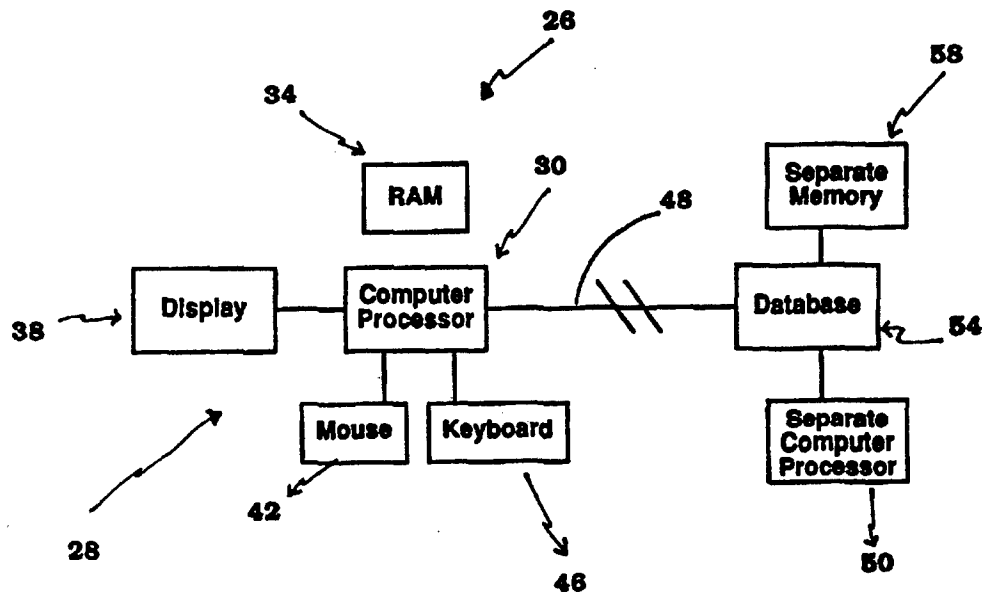




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(54) Title: METHOD AND APPARATUS FOR INDEXING SEARCHING AND DISPLAYING DATA



(57) Abstract

A computer research tool (26) for indexing, searching and displaying data is disclosed. Textual objects and other data in a database (54) are indexed by creating a numerical representation of the data. An indexing technique called proximity indexing indexes the data by using statistical techniques and empirically developed algorithms. Using proximity indexing, an efficient search for pools of data can be effectuated. The Computer Search program, called the Computer Search Program for Data represented in Matrices (CSPDM), provides efficient computer search methods. The CSPDM rank orders data in accordance with the data's relationship to time, a paradigm datum, or any similar reference. The user interface program, called the Graphical User Interface (GUI), provides a user friendly method of interacting with the CSPDM program and prepares and presents a visual graphical display. The graphical display provides the user with a two

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METHOD AND APPARATUS FOR INDEXING

SEARCHING AND DISPLAYING DATA

TECHNICAL FIELD

This invention pertains to computerized research tools.

5 More particularly, it relates to computerized research on stored databases. Specifically, the invention indexes data, searches data, and graphically displays search results with a user interface.

BACKGROUND

10 Our society is in the information age. Computers maintaining databases of information have become an everyday part of our lives. The ability to efficiently perform computer research has become increasingly more important. The area in our society in which this is most evident is the legal profession. A major problem in the legal profession today is the great deal of time
15 spent performing legal research. Many aspects of legal research are tedious and time consuming. Therefore, performing legal research detracts from the amount of time the attorney is able to spend on tasks that actually require him to utilize his legal judgment and reasoning. Recent efforts in the art of computer research have been
20 aimed at reducing the time required to accomplish legal research. Current computer search programs use a text-by-text analysis procedure (Boolean Search) to scan a database and retrieve items from a database. The attorney must input a string of text, and the computer evaluates this string of text. Then the computer retrieves
25 items from the database that match the string of text. The two most popular systems for computerized searching of data used in the legal profession are Westlaw™, a service sold by West Publishing Company, 50 W. Kellogg Blvd., P.O. Box 64526, St. Paul, Minnesota 55164-0526, and Lexis™, a service sold by Mead Data Central, P.O.
30 Box 933, Dayton, Ohio 45401.

However, Boolean searches of textual material are not very efficient. Boolean searches only retrieve exactly what the computer

interprets the attorney to have requested. If the attorney does not phrase his or her request in the exact manner in which the database represents the textual object, the Boolean search will not retrieve the desired textual object. For example, if the attorney desires to retrieve cases in which a judge decided the issue before the jury could decide it, the attorney may enter "Summary Judgment" as his textual string. However, such a request will not retrieve cases that were decided by the judge under a motion to dismiss. Therefore, the researcher may effectively be denied access to significant cases, statutes, laws or other textual objects that may be crucial to the project on which the attorney is working. A second problem encountered with Boolean searches is that the search retrieves a significant amount of irrelevant textual objects. (It should be noted that in the context of legal research, a textual object could be any type of written legal material such as a judicial opinion, a statute, a treatise, a law review article, etc. The term textual object is used to stress the fact that the present invention applies to all types of databases, and not just legal research databases.) The only requirement that a textual object must satisfy in order to be selected by a Boolean search program is that part of the textual object match the particular request of the researcher. For example, if the researcher desires to recover all cases that relate to a Fourth Amendment issue, the researcher may input "search and seizure" as his textual string. However, the computer will retrieve every case that happens to mention "search and seizure" one time, even if the case has nothing to do with a Fourth Amendment issue. Since the researcher cannot possibly know all of the groupings of text within all the textual objects in the database, the researcher is unable to phrase his request to only retrieve the textual objects that are relevant.

Aside from the inefficiency of Boolean searches, the present systems for computerized searching of data are inadequate to serve the needs of a researcher for several other reasons. Even if one assumes that all the textual objects retrieved from a Boolean search are relevant, the listing of the textual objects as done by Westlaw™ or Lexis™ does not convey some important and necessary information to the researcher. The researcher does not know which textual objects are the most significant (i.e., which textual object is referred to the most by another textual object) or which textual objects are considered essential precedent (i.e., which textual objects describe legal doctrines).

In addition, both Westlaw™ and Lexis™ have a Shepardizing™ feature that enables the researcher to view a list of textual objects that mention a particular textual object. The shepardizing feature does not indicate how many times a listed textual object mentions the particular textual object. Although the shepardizing feature uses letter codes to indicate the importance of a listed textual object (e.g. an "f" beside a listed textual object indicates that the legal rule contained in particular textual object was followed in the listed textual object), data on whether a listed textual object followed the rule of a particular textual object is entered manually by employees of Shepard's™/McGraw Hill, Inc., Div. of McGraw-Hill Book Co., 420 N. Cascade Ave., Colorado Springs, CO. 80901, toll free 1-800-525-2474. Therefore, such process is subjective and is prone to error.

Another legal research system that is available is the Westlaw™ key number system. The Westlaw™ key number system has a problem similar to the shepardizing feature on the Lexis™ and Westlaw™ systems. West key numbers are groups of textual objects organized by topic. The West key numbers enable a

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