EXHIBIT D

Dockets.Justia.com

Claim 1. A method, using a processor and memory, for generating a thesaurus of word vectors

thesaurus – A thesaurus is a data structure that defines semantic relatedness between words. It is typically used in information retrieval to expand search terms with other closely related words. Even if the thesaurus is not explicitly computed, the mapping performed by query expansion explicitly defined a thesaurus. (col. 1, ll. 51-56).

word vector – The word vectors represent global lexical cooccurrence patterns and relationships between word neighbors. (Abstract). Google Search Appliance uses a processor and memory for generating a thesaurus of word vectors. The Google Search Applicance further enables and induces its users to use and further develop such thesaurus features.

Enterprise Solutions : Google Search Appliance

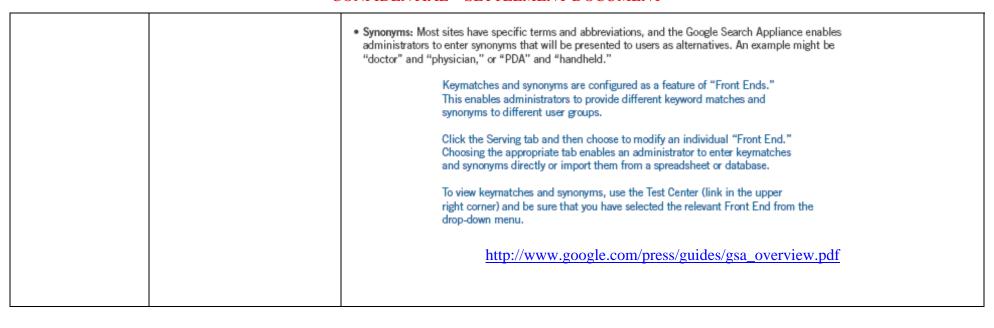
Product Features

The Google Search Appliance delivers highly relevant, fast, easy-to-use search results to users across all corporate content – including file servers, web servers, document and content management systems, and enterprise applications.

- · End User Features
- · Enterprise Content
- Security and Access Control
- · Administration and Customization
- Content Management
 - Query Expansion in Additional Languages New

Increase the number of relevant search results with query stemming and synonyms dictionaries for French, Italian, German and Spanish and Portuguese.

http://www.google.com/enterprise/gsa/features.html



based on lexical co-occurrence of words within documents of a corpus of documents, the corpus stored in the memory, the method comprising: retrieving into the processor a retrieved word from the corpus;

lexical co-occurrence -

Lexical co-occurrence is more informative both qualitatively and quantitatively. Two terms lexically cooccur if they appear in text within some distance of each other, i.e., a window of k words. Qualitatively, the fact that two words often occur close to each other is more likely to be significant than the fact that they occur in the same documents. Quantitatively, there are more co-occurrence events than occurrence-in-document events in a given document collection. For a word occurring n times in the document collection and for a definition of cooccurrence as occurring in a window of k words, there are nk co-occurrence events. However, there are only n occurrence-in-document events. If the goal is to capture information about specific words, lexical co-occurrence is the preferred basis for statistical thesaurus construction. (col. 4, ll. 28-42).

corpus of documents -

...in a corpus of computer science documents... (col. 1, ll. 39-40).

...in a corpus of legal documents... (col. 2, ll. 14).

retrieved word -

A query consisting of the terms "tank" and "water" retrieves only words relevant to the "receptacle" sense of the word "tank." (col. 13, ll. 6-9).

Google Search Appliance as used on Procter & Gamble's website (www.pg.com) searches all documents and websites on Procter & Gambles webservers (corpus of documents). Here the search term was *Crest toothpaste*.

Procter & Gamble | Dental Esthetics in Practice

Dental ResourceNet - Procter & Gamble (P&G), the makers of **Crest Toothpaste**, is proud to make available an internet site for dental professionals (dentists ... www.dentalcare.com/de/ - 2k - 2005-12-13 - Cached

Crest Oral-B Patient Education Fluoride and Tooth Decay

... weak spots and exposed roots and prevent the early stages of tooth decay, brush regularly with a fluoridated **toothpaste** like **Crest®** Cavity Protection. ... www.dentalcare.com/soap/patient/english/fluoride.htm - 9k - Cached



crest toothpaste Google Search

• ALL P&G SITES C PG.com

http://pg-googleit-01.isc.savvis.net/search?entqr=0&access=p&sort=date%3AD%3AL %3Ad1&output=xml_no_dtd&ie=UTF-8&btnG=Google+Search&client=pgqa_front end&q=crest+toothpaste&ud=1&site=ALL_PG_SITES&spell=1&oe=UTF-8&proxystylesheet=pgqa_frontend&ip=67.167.8.250&start=60

recording a
number of times a
co-occurring word
co-occurs in a
same document
within a
predetermined
range of the
retrieved word;
repeating the
recording step for
every co-occurring
word located
within the
predetermined
range for each
occurrence of the
retrieved word in
the corpus;

predetermined range – ordinary meaning

Google ranks pages according to word matches.

Among other elements, the search results page includes:

• Relevance Ranking: Shows the best pages first, based on word matches, links and other criteria.

http://www.google.com/press/guides/gsa_overview.pdf

When the search term *Crest toothpaste* was typed into Procter & Gamble's search engine, the first result contained the term *Crest toothpaste* 6 times. The second result contained the term *Crest toothpaste* 5 times.

http://pg-googleit-01.isc.savvis.net/search?q=crest+toothpaste&btnG=Google+Search
&site=ALL_PG_SITES&entqr=0&output=xml_no_dtd&sort=date%3AD%3AL%3Ad1&ie=
UTF-8&client=pgqa_frontend&ud=1&spell=1&oe=UTF-8&proxystylesheet=pgqa_frontend

The search also produces documents with the words *Crest* and *toothpaste* within a few words of each other.

Crest Oral-B Patient Education Fluoride and Tooth Decay

... weak spots and exposed roots and prevent the early stages of tooth decay, brush regularly with a fluoridated **toothpaste** like **Crest®** Cavity Protection. ... www.dentalcare.com/soap/patient/english/fluoride.htm - 9k - Cached

http://pg-googleit-01.isc.savvis.net/search?entqr=0&access=p&sort=date%3AD%3AL %3Ad1&output=xml_no_dtd&ie=UTF-8&btnG=Google+Search&client=pgqa_front end&q=crest+toothpaste&ud=1&site=ALL_PG_SITES&spell=1&oe=UTF-8&proxystylesheet=pgqa_frontend&ip=67.167.8.250&start=60

generating a word vector for the word based on every recorded number;	The Google Search Appliance is capaable of searching repeatedly and continuously, with the resulting word vectors being stored in memory for use (among other things) in search engine reports and metrics analysis:
repeating the retrieving, recording, recording repeating and generating steps for each word in the corpus, and storing the generated word vectors in the memory as the thesaurus.	Search Logs, Reports and Metrics Search engine usage logs provide valuable information about a website as well as the search engine. The Google Search Appliance provides reports of the number of searches per day and hour, the top 100 searches and so on. In addition, raw search logs preserve information including the query, result, collection, style sheet used and time required. This can be exported for analysis in a spreadsheet, database or script. The Google Search Appliance further enables the customizing and control of all aspects of creating collections and managing crawls:

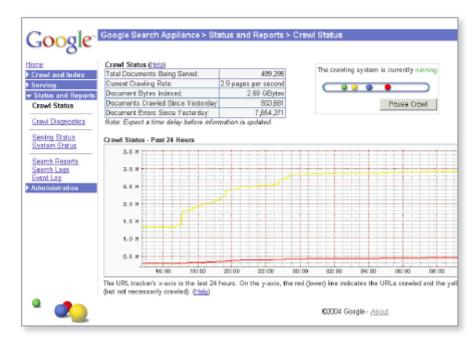
Getting Around the Google Search Appliance

The Google Search Appliance is controlled entirely from a browser-based Admin Console. The Google Search Appliance Admin Console enables you to control all aspects of search configuration such as creating collections, managing crawls, customizing search layout pages and running test queries.

Reviewer Notes: You will find fewer controls and options in the Google Admin Console than you might expect. We have simplified the administrative environment and shifted much of the complexity to be automatically handled by the software.

More details regarding the Admin Console are on pages 19 through 26 of the Installation Guide.

Setting Up a Crawl



Crawls are set up and managed via the Admin Console. This enables you to manage the configuration of your search index and include which URLs to crawl or which URL patterns, servers or filetypes to exclude from the search index.

The Google Search Appliance crawler automatically reads and indexes a wide variety of document formats, including HTML, PDF, Word and Excel – more than 200 file formats in total. In addition to web servers, the crawler recognizes a variety of document repositories, including a number of corporate knowledge management,

http://www.google.com/press/guides/gsa_overview.pdf