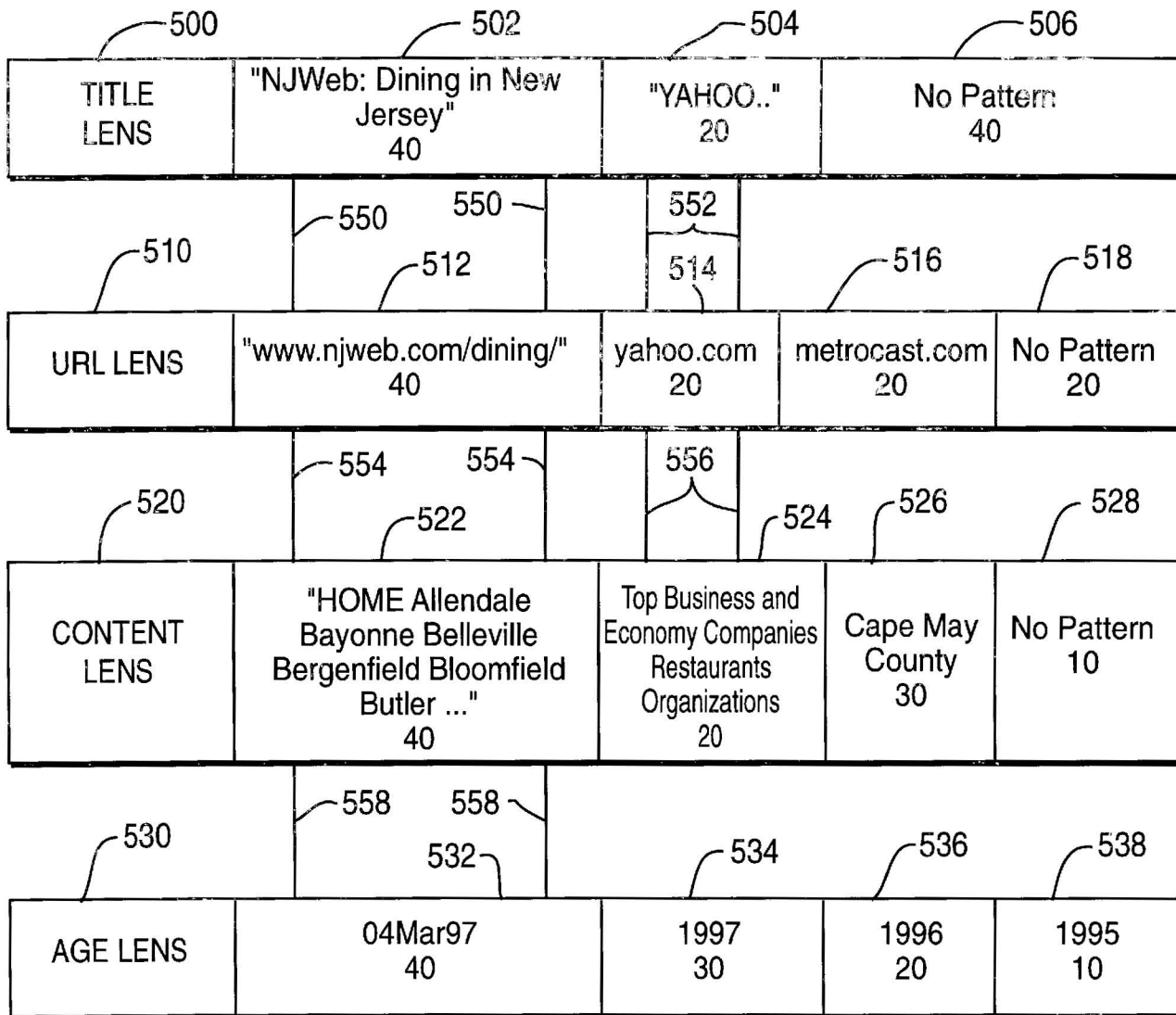


FIG. 5

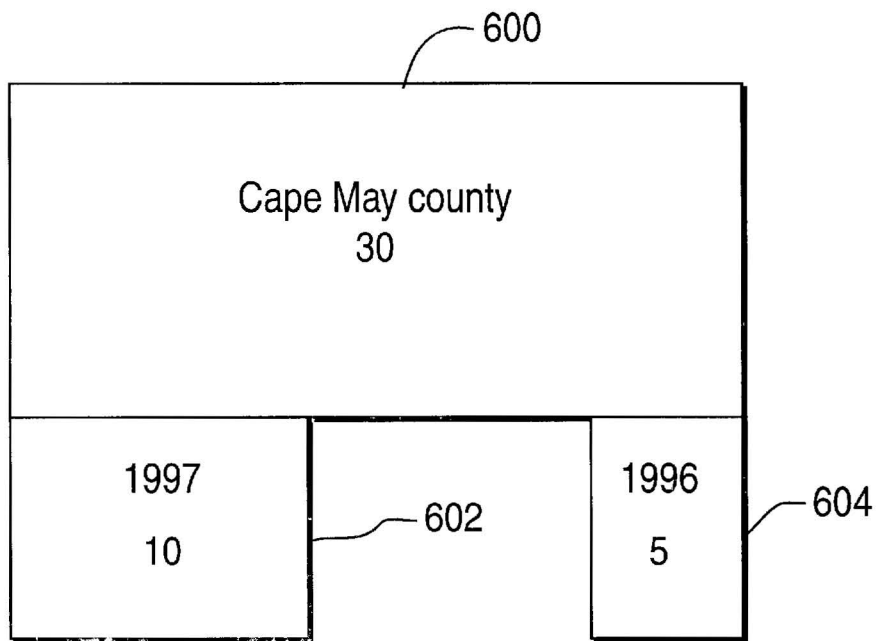


FIG. 6

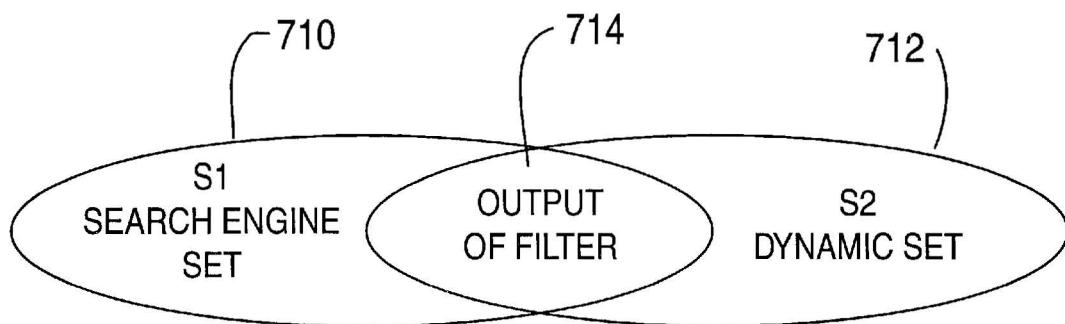


FIG. 7

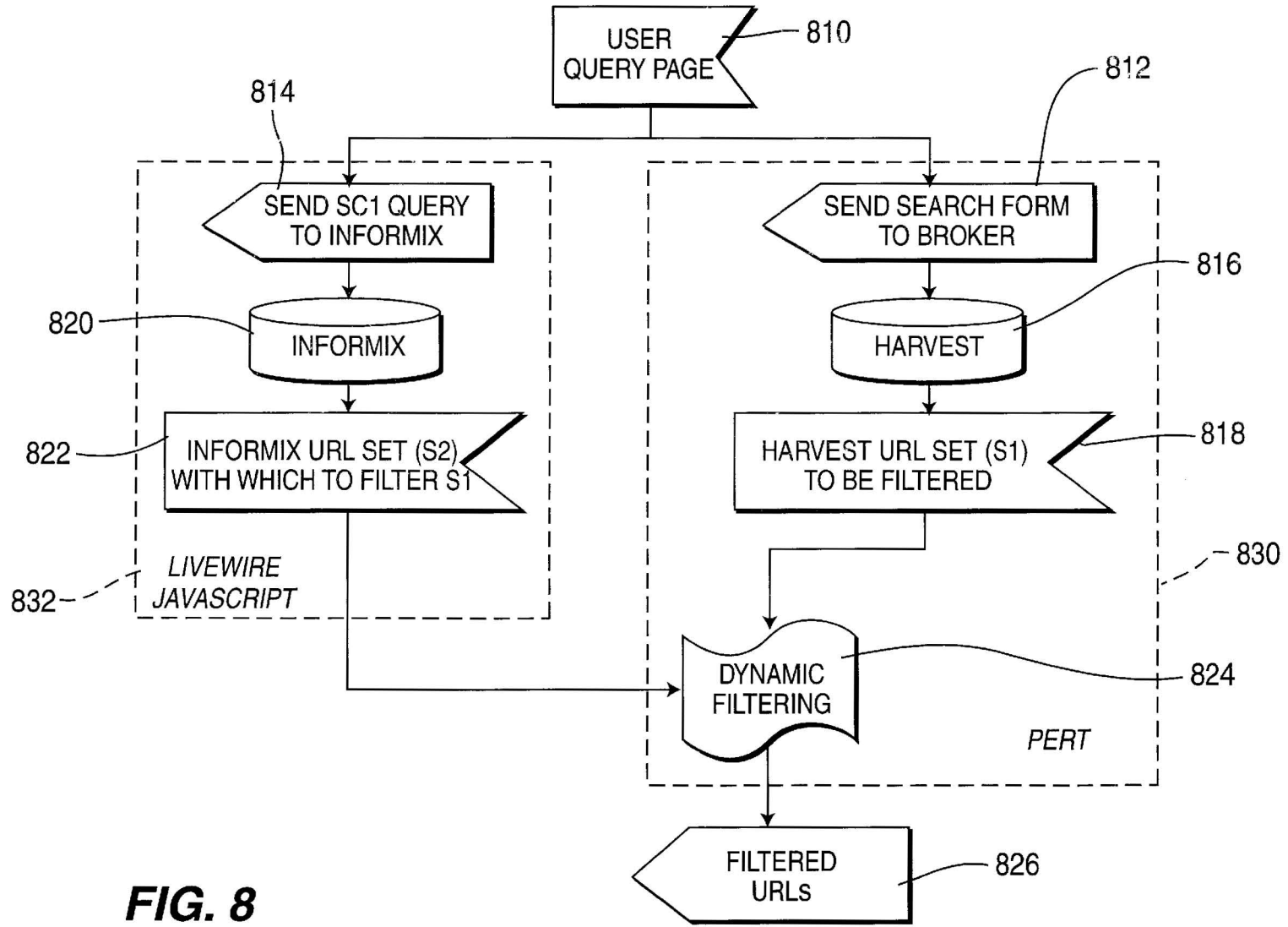


FIG. 8

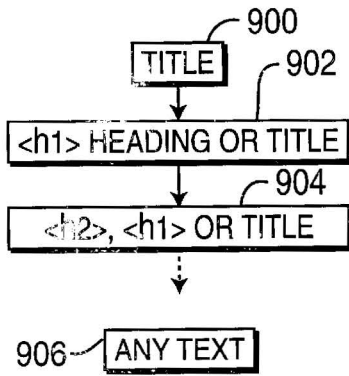


FIG. 9A

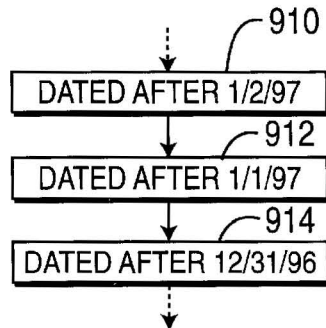


FIG. 9B

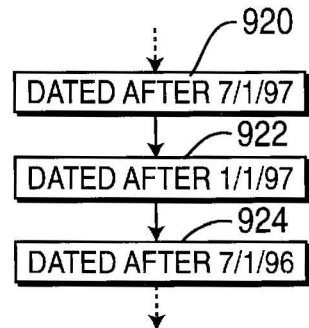


FIG. 9C

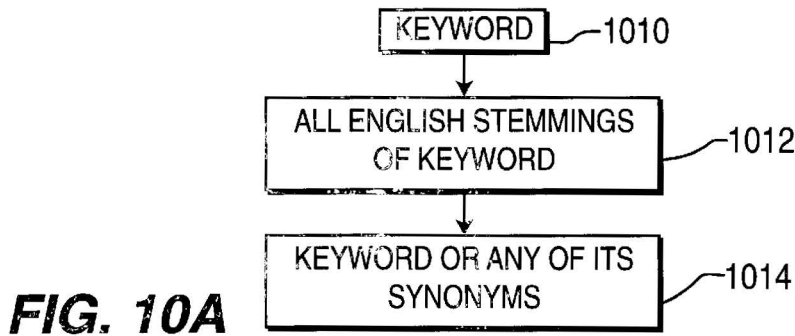


FIG. 10A

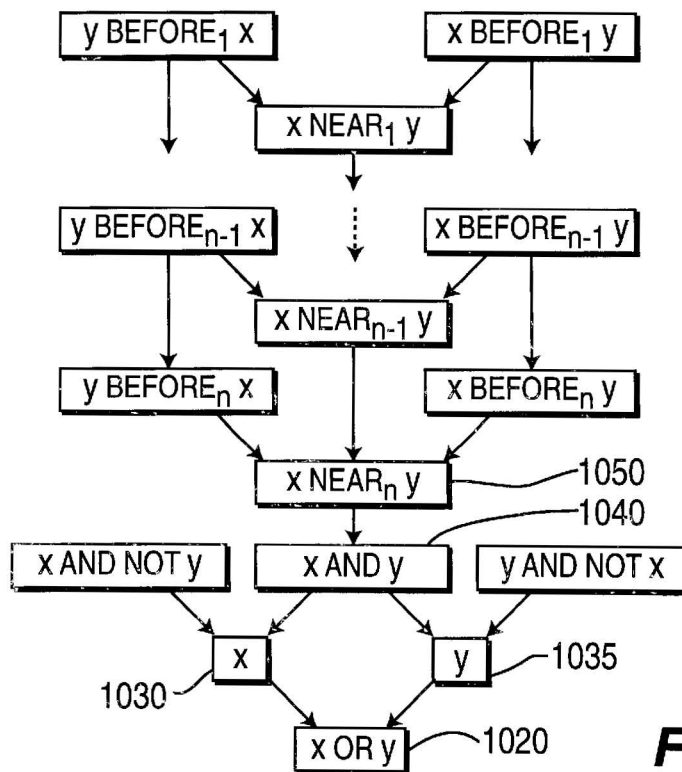


FIG. 10B

Netscape: Sarnoff Query Tuner

http://unll.8003/user.cgi?qry=x28NIST+or+NSFx29+and+proposal&lower=10

Sarnoff Query Tuner

QUERY	<input type="text" value="I(NIST or NSF) and proposal"/> Example: chinese(1) food AND (nj OR new (1) jersey) AND NOT hunan		
DESIRED # MATCHES:	<input type="text" value="10"/>	<input type="checkbox"/> ONLINE DEMO	<input type="button" value="SUBMIT QUERY"/> <input type="button" value="RESET"/>

query:((NIST and proposal) or (NSF and proposal)) matches 919 pages

First 5 matching pages:
<http://www.eng.nsf.gov/eec/9-rochst.htm>
<http://www.atp.nist.gov/atp/conf/atp98bid.htm>
<http://www.geo.nsf.gov/adgeo/budget/98budget/98geo.htm>
<http://www.nsf.gov/pubs/stis1996/nsf9731/nsf9731.txt>
<http://www.atp.nist.gov/atp/conf/02-13mtg.htm>

Now seeking similar queries that result in closer to 10 hits.

query:(body: NSF and proposal (50) NIST) matches 15 pages
query:(body: NSF and proposal (100) NIST) matches 16 pages
query:(headings: NSF and proposal (100) NIST) matches 2 pages
query:(body: NIST and proposal (50) NSF) matches 27 pages
query:(body: proposal and NSF (100) NIST) matches 32 pages

FIG. 11