(54) Title: COMPETITIVE INFORMATION MANAGEMENT SYSTEM

(57) Abstract: A competitive information management system is provided which perform one or more of the following functions: (a) finds documents for a user to review based on information provided to the system by the user; (b) record information regarding the user’s use of the data management system; (c) sorts documents based on their anticipated relevance to the user using information recorded into the system by the user; (d) display groups of documents in various display formats to assist the user to visualize functional interrelationships between different pieces of intellectual property in the group; (e) maintains a database containing documents and various forms of information associated with each document; (f) hunts for new documents or new pieces of information associated with each document; (g) alerts users when new documents or new pieces of information which are anticipated to be relevant to the user are identified; and (h) creates customized reports involving the documents identified by the above processes, and optionally information recorded into the system by the user.
COMPETITIVE INFORMATION MANAGEMENT SYSTEM

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates to methods and systems for managing intellectual property, and in one embodiment, methods and systems for searching, organizing, and managing patent related information.

Description of Related Art

Two significant drivers of the global economy of the 21st century will be technological advances and the Internet's revolutionary impact on the world's ability to access information.

As the significance of technology to the global economy increases, so will the importance of intellectual property. Intellectual property, and in particular patents, serves as a form of technology currency by creating a right of ownership to technological advances. More specifically, intellectual property creates a barrier to the free use of technological advancements by third parties and thus serves to insure that innovators receive proper returns on investment for their innovations.

Innovators and those funding their research and development can use intellectual property and the barriers to free use that intellectual property creates in a variety of ways to best suit their particular business needs. Intellectual property can be used to dissuade competitors from entering a market niche or to create a competitive advantage by preventing competitors from utilizing the innovator's technological advancement. Intellectual property rights can also be transferred to third parties in exchange for royalties or access to technology.

One aspect of intellectual property rights is that they are not evanescent. For example, patents provide the right to exclude others from making, using or selling the patented technology for 20 years after the priority date of the patent. The extended period of monopolistic power which intellectual property can provide makes intellectual property critical to the long term planning of technology based businesses.

In order for businesses to utilize intellectual property effectively, businesses must be able to monitor what intellectual property they have; what intellectual property they can acquire; what intellectual property they need; who their competitors are; what intellectual property their competitors have; what intellectual property their competitors can acquire; and what intellectual property their competitors need. Answering these questions is currently a difficult task, requiring the identification, review and analysis of a very large number of documents.
The intellectual property landscape is constantly changing with new technology being
developed and new intellectual property issuing and changing hands continuously. Businesses therefore
cannot rely on a static understanding of their intellectual property position. Rather, businesses need to
continuously update the analysis of their intellectual property position.

Multiple Internet services have been developed for searching and reviewing patents and other
forms of intellectual property. These services typically allow the user to search a database based on
keywords and selected fields such as assignee, inventor, agent, filing date, issue date, art unit, and
examiner. Depending on the service, differing levels of searching and sorting are supported. Examples
of existing services include the services provided by Aurgin Systems (www.aurgin.com), the U.S.
Patent and Trademark Office (e.g., www.uspto.gov/patft), IBM (e.g., www.patents.ibm.com), Dialog
(e.g., www.dialog.com), Reedfax (e.g., www.reedfax.com), Micropat (e.g., www.micropat.com) and
Optipat (e.g., www.optipat.com).

One of the difficulties associated with patent searching is the great volume of patents and
published applications that need to be reviewed. There are currently about six million U.S. patents with
more patents issuing every week. In addition, there are Patent Cooperation Treaty (PCT) applications,
European published applications and patents, and published applications and issued patents by
individual countries. With this large volume of patent literature, it is often necessary to review a very
large number of patent references in order to identify the most relevant patents. Since knowledge of a
patent is not required in order for there to be infringement of a patent, care must be taken for the search
to be inclusive of all potentially relevant patents, thus driving up the volume of information that must be
evaluated. Further, since there is a significant time delay between when an application is filed and when
a patent issues, searches must be regularly updated in order to identify new relevant patents as they
issue.

The Internet has made a tremendous amount of information readily accessible to people around
the world. Now that this information is accessible, the challenge is being able to parse through the
information rapidly in order identify the most relevant information.

Early Internet companies provided browsers (e.g., Netscape Navigator, Microsoft Explorer,
AOL) so people could access content on the Internet. Search engines (e.g., Yahoo, Infoseek, Lycos,
Excite) then emerged to assist people with finding content. With the explosive emergence of content on
the Internet, a new wave of Internet companies have now emerged to help people parse through the
content on the web, many of these companies being specifically designed for a particular niche.
Examples of these Internet services include www.About.com; MySimon.com, and AskJeeves.com.
SUMMARY OF THE INVENTION

The present invention relates to systems and methods for searching documents. Searching may be conducted using required information, probable information, and/or a shared inherent properties analysis. Searching may also be conducted using information that is anticipated to be related to a document but is not contained within the document.

The present invention also relates to systems and methods for sorting documents. Sorting may be conducted using required information, probable information, and/or a shared inherent properties analysis. Sorting may also be conducted using information that is anticipated to be related to the document but is not contained within the document.

Sorting may be based on an anticipated relevance to the user. Anticipated relevance sorting may be based on an anticipated relevance to required information, probable information, and/or a shared inherent properties analysis with one or more documents. When analyzing anticipated relevance to one or more documents, information relating to the one or more documents may be used which is included in the one or more documents. Information which is not included in the one or more documents which is either known to be or anticipated to be associated with the one or more documents may also be used. For example, the information may be information which does not cite or link to the particular documents but is anticipated to be relevant to the document based on a comparison of the contents of the information to the contents of the document.

Sorting may be based on information recorded by the system regarding a user’s review of documents. For example, sorting may be based on information whether a user found particular documents relevant or irrelevant.

Sorting may be performed by a same set of criteria that was used to search for the documents. Alternatively, sorting may be performed using a different set of criteria than the criteria that was used to search for the documents.

Sorting may be performed by a sorting system which is customized for a particular purpose such as patentability, invalidity, infringement, licensing or interferences.

In one embodiment, the systems and methods for sorting are capable of performing sorting based on a plurality of different sorting systems, the plurality of different sorting systems being user selectable. In another embodiment, the sorting system is customizable by the user. In yet another embodiment, optimization of the sorting system is automated where actual relevancy information is employed to perform the optimization.

Resorting of already sorted documents may be performed based on new sorting information without performing a new search.
When information is sorted and then displayed, the displayed information preferably does not include information which a user has already reviewed.

The present invention also relates to systems and methods for performing computerized searches for documents. In one embodiment, the method comprises taking keywords that are input into a computer system; having the computer system identify a first group of documents that are anticipated to be relevant to the input keywords; and having the computer system perform a first shared inherent property search and sorting using one or more documents from the first group of documents.

According to the method, the keywords may be input local to the user and the steps of identifying a first group of documents and performing a first shared inherent property search and sorting may be performed remote from the user.

Types of documents that may be searched include pieces of intellectual property such as patents, scientific and engineering documents and published legal decisions. In one variation, scientific and engineering documents and patents are searched together. Internet webpages may also be searched and sorted according to the present invention.

In one variation, at least two documents of the first group of documents are used to perform the first shared inherent property search and sorting. Optionally, at least 3, 4, 5, 6, 7, 8, 9, 10, 15, 20 or more documents of the first group of documents may be used to perform the first shared inherent property search and sorting.

In one variation, the method further includes having the computer system perform a second shared inherent property search and sorting using one or more documents identified by the shared inherent property search and sorting. At least two documents of the second group of documents may be used to perform the second shared inherent property search and sorting. Optionally, at least 3, 4, 5, 6, 7, 8, 9, 10, 15, 20 or more documents of the second group of documents may be used to perform the second shared inherent property search and sorting.

In another variation, the method further includes having the computer system take the input keywords, create an expanded set of keywords from the input keywords, and use the expanded set of keywords to identify the first group of documents. The expanded set of keywords may include synonyms of the keywords, the expanded set of keywords being formed by taking the input keywords and employing logic which identifies the synonyms for the input keywords. The expanded set of keywords may also include natural language expansion of the keywords, the expanded set of keywords being formed by taking the input keywords and employing logic which employs natural language expansion to form the expanded set of keywords.

In another embodiment of the method for performing a computerized search, the method comprises: taking names that are input into a computer system; having the computer system identify a
first group of documents based on the input names; and having the computer system perform a first
shared inherent property search and sorting using one or more documents from the first group of
documents.

According to this embodiment, the names may be input local to the user and the steps of
identifying a first group of documents and performing a first shared inherent property search and sorting
may be performed remote from the user.

Also according to this embodiment, identifying the first group of documents may include
identifying documents that are authored by or invented by the input names.

Also according to this embodiment, identifying the first group of documents may include
forming an expanded set of names comprising the coinventors or coauthors of the input names, and
identifying documents based on the expanded set of names. When the documents are patents, forming
the expanded set of names may comprise identifying the patents that name the input names as inventors,
and identifying the coinventors of the identified patents.

Also according to this embodiment, identifying the first group of documents may include
identifying documents that are assigned to the input names.

Types of documents that may be searched include pieces of intellectual property such as
patents, scientific and engineering documents and published legal decisions. In one variation, scientific
and engineering documents and patents are searched together. Internet webpages may also be searched.

In one variation, at least two documents of the first group of documents are used to perform the
first shared inherent property search and sorting. Optionally, at least 3, 4, 5, 6, 7, 8, 9, 10, 15, 20 or
more documents of the first group of documents may be used to perform the first shared inherent
property search and sorting.

The method according to this embodiment may further include having the computer system
perform a second shared inherent property search and sorting using one or more documents identified
by the shared inherent property search and sorting. At least two documents of the second group of
documents may be used to perform the second shared inherent property search and sorting. Optionally,
at least 3, 4, 5, 6, 7, 8, 9, 10, 15, 20 or more documents of the second group of documents may be used
to perform the second shared inherent property search and sorting.

Another embodiment for performing a computerized search for documents is provided which
comprises: taking citations for documents that are input into a computer system; and having the
computer system perform a first shared inherent property search and sorting using the input citations.

The citations may be input local to the user and the steps of identifying a first group of
documents and performing a first shared inherent property search and sorting may be performed remote
from the user.

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SUBSTITUTE SHEET (RULE 26)
The documents may be pieces of intellectual property such as patents. In such instances, the citations may be patent numbers. The documents may be scientific and engineering documents. In such instances, the citations may include volumes and page numbers of the scientific and engineering documents. The documents may also be webpages. In such instances, the citations are links to other webpages. The documents may include a combination of scientific and engineering documents and patents. The documents may also include published legal decisions. In such instances, the citations may include volumes and page numbers of the published legal decisions.

The number of citations input into the system may be at least 2, 3, 4, 5, 6, 7, 8, 9, 10, 15, 20 or more documents.

The method may further include having the computer system perform a second shared inherent property search and sorting using one or more documents identified by the shared inherent property search and sorting. At least two documents of the second group of documents may be used to perform the second shared inherent property search and sorting. Optionally, at least 3, 4, 5, 6, 7, 8, 9, 10, 15, 20 or more documents of the second group of documents may be used to perform the second shared inherent property search and sorting.

The present invention also relates to systems and methods for displaying documents. In one embodiment, the method includes displaying a plurality of documents in a plot having at least one dimension where the documents are distributed in the plot as a function of at least one inherent property of each document. The system includes computer executable logic for causing the documents to be displayed in this manner.

In one variation, displaying a plurality of documents includes displaying a plurality of documents in a plot having at least two dimensions where the documents are independently distributed in the plot along each dimension as a function of at least one inherent property of each document. Optionally, displaying a plurality of documents includes displaying a plurality of documents in a plot having at least three dimensions.

The at least one inherent property by which documents are distributed may be any single inherent property which the documents may possess. Optionally, the at least one inherent property includes two or more inherent properties. Optionally, the at least one inherent property includes at least one inherent property which was not specified to the system by the user. Optionally, the at least one inherent property includes at least one inherent property which cannot be identified from the piece of intellectual property itself. Optionally, the at least one inherent property includes non-intellectual property information regarding the document itself.

The function by which the documents are distributed in the plot may optionally be based on an analysis of the piece of documents' anticipated relevance to the user. The anticipated relevance analysis
may be based on required information, probable information and/or a shared inherent properties analysis. The function by which the documents are distributed in the plot may optionally be based on information recorded by the system from the user. The user information may be information other than information which the user provides to the system to perform a search. The user information may be information regarding a document other than the documents which are being distributed in the plot.

Each document may optionally be displayed in the plot as an icon. The icon may be selectable by a user. Selection of the icon may cause information regarding the document to be displayed. The information regarding the piece of document may optionally be displayed by a new window being created within which the information is displayed. Selection of the icon may also cause information regarding the document to be sent to the user. The information may be sent automatically or manually. For example, the selection may cause a request for the information to be sent such that the information is sent by some mechanism to the user. The information may be sent electronically, for example, over a network, via email, by a wireless communication, by a phone line, mail, courier, etc.

The icon may indicate various forms of information regarding the document. In one variation, the information is whether the user has reviewed the document, whether the user has ordered the document, whether the user has recorded comments regarding the document, and/or whether the user considers the document to be relevant or irrelevant. The icon may also indicate an anticipated relevancy score for the user for the document.

A database is also provided which includes memory containing documents and pieces of information associated with a particular document. The information associated with a particular document is preferably information which is identified by a searching program associated with the database which automatically searches for information and records the information in the database. Information may optionally be analyzed for its anticipated relevance to the document prior to being recorded in the database.

In one embodiment, the documents include patents. The patents may be U.S. patents, published applications by the Patent Cooperation Treaty (PCT), published applications and/or issued patents by the European Patent Office (EPO) and/or published applications and/or issued patents by various individual countries throughout the world.

In another embodiment, the documents include scientific and/or engineering articles. In another embodiment, the documents include webpages.

The information stored relative to each document may organized based on a variety of subcategories such as author, inventor, assignee, licensee, products, and competitors. Different and/or additional subcategories of information may also be included in the database for a given document.
The information may be information that is not typically associated with databases of that type of document. For example, the information may not be intellectual property related information when the documents are patents. In this regard, the information may be information which is not recorded in databases provided by the various government entities which issue pieces of intellectual property. For example, the information may be news about the inventors, assignee, products, litigation, regulatory filings, securities filings, grant applications, scientific publications, conferences, periodicals, and suspected competitors that are not obtained from a government entity which issues pieces of intellectual property.

The information may be information obtained by a source other than a government entity which issues pieces of intellectual property. For example, the information may be obtained by searching the Internet for information contained in websites other than websites maintained by government entities which issue pieces of intellectual property. The information may also be obtained by searching non-intellectual property related databases and wire services for information relating to a particular piece of intellectual property.

In one variation, information in the database relating to a particular document cites the particular document. In another variation, the information does not specify the document but is anticipated to be relevant to the document based on a comparison of the content of the information to the content of the particular document. Optionally, the information may have associated with it a value indicating an anticipated degree of relevance to the particular document.

In one embodiment, the pieces of information relate to an inventor of a piece of intellectual property, such as an address, phone number, email, or news relating to the inventor. This information may be information which is obtained from a source other than a patent office.

The present invention also relates to automated systems and methods for periodically searching for documents based on information stored in the system by the user. The periodic identification of documents may be performed by the various searching and sorting capabilities that may be employed in the present invention.

The present invention also relates to automated systems and methods for periodically searching for information relating to selected documents identified to the system by the user. The periodic identification of information relating to documents may be performed by the various sorting capabilities that may be employed in the present invention.

The present invention also relates to automated systems and methods for periodically identifying one or more pieces of information associated with a particular document. The one or more pieces of information that are identified may be stored in a database comprising the documents where each piece of information is associated with a particular document to which the information is
associated. The one or more pieces of information may be associated with a particular document because the information cites the particular document. Alternatively, the information does not specify the document but is anticipated to be relevant to the document based on a comparison of the content of the information to the content of the particular document. Optiona, a value may be associated with the information relating to an anticipated degree of relevance to the particular document.

The information may be obtained from a source other than the entity that publishes the document. For example, the information may be obtained by searching the Internet for information contained in websites other than websites maintained by entities which publish the document. The information may also be obtained by searching databases and wire services for information relating to a particular document.

The present invention also relates to automated systems and methods for notifying a user of the identification of documents based on information stored in the system by the user. The identification of documents may be performed by the various searching and sorting capabilities that may be employed in the present invention.

The present invention also relates to automated systems and methods for notifying a user of information relating to selected documents identified to the system by the user. The identification of information relating to documents may be performed by the various sorting capabilities that may be employed in the present invention.

Notifying may be performed by a message sent by phone, mail, express courier, email, facsimile, pager, as well as a variety of other forms of notification. The systems and methods may employ an anticipated relevancy analysis in order to determine how to send the message to the user. The system may include instructions from the user regarding how to send a message to the user based on an anticipated relevancy determination by the system regarding the information about which the message pertains.

Notifying may include sending a message without the identified information or may contain all or selected portions of the identified information. The system may include information from the user regarding what to send to the user. The systems and methods may employ an anticipated relevancy analysis in order to determine what to send in the message to the user. The system may include instructions from the user regarding what to send to the user based on an anticipated relevancy determination by the system regarding the information about which the message pertains.

Notifying may include sending a message within a certain period of time of the information’s identification. The systems and methods may employ an anticipated relevancy analysis in order to determine when to send the message to the user. The system may include instructions from the user.
regarding when to send a message to the user based on an anticipated relevancy determination by the system regarding the information about which the message pertains.

The present invention also relates to systems and methods for forming reports based on information stored in the information management system regarding the user's review of documents and information which the user has input into the system in response.

These and other aspects of the present invention are described herein in greater detail.

BRIEF DESCRIPTION OF THE FIGURES

Figures 1A-1F provide an overview of a mode of operation for the data management systems of the present invention.

Figure 1A illustrates the interaction of various modules of the data management system when a search is performed.

Figure 1B illustrates the interaction of various modules of the data management system when the user reviews the information displayed to the user as a result of the search described in regard to Figure 1A.

Figure 1C illustrates the interaction of various modules of the data management system when the user requests a different visualization format to be provided.

Figure 1D illustrates the interaction of various modules of the data management system when the IPHUNTER module identifies new information to add to the IPHISTORIAN database.

Figure 1E illustrates the interaction of various modules of the data management system when the IPALERT module identifies new information which the data management system anticipates will be of interest to the user to review.

Figure 1F illustrates the interaction of various modules of the data management system when the IREPORTER module is used to form customized reports based on the various forms of information that the IPRECORDER module records throughout the user's use of the data management system.

Figure 2 illustrates the front page of an issued patent and the various forms of inherent property information which it includes.

Figures 3A-3D illustrate a series of searches which employ required information, probable information, and/or information for performing shared inherent properties searching.

Figure 3A illustrates a series of searches which reflect how required information and probable information searching can be used in combination.
Figure 3B illustrates a series of searches which reflect how required information and probable information searching can be used in combination with shared inherent property searching.

Figure 3C illustrates another series of searches which reflect how required information and probable information searching can be used in combination with shared inherent property searching.

Figure 3D illustrates another search which reflects how required information and probable information searching can be used in combination with shared inherent property searching.

Figure 3E illustrates an example of an initial shared inherent properties search that might be performed by a startup company wishing to enter the cellular phone market.

Figure 4 illustrates a graphical user interface which includes a series of different fields and subfields into which the user can introduce information into the system.

Figure 5A illustrates a user interface where the user is able to select between multiple different sorting systems.

Figure 5B illustrates an example of a sorting system that may be used by the IPSORTER module.

Figure 6A provides a two dimensional plot (relevance to patentability vs. issue date) where different pieces of intellectual property are illustrated as separate icons.

Figure 6B illustrates an one dimensional plot where pieces of intellectual property are plotted as a function of their anticipated relevance to infringement.

Figure 6C illustrates an one dimensional plot where pieces of intellectual property are plotted as a function of their anticipated relevance to patentability.

Figure 6D illustrates an one dimensional plot where pieces of intellectual property are plotted as a function of their priority date.

Figure 6E illustrates a series of one dimensional plots aligned in parallel to each other.

Figure 6F illustrates a series of one dimensional plots where pieces of intellectual property are sorted by relevance to infringement.

Figure 6G illustrates a series of one dimensional plots where pieces of intellectual property are sorted by relevance to patentability.

Figures 6H-6N provide a series of different multidimensional plots according to the present invention.

Figure 6H illustrates an example of a two dimensional plot in which the x coordinate is time and the y coordinate is anticipated relevance to infringement.

Figure 6I illustrates an example of a two dimensional plot in which the x coordinate is priority date and the y coordinate is anticipated relevance to infringement.
Figure 6J illustrates an example of a two dimensional plot in which the x coordinate is the reference's effective date as prior art under 35 U.S.C. §102 and the y coordinate is anticipated relevance to patentability.

Figure 6K illustrates an example of a two dimensional plot of the information that is shown in Figures 6G and 6I.

Figure 6L illustrates an example of a polar coordinate plot where the distance (r) from the center is inversely proportional to the anticipated relevance of a piece of intellectual property.

Figures 6M and 6N illustrate two examples of a three dimensional plot.

Figure 6M illustrates a three dimensional plot corresponding to a cube where icons are floating in the cube.

Figure 6N illustrates a three dimensional plot which corresponds to slices of the cube shown in Figure 6M laid one on top of the other.

Figure 6O illustrates a novel method by which users may select groups of intellectual property from a one dimensional plot.

Figure 6P illustrates a novel method by which users may select groups of intellectual property from a two dimensional plot.

Figure 6Q illustrates another novel method by which users may select groups of intellectual property from a one dimensional plot.

Figure 6R illustrates another novel method by which users may select groups of intellectual property from a two dimensional plot.

Figure 6S illustrates some of the user feedback loops that may be used in the system of the present invention and the interrelationships the feedback loops create between the IPFINDER, IPSORTER, interfaces for reviewing patents and providing feedback and interfaces for showing a plot of sorting results.

Figure 7 illustrates the intellectual property centricity of the IPHISTORIAN database.

Figure 8 illustrates a graphical user interface with an example of information that may be contained in the IPHISTORIAN database and displayed to the user for a particular piece of intellectual property.

Figure 9 illustrates a graphical user interface which may be used to select how different information is to be delivered to the user.

Figure 10A illustrates the application of the IPITOMIZER module when the input search criteria includes keywords.

Figure 10B illustrates the application of the IPITOMIZER module when the input search criteria includes inventors.
Figure 10C illustrates the application of the IPITOMIZER module when the input search criteria includes assignees.

Figure 10D illustrates the application of the IPITOMIZER module when the input search criteria includes patents and/or patent applications.

Figure 10E illustrates a user interface that may be employed with the IPITOMIZER module.

Figure 11A illustrates a page from SHEPARDS where each citation includes a root case and later cases which cite the root case.

Figure 11B is a diagram illustrating a series of SHEPARDS style citations where each citation includes a root case and later cases which cite the root case.

Figure 11C is a diagram illustrating the citations shown in Figure 11B where the shared inherent properties of those cases citing each other is illustrated.

Figure 11D illustrates an IPVIEWER depiction of the information shown in Figure 11C.

DETAILED DESCRIPTION

The present invention relates to intellectual property data management systems which perform one or more of the following functions: (a) find intellectual property for a user to review based on information provided to the system by the user (See IPFINDER module); (b) record information regarding the user's use of the data management system (See IPRECORDER module); (c) sort intellectual property based on its anticipated relevance to the user using information recorded into the system by the user (See IPSORTER module); (d) display groups of intellectual property in various display formats to assist the user to visualize functional interrelationships between different pieces of intellectual property in the group (See IPVIEWER module); (e) maintain a database containing pieces of intellectual property and various forms of information associated with each piece of intellectual property (See IPHISTORIAN); (f) hunt for new intellectual property or new pieces of information associated with each piece of intellectual property (See IPHUNTER module); (g) alert users when new intellectual property or new pieces of information which are anticipated to be relevant to the user are identified (See IPAALERT module); and (h) create customized reports involving the intellectual property identified by the above processes, and optionally information recorded into the system by the user (See IPREPORTER module).

It is noted that data management systems of the present invention may include one, several, or all of the above-described modules. Each module and different combinations of these modules are all independently intended to fall within the scope of the present invention. As used herein, a module
includes a program, a subroutine, a portion of a program, or a hardware component capable of performing a stated task or function. A module can exist on a hardware component such as a server independently of other modules, or a module can exist with other modules on the same server, or within the same program.

It is also noted that the data management systems and modules of the present invention are described herein in regard to the actions and analyses that they perform. The present invention is intended to include various computer executable programs which contain logic for performing these various actions and analyses. The present invention is also intended to relate to various computer executable methods which perform the various actions and analyses described herein in regard to the data management system and its various modules.

Intellectual property, as the term is used herein, refers to various forms of government protection including, but not limited to patents, trademarks, and copyrights, whether issued by the U.S. government, published by the Patent Cooperation Treaty (PCT), published or issued by the European Patent Office (EPO) and/or published or issued by individual countries throughout the world. While the methods and modules described herein are described in relation to intellectual property and patents in particular, it is anticipated that the present invention can be more broadly applied to other forms of information (such as court decisions, FDA decisions, scientific journals, and scientific digests such as MEDLINE or CHEMABSTRACTS, etc.) which are periodically published, maintained in databases, and desirable to search. In particular, it is noted that the methods and software of the present invention can be more broadly applied to forms of information that consist of a series of documents which (a) may be stored in database form, (b) can be keyword searched, (c) include citations, links or hyperlinks to other documents in the database, and (d) are subsequently cited by other documents in the database. One particular area in which the present invention may be applied is in relation to the scientific and engineering literature. Another particular area in which the present invention may be applied is in relation to legal court decisions. However, it is noted that the present invention can be employed to analyze other bodies of literature including webpages on the Internet.

Figures 1A-1F provide an overview of a mode of operation of a data management system according to the present invention. Through these figures, an overview is provided of the various different modules that may be included in a data management system according to the present invention and their interactions. A more in-depth description of each of the modules is provided herein.

Illustrated in Figures 1A-1F is a user database 12. The user database 12 stores information relating to a plurality of users and information obtained through the users' use of the data management system. For the purposes of illustration, the user database 12 is illustrated as being divided into subject sub-databases 14, each subject sub-database 14 including information relating to a particular subject.
which is being investigated by a particular user. It is noted that a given user may have one or more
different subject sub-databases 14 depending on the number of different subjects that the user is
investigating. It is envisioned that multiple alternate schemes may be employed for storing information
in the user database 12, all of which are intended to be encompassed in the present invention.

Examples of information which may be stored in a user database 12 include, but are not limited
to, search terms, a list of intellectual property identified to the user, a list of intellectual property
reviewed by the user, a list of intellectual property identified by the user as being relevant, comments
regarding intellectual property that the user has reviewed, non-intellectual property forms of information
which the system has identified as potentially being relevant to pieces of intellectual property that the
user has reviewed, a list of intellectual property that the user has requested additional information about,
reports which the user has generated, user information (name, address, contact information), account
information, usage information, and any other forms of information which the user may have saved in
the data management system. Other forms of information which may be stored in the user database 12
are described herein or would be apparent to one of ordinary skill in view of what is described herein.

Also illustrated in Figures 1A-1F is an IPHISTORIAN database 16. The IPHISTORIAN database
includes one or more forms of intellectual property. In one embodiment, the one or more forms of
intellectual property includes patents. For example, the IPHISTORIAN database 16 may include various
patent databases including databases of U.S. patents, published applications by the Patent Cooperation
Treaty (PCT), published applications and/or issued patents by the European Patent Office (EPO) and/or
published applications and/or issued patents by various individual countries throughout the world.

It is noted that databases of patent information are made available by the various patent offices
around the world. For example, the U.S. Patent and Trademark Office makes magnetic tapes with text
files containing the text of U.S. patents as well as image files corresponding to scanned images of U.S.
patents issued by the U.S. Patent and Trademark Office and published by the U.S. government.

The databases of intellectual property, particularly patents, may be in any format, including text
based and image based formats. At least one format of the intellectual property should be searchable by
the system of the present invention.

The IPHISTORIAN database 16 may be divided into sub-databases 18 which include an
intellectual property section 17 and a related information section 19. The intellectual property section
17 may include a single piece of intellectual property or multiple related pieces of intellectual property.
In one embodiment, the multiple related pieces are patents and are members of a family of related
patents. The family may be limited to patents of one country or may be families of related patents from
multiple different countries.
The related information section 19 includes various forms of information associated with the one or more pieces of intellectual property in the intellectual property section 17. Numerous examples of information that may be stored in the IPHISTORIAN database 16 are described in the IPHISTORIAN section of the application.

Figure 1A illustrates the interactions of various modules of the data management system when a search is performed. As illustrated in the figure, the IPFINDER 20, IPSORTER 22, and IPVIEWER 24 modules interact with each other during a search to display information to the user 10 in response to a search request 26.

The user interacts with a graphical user interface (e.g., generated by a computer monitor, not shown) to prepare a search request. The search request may be based on new search information and/or search information that has already been provided to the system. Once the search request is prepared, the user interacts with the graphical user interface to request 26 the system to perform a search.

In response to the search request 26, the system stores 28 any information which the user has provided in an appropriate subject sub-database 14 for that user. The act of storing the various forms of information relating to the user's use of data management system is performed by the IPRECORDER module (not shown).

The search information which the data management system uses to perform the search is stored in and accessed 30 from the appropriate subject sub-database 14 by the IPFINDER module 20. The IPFINDER module 20 then accesses 32 the IPHISTORIAN database 16 to search for pieces of intellectual property that satisfy the user's search request. As will be described herein in the IPFINDER section of the application, the IPFINDER module may not only search for pieces of intellectual property 32A but may also search for information associated with the pieces of intellectual property 32B that is identified in the IPHISTORIAN database 16. In addition, the IPFINDER module may employ both pieces of intellectual property 32A and the information associated with the pieces of intellectual property 32B that is identified in the IPHISTORIAN database 16 in order to perform a search.

When pieces of intellectual property that satisfy the user's search are identified by the IPFINDER database 20, the search results are communicated 34 to IPSORTER module 22. The IPSORTER module 22 then sorts the search results. Sorting is preferably based on the anticipated relevance of the search results to the user. Anticipated relevance sorting is preferably performed by retrieving 36 information stored in the appropriate subject sub-database 14 and retrieving 38 information in the IPHISTORIAN database 16 regarding each piece of intellectual property. These forms of information may then be used to sort the search results. The information retrieved from the IPHISTORIAN database 16 may be about the piece of intellectual property itself 17 as well as about information 19 relating to the piece of intellectual property.
Once the pieces of intellectual property identified by the search are sorted by the IPSORTER 22, the sorted information is communicated 40 to the IPVIEWER 24. The IPVIEWER 24 then queries 42 the appropriate subject sub-database 14 in order to determine what information to display to the user as well as how to display the information to the user. The IPVIEWER 24 then controls the graphical user interface which displays 44 the information to the user.

Figure 1B illustrates the interactions of various modules of the data management system when the user 10 reviews the information displayed to the user as a result of the search described in regard to Figure 1A. As illustrated in Figure 1B, the IPVIEWER 24 displays 44 information (e.g., a piece of intellectual property) to the user 10. In response, the user 10 optionally inputs 46 into the system feedback regarding the information being displayed. It is noted that the user feedback may include a modification to the search terms that were used to identify the information. The feedback may also include comments from the user regarding the pieces of intellectual property that the user has reviewed. The IPRECORDER module saves 48 any information that the user inputs 46 into the system in the appropriate subject sub-database 14.

After the user has reviewed one or more pieces of information and inputted any feedback the user might have into the database management system regarding what the user has reviewed, the user may optionally request 50 that the system perform a new search in view of modified search terms that the user has input into the system. In response, the system performs another search as described in regard to Figure 1A. Prior to the search results from the new search being displayed to the user, the IPSORTER module resorts the search results based on any new information from the user that has been stored in the system. As will be discussed herein in the IPSORTER section, the additional information from the user that may have been stored in the system since the last search can greatly enhance the sorting capabilities of the IPSORTER module.

Prior to displaying the new search results to the user, the IPVIEWER module 24 may also query the user's sub-database 14 to determine how to best display the new, resorted search results. In one embodiment, the IPVIEWER module 24 omits pieces of information from the displayed search results which the user has already reviewed. This enables the user to avoid having to review the same pieces of intellectual property over and over again as new searches are performed.

As illustrated in Figure 1B, the user may also request 52 the system to resort search results that the user is reviewing in view of new information from the user that the system has stored in the appropriate subject sub-database 14. In this case, a new search is not performed. Instead, after the user has reviewed one or more pieces of information and has stored feedback into the system regarding the information the user has reviewed, the user requests 52 the system to resort the information in the search...
results that the user has not yet reviewed in view of the new information that the user has provided to the system.

In response to the user's request 52, the IPVIEWER module 24 notifies 54 the IPSORTER module 22 that a resorting has been requested. The IPSORTER module 22 then resorts the search results based on their anticipated relevance to the user by retrieving 56 information stored in the appropriate subject sub-database 14 and retrieving 58 information in the IPHISTORIAN database 16 regarding each piece of intellectual property. The information retrieved is then used to resort the search results. The information retrieved from the IPHISTORIAN database 16 may be about the piece of intellectual property itself 17 as well as about information 19 relating to the piece of intellectual property. As noted above and discussed in the IPSORTER section in greater detail, the additional information 46 which the user provides to the system regarding pieces of intellectual property that the user has reviewed (saved in the appropriate subject sub-database 14) can greatly enhance the sorting capabilities of the IPSORTER module 22.

The resorted information is then communicated to the IPVIEWER module 24. The IPVIEWER module 24 may also query 62 the appropriate subject sub-database 14 to determine how to best display 64 the resorted information to the user. For example, the IPVIEWER module 24 may partition information in the resorted search results based on whether the user has reviewed the information. In one embodiment, information that the user has already reviewed is omitted from the search results that are displayed to the user.

Figure 1C illustrates the interactions of various modules of the data management system when the user 10 requests a different visualization format to be provided. A feature of the present invention which is described in the IPVIEWER section in greater detail is the various visualization techniques provided by the present invention to better display visual interrelationships between different pieces of intellectual property. It is anticipated that the ability of the IPVIEWER module to modify how intellectual property is visually displayed will assist the user in identifying key interrelationships and will be a valuable tool for mining intellectual property databases for various forms of information such as industry trends, the relationship between stock performance and patent filings, licensing opportunities, and patent infringement.

As illustrated in Figure 1C, the user 10 may input 66 into a graphical user interface (not shown) a request to alter how pieces of intellectual property are being displayed to the user. In response to the user's request, the IPVIEWER module 24 requests 68 the IPSORTER module 22 to resort the pieces of intellectual property based on the user's input 66. The IPSORTER module 22, in order to resort the information, retrieves 70 the information stored in the appropriate subject sub-database 14 and retrieves 72 information in the IPHISTORIAN database 16 regarding each piece of intellectual property. The
IPSORTER module 22 then uses the retrieved information to perform the resorting. The sorted information is communicated 74 by the IPSORTER module 22 to the IPVIEWER module 24 which in turn controls the graphical user interface and redisplay 76 the information to the user 10.

Figure 1D illustrates the interactions of various modules of the data management system when the IPHUNTER module 80 identifies new information to add to the IPHISTORIAN database 16. The IPHUNTER module 80 may be automated to search 83 various available sources of information (e.g., the Internet 84, public databases 86, private databases 88, wire services 90, etc.) for any information which might pertain to any of the pieces of intellectual property that are stored in the IPHISTORIAN database 16. As new information is identified, the IPHUNTER module 80 causes 94 the information identified, or an identifier for that information, to be saved in the IPHISTORIAN database 16.

As illustrated in Figure 1D, new pieces of intellectual property are periodically added 82 to the IPHISTORIAN database 16. These additions may be done by a system administrator (e.g., when newly issued patents are obtained from a government patent office) or by an automated identification process, for example by the IPHUNTER module 80. In response, new sub-databases 18 are formed in the IPHISTORIAN database 16 to include the new piece of intellectual property 17 and information relating to the new piece of intellectual property 19. As the IPHUNTER module 80 searches, the IPHUNTER module 80 causes the information which it finds to be saved in the IPHISTORIAN database 16.

Figure 1E illustrates the interactions of various modules of the data management system when the IPALERT module 96 identifies new information which the data management system anticipates will be of interest to the user to review. As illustrated in Figure 1E, the IPALERT module 96 periodically queries 98 user sub-databases 14 and then automates the updating of searches based on information stored in the user sub-databases 14. For example, as a result of obtaining 100 information stored in a user sub-database 14, the IPALERT module 96 requests 102 the IPFINDER module 20 to search the IPHISTORIAN database 16 for any information which might be of interest to the user. The information might be new pieces of intellectual property that the user has not yet reviewed, e.g., pieces of intellectual property which have been added to the IPHISTORIAN database 16 subsequent to the user's last review or the system's last search. The new information might also be new information that the IPHUNTER module 80 has identified subsequent to the user's last review or the system's last search, as discussed in regard to Figure 1D.

In response to the IPALERT module's request 102, the IPFINDER module 20 accesses 104 the IPHISTORIAN database 16 to search for pieces of intellectual property that satisfy the IPALERT module's search request. As will be described herein in the IPFINDER section of the application, the IPFINDER module 20 may not only search for pieces of intellectual property 104A but may also search for information associated with the pieces of intellectual property 104B that is
identified in the IPHISTORIAN database 16. In addition, the IPFINDER module 20 may use pieces of
intellectual property 104A as well as information associated with pieces of intellectual property 104B in
order to perform the search.

Information that is retrieved 106 by the IPFINDER module 20 is then compared 108 to
information already stored in the appropriate subject sub-database 14. Any new information is saved in
the appropriate subject sub-database 14. The IPFINDER module 20 then requests 110 the IPSORTER
module 22 to evaluate the anticipated relevance of the newly identified information. The IPSORTER 22
sorts the new information based on its anticipated relevance to the user in view of the information that
the user has stored in the appropriate subject sub-database 14, such as search terms and information
whether certain pieces of intellectual property, inventors, and assignees are considered relevant.
Information regarding the IPSORTER module's 22 evaluation of the anticipated relevance of different
pieces of information is stored 112 in the appropriate subject sub-database 14 and communicated to the
IPALET module 96.

The IPALET module 96 may then access 114 instructions from the user regarding how the user
wishes to be notified when new information is identified which has been stored in the user's sub-
database 14. The IPALET module 96 then determines how to notify 115 the user and determines what
information to send the user in the notification. The IPALET module 96 may optionally use the
IPSORTER module's 22 evaluation of the anticipated relevance of the new pieces of information in
combination with the user's instructions when determining how to notify 115 the user and what to send
to the user in the notification.

Examples of notification mechanisms which the IPALET module 96 may use include, but are
not limited to, phone 116, mail 118, email, 120, facsimile 122, and pager 124. Other forms of
notification may also be employed.

When the user is notified, the user may get a notice to visit the database management system, or
may receive all or an excerpt of the new information by some mechanism. The IPALET module 96
may also indicate the anticipated relevance of the new information to the user in the communication.
When the user visits the database management system, the data management system identifies the new
information as well as its anticipated relevance.

Figure 1F illustrates the interactions of various modules of the data management system when
the IPREPORTER module 126 is used to form customized reports based on the various forms of
information that the IPRECORDE module records throughout the user's use of the data management
system.

The IPRECORDE module performs several valuable functions in the data management system
of the present invention by recording information that the user provides to the data management system.
in order to identify information relating to intellectual property; tracking what intellectual property the
user has reviewed; and recording information regarding what the user thought of the information that
was reviewed. For example, the IPRECODER module tracks what search terms have been used, what
pieces of intellectual property have been identified by the search terms, what pieces of intellectual
property have been reviewed, what portions of the intellectual property have been reviewed, and what
pieces of intellectual property that have been reviewed are considered relevant by the user and why.

The IPREPORTER module 126 is able to use the information stored in a subject sub-directory 14
to generate various reports based on the information stored in the sub-directory 14 in combination with
the information (pieces of intellectual property and other information) stored in the IPhistorian 16. By
having both the information stored in the sub-directory 14 and the information stored in the
IPHISTORIAN 16 in the same data management system, customized reports may be readily generated
where different pieces of intellectual property (or portions thereof) are easily interwoven with
information from the user in a user defined manner.

Once generated, the reports may be stored in the appropriate subject sub-directory 14. Since the
reports will typically include various forms of information which are already stored elsewhere in the
system, such as the IPhistorian 16, the reports can be stored in the sub-directory 14 in a condensed
form. For example, instead of saving a report with a copy of every pieces of intellectual property
that is supposed to appear in the report, the report may simply specify a code corresponding to the piece
of intellectual property. As a result, the total memory taken up by a given report may be significantly
reduced.

As illustrated in Figure 1F, the user 10, through a graphical user interface (not shown)
coordinates 128 with the IPREPORTER module 126 to construct a report. The report may be an
information disclosure statement where the user 10 fills out a 1449 form on line, or may be a more
complex report. For example, a user which has performed a freedom to operate study may wish to
produce a report which includes (a) a summary of the search terms that were used, including any
assignee and inventor searches; (b) a list of all patents reviewed (sorted alphabetically by assignee, then
by issue date); (c) abstracts and bibliographies of all patents reviewed which where considered
somewhat relevant (sorted alphabetically by assignee, then first inventor, then by issue date); and (d)
full copies of patents that were considered to be highly relevant (sorted alphabetically by assignee, then
first inventor, then by issue date). The user may also want the report to include, following each patent
that was considered to be highly relevant, a summary of the user's comments regarding that patent plus
copies of information stored in the IPhistorian regarding that patent.
The user may readily construct this report using the IPREPORTER module 126 since all of this information exists in the data management system and all of the numerical and alphabetical organizing can be automated by the system.

In order to construct a freedom to operate study report, the IPREPORTER module 126 would access 130 the information regarding what the user 10 has reviewed and what the user 10 has considered to be relevant from the appropriate subject sub-database 14. The IPREPORTER module 126 would access 132 the intellectual property to be incorporated into the report from the IPHISTORIAN 16 as well as other forms of information (e.g., from information section 19) which the user might designate to incorporate into the report. Functionality from the IPSORTER module 22 might be used 134 to organize the information to be included in the report (e.g., sorted alphabetically by assignee, then by issue date).

The process of forming the above-described freedom to operate study report by hand would easily take tens to hundreds of hours, making the process very expensive and time consuming. Instead, by having all of the information which is used to form the report, including templates for the report, stored in the data management system, these highly complex reports can be readily generated by the data management system of the present invention.

Once the report is formed electronically, a copy of the report may be saved, preferably in a condensed form, in the appropriate subject sub-directory 14. The report may also be communicated to the user, for example by printing the report or providing the report to the user electronically, most likely by CD or DVD in view of its likely large size. Since the entire report may be generated and stored electronically, new reports can be simply regenerated electronically rather than be reassembled manually.

As illustrated above, an important feature of the present invention is the various interactions between the different modules used in the present invention. Through these interactions, each module is enabled to work more efficiently, more autonomously, and in a more sophisticated manner.

A further important feature of the present invention is the use of the various forms of information which are stored in intellectual property data management systems of the present invention, both in regard to the user, and in regard to the pieces of intellectual property themselves.

Numerous advantages are derived from the storage of various forms of information from the user and his or her use of the system in the subject sub-database 14. The function of the IPREORDER module to record user feedback regarding pieces of intellectual property that the user has reviewed greatly enables the IPFINDER and IPSORTER modules to efficiently find and sort intellectual property for the user to review. It also enables the IPHUNTER and IPALERT modules to find information for the user when the user is offline. The function of the IPREORDER module to keep track of what the user has reviewed also benefits the user by reducing the amount of information which the user needs to review.
when new searches and new sorting are performed. The recordation of the entire history of the user's use of the system, in combination with the information resident in the system in the IPHISTORIAN database, enables thorough and highly sophisticated reports to be readily generated.

Numerous advantages are also derived from the fact that the IPHISTORIAN database includes pieces of intellectual property and various forms of information associated with each piece of intellectual property. The IPFINDER module may use both these forms of information to perform sophisticated searching. The IPSORTER module may use both these forms of information to perform sophisticated sorting of information. By having this information resident in the system, the user can be kept better apprised of both relevant pieces of intellectual property and information which relates to the intellectual property. Since all of this information is in the system, highly sophisticated reports can be generated which includes all this information.

It is noted that the intellectual property data management systems of the present invention are designed to be operated remotely by a community of users where the information stored in the user database and in the IPHISTORIAN is maintained in a central location and then accessed by the users over the Internet, over an intranet, over phone lines, by wireless communication technology, and other mechanisms for accessing a remote system that may be later developed. In this regard, the intellectual property data management systems may be distinguished from systems where a database of static information is stored locally for the user.

A feature of the present invention is the updating of subject sub-databases and the IPHISTORIAN by the IPHUNTER. As a result, each subject sub-database and the IPHISTORIAN can be updated to include the latest intellectual property information. It would be impractical to perform this type of updating for thousands of users by having to update each user's local system.

The different modules employed in the intellectual property data management systems of the present invention will now be described in greater detail.
A. **IPFINDER**

The IPFINDER module finds intellectual property for a user to review based on information provided to the system by the user. The intellectual property that is searched by the IPFINDER module may be stored in a variety of different forms including text based and image based databases. Any of a large number of text based and image based searching programs can be used by the system to search for pieces of intellectual property.

In one particular embodiment, the intellectual property searched by the IPFINDER module contains published patent applications and/or issued patents. The patents may be issued U.S. patents, European patents or patents issued by various individual countries throughout the world. The published applications may be published by the Patent Cooperation Treaty (PCT), the European Patent Office (EPO) or various individual countries throughout the world.

Information that the user provides for performing a search may be designated to the IPFINDER module by the user as "required information" or "probable information." As used herein, "required information" refers to information which the system requires to be present in a piece of intellectual property in order for the piece to be retrieved in search results. Intellectual property which does not include all the required information specified by the user to perform a search is not returned in the search results. Search results based on required information may be relevancy ranked based on where the required information appears in the piece of intellectual property.

Probable information" refers to information which the module looks for to be related to a piece of intellectual property as evidence that the piece is relevant to the subject matter being searched. Each item of "probable information" used to perform a search is not required by the module to be related to a piece of intellectual property in order for that piece to be retrieved in search results. Instead, intellectual property which includes all the specified required information is relevancy ranked based on what probable information is related to the piece of intellectual property. If only probable information is employed to perform a search, the module identifies intellectual property which relates to at least one item of probable information and relevancy ranks the identified pieces of intellectual property based on the probable information that relates to the intellectual property.

The IPFINDER module is preferably designed to give the user the flexibility to specify whether a given bit of information is to be treated as required information or probable information in a search.

Searches may be performed with required information only, probable information only, or a combination of required and probable information. This allows the user to set definite search limitations where possible (by specifying required information) and to avoid having to set definite search limitations when setting definite search limitations is difficult or is likely to exclude relevant pieces of intellectual property.
intellectual property. As a result, the IPFINDER module gives the user a high degree of searching flexibility.

The IPFINDER module may also perform "shared inherent properties" searching where pieces of the intellectual property are analyzed based on whether they share inherent properties with pieces of intellectual property that the user has identified to the system as being relevant. Optionally, pieces of intellectual property that the user has identified to the system as being irrelevant may also be used in shared inherent properties searching to reduce the relevancy ranking of pieces of intellectual property which are similar to pieces of intellectual property that the user has identified to the system as being irrelevant.

The "inherent properties" used to perform shared inherent properties searching may be any form of information which can be used as a basis for performing a search. Examples of inherent properties which a piece of intellectual property can possess include, but are not limited to, text (e.g., words, phrases, names, trademarks, products, entities, equations), images, priority dates, filing dates, issuance dates, registration dates, application numbers, patent numbers, registration numbers, priority documents, authorship, inventorship, ownership, licensing information, U.S., International or search classifications, examiners, attorneys or agents of record, references (including intellectual property) that are cited by a piece of intellectual property, and references (including intellectual property) that cite a piece of intellectual property.

Figure 2 illustrates the front page of an issued patent. Inherent property information appearing on the front page includes, but is not limited to the patent number 210, issue date 211, title 212, inventors 214, assignee 216, application number 217, filing date 218, related U.S. applications 220 and their priority dates 222, related foreign applications 224 and their priority dates 226, the patent's date as prior art under 35 U.S.C. § 102(e) 228, international classification 230, U.S. classification 232, field of search 234, references cited 236 which includes U.S. patents, foreign patent documents, and other publications, examiners 238, attorney, agent or firm 240, abstract 242, and an image 244 of one of the figures. In addition, the first page of the patent may also include terminal disclaimer information (not shown).

The "inherent properties" used to perform shared inherent properties searching may also be information associated with a piece of intellectual property that does not appear in the piece of intellectual property but is nonetheless associated with the piece of intellectual property. As discussed herein, the data management system may include an IPHISTORIAN database which aggregates various forms of information associated with a piece of intellectual property, such as licensing, assignment, litigation, and product information. The various forms of information relating to a piece of intellectual
property that may be stored in the IPHISTORIAN database may be used as inherent properties of the piece of intellectual property to perform inherent properties searching.

The following are examples of how shared inherent properties searching can be used to find relevant pieces of intellectual property where the shared inherent property is information associated with a piece of intellectual property that does not appear in the piece of intellectual property but is nonetheless associated with the piece of intellectual property.

In one example, the user specifies a particular patent. Unknown to the user, that particular patent is named in an infringement lawsuit with five other patents. The IPHISTORIAN database may contain information about the lawsuit and the five other patents. The IPFINDER module may use the lawsuit information identifying the five other patents as an inherent property of the patent, even though the inherent property could not be deduced from any information appearing in the patent itself. The five other patents may be returned in the search results in view of their detected relationship with the patent that the user specified.

In another example, the user again specifies a particular patent. The IPHISTORIAN database may contain information about product literature which lists the particular patent and two other patents. Those two other patents, by virtue of the product literature, are shared inherent properties of the patent specified by the user. The two other patents may be returned in the search results in view of their detected relationship with the particular patent that the user specified.

In yet another example, the user again specifies a particular patent. The IPHISTORIAN database may contain information about a scientific article associated with that particular patent. Another patent may cite the scientific article but not the particular patent as prior art. The patent which cites the scientific article as prior art may be returned in the search results in view of its detected relationship with the particular patent that the user specified.

It is noted that searching for intellectual property based on shared inherent properties is different than searching based on user specified required or probable information (e.g., a search term, such as inventorship, assignee, etc.). When a search is performed based on required or probable information, the IPFINDER module is asked to identify any piece of intellectual property with that inherent property (e.g., all patents with inventor Joe Smith). By contrast, when a search is performed based on shared inherent properties according to the present invention, the system is asked to identify pieces of intellectual property which share one and preferably multiple inherent properties with one or more pieces of intellectual property that the user specifies. The identified pieces of intellectual property may then be sorted based on their degree of shared inherent properties, the theory being that pieces of intellectual property with the most shared inherent properties to pieces of intellectual property already considered to be relevant are the most likely to be relevant.
Once a group of inherent properties is identified for each piece of intellectual property, the IPFINDER module compiles a master list of all the inherent properties associated with all of the identified pieces of intellectual property and uses the master list of inherent properties as probable information to perform a probable information search.

Shared inherent properties searching allows the user to conduct probable information searching based on numerous and optionally all of the inherent properties of several pieces of intellectual property by simply citing the several pieces of intellectual property to the system. As indicated in Figure 2, any given patent has a large amount of inherent properties. As described in relation to the IPHISTORIAN database, a given patent may have shared inherent properties with other patents that are not evident from the patents themselves but rather can be detected from non-intellectual property forms of information stored in the IPHISTORIAN database. Shared inherent properties searching thus allows the user to perform a very complex, multiple variable analysis on a database of intellectual property without having to specify the multiple variables employed in performing the analysis. In addition, the user does not have to specify to the system which of the multiple variables are relevant and which are not relevant.

Instead, the IPSORTER module anticipates which variables are important and sorts the search results for the user based on their anticipated relevance to the user.

When pieces of intellectual property for performing shared inherent properties searching are not yet known, the user may specify required and probable information in order to perform some initial searches and identify pieces of intellectual property relevant to the user's search. As the user reviews pieces of intellectual property identified by the initial searches, the user may modify the required and probable information used to perform the initial searches. In addition, the user may specify that certain pieces of intellectual property are relevant or irrelevant. Additional searches may then be performed. The system may use the information that certain pieces of intellectual property are relevant or irrelevant to perform shared inherent properties searching alone or in combination with performing required and/or probable information searching.

One advantage of shared inherent properties searching is that it allows the user to perform a search when several pieces of relevant intellectual property are known without having to formulate a search based on search terms. This is advantageous when formulating search terms (whether based on required and/or probable information) is difficult, for example because the search terms are not known, because the search terms are likely to yield too many pieces of intellectual property in the search results, or because the search terms are likely to exclude relevant pieces of intellectual property. Instead, the IPFINDER module takes citations to the several pieces of relevant intellectual property and identifies a group of inherent properties associated with each identified piece of intellectual property. As noted in
regard to the IPHISTORIAN database, the inherent properties may include various forms of information relating to the intellectual property that cannot be obtained from the piece of intellectual property itself.

In one embodiment, shared inherent properties searching may be performed by simply specifying all patents assigned to "X" or invented by "Y". For a business with multiple patents, specifying its own patents can be sufficient to initiate a search of any patents which are related to its patents. The system then searches for all patents assigned to "X" or invented by "Y", performs a shared inherent properties search based on those patents, and returns the search results for the user to review, preferably sorted based on their anticipated relevance to the user.

Once the initial shared inherent properties search is performed, the search results are reviewed by the user in order to identify which patents in the search results are considered relevant. The patents identified as being relevant may then be used to perform further shared inherent properties searching. Thus, by starting with one party's patents (the user's or a third party's), searches can be easily performed to identify any patents covering the same or similar technology through shared inherent properties searching.

1. **Required Information Searching**

   The IPFINDER module uses required information to identify pieces of intellectual property based on whether they include or exclude the required information. For example, if the term "pump" is specified as required information, the IPFINDER module only yields those pieces of intellectual property which include the term "pump." It is noted that negative search terms (e.g., not "water pump"), grouped terms (e.g., "vein, or artery or vessel"), truncated terms (e.g., "separat? for separate, separated, separation, etc.) may also be treated as required information.

   Natural language expansion is also a form of required information since it only covers natural variations of the root term.

   Required information may be any form of information which may be inherent to a piece of intellectual property. Keywords or groups of keywords which the user believes will have been used in relevant pieces of intellectual property are examples of required information. Other examples of required information include various forms of inherent properties which a piece of intellectual property may possess including, but not limited to, priority dates, filing dates, issuance dates, registration dates, application numbers, patent numbers, registration numbers, priority documents, authorship, inventorship, ownership, licensing information, U.S., International or search classifications, examiners, attorneys or agents of record, references (including intellectual property) that are cited by a piece of intellectual property, and references (including intellectual property) that cite a piece of intellectual
property. Image data, such as a portion of a circuit diagram, a chemical structure, or a nucleic acid or peptide sequence can also be used as required information.

2. Probable Information Searching

Whenever one searches for relevant intellectual property, it can be difficult to explain what one is looking for since it has not yet been found. Instead, it is generally easier to search on a "I'll know it when I see it" basis. One difficulty associated with required information searching is that it presumes that the searcher already knows what the searcher is looking for and can specify search terms which will be effective in differentiating relevant pieces of intellectual property from irrelevant pieces. Often times, terminology usage varies and the user does not know all the different terms that have been used in the intellectual property literature to describe the same thing. This creates significant problems when relying upon relevant information searching alone.

A feature of the IPFINDER module is that it uses probable information, alone, or in combination with required information to identify pieces of intellectual property to the user. Probable information refers to information which the IPFINDER module looks to see if a piece of intellectual property includes, but does not require the piece of intellectual property to include, in order for the piece of intellectual property to be included in the search results. Hence, if the term "pump" is specified by the user as probable information, the IPFINDER module may yield pieces of intellectual property which do not include the term "pump" but nonetheless appear relevant for other reasons.

When the IPFINDER module uses probable information to perform a search, the IPFINDER module uses the specified probable information to define a community of interest based on that probable information. Pieces of intellectual property which most closely share that community of interest are then identified using the probable information based on a relevancy ranking which is performed by the IPSORTER module.

When required information is specified in a search in addition to probable information, the required information serves to drastically reduce the size of the search results. Required information, as a supplement to probable information, thus serves to reduce the universe of possible search results and hence speeds up the searching process.

Required information may also be used in relevancy ranking sorting process. Since required information is necessarily present in a search result, relevancy ranking may be based on where the required information appears in the piece of intellectual property (e.g., the claims, abstract, drawings, summary of invention, etc.), and not just based on whether the required information is present. Relevancy ranking using probable information may also be based on where the probable information appears in the piece of intellectual property.
By sorting pieces of intellectual property identified in a search based on their anticipated relevancy, the user is able to review the most relevant pieces of intellectual property first. This allows the user to hone the search terms more rapidly. As a result, the user is able to reduce the total amount of intellectual property that needs to be reviewed while identifying the most relevant intellectual property faster.

By being able to specify that information is probably relevant to the subject being searched (as opposed to requiring the information to be present), the user is alleviated of the burden of specifying in black and white terms prior to review what differentiates relevant pieces of intellectual property from irrelevant pieces. As a result, the user is not required to specify what he or she is looking for before the user finds it. Instead, the user is able to describe to the IPFINDER module what relevant pieces of intellectual property are probably like. As the user reviews more and more pieces of intellectual property, the user is better able to define what he or she is looking for and is thus better able to paint a picture, using probable information search terms, of what relevant pieces of intellectual property are likely to include.

Probable information may be any form of information which may be inherent to a piece of intellectual property. Keywords which the user believes are likely to have been used in relevant pieces of intellectual property (but is not certain have been used) is an example of probable information. Other examples of probable information include various forms of inherent properties which a piece of intellectual property may possess including, but not limited to, priority dates, filing dates, issuance dates, registration dates, application numbers, patent numbers, registration numbers, priority documents, authorship, inventorship, ownership, licensing information, U.S., International or search classifications, examiners, attorneys or agents of record, references (including intellectual property) that are cited by a piece of intellectual property, and references (including intellectual property) that cite a piece of intellectual property. Image data, such as a portion of a circuit diagram, a chemical structure, or a nucleic acid or peptide sequence can also be used as required information. Image data, such as a portion of a circuit diagram, a chemical structure, or a nucleic acid or peptide sequence can also be used as probable information.

3. **Shared Inherent Property Searching**

Shared inherent property searching involves comparing multiple inherent properties of a piece of intellectual property that has not yet been reviewed to the multiple inherent properties of one or more pieces of intellectual property that the user has already specified to the system as being relevant. Shared inherent property searching can also involve taking one or more pieces of intellectual property that the user has already reviewed and deemed irrelevant and reduce the relevancy ranking of pieces of

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intellectual property that have an overlap in inherent properties with those pieces of intellectual property already identified as being irrelevant.

As discussed herein, the IPSORTER module provides an anticipated relevancy ranking for pieces of intellectual property that are identified through a search. Anticipated relevancy ranking can be used in combination with shared inherent property searching to give priority to those references with the largest or most significant overlap in inherent properties. By combining shared inherent property searching with anticipated relevancy ranking, the IPFINDER module is able to allow the user to identify several references which the user considers relevant and then have the IPFINDER module find those references which are most similar based on the intellectual property having the most shared inherent properties with the pieces of intellectual property already deemed relevant. In one embodiment, the initial several references which the user specifies may simply be his or her own patents, optionally all identified by: "patents assigned to X" and/or "patents invented by Y".

Probable information searching, by not requiring the user to specify search terms in absolute yes or no terms, provides a level of indirection relative to required information searching. For example, in probable information searching, unlike required information searching, the probable information is not required to be present in each item identified in the search results. However, the user is required to provide the probable information search terms to the IPFINDER module.

Shared inherent property searching takes the indirection of probable information searching one step further. Shared inherent property searching employs pieces of intellectual property which the user has deemed relevant or irrelevant and uses those pieces to find other pieces of intellectual property which have similar inherent properties. Like probable information searching, the information which the IPFINDER module uses to perform the shared inherent property searching is not required to be present in each item identified in the search results. Unlike probable information searching, the actual points of comparison (the inherent properties) are not specified to the IPFINDER module. Instead, when the user identifies a piece of intellectual property as being relevant (or irrelevant), the bundle of inherent properties naturally associated with that piece of intellectual property are treated by the IPFINDER module as being specified as probable information (indicating relevance, and optionally irrelevance). The IPFINDER module then compares the inherent properties of relevant (or irrelevant) pieces of intellectual property to pieces which the user has not yet reviewed.

It is noted that the inherent properties analyzed in shared inherent properties searching are not specified to the IPFINDER module by the user. Instead, shared inherent property searching is based on information which the IPFINDER module derives from the pieces of intellectual property specified to the IPFINDER module by the user and/or information associated with the pieces of intellectual property in the IPHISTORIAN. This alleviates the burden on the user to know which inherent properties (e.g.,
required and probable information) should be used to identify other relevant pieces of intellectual property. Instead, the user, by specifying to the IPFINDER module that a piece of intellectual property is relevant, is able to essentially ask the system to find other pieces of intellectual property "like it" without having to explain what "like it" means. If the user chooses, the user may specify required information and/or probable information to further define to the system what makes a piece of intellectual relevant to the user.

As noted in regard to the IPHISTORIAN, inherent properties may be based on information relating to a piece of intellectual property that does not appear anywhere in the piece of intellectual property and thus could not be deduced from the piece of intellectual property upon review. The use of the various forms of information that may be stored in the IPHISTORIAN in inherent property searching significantly expands the reach of the IPFINDER module of the present invention to identify relationships between different pieces of intellectual property, thereby helping to insure that relevant pieces of intellectual property are not overlooked.

When pieces of intellectual property are specified to the IPFINDER module as being relevant (or irrelevant), the multiple inherent properties of these pieces of intellectual property are inherently specified to the IPFINDER module as being potentially relevant. By comparing the multiple inherent properties of a piece of intellectual property that has not yet been reviewed to the multiple inherent properties of one or more pieces of intellectual property that the user has already specified as being relevant, the IPFINDER module is able identify those pieces of intellectual property which are most closely related to pieces of intellectual property already identified as being relevant. As the user identifies more and more pieces of relevant intellectual property, the IPSORTER module is better able to define the commonality among the group of relevant pieces of intellectual property. As a result, the IPSORTER module becomes better and better able to predict whether a piece of intellectual property is likely to be considered relevant by the user based on how similar or dissimilar a piece of intellectual property is to pieces of intellectual property which the user has already identified as being relevant, and optionally pieces of intellectual property which the user has already identified as not being relevant. In this regard, the IPSORTER module is able to learn from the user and is thus able to do the "I'll know it when I see it" work for the user. This alleviates the user's need to depend on required and probable information searching.

One inherent limitation with relying upon search terms to perform a search is that it assumes that the subject being searched is amenable to being defined based on search terms. More typically, the interrelationships between relevant pieces of intellectual property are complex, multidimensional, and not well understood, even when the relevant pieces of intellectual property are already known. With searching, one is trying to find the relevant pieces, making the task of specifying their commonality that
much harder. As a result, formulating a search based solely on search terms which identify all the relevant references without identifying a very large number of references can be very difficult.

One advantage of shared inherent property searching is that it identifies for the user how relevant references are interrelated. As a result, the user is not expected to know in advance how relevant references are interrelated. Instead, the system can be used to tell the user what are the ways in which pieces of intellectual property are most interrelated. For example, using shared inherent property searching, the user need not specify in advance the inherent property or properties upon which to base a search. Instead, the user can communicate to the IPFINDER module one or more pieces of intellectual property which the user considers to be relevant. The IPFINDER module then looks for interrelationships between the relevant intellectual property and intellectual property that the user has not yet reviewed. The IPSORTER module sorts the new pieces of intellectual property based on their anticipated relevance, which may be based, at least in part, on how many inherent properties are shared between a new piece of intellectual property and the pieces of intellectual property which the user has already deemed relevant.

The IPFINDER module's ability to analyze multiple inherent properties among numerous pieces of intellectual property simultaneously enables the IPFINDER module to detect shared inherent properties that would not be apparent to the user without significant effort. For example, the IPFINDER module can readily determine things like the most commonly cited prior art. The IPFINDER module can then give preference to intellectual property which cites the most commonly cited prior art. The system can also be used to report those most shared inherent properties.

A further inherent limitation with relying upon search terms to perform a search is the fact that terminology changes over time. For example, when an area of technology is first being developed, individual researchers may use many different terms for the same thing. As time passes, terminology changes. Terms go into and out of fashion. This is particularly problematic in the biotechnology arts.

Since the person doing the search has not yet identified, let alone reviewed, the intellectual property to be identified, the person doing the search has no way of knowing how terminology has changed over time. As a result, it is easy for a person doing a search based on search terms to miss groups of intellectual property which use different terminology for the technology being searched.

Shared inherent property searching, by not relying on required and probable information search terms, frees the user from needing to know in advance what terminology is commonly used to describe the technology which the user is seeking to identify and thus has not yet reviewed. Instead, the IPFINDER module is able to identify the commonality in terminology between relevant pieces of intellectual property which the user can then use in further searches.
A great deal of information regarding how different pieces of intellectual property are interrelated is embedded in which pieces of intellectual property are cited by a piece of intellectual property and which pieces of intellectual property cite to a piece of intellectual property. Although this information is readily available for individual pieces of intellectual property, it is extremely difficult to discern this information for a group of pieces of intellectual property. As a result, an individual reviewing several pieces of intellectual property is not able to discern these interrelationships absent a significant amount of work.

Shared inherent properties searching recognizes the value of the information that can be derived from knowing which pieces of intellectual property are most frequently either cited to or cited by a group of pieces of intellectual property and brings this information readily to the user's fingertips.

Shared inherent properties searching also takes advantage of the many hours of work that are performed by the applicant and the examiner in determining what pieces of intellectual property should be cited in a given patent application. Both the applicant and the examiner may each independently review hundreds of related patents and various forms of prior art publications and only make a fraction of what is reviewed of record in a patent application.

The reason that a patent or other form of prior art is made of record may not be identifiable with search terms. For example, a piece of prior art may be cited because it discloses a related embodiment which only appears in one of the figures but is not described. As noted above, terminology can change over time. A piece of prior art may employ non-conventional terms to describe something similar to what is being claimed in a patent application, it being the manual review of the reference by the applicant or examiner which enables the similarity to be determined. Unfortunately, the reason that a given reference is made of record is not recorded in a searchable form. The commonality between two pieces of intellectual property may also be the fact that they both cite the same piece of prior art, that common piece of prior art not being available in a computer searchable database.

By monitoring which pieces of intellectual property are either cited to or cited by a group of pieces of intellectual property, the IPFINDER module is able to detect the relevance of a piece of intellectual property absent search terms. As a result, the IPFINDER module is able to take advantage of someone (the examiner or applicant) having actually read a piece of intellectual property and determining that it is in some way related to another piece of intellectual property.

Utilization of what has been cited during the prosecution of a patent (including U.S. patents, foreign patent documents, and other publications) in inherent properties searching allows the IPFINDER module of the present invention to tap into the millions of hours of work that applicants and examiners have performed and recorded on the face of each patent. It also extends the searching capabilities of the IPFINDER module beyond what is otherwise possible when limited to key word searching.
A further advantage of using shared inherent properties is that it allows the user to reduce his or her reliance on key word searching as more and more relevant references are identified. In this regard, the IPFINDER and IPSORTER modules learn from the user's feedback and become increasingly adept at identifying and then priority ranking new intellectual property. In one embodiment, once multiple pieces of "relevant" intellectual property have been identified to the system, the user may opt to identify and relevancy rank additional pieces of intellectual property using shared inherent properties searching alone, i.e., without required or probable information searching.

A further advantage of shared inherent property searching is that the search method becomes more and more effective as more pieces of intellectual property are specified to the system as being relevant. This is because the IPFINDER module is better able to define a group of intellectual property where each piece has a degree of overlap with the other pieces in the group when more relevant pieces are specified to the module. Then, by sorting the pieces with overlap based, at least in part on their degree of overlap, the pieces with the most overlap can be identified, it being assumed that the pieces of intellectual property with the most shared inherent properties to pieces of intellectual property already considered to be relevant are the most likely to also be relevant.

Yet a further advantage of shared inherent property searching is that the IPFINDER module identifies key interrelationships between pieces of intellectual property. It is anticipated that the ability of the IPFINDER module to identify these key interrelationships will be useful as a tool for mining intellectual property databases for various forms of information such as industry trends, the relationship between stock performance and patent filings, licensing opportunities, and patent infringement.

As will be described in Section E herein, the present invention also provides an IPVIEWER module which allows the user to view intellectual property identified through searching in various graphical depictions which assist the user to visualize important interrelationships between pieces of intellectual property. These depictions can be used to rapidly identify the most relevant pieces of intellectual property, relationships between different pieces of intellectual property, and identify when further review of the intellectual property identified is not worth pursuing because a point of diminishing return has been achieved.

4. **Illustration of the IPFINDER Module**

Figures 3A-3E illustrate a series of searches which employ required information, probable information, and/or information for performing shared inherent properties searching. Through the searches illustrated in Figures 3A-3E, it is intended that some of the features of the present invention will be more readily understood and appreciated.
Figure 3A illustrates a series of searches which reflect how required information and probable information searching can be used in combination. In Search A, a series of probable terms are provided. Since the user does not know which terms are most relevant, no required information is specified. After some pieces of intellectual property have been reviewed that were found as a result of Search A, Search B is formulated. In Search B, a list of inventors and assignees are specified. In Search C, the user specifies water as being required since it is desired to identify water pumps. Meanwhile, the user specifies "not blood" after having reviewed several irrelevant blood pump patents.

Figure 3B illustrates a series of searches which reflect how required information and probable information searching can be used in combination with shared inherent property searching. In Search D, a series of probable terms are provided. Since the user does not know which terms are most relevant, no required information is specified. After some pieces of intellectual property have been reviewed that were found as a result of Search D, Search E is formulated. In Search E, pieces of intellectual property (patent numbers) that were found to be relevant are specified. After some pieces of intellectual property have been reviewed that were found as a result of Search E, Search F is formulated. In Search F, the user specifies several pieces of intellectual property that have been found to be relevant. In addition, the user specifies several pieces of intellectual property which are deemed totally irrelevant. As shown in Search F, probable information is removed from the search since in this case it is desired for the identified relevant pieces to direct the search results. As can be seen from Searches D-F, the user is able to use the probable information to initiate the search process and then transition to shared inherent property searching once a certain number of relevant references are identified.

Figure 3C illustrates another series of searches which reflect how required information and probable information searching can be used in combination with shared inherent property searching. In Figure 3C, Search G employs shared inherent property searching where the user identifies four pieces of intellectual property. After having reviewed the search results of Search G, the user formulates Search H which includes probable information including keywords, inventors, and assignees. As can be seen from Searches G-I, the user is able to use the knowledge of several relevant pieces of intellectual property and shared inherent property searching to initiate searching based on key words.

Figure 3D illustrates another search which reflects how required information and probable information searching can be used in combination with shared inherent property searching. In Search J, the user performs a brain storming session and provides all the information which the user can think of including required information, probable information and a couple of pieces of intellectual property which are already known to be relevant. In this instance, the system finds the most relevant information based on the totality of information which the user can provide to the module regarding the topic being searched. It is noted that the user is not attempting to formulate a search in this instance. Instead the
user is telling the system as much as the user can about what relevant pieces of intellectual property may be like. Because most of the information provided is probable information, the system has the flexibility to discard information which turns out to be minimally relevant (note that piston and shaft are removed from Search K). Once the search is provided to the system, the system finds what it believes are the most relevant references. As can be seen in Search K, the user has reviewed several pieces of intellectual property and has given the system feedback regarding what was relevant and what was not relevant. The system can then use this additional information, plus refinements to the required and probable information terms, to improve the next search.

Figure 3E illustrates yet another search. In Search L, a startup company wishing to enter the cellular phone market lists as shared inherent properties the patents which are assigned to the competitors it knows exist in the field, specifically, Erikson, Nokia, Motorola, Sony and Samsung. The user also specifies cellular or phone or pager as probable information. As illustrated, the user can initiate a search to learn about a market while knowing very little about the market.

5. Interaction Between IPFINDER Module and Other Modules

An important feature of the intellectual property data management system is the interactions between the various modules that are described herein. For example, as will be discussed in Section B herein, as pieces of intellectual property are reviewed by the user, the IPRECORD module may record information from the user regarding the intellectual property that has been reviewed. At the same time, the IPRECORD module may also keep track of what pieces of intellectual property the user has reviewed. When new and modified searches are performed, for example as illustrated in Figures 3A-3E, the IPFINDER module can be configured to present all the pieces of intellectual property identified by the search or can only present those pieces of intellectual property identified by the search which the user has not already reviewed. This allows the user to avoid having to read the same pieces of intellectual property over and over again. In addition, by tracking what intellectual property the user has reviewed as well as the user's comments regarding the different pieces of intellectual property, the system makes it feasible for the user to continually modify the search terms without laboring to keep a separate record of what the user has reviewed and the user's thoughts on the reviewed material.

As will be discussed in Section C in greater detail, the present invention also relates to novel methods (the IPSORTER module) for sorting intellectual property that the IPFINDER module has found using the information that the user has recorded into the user's database. The recorded information used to sort the intellectual property may be the information that the user specified for performing the
searches and/or information that the user recorded into the user's database regarding pieces of intellectual property that the user has reviewed.

By sorting pieces of intellectual property identified in a search based on anticipated relevancy, the user is able to review the most relevant pieces of intellectual property first. This allows the user to hone the search terms more rapidly. As a result, the user is able to reduce the total amount of intellectual property that needs to be reviewed while identifying the most relevant intellectual property faster. In addition, by using probable information searching and shared inherent properties searching in combination with relevance ranking, the system can reduce its reliance on required search terms. As a result, broader searches can be performed since the most relevant material will appear first and relevant material is not excluded by unduly narrow required information search terms. In addition, it is possible to perform searches based solely on the shared inherent properties searching.

As a user reviews pieces of intellectual property identified through a search, aided by the information recordation and sorting tools provided by the various modules of the data management system, the user is able to continually modify the search terms in order to insure that all relevant pieces of intellectual property are identified. Modifying the search terms also allows the user to reduce the amount of irrelevant information that is identified by a given search, thereby reducing the amount of irrelevant information that the user needs to review.

B. IPRECODER

The IPRECODER module records information from the user regarding intellectual property that the user has reviewed. Recording information from the user as the user reviews the intellectual property provides several significant advantages to the overall system of the present invention.

The system may be designed so the user can continuously modify the searches being used as new pieces of intellectual property are reviewed. By using better and better searches, the system is able to more rapidly identify the most relevant pieces of intellectual property for the user. For example, recording what pieces of intellectual property the user considers to be relevant or irrelevant can be used to search for intellectual property which share inherent properties with the relevant or irrelevant pieces of intellectual property (See discussion of the IPFINDER module).

The overall system may also be designed so the user can continuously modify how pieces of intellectual property are sorted. As more and more information is specified to the system, for example in regard to which pieces of intellectual property are relevant or irrelevant, the IPSORTER module is better able to relevancy rank search results.
One difficulty associated with modifying search terms and/or modifying sorting criteria is that pieces of intellectual property which have already been reviewed may be identified over and over again in each modified search or resorting of search results. The ability of the IPRECORD module to record what pieces of intellectual property have been reviewed allows the user to avoid having to review information which is repeatedly identified in each modified search or modified sorting of search results. Instead, the IPRECORD module can be designed to indicate to the user that a piece of intellectual property has already been reviewed. This may be done by altering an appearance of the piece of intellectual property when it is displayed to the user, e.g., shadowing the title. Alternatively, a field may be provided which includes a visual indicator whether the user has already reviewed the piece of intellectual property, e.g., a box where a check mark appears when the piece has already been reviewed.

The IPSORT module can also use the information recorded into the user's database by the IPRECORD module to prioritize what is presented to the user by first showing the user pieces of intellectual property that the user has not yet reviewed. Alternatively, the IPSORT module can exclude pieces of intellectual property which have already been reviewed from what is shown to the user, thereby eliminating the need for the user to read the same references over and over again. Instead, the user may request to review those pieces which have been reviewed, preferably divided into pieces which have been reviewed and are considered relevant and pieces which have been reviewed and are not considered relevant.

A further difficulty associated with continually modifying searches is that it makes it difficult for the user to keep track of what has been reviewed and what has not been reviewed. It is frequently important for a searcher to be able to specify what he or she has reviewed, for example when preparing an information disclosure statement or a freedom to operate analysis. In addition, when a searcher loses track of what has been reviewed, there is a danger that the searcher might overlook a relevant piece of intellectual property.

By recording what has been reviewed, the user is freed to review pieces of intellectual property without having to worry about keeping track of what has been reviewed and what has not been reviewed. The ability to record information about pieces of intellectual property as the material is reviewed facilitates record keeping and the formulation of reports regarding the intellectual property. (See discussion regarding the IPREPORT module). As a result, the user is able to freely modify searches without having to track what has been reviewed.

The overall system can also be designed such that the information recorded about the different pieces of intellectual property can be searched by the user. This enables the user to rapidly navigate through a large volume of intellectual property which the user has reviewed.
Various forms of information may be recorded by the IPRECODER module. In one variation, the user is able to record text comments regarding pieces of intellectual property. The user's database where the IPRECODER module stores information may be designed such that these text comments can be searched.

Various predetermined fields may also be provided which answer predefined questions regarding a piece of intellectual property. For example, the system may be designed to create user interfaces to ask the user whether the user considers a particular piece of intellectual property to be relevant or irrelevant. A field for giving a relevancy grade to a piece of intellectual property may also be provided in the user interface. As discussed herein, the IPSORTER module provides relevancy ranking which may optionally be based on a weighing module which is at least partially defined by the user.

The user interface provided to the user to record information to be stored by the IPRECODER module in the user's database may include fields which allow the user to indicate whether a piece of intellectual property is considered relevant for a predefined purpose, such as patentability, validity, infringement, licensing. For example, a field may be provided for the user to indicate that a piece of intellectual property should be cited to the Patent Office in an Information Disclosure Statement (IDS). Subfields may be provided to allow the user to indicate in which application or applications the piece of intellectual property should be cited.

In many instances, a business may have multiple closely related product lines. The user may customize the user interface to include fields for the different product lines. Accordingly, the user may indicate that a particular piece of intellectual property is relevant as prior art to applications relating to product line A, relevant as prior art to applications relating to product line B and an infringement risk to products X, Y, and Z in product line B.

In some instances, the area being searched may be divisable into multiple categories. For example, a search may relate to multiple products, multiple methods, multiple applications or patents, multiple inventors, or multiple assignees. By way of example, in the case of a car, different categories might include engine, steering, brakes, wheels, tires and exhaust. The user interface can be designed to allow the user to enter information into the interface for these different categories and provide separate fields for each category.

The user may indicate that the information applies to all categories or to a particular category or group of categories. For example, in a search relating to products A, B, C, and D, the system may be designed to allow the user to indicate that a piece of intellectual property is relevant to infringement of product A, but not products B, C, or D. The piece of intellectual property may also be relevant to the patent applications relating to products A and B but not C or D.
Other information which the user wishes to record regarding a piece of intellectual property or
the topic being searched may also be recorded by the IPREORDER module as the user reviews
information. For example, the user may indicate to the IPREORDER module that a particular author,
inventor, or assignee is considered important. During the process of reviewing pieces of intellectual
property, the user may also indicate to the IPREORDER module that a reference, person, organization,
material, or product cited or described in a piece of intellectual property is considered important.

As will be discussed herein, the IPREPORTER module can use this information to produce a wide
variety of customized reports based on the information provided to the module by the user.

Figure 4 illustrates a graphical user interface which includes a series of different fields and
subfields into which the user can introduce information into the system. It is noted that this graphical
user interface can be varied widely to match the needs of the user. The IPREORDER module may
include one or a plurality of predefined templates with predefined fields. Alternatively, the
IPREORDER module may allow the user to customize the interface to include fields which match the
subject matter that the user is searching.

As illustrated in Figure 4, a record 410 corresponding to a piece of intellectual property is
provided. In this case, the piece of intellectual property is a patent. As illustrated, the record shown
specifies the patent number 412, issue date 414, title 416, inventors 418, assignee 420, application
number 422, filing date 424, abstract 425, and the image 426 which appears on the face of the patent. It
is noted that the user may select from a plurality of different record display formats, the different
formats including different amounts of information regarding the piece of intellectual property.
Alternatively, the user may customize the display format.

Illustrated below the record 410 is a comments section 428 which includes multiple fields to
allow the user to specify different information relating to the piece of intellectual property. The
comments section 428 is divided into five subsections 430, 432, 434, and 436, 437 relating to product
lines A, B, C, and D and all product lines respectively. In each subsection, fields are provided to allow
the user to indicate whether the piece of intellectual property relating to the record is relevant to
patentability (field 438) and infringement (field 440) for product lines A, B, C, and/or D. A field 442
for whether the piece should be cited in an IDS in applications relating to each product line is also
provided. Also provided are fields 444 for providing text comments for each of product lines A, B, C,
and D. The user may optionally indicate that a text comment is applicable to multiple product lines A,
B, C, and D.

Also provided are fields displaying the required information 446, probable information 448, and
shared inherent property information 450 used to identify the piece of intellectual property. As a result
of reviewing the record 410, the user can modify any of these search fields.
Also provided are fields 452 which allow the user to order the patent from the system. Different delivery formats may be selected.

As can be seen from Figure 4, the IPRECORNER module allows a great deal of information to be recorded regarding each piece of intellectual property that is reviewed. This allows the user to review a piece of intellectual property once, record all of the user's observations, and then be able to employ those observations either in regard to searching for intellectual property, sorting intellectual property, or creating reports regarding the intellectual property that has been reviewed.

C. IPSORTER

The IPSORTER module functions within the data management system to sort intellectual property and other forms of information based on various sorting system. The sorting systems may be simple systems which perform alphabetical and numerical sorting (e.g., alphabetically by inventor, assignee or title; numerically by patent number, issue date, filing date, or priority date). The sorting systems may also be more complex systems which attempt to predict the relevance of information on behalf of the user, referred to herein as anticipated relevancy.

The IPSORTER module may be employed in combination with several of the other modules of the intellectual property data system. For example, the IPSORTER module may be used in combination with the IPIFINDER module to sort search results produced by the IPIFINDER module. The IPSORTER module may be used in combination with the IPHUNTER module to evaluate whether information is relevant to a piece of intellectual property and therefore should be added to the IPHISTORIAN database in relation to that piece of intellectual property. The IPSORTER module may be used in combination with the IPALERT module to evaluate the relevance of information identified by the IPALERT module to determine what, when, and how to alert a user that new information has been identified. The IPSORTER module may also be used in combination with the IPREPORTER module to sort information which is to be incorporated into a report.

As discussed above in regard to the IPIFINDER module, one feature of the present invention is the use of probable information searching and shared inherent property searching where information is identified which includes some, but possibly not all of the elements upon which the search was based. Because not all of the information used to perform a search is required to be present in the returned information, a larger number of pieces of information are identified in comparison to required information searching. In this regard, the IPSORTER module plays an important role in bringing the most relevant information to the attention of the user. As a result, the user is able to review the most relevant pieces of intellectual property first. This allows the user to more rapidly identify relevant
information and reduce the amount of irrelevant information that is reviewed. The time required to review the intellectual property is thereby reduced. Further, as the user reviews additional pieces of intellectual property, the user preferably perceives that the subsequent pieces of intellectual property are of diminishing relevance. Finding that additional pieces of information are of diminishing relevance helps the user to validate the effectiveness of the search terms being used. The user may optionally discontinue review once it is perceived that the information that remains to be reviewed is not likely to be relevant.

Relevance is subjective since it is dependent upon the needs of the user seeking to identify the intellectual property as well as how the intellectual property is ultimately interpreted. "Anticipated relevance" as the term is used herein, refers to an effort made by the IPSORTER module to sort intellectual property in a way that anticipates what the user is looking for and why.

As discussed above in regard to the IPRECODER module, one feature of the present invention is the ability of the system to record information from the user regarding whether pieces of intellectual property that the user has reviewed are considered relevant and why. The IPRECODER module may also record the search terms that the user has used, the searches the user has performed, the information which the searches have returned, and the information that the user has reviewed. The IPRECODER module may also record sorting preferences that the user specifies to the system.

The IPSORTER module may sort intellectual property based on sorting systems which do not employ information from the user that the IPRECODER module stores in the system. Preferably however, the IPSORTER module sorts intellectual property using the various forms of information that the IPRECODER module stores regarding the user's use of the system. By doing so, the data management system is able to use information from the user to customize the anticipated relevancy ranking capabilities of the IPSORTER module for the user and the particular subject of the search. Customization may be done automatically by the IPSORTER module which alters the sorting system based on the information that the user has provided. Customization may also be done manually by the user.

The user information which the IPSORTER module uses may simply be information from the user regarding how the user wants the information sorted. For example, the user may provide customized sorting rules to the system which reflect what the user thinks is likely to be the most relevant. For example, the user may specify that particular assignees or inventors should be given priority, thereby indicating to the system what the user believes are some of the more relevant parties.

The IPSORTER module may be designed to allow the user to exclude or diminish the relevance of references that are irrelevant by using negative conjurgators (e.g., not X). This allows the user to reduce the relevance of references that are identified due to the search terms being broad or subject to
multiple meanings without having to narrow the search terms. For example, imagine a user is searching for heart pumps and water pump art is included in the search results. The IPSORTER module can be configured to allow the user to add "not water pump" to the sorting criterion in order to reduce the relevance of references to a water pump.

The information which the IPSORTER module uses may also be information regarding whether the user considers particular pieces of intellectual property that the user has reviewed as being relevant or irrelevant. When particular pieces of intellectual property are used in sorting, the IPSORTER module may perform a shared inherent properties analysis for pieces of intellectual property that the user has not yet reviewed in order to give priority to those pieces of intellectual property which share the most inherent properties with the pieces the user considers relevant, and the least priority to those pieces which share the most inherent properties with the pieces the user considers irrelevant.

It is noted that the IPSORTER module may also perform a shared inherent properties analysis that does not use information stored in the subject sub-database in order to determine those pieces of intellectual property which have the most in common with each other. The shared inherent properties analysis may be used to give certain pieces of information priority, for example those which are most frequently cited by the other pieces of intellectual property, those by the most prolific inventor or assignee, or those which have the most in common with the search terms. Examples of inherent properties that may be used to sort information include, but are not limited to text (e.g., words, phrases, names, trademarks, products, entities, equations), images, priority dates, filing dates, issuance dates, registration dates, application numbers, patent numbers, registration numbers, priority documents, authorship, inventorship, ownership, licensing information, U.S., International or search classifications, examiners, attorneys or agents of record, references (including intellectual property) that are cited by a piece of intellectual property, and references (including intellectual property) that cite a piece of intellectual property.

It is noted that priority may be based not only on whether a piece of intellectual property includes an inherent property, but also based on where the inherent property appears in the piece of intellectual property. For example, in the case of patents, the appearance of key words in the claims and abstract may be given greater weight than the appearance of key words in the claims and not the abstract, and more weight than the appearance of key words in the abstract and not in the claims, and even more weight than the appearance of key words in the Specification and not in either the abstract or the claims.

It is noted that the inherent properties may be various things other than key words. Weight may be given to the priority, filing, or issue date of the piece of intellectual property. Weight may be given to whether the piece of intellectual property was authored or invented by a particular individual,
authored or invented by an individual residing in a particular location or region, owned, licensed, or assigned to a particular individual or entity. Subject to a government proceeding (reexamination, reissue, or opposition), subject to a legal proceeding (e.g., an arbitration, mediation or litigation), cited by a particular piece of intellectual property, cites a particular piece of intellectual property, claims priority to a particular piece of intellectual property, or a member of a national or international classification or subclassification.

As discussed herein, the data management system may also include an IPHISTORIAN database which aggregates various forms of information associated with a piece of intellectual property, such as licensing, litigation, and product information. Since the IPSORTER module has access to this database of information, the various forms of information that are stored in the IPHISTORIAN database may also be used as inherent properties to sort intellectual property. For example, the IPSORTER module may employ the amount of information associated with a particular piece of intellectual property and/or whether particular types of information are associated with a particular piece of intellectual property to influence the relevance of a piece of intellectual property. Additional weight may be given to a piece of intellectual property which has been the subject of a litigation or licensing activity or a product FAQ sheet on the presumption that pieces of intellectual property which are news worthy are more likely to be important and should be reviewed.

It is noted that the information (required information, probable information, and shared inherent properties) that the IPSORTER module uses to sort intellectual property may be the same or different than the information which is used by the IPFINDER module to find the intellectual property. This is in contrast to prior art systems which use the same set of required information to perform a search and perform relevancy ranking (in the case of prior art systems which also have some relevancy ranking capabilities).

The IPSORTER module is capable of employing multiple different sorting systems based on different sets of inherent properties to sort the pieces of intellectual property. In some embodiments, the IPSORTER module gives some inherent properties greater weight than others. For example, the IPSORTER module may give words greater weight than other properties such as inventor or assignee. The IPSORTER module may also give greater weight based on where an inherent property appears in a piece of intellectual property (e.g., claims > summary of the invention > abstract > specification). The user may optionally specify that some inherent properties are to be given greater weight than others.

The IPSORTER module may include a plurality of sorting systems customized to sort information based on their anticipated relevance for different purposes. For example, the IPSORTER module may include customized sorting systems for patentability, for invalidity, for infringement, for

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licensing or for interferences. These different sorting systems may be user selectable. In addition, the IPSORTER module may allow the user to further customize the sorting system.

A customized sorting system for patentability could be designed to exclude pieces of intellectual property which would not be effective as prior art before a specified date. Hence, U.S. patents might be excluded if they do not have an early enough 35 U.S.C. § 102(e) date, whereas PCT applications and international patent documents would be excluded based on their first publication date. When a relevant PCT application or international application/patent is identified which designates the U.S., but a U.S. patent has not yet issued, the customized sorting system may nonetheless identify the PCT application or international application/patent along with a note that the PCT application is not prior art but a related U.S. patent might be prior art under 35 U.S.C. § 102(e).

A customized weighing system for patentability may also give preference to keywords which are specified in the search over shared inherent properties such as inventorship and assignee since the keywords are more likely to indicate relevance. A piece of intellectual property with a later effective date as prior art might be given priority over a piece with an earlier effective prior art date on the theory that the later reference is more likely to be an anticipatory reference than a much earlier reference.

Once patents are identified which the user considers to be relevant (or irrelevant), priority may be given to (or taken away from) patents which cite or are cited by the relevant (or irrelevant) patent. Patents by the same inventor or assignee might also be given preference.

A customized sorting system for invalidity could be designed to be similar to the weighing system for patentability described above. Invalidity, unlike patentability, means that the patent has already been examined. As a result, there is likely to already be a body of prior art which the applicant and examiner have already deemed to be relevant because it was cited in the patent. Sorting based on shared inherent properties between the prior art that was cited may be given particular weight. In instances where the patent has been cited by later issued patents (U.S. or internationally), added weight may also be given to prior art which is also cited by those later issued patents.

In an invalidity sorting system, the IPSORTER module may give priority to pieces of intellectual property which were cited in patents by the same inventors or assignees that were not cited in a given patent since those patents might assist to establish a fraud defense.

It is noted in regard to patentability and infringement that the information in the IPHISTORIAN regarding patents that the user has found to be relevant may be very helpful to the user. Since the IPHISTORIAN is organized based on pieces of intellectual property, the identification of information pertaining to the identified relevant patents is readily obtained.

A customized sorting system for infringement could be designed to give particular weight to whether selected keywords appear in the claims. The absence of selected keywords in the claims could
be used to reduce a relevancy ranking. If a piece of intellectual property is identified as being relevant, other pieces of intellectual property which are by the same inventors, owned by the same assignee, licensed to the same parties, described as being related to the same products might be given added weight. Pieces of intellectual property with the earliest priority dates might be given added weight on the theory that earlier filing dates are likely to yield broader claims. Pieces of intellectual property with the earliest priority dates and latest issue dates might be given the greatest weight on the theory that the claims may have been drafted after the competition has been identified. Pieces of intellectual property that are the subject of news or litigation might be given added weight because news worthy patents and litigation worthy patents are likely to have broad claims. Pieces of intellectual property that are cited the most frequently by later filed applications may also be given added weight for being likely to be related to a core piece of technology.

A customized sorting system for licensing could be designed to give particular weight to whether a piece of intellectual property has been assigned, how many pieces of intellectual property are associated with the inventor or the assignee, whether the inventor or assignee has recently had a increase or decline in filings, and whether the piece of intellectual property is by the same inventors, owned by the same assignee, licensed to the same parties as a piece of intellectual property already identified as being relevant to license. Pieces of intellectual property with the earliest priority dates might be given added weight on the theory that earlier filing dates are likely to yield broader claims. Pieces of intellectual property with the earliest priority dates and latest issue dates might be given the greatest weight on the theory that the claims may have been drafted after the competition has been identified. Pieces of intellectual property that are the subject of news or litigation might be given added weight because news worthy patents and litigation worthy patents are likely to have broad claims. Pieces of intellectual property that are cited the most frequently by later filed applications may also be given added weight for being likely to be related to a core piece of technology. In regard to the IPHISTORIAN, pieces of intellectual property that have news information associated with them that might indicate that the patent owner is in distress (e.g., notice of a bankruptcy filing, downturn in their stock price, news of layoffs, etc.) may be used to give patents with those properties added weight.

A customized sorting system for identifying interferences could be designed to give particular weight to whether pieces of intellectual property have similar priority dates to a given application and whether there is significant overlap in keywords used in the claims of the given application and the claims of pieces of intellectual property.

The sorting systems employed by the IPSORTER module may also be custom designable by the user. For example, the IPSORTER module may allow the user to select which inherent properties to employ in the sorting system. The user may also be able to grade the importance of different inherent
properties on a scale (e.g., 1-5). In regard to shared inherent property searching, the user may also grade the relevance of pieces of intellectual property.

Figure 5A illustrates a user interface where the user is able to select between multiple different sorting systems. Window 510 shows user selectable buttons for general 512, patentability 514, invalidity 516, infringement 518, licensing 520, and interferences 522 sorting systems. The user may select one of these buttons to communicate to the system the purpose of the sorting, and thus cause the IPSORTER module to employ a sorting system which is adapted to prioritize information based on the purpose. Patentability 514 is shown as having been selected by the blackened box.

In regard to the patentability button 514 and the invalidity button 516, activation of these selections activate window 524 into which the user may specify the priority date of the invention. By doing this, the IPSORTER module will give priority to information which would be prior art to the invention.

As also illustrated, the user interface shows a window 528 with the various sorting terms 530. The sorting terms 530 may be the search terms that were used to identify the information to be sorted. Other groups of terms may also be used as the sorting terms 530. The user may customize the sorting system by selecting which of the search terms to employ in the sorting system. This may be done, for example, by the user clicking on the search terms to be emphasized. Optionally, the user may grade the importance of terms in the sorting system. As illustrated, the user may give a 1-5 ranking 532 to the various terms, a 5 giving intellectual property with that inherent property the greatest priority. This grading may be done by inserting a number, or by clicking on the term to cycle the ranking from 1-2-3-4-5-1 etc. The user may also be given the option of specifying whether to give priority to particular terms based on whether they appear in a particular portion of the piece of intellectual property, i.e., the claims, the abstract, the summary of invention, etc. For example, as illustrated, terms with a C may be given higher priority if they appear in the claims, terms with an A may be given higher priority if they appear in the abstract or the claims, and terms with an S may be given higher priority if they appear in the summary of the invention, the abstract or the claims.

As illustrated in window 534, the user interface may also enable the user to select whether to employ a shared inherent properties analysis based on one or more pieces which the user identified as being relevant 536 and one or more pieces which the user identified as being irrelevant 538.

As also illustrated in window 540, the user interface may also enable the user to select whether to give pieces of intellectual property which have certain types of information associated with them in the I PHISTORIAN weight.

Figure 5B illustrates an example of a sorting system that may be used by the IPSORTER module. As illustrated in Figure 5B, the sorting system may be based on a point system where the cumulative
number of points determines the relative ranking of the piece of intellectual property. As illustrated, the point system includes points for required and probable information, with added weight given in some instances based on where the information appears in the piece of intellectual property. As also illustrated, shared inherent properties and IPHISTORIAN information are also included in the points system.

It is noted that the various forms of information and the various points given for the various forms of information shown in the Figure is only provided by way of example. A large variety of different sorting systems may be designed using different point schemes and different sets of required and probable information, inherent properties, and IPHISTORIAN information.

1. Use of User Specified Information By The IPSORTER Module

An advantage of the IPSORTER module of the present invention is its ability to learn from the user as the user reviews additional pieces of intellectual property. For example, as the user identifies more and more relevant pieces of intellectual property, the information which the user records about the relevant pieces, as well as the inherent properties of the relevant pieces (e.g., inventor, assignee, related applications, cited references, citing references, International, U.S., and search classifications, etc.) enable the IPSORTER module to better prioritize those pieces of intellectual property which are likely to be relevant that the user has not yet reviewed. As a result, once several relevant pieces of intellectual property have been identified, the user can optionally broaden the search (e.g., by eliminating narrowing search terms) and rely on the relevancy ranking to continue to present the user with the most relevant references. By broadening the search terms, one avoids eliminating relevant pieces of intellectual property due to unduly narrow search terms. Meanwhile, although broadening the search drives up the number of pieces of intellectual property identified, the information saved in the system regarding what is relevant aids the IPSORTER module in providing the user with the most relevant intellectual property that have not been reviewed.

As the user reviews additional references, the user can optionally continue to broaden the search terms. Once a sufficient body of relevant intellectual property, the user may optionally eliminate the search terms and instead use the body of relevant intellectual property and shared inherent properties sorting to prioritize intellectual property that has not yet been reviewed. As the user continues to review additional intellectual property, the user should perceive a diminishing relevance of the remaining references and eventually feel comfortable in discontinuing his or her review. As will be illustrated in regard to the IPVIEWER module, the user is able to visualize the diminishing returns of continuing to search.
By using the information recorded into the system from the user regarding the user's searches and review of information, as well as inherent properties of pieces of intellectual property indicated by the user as being relevant (or irrelevant), the IPSORTER module is able to sort intellectual property using a broader range of information than just the search terms used to find the information. In this regard, it is noted that the user is free to depart from the search terms when performing sorting.

2. **Use of Shared Inherent Properties By The IPSORTER Module**

One ability of the IPSORTER module to sort pieces of intellectual property based on their shared inherent properties to pieces of intellectual property which the user has specified as being relevant or irrelevant greatly enhances the sorting abilities of the IPSORTER module. As discussed above in greater detail in regard to the IPFINDER module, analyzing pieces of intellectual property based on their shared inherent properties, whether for the purpose of searching or sorting, allows the user to perform very complex, multiple variable analyses on a database of intellectual property without having to specify the multiple variables to be employed in performing the analyses. In addition, the user does not have to specify to the system which of the multiple variables are relevant and which are not relevant. As a result, the IPSORTER module's ability to sort intellectual property by determining which pieces are most similar to pieces already deemed relevant performs the work that the user would traditionally have to perform. Ultimately, by having the IPSORTER module perform the work for the user, the user is able to hone in on the user's target much more rapidly, inclusively and effectively.

3. **Iterative Resorting Based On New Information**

A further feature provided by the overall system of the present invention is the decoupling of the search criterion and the sorting criterion. As a result, the user can modify how information is sorted whenever the user wishes, regardless of whether a new search is performed.

In one mode of use, the system may perform a search, optionally have the IPSORTER module prioritize the search results, have the user review one or more pieces of intellectual property where information is introduced into the system regarding the one or more pieces that the user has reviewed, and then have the IPSORTER module prioritize or reprioritize the pieces of intellectual property that have not yet been reviewed, at least in part, using the information provided to the system regarding the one or more pieces that the user reviewed.

It is noted that resorting of intellectual property may be performed whenever new information is recorded into the system. The new information may be the evaluation of one or more new pieces of intellectual property. The new information may also be an altering of the sorting criterion. The user may introduce the new information after the performance of a new or modified search. However, it is
noted that a new search does not need to be performed. Again, since the search criterion and the sorting criterion are decoupled in the system of the present invention, the user can modify how information is sorted whenever the user wishes.

It is noted that the user's review of new information can serve to continuously modify how information is sorted by the IPSORTER module. As a result, the system may operate to automatically resort intellectual property which the user has not yet reviewed whenever a new piece of intellectual property is to be displayed. Alternatively, the system may operate to automatically resort intellectual property which the user has not yet reviewed after a selected number of pieces of intellectual property have been reviewed. The system may also be designed so that the user may turn the automated sorting on or off. The system may also be designed so that the user can request that the intellectual property be resorted whenever the user wishes.

The ability of the IPSORTER module to resort pieces of intellectual property between searches based on information garnered from the user's review of some new information greatly enhances the ability of the IPSORTER module to prioritize intellectual property that has not yet been reviewed. In particular, the ability to resort information as desired improves the ability of the IPSORTER module to present the most relevant intellectual property first to the user. This, in turn, allows the user to hone the search terms and sorting system more rapidly. As a result, the user is able to reduce the total amount of intellectual property that needs to be reviewed while identifying the most relevant intellectual property faster.

4. **Recordation of Information By The IPSORTER Module**

The ability of the data management system to allow the user to repeatedly modify search terms and resort search results provides significant advantages in regard to assisting the user in identifying the most relevant pieces of intellectual property more rapidly. One difficulty that arises with repeatedly modifying search terms and sorting systems, however, is that it makes it more difficult for the user to independently keep track of what the user has searched for, what the system has identified, and what the user has reviewed. As has been noted in regard to the IPRECODER module, an important feature of the present invention is the ability of the IPRECODER module to track what the user has searched and reviewed so that the user can later have a record of what the user found and reviewed. As a result, the user is free to continuously modify searching and sorting approaches. With the aid of the IPRECODER module, the user is able to later decipher what the user has searched and reviewed. The IPREPORTER module may then use this information later on to prepare reports.

Another important feature of the present invention is the ability of the IPRECODER module to track what the user has reviewed and optionally display to the user only those pieces of intellectual
property which the user has not yet reviewed. This ability of the IPRECORDER module to keep track of what the user has reviewed and avoid having the user repeatedly review the same material allows the user to continuously modify the search terms without creating more work for him or herself. For example, lets assume the user performs an initial search which specifies (vessel or vein). After reviewing 25 pieces of intellectual property, the user decides to expand the search to include (vessel or vein, or artery or capillary or body lumen). The ability of the IPRECORDER module to keep track of the 25 pieces of intellectual property that the user has already reviewed enables to IPRECORDER module to prevent the user from having to review those 25 pieces of intellectual property over again after a new search is performed in response to the additional information garnered from the user’s review of the 25 pieces of intellectual property.

The ability of the user to only review new pieces of intellectual property also makes it feasible for the sorting criterion to be repeatedly changed. For example, as the user reviews additional references, the user can continually modify the sorting criterion without having to worry about keeping track of what has already been reviewed.

By recording information from the user, the user is freed to learn new ways to specify what is being searched for and modify the search terms and sorting criterion in response. The user can also discover that particular authors, inventors, or assignees are relevant and add them to the search terms and/or sorting criterion. As a result, all of the various forms of information that the user can identify as a result of reviewing new information can be fed back into the system to hone the searching and sorting performance of the system.

As the user reviews new information, a user interface may be provided which allows the user to store comments which the system can later use to organize materials that have been reviewed. Fields may be provided for the user to associate comments with pieces of intellectual property as they are reviewed. These fields can simply indicate that a piece of intellectual property is considered by the user to be relevant. Preferably, the fields allow the user to specify that the piece of intellectual property is relevant for a particular purpose, e.g., for infringement, validity, patentability, or as a potential acquisition. Comments can also be text based comments which can be subject to text searches. By allowing the user to note how each reference is relevant as the user reviews each document, customized reports using this information can be readily generated.

5. **Optimization Of The IPSORTER Module In View of Actual User Relevancy Ranking**

Once a group of intellectual property has been reviewed by the user, the user may request the system to optimize the sorting system which the data management system is employing in view of the
user's feedback. For example, assume that the user has indicated that a first group of pieces of intellectual property are considered relevant for patentability, a second group of pieces of intellectual property are considered irrelevant for patentability, a third group of pieces of intellectual property are considered relevant for infringement, and a fourth group of pieces of intellectual property are considered irrelevant for infringement. The system may take this information regarding actual relevance to the user, along with any required and probable information which the user has provided to perform searching and sorting, and then test multiple different sorting systems in order to evaluate the different sorting systems' abilities to simulate the actual relevance ranking information indicated to the system by the user.

As was noted above, the data management system may have a library of different sorting systems stored in the system which the IPSORTER module may employ. In response to a request to optimize the sorting capabilities of the system in view of the user's actual relevancy ranking, the data management system may test the various sorting systems stored in the data management system in order to identify one or more sorting systems which best match the user's actual relevance ranking.

Optionally, the data management system may also iterate through multiple variations of the one or more different sorting systems which best match the user's actual relevancy ranking. This may be done by modifying the sorting systems in view of different sets of required and probable information which the user has provided to perform searching and sorting. When a sorting system is identified, or optionally customized, which better reflects the actual relevance of pieces of intellectual property to the user, the identified new sorting system may be stored in the applicable user sub-database and used on behalf of the particular user. Multiple customizations of the sorting system may be performed as more and more actual user relevance information is stored in the data management system.

It is noted that customized relevance ranking sorting systems may be identified for an overall relevance to the user, and/or for different types of relevance to the user, for example, relevance in regard to patentability, invalidity, infringement, licensing or interferences.

E. **IPVIEWER**

The IPVIEWER module controls how information is displayed to the user. In one regard, the IPVIEWER module may be employed in combination with the various other modules of the present invention to control how information is displayed when searching and sorting is performed, when the system alerts the user of new information that has been identified, when the user wants to analyze information that has already been searched, sorted, and/or reviewed, or when the user wishes to prepare reports.
One feature of the IPVIEWER module is the various ways in which it allows information to be displayed to the user. Information from intellectual property search results may be displayed as a list of pieces of intellectual property, typically organized either alphabetically, numerically, or by their anticipated relevance. A relevancy score, for example produced by the IPSORTER module, may be provided for each piece of intellectual property.

In addition to providing lists of intellectual property, the IPVIEWER module is able to produce various one dimensional and multidimensional plots of intellectual property where the pieces of intellectual property that are displayed are distributed within the plots based on sorting criteria which are used to determine the position of each piece of intellectual property along the various coordinates of the plot.

The IPVIEWER module utilizes the various sorting capabilities of the data management system to create these various one dimensional and multidimensional plots of intellectual property. In addition, the user is able to select which sorting criteria to employ to create these plots.

The different graphical depictions that the IPVIEWER module is able to produce enable users to better visualize the anticipated relevance of different pieces of intellectual property as well as the inherent relationships between different pieces of intellectual property. As will be illustrated herein, these depictions can be used by the user to rapidly identify various interrelationships between pieces of intellectual property, such as the earliest filings, the evolution of who filed what when, who are the early entrants into the field, who are the recent entrants, which are the most important pieces of intellectual property, who are the most significant inventors in the field and which are the most important assignees. Information such as which patents are likely to be dominant or improvement patents can also be deduced.

One advantage of the present invention is the ability of these depictions to allow the user to visualize the anticipated relevance of pieces of intellectual property that have not yet been reviewed relative to pieces of intellectual property that have already been reviewed. This assists the user in deciding what to review next. In addition, as the user reviews more and more information, the user can eventually decide when further review of the intellectual property is not worth pursuing because a point of diminishing return has been achieved. For example, the user may choose to stop reviewing new pieces of intellectual property because all of the intellectual property that has not been reviewed are illustrated as being significantly less relevant than what has already been reviewed.

As will be described in regard to the IPALERT module, the data management system may periodically identify new information to the user for review (e.g., newly identified pieces of intellectual property or information regarding relevant pieces of intellectual property). Using the display techniques provided by the present invention, the user is able to visualize the significance of the new information.
more readily. For example, certain aspects of the relevance of the new information can be anticipated based on how the new information is displayed relative to other pieces of intellectual property without the user having to review the new information itself.

1. Coordinate Systems of Plots Produced By The IPVIEWER Module

The plots produced by the IPVIEWER module may be one dimensional (e.g., a line of pieces of intellectual property organized based on one sorting criterion), two dimensional (e.g., a plot where pieces of intellectual property are organized based on two different sorting criteria), or three dimensional (e.g., a plot where pieces of intellectual property are organized based on two different sorting criteria). Four, or more dimensional sorting may also be employed. For example, three dimensional plots for different inventors or assignees may be viewed in combination as a four dimensional plot. A group of four dimensional plots for a particular assignee where each plot is for a different inventor may be viewed in combination as a five dimensional plot.

Although the below discussion is primarily directed to plots based on a Cartesian coordinate system, it is noted that other forms of multidimensional plots may also be constructed. For example, plots based on a polar coordinate system may also be created where relevance is a function of a displacement from the center. Different angles may relate to different assignees or inventors. Alternatively, different angles may relate to time (e.g., priority date, filing date, issuance date). Although the positioning of pieces of intellectual property along a coordinate is generally illustrated herein as being linear, it is noted that non-linear positioning along coordinates may also be employed (e.g., a log scale plot).

Each coordinate of a plot may define a different sorting system upon which the piece of intellectual property is positioned along the coordinate. As noted in regard to the IPSORTER module, the data management system of the present invention enables the system to perform many different forms of sorting, including sorting based on a specific inherent property (e.g., alphabetically or numerically by priority date, filing date, issue date, author, inventor, or assignee), multiple inherent properties, as well as by various sorting systems which anticipate the relevance of each piece of intellectual property.

As discussed above in regard to the IPSORTER module, anticipated relevancy ranking attempts to predict the relevance of information on behalf of the user. A wide variety of sorting systems may be employed to anticipate the relevance of pieces of intellectual property. Any of these sorting systems may be employed by the IPVIEWER module to plot pieces of intellectual property based on their anticipated relevancy ranking.

One dimensional and multidimensional plots may be produced by the system where at least one coordinate is based on an anticipated relevancy ranking system. Multidimensional plot may also be
produced by the system where at least two coordinates are based on different anticipated relevancy ranking systems.

Anticipated relevancy sorting may be based only on what was used to perform the search or may be based on a different set of information. Anticipated relevancy sorting may be based solely on required information, but preferably employs probable information and most preferably employs a shared inherent properties analysis.

The sorting systems used for each coordinate may be user selectable. For example, the user may choose to plot a group of patents where the X axis is sorted by priority date, the Y axis is sorted by issue date, and Z axis is sorted by assignee. The user may then independently modify each coordinate. For example, the user may choose to change the Y axis to sort by a customized sorting system for detecting infringement. The user may then choose to change the Y axis to sort by a customized sorting system for detecting patentability.

In addition to being user selectable, the sorting systems used for each coordinate may be customized by the user. As discussed in regard to the IPSORTER module, the user may create customized sorting systems which may be stored in the subject sub-database for the user.

As will be explained herein in greater detail, the various one, two, three or more dimensional plots enabled by the IPVIEWER module provide significant visual feedback benefits to the user. As a result, the user can evaluate a large body of intellectual property more rapidly, more effectively and more intelligently. It is anticipated that the ability of the IPVIEWER module to display groups of intellectual property by these various graphic visualization techniques will also assist the user in identifying key interrelationships between pieces of intellectual property. For example, it is anticipated that the IPVIEWER module will prove to be a valuable tool for mining intellectual property databases for various forms of information such as industry trends, the relationship between stock performance and patent filings, licensing opportunities, and patent infringement.

2. Use Of Visual Indicators In Plots

The appearance of each piece of intellectual property in a plot may be designed to communicate one or more inherent properties of the piece to the user. For example, the system may be color and/or shape coordinated to indicate who is the assignee or inventor. Alternatively or in addition, the system may provide various symbols to indicate inherent properties, such as that the piece has been the subject of a litigation, reexamination, reissue, assignment, license, or when the particular piece has expired. A legend can be provided on the plot to explain what each symbol, shape and/or color indicates.
The appearance of each different piece of intellectual property may also be used to indicate whether the piece has been reviewed, whether the user considered the piece relevant or irrelevant, and whether the user has recorded any comments regarding the piece, etc.

The various ways in which the appearance of different pieces of intellectual property may be used to communicate information to the user about the pieces is illustrated in Figure 6A. It is noted that a very large range of visual indicator schemes beyond what is shown in Figure 6A may be devised, all of which are intended to be encompassed in the present invention.

Figure 6A provides a two dimensional plot (relevance to patentability vs. issue date) where different pieces of intellectual property are illustrated as separate icons. The different shaped icons (circle, square) represent different assignees. Alternatively, the icons may be color coordinated to indicate who is the assignee or inventor. In the case of plots with pieces of intellectual property from multiple origins (e.g., U.S. Patents, PCT, European patents, other national patents), the shape and/or color of the icon can be used to indicate the origin of the piece associated with the icon.

Thick lines around an icon are used in the figure to indicate that a piece of intellectual property has been reviewed while thin lines around an icon are used in the figure to indicate that a piece has not been reviewed. An asterisk (*) is shown to appear in the upper right hand corner of an icon for pieces of intellectual property which the user has reviewed and deemed to be relevant. It is noted that pieces which are relevant will typically appear in a higher relevancy region of the plot (for example in the top portion of Figure 6A) than icons for pieces of intellectual property which have been reviewed and were not considered relevant.

The following symbols and their meanings are also used in Figure 6A: E = piece has expired; L = piece named in a litigation; R = reexamined; F = has related foreign applications. Each icon may also include a series of numbers, such as the number of references that cite this piece, the number of references it cites, the number of items are associated with the piece in the IPHISTORIAN, etc. (not shown).

With the information provided in the plot shown in Figure 6A, a user observing the plot could view icon 612 corresponding to a particular patent and know without having reviewed the patent that (a) it is assigned to a particular assignee based on its shape; (b) it is likely to be highly relevant since it appears in the upper right hand corner of the plot; (c) it was subject to a litigation because an L is shown within the boundary of the icon; (d) it has been foreign filed; and (d) it has not yet been reviewed because the lines around the icon are thin.
3. One Dimensional Visualization Techniques

Even in its simplest form, the relative positionings of pieces of intellectual property in a one dimensional plot communicate more than just an order of their anticipated relevance to the user. For example, the relative positioning of a piece of intellectual property communicates a degree of anticipated relevance both in absolute terms and relative to other pieces shown in the plot.

Assume that there are five pieces of intellectual property associated with a particular assignee and the sorting system believes that two pieces are highly relevant to infringement, one is moderately relevant, and the two others are likely to be of little relevance. As illustrated in Figure 6B, the five pieces of intellectual property may be illustrated in a line having an order: first piece 614, second piece 616, third piece 618, fourth piece 620, fifth piece 622, where the first and second pieces 614, 616 are close to each other on the far left side, the third piece 618 is in the middle and the fourth and fifth pieces 620, 622 are on the far right side. As a result, the user can visualize the relative anticipated relevance of the various pieces both in absolute terms and relative to each other. This facilitates the review of large numbers of pieces without having to actually review any given piece.

As described above, each piece of intellectual property may be illustrated as an icon. It is noted that the system may be designed such that the user may select any piece of intellectual property by simply selecting the icon. Selecting the piece of intellectual property may cause the selected piece to be displayed, to be added to a list, to be ordered and sent to the user, or any other function which may be performed in response to selecting a piece of intellectual property.

In regard to viewing a piece of intellectual property associated with an icon, the user may simply select the icon in order to cause a window to appear with that piece of intellectual property, or a selected display format of the piece. The display format for the piece of intellectual property may be user selectable and optionally user customizable. Information regarding the desired display format can be stored in the applicable sub-database.

Figure 6B illustrates icons being organized based on their anticipated relevance to infringement, i.e., the associated pieces of intellectual property are sorted using a sorting system designed to anticipate their relevance to infringement. As illustrated in Figure 6C, the same five pieces of intellectual property may also be sorted by the system based on another sorting scheme, in this case patentability. As illustrated in Figure 6C, the five pieces have both a different order and a different relative spacing than in Figure 6B. As can be seen in Figure 6C, the third piece 618 is the most highly relevant to patentability. Meanwhile, the fourth and fifth pieces 620, 622 are less relevant to patentability than infringement. The first and second pieces 614, 616 appear to be of little relevance to patentability or infringement.
Figure 6D illustrates the icons being organized based on their priority date. As illustrated, the first and second pieces 614, 616 have the earliest priority date, followed by the fifth piece 622, and then by the fourth and third pieces 620, 618.

A feature of the present invention is the ability to display the plots shown in Figures 6B-6D in combination and allow the user to garner the information that is inherently communicated by these plots alone and in combination. For example, the early priority dates of the fourth and fifth pieces 620, 622 in combination with their high degree of relevance to infringement reveal that these pieces are likely to be dominant pieces of intellectual property. The later but not recent priority date of the third piece 618 in combination with the relatively high degree of relevance to patentability and moderate degree of relevance to infringement reveals that the assignee was moving in the direction of the user's interest. However, the most recent filings of the first and second pieces 614, 616, in combination with their low degree of relevance to infringement and patentability reveal that the assignee likely has adopted a different approach than what is being analyzed by the user.

A further advantage of displaying a series of one dimensional plots in combination is illustrated in regard to Figures 6E-6G. Figure 6E illustrates a series of one dimensional plots 630A-630E aligned in parallel with each other. Plot 630A includes 17 pieces to assignees: Albert Corp., Bruce Corp., Charles Corp., and David Corp. Meanwhile, plot 630B includes the 7 pieces appearing in plot 630A which are assigned to David Corp., plot 630C includes the 5 pieces appearing in plot 630A which are assigned to Bruce Corp., plot 630C includes the 3 pieces appearing in plot 630A which are assigned to Albert Corp., and plot 630D includes the 2 pieces appearing in plot 630A which are assigned to Charles Corp. The order of plots 630B-630E is based on the number of patents, followed by the alphabetical order of assignees with the same number of pieces. Within each of plots 630A-630E, the pieces are organized based on their priority date.

As can be seen from the combination of plots shown in Figure 6E, although David Corp. has the most pieces of intellectual property, Bruce Corp. has pieces with earlier priority dates. This might signal that Bruce Corp. actually has a stronger position even though there are fewer pieces. Although Charles Corp. only has two pieces, these pieces have the earliest priority dates. The relatively early priority dates of these pieces make them potentially significant. Interestingly, Charles Corp. shows no recent pieces of intellectual property. This may signal that Charles Corp. has discontinued work in this area or perhaps has changed names or been acquired. The later priority dates of Albert Corp. reveal that Albert Corp. is a late entrant into this field. This may be of interest since it signals new competition.

Figure 6F illustrates a series of one dimensional plots 640A-640E where the 17 pieces of intellectual property are sorted by relevance to infringement. As can be seen, despite having the most pieces, David Corp. is anticipated to pose the least significant risk for infringement. Meanwhile, Bruce
Corp is anticipated to pose a risk in regard to one piece but the other pieces appear to be less troublesome. The two pieces to Charles Corp. are shown to have a high level of anticipated relevance to infringement. Coupled with their early priority dates (See Figure 6E), these pieces would appear to potentially present a significant issue regarding infringement. In regard to Albert Corp., the high relevance of these later filed pieces reveal that Albert Corp. is of a high degree of relevance to the user. In addition, the combination of the late priority dates and the high degree of relevance to infringement suggest that Albert Corp. is pursuing a very similar approach as the user.

Figure 6G illustrates a series of one dimensional plots 650A-650E where the 17 pieces of intellectual property are sorted by relevance to infringement. As can be seen in the figure, Albert Corp. appears to have a high degree of relevance to the user in regard to patentability. This, in combination with the later priority dates of the pieces and their high degree of relevance in regard to infringement would signal that Albert Corp. may be a direct competitor of the user. In further regard to Figure 6G, the moderate relevance of the pieces to Charles Corp. in regard to patentability, in combination with their early priority dates and high degree of relevance to infringement is consistent with a profile for a dominant patent. The low degree of relevance to patentability of Bruce Corp. and David Corp. indicate that these entities are less likely to be direct competitors.

As can be seen from the discussion provided in regard to Figures 6A-6G, a great deal of information can be derived from the one dimensional visualization techniques provided by the system of the present invention without having to read any of the pieces of intellectual property. For example, the display format allows users to visualize the competitive landscape in manners which are not possible from lists of intellectual property, regardless of whether the user has reviewed the items on the lists. When information is displayed in a graphical format, the user can readily determine which assignee is the most active patent filer, which assignee is the earliest patent filer, which assignees are later entrants into the field, etc. This information may be useful to allow a user to rapidly anticipate which assignee probably has the dominant patent position. It also enables the user to decide what is the most important information and therefore what information should be reviewed first. Further advantages of these techniques will become apparent to users as the system is employed.

It is anticipated that the display formats made available by the IPVIEWER module will enable users to determine a great deal of information from large groups of intellectual property beyond the information described above. For example, as was noted in regard to the IPFINDER module, one difficulty associated with searching is changes in terminology. One dimensional plots, such as those shown in Figures 6B-6G may be formed where each different plot represents intellectual property that possesses a particular key word. This display format allows the user to readily observe when different terms fall into and out of favor.
4. Multidimensional Visualization Techniques

The IPVIEWER module provides multidimensional plots of intellectual property where sorting criteria is used for each coordinate to independently determine where to position each piece of intellectual property along each coordinate of the plot. These plots may be based on a Cartesian coordinate system (e.g., x, y, z axes), a polar coordinate system (e.g., r and θ) or any other multidimensional coordinate system.

As noted in regard to the IPSORTER module, the data management system of the present invention enables the system to perform many different forms of sorting, including sorting based on a specific inherent property (e.g., alphabetically or numerically by priority date, filing date, issue date, author, inventor, or assignee), multiple inherent properties, as well as by various sorting systems which anticipate the relevance of each piece of intellectual property. Different sorting systems or the same sorting system may be used for each coordinate. The sorting systems used for each coordinate may be user selectable. In addition, the sorting system which the user selects may also be a sorting system which has been customized by the user or optimized by the system for the user based on the user's feedback.

It is preferred that at least one of the coordinates used to form the multidimensional plots is a time based coordinate (e.g., priority date, filing date, or issue date). In particular, it is preferred that the priority date is used as the time coordinate since the date of original filing is the most relevant to establishing when an invention occurred. Further, the late issuance of a patent with an early priority date is important for the user to identify. For example, patent practitioners commonly maintain continuations of their more important cases so they can modify the claims at a later date to catch infringers after the market develops.

Figures 6H-6N provide a series of different multidimensional plots according to the present invention. Since the user may select, and optionally customize the sorting system which controls how pieces of intellectual property are sorted, a very large number of multidimensional plots may be constructed using the data management system of the present invention, all of which are intended to be encompassed by the present invention.

Figure 6H illustrates an example of a two dimensional plot in which the x coordinate is time and the y coordinate is anticipated relevance to infringement. As shown in the figure, both the priority date (■) and issue date (△) for each piece of intellectual property (in this case patents) is shown in the figure. The symbol △ is also intended to represent an icon. The use of icons is discussed above. Also shown in the figure at the union (●) of the different pieces of intellectual property is the filing date. As can be seen in the figure, patents 660A, 660B and 660C are shown to have the same early priority date. This is
significant since patents with an early priority date are likely to have broad claims. Also shown is that patent 660C issued substantially after 660A. This may be significant since patents with a later issue date and an early priority date frequently have broad claims or claims which are drafted to cover existing products.

Patents 660D-660G are shown to have later priority dates and no subsequent related patents. This information, in contrast to patents 660A-660C may reveal that the patentee makes it a practice to keep the 660A-660C patent family pending, further revealing the probable importance of this patent family. If patents 660A-660C, once reviewed, are found to be important, user may place an alert (See IPALERT module) on any news regarding this patent or the issuance of any patents which claim priority to this patent.

Patent 660E is shown to have a later priority date and a high degree of relevance. This patent, given its priority date and relevance is likely to be an improvement patent and therefore relevant to the user. If the patent 660E is found to be an improvement patent, it may be important to the user to place an alert (See IPALERT module) on any news regarding this patent or the issuance of any patents which claim priority to this patent.

Figure 61 illustrates an example of a two dimensional plot in which the x coordinate is priority date and the y coordinate is anticipated relevance to infringement. In this figure, the symbol ■ represents an icon for a U.S. patent, △ represents an icon for a published PCT application, and ● represents an international patent, such as a patent from the European Patent Office. Although not shown in the black and white figure, it is noted that the plot could be multiple colors to show, for example, different assignees, different inventors, what has been reviewed and what has not been reviewed, the patent which have been deemed relevant, etc.

By illustrating a group of patents in the manner shown, certain patterns can become apparent upon review which are highly useful to the user. If dominant patents have been issued, it is likely that these patents will be positioned in the upper left corner of the plot (indicated by circle 652) since those patents have early priority dates and thus will be less encumbered by prior art. As can be seen, this display format allows dominant patents to be readily identified.

Improvement patents are likely to be highly relevant and have later priority dates. The patents in the upper right portion of the plot (indicated by circle 654) are likely to be improvement patents.

Patents positioned on the left side which are not highly relevant may be of interest to the user as potentially being relevant to either invalidate one of the dominant patents, or for seeking to achieve broad claims via a continuation application or a reissue application. It is noted that the plot uses the priority date as the x axis. A symbol indicating that the patent is either a member of a chain of continuations and divisionals or has issued within the last two years can be added to plot to signal the
user that it is likely that the chain of copendency is likely to still be alive or to indicate that applying for a broadening reissue is still possible.

As discussed in regard to the IPALERT module, the user may request the system to periodically monitor for new information, such as the issuance of new relevant patents or the occurrence of new relating to selected patents. As illustrated in Figure 61, the user may readily draw a circle in the plot of Figure 61 around a region which corresponds to where dominant patents or improvement patents would be positioned. The system may use this positioning of the patents in the plots in combination with the IPALERT module to evaluate the anticipated relevance of any newly identified information. In the instances where the user visits the data management system, the plot may be designed to alert the user of new information in the sections of the plot which are likely to contain relevant information, for example by causing the new information in those sections to flash or be of a particular color.

Figure 61 illustrates an example of a two dimensional plot in which the x coordinate is the reference's effective date as prior art under 35 U.S.C. §102 and the y coordinate is anticipated relevance to patentability. In this figure, the symbol □ represents an icon for a U.S. patent which is positioned at its 35 U.S.C. §102(e) date, △ represents an icon for a published PCT application or an international application or patent which is positioned at its publication date, and ○ represents a PCT application or international patent which is related to a U.S. application which is positioned at the 35 U.S.C. §102(e) date that a related U.S. patent would have if it were to issue. The dashed line 655 represents either a filing date, a date of conception, or a date of actual reduction to practice which the user can utilize to specify what is the dividing line for what constitutes prior art to the user's invention.

By illustrating a group of patents in the manner shown, certain patterns can become apparent upon review which are highly useful to the user. Patents which are in the upper right corner (indicated by circle 656) are likely to be the most relevant because these patents are most likely to specify an invention which the user is attempting to claim. Patents which are in the upper left corner (indicated by circle 658) are likely to be relevant due to their high relevance score. Patents in this region can represent early work that was done in the area. Patents in this area may indicate to the user that the search terms being used are too broad and that the application being searched for patentability purposes is an improvement patent. Sometimes, work is done early on and then later forgotten, only to be reinvented many years later. Patents in the upper left may also signal this possibility.

Patents in the middle section (indicated by circle 660) of the plot represent patents which may contain some but not all of the features of the claimed invention and thus may serve the basis for unpatentability for obviousness. Patents at the bottom of the plot (indicated by circle 662) likely represent the general state of the art.
As noted in the figure, the entries shown are positioned on the x axis at their effective date as prior art under 35 U.S.C. §102. Some entries have a later date as prior art (e.g., a published PCT application or a published international patent) but would have the effective date shown if a related U.S. application were to issue. Published applications in this category can be very important for the user to identify. Further, published applications in this category can be very important to monitor using the IPALERT module for when a corresponding U.S. patent issues, if ever.

Figure 6K illustrates an example of a two dimensional plot of the information that is shown in Figures 6G and 6l. In this instance, the x coordinate is priority date (criterion for Figure 6G) and the y coordinate is anticipated relevance to infringement (criterion for Figure 6l). In Figure 6K, as in Figures 6G and 6l, the symbols Δ, ●, *, and ■ represent icons corresponding to 17 patents assigned to Albert Corp., Bruce Corp., Charles Corp., and David Corp. respectively.

As can be seen from Figure 6K, the role of patents to Charles Corp. (*) as dominant patents is more apparent than Figures 6G and 6l independently since these patents are positioned in the portion of the plot (indicated by circle 664) which typically correspond to dominant patents. It is also more readily apparent that the patents to Albert Corp. (Δ) are likely to be improvement patents given then position on the plot (indicated by circle 666). Thus, as can be seen from Figure 6K, useful information can be discerned from the relative positioning of different pieces of intellectual property when viewed in the one dimensional and multidimensional plots provided according to the present invention.

Figure 6L illustrates an example of a radial plot where the distance (r) from the center is inversely proportional to the anticipated relevance of a piece of intellectual property. Different angles may relate to different assignees or inventors. Alternatively, different angles may relate to time (e.g., priority date, filing date, issuance date). It is further noted that although the positioning of pieces of intellectual property along a coordinate axes is generally illustrated as being linear, it is noted that nonlinear positioning may also be employed (e.g., a log scale plot).

As illustrated, the angular positioning (θ) of each piece of intellectual property is based on the anticipated relevance of the assignee to which the pieces are assigned relative to each other. For example, four assignees are illustrated, those being the same assignees as are illustrated in Figures 6E-6F. Patents to Charles Corp. (*) are anticipated to be the most relevant and are positioned at 0° to 90°. Patents assigned to Albert Corp. (Δ) are anticipated to be the second most relevant and is positioned at 90° to 180°. Patents assigned to David Corp. (■) are anticipated to be the third most relevant and is positioned at 180° to 270°. Patents assigned to Bruce Corp. (●) are anticipated to be the least relevant and are positioned at 270° to 0°.

Figures 6M and 6N illustrate two examples of a three dimensional plot. In both instances, the x axis corresponds to time, the y axis corresponds to anticipated relevance, and the z axis corresponds to
assignee. In the case of Figure 6M, the three dimensional plot corresponds to a cube where icons are floating in the cube. The dashed lines shown on the top and right side of the cube reflect the dividing line for different assignees. It is noted that when the cube shown in Figure 6M is viewed from the top, the cube appears like the plot shown in Figure 6E (e.g., time vs. assignee). When viewed from the side, the cube appears like the plot shown in Figure 6F (e.g., relevance vs. assignee).

In the case of Figure 6N, the three dimensional plot corresponds to slices of the cube laid upon each other. Each slice may be viewed individually by the user. Alternatively, overlays of one or more slices may be viewed by the user.

As can be seen by the above discussion, a very wide array of one, two, and three dimensional plots may be generated by the module and displayed to the user. The user can select the various sorting systems for the different coordinates of the plot based on any inherent property, group of inherent properties, or relevancy ranking formula that the user chooses to form the various plots. From these plots, a great deal of information can be derived from the plots. As the IPVIEWSR module is used further, additional forms of information can be readily garnered by visualizing the pieces of intellectual property in different manners.

6. Pattern Recognition of Intellectual Property

It is noted that the illustrations and discussions provided in regard to Figures 6A-6N are intended to demonstrate the great deal of information which a user can derive from the visualization techniques provided by the system of the present invention. It is noted that the above discussion centers around what information the user can derive from pieces of intellectual property and their inventors and/or assignees without having to read any of the pieces of intellectual property. This enables a user to decide what is the most important information and therefore what information should be reviewed first.

As illustrated by the above discussion regarding the IPVIEWSR module, the plots provided by the IPVIEWSR module allow users to visualize the competitive landscape in manners which are not possible from lists of intellectual property, regardless of whether the user has reviewed the items on the lists. For example, as discussed above, the users can visualize patterns which reveal information about the importance of different pieces of intellectual property, their inventors and assignees. It should be noted, however, that the information that can be obtained is not limited patent law questions but also extend to business information such as when did an entity began doing research in the field?; how active is the entity in the field?; who are the early innovators in the field?; who are the later entrants in the field?; etc. These types of information are not readily discernable from currently available search tools.
7. **Visual Evaluation Of The Effectiveness Of A Search Or Sorting System**

Displaying search results as a distribution based on relevance allows the user to evaluate the effectiveness of the search criteria being used. For example, graphical visualization of the search results can provide feedback to the user whether the search terms being used are effective. In one embodiment, one or more pieces of intellectual property known to be highly relevant (or known to be irrelevant) may be labeled as such. Then, by seeing the relative positioning of the highly relevant pieces of intellectual property (or irrelevant ones), the user can visually observe whether the search or sorting strategy being employed is effective. For example, a known relevant piece of intellectual property appearing in region of the plot associated with low relevance serves as negative feedback; a known relevant piece of intellectual property appearing in a high relevance region serving as positive feedback; a known irrelevant piece of intellectual property appearing in a high relevance region serving as negative feedback; and a known irrelevant piece of intellectual property appearing in a low relevance region serving as positive feedback.

As discussed in regard to the IPSORTER module, iterative searching and sorting of information can be performed as additional pieces of intellectual property are reviewed and additional information regarding the pieces of intellectual property are stored in the system. The precision with which the IPSORTER module’s predicts relevance increases over time as more and more information is provided. As the effectiveness of the IPSORTER module to predict relevance increases, the probative value of the plots provided by IPVIEWER module also increase.

The combination of the visualization techniques provided by the IPVIEWER module, in combination with the iterative searching and sorting of information enabled by the IPSORTER module, enable the user to receive valuable visual feedback from the system regarding the effectiveness of the search and sorting terms and techniques which the user is employing. For example, once the user has reviewed information and provided feedback to the system, the user preferably observes that the system is becoming more and more effective in its relevance predicting abilities. As a result, as more information is provided to the system, the relative positioning of a piece of intellectual property that the user has not yet reviewed to pieces that the user has already reviewed preferably better reflects what the user will consider to be its degree of relevance once the user reviews the new piece of intellectual property.

As discussed in regard to the IPSORTER module, the user may request the IPSORTER module to optimize the sorting system to reflect the user’s feedback. In one embodiment, this feedback may include the user moving icons, such as those illustrated in Figures 6A-6N to reflect positionings that correspond to what the user considers to be their relative relevance. The IPSORTER module may then take that positional information in order to identify a sorting system from its library of possible sorting.
systems to find a sorting system which best approximates the user's relevancy positioning. Optionally, the IPSORTER module may take one of the sorting systems in its library and use information which the user has recorded into the system in order further customize the sorting system.

8. Visual Comparison Of Different Plots
A further feature of the one dimensional and multiple dimension plots is the ability of the system to compare plots generated based on different search results and/or different sorting systems. Comparison of different plots may be performed by an overlay of the different plots or by other visual comparison techniques. For example, the positioning of selected pieces of intellectual property may be tracked in different plots. It is anticipated that the ability to visually compare the results of different searches using the graphical display formats of the present invention will prove to be a useful tool for the user. It is also anticipated that the ability to visually compare the results of different sorting systems using the graphical display formats of the present invention will also prove to be a useful tool for the user.

As noted in regard to the IPHUNTER module and IPALERT module, a feature of the present invention is the ability of the system to identify new pieces of intellectual property as well as new information relating to pieces of intellectual property that have already been deemed reviewed and relevant. Once identified, the user is alerted to the existence of the newly identified information, if not the information itself. In view of the great deal of information that can be readily discerned from the various plots provided by the IPVIEWER module, the system of the present invention is well designed to allow user's to determine the relevance of pieces of intellectual property that the user has not yet reviewed based on where the pieces are positioned on a plot according to the present invention. For example, in regard to Figure 6K, if a new patent were to be identified and appear in section 664, the user would be able to anticipate that the patent is highly relevant, and likely to be a dominant patent. If a new patent were to be identified and appear in section 666, the user would be able to anticipate that the patent is highly relevant, and likely to be an improvement patent. If new patents by other assignees are found which appear in section 666, this may indicate to the user that a new competitor has entered the field.

The utility of the plots of the present invention also extend to new non-intellectual property information which is associated with pieces of intellectual property deemed relevant to the user. For example, also in regard to Figure 6K, if new information relating to a patent appearing in sections 664 or 666 were identified, the user, observing the plot, would immediately be able to identify the relevance.
of the associated piece of intellectual property and hence the reason why the user was alerted of the identification of the new information regarding that piece of intellectual property.

10. Selecting And Ordering Of Information

From Plots Provided by the IP Module

Figure 6O illustrates a novel method by which users may select groups of intellectual property from a one dimensional plot. Figure 6O corresponds to Figure 6F. Figure 6P illustrates a novel method by which users may select groups of intellectual property from a two dimensional plot. Figures 6Q and 6R illustrate another novel method by which users may select groups of intellectual property from a one or two dimensional plot.

As illustrated in Figures 6O and 6P, the user may draw a box 690 (circle, loop, etc.) around several of the pieces of intellectual property. In the case of Figure 6O, the box 690A is positioned around the patents which have the highest relevancy rating, e.g., the patent in the right side of each plot. In the case of Figure 6P, box 690B is around the patents that are in the dominant patent region and box 690C is around patents in the improvement patent region. As can be seen from Figures 6O and 6P, both the one and two dimensional display formats allow the user to rapidly select a group of intellectual property.

Figures 6Q and 6R illustrate another novel method by which users may select groups of intellectual property from a one or multidimensional plot respectively. As illustrated in Figures 6Q and 6R, the plots include one or more lists 692 of groupings of the patents that are displayed. The groupings may be by assignee, inventor, art unit, examiner or another grouping that may be of interest to the user. For example, the grouping may be a list of the patents that are most frequently cited to or cited by the displayed patents. The system may also be designed to allow the user to select a particular grouping. Shown in Figure 6Q is a grouping based on assignee. Shown in Figure 6R are groupings of the top three assignees, inventors, and the most frequently cited patents.

As illustrated, the system may include a relevancy threshold bar 694. As noted elsewhere, the plots of the present invention can include an anticipated degree of relevance as the value for one of the axes. Accordingly, it is desirable to be able to distinguish between patents which are below a threshold degree of relevance and those patents which are above the threshold degree of relevance. The relevancy threshold bar 694 can be moved within the plot to set that threshold degree of relevance.

As also illustrated, the list may indicate the number of patents associated with each entry on the list. The number of patents shown in the lists 692 may be based on the number of patents which have an anticipated relevance that is greater than the degree of anticipated relevance reflected by the position of the relevancy threshold bar 694. For example, while Figures 6F and 6Q are based on the same data, the
number of hits and ordering shown in Figure 6Q better reflects which assignees are anticipated to be the most relevant to the user.

Selecting a group of intellectual property from the plots shown in Figures 6Q and 6R may be performed by selecting one or more members of the lists 692, optionally in combination with positioning of the relevancy threshold bar 694.

Selecting a group of intellectual property may be associated with a wide variety of functions that can be performed by the system of the present invention. For example, selecting may be performed in order to specify that the selected pieces are relevant, that the selected pieces are to be reviewed, to order all or a portion of the selected pieces, in order to specify that the selected pieces should be included in a report, in order to specify that the selected pieces should be included in an Information Disclosure Statement, etc.

It is noted in regard to Figures 6O, 6P, 6Q and 6R that these display formats also allow the user to readily select all pieces of intellectual property having a particular inherent property by simply selecting one of the series of plots. For example, as illustrated in regard to Figure 6O, the user may select all pieces of intellectual property displayed in the figure to Charles Corp. by either drawing a box 695 (circle, loop, etc.) around all entries in the Charles Corp. plot, by selecting (e.g., double-clicking) the Charles Corp. plot, or by selecting the Charles Corp. entry in the legend. It is envisioned that a wide variety of different user interface techniques (e.g., control buttons, right mouse clicks) all well known in the art may be performed to make the actual selections.

In regard to the various one dimensional and multidimensional display formats, for example such as those shown in Figures 6A-6R, a further feature of the present invention is the ability to link the icons shown in the plots with all or a portion of the associated piece of intellectual property. As a result, the user may select an icon corresponding to a piece of intellectual property and cause all or a portion of that piece of intellectual property to be displayed to the user as a result. This would enable a user to view a plot of intellectual property, select an icon corresponding to a particular piece of intellectual property, have all or a portion of that piece of intellectual property be displayed to the user, and have the user input comments regarding that selected piece of intellectual property (e.g., via a display such as Figure 4). Once the piece of intellectual property has been reviewed, and optionally after comments regarding the piece of intellectual property has been entered, the system could return the user to the plot to allow the user to select another icon. Optionally, the system may select the patent that has not yet been reviewed that has the highest degree of anticipated relevance. The system could cause the appearance of the icons to be modified to reflect that the user has reviewed an icon and/or that comments regarding a piece of intellectual property has been entered into the system.
11. **Illustration of the User Feedback Loop**

Figure 6S illustrates some of the user feedback loops that may be used in the system of the present invention and the interrelationships the feedback loops create between the IPFINDER, IPSORTER, interfaces for reviewing patents and providing feedback (e.g., Figure 4) and interfaces for showing a plot of sorting results (e.g., Figures 6A-6R).

As illustrated in Figure 6S, the user may input information into the system. This enables the IPFINDER to initiate a search and sorting. As noted elsewhere, a variety of different forms of information may be input into the system in order to enable the system to perform a search and sorting (e.g., keywords, list of important inventors, assignees, list of patents, etc.).

Once an initial search and sorting is performed, the user may review the results. As has been discussed, the user may visualize the results as a list of patents or as a plot of the patents graphed in one, two or more dimensions.

As illustrated, the user may initially view the plot, for example, in order to determine what to review first. From the plot, the user may modify the search criteria and perform a new search, modify the sorting criteria and perform a modified sorting, and/or may review the patents.

Alternatively, the user may initially review the patents prior to reviewing the plot. In the process of reviewing the patents, the user may modify the search criteria and perform a new search, modify the sorting criteria and perform a modified sorting, and/or provide feedback regarding the patents reviewed which the system can use to modify the searching and/or sorting criteria.

As also illustrated, the user may shift between viewing the plot and reviewing the patents, with or without performing a new search or sorting.

When the user reviews the patents (either with or without viewing the plot), the user may input feedback into the system in regard to the relevance of the patents reviewed or in relation to providing modified searching and sorting criteria. As the review process proceeds, the user input feedback may be used to perform a new search or perform a new sorting in view of the feedback. The user may then review additional patents as a result of the new search and/or sorting or may review the modified plot generated in response to the modified searching and/or sorting.

As can be seen from Figure 6S, the user feedback loops utilized in the system of the present invention provides the user with a great deal of flexibility in regard to performing new searches, new sorting, reviewing patents, and visualizing searching and sorting results.
E. **IPHISTORIAN**

The IPHISTORIAN refers to a database or other form of memory containing pieces of intellectual property and various forms of information associated with each piece of intellectual property in the database. Actual copies of the information or references to where the information can be found may be stored in the IPHISTORIAN database.

Examples of types of information that may be stored in the IPHISTORIAN database relating to a particular piece of intellectual property include, but are not limited to:

(a) various government proceedings and filings which cite the piece of intellectual property (e.g., reissue, reexamination, opposition, certificate of correction, payment of maintenance fees, expiration, terminal disclaimer, assignment, licensing, regulatory filings (e.g., FDA filings), SEC filings, federal grant applications, and court filings);

(b) information relating to products that are protected by the intellectual property (e.g., product information which cites the piece of intellectual property and product information which cites the author(s), inventor(s), owner(s), assignee(s), and license(s) of the piece of intellectual property and employs similar technology to what is claimed by the piece of intellectual property);

(c) information relating to the author(s), inventor(s), owner(s) and licensee(s) of the intellectual property (e.g., websites, news articles, publications, corporate filings, government regulatory filings, address, email and phone changes);

(d) information relating to products that employ similar technology to what is claimed by the piece of intellectual property and therefore may infringe the piece of intellectual property; and

(e) various other forms of information which is likely to be relevant to the intellectual property or the people, products and business entities to which the intellectual property may be related.

Even after a user has identified a piece of intellectual property as being relevant, numerous questions may still exist surrounding that piece of intellectual property. For example, the user may wish to know: (a) who currently owns it? (b) has it been licensed? (c) has it expired? (d) has it been maintained? (e) has it been renewed? (f) has it been the subject of a litigation? (g) has it been rendered invalid? (h) has it been reexamined? (i) has it been reissued? (j) has it been opposed? (k) are there related applications or foreign counterparts? (l) what is an illustration of the family of patents and applications relating to the patent? (m) does the intellectual property protect any commercial products or processes? (n) are there third party products with very similar technology to what is claimed? (o) has there been any government filings such as an FDA filing or federal grant application which cites the piece of intellectual property? and (p) has there been any news citing the intellectual property, its inventors, authors, owners, or product(s) and process(es) it protects? Contained in the information
stored in the IPHISTORIAN database relative to each of the pieces of intellectual property may be found answers to these questions for each piece of intellectual property.

The intellectual property centric organization of the IPHISTORIAN database simplifies the retrieval of answers to questions which the user may have regarding a piece of intellectual property since it is unnecessary for the user to search multiple databases to find these different answers. By also organizing information about a piece of intellectual property by various subcategories of information, the use is able to rapidly navigate the available information for what the user is looking for.

Figure 7 illustrates the intellectual property centricity of the IPHISTORIAN database. As illustrated, information 14 regarding a piece of intellectual property 12 is organized around the piece of intellectual property 12 to which the information pertains. As illustrated in Figure 7, information stored relative to each piece of intellectual property may be organized based on a variety of subcategories such as author 16, inventor 18, assignee 20, licensee 22, products 24, and competitors 26. Different and/or additional subcategories 28 of information may also be included in the IPHISTORIAN database for a given piece of intellectual property.

When a user accesses information from the IPHISTORIAN database regarding a particular piece of intellectual property, the information may be displayed to the user where the information is organized by category, such as the above described subcategories. Figure 8 illustrates a graphical user interface with an example of information that may be contained in the IPHISTORIAN database and displayed to the user for a particular piece of intellectual property. As illustrated, the information is divided by category and indicates the date it was added to the IPHISTORIAN database, and a list of pieces of intellectual property to which the information also relates. The system may also display the information’s anticipated relevance to the piece of intellectual property. For each user (or subject being searched), the system may also determine and display an anticipated relevance for each entry for the particular user based on information from each user’s subject sub-database.

As illustrated in regard to Figure 8, the IPHISTORIAN database is intended to include a wide variety of forms of information regarding different pieces of intellectual property. Databases that are intellectual property centric exist which include pieces of intellectual property as well as various patent office related information.

One feature of the present invention is the extension of the content of the IPHISTORIAN database to include a wide variety of information that is not typically associated with databases of intellectual property. In particular, the IPHISTORIAN database is intended to include forms of information which are not intellectual property related and thus are not recorded in databases provided by the various government entities which issue pieces of intellectual property (e.g., the various patent offices). Intellectual property related information such as terminal disclaimer, reassignment, reissue,
reexamination, opposition, certificate of correction, maintenance fee payments are forms of information which are typically tracked by patent offices. By contrast, the other forms of information listed in Figure 8 (e.g., news about the inventors, assignee, products, litigation, regulatory filings, securities filings, grant applications, scientific publications, conferences, periodicals, and suspected competitors) are representative of forms of information that are not maintained in databases of intellectual property and are obtained from sources other than the government entities which issue pieces of intellectual property.

It is noted that the IPHISTORIAN database may include information which is obtained by monitoring one or more sources other than the government entities which issue pieces of intellectual property. The IPHISTORIAN database may also include information which is obtained by searching the Internet for information contained in websites other than websites maintained by government entities which issue pieces of intellectual property. The IPHISTORIAN database may also include information which is obtained by searching non-intellectual property related databases and wire services for information relating to a particular piece of intellectual property.

Information that is stored in the IPHISTORIAN database may be stored in the IPHISTORIAN database database because it specifies the particular piece of intellectual property. In addition, information may also be stored in the IPHISTORIAN database which does not specify the piece of intellectual property but nonetheless is anticipated to be relevant to the piece of intellectual property. For example, the IPHUNTER module, which is described herein, may include information in the IPHISTORIAN database which the IPHUNTER module believes is highly likely to be of interest to a user who finds the piece of intellectual property relevant. In this regard, the system may relevancy rank the information in the IPHISTORIAN database for a particular piece of intellectual property for the user in view of information stored in the user's subject sub-database.

The IPHISTORIAN database may be formed and subsequently updated by monitoring public and private databases, and the Internet for information relating to different pieces of intellectual property. This function of forming and updating the IPHISTORIAN database may be performed by the IPHUNTER module. Optionally, users and system administrators may also identify information relating to a particular piece of intellectual property which may then be stored in the IPHISTORIAN database. As new information is identified by the IPHUNTER module and stored in the IPHISTORIAN database, the IPALERT module may operate to notify users of the newly identified information.

Several significant advantages are provided by maintaining an intellectual property database where all available information about a piece of intellectual property (and information anticipated to be relevant to the piece of intellectual property) is stored in the IPHISTORIAN database, organized around that piece of intellectual property. For example, the IPHISTORIAN database allows a user who has
identified a piece of intellectual property of interest to readily identify all available information which 
has been identified and stored in the data management system relative to that piece of intellectual 
property. In databases such as those provided by the Dialog Corporation, a user has to search multiple 
different databases to find all the available information regarding a piece of intellectual property. By 
contrast, the IPHISTORIAN database allows the user to access one database and returns all available 
information for a given piece of intellectual property.

A further feature of the IPHISTORIAN database is its use in combination with the IPFINDER 
module. As illustrated in Figure 8, the IPHISTORIAN database may contain information indicating a 
relationship between a given piece of intellectual property and other pieces of intellectual property. The 
relationship between these different pieces of intellectual property may be used by the IPFINDER module 
as an inherent property which may be used in inherent property searching. For example, the 
IPHISTORIAN database may record information relating to a litigation involving five patents with each of 
the patents. When the IPFINDER module searches for intellectual property with shared inherent 
properties to one of the five patents, the information stored in the IPHISTORIAN can serve to identify the 
shared inherent property that the five patents were cited in the same litigation.

Yet a further feature of the IPHISTORIAN database is its use in combination with the IPSORTER 
module. The amount of information that is identified relating to a particular piece of intellectual 
property may be employed by the IPSORTER module to influence the relevancy ranking of a particular 
piece of intellectual property, it being assumed that a piece of intellectual property that is newsworthy is 
more likely to be relevant to various matters. Interrelationships between different pieces of intellectual 
property identified within information stored in the IPHISTORIAN database may also be used to influence 
the ranking produced by the IPSORTER module. Particular types of information may be given greater 
weight than other types of information when the IPSORTER module ranks different pieces of intellectual 
property.

Yet a further feature of the IPHISTORIAN database is its use in combination with the IPALERT 
module. The need to know information regarding a piece of intellectual property is not static, it is 
dynamic. The IPALERT module may be used to notify users when new information relating to a selected 
piece of intellectual property is identified. The IPALERT module functions to notify users when new 
pieces of intellectual property are identified or when new information is added to the IPHISTORIAN 
database relating to selected pieces of intellectual property.

One example of information stored in the IPHISTORIAN database may be personal information 
relating to the inventors, such as address, phone number, email, as well as news relating to the 
inventor(s). By monitoring for changes in this information, the IPHISTORIAN database can be used in 
combination with the IPALERT module to notify users of information which might signal a change
regarding the key inventors. As discussed in regard to the IPALERT module, technology is frequently advanced on the backs of only a few key inventors. Detecting information about a key inventor (e.g., what the key inventor has recently published, that the key inventor has switched jobs, has moved, has died, etc.) can be very useful information to know about one’s competitor.

Yet a further feature of the IPHISTORIAN database is its use in combination with the IREPORTER module to allow users to organize reports which include both intellectual property information and information that relates to the intellectual property, effectively interwoven with each other.

The IPHISTORIAN database can be maintained such that all relevant information, once identified, is saved is some form in the database. As a result, the IPHISTORIAN database may contain information which is no longer accessible, such as information transiently posted on a website. In this regard, the IPHISTORIAN database may be used to perform a valuable historical function. By saving any information recorded by the IPHISTORIAN database, information relating to a piece of intellectual property can be found time stamped within the IPHISTORIAN database even after the publication is no longer available. For example, information about a product covered by a patent that appears on a website can be saved by the IPHISTORIAN database even after the entity maintaining the website goes out of business or changes its website content.

The ability to monitor what information is posted on various websites, determine what pieces of intellectual property the information probably relates to, store the information for eternity in the IPHISTORIAN database with a time stamp, and then monitor and record changes in the information posted greatly enhances the ability of the public to identify relevant prior art for patentability and infringement purposes.

F. IPHUNTER

The IPHUNTER module operates to update the IPHISTORIAN database with information which may relate to particular pieces of intellectual property by searching for information, typically accessed remotely over the Internet, over an intranet, over phone lines, by a wire service, or by wireless communication technology. Numerous webcrawler technologies have been developed which search through the Internet for content relating to a particular subject. These webcrawler technologies may be utilized to search for and identify information relating to pieces of intellectual property. Other search mechanisms that are available or are developed in the future may also be used.

It is noted that the search mechanisms used by the IPHUNTER module may look for pieces of information which cite a given piece of intellectual property. The search mechanisms may also look for
pieces of information which do not cite a given piece of intellectual property but are nonetheless anticipated to be relevant to a given piece of intellectual property. The numerous relevancy ranking systems provided by the IPSORTER module are examples of how information may be relevancy ranked. In one embodiment, the claims and/or abstract are analyzed to determine key terms for the given piece of intellectual property. These key terms, along with the author, inventor, and assignee of the piece of intellectual property, are used to search for and relevancy rank information. Information which is anticipated to be relevant to a given piece of intellectual property is then stored in the IPHISTORIAN database.

When information is identified by the IPHUNTER module, the information may be compared to information already stored in the IPHISTORIAN database. If the information identified is new or modified relative to what is already in the IPHISTORIAN database, the information may be stored in the IPHISTORIAN database and time stamped to indicate the time and place where the information was identified. Alternatively, an address identifying where the new information can be found may be stored in the IPHISTORIAN database.

H. IPALERT

The IPALERT module functions to periodically update subject sub-databases with new information which has been added to the IPHISTORIAN which the particular user has not yet reviewed. Information which the IPALERT module identifies may be pieces of intellectual property which the IPALERT module determines are likely to be considered relevant to the user based on the information specified in the subject sub-database. Information which the IPALERT module identifies may also be non-intellectual property information which the IPALERT module determines is likely to be related to pieces of intellectual property that the user has identified as being relevant. For example, non-intellectual property information which the IPALERT module identifies may be information relating to businesses, people, products, and materials specified in a piece of intellectual property that has been identified in the subject sub-database as being relevant. In general, the information which the IPALERT module identifies may be any form of information that might be stored in the IPHISTORIAN.

The IPALERT module is designed to utilize the information stored in the subject sub-database to automate the searching of the IPHISTORIAN for new information which may be of interest to the user. Once new information is identified, the IPALERT module is designed to utilize the information stored in the subject sub-database to automate the evaluation of the new information regarding its anticipated level of importance to the user.
Once new information is identified by the IPALERT module, the IPALERT module updates the appropriate subject sub-database to include the newly identified information or references to the newly identified information. How the new pieces of intellectual property are communicated to the user is also controlled by the IPALERT module.

A business's intellectual property landscape is constantly changing with new technology being developed, new intellectual property being created and existing intellectual property changing hands continuously. Businesses therefore cannot rely on a static understanding of their intellectual property position. Frequently, as markets develop, later issued patents with early priority dates are pursued with broader claims and/or claims better directed toward existing products. As a result, these early priority date, later issuing patents can pose significant infringement risks. Given the volume of intellectual property information, it is very difficult for businesses to stay abreast of developments in intellectual property relating to their businesses. Nevertheless, businesses need to continuously update their analysis of their intellectual property position. The IPALERT module is designed to automate the monitoring of changes in a business's intellectual property position.

Changes in the intellectual property landscape can be a harbinger of changes in competition. For example, businesses frequently enter new markets to seek added revenue and exit markets where penetration has been unsuccessful. Detecting that a business has started to file patents in a new market niche can signal a move in the direction of the business long before new products are announced. Detecting news articles and publications in scientific journals involving key inventors can also signal where a company is innovating. The IPALERT module is designed to bring a wide range of information to the attention of the user to give advanced notice of these changes.

Technology is frequently advanced on the backs of only a few key inventors. Detecting that a key inventor has published an article can be used to get an advanced read on where a company is going. Knowledge that one of these key inventors has changed employers can also signal a significant change in the ability of a business to innovate in a technology niche. By monitoring various forms of information on the Internet, such as the address, phone number, and email address of key inventors, early detection of changes in employment status can be detected.

An embodiment of an operation of the IPALERT module is described above in regard to Figure 1E. For example, the IPALERT module 96 may request 102 the IPFINDER module 20 to search the IPHISTORIAN database 16 for any information which might be of interest to the user. The information might be new pieces of intellectual property which the user has not yet reviewed, e.g., pieces of intellectual which have been added to the IPHISTORIAN database subsequent to the user's last review. The new information might also be new information which the IPHUNTER module has identified.

In response to the IPALERT module's request 102, the IPFINDER module 20
accesses 104 the IPHISTORIAN database 16 to search for pieces of intellectual property that satisfy the IP ALERT module's search request. The IPFINDER 20 may use pieces of intellectual property as well as information associated with the pieces of intellectual property to perform the search.

Information that is retrieved 106 by the IPFINDER module 20 is then compared 108 to the information already stored in the user's sub-database 14 and any new information is saved. The IPFINDER module 20 then requests 110 the IPSORTER module 22 to evaluate the anticipated relevance of the newly identified information. The IPSORTER 22 then sorts the new information based on its anticipated relevance to the user in view of the information that the user has stored in the user's sub-database 14, such as search terms and information whether certain pieces of intellectual property, inventors, assignees are considered relevant. Information regarding the IPSORTER module's 22 evaluation of the anticipated relevance of different pieces of information is stored 112 in the user's sub-directory 14 and communicated to the IP ALERT module 96.

The IP ALERT module 96 may analyze the IPSORTER module's 22 evaluation of the anticipated relevance of the new pieces of information by accessing 114 instructions from the user regarding how the user is to be notified when new information is identified which has been stored in the user's sub-database 14. The IP ALERT module 96 then determines how to notify 115 the user and determines what information to send the user in the notification.

The user may be notified by a variety of different mechanisms depending on what the user has requested. For example, the IP ALERT module may automatically send an email, page, phone message, facsimile, or piece of mail indicating to the user that new information has been identified. Other forms of notification may also be provided.

The notification may simply request the user to visit the data management system in order to determine what new information has been identified. Alternatively, the IP ALERT module may optionally cause a copy or excerpt of the new information, e.g., a new patent, a patent abstract, a news article, a url, etc. to be sent to the user.

When the user is notified, the user may get a notice to visit the database management system over the Internet, or may receive all or an excerpt of the new information by some other mechanism. The IP ALERT module 96 may also indicate the anticipated importance of the new information to the user in the communication. When the user visits the database management system over the Internet, the data management system identifies the new information as well as its anticipated importance.

The IP ALERT module may be designed such that the user can select the mode or modes of notification, the timing of the notification, as well as the content of the notification. For example, the user may instruct the IP ALERT module to send immediately by fax a full copy of any patent by inventors
X, Y and Z and/or assigned or reassigned to Q and M and to send by email once a month the abstracts of any other patents that are identified.

A feature of the IPALERT module is that the user can request the IPALERT module to anticipate the relevance of the new information and alert the user in a fashion which reflects the anticipated relevance of the information. For example, the IPALERT module can employ relevancy ranking, such as described in regard to the IPSORTER module, to evaluate the anticipated relevance of the new information. The system may employ relevancy ranking to control how and when the module notifies the user of new information. For example, the IPALERT module can cause an urgent message to be sent for information that the system determines is likely to be highly relevant to the user and a less urgent message for information that the system determines is likely to be less highly relevant to the user.

Information that the system determines is likely to be highly relevant may be sent by a first form of communication and information that the system determines is less likely to be highly relevant may be sent by a second form of communication. Further, information that the system determines is likely to be highly relevant may be sent by in a first format and information that the system determines is less likely to be highly relevant may be sent by a second format.

Because the system may be fully automated, the user can set the notification parameters to suit the user's individual needs. As a result, a user in need of immediate updates on particular matters can instruct the system to obtain them without being unnecessarily bothered with other information.

By way of illustration, the user may specify that information of a first, high relevancy level is to be delivered to the user in a first fashion (e.g., full text, immediately, by fax) and that information of a second, lower relevancy level is to be delivered to the user in a second, different fashion (e.g., an excerpt, once a month, by email). For example, the user may request to receive full copies by email immediately when any patents are issued to X or detected as having been reassigned to X, an email once a week containing the abstracts of patents to other assignees which are anticipated to be highly relevant immediately when such patents are identified, and a monthly email with the abstracts of any patents which are identified which are anticipated to be less highly relevant.

Figure 9 illustrates a graphical user interface which a user may use to select how different information is to be delivered to the user. As illustrated, the graphical user interface allows the user to specify how, what, when, and where information is to be sent to the user. More specifically, the user can request information which is anticipated to be generally relevant, relevant to patentability or relevant to infringement. The user may also request information which relates to particular inventors and assignees, which are related to a particular serial number, which are cited by a particular patent, and are in the same family as a particular patent. The user may also request information relating to particular pieces of intellectual property that may exist in the IPHISTORIAN database. As also illustrated,
several drop down windows are provided which allow the user to specify the range of types of
intellectual property to include (e.g., U.S. only; U.S. and PCT; US, PCT and European, worldwide,
etc.), how the information is to be delivered, what content is to be included in the delivery, and the
periodicity of the delivery. As can be seen from Figure 9, the system allows the user to customize what,
how and when each of multiple different forms of information are provided to the user. As also
illustrated, delivery can be based on an anticipated relevance to what the user is searching for and can
include non-intellectual property information which is stored in the IPHISTORIAN.

As previously noted, the visualization tools provided by the IPVIEWER module allow the user to
readily determine a likely significance of a new piece of intellectual property without having to actually
review the intellectual property. Thus, the IPVIEWER module is capable of working effectively with the
IPALERT module by notifying the user of a change in status (IPALERT) and allowing the user to readily
perceive through visualization tools (IPVIEWER) the significance of that change.

I. IPREPORTER

The IPREPORTER module works in combination with the IPRECORDER module, the subject sub-
database, and the IPHISTORIAN database to enable the user to create customized reports based on the
various forms of information that is stored in the intellectual property data management system.

As discussed above, a powerful feature of the present invention is the IPRECORDER module
which records information that the user provides to the system in order to identify information relating
to intellectual property, tracks what intellectual property the user has reviewed, and records information
regarding what the user thought of the information that was reviewed. For example, the IPRECORDER
module tracks what search terms have been used, what pieces of intellectual property have been
identified by the search terms, what pieces of intellectual property have been reviewed, and what pieces
of intellectual property that have been reviewed are considered relevant and why. The IPREPORTER
module is able to use the information stored in the user's sub-database in combination with information
stored in the IPREPORTER database to generate a wide variety of reports where the different forms of
information are interwoven together in a user defined manner.

For example, a user which has performed a freedom to operate study may wish to produce a
report which includes (a) a summary of the search terms that were used, including any assignee and
inventor searches; (b) a list of all patents reviewed (sorted alphabetically by assignee, then by issue
date); (c) abstracts and bibliographies of all patents reviewed which where considered somewhat
relevant (sorted alphabetically by assignee, then first inventor, then by issue date); and (d) full copies of
patents that were considered to be highly relevant (sorted alphabetically by assignee, then first inventor,
then by issue date). The user may also want the report to include, following each patent that was considered to be highly relevant, a summary of the user’s comments regarding that patent plus copies of information stored in the IPHISTORIAN regarding that patent.

Traditionally, one would need to revisit the search results and the one’s notes in order to determine what pieces of intellectual property to include in the report. One would then have to organize the report to include all the above information and in the right order. Clean copies of the pieces of intellectual property to be included in the report would need to be obtained. Once all the information to be included in the report is obtained in one place, the information then needs to be organized, including the sorting of pieces of intellectual property. The process of forming the above described report can easily take tens to hundreds of hours, making the process very time consuming and expensive.

By contrast, the IPREPORTER module can be used to formulate the above described report in very little time. This is greatly facilitated by the fact that all of the information needed to form the report is stored in either the corresponding subject sub-database or the IPHISTORIAN database.

To form a report, the user specifies an organization for the report. This may be done manually by the user. Alternatively, stored in the system and accessible to the IPREPORTER module are a series of report templates that may be used. In addition, the user may design and save customized report templates.

Once the user selects a report template, the IPREPORTER module makes a first attempt at retrieving the various forms of information and organizing the information for the user. Most of the report is organized automatically by the IPREPORTER module. For example, the user can simply request the IPREPORTER module to list (a) the search terms that were used, including any assignee and inventor searches; (b) all patents reviewed (sorted alphabetically by assignee, then by issue date); (c) abstracts and bibliographies of all patents reviewed which where considered somewhat relevant (sorted alphabetically by assignee, then first inventor, then by issue date); and (d) full copies of patents that were considered to be highly relevant (sorted alphabetically by assignee, then first inventor, then by issue date). All of the organizing alphabetically, then first inventor, then issue date is done by the system automatically. Once the report is organized, the report may be reviewed by the user and finalized.

Traditionally, when a new report is needed, a photocopy of the original report is made. When this is done, one worries (a) whether someone has made notes on the file copy; (b) that copying the report will result in the original getting crumpled in the copy machine; (c) that pages will stick together (d) that sections will be mislabeled, get lost, be misorganized, etc.

In the present invention, once a report is formed, the report may be saved in electronic form, including all the exhibits. As a result, whenever a new report is needed, the new report can simply be
printed, transferred over the Internet, copied onto a CD-ROM, etc. As a result, all of the worries regarding organizing, handling and copying the original report are avoided.

One advantage of the IPREPORTER module is the great flexibility of reporting which the module provides. By recording information from the user about pieces of intellectual property as they are reviewed, the IPREPORTER module is also able to produce customized reports using this information. For example, reports can be produced providing all pieces of intellectual property reviewed, optionally divisible by what portions of the pieces of intellectual property has been reviewed (e.g., abstract only, claims only, abstract and claims, figures, full text), all pieces of intellectual property ordered, all pieces of intellectual property that should be cited in an IDS, all pieces of intellectual property that raise an infringement issue, all pieces of intellectual property that should be reviewed in full, etc. Further, since multiple categories can be specified to the system, the system is able to track how each piece of intellectual property relates to any given category. For example, the system can be adapted so the user can record into the appropriate subject sub-database which pieces of intellectual property should be cited in an IDS for application A; which pieces of intellectual property should be cited in an IDS for application B; which pieces of intellectual property should be cited in an IDS for application C; etc. This obviates the need for the user to keep separate record keeping or to have to review a body of references over and over again.

The IPREPORTER module is able to generate these various reports where the intellectual property is sorted in a variety of different fashions. For example, reports may be generated which divide the pieces of intellectual property into various user defined categories. The intellectual property may also be sorted by an inherent property such as its priority date, filing date, issue date, serial number, patent number, inventor, assignee, and combinations thereof. The intellectual property may also be sorted by a value assigned to each piece of intellectual property (e.g., 1-5 scale of relevance). It is noted, that the reports can be arranged category, subcategory, sub-subcategory, etc. sorting, all at the user's option.

Because the system stores the intellectual property in one or more formats, as well as information from the user regarding the intellectual property, the system is able to produce these various reports organized as the user sees fit where each section of the report may include different portions of the pieces of intellectual property, e.g., title, filing date, issue date, chain of priority, inventor, assignee, abstract, cover page, claims, figures, various combinations of portions of each piece of the intellectual property, or entire copies of each piece of intellectual property. For example, it may be desirable to produce a report listing just the patent numbers of all pieces of intellectual property reviewed, organized by assignee, and then by issue date. It may then also be desirable to produce a report listing the patent claims for a particular group of pieces of intellectual property reviewed, organized again by assignee, and then by issue date.
Since all the information regarding what has been reviewed and the pieces of intellectual property themselves are stored in the system, these various customized reports, to numerous to individually mention, can be rapidly generated by the system. As a result, significant amounts of time that is currently spent compiling such data and organizing such reports can be eliminated. Instead, the IPREPORTER module is able to organize the data for each such report and then provide that report in a variety of formats including various electronic and printed formats.

It is noted that different reports may be needed, depending upon the application and the needs of the user. For example, a user may need to provide a first party with a list of relevant documents sorted by filing date; provide a second party with a list of relevant documents sorted by inventor; and provide a third party with a list of relevant documents sorted by assignee. Separate reports may also be needed for an infringement analysis report and a patentability analysis report. By allowing the user to store information regarding what a particular reference might be relevant to, the IPREPORTER module is able to rapidly generate these reports as well as sets of documents organized in a manner customized to the user without the user having redo an analysis of the various documents.

As noted in regard to the IPHUNTER module, the intellectual property landscape is continually changing. When a freedom to operate study such as the one described above is updated, it would traditionally be very difficult to incorporate the new information into the old report. Instead, a new supplemental report is typically generated. By contrast, since the entire original report is stored by the IPREPORTER module, updating the original report to include the newly identified information can be readily accomplished according to the present invention.

One powerful aspect of the IPREPORTER module is its ability to interweave information recorded in the IPRECORER module with pieces of intellectual property or portions thereof which are stored in the intellectual property databases associated with the data management system. For example, different excerpts of pieces of intellectual property (title, abstract, claims, figures, front page, etc.) and entire copies of pieces of intellectual property can be printed from the system alone or interwoven with other information recorded into the system. For example, the IPREPORTER module can produce a report which includes a user defined bibliographic citation (e.g. Patent No. 5,555,555; Issued: Jan. 1, 1998; Expiration Date: March 23, 2015) followed by the abstract, Figure 1, and comments recorded into the IPRECORER module regarding that piece of intellectual property.

As noted in regard to the IPRECORER module, the user may define fields by which to categorize pieces of intellectual property. By way of example, in the case of an analysis of patents relating to a car, different user defined fields might include engine, steering, brakes, wheels, tires, and exhaust. A further advantage provided by the combination of the IPRECORER module and the IPREPORTER module is the ability to create reports which are organized by user defined fields where the
user creates the user defined fields and categorizes pieces of intellectual property based on the user defined fields during the user's review.

As also noted in regard to the IPRECORDER module, fields may also be provided to allow the user to indicate whether a piece of intellectual property is considered relevant for a predefined purpose, such as patentability, validity, infringement, licensing. For example, a field may be provided for the user to indicate that a piece of intellectual property should be cited to the Patent Office in an Information Disclosure Statement (IDS). Subfields may be provided to allow the user to indicate in which application or applications the piece of intellectual property should be cited. This field information can then be used by the IPREPORTER module to create customized reports.

In one particular regard, the U.S. Patent and Trademark Office requires applicants to disclose any references that may be relevant to the patentability of an application. The present invention facilitates compliance with this requirement by enabling the user to compile a list of the documents that should be cited in the Information Disclosure Statement as the user reviews the documents. For example, the present invention is capable of forming an Information Disclosure Statement comprising a filled out PTO 1449 form and a copy of all references identified during the process of the user's review as being relevant without the user having to compile that list.

As a prosecution of an application proceeds, compliance with the disclosure requirement can become more complicated when there are multiple related applications and foreign filed applications. The IPREPORTER module can be used to facilitate the preparation of IDS statements in continuation, divisional and continuation-in-part applications, particularly where there are also foreign counterparts, by tracking for the user what has been cited in each application and then alerting the user when additional information disclosure statements need to be filed. The user may indicate to the system what applications have been filed to date and what references have been cited in those cases. In the case of issued patents, the IPREPORTER module may also determine what patents have issued and what references were cited from the IPHISTORIAN database.

Applicants believe that one advantage of the IPREPORTER module is the ability to produce information disclosure statements by simply forming a 1449 form on the IPREPORTER module and then requesting a copy of the information disclosure statement to be printed from the IPREPORTER module. Ultimately, it is anticipated that CD-ROM versions of information disclosure statements may be submittable to the patent office using the IPREPORTER module.

A further advantage of the IPREPORTER module is the module's ability to track for applicants what has been cited and what has not been cited, thereby reducing the amount of energy needed to insure compliance with the duty of disclosure and to reduce the risk that references that should be cited are omitted.
J. **IPITOMIZER**

One of the difficulties associated with performing intellectual property searching is the process of formulating search and sorting criteria. In particular, it is frequently difficult to express with keywords what the user is looking for. It is also difficult to know who are the key inventors and/or assignees prior to performing a search. Generally, the most relevant intellectual property is not known to the user prior to performing a search.

The IPITOMIZER module serves to simplify and streamline the process of searching and sorting intellectual property by automating the creation of searching and sorting criteria for performing searching and sorting. The IPITOMIZER module may also be used to automate the expansion of search and sorting criteria. The IPITOMIZER module may also be used to automate the performance of some initial searches and sorting.

Many existing intellectual property searching systems are complex to use. The IPITOMIZER module simplifies the process of searching for intellectual property by automating the creation of searching and sorting criteria, automating the expansion of the searching and sorting criteria, and/or automating the performance of searches and sorting. As a result, novice users can simply input as much information as they have and allow the system to make educated guesses based on the information that is provided regarding (a) what is the best search criteria to use; (b) how can the search criteria that is provided be expanded; and (c) what are likely to be the most relevant pieces of intellectual property to the user in view of the information that the user does input into the system.

The IPITOMIZER module leverages the intellectual property searching and sorting capabilities of the system to figure out who are the most important assignees (e.g., competitors) and inventors (e.g., researchers, scientists, engineers) in a given field. The IPITOMIZER module facilitates this use by making it significantly easier to create search criteria, perform searches, sort the information and identify the key players. In addition, as will be explained herein, the IPITOMIZER module is able to make certain intelligent guesses as to what is likely to be relevant in order to both expand upon the search criteria and bring to the user's attention relevant information more quickly.

It is anticipated that one application of the overall system of the present invention will be to identify competitive information that is stored in the IPHISTORIAN. As noted elsewhere, information in the IPHISTORIAN is associated with individual pieces of intellectual property. The individual pieces of intellectual property may be grouped by inventor, assignee, as well as a series of other categories. Some users of the system will not care to review the intellectual property that is identified by searching and sorting but rather wish to rapidly identify the most relevant inventors, assignees, and/or patents and find
out what information exists in the IPHISTORIAN regarding these people, businesses and documents. By automating the creation of search and sorting criteria and the performance of searches and sorting, the IPITOMIZER module simplifies the process of identifying the most relevant pieces of intellectual property. As a result, the IPITOMIZER module automates the process of identifying the most relevant most relevant inventors, assignees, and/or pieces of intellectual property. This enables a user to simply input information and receive a list of the most relevant inventors, assignees, and/or pieces of intellectual property without having to review pieces of intellectual property or know how to perform searches and sorting. For example, a user may specify the keywords "cell" and "phone" and specify Nokia and Motorola as assignees. Using the IPITOMIZER module, the user is able to get a list of assignees in the cell phone space (e.g., Nokia, Motorola, Eriksen, Sony, Qualcomm, etc.) and/or the most prolific inventors by simply pressing the enter button. Invisible to the user is the fact that the system leverages the patent literature to expand upon the user's search criteria and find what are anticipated to be the most relevant pieces of intellectual property. Furthermore, the user is able to obtain this information without having to review any information other than the list that is produced. This makes the system very easy to use.

User input to the IPITOMIZER module may be any form of information which may be used to perform keyword or shared inherent property searching. In particular, keywords, inventors, assignees, and/or pieces of intellectual property can be initially input into the system. One or more of these categories of information may be provided. Different groups of these categories may also be provided (e.g., keywords only; keywords and inventors; keywords and assignees; keywords and patents; inventors only; inventors and assignees; inventors and patents; assignees only; assignees and patents; patents only; keywords, inventors, and assignees; keywords, inventors, and patents; keywords, assignees, and patents; inventors, assignees, and patents; and keywords, inventors, assignees, and patents).

As illustrated in Figure 10A, when keywords are provided, the IPITOMIZER module can take the keywords 1012; optionally use a thesaurus and/or natural language expansion to identify additional keywords to employ in a search 1014; and identify a group of patents that are anticipated to be the most relevant to the keywords that are provided (or an expanded set of keywords using a thesaurus and/or natural language) 1016. Optionally, all or some of the identified group of patents that are anticipated to be the most relevant to the keywords can be used to perform one or more cycles of shared inherent property searching and sorting 1018. When multiple cycles of shared inherent property searching and sorting, some or all of the patents which form the output of an earlier cycle of shared inherent property searching and sorting serve as the input for a later cycle of shared inherent property searching and sorting. The patents identified, either by keyword searching alone, or a combination of keyword searching and shared inherent property searching and sorting can be shown to the user for review 1020.
The user may then provide feedback regarding the relevance of the patents that are identified. One or more rounds of feedback may be provided. Optionally, the user review process 1020 can be bypassed and simply a list of the most relevant patents, inventors, assignees, etc. can be provided 1022. Alternatively, the list 1022 can be accessed after one or more rounds of feedback 1020 are performed.

Optionally, the information stored in the IPHISTORIAN 1024 that is deemed relevant to the patents, inventors, assignees, etc. identified can be accessed.

It is noted that the above described sequence of steps may be executed by the user by simply providing the initial keywords and hitting enter. The iterations of expanding the keywords 1014 and/or performing shared inherent property searching based patents identified based on the keywords 1016 can be performed invisible to the user.

It is also noted that the user review process 1020 can also be bypassed. As a result, a user inputs keywords 1012 and a list of the most relevant patents, inventors, assignees, etc. 1022 is produced. This allows the user rapid access to the information stored in the IPHISTORIAN 1024 without having to review patents 1020 or do any steps other than entering keywords. Meanwhile, invisible to the user, the patent literature is being utilized to identify the most relevant patents, inventors, assignees, etc. relative to the keywords that are provided.

As illustrated in Figure 10B, when inventors are provided, the IPITOMIZER module can take the inventors 1026; identify a group of patents that name the inventors 1028; and then perform shared inherent property searching 1030 based on the identified patents. Optionally, the IPITOMIZER module can take one or more patents identified by shared inherent property searching 1030 as being the most likely to be relevant and use those patents to perform shared inherent property searching and sorting 1032 based on a combination of (a) the patents identified based on the named inventors, and (b) the patents anticipated to be most relevant based on the first round of shared inherent property searching. Optionally, multiple cycles of shared inherent property searching and sorting may be performed. When multiple cycles of shared inherent property searching and sorting are performed, some or all of the patents which form the output of an earlier cycle of shared inherent property searching and sorting serve as the input for a later cycle of shared inherent property searching and sorting.

When patents are identified, either in steps 1028, 1030, and/or 1032, the IPITOMIZER module may optionally identify an expanded set of inventors 1034 corresponding to all the inventors named in the patents to the named inventors. The IPITOMIZER module may optionally then identify patents that name at least one of expanded set of inventors 1036; identify patents that name at least two of expanded set of inventors 1036; identify patents that name one or more of the most prolific inventors in the expanded set of inventors 1036; and/or variations thereof.
Optionally, shared inherent property searching and sorting 1038 may be performed on some or all of the patents to the expanded set of inventors 1036. The IPITOMIZER module may use all of the patents to the expanded set of inventors or may take a subset of those patents to perform the additional round of shared inherent property searching. For example, the IPITOMIZER module may use a set of patents corresponding to patents which name two or more of the inventors; patents which are anticipated to be most highly relevant to patents to the initially named inventors; patents which are anticipated to be most highly relevant to patents to the expanded group of inventors; patents to the most prolific inventors; and/or variations thereof. It is noted that a wide variety of other subsets of patents may be derived according to the present invention and may also be used.

The patents identified via steps 1030, 1032, 1036 and/or 1038 can be shown to the user for review. As in step 1020 of Figure 10A, the user may then provide feedback regarding the relevance of the patents that are identified. One or more rounds of feedback may be provided. Optionally, the user review process can be bypassed and simply a list of the most relevant patents, inventors, assignees, etc. can be provided, as in step 1022 of Figure 10A. Alternatively, the list can be accessed after one or more rounds of feedback are performed. Optionally, the information stored in the IPHISTORIAN (as in step 1024 of Figure 10A) that is deemed relevant to the patents, inventors, assignees, etc. identified can be accessed.

As illustrated in Figure 10C, when assignees are provided, the IPITOMIZER module can take the assignees 1042; identify a group of patents assigned to the assignees 1044; and then perform shared inherent property searching 1046 based on the identified group of patents. Optionally, the IPITOMIZER module can take the patents identified by shared inherent property searching 1046 and use those patents to perform another shared inherent property search and sorting 1048 based on a combination of (a) one or more of the patents identified based on the named assignees, and (b) one or more of the patents that are anticipated to be most relevant based on the first round of shared inherent property searching.

Optionally, multiple cycles of shared inherent property searching and sorting may be performed. When multiple cycles of shared inherent property searching and sorting are performed, some or all of the patents which form the output of an earlier cycle of shared inherent property searching and sorting serve as the input for a later cycle of shared inherent property searching and sorting.

The patents identified via steps 1044, 1046, and/or 1048 can be shown to the user for review. As in step 1020 of Figure 10A, the user may then provide feedback regarding the relevance of the patents that are identified. One or more rounds of feedback may be provided. Optionally, the user review process can be bypassed and simply a list of the most relevant patents, inventors, assignees, etc. can be provided, as in step 1022 of Figure 10A. Alternatively, the list can be accessed after one or more rounds of feedback are performed. Optionally, the information stored in the IPHISTORIAN (as in step
1024 of Figure 10A) that is deemed relevant to the patents, inventors, assignees, etc. identified can be accessed.

As illustrated in Figure 10D, when patents and/or published applications are provided, the IPITOMIZER module can take the patents 1052; and perform shared inherent property searching 1054 based on the input patents. Optionally, the IPITOMIZER module can take the patents identified by shared inherent property searching 1054 and use some or all of those patents to perform another shared inherent property search and sorting 1056 based on a combination of (a) one or more of the patents input, and (b) one or more of the patents that are anticipated to be most relevant based on the first round of shared inherent property searching. Optionally, multiple cycles of shared inherent property searching and sorting may be performed. When multiple cycles of shared inherent property searching and sorting, some or all of the patents which form the output of an earlier cycle of shared inherent property searching and sorting serve as the input for a later cycle of shared inherent property searching and sorting.

The patents identified via steps 1054 and/or 1056 can be shown to the user for review. As in step 1020 of Figure 10A, the user may then provide feedback regarding the relevance of the patents that are identified. One or more rounds of feedback may be provided. Optionally, the user review process can be bypassed and simply a list of the most relevant patents, inventors, assignees, etc. can be provided, as in step 1022 of Figure 10A. Alternatively, the list can be accessed after one or more rounds of feedback are performed. Optionally, the information stored in the IPHISTORIAN (as in step 1024 of Figure 10A) that is deemed relevant to the patents, inventors, assignees, etc. identified can be accessed.

In regard to the user inputting inventors, assignees and patents, the IPITOMIZER module can also use this information to automate the generation of keywords to perform keyword searching. For example, when one or more inventors and/or one or more assignees are input by the user, the IPITOMIZER module can identify patents that are anticipated to be relevant, for example as described herein. The identified patents can then be used to determine keywords from those patents for use in keyword searching. Similarly, when one or more patents are input by the user, the IPITOMIZER module can determine keywords based on those patents.

A variety of different methodologies can be used to determine keywords and phrases from one or more patents. When a single patent is involved (or another form of document), various methodologies can be used to identify keywords and/or phrases that appear in that document. For example the claims, abstract, title, and/or summary of invention can be analyzed for keywords and phrases. Optionally, two or more sections (e.g., the claims, abstract, title, and/or summary of invention) can be compared to identify keywords and phrases based on an overlap between the different sections.

When multiple patents are involved, the multiple patents can be each analyzed for keywords and phrases. The multiple patents can also be compared to determine keywords and phrases. For
example, the claims, abstract, title, and/or summary of invention of different patents can be compared to
determine overlaps in word and phrase usage, those overlapping words and phrases serving as keywords
and phrases. In one variation, keywords and phrases are determined from a group of patents by
comparing the claims and identifying one or more words and/or phrases which appear in the claims of
the different patents for use as keywords and/or phrases. Common words and phrases (e.g., a, the, and,
method, process, composition, etc.) can be filtered out.

Figure 10E illustrates a user interface that may be employed with the IPITOMIZER module. As
illustrated, the user interface provides the user with an area to input keywords to be used in keyword
searching. The user interface also provides the user with an area to input text as opposed to keywords.
The system may include software that enables the system to take the input text and convert the input text
into a set of keywords to employ in keyword searching. This allows a novice user to simply cut and
paste a claim, abstract, summary of invention or invention disclosure into the user interface and
eliminate the need to formulate a keyword search.

The user interface also provides the user with area to provide a list of inventors. These
inventors may include the inventors on a patent application or invention disclosure which the user wants
to analyze. It may also include people who are leading scientists and engineers in a given area.

The user interface also provides the user with an area to provide a list of assignees. These
assignees may include the assignee on a patent application or invention disclosure which the user wants
to analyze. It may also include people, businesses, universities, foundations, etc. who may be working
in a particular area.

The user interface also provides the user with area to provide a list of patents or patent
applications.

The user interface also provides the user with several buttons to allow the user to expand the
search criteria in regard to keywords and/or inventors and/or assignees and/or patents. Expansion of the
search criteria can be performed by the various methods described in this section.

The user interface also provides the user with several buttons or other selection mechanisms for
requesting a search to be performed. The search can be performed based on the search criteria that is
provided or can be performed where the system expands the search criteria and then performs the
search. Optionally, the user can request searches be performed with and without expanding the search
criteria to see how expansion of the search criteria affects the search and sorting results.

It is noted in regard to the processes shown in Figures 10A-10D that these processes may
operate independently or in combination with each other. For example, as illustrated in Figure 10E, the
user may input keywords and/or inventors and/or assignees and/or patents. Depending on what types of
information are input, different combinations of the processes described in regard to Figures 10A-10D may be needed and may be employed.

One of the advantages that can be seen from the processes described in regard to Figures 10A-10D is that the IPITOMIZER module works to expand the search criteria being used by having the system "assume" that the identified patents are relevant and use the assumed to be relevant patents to perform shared inherent property searching in order to find other patents which share inherent properties with the identified patents. In this regard, the system operates as if the user had directly entered the patents identified by keyword or shared inherent property searching. This simplifies the operation of the system and makes it more usable by novice users. For example, the user need only specify "Assignees = Able Corp. and Burt Corp." and the system will figure out what patents are assigned to these assignees and perform shared inherent properties searching and sorting based on the assigned patents. Then, if the user wants, the system may also identify patents to other assignees that are anticipated to be relevant to the patents assigned to Able Corp. and Burt Corp., and then use some or all of the patents to Able Corp., Burt Corp., and other related assignees in order to perform shared inherent property searching and sorting.

The processes described in regard to Figures 10A-10D may be more fully understood and appreciated in view of the following description. Assume that the user specifies "Assignees = Able Corp. and Burt Corp." The system then identifies what patents are assigned to Able Corp. and Burt Corp. Lets assume that patents A, B, C, D, and E are assigned to these two assignees. A first shared inherent properties searching and sorting is then performed based on patents A, B, C, D, and E. The first shared inherent properties searching and sorting identifies numerous patents as being potentially relevant and finds that patents F, G, H, and I are among the ones most probably relevant to patents A, B, C, D, and E. A second shared inherent properties searching and sorting may then be performed based on patents A, B, C, D, E, F, G, H, and I or different subsets thereof. Alternatively, the inventors and/or assignees to patents F, G, H, and I may be identified, the patents to the identified inventors and/or assignees may be identified, and then a second shared inherent properties searching and sorting may then be performed based on identified patents or different subsets thereof.

By expanding the number of patents employed in the second shared inherent properties searching and sorting, a better fingerprint of the competitive landscape that the user is seeking to research is provided to the system. As a result, the system is able to make a broader, more thorough, and more intelligent searching and sorting based on the initial information that is provided. While this example is described in regard to expanding on the list of patents based on one additional round of shared inherent properties searching and sorting, it is noted that one, two, three, or more rounds of shared inherent properties searching and sorting may be performed.

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SUBSTITUTE SHEET (RULE 26)
Figures 10A-10D each show a box 1060 around the steps of identifying patents and performing searching and sorting. This box is intended to indicate that these multiple steps may be performed entirely blind to the user, e.g., without need for user intervention. For example, the user may input keywords and/or a list of inventors and/or assignees and/or patents and receive an output of a list of keywords and/or inventors and/or assignees and/or patents that the system has determined may be related to input information. Although the system may be expanding search criteria and performing multiple cycles of searching and sorting, these steps may be invisible to the user and thus may be performed without requiring an action by the user. It is believed that many existing searching and sorting programs are relatively complex to use. By automating the performance of many of these steps, the processes shown in Figures 10A-10D may be valuable tools for allowing users to leverage the content of the patent literature to identify information without having to review patents or know very much regarding operating the system.

**K. Application of the Present Invention To Databases Of Non-Intellectual Property Forms Of Information**

While the methods and modules described herein are primarily described in relation to intellectual property and patents in particular, it is noted that the methods and software of the present invention can be more broadly applied to forms of information that consist of a series of documents which (a) may stored in database form, (b) can be keyword searched, (c) include citations to other documents in the database, and (d) are subsequently cited by other documents in the database. One particular area in which the present invention may be applied is in relation to the scientific and engineering literature. Another particular area in which the present invention may be applied is in relation to legal court decisions. The application of the present invention will now be described in relation to these two particular areas. However, it is noted that the present invention can be employed to analyze other bodies of literature.

**1. Application Of The Present Invention To The Scientific And Engineering Literature**

Like the intellectual property literature, the scientific and engineering literature consists of documents (e.g., papers, articles, abstracts, etc.) which include one or more authors, text which may be keyword searched, and a bibliography. The authors of a scientific or engineering document is akin to inventors of a patent. The text of the scientific or engineering document is akin to the text of a patent. Meanwhile, the scientific or engineering bibliography section of the document is akin to the references...
that are cited by a patent. Subsequent citations to a scientific or engineering document, like subsequent citations to a patent, do not appear on the face of the document, but can be determined by forming a database containing a body of scientific and engineering literature and determining subsequent citations.

5 In view of the parallels between intellectual property and documents from the science and engineering literature, the various aspects of the present invention as described herein in regard to intellectual property may be applied to the science and engineering literature. For example, keyword searching, required information searching, probable information searching and shared inherent property searching can be performed with documents from the science and engineering literature. Recordation of user feedback regarding documents that have been reviewed can also be recorded. Visualization of the anticipated relevance of different documents with the IPVIEWER can also be performed. The IPITOMIZER module can also be used to automate the creation of search criteria, expand search criteria, identify keywords, etc.

One feature of the present invention is the ability to utilize the intellectual property literature to assist in the review of the scientific and engineering literature and visa versa. Another feature of the present invention is the ability to simultaneously review the intellectual property literature and the scientific and engineering literature where user feedback regarding the relevance of each type of literature can be used to assist in the relevancy ranking of the other type of literature.

Both forms of literature can be reviewed using keywords searching, shared inherent property searching, and user feedback regarding documents that have been reviewed. Feedback that certain patents are relevant can be used to indicate that the inventors of those patents are anticipated to be relevant. This can be used to enhance the anticipated relevance of documents in the scientific and engineering literature that are authored by the inventors. Similarly, feedback that certain documents in the scientific and engineering literature are relevant can be used to indicate that the authors of those documents are anticipated to be relevant. This can be used to enhance the anticipated relevance of patents that are invented by the authors.

There is some degree of cross citation between the science and engineering literature and the patent literature. User feedback that a particular piece of intellectual property is relevant can be used to enhance the anticipated relevance of articles that cite the piece of intellectual property or are cited by the piece of intellectual property. Similarly, user feedback that a particular article is relevant can be used to enhance the anticipated relevance of pieces of intellectual property that cite the article or are cited by the article.

The finding that there is a significant overlap between the terms used in a piece of intellectual property that is deemed to be relevant and a document from the science and engineering literature that
has not yet been reviewed can be used to enhance the anticipated relevance of the non-reviewed
document from the science and engineering literature. The association of a same piece of information in
the IPHISTORIAN regarding a particular piece of intellectual property and a document from the science
and engineering literature can be used to identify the piece of intellectual property and the science and
engineering document as sister documents. By identifying them as sister documents, the anticipated
relevance of one can be linked to the anticipated relevance of the other.

2. Application Of The Present Invention To The Legal Literature

Like the intellectual property literature and the science and engineering literature, the
documents forming the legal literature (e.g., court decisions, law review articles, etc.) include text which
may be keyword searched, and a bibliography. The text of documents in the legal literature is akin to
the text of a patent. Meanwhile, the bibliography section or caselaw citations in a document in the legal
literature is akin to the references that are cited by a patent. Subsequent citations to documents in the
legal literature, like subsequent citations to a patent, do not appear on the face of the documents, but can
be determined by forming a database containing a body of documents in the legal literature.
SHEPARDS is a legal periodical and electronic service which provides a list of all later citations to U.S.
court decisions.

In view of the parallels between intellectual property and documents in the legal literature, the
various aspects of the present invention as described herein in regard to intellectual property may be
applied to the legal literature. For example, keyword searching, required information searching,
probable information searching and shared inherent property searching can be performed with
documents from the legal literature. Recordation of user feedback regarding documents that have been
reviewed can also be recorded. Visualization of the anticipated relevance of different documents with
the IPVIEWER can also be performed to understand the evolution of the law and to appreciate what cases
are likely to be earlier cases relative to other cases. The IPITOMIZER module can also be used to
automate the creation of search criteria, expand search criteria, identify keywords, etc.

In one particular embodiment, the present invention is employed in regard to the legal literature
in order to provide a more effective SHEPARDS analysis of the caselaw. SHEPARDS publishes a book
and provides an electronic service which lists all of the cases which cite a given case. SHEPARDS is
used to allow lawyers to check whether a given case has been overturned, is followed in other
jurisdictions, etc. Shepardization of the caselaw is required when preparing legal briefs and
memorandum.
By utilizing shared inherent property searching according to the present invention, alone or in combination with keyword searching, a more intelligent process for shepardizing cases and finding the most important caselaw is provided. Once one or more cases are identified as being relevant to a given point of law, the more controlling cases, the more closely relevant cases, and relevant recent decisions can be readily identified by leveraging the information regarding which cases cite a given case and which cases are cited by a given case. This allows users to very readily determine the controlling cases in terms of legal precedent, thereby saving time and legal expense. In addition, the system insure that relevant caselaw is not overlooked.

Figure 11A illustrates a page from SHEPADRS where each citation includes a root case 1112 and later cases which cite the root case. One currently needs to shepardize each case independently.

Figure 11B is a diagram illustrating a series of SHEPADRS style citations where each citation includes a root case 1112 and later cases which cite the root case. It is noted that Applicants are not aware of SHEPADRS graphically depicting a series of SHEPADRS style citations next to each other as in Figure 11B and accordingly Figure 11B is not intended to illustrate the prior art.

As can be seen in Figure 11B, the SHEPADRS style citations do not include any citations between members of the group other than to the root case. When one lines up a series of SHEPADRS style citations in parallel, as in a IPVIEWER format, one can readily identify contextual information that was not apparent from the SHEPADRS style citation. For example, looking at Figure 11B, it appears that A is probably the controlling case given the number of subsequent citations. B, D, and F appear to be important later cases in view of their citation to A and their frequent subsequent citations. Cases C and E appear to be less important than B and D because these cases are not subsequently cited. In particular, note that F cites D but not C or E.

By visualizing case citations as in Figure 11B, one is able to visualize the significance of different cases more readily than is possible by simply viewing individual SHEPADRS style citations as they are currently made available, e.g., as shown in Figure 11A.

Figure 11C is a diagram illustrating the citations shown in Figure 11B where the shared inherent properties of those cases citing each other is illustrated. The root case in each series is circled. Earlier cases which the root case cites are lower and to the left whereas later cases which cite the root case are higher and to the right. By using shared inherent property searching, the relevance of cases that have not yet been reviewed can be anticipated. Taking Figure 11C, lets assume that shared inherent property searching and sorting system gives 10 points of weight to a case that is cited by a relevant case and 5 points to a case that is cites a relevant case. If a user finds case F, the anticipated relevance of cases A-E are: A=10; B=10; C=0; D=10; E=0. Now lets assume that the user reviews A, maybe because it is the earliest and has the highest anticipated relevance point total. Then the user communicates to the system.
that A is relevant. With A and F deemed relevant, the anticipated relevance of cases B-E are: B=15; C=0; D=15; E=5. Now let's assume that the user reviews B because it is the earliest, most relevant case not yet reviewed and finds it relevant. With A, B and F deemed relevant, the anticipated relevance of cases C-E are: C=5; D=20; E=5. As can be seen, D is clearly anticipated to be more relevant than C or E, consistent with what can be gleaned from Figure 11C.

The IPITOMIZER module can be used to expand search criteria and automate review of cases. Taking the cases of Figure 11C as an example, the user may again find case F. The inputs case F and asks the IPITOMIZER module to expand the search criteria and perform a shared inherent properties search and sorting. In order to do this, the IPITOMIZER module may perform a shared inherent properties search to anticipate the relevance of A-E and again find the anticipated relevance of cases A-E to be: A=10; B=10; C=0; D=10; E=0. The IPITOMIZER module may then assume that A, B and D are relevant in view of their higher anticipated relevance scores (or a different subset of A-F), and perform a shared inherent properties search and sorting analysis based on A, B, D and F. Such an analysis would find the anticipated relevance of A-F to be: A=30; B=25; C=5; D=20; E=5; F=15. Hence, as can be seen, the IPITOMIZER module can effectively expand the search criteria (case A to cases A, B, D, and F) and run searches that help the user to anticipate that A is the controlling case and B is probably the next most important case.

The anticipated relevance scores can be used by the IPVIEWER to create a plot where the Y axis in an plot where the X axis is the date the case was published. Assuming that cases A-F were published in 1990, 1991, 1992, 1993, 1994, 1995 respectively, such a plot would look like Figure 11D. By the user visualizing Figure 11D, the user would see that A is both the earliest and anticipated to be the most relevant, both of which would lead the user to conclude that A is probably the controlling case. Hence, without reviewing cases A-E, the IPITOMIZER module in combination with the IPVIEWER can enable a user to rapidly identify what is anticipated to be the most relevant information. This, if nothing else, will assist the user in deciding an order to review information. Accordingly, by viewing the plot of Figure 11D, the user can review A, then B, then D to confirm or correct the assumptions made by the IPITOMIZER module.

As has been discussed earlier, the user can input feedback regarding the relevance of each case, resort the cases, and create reports regarding the anticipated relevances of the cases. The system can keep track of what the user has reviewed and has not reviewed, thereby making sure that important cases are not overlooked. For example, the user can use the IPVIEWER to see what highly relevant cases have not yet been reviewed, icons representing the unreviewed cases perhaps having a different appearance than icons representing the reviewed cases. Hence, as can be seen from the above discussion, the various different aspects of the overall system of the present invention can be utilized to
review and analyze the legal literature in addition to intellectual property and scientific and engineering literature.

The foregoing description of the invention has been presented for purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise forms disclosed. Obviously, many modifications and variations will be apparent to practitioners skilled in this art. For example, it is noted that the various forms of information described above as being stored in theIPHISTORIAN and the users database may be stored in a wide variety of organizational schemes, all of which are intended to fall within the scope of the present invention. It is noted that the various examples of inherent properties which are described in this application are not all inclusive and are not intended to be exhaustive of all possible forms of inherent properties which may be used. Further, it is noted that the various functions performed by the various modules described above may be performed where the functions are performed by more or less modules, and organized in different organizational schemes, all of which are also intended to fall within the scope of the present invention.
What is claimed is:

1. A method for performing a computerized search for documents comprising:
   taking keywords that are input into a computer system;
   having the computer system identify a first group of documents that are anticipated to be relevant to the input keywords; and
   having the computer system perform a first shared inherent property search and sorting using one or more documents from the first group of documents.

2. The method according to claim 1 wherein the keywords are input local to the user and the steps of identifying a first group of documents and performing a first shared inherent property search and sorting is performed remote from the user.

3. The method according to claim 1 wherein the documents searched include documents selected from the group consisting of patents, scientific and engineering documents, and published legal decisions.

4. The method according to claim 1 wherein at least two documents of the first group of documents are used to perform the first shared inherent property search and sorting.

5. The method according to claim 1 wherein the method further includes having the computer system perform a second shared inherent property search and sorting using one or more documents identified by the shared inherent property search and sorting.

6. The method according to claim 5 wherein at least two documents of the second group of documents are used to perform the second shared inherent property search and sorting.

7. The method according to claim 1 wherein the method further includes having the computer system take the input keywords, create an expanded set of keywords from the input keywords, and use the expanded set of keywords to identify the first group of documents.

8. The method according to claim 7 wherein the expanded set of keywords includes synonyms of the keywords, the expanded set of keywords being formed by taking the input keywords and employing logic which identifies the synonyms for the input keywords.
9. The method according to claim 7 wherein the expanded set of keywords includes natural language expansion of the keywords, the expanded set of keywords being formed by taking the input keywords and employing logic which employs natural language expansion to form the expanded set of keywords.

10. A method for performing a computerized search for documents comprising:
    taking names that are input into a computer system;
    having the computer system identify a first group of documents based on the input names; and
    having the computer system perform a first shared inherent property search and sorting using one or more documents from the first group of documents.

11. The method according to claim 10 wherein the names are input local to the user and the steps of identifying a first group of documents and performing a first shared inherent property search and sorting are performed remote from the user.

12. The method according to claim 10 wherein identifying the first group of documents includes identifying documents that are authored by or invented by the input names.

13. The method according to claim 10 wherein identifying the first group of documents includes forming an expanded set of names comprising the coinventors or coauthors of the input names, and identifying documents based on the expanded set of names.

14. The method according to claim 13 wherein the documents are patents and forming the expanded set of names comprises identifying the patents that name the input names as inventors, and identifying the coinventors of the identified patents.

15. The method according to claim 10 wherein identifying the first group of documents includes identifying documents that are assigned to the input names.

16. The method according to claim 10 wherein the documents include published legal decisions.

17. The method according to claim 10 wherein the method further includes having the computer system perform a second shared inherent property search and sorting using one or more documents.
identified by the shared inherent property search and sorting.

18. The method according to claim 17 wherein at least two documents of the second group of documents are used to perform the second shared inherent property search and sorting.

19. A method for performing a computerized search for documents comprising:
   taking citations for documents that are input into a computer system; and
   having the computer system perform a first shared inherent property search and sorting using the input citations.

20. The method according to claim 19 wherein the citations are input local to the user and the steps of identifying a first group of documents and performing a first shared inherent property search and sorting is performed remote from the user.

21. The method according to claim 19 wherein the documents are patents and the citations are patent numbers.

22. The method according to claim 19 wherein the documents are scientific and engineering documents and the citations include volumes and page numbers of the scientific and engineering documents.

23. The method according to claim 19 wherein the documents include published legal decisions and the citations include volumes and page numbers of the published legal decisions.

24. The method according to claim 19 wherein the method further includes having the computer system perform a second shared inherent property search and sorting using one or more documents identified by the shared inherent property search and sorting.

25. A system for sorting pieces of documents for an anticipated relevance to sorting information, the system comprising:
   computer readable logic for taking sorting information including one or more pieces of probable information and sorting a group of documents based on an anticipated relevance to the sorting information.
26. A system according to claim 25 wherein the documents are patents.

27. A system according to claim 25 wherein the sorting information includes information which is not specified to the system by the user.

28. A system according to claim 27 wherein the information which is not specified to the system by the user is information which is not contained within the document and cites the document.

29. A system according to claim 27 wherein the system further includes logic for anticipating whether information is related to a document, the information which is not specified to the system by the user is information which is not contained within the document and is not a citation to the document.

30. A system according to claim 29 wherein the information is anticipated to be relevant to the document based on a comparison of the contents of the information to the contents of the document.

31. A system according to claim 25 wherein the sorting information includes information which is not contained within the document.

32. A system according to claim 25 wherein the sorting information includes information recorded by the system regarding a user's review of documents.

33. A system according to claim 25 wherein the sorting information includes information recorded by the system regarding documents that a user has indicated to the system as being relevant to the user.

34. A system according to claim 25 wherein the documents were identified by searching a database of documents using a set of search criteria, the information used to perform the sorting being different information than the search criteria.

35. A system according to claim 25 wherein the sorting logic includes a sorting system which is customized for a particular purpose.

36. A system according to claim 35 wherein the particular purpose is selected from the group consisting of patentability, invalidity, infringement, licensing and interferences.
37. A system according to claim 25 wherein the system includes at least two sorting systems, each sorting system being customized for a different purpose, the system being designed such that a user can select which of the at least two sorting systems the sorting logic employs.

38. A system according to claim 1, further including logic for allowing a user to customize a sorting system used by the logic for sorting intellectual property.

39. A system according to claim 25, further including logic for optimizing a sorting system used by the logic for sorting intellectual property based on actual relevancy information from the user.

40. A system according to claim 25, the system further including logic for preventing information which a user has already reviewed from being displayed with the sorted group of documents.

41. A system for sorting documents for an anticipated relevance to sorting information, the system comprising:
   - logic for taking sorting information including one or more documents that a user has indicated to the system as being relevant, and sorting a group of documents based on an anticipated relevance to the sorting information, anticipated relevance being determined, at least in part, by a shared inherent properties analysis with the one or more documents that the user has indicated to the system as being relevant.

42. A system according to claim 41 wherein the documents are patents.

43. A system according to claim 41 wherein the documents are scientific journal articles.

44. A system according to claim 41 wherein the sorting logic includes a sorting system which is customized for a particular purpose.

45. A system according to claim 44 wherein the particular purpose is selected from the group consisting of patentability, invalidity, infringement, licensing and interferences.

46. A system according to claim 41 wherein the system includes at least two sorting systems, each sorting system being customized for a different purpose, the system being designed such that a user can select which of the at least two sorting systems the sorting logic employs.
A noise detection system is provided which includes a receiving unit, a processing unit and a user interface unit connected together. The receiving unit consists of a three-dimensional acoustical array for generally simultaneously receiving a multiplicity of sound signals from different directions. The sound signals have at least one sound source of interest. The processing unit processes the sound signals and consists of a three-dimensional spatial filter for identifying the elevation and azimuth of each of the sound signals.

A sound database containing a multiplicity of soundprints of sound sources of interest, apparatus for classifying the sound signals with the soundprints, and apparatus for providing the azimuth and elevation of each of the classified sound signals. The user interface unit indicates to the user the azimuths and elevations of the classified sound signals. The processing unit further consists of filtering apparatus for filtering extraneous noise signals received by the acoustical array.

19 Claims. 5 Drawing Sheets
SEARCH A

Required Information:
Keywords:
Inventors:
Assignees:

Probable Information:
Keywords: pump, motor, piston, regulator
Inventors: Jones, Smith, Davis, Peters
Assignees: Acme, Belfast, Chumley

SEARCH B

Required Information:
Keywords:
Inventors:
Assignees:

Probable Information:
Keywords: pump, motor, piston, regulator
Inventors: Jones, Smith, Davis, Peters
Assignees: Acme, Belfast, Chumley

SEARCH C

Required Information:
Keywords: water, not blood
Inventors:
Assignees:

Probable Information:
Keywords: pump, motor, piston, regulator
Inventors: Jones, Smith, Davis, Peters
Assignees: Acme, Belfast, Chumley, Dunlop
Search Class: 352, 353, 354
FIGURE 3B

SEARCH D

Required Information:
Keywords:
Inventors:
Assignees:

Probable Information:
Keywords: pump, motor, piston, regulator
Inventors:
Assignees:

SEARCH E

Required Information:
Keywords:
Inventors:
Assignees:

Shared Inherent Properties Searching
5,343,455
4,893,747

Probable Information:
Keywords: pump, motor, piston, regulator
Inventors: Jones, Smith, Davis, Peters
Assignees: Acme, Belfast, Chumley
Search Class: 352, 353, 354

SEARCH F

Shared Inherent Properties Searching
5,343,455
4,893,747
4,999,665
5,212,222
5,206,333
4,789,323
not 4,888,354
not 5,232,444
FIGURE 3C

SEARCH G

Required Information:
Keywords:
Inventors:
Assignees:

Probable Information:
Keywords:
Inventors:
Assignees:

Shared Inherent Properties Searching
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4,893,747
4,999,665
5,212,222

SEARCH H

Required Information:
Keywords:
Inventors:
Assignees:

Probable Information:
Keywords: pump, motor, piston, regulator
Inventors: Jones, Smith,
Assignees: Acme,

Shared Inherent Properties Searching
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5,212,222
FIGURE 3C (cont.)

SEARCH I

Required Information:
Keywords: water, not blood
Inventors:
Assignees:

Probable Information:
Keywords: pump, motor, piston, regulator
Inventors: Jones, Smith, Davis, Peters
Assignees: Acme, Belfast, Chumley, Dunlop
Search Class: 352, 353, 354

Shared Inherent Properties Searching
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5,212,222
5,206,333
4,789,323
FIGURE 3D

SEARCH J

Required Information:
Keywords: pump, motor, piston, regulator
Inventors: Jones, Smith, Davis, Peters
Assignees: Acme, Belfast, Chumley, Dunlop
Search Class: 352, 353, 354

Shared Inherent Properties Searching
5,343,455
4,893,747

SEARCH K

Required Information:
Keywords: water, not blood
Inventors:
Assignees:

Probable Information:
Keywords: pump, motor, shaft
Inventors: Jones, Smith, Davis, Peters
Assignees: Acme, Belfast, Chumley, Dunlop
Search Class: 352, 353, 354

Shared Inherent Properties Searching
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4,789,323
FIGURE 3E

SEARCH L

Required Information:
Keywords:
Inventors:
Assignees:

Probable Information:
Keywords: cellular or phone or pager
Inventors:
Assignees:
Search Class:

Shared Inherent Properties Searching
Assignee = Erikson, Nokia, Motorola, Sony or Samsung
An intellectual property data management system is provided which perform one or more of the following functions: (a) find intellectual property for a user to review based on information provided to the system by the user; (b) record information regarding the user's use of the data management system; (c) sort intellectual property based on its anticipated relevance to the user using information recorded into the system by the user; (d) display groups of intellectual property in various display formats to assist the user to visualize functional interrelationships between different pieces of intellectual property in the group; (e) maintain a database containing pieces of intellectual property and various forms of information associated with each piece of intellectual property; (f) hunt for new intellectual property or new pieces of information associated with each piece of intellectual property; (g) alert users when new intellectual property or new pieces of information which are anticipated to be relevant to the user are identified; and (b) create customized reports involving the intellectual property identified by the above processes, and optionally information recorded into the system by the user.
**FIGURE 5A**

**SORTING SYSTEM**
- General
- Patentability
- Invalidity
- Infringement
- Licensing
- Interference

Priority date: ___

**SORTING TERMS**

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### #IPHISTORIAN

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- ![ ] Selected  - ![ ] Not selected  
  Grade: 1 (lowest) - 5 (highest)
FIGURE 5B

REQUIRED AND PROBABLE INFORMATION

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FIGURE 5B (cont.)

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IPHISTORIAN

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FIGURE 6B, FIGURE 6C, FIGURE 6D

Relevance (infringement) →

Relevance (patentability) →

Priority Date →

G10, G18, G20, G22, G20, G22, G22, G20, G16, G20, G22
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*FIGURE 6E*

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Relevance (infringement) ➔

ASSIGNEE

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★ Charles Corp.
■ David Corp.
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**ASSIGNEE**

- Albert Corp.
- Bruce Corp.
- Charles Corp.
- David Corp.

**Relevance (patentability)**

**FIGURE 6G**
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**Relevance** (infringement)

**Figure 6Q**

SUBSTITUTE SHEET (RULE 26)
FIGURE 8

U.S. Patent No. 6,000,000

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H: high relevance  
M: medium relevance  
L: low relevance  
Bibliographic: title, inventor, assignee, issue date, patent number, filing date, serial number
Keywords input 1012

Expansion of keywords via thesaurus, natural language expansion, etc [OPTIONAL] 1014

Identify patents based on keywords 1016

Perform shared inherent property searching using all or some of the identified patents [OPTIONAL] 1018

Most relevant patents, assignees, etc. identified 1022

Information regarding patents, inventors, assignees obtained from [PHISTORIAN] 1024

User reviews patents, enters feedback, searching and sorting revised in view of feedback 1020

Optionally one or more cycles

Figure 10A
Inventors input 1026

Identify a group of patents that name the inventors 1028

Perform shared inherent property searching and sorting 1030

Perform one or more additional cycles of shared inherent property searching and sorting 1032

OPTIONAL

Identify expanded set of inventors based on 1028, 1030, and/or 1032 1034

OPTIONAL

Identify patents relating to expanded set of inventors 1036

OPTIONAL

Perform one or more cycles of shared inherent property searching and sorting 1038

OPTIONAL
Figure 10C

Input assignees 1042

Identify patents to assignees 1044

Perform shared inherent property searching and sorting based on some or all identified patents 1046

Perform additional OPTIONAL shared inherent property searching and sorting 1048
Figure 10D

Input patents 1052
or published applications

Perform shared inherent property searching and sorting based on input patents and applications 1054

Perform additional 1056 shared inherent property searching and sorting based on patents identified in step 1054
Any reference to
FIGURE 10e
shall be considered
NON-EXISTENT
(see Article 14(2))
SHEPARD'S Signal: Caution - Possible negative treatment
Restricted: No Restrictions

Case History
Same case
Same case
Shamrock Technologies Inc. v. Precision Micron Powders Inc., 20 U.S.P.Q.2d (BNA) 1797
Connected case
1st Circuit
P.1797
P.1640
Vitronics Corp. v. Conceptronics Inc., 27 U.S.P.Q.2d (BNA) 1046
P.1049
2nd Circuit
P.154
P.155
P.1698
P.1135
Followed P.1136
Distinguished P.1137
P.1138
P.1139
Deer Park Spring Water Inc. v. Appalachian Mountain Spring Water Co., 19 U.S.P.Q.2d (BNA) 1201
Distinguished P.1206
Explained P.1735
3rd Circuit
Merck & Co. v. Mylan Pharmas., Inc., 19 F. Supp. 2d 334
P.343
P.1306

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