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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Control No.	: 90/011,014	Art Unit	: 3992
Patent No.	: 5,832,494	Examiner	: Joshua D. Campbell
Filed	: May 26, 2010	Conf. No.	: 6009

Title: METHOD AND APPARATUS FOR INDEXING, SEARCHING, AND DISPLAYING DATA

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AMENDMENT AND REPLY

This Amendment and Reply is in response to the non-final Office Action dated January 25, 2011.

Amendments to the claims begin on page **2** of this paper.

A Listing of the Status of Claims and Support for Claim Changes begins on page **7** of this paper.

Remarks begin on page **8** of this paper.

Remarks

I. Introduction

U.S. Patent No. 5,832,494 ("the '494 patent") is generally directed to systems and methods for computerized indexing and searching of a database. The textual objects and other data in the database may be indexed by creating numerical representations for a set of objects chosen for indexing from the database. *See* Abstract. An indexing technique, referred to as "proximity indexing," generates representations of relationships, patterns, or similarity to determine the degree of relatedness of database objects. In claimed embodiments, the invention employs a cluster link generation algorithm which uses links and nodes to generate mathematically derived relationships called "cluster links." The cluster links are used to proximity index a database. *See id.*

Further, the inventive method may generate "candidate cluster links" and derive "actual cluster links" to determine the strongest cluster link relationships in the database to efficiently analyze a data base. Col. 21, l. 45 – col. 24:15, l. 1. Only a subset of the candidate cluster links, the "actual cluster links," need be used in the proximity index and may be selected based on certain criteria. *See* col. 22, ll. 1-4. A cluster link generator is a specific type of a patterner, and, as such, its output is used to support the pool and single node search routines of the CSPDM. Col. 21:30-33; *see, e.g.,* Step 460 of Fig. 4H. Ranks and other values for the search nodes (*i.e.,* nodes that are analyzed for searching) of the pool based and single node search routines are generated using cluster links. *See, e.g.,* Step 464 and 460 of Fig. 4H. Cluster links, like other values of a proximity index, are stored for use in searching (*i.e.,* stored prior to the initiation of a search and used to search for objects or generate values used to search for objects). Col. 21:30-

33. The claims of the '494 patent are directed to several embodiments of the inventive computer research tools for indexing, searching, and displaying data detailed in the specification. Limitations such as "generating candidate cluster links," "deriving actual cluster links" and "determining the weight of the path using the retrieved direct links" are all related to the analysis and display of indirect relationships (*i.e.*, inherent relationships[1] of objects related through a chain of referential citations) in a database. The analysis and display of indirect relationships is an important aspect of the invention.

On May 26, 2010, the Third Party submitted its Request for *Ex Parte* Reexamination ("the Request") of claims 1-3, 5, 7-16, 18-21, 23-25, and 31-33 of the '494 patent. On August 6, 2010, the Request was granted and an Office Action issued January 25, 2011 ("the Office Action") rejecting each of claims 1-3, 5, 7-16, 18-21, 23-25, and 31-33. Patent Owner respectfully submits that the cited references do not anticipate or render obvious the subject matter of any of the rejected claims of the '494 patent. Accordingly, all rejections are traversed, and reconsideration is respectfully requested.

Furthermore, Patent Owner submits that the new claims are patentable for at least the reasons discussed below.

II. Claimed Invention

The claims of the '494 patent may be grouped broadly into three categories:

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[1] "Direct relationship" and "citations" are inherent referential relationships between database objects. An inherent relationship is a referential relationship that exists within the database object to another database object and is not merely imputed or inserted as part of the subsequent proximity analysis of the database. For example, a hyperlink citation reflecting a reference placed by an author on the web is an inherent link, whereas a hyperlink subsequently generated to reflect a semantical word match that is imputed as part of analyzing the database is not an inherent relationship or non-semantical relationship.

- Claims 1-3, 5, and 7-16 ("the cluster link claims")

- Claims 18-21 ("the stored numerical representation claims")

- Claims 23-25 and 31-33 ("the nodes and links claims")

Though each set of claims requires analysis of indirect relationships, each set uses different terminology to claim the respective indexing methods.

All of the cluster link claims recite the limitation of analyzing "indirect relationships," and, therefore, require an analysis of non-semantical relationships. *See* discussion *infra*, pp. 12-27 (claim interpretation). Claim 1 is representative of the cluster link claims and is directed to a method for analyzing indirect relationships in a database having links and nodes by generating candidate cluster links then deriving actual cluster links for use in displaying the identity of one or more nodes:

> A method of analyzing a <u>database with indirect relationships</u>, using links and nodes, comprising the steps of:
>
> selecting a node for analysis;
>
> <u>generating candidate cluster links</u> for the selected node, wherein the step of generating comprises an <u>analysis of one or more indirect relationships in the database</u>;
>
> <u>deriving actual cluster links</u> from the candidate cluster links;
>
> identifying one or more nodes for display; and
>
> displaying the identity of one or more nodes using the actual cluster links.

Col. 51, ll. 37-48 (emphasis added). Claim 1 recites a method that mathematically represents the relationship (*i.e.*, cluster link) between two nodes as measured by the potentially multiple pathways of direct links (*e.g.*, citations) between objects in databases.

Claim 19 is a stored numerical representation claim and is directed to a method of analyzing a database having objects and a first numerical representation of direct relationships that includes <u>generating and storing a second numerical representation</u> that accounts for indirect relationships in the database, where the generating step comprises:

> selecting an object in the database for analysis;
>
> analyzing the direct relationships expressed by the first numerical representation for indirect relationships involving the selected object; and
>
> creating a second numerical representation of the direct and indirect relationships involving the selected object.

Col. 53, ll. 40-48. This claim requires creating a numeric representation of *both* direct and indirect relationships and then storing this representation for searching.

> Claim 23 reads:
>
> A method of representing data in a computer database with relationships, comprising the steps of:
>
> assigning nodes node identifications;
>
> generating links, wherein each link represents a relationship between two nodes and is identified by the two nodes in which the relationship exists;
>
> allocating a weight to each link, wherein the weight signifies the strength of the relationship represented by the link relative to the strength of other relationships represented by other links; and
>
> displaying a node identification.

Col. 54, ll. 22-32. This claim requires a link weight for links that represent non-semantic relationships. *See* discussion *infra*, pp. 58-59.

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