

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

UIPATH, INC.,

Petitioner,

v.

RULE 14 LLC.,

Patent Owner.

Case No. IPR2024-01304

U.S. Patent No. 9,229,977

DECLARATION OF DR. JAIDEEP SRIVASTAVA, PH.D.

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I. INTRODUCTION

1. My name is Dr. Jaideep Srivastava. I have been retained as an expert witness on behalf of Petitioner to provide expert opinions on the patentability of U.S. Patent No. 9,229,977 (the “’977 patent”) (Ex. 1001).

2. I am being compensated at my normal rate, plus reimbursement for expenses, for my analysis. My compensation does not depend on the content of my opinions or the outcome of this proceeding.

II. EXPERIENCE AND QUALIFICATIONS

3. My qualifications are set forth in my curriculum vitae, a copy of which is submitted as Ex. 1004.

4. I received my Bachelor’s degree from the Indian Institute of Technology (IIT), India (1983), and my Master’s (1985) and PhD (1988) degrees from the University of California – Berkeley. All of my degrees are in Computer Science.

5. I am currently a Professor of Computer Science and Engineering at the University of Minnesota, a position I have held since 1988.

6. I have more than thirty five (35) years of technical expertise in the field of computer science and engineering, including experience with databases, optimization techniques, applications of graphs and database system design and architecture.

7. I have taught a range of database courses at the University of Minnesota, including core database courses like *Principles of Database Systems*, *Database System Implementation*, *Introduction to Database Research*, and specialized ones like *Introduction to Social Network Analysis* – which have strong database components.

8. I have supervised forty-six (46) doctoral dissertations and seventy (70) Masters theses/projects in the field of Computer Science & Engineering. Sixteen (16) of my PhD advisees themselves are professors in various universities across the world, while many of the rest are in some of the top technology companies. I have also mentored a number of university undergraduates and high schools students, many of which have gone on to careers in the STEM disciplines.

9. I have authored or co-authored over four hundred and sixty (460) papers in peer-reviewed journals and conferences in the field of Computer Science and Engineering.

10. I am a co-inventor on 6 United States patents in the field of Computer Science & Engineering.

11. My research in the field of Computer Science & Engineering has been funded by various federal agencies including the National Science Foundation (NSF), the National Aeronautics and Space Administration (NASA), the Defense Advanced Research Projects Agency (DARPA), the Intelligence Advanced

Research Projects Agency (IARPA), the U.S. Army, and the US Air Force – via multiple, peer-reviewed grants. My research has also been supported by the State of Minnesota and private organizations.

12. I have worked with a number of commercial database systems while serving as a Data Mining Architect at Amazon from December 1999 through June 2000, and the Director of Data Analytics at Yodlee from July 2000 through June 2001. In my role as Director of Data Analytics at Yodlee, Inc., I led the creation of an analytics system from scratch, and was responsible for various technical decisions related to it.

13. I have advised a number of companies on database technologies, including Apertus, Honeywell, Eaton and United Technologies, among others.

14. I was an advisor to the State of Minnesota from 2006 through 2008, and the Government of India from 2011 through the present, in the use of database and other information technologies for more effective governance.

15. In 2010, I co-founded an analytics company, and was responsible for overseeing the end-to-end development of the first version of the system. I was responsible for the architecture and other technical aspects of the system, and leading the team that did the programming and development. A SQL database was at the core of the system, and I was personally responsible for the design, architecture, and implementation decisions around it.

16. I am a Fellow of the Institute of Electrical and Electronics Engineers (IEEE), the world's largest professional society of Electrical Engineering, Communications and Computing professionals. I have been an IEEE Distinguished Visitor, and received the PAKDD's Lifetime Achievement Award for my contributions to the field of data mining. I have served on various journal editorial boards and conference organizing committees – many times chairing the technical committees. I have been invited to deliver over fifty (50) keynote speeches, tutorials and other invited talks in national and international conferences.

17. I am an active researcher, with eight (8) current PhD and four (4) current MS students, working in the areas of Social Media Analytics and Health Informatics.

18. My analyses set forth in this Declaration are informed by my experience in the field of computer science, including computer architecture, operating systems, distributed systems, database systems, data mining and machine learning. Based on my above-described experience, I believe that I am considered to be an expert in these fields.

III. MATERIALS CONSIDERED

19. In preparing this Declaration, I have reviewed the '977 patent and file history. I also have considered the accompanying Petition, and the following documents cited in this Declaration.

Ex. 1001	U.S. Patent No. 9,229,977
Ex. 1002	File History of U.S. Patent Appl. 13/928,313, filed June 26, 2013
Ex. 1005	J. Callan et al., <i>Searching Distributed Collections With Inference Networks</i> , Presented at the 18th Annual International Conference on Research and Development in Information Retrieval, 1995
Ex. 1006	Lu et al., <i>Measures in Collection Ranking Evaluation</i> , Technical Report TR-96-39, Computer Science Department, University of Massachusetts, 1996
Ex. 1007	French et al., <i>Comparing the Performance of Database Selection Algorithms</i> , Proceedings of the 22nd annual international ACM SIGIR conference on research and development in information retrieval
Ex. 1008	D'Souza et al., <i>Collection Selection for Managed Distributed Document Databases</i> , Information Processing & Management, Volume 40, Issue 3 (May, 2004)
Ex. 1009	U.S. Patent No. 6,018,733 (Kirsch et al.)
Ex. 1010	U.S. Patent Publication No. 2006/0106793 (Liang)
Ex. 1011	"Learning lexis.com"("Learning Lexis")
Ex. 1012	Printout from Wayback Machine Internet Archive dated 12/10/01
Ex. 1013	Printout from Wayback Machine Internet Archive dated 12/09/01
Ex. 1014	U.S. Patent No. 7,765,228 to (Eichstaedt)
Ex. 1015	U.S. Patent No. 7,844,603 (Lucovsky)
Ex. 1016	WO Publication No. 01/65336 (Mellin)
Ex.. 1017	U.S. Patent No. 5,721,902 (Schultz)
Ex. 1018	Infringement Contentions of Patent Owner in <i>Rule 14, LLC v. UiPath, Inc.</i> , Case No. 2:23-cv-627 (E.D. Tex.)
Ex. 1020	U.S. Patent No. 7,043,482 (Vinsonneau)
Ex. 1021	U.S. Patent No. 9,418,139 (Moulinier)
Ex. 1022	U.S. Patent No. 8,121,997 (Raciborski)
Ex. 1023	Reed Elsevier Annual Report, 2001

In formulating my opinions, I have further relied upon my extensive experience.

IV. LEGAL STANDARDS

A. Anticipation

20. It is my understanding that the claims of a patent are anticipated by a prior art reference if each and every element of the claim is found either explicitly or inherently in a single prior art reference or system. I understand that inherency requires a showing that the missing descriptive matter in the claim is necessarily or implicitly present in the allegedly anticipating reference, and that it would have been so recognized by a person of ordinary skill in the art at the time (POSITA). In addition, I understand that an enabling disclosure is one that allows a POSITA to make the invention without undue experimentation. Although anticipation typically involves the analysis of a single prior art reference, I understand that additional references may be used to show that the primary reference has an enabling disclosure, to explain the meaning of a term used in the primary reference, and/or to show that a characteristic is inherent in the primary reference.

B. Obviousness

21. I understand that a claim is unpatentable if the differences between the claimed subject matter and the prior art are such that the subject matter as a whole would have been obvious to a POSITA at the time the claimed subject matter was made. I understand that a patent claim may be obvious to a POSITA in view of the prior art teachings of a single reference or a combination of references. I understand that a claim is obvious based on a combination of references where a POSITA would

have been motivated to make such a combination, and would have had a reasonable expectation of success in arriving at the claimed subject matter.

22. To assess obviousness, I understand that I am to consider the scope and content of the prior art, the differences between the prior art and the claim, the level of ordinary skill in the art, and any secondary considerations to the extent they exist.

23. It is also my understanding that there are principles that may be used as further guidance in obviousness analysis (especially when considering combinations of references), which include considering whether:

- the claimed subject matter is simply a combination of prior art elements according to known methods to yield predictable results;
- the claimed subject matter is a simple substitution of one known element for another to obtain predictable results;
- the claimed subject matter uses known techniques to improve similar devices or methods in the same way;
- the claimed subject matter applies a known technique to a known device or method to yield predictable results;
- the claimed subject matter would have been “obvious to try” choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;

- there is known work in one field of endeavor that may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations would have been predictable to a POSITA;
- there existed at the time of conception and reduction to practice a known problem for which there was an obvious solution encompassed by the patent's claims; and
- there is some teaching, suggestion, or motivation in the prior art that would have led a POSITA to modify the prior art reference or to combine prior art reference teachings to arrive at the claimed subject matter.

24. I understand that there are secondary considerations that may tend to show that a claimed invention would not have been obvious to a POSITA. These include, for example, commercial success, long-felt but unsolved needs, failure of others, and unexpected results. I further understand that there must be a relationship, or nexus, between any secondary considerations and the novelty of the claimed invention.

V. LEVEL OF ORDINARY SKILL IN THE ART

25. I am informed and understand that various factors can be considered in determining the skill and experience of a POSITA. I am informed and understand

that those factors include: (1) the educational level of the inventors; (2) the type of problems encountered in the art; (3) prior art solutions to those problems; (4) the rapidity with which innovations are made; (5) sophistication of the technology; and (6) education level of active workers in the field.

26. A POSITA as of August 2, 2012 would have had a working knowledge of techniques for querying and monitoring data sources as pertinent to the '977 Patent. A POSITA would have had a bachelor's degree in electrical engineering, computer science, or equivalent training, and approximately two years of work experience in software development with a basic knowledge of database searching techniques.

VI. THE SPECIFICATION AND CLAIMS OF THE '977 PATENT

27. The specification of the '977 Patent describes “a data mining system” in which “a query” such as “a natural language query” is “generated by a user.” Ex. 1001, 4:9-13. The query is “expanded” by, for example, supplementing the query terms with synonyms. *Id.*, 4:17-23. Next, multiple “data sources”¹ are searched

¹ The specification provides a variety of examples of different “data sources” that can be searched including “social media, web feeds, customer feedback, internal company databases, and proprietary data silos,” “publicly available data, such as data available via Wikipedia or the CIA fact book,” “[s]ources that are indexed by search engines,” “a blog,” and “classified databases, data behind a firewall, or data that is available via a paid subscription, such as Lexis.” *Id.*, 1:23-25, 4:35-49 and 4:51-53.

using the query and “the results of the query are reviewed.” *Id.*, 4:27-32; 4:54. “If the results are satisfactory, specific data sources may be selected to be monitored” periodically for updates. *Id.*, 4:54-56. Monitoring results are communicated to users by “establishing a communication channel,” such as “a message board, phone, SMS, or email” with user(s). *Id.*, 5:1-12; 12:20-35. These steps are recited in Claim 1 of the '977 Patent, set forth below:

A method of analyzing data, comprising:
generating, via a first user, a query based at least in part on a topic of interest;
expanding search terms of the query;
executing the query on a plurality of data sources;
selecting at least one data source from the plurality of data sources, the at least one data source being selected when results of the query are greater than or equal to an accuracy thresholds;
monitoring, based on a set schedule, the at least one data source to extract data from the at least one data source when at least an update to stored data that matches the query, newly added data that matches the query, or a combination thereof; and
establishing a communication channel with a second user based at least in part on the data extracted from the at least one monitored data source.

28. In Claim 1, the step in which data sources are “selected” recites “selecting at least one data source from the plurality of data sources, the at least one data source being selected when results of the query are greater than or equal to an

accuracy thresholds.”² The specification does not recite an “accuracy threshold” or “accuracy thresholds.” However, the specification equates the relevancy of the search results with the accuracy of the search results:

... As previously discussed, at the results module 502, the user selects relevant results for processing (e.g., calibration). That is, the user may judge the results for accuracy based on the intent of the query. *Id.*, 10:18-21 (emphasis added).

29. Similarly, in its infringement contentions in parallel district court litigation (the "Litigation,") the Patent Owner has equated “an accuracy thresholds” with relevancy. Specifically, the Patent Owner's infringement contentions state:

... UiPath Communication Mining selects at least one data source from the plurality of data sources, the at least one data source being selected when results of the query are greater than or equal to an accuracy thresholds, including by selecting a data source with information that is considered “most relevant” to the query. Ex. 1018, at 40 (emphasis added).

30. Thus, based on both the specification and Patent Owner's infringement contentions, it is clear that in the context of the '977 Patent, a “relevancy” threshold is an example of “an accuracy thresholds.”

² The reference to “an accuracy thresholds” is grammatically awkward because “an” is singular while “thresholds” is plural. However, the specification does not refer to multiple accuracy thresholds being used for selection of data sources. Therefore, interpreting the claim to require multiple accuracy thresholds would exclude from the scope of the claim any disclosed embodiment(s) in the specification.

VII. THE PROSECUTION HISTORY OF THE '977 PATENT

31. The '977 Patent matured from Appl. No. 13/928,313, filed June 26, 2013. In the First Office Action, all claims were rejected as anticipated by US 2011/0047161 (“Myaeng”). Ex. 1002, at 148-159. An Examiner Interview was conducted on April 13, 2015. In advance of the Interview, the Applicant provided an Agenda in which the Applicant proposed claim amendments and argued that Myaeng was distinguishable, arguing in part as follows:

... claim 1 recites, in part, establishing, via the first user, a communication channel with a second user based at least in part on the data extracted from the at least one monitored data source. ... Myaeng is silent on establishing a communication channel between two users ... Ex. 1002, at 143 (emphasis added).

32. After the Interview, the Applicant filed a Reply Under 37 C.F.R. 1.111 in which the Applicant amended the claims with some (but not all) of the amendments proposed during the Interview. Ex. 1002, at 120-129. Notably, the amendments submitted with the Reply lacked the requirement that the communication channel be established with the second user “via the first user” (as proposed during the Interview), and instead simply recited establishing the communication channel with the second user (with no requirement that the channel with the second user be established via the first user.)

33. The Examiner allowed the Application in the next Office Action. In the reasons for allowance, the Examiner found that the prior art failed to show (i)

selecting a data source from a plurality of data sources based on the accuracy (relevancy) of search results from the selected data source, (2) monitoring the selected data source(s) for updates, and (3) establishing a communication channel by, e.g., sending an email³ to a second user alerting them of the update. Ex. 1002, at 30 (reasons for allowance).

VIII. CLAIM CONSTRUCTION

34. I understand that claim terms should normally be given their ordinary and accustomed meaning as would have been understood by a POSITA as of the priority date in view of the specification and prosecution history. In formulating my opinions, I have applied the ordinary and accustomed meaning as would have been understood by a POSITA as of the priority date in view of the specification and prosecution history to the claims of the '977 Patent.

a. Claims 1, 10 and 19 of the '977 Patent recite "generat[e/ing], via a first user, a query based at least in part on a topic of interest." I have been instructed that the plain meaning of this term, consistent with the specification, covers a query generated by a human user. All the proposed grounds of rejection in the Petition satisfy this element as they all rely on prior art where queries are generated by human users.

³ The '977 Patent explains that “establishing a communication channel” with a user means nothing more than sending a message to the user via “a message board, phone, SMS, or email” with the user. *Id.*, 12:20-35.

b. The specification describes “expanding the search terms of the query” as an exercise whereby a lexicographical analysis is used to “expand” the search terms, Ex. 1001, 4:17–21, 6:34–36 and 6:40–44, and I have been instructed that the plain meaning of this term, consistent with the specification, covers query expansion using a lexicographical analysis.

IX. OVERVIEW OF PRIOR ART

A. The “Collection Selection” Problem

35. By 1995, hundreds of different data sources (referred to as “collections”) had become available on the Internet, but it was impractical to search all of them for a given topic. The problem presented back in 1995 -- named the “collection selection” problem -- was how to narrow a search to a few useful collections. As one author explained:

Users of commercial retrospective information retrieval systems have always faced the collection selection problem. The user must either search all collections or choose the subset to be searched.

J. Callan et al., *Searching Distributed Collections With Inference Networks*, Presented at the 18th Annual International Conference on Research and Development in Information Retrieval, 1995 (the “Callan Paper”) (emphasis added) (Ex. 1005, at 1).

36. The Callan Paper proposed the following four-step solution to the “collection selection” problem:

1. Use the query to retrieve a ranked list of collections,
2. Select the top group of collections,
3. Search the top group of selections, in parallel or sequentially, and
4. Merge the results from the various collections into a single ranking.

Id., at 2.

37. In 1996, the Callan Paper was cited (as reference 1) in Lu et al., *Measures in Collection Ranking Evaluation*, Technical Report TR-96-39, Computer Science Department, University of Massachusetts, 1996 (the “Lu Paper”)(Ex. 1006), which also described the “collection selection” problem:

As hundreds or even thousands of collections become available on the Internet, it is practically impossible to query all of them when searching for information on a given topic. ... Consequently the need to narrow the search to a few useful collections raises the issue of how to locate the most useful collections. Several approaches have been proposed to solve this problem. ... In this paper, we survey the measures for collection ranking used in the current research ... Ex. 1006, at 1 (emphasis added).

The Lu Paper described several methods for ranking collections, including methods that scored collections based on relevancy. *Id.*, at 2-8.

38. In 1999, the Lu Paper was cited (as reference 17) in French et al., *Comparing the Performance of Database Selection Algorithms*, Proceedings of the 22nd Annual International ACM SIGIR Conference On Research And Development In Information Retrieval (the “French Paper”) (Ex. 1007, at 8). There, the authors again addressed the “collection selection” problem by comparing two solutions, i.e., *gGLOSS* and *CORI*. Ex. 1007, at 1-2. The *gGLOSS* approach ranked databases based

on a “goodness” score that was a function of the similarities between the query and documents in a database. *Id.*, at 2. The *CORI* approach represented each database based on the frequency of terms appearing in the documents in the database, and ranked the databases by analyzing the query against this frequency information. *Id.*, at 2.

39. In 2004, the French Paper was cited⁴ in D'Souza et al., *Collection Selection for Managed Distributed Document Databases*, Information Processing & Management, Volume 40, Issue 3 (May, 2004) (Ex. 1008). There, the authors again addressed the “collection selection” problem, describing still further solutions that had emerged since the French Paper. In this regard, the authors stated:

Broadcasting queries to all collections could well be costly or impractical, thus it is attractive to first rank the collections in the database ... The user can then query the top-ranked collections directly ... Ranking the collections then provides a form of collection selection.

* * *

Several techniques have been proposed for collection selection. ... There are two general kinds of techniques based on indexing. One is to gather the set of distinct terms, or lexicon, from each collection, together with some inter- and intra-collection statistics such as the number of documents containing each term; these statistics may then be used to estimate the appropriateness of each collection to a query. ... The other kind of selection technique is to index documents in the database of collections, then select at query time the collection with the most promising documents. Ex. 1008, at 2 (emphasis added).

⁴ See, list of References in D'Souza et al., Ex. 1008, at 19.

Among other points relevant to the claims of the '977 Patent, D'Souza et al. observed that long queries “generated by query expansion” are “better at collection selection.” *Id.*, at 4 (emphasis added).

40. Thus, by 2004, the “collection selection” problem had been written about extensively, and numerous solutions had been developed.⁵ The first, third and fourth steps of Claim 1 of the '977 Patent -- i.e., generating, via a first user, a query based at least in part on a topic of interest; executing the query on a plurality of data sources; and selecting at least one data source from the plurality of data sources, the at least one data source being selected when results of the query are greater than or equal to an accuracy thresholds -- simply restate the “collection selection” problem and cover all previous solutions to the problem. Also by 2004, the second step of Claim 1 -- expanding search terms of the query -- had been identified by D'Souza et al. as beneficial for “collection selection.” *Id.*, at 4.

B. U.S. Patent No. 6,018,733 - Kirsch

41. In 1997, Infoseek Corporation -- a search engine founded by Steve Kirsch -- filed an application that matured into U.S. Patent No. 6,018,733 entitled

⁵ The Callan Paper (Ex. 1005), Lu Paper (Ex. 1006), French Paper (Ex. 1007), and D'Souza (Ex. 1008) all relate to the field of database searching and the collection selection problem. As a person of ordinary skill in the art in the relevant field, I would have had an interest in the subject matter of these publications at the time of the invention of the '977 Patent. In addition, a person of ordinary skill in the art would have been able to find these publications with reasonable diligence at around the time of the invention of the '977 Patent.

“Methods for Iteratively Performing Collection Selection In Full Text Searches.” (Kirsch) (Ex. 1009). In the Background of his patent, Kirsch explained that “[w]hile access to much of the information available through the Internet is free for public use, numerous proprietary or fee-based access document collections exist.” Ex. 1009, 1:32-35. Kirsch noted that the “collection selection” problem “is complicated further when the opportunity and desire exists to search any combination of public and private document collections.” *Id.*, at 2:21-23.

42. In Kirsch, a user query “formed using any combination of a free text” (*id.*, 6:40-43) is “expanded as appropriate into a list of specifically identified search terms.” *Id.*, 7:6-7. Kirsch disclosed a plurality of different “document collections,” each of which is a “data source.”⁶ Kirsch taught initially directing the query against multiple document collections. *Id.*, at 14:48-50 (“the user query 84 is preconditioned upon issuance from the user workstation 82 to specify the particular set of collections 88, 90, 92 that the query is to be resolved against.”) Kirsch taught that the user query was then “used to select a qualified set of most likely relevant document collections.” *Id.*, 6:29-30 and 10:19-21 (“the present invention supports automatic ... collection selection.”)

⁶ Kirsch equates “document collections” with information (or data) sources. *See*, Ex. 1009, at 1:33-43 (“Private document collections are likely to continue to exist as significant sources of unique information.”)(emphasis added).

43. In Kirsch, the selection of a document collection from the set of collections was based on the document collection exceeding a relevance score and a rank. In order for a document collection to be selected, the collection needed to meet a “minimum level of relevance.” *Id.*, 12:11-12; 9:67-10:4 (discussing a "minimum relevance ranking threshold.") A further "post-search constraint" required a selected collection to rank high enough to fall within a "maximum number of collections returned." *Id.*, 12:11-12.

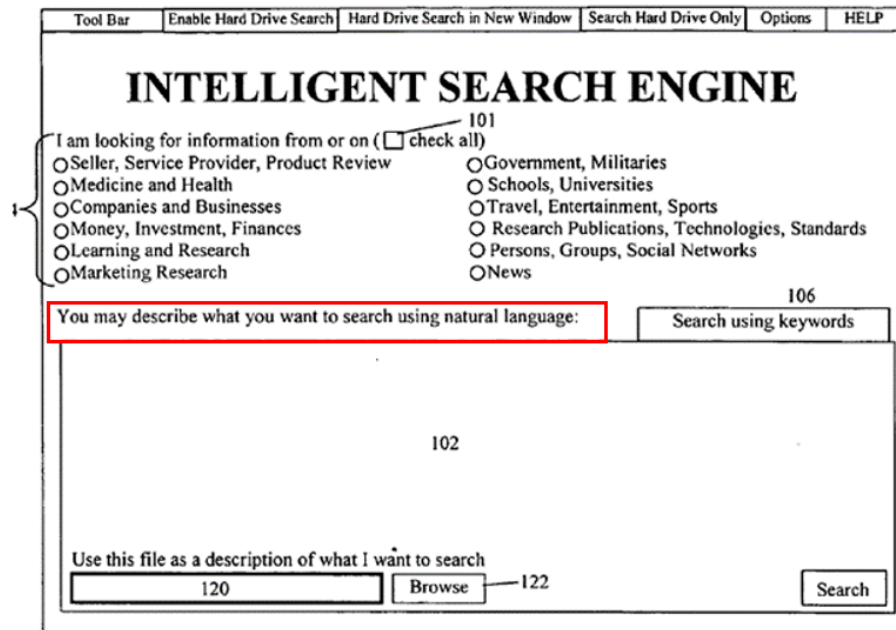
C. Learning Lexis.com

44. I have been informed that “Learning lexis.com®” (“Learning Lexis Guide”) (Ex. 1011) is prior art to the '977 Patent.

45. Details of Learning Lexis are set forth later in Section XI(I) of this Declaration.

D. U.S. Patent Publication No. 2006/0106793 - Liang

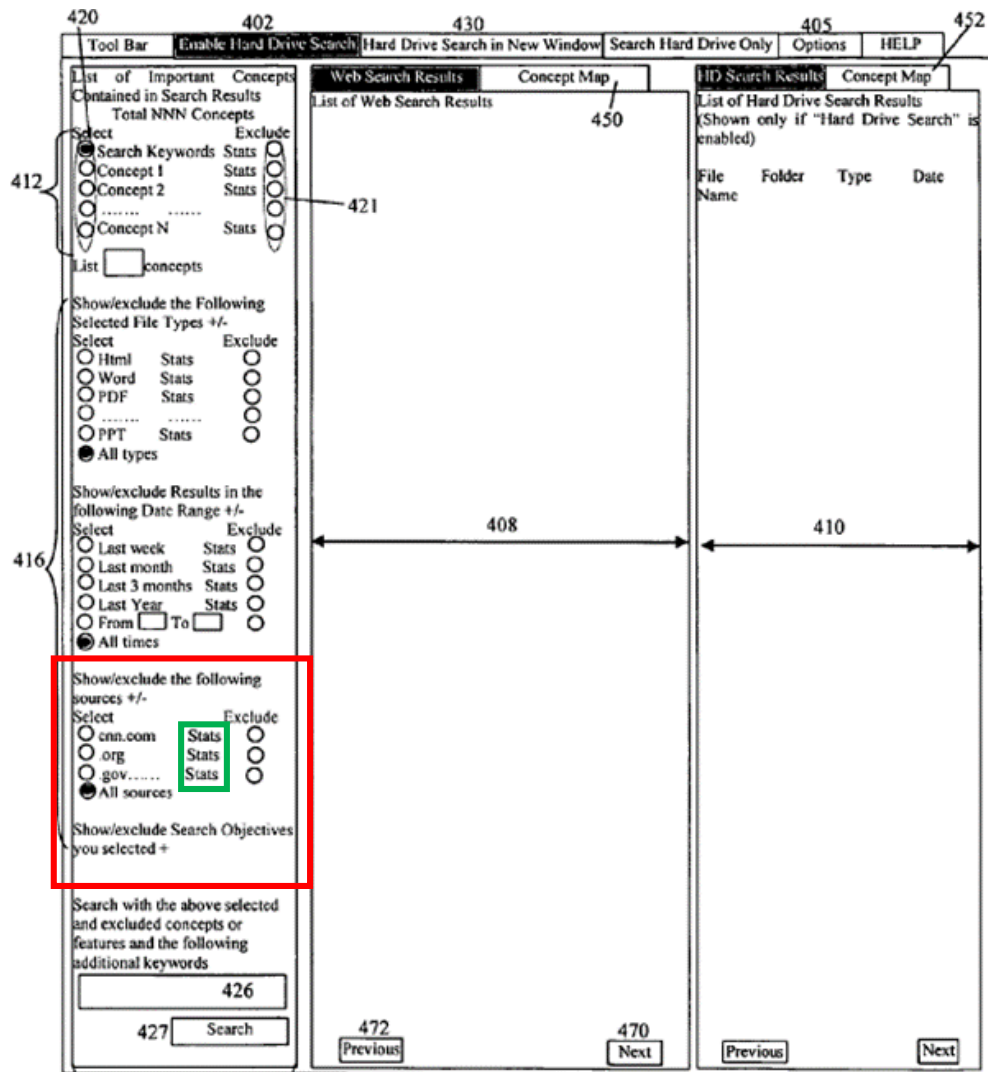
46. U.S. Patent Publ. No. 2006/0106793 (“Liang”) (Ex. 1010) entitled “Internet and Computer Information Retrieval And Mining With Intelligent Conceptual Filtering, Visualization And Automation,” disclosed an “Intelligent Search Engine,” an illustrative interface of which was depicted in Figure 1 (annotations added in red):



47. As shown above, Liang included a user interface through which a user could enter a natural language search query (red box). Liang also taught expanding search keywords using synonyms.⁷ Ex. 1010, [0013].

48. Liang taught execution of the query on multiple sources (see red box below), as depicted in Figure 1 of the reference (annotations added in red/green):

⁷ Liang taught ‘broadening’ (which is another term for expanding) search terms with “synsets.” Ex. 1010, [0013]. A synset is a set of synonyms.



49. A POSITA would have understood Liang as teaching that a query is initially executed on a plurality of data sources. In describing Figure 4, Liang states that “sections 416 allow a user to filter the search results by other filtering features such as file types, dates of modification, sources, among other things.” *Id.*, [0178] (emphasis added). In order for a user to be able to filter based on sources (plural) in Liang, the query would first need to have been executed on a plurality of sources.

The fact that the “All Sources” box is checked in Figure 4 further suggests that the initial query is applied to multiple data sources in Liang.

50. Liang also provides “Stats” (see green box in Figure 4 above) for each of the data sources that were searched. Liang explains that these “Stats” correspond to statistics, such as “the total number of appearances of an important concept in the search results.” *Id.*, [0184].

51. Liang provides users functionality to monitor data sources for updates using the query, and to receive an alert (e.g., by email) when changes are detected. This aspect is disclosed in Figure 1 of Liang (annotations added in red):

The screenshot shows the 'INTELLIGENT SEARCH ENGINE' interface. At the top is a 'Tool Bar' with buttons: 'Enable Hard Drive Search', 'Hard Drive Search in New Window', 'Search Hard Drive Only', 'Options', and 'HELP'. The main title is 'INTELLIGENT SEARCH ENGINE'. Below the title, there is a section for selecting search criteria. A bracket labeled '104' groups a list of categories: 'Seller, Service Provider, Product Review', 'Medicine and Health', 'Companies and Businesses', 'Money, Investment, Finances', 'Learning and Research', and 'Marketing Research'. To the right of this list is a checkbox labeled 'check all' with an arrow pointing to it labeled '101'. Further right is another list of categories: 'Government, Militaries', 'Schools, Universities', 'Travel, Entertainment, Sports', 'Research Publications, Technologies, Standards', 'Persons, Groups, Social Networks', and 'News'. Below these lists is a text input field labeled 'You may describe what you want to search using natural language:' with a 'Search using keywords' button next to it, labeled '106'. Below the text input field is a large empty box labeled '102'. Below box '102' is a section for file uploads. It says 'Use this file as a description of what I want to search' and has a text input field labeled '120' and a 'Browse' button labeled '122'. To the right of the 'Browse' button is a 'Search' button. Below the file upload section is a 'More Options:' section. It contains a group of radio buttons for 'Search for information that was updated' with options: 'Anytime', 'Past Week', 'Past Month', 'Past 3 months', 'Past 6 Months', 'Past Year', and 'Past 3 Years'. A bracket labeled '108' groups these radio buttons. Below the radio buttons is a section for 'You want this search to be active from' with a date range selector labeled '110' and a note '(If no date is selected, it is treated as a one-time search)'. At the bottom, there is a red-bordered box containing the text 'You will receive an alert on your desktop when new sources or changes are detected. If you want also to receive an email alert, please enter your email address' and an email input field, labeled '112'.

52. With respect to Figure 1, Liang stated that “it offers a user ... the option to keep his search active for a period of time to monitor for new sources and changes to existing sources by specifying a date range in 110, and when a change is detected,

the option to alert the user on his local PC or send an email to an email account that the user provides in 112.” *Id.*, [0052] (emphasis added). Liang also taught that “[b]oth the time period and the monitoring frequency may be chosen by a pull-down menu, or text box and check boxes.” *Id.*, [0347] (emphasis added).

53. Liang further taught techniques for visualization of search results, as shown for example in Figure 9 of the reference (red box added):

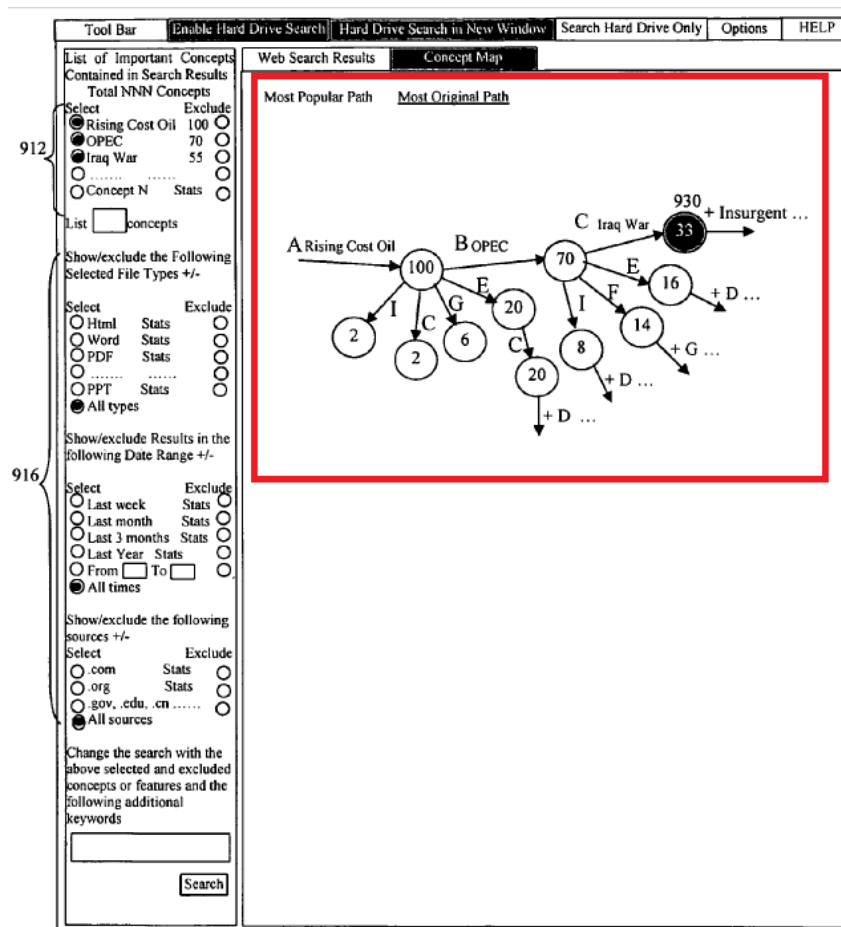


Figure 9

E. U.S. Patent No. 7,765,228 (Eichstaedt)

54. U.S. Patent No. 7,765,228 to Eichstaedt et al. taught servers that "compare old query results" to "current content item(s)" after a "predefined period" and deliver an email alert to the user with the new content item. Ex. 1014, 8:19-20, 8:37-54 and Figures 5-6.

F. U.S. Patent No. 7,844,603 (Lucovsky)

55. U.S. Patent 7,844,603 to Lucovsky (Lucovsky) is entitled "Sharing User Distributed Search Results." Lucovsky discloses mechanisms by which a first user could share search results with a second user via an email, a message board, an instant message and a blog. Ex. 1015, at Figures 4-9.

G. WO Publication No. 01/65336 (Mellin)

56. WO Publication No. 01/65336 (Mellin), taught the use of an email address directed to a group in order to facilitate dissemination of information to all members of the group. *See, e.g.,* Ex. 1016, at 3:24-26 ("A group is a collection of users, known as group members. Each group has an email address with the system.")

H. U.S. Patent No. 5,721,902 (Schultz)

57. U.S. Patent No. 5,721,902 to Schultz (Schultz) (Ex. 1017) taught that a results list can be sent from a server to a user computer over a communication channel. The user can then provide feedback by clicking on a particular search result causing the server to return the corresponding document to the user over the same

communication channel that the server used to send the search results list to the user.

Ex. 1017, 14:13-15:16.

I. U.S. Patent No. No. 7,043,482 (Vinsonneau)

58. U.S. Patent No. 7,043,482 (Vinsonneau) (Ex. 1020) taught a method for querying data banks where the number of bots used to process search queries depends on the volume or quantity of data being searched. Ex. 1020, 4:8-9.

J. U.S. Patent No. 9,418,139 (Moulinier)

59. U.S. Patent No. 9,418,139 to Moulinier taught translation of a natural language query from one language to another. Ex. 1021, 4:10-14 and 6:3-57.

X. SUMMARY OF GROUNDS

Ground	Claim(s)	Combinations of References Rendering the Challenged Claims Invalid Under 35 U.S.C. §103
1	1, 2, 4-6, 8, 10-11, 13-15, 17 and 19-20	Kirsch, Eichstaedt and Lucovsky
2	1, 4, 6, 8, 10, 13, 15, 17 and 19	Kirsch, Eichstaedt and Mellin
3	4, 5, 13, 14 and 21	Kirsch, Eichstaedt, Lucovsky and Schultz
4	2, 11 and 20	Kirsch, Eichstaedt, Mellin and Schultz
5	3 and 12	Kirsch, Eichstaedt, Lucovsky and Liang
6	7 and 16	Kirsch, Eichstaedt, Lucovsky, Schultz and Moulinier
7	9 and 18	Kirsch, Eichstaedt, Lucovsky, and Vinsonneau
8	9 and 18	Kirsch, Eichstaedt, Mellin and Vinsonneau
9	1, 2, 5, 6, 8, 10, 11, 14, 15, 17 and 19-21	Learning Lexis, Kirsch and Lucovsky
10	4 and 13	Learning Lexis, Kirsch, Lucovsky and Schultz
11	3 and 12	Learning Lexis, Kirsch, Lucovsky and Liang
12	7 and 16	Learning Lexis, Kirsch, Lucovsky and Moulinier
13	9 and 18	Learning Lexis, Kirsch, Lucovsky and Vinsonneau
14	1, 3, 4, 10, 12, 13 and 19	Liang and Lucovsky
15	1-6, 8, 10-15, 17 and 19-21	Liang, Lucovsky and Kirsch
16	1, 10 and 19	Liang, Kirsch and Mellin
17	2, 5, 11, 14 and 20-21	Liang, Kirsch, Mellin and Schultz
18	7 and 16	Liang, Lucovsky and Moulinier
19	7 and 16	Liang, Lucovsky, Kirsch and Moulinier
20	9 and 18	Liang, Lucovsky and Vinsonneau
21	9 and 18	Liang, Lucovsky, Kirsch and Vinsonneau

XI. ALL OF THE CHALLENGED CLAIMS ARE OBVIOUS

A. Ground 1 - Claims 1, 2, 4-6, 8, 10-11, 13-15, 17 And 19-20 Are Obvious Over Kirsch, Eichstaedt And Lucovsky

1. Claim 1

60. As set forth below, all of the elements of Claim 1 are met by Kirsch, Eichstaedt and Lucovsky.

a. Element 1.1 - “A method of analyzing data”

61. To the extent the preamble is limiting, Kirsch teaches a method for searching databases, which maps to “[a] method of analyzing data.” Ex. 1009, 7:47-49 (search terms are provided “for analysis against a collection meta-index 16.”)(emphasis added). Kirsch also teaches that the “user query 12 is then used ... to select some number of most likely relevant documents from the identified collection set.” Ex. 1009, 6:34-37. When Kirsch selects the “most likely relevant documents from the identified collection set,” it is also “analyzing data.”

b. Element 1.2 - “generating, via a first user, a query based at least in part on a topic of interest”

62. Kirsch teaches that “a user query 12 may be preferentially formed using “any combination of a free text syntax,” such as “growing orchids indoors.” *Id.*, 6:40-43. The formation of “user query 12” directed to “growing orchards outdoors” in Kirsch maps to “generating, via a first user, a query based at least in part on a topic of interest” in the claims.

c. Element 1.3 - “expanding search terms of the query”

63. Kirsch teaches that the “search terms are thus ... expanded as appropriate into a list of specifically identified search terms,” (*id.*, 7:6-7), which maps to “expanding search terms of the query” in the claims.

d. Element 1.4 - “executing the query on a plurality of data sources”

64. Kirsch teaches searching a plurality of different “document collections,” each of which is a “data source.” Kirsch equates each document collection with a “source of unique information” which corresponds to a “data source” (see note 1, *supra*):

While access to much of the information available through the Internet is free for public use, numerous proprietary or fee-based access document collections exist. Although such private document collections may all be accessible through the Internet, ... , the collections are generally forced to be accessible as discrete entities in order to maintain fee-based access control. Private document collections are likely to continue to exist as significant sources of unique information. *Id.*, 1:33-43 (emphasis added).

65. Kirsch teaches that the query is initially directed against multiple document collections (which map to “a plurality of data sources” in the claim.) *Id.*, at 14:48-50 (“the user query 84 is preconditioned upon issuance from the user workstation 82 to specify the particular set of collections 88, 90, 92 that the query is to be resolved against”).

e. Element 1.5 - “selecting at least one data source from the plurality of data sources, the at least one data source being selected when results of the query are greater than or equal to an accuracy thresholds”

66. Kirsch teaches that “a user query 12 is used to select a qualified set of most likely relevant document collections.” *Id.*, 6:29-30 and 10:19-21 (“the present invention supports automatic ... collection selection.”) The selection of “a qualified set” of document collections in Kirsch maps to “selecting at least one data source from the plurality of data sources” in the claim.

67. As explained in Section VI, *supra*, based on the specification and Patent Owner's infringement contentions, it is clear that in the context of the '977 Patent, a “relevancy” threshold is an example of “an accuracy thresholds.” Kirsch teaches that in order for a document collection to be selected, the document collection must meet a “minimum level of relevance.” *Id.*, 2:12; 9:67-10:4 (discussing “minimum relevance ranking threshold.”) A further “post-search constraint” in Kirsch required a selected collection to rank high enough to fall within a “maximum number of collections returned.” *Id.*, 12:11-12. The “minimum level of relevance,” “minimum relevancy ranking threshold” and requirement that a selected collection rank high enough to fall within a “maximum number of collections returned” in Kirsch, individually or collectively, map to “an accuracy thresholds” in the claims.

- f. **Element 1.6 - “monitoring, based on a set schedule, the at least one data source to extract data from the at least one data source when at least an update to stored data that matches the query, newly added data that matches the query, or a combination thereof”**

68. Eichstaedt teaches providing an email notification (or alert) to a user "when new information becomes available regarding ... search results." Ex. 1014, 2:5-15. Eichstaedt teaches that "queries can be applied to new content information ... as the new content information becomes available." *Id.*, 2:43-45. In order to prepare alerts, a poller server "wakes up after a predefined period" (e.g., after each "15 minute" slot elapses) and compares "old query results to the current content item(s). For example, if a current content item is different from an old query result, the poller server can replace the old query result with the current content item. ... The poller server also sends a request to the delivery server" which delivers "an alert with the content item." *Id.*, 7:67, 8: 14-21, 8:28-54, 12:38-41 and Figures 5-6.

69. Eichstaedt's disclosures of (i) applying an old query to new content information after a predefined period (e.g., after expiration of 15 minute slots) and (ii) delivering an alert to a user with the new content item, map to “monitoring, based on a set schedule, the at least one data source to extract data when at least an update to stored data that matches the query,” in the claim.

70. Kirsch and Eichstaedt are both directed to search query technology. It would have been obvious to a POSITA to incorporate Eichstaedt's monitoring

functionality into Kirsch, so that a user could receive periodic updates of new search results from the “selected document collections” in Kirsch.

71. A POSITA would have had a reasonable expectation of success in incorporating Eichstaedt's monitoring functionality into Kirsch, as the combination involves nothing more than the routine combination of existing software functionality.

g. Element 1.7 - “establishing a communication channel with a second user based at least in part on the data extracted from the at least one monitored data source”

72. As explained in Section VI, *supra*, the '977 Patent provides examples of “establishing a communication channel” that include sending a message via email to user(s). Ex. 1001, 5:1-12. Thus, sending an email alert with updated query results is an example of “establishing a communication channel ... based at least in part on the data extracted from the at least one monitored data source,” as claimed.

73. During prosecution, the Applicant made clear that the claimed establishing of the communication channel with the second user could be performed “via the first user.” *See*, Section VII, *supra*. While the Applicant later broadened the claim by deleting the requirement that the communication channel be established with the second user “via the first user” before allowance, the prosecution history makes clear that establishing the communication channel with the second user via the first user is within the scope of the claim.

74. In addition, the plain and ordinary meaning of "establishing a communication with a second user" encompasses establishing such channel via the first user. Thus, a POSITA reading the claims of the '977 Patent in light of the specification and prosecution history would have understood "establishing a communication with a second user" encompasses establishing such channel via the first user.

75. Lucovsky (Ex. 1015) discloses a first user sharing search results with a second user via an email (Figures 4-6), message board (Figure 7), instant messaging (Figure 8) and a blog (Figure 9). Kirsch, Eichstaedt and Lucovsky are all directed to search query technology. It would have been obvious to incorporate Lucovsky's search results sharing techniques with Eichstaedt and Kirsch, so that a first user could share updates with a second user. A POSITA would have had a reasonable expectation of success in incorporating Lucovsky's search results sharing techniques with Eichstaedt and Kirsch, as the combination involves nothing more than the routine combination of existing software functionality.

76. To the extent this element requires that the communication channel be established with a different user without traversing the user submitting the query, the limitation is taught by Eichstaedt. Eichstaedt discloses that when new content matching a query is identified, a communication that includes the update is sent not only to the user that generated the query, but also to other users "who desire the

same, or very similar, query results." Ex. 1014, 4:13-51. Sending an update to any one of the "other users" maps to "establishing a communication channel with a second user."

77. Accordingly, Claim 1 is obvious over Kirsch, Eichstaedt and Lucovsky.

2. Claims 10 and 19

78. Claims 10 and 19 recite all of the limitations of Claim 1 discussed above, but in the format of an apparatus or computer program product rather than a method. Claim 10 further recites "a memory unit" and "at least one processor ... configured" to perform the recited functions, and Claim 19 further recites "a non-transitory computer-readable medium having program code recorded thereon" to perform the recited functions. These aspects of Claims 10 and 19 are met by Kirsch. Ex. 1009, 6:24-29 ("The methodology 10 is preferably implemented as an application program ... executing on one or more conventional networked computer systems.") A POSITA would have understood a conventional network computer system to include memory coupled to a processor.

79. Accordingly, Claims 10 and 19 are obvious over Kirsch, Eichstaedt and Lucovsky.

3. Claims 2, 11 and 20

80. Claims 2, 11 and 20 are cast in different formats (i.e., method, apparatus and computer program product) but otherwise contain substantively identical limitations. The analysis below of Claim 2 applies identically to Claims 11 and 20.

a. Element 2.1 - “analyzing the extracted data”

81. Kirsch teaches that the document list returned from the selected collection(s) may be refined “based on preferences established from the user workstation 82. These preferences may define refinement criteria such as minimal acceptable relevancy score, total number of documents identified, maximum number of documents from a particular collection, and the like. The refined document list is then provided by the search interface 122 through the Internet 86 as a report 121 to the user workstation 82. Thus, the end user can analyze the report 121 and selectively retrieve identified documents from the various collections 88, 90, 92 as desired.” Ex. 1009, 15:50-59 (emphasis added). When Kirsch's system refines the document list based on user preferences, it is “analyzing” data. Similarly, Kirsch states that the user analyzes the document list, which also maps to “analyzing” data.

82. As noted above, Eichstaedt teaches extracting data as part of the process of monitoring for updates. It would have been obvious to apply Kirsch's teachings for refining and/or analyzing a document list (as set forth in the paragraph above) to Eichstaedt so that user preferences could be used to refine (or narrow) the subject

matter of alerts. A POSITA would have had a reasonable expectation of success in applying Kirsch's teachings for refining and/or analyzing a document list to Eichstaedt, as the combination involves nothing more than the routine combination of existing software functionality.

b. Element 2.2 - “receiving feedback from the user based at least in part on the established communication channel”

83. As mentioned above in Section XI(A)(1)(g), Lucovsky discloses a first user sharing search results with a second user via an email. An example of such an email is depicted in Figure 5 of the reference (shown below):

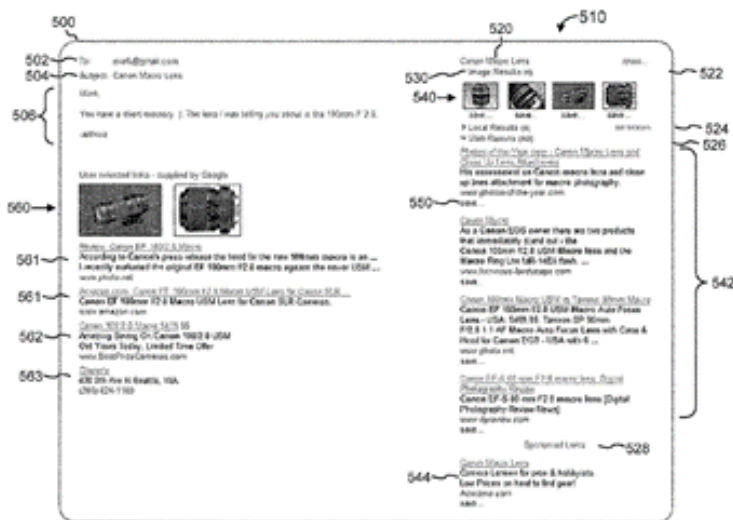
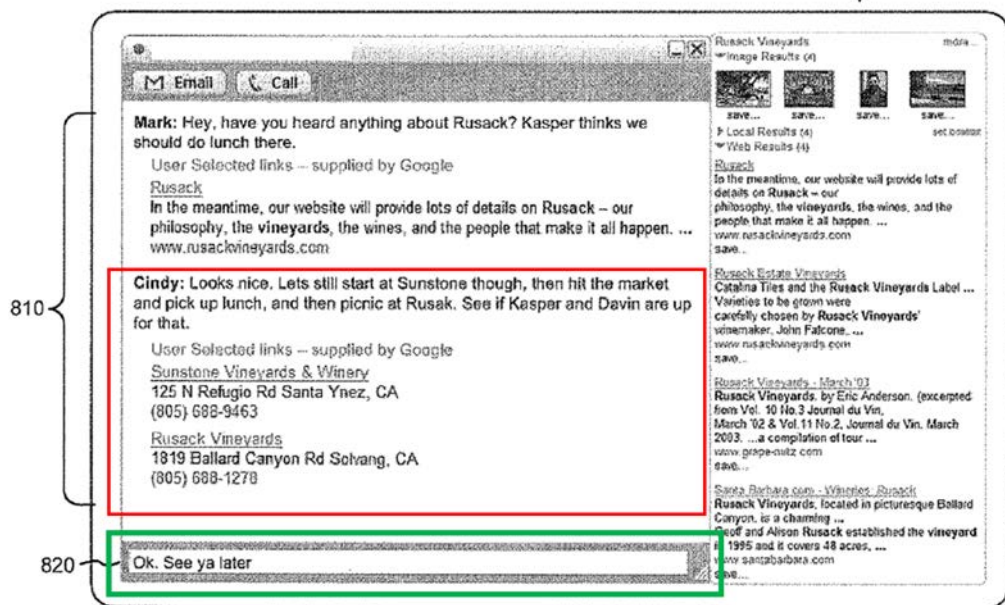


Fig. 5

84. As shown in Figure 8 of the reference (shown below with annotations added), Lucovsky discloses a user interface through which one user (Cindy) sends an email with search results (red box below) to a second user (Mark). Lucovsky

discloses that the second user (Mark) responds to the first user's email with the search results with the message "OK, See ya later" (green box below).



The responsive message (green box above) maps to “receiving feedback from the user based at least in part on the established communication channel” in the claim.

85. In view of the above, Claims 2, 11 and 20 are obvious over Kirsch, Eichstaedt and Lucovsky.

4. Claims 4 and 13

86. Claims 4 and 13 are cast in different formats but otherwise contain substantively identical limitations. The analysis below of Claim 4 applies identically to Claim 13.

a. Element 4.1 - “expanding the query comprises expanding the search terms to include at least misspellings, synonyms, sub-topics, antonyms, or a combination thereof”

87. Kirsch teaches that “[c]ommon variably represented terms, such as online, are also equivalently recognized; online being made equivalent to “on line” and “on-line” for purposes of term equivalence mapping. ... The various search terms are thus reduced and expanded as appropriate into a list of specifically identified search terms.” Ex. 1009, 6:64-7:7. Expanding the query to include “equivalently recognized” search terms in Kirsch maps to “expanding the search terms to include ... synonyms.”

88. Thus, Claims 4 and 13 are obvious over Kirsch, Eichstaedt and Lucovsky.

5. Claims 5, 14 and 21

89. Claims 5, 14 and 21 are cast in different formats but otherwise contain substantively identical limitations. The analysis below of method Claim 5 applies identically to Claims 14 and 21.

- a. **Element 5.1 - “refining the search terms based at least in part on the executed query, and in which the monitoring is performed to monitor for matches to a refined query “**

90. Lucovsky teaches that the “user may continue to edit the content, enter or refine search queries.” Ex. 1015, 7:49-50. (emphasis added). It would have been obvious to apply a refined (narrowed) query as taught in Lucovsky to the monitoring taught in Eichstaedt in order to narrow the updates to those reflected by a refined query. A POSITA would have had a reasonable expectation of success in applying a refined (narrowed) query as taught in Lucovsky to the monitoring taught in Eichstaedt in order to narrow the updates to those reflected by a refined query, as the combination involves nothing more than the routine combination of existing software functionality.

91. Thus, Claims 5, 14 and 21 are obvious over Kirsch, Eichstaedt and Lucovsky.

6. Claims 6 and 15

92. Claims 6 and 15 are cast in different formats but otherwise contain substantively identical limitations. The analysis below of Claim 6 applies identically to Claim 15.

a. Element 6.1 - “ the plurality of data sources include open-source data sources that are publicly available and closed-source data sources that at not publicly accessible”

93. Kirsch applies its teachings to document collections that include both (i) “information available through the Internet [that] is free for public use” (which maps to “open-source data sources that are publicly available” in the claim), and (ii) “proprietary or fee-based access document collections” (which map to “closed-source data sources that are not publicly accessible” in the claim.) Ex. 1009, 1:33-42.

94. Thus, Claims 6 and 15 are obvious over Kirsch, Eichstaedt and Lucovsky.

7. Claims 8 and 17

95. Claims 8 and 17 are cast in different formats but otherwise contain substantively identical limitations. The analysis below of Claim 8 applies identically to Claim 17.

a. Element 8.1 - “the plurality of data sources are pre-defined”

96. The algorithm in Kirsch is applied to a “list of likely most relevant collections” (Ex. 1009, 9:66) or “a constrained set of collections” (*Id.*, 11:19-23), either of which maps to a plurality of “pre-defined” data sources in the claim.

97. Thus, Claims 8 and 17 are obvious over Kirsch, Eichstaedt and Lucovsky.

B. Ground 2 - Claims 1, 4, 6, 8, 10, 13, 15, 17 And 19 Are Obvious Over Kirsch, Eichstaedt And Mellin

98. As explained in Sections XI(A)(1)(a)-(f), *supra*, Elements 1.1 - 1.6 of Claim 1 are met by Kirsch and Eichstaedt. Instead of relying on Lucovsky for Element 1.7 as set forth in Ground 1 above, Ground 2 maps Element 1.7 (“establishing a communication channel with a second user based at least in part on the data extracted from the at least one monitored data source”) to Mellin which taught the use of a group email address to facilitate collaboration among members of a group. *See*, Mellin (Ex. 1016), at 3:24-26. In a case where the author of the query (mapped to “a first user” in the claim) was part of a group collaboration, it

would have been obvious for the author to designate a group email address to receive search result updates (based on Eichstaedt) so that the updated search results were distributed to all collaborators. Any collaborator on the group email address other than the author of the search query maps to “a second user” in the claim.

99. Accordingly, Claim 1 is obvious over Kirsch, Eichstaedt and Mellin.

100. As set forth in Section XI(A)(2), *supra*, the additional limitations of Claims 10 and 19 are met by Kirsch. Accordingly, Claims 10 and 19 are also obvious over Kirsch, Eichstaedt and Mellin.

101. As set forth in Section XI(A)(4), *supra*, the additional limitations of Claims 4 and 13 are met by Kirsch. Accordingly, Claims 4 and 13 are also obvious over Kirsch, Eichstaedt and Mellin.

102. As set forth in Section XI(A)(6), *supra*, the additional limitations of Claims 6 and 15 are met by Kirsch. Accordingly, Claims 6 and 15 are also obvious over Kirsch, Eichstaedt and Mellin.

103. As set forth in Section XI(A)(7), *supra*, the additional limitations of Claims 8 and 17 are met by Kirsch. Accordingly, Claims 8 and 17 are also obvious over Kirsch, Eichstaedt and Mellin.

C. Ground 3 - Claims 4, 5, 13, 14 and 21 Are Obvious Over Kirsch, Eichstaedt And Lucovsky, In View Of Schultz

1. Claims 4 and 13

104. As explained above, Claims 4 and 13 recite expanding the query to include synonyms. To the extent this feature is not expressly taught in Kirsch as explained in Section XI(A)(4)(a), *supra*, Schultz teaches expansion of a query term using a semantic network. The term “is applied to a semantic network in step 142d to determine expansion words corresponding to the query term. For purposes of the present invention, the term “semantic network” means a database in which each term carries with it semantic information such as, for example, part of speech and synonym information.” Ex. 1017, 23:42-48. Thus, Schultz taught expanding a search terms to include synonyms.

105. Kirsch, Eichstaedt, Lucovsky and Schultz are all directed to search query technology. It would have been obvious to incorporate Schultz's query expansion techniques with the other references so that a user could apply an expanded query including synonyms to Kirsch's document collections. A POSITA would have had a reasonable expectation of success in incorporating Schultz's query expansion techniques with the other references so that a user could apply an expanded query including synonyms to Kirsch's document collections, as the combination involves nothing more than the routine combination of existing software functionality.

106. Thus, Claims 4 and 13 are also obvious over Kirsch, Eichstaedt and Lucovsky, in view of Schultz.

2. Claims 5, 14 and 21

107. As explained above, Claims 5, 14 and 21 recite refining the search terms based on the executed query and monitoring using the refined query. To the extent this claim element is not taught by Lucovsky as set forth in Section XI(A)(5)(a), *supra*, Schultz teaches performance of a “recursive” search, i.e., a search query “performed only on the results of a prior query.” Ex. 1017, 14:4-7. A POSITA would have understood the recursive query in Schultz to include “refined” search terms that are directed to searching within the prior search results.

108. Kirsch, Eichstaedt, Lucovsky and Schultz are all directed to search query technology. It would have been obvious to apply a refined (narrowed) query as taught in Schultz to the querying and monitoring taught in Kirsch and Eichstaedt, respectively, in order to narrow the updates to those reflected by the refined query. A POSITA would have had a reasonable expectation of success in applying a refined (narrowed) query as taught in Schultz to the querying and monitoring taught in Kirsch and Eichstaedt, respectively, in order to narrow the updates to those reflected by the refined query, as the combination involves nothing more than the routine combination of existing software functionality.

109. Thus, Claims 5, 14 and 21 are also obvious over Kirsch, Eichstaedt and Lucovsky, in view of Schultz.

D. Ground 4 - Claims 2, 11 and 20 Are Obvious Over Kirsch, Eichstaedt And Mellin, In View Of Schultz

110. As noted above, Claims 2, 11 and 20 contain substantively identical limitations. The analysis below of Claim 2 applies identically to Claims 11 and 20.

1. Element 2.1 - “analyzing the extracted data”

111. This feature is taught by, or obvious in view of, Kirsch and Eichstaedt as set forth in Section XI(A)(3)(a) above.

2. Element 2.2 - “receiving feedback from the user based at least in part on the established communication channel”

112. As explained above in Section XI(B), *supra*, it would have been obvious in view of Mellin (Ex. 1016) for an author of a query to designate a group email address to receive search result updates so that the updated search results were distributed to all collaborators. Any collaborator on the group email address other the author of the search query maps to “a second user” in the claim.

113. Schultz (Ex. 1017) teaches that a results list can be sent from a server to a user computer. The channel used to send the results to the user maps to “the established communication channel” in the claim. Schultz teaches that, using the search results displayed on the user's computer, the user can then click on a particular search result and the server will return the corresponding document to the user over

the same communication channel. In this scenario, when the user (e.g., a collaborator in Mellin's group email address mapped to the “second user”) clicks on a particular result, the server receives “feedback” (in the form of the selected search result) from the user. This “feedback” is sent back to the server using the same communication channel that the server used to send the search results list to the user. By sending the feedback on the same communication channel as was used to send the search results list (“the established communication channel”), the feedback is received based in part on the established communication channel. Ex. 1017, 14:13-15:16.

114. Kirsch, Eichstaedt and Schultz are all directed to search query technology. It would have been obvious to incorporate Schultz's retrieval techniques with the other references so that a user could retrieve individual documents responsive to query using the same platform that provided the query results to the user. A POSITA would have had a reasonable expectation of success in incorporating Schultz's retrieval techniques with the other references so that a user could retrieve individual documents responsive to query using the same platform that provided the query results to the user, as the combination involves nothing more than the routine combination of existing software functionality.

115. Thus, Claims 2, 11 and 20 are also obvious over Kirsch, Eichstaedt and Mellin, in view of Schultz.

E. Ground 5 - Claims 3 And 12 Are Obvious Over Kirsch, Eichstaedt And Lucovsky, In View Of Liang

116. Claims 3 and 12 contain substantively identical limitations. The analysis below of Claim 3 applies identically to Claim 12.

117. Claim 3 depends from Claim 2. As set forth in Section IX(A)(3), *supra*, Claim 2 is obvious over Kirsch, Eichstaedt And Lucovsky.

1. Element 3.1 - “visualizing at least the extracted data, the analyzed data, or a combination thereof”

118. Liang (Ex. 1010) teaches visualization of search results using graphical diagrams (see Figure 9 of Liang below - red box added).

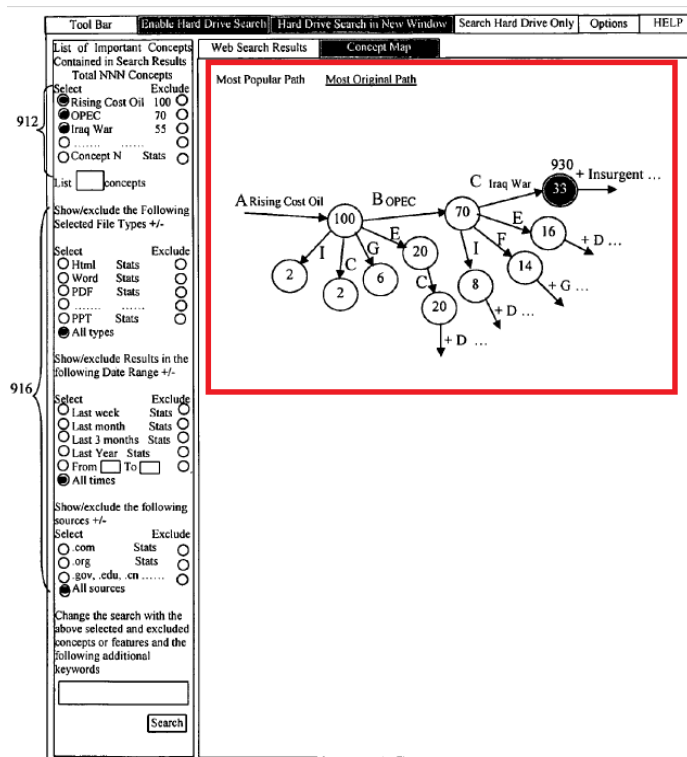


Figure 9

119. Kirsch, Eichstaedt, Lucovsky and Liang are all directed to search query technology. It would have been obvious to incorporate Liang's visualization techniques with the other references so that a user could visualize search results. A POSITA would have had a reasonable expectation of success in incorporating Liang's visualization techniques with the other references so that a user could visualize search results, as the combination involves nothing more than the routine combination of existing software functionality.

120. Thus, Claims 3 and 12 are obvious over Kirsch, Eichstaedt and Lucovsky, in view of Liang.

F. Ground 6 - Claims 7 And 16 Are Obvious Over Kirsch, Eichstaedt And Lucovsky, In View Of Schultz And Moulinier

121. Claims 7 and 16 contain substantively identical limitations. The analysis below of Claim 7 also applies to Claim 16.

a. Element 7.1 - “the query is a natural language query, and further comprising translating the query to a system understood language”

122. Schultz teaches that the “search query is preferably in a natural language format.” Ex. 1017, 4:8-9. Moulinier taught translation of a natural language query from one language to another. Ex. 1021, 4:10-14 and 6:3-57.

123. Kirsch, Eichstaedt, Lucovsky, Schultz and Moulinier are all directed to search query technology. It would have been obvious to have a user enter a natural language search query as taught in Schultz and then convert the natural language

query into a Boolean format for processing in Kirsch. The approach would make Kirsch more user-friendly for users who prefer not to formulate a Boolean search.⁸ Conversion of natural language queries to a Boolean equivalent was well known in the art. See, e.g., U.S. Patent No. 8,121,997 to Raciborski (Ex. 1022), 7:31-35 ("[n]atural language queries are possible in this embodiment. The language processor 216 parses the input search query to produce a Boolean equivalent.") Alternatively, it would also have been obvious to apply Moulinier's language translation techniques to Schultz's natural language query.⁹ In a case where Kirsch's document collections were indexed in one language (e.g., English) and the first user had French as her/her native language, a POSITA would have been motivated to use Moulinier's language translation techniques with Schultz, so as to permit the user to submit a natural language query in his/her native language. A POSITA would have had a reasonable expectation of success in incorporating (i) Schultz's natural language search queries in Kirsch, and (ii) Moulinier's language translation techniques with Schultz/Kirsch, as the combination involves nothing more than the routine combination of existing software functionality.

⁸ The specification of the '977 Patent identifies conversion of a query to "system-understood operations, such as Boolean operations" as an example of "translating the query to a system-understood language." Ex. 1001, 9:55-58.

⁹ The specification of the '977 Patent identifies translation of query "from English to another language, and vice versa" as an example of "translating the query to a system-understood language." Ex. 1001, 9:48-53.

124. Thus, Claims 7 and 16 are obvious over Kirsch, Eichstaedt, Lucovsky, Schultz and Moulinier.

G. Ground 7 - Claims 9 and 18 Obvious Over Kirsch, Eichstaedt And Lucovsky, And Further In View Of Vinsonneau

125. Claims 9 and 18 contain substantively identical limitations. The analysis below of Claim 9 applies identically to Claim 18.

126. Claim 9 depends from Claim 1. As set forth in Section XI(A)(1), *supra*, Claim 1 is obvious over Kirsch, Eichstaedt and Lucovsky.

1. Element 9.1 - “the monitoring comprises deploying extractors to each of specific data source, a number of extractors being dynamic based at least in part on a traffic volume of each specific data source”

127. Vinsonneau (Ex. 1020) taught a method for querying data banks where the number of bots used to process search queries depends on the volume or quantity of data being searched. *Id.*, 4:8-9. Vinsonneau and Eichstaedt are both directed to search technology. In view of Vinsonneau, it would have been obvious to dynamically scale the number of extractors (or "poller servers") in Eichstaedt for a particular data source based on traffic volume in order to improve the performance of Eichstaedt as traffic volume varied. A POSITA would have had a reasonable expectation of success in dynamically scaling the number of extractors (or "poller servers") in Eichstaedt for a particular data source based on traffic volume in order to improve the performance of Eichstaedt as traffic volume varied, as the

combination involves nothing more than the routine combination of existing software functionality.

128. Thus, Claims 9 and 18 are obvious over Kirsch, Eichstaedt and Lucovsky, in view of Vinsonneau.

H. Ground 8 - Claims 9 and 18 Obvious Over Kirsch, Eichstaedt And Mellin, And Further In View Of Vinsonneau

129. Claims 9 and 18 contain substantively identical limitations. The analysis below of Claim 9 applies identically to Claim 18.

130. Claim 9 depends from Claim 1. As set forth in Section XI(B), *supra*, Claim 1 is obvious over Kirsch, Eichstaedt and Mellin. With respect to the additional limitation of Claim 9, it would have been obvious in view of Vinsonneau to dynamically scale the number of extractors (or "poller servers") in Eichstaedt for a particular data source based on traffic volume, and it would have been obvious to combine Vinsonneau's dynamic scaling techniques with Eichstaedt's monitoring techniques in order to improve the performance of Eichstaedt as traffic volume varied. *See*, Section IX(G), *supra*. A POSITA would have had a reasonable expectation of success in dynamically scaling the number of extractors (or "poller servers") in Eichstaedt for a particular data source based on traffic volume in order to improve the performance of Eichstaedt as traffic volume varied, as the combination involves nothing more than the routine combination of existing software functionality.

131. Thus, Claims 9 and 18 are also obvious over Kirsch, Eichstaedt and Mellin, in view of Vinsonneau.

I. Ground 9 - Claims 1, 2, 5, 6, 8, 10, 11, 14, 15, 17 and 19-21 Are Obvious Over Learning Lexis, Kirsch And Lucovsky

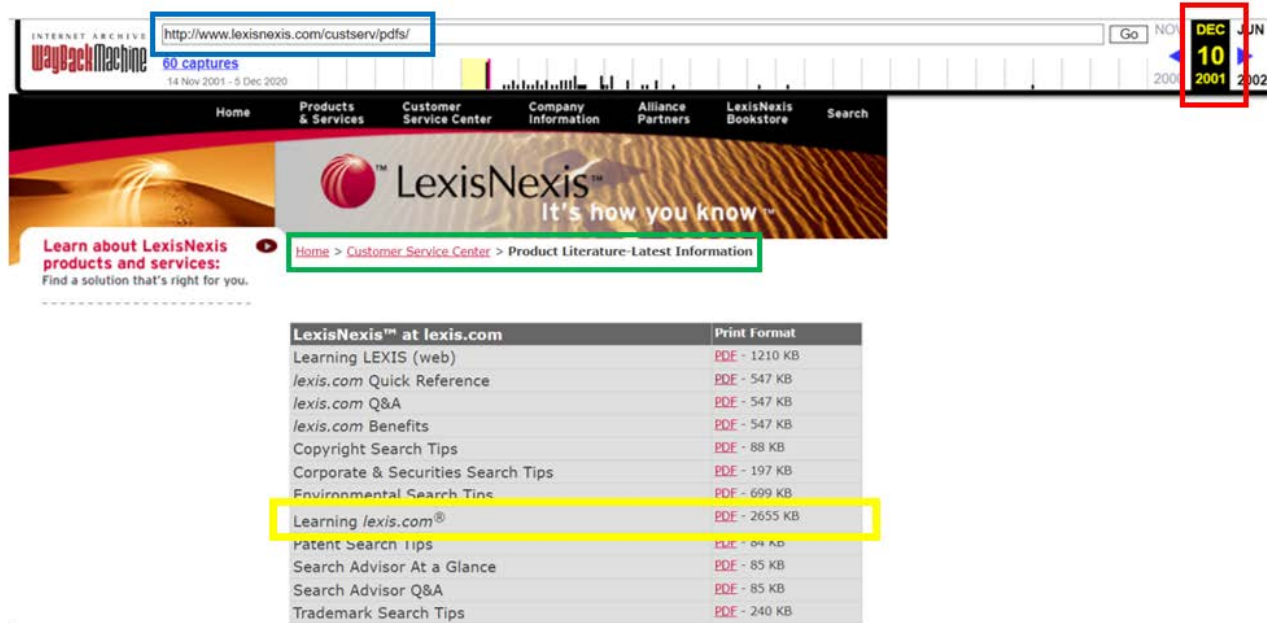
1. A Person Interested In Understanding Prior Art Search Solutions Would Have Found Learning Lexis On The Lexis Website

132. The '977 Patent identified “Lexis” as a database system that predated the patent. Ex. 1001, 4:52-53. By 2001, "LexisNexis handled over 400,000 searches each working day." Ex. 1023, at 6.

133. Learning Lexis bears a copyright date of 2000. Ex. 1011, at 33.

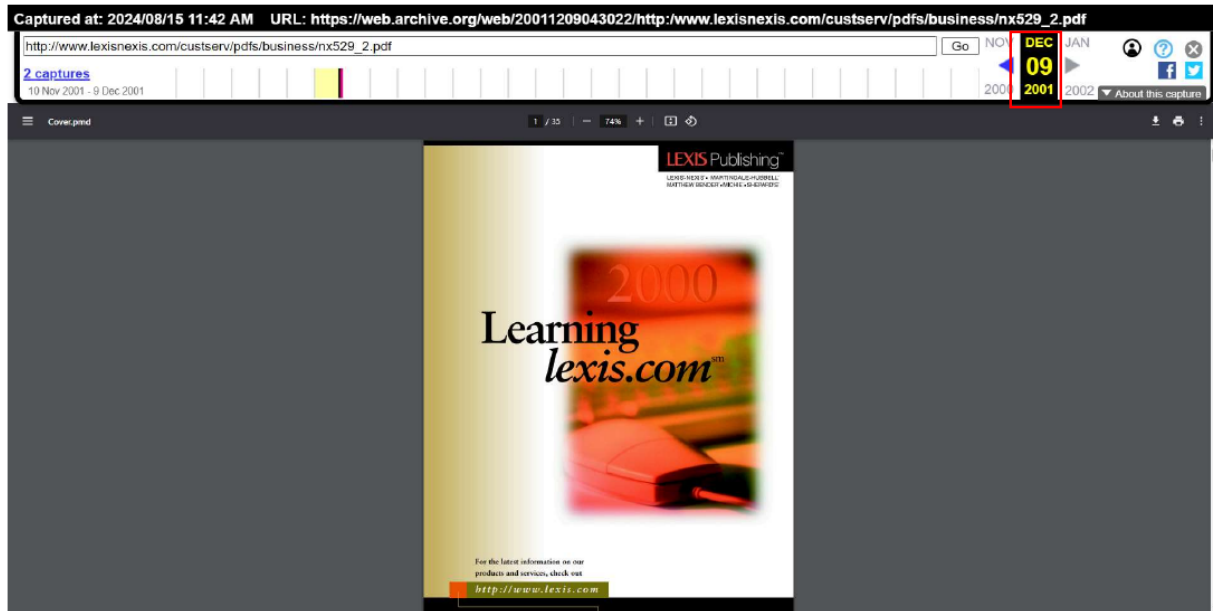
134. In addition, I have been informed that evidence from the Wayback Machine Internet Archive (discussed below) demonstrates that Learning Lexis was available for download on the www.lexisnexis.com website in 2001.

135. I have been informed that the printout reproduced below is from the Wayback Machine Internet Archive of the "Product Literature-Latest Information" page ([green box](#)) of www.lexisnexis.com ([blue box](#)) on December 10, 2001 ([red box](#)).



Ex. 1012 (yellow, green, blue and red annotations added above).

136. I have been informed that the printout reproduced below (also Ex. 1013) was obtained from the Wayback Machine Internet Archive by clicking the PDF button for "Learning *lexis.com*®" (see yellow box in diagram above) on the archived "Product Literature-Latest Information" page (Ex. 1012). I have been informed that this evidences that a user was directed to a pdf of "Learning *lexis.com*®" upon clicking the PDF button for "Learning *lexis.com*®" on the "Product Literature-Latest Information" page in December, 2001.



137. A person interested in understanding prior art search solutions at the time of the purported invention of the '977 Patent would have recognized Lexis as a leading provider of such solutions, would have known to look on the Lexis website (www.lexisnexis.com website) for information about how Lexis operated, and could have easily located Learning Lexis from the link on the "Product Literature-Latest Information" page of that website.

2. Claim 1

a. Element 1.1 - "A method of analyzing data"

138. Learning Lexis (Ex. 1011) describes performing research using the "lexis.com" service, which includes selecting sources (blue box), searching document collections (red box), and retrieving and reviewing documents (green box), all of which map to "analyzing data."



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Ex. 1011, at 1, 3 (annotations added).

b. Element 1.2 - “generating, via a first user, a query based at least in part on a topic of interest”

139. As illustrated below, Learning Lexis teaches that a user generated query is entered into a search box (see yellow box below). The query can either be in either a boolean format (red box) or natural language format (blue box). In the example shown below, the "topic of interest" corresponds to "employee drug tests" (green box).

Completing the Search Terms Form

1. Select the search format you want to use. Choose from:

Terms and Connectors (known as Boolean search logic), which uses words and connectors to create phrases and concepts based on specific rules of search logic. The search for appropriate documents is based on the specific words and combinations of words in the search request. Each word or one of its alternatives must appear in each document retrieved. For example, to find documents concerning employee drug tests, you might use this search request: *drug /15 test or screen /10 employ!*

For more information on how to use Terms and Connectors searching, see page 9.

Or

Natural Language (known as the FREESTYLE™ feature), which lets you create your own search description with natural language (meaning just as you would use in normal conversation), removing the need for using connectors and search logic. Use Natural Language when you want to research conceptual issues rather than highly specific topics and/or are starting to research a complex issue and you are unsure of what words to use.

The screenshot shows the Lexis.com search page. At the top, there are links for 'Change Client', 'Options', 'Feedback', 'Sign Off', and 'Help'. Below these are tabs for 'Search', 'Search Advisor', 'Get a Document', 'Check a Citation', 'ECLIPSE', and 'History'. The 'Sources' tab is selected, showing 'All Sources: Federal Legal - U.S.: Federal Cases, Combined Courts'. The 'Enter Search Terms' section has two radio buttons: 'Terms and Connectors' (selected) and 'Natural Language'. A yellow box highlights the search input field. A red dot is placed on the 'Search' button. Below the input field, there are links for 'Use connectors to show relation of terms (cat or feline, jane will doe) more...' and two expandable sections: 'Suggest Words and Concepts for Entered Terms' and 'Restrict Search Using Document Segments'. At the bottom, there is an 'Optional: Restrict by Date' section with a dropdown menu set to 'No Date Restrictions' and 'From' and 'To' date fields.

Terms and Connectors

Natural Language

Type your search terms

Click "Search" after search form is completed

Ex. 1011, at 10 (yellow, red, blue and green boxes added).

c. Element 1.3 - “expanding search terms of the query”

140. Learning Lexis included functionality for suggesting additional terms to incorporate into the query, which maps to “expanding search terms” in the claim:

Terms and Connectors

Natural Language

Type your search terms

Click "Search" after search form is completed

2. Type your search terms (appropriate for your selected search format) in the blank field.

Click "Suggest Words and Concepts for Entered Terms" for additional terms you may want to include in your search request.

Ex. 1011, at 10 (yellow boxes added).

141. Learning Lexis also included functionality for automatically searching for terms that "are equivalent to each other," which also maps to "expanding search terms" in the claim.

H.U.D. = HUD
Thursday = Thurs
eighty = 80
certiorari = cert

Equivalents

The *lexis.com* service automatically searches for some words and abbreviations that are equivalent to each other. If you use one in a search request, *lexis.com* will search for all equivalents. For example, *cal* will automatically find *Cal*, *Calif.* and *California*.

Ex. 1011, at 13.

d. **Element 1.4 - “executing the query on a plurality of data sources”**

142. Learning Lexis discloses various options for source selection, one of which involved use of a "source hierarchy."

Select a source

You have several options for selecting a source. You can:

- choose a source from the list of sources you recently used;
- find a source by specifying the name of the source;
- explore sources through the source hierarchy; or
- use the LEXIS® Search Advisor (a source selection tool for area-of-law case finding).



Explore Sources

Exploring sources is useful when you're unsure of the ultimate source you want to use for your research. As the name of the method implies, you explore by pointing and clicking through the source hierarchy until you reach the source you want. Each selection you make by clicking on the source name takes you deeper into the source hierarchy and a "trail" of your selection displays. A "trail" may look like this:
Combined Federal & State Case Law – U.S.: All Courts – By State: CA Federal & State Cases

Click on the source name to choose and advance through the hierarchy. To retrace your selection steps, click on the Back arrow button on your browser bar.

Ex. 1011, at 6-7 (yellow boxes added).

143. In one of the examples shown above, a hierarchy of sources included "Combined Federal & State Case Law -US" at the top of the hierarchy. A POSITA would have understood that the "Combined Federal & State Case Law US" collection represented a combination of individual collections (or data sources) each of which represented the Federal and State cases for a particular state jurisdiction (e.g., "CA Federal & State Cases").

144. In another of the examples shown above, a hierarchy of sources included "Federal Legal - U.S." at the top of the hierarchy. A POSITA would have understood that the "Federal Legal - US" collection represented a combination of individual collections (or data sources) each of which represented the cases for a jurisdiction corresponding to a particular Federal Circuit such as the 4th, 6th or 7th Circuit (see red box below).

Custom Restrictions

Citation: 800 F2d 111

Type: [Analysis](#), [Jurisdictions](#), [Headnotes](#), [Date](#) Show Restrictions Undo

Analyses available in KWIC:

Negative:

☐ Distinguished ☐ Overruled

Positive:

☐ Followed

Other:

☐ Concurring Opinion ☐ Dissenting Op. ☐ Explained

Jurisdictions available in KWIC:

Federal:

☐ 4th Circuit ☐ 6th Circuit ☐ 7th Circuit

State:

☐ Colorado ☐ Iowa ☐ Wisconsin

Ex. 1011, at 31 (red and blue boxes added).

145. In another of the examples in Learning Lexis, a hierarchy of sources included "States Legal - U.S." at , e.g., at the top of the hierarchy. A POSITA would have understood that the "States Legal - US" collection represented a combination of individual collections each of which represented the cases for a particular state jurisdiction such as Colorado, Iowa or Wisconsin (see blue box above).

146. To the extent it is not explicitly taught in Learning Lexis that each such "Combined" collection was implemented using a combination of individual collections (or data sources), it would have been obvious to have implemented the technology disclosed in Learning Lexis in that way.

147. Whenever a user selected the top of a source hierarchy (for example, "Combined Federal & State Case Law -US") for executing a query, the user was necessarily selecting all of the data sources (e.g., one for each state jurisdiction) represented in the hierarchy for execution of the query. In this way, Learning Lexis disclosed "executing the query on a plurality of data sources," as claimed.

e. Element 1.5 - “selecting at least one data source from the plurality of data sources, the at least one data source being selected when results of the query are greater than or equal to an accuracy thresholds”

148. As described in connection with Element 1.6 below, Learning Lexis disclosed an "ECLIPSE Feature" that allows a user monitor a source for updates.

Ex. 1011, at 26. In a case where a user selected the top of a source hierarchy (for example, "Combined Federal & State Case Law -US") for initially running a query, it would have been obvious to use the teachings of Kirsch to select a source (e.g., a collection limited to the specific state jurisdiction) from within the hierarchy to monitor for updates. For example, if an initial query directed to "employee drug tests" indicated that all or most of the pertinent cases were being litigated in a particular state, it would make sense to limit the ongoing monitoring of caselaw developments in the topic to developments in that particular state. It would have been obvious to use the teachings of Kirsch to automatically select such a data source for ongoing monitoring.

149. Like Learning Lexis, Kirsch discloses initially querying a plurality of data sources. Kirsch teaches that the query is initially directed against multiple document collections (which map to “a plurality of data sources” in the claim.) *See*, Ex. 1009, at 14:48-50. Kirsch teaches that “a user query 12 is used to select a qualified set of most likely relevant document collections.” Ex. 1009, 6:29-30. The selection of “a qualified set” of document collections in Kirsch maps to “selecting at least one data source from the plurality of data sources” in the claim. As discussed in Section XI(A)(1)(e), *supra*, Kirsch teaches that selection of the document collection is based on the collection exceeding a “minimum level of relevance” and

a “minimum relevancy ranking threshold,” which map to “an accuracy thresholds” in the claim.

150. It would have been obvious to apply Kirsch's collection techniques to the system taught in Learning Lexis. A POSITA would have been motivated to use the collection selection techniques in Kirsch to narrow the combined sources searched in Learning Lexis in an initial query to a single data source or a subset of the combined sources for ongoing monitoring.

- f. Element 1.6 - “monitoring, based on a set schedule, the at least one data source to extract data from the at least one data source when at least an update to stored data that matches the query, newly added data that matches the query, or a combination thereof”**

151. Learning Lexis disclosed an “ECLIPSE Feature” that allows a user "to follow development of topics of interest." The feature allows a user to "automatically save and re-run searches for updates" at periodic intervals, and receive the updates by, e.g., email.

The ECLIPSE™ Feature

The ECLIPSE feature is an electronic clipping service that allows you to follow the development of topics of interest to you. You can have *lexis.com* automatically save and re-run searches for updates at daily, business daily, weekly, or monthly intervals. ECLIPSE results can be viewed online or e-mailed to you.

Each time your search is processed, an ECLIPSE search only gives you the new, updated information and doesn't retrieve the documents you've already seen.

Name:

Source: Congressional Bills and Bill Tracking - Current Congress - LEGIS,BILLS

Terms: s 33

Frequency

☐ Daily ☒ Weekly

☐ Business Days (M-F) ☒ Monthly Day of Month

Delivery

☒ Online only

☐ *Email

Ex: johndoe@yourcompany.com

Notification

☐ *Email

Ex: johndoe@yourcompany.com

* Email Distribution is subject to [Terms and Conditions](#)

Click "Save As ECLIPSE" at the top of the document you are viewing to set up a new ECLIPSE search.

Ex. 1011, at 26.

152. As noted in the discussion of Element 1.5 above, in a case where a user selected the top of a source hierarchy such as "Combined Federal & State Case Law -US" for initially running a query, it would have been obvious to use the teachings of Kirsch to select a source (e.g., a collection limited to a specific state jurisdiction) from within the hierarchy to monitor for updates. Using the ECLIPSE function in Learning Lexis to periodically re-run the query on the data source selected by Kirsch and receive new results via email maps to "monitoring, based on a set schedule, the at least one data source to extract data from the at least one data source when" either

"at least an update to stored data" or "newly added data" matches the query, as claimed.

g. Element 1.7 - “establishing a communication channel with a second user based at least in part on the data extracted from the at least one monitored data source”

153. Learning Lexis teaches that updates extracted by the "ECLIPSE Feature" can be sent by email (red box) below:

The ECLIPSE™ Feature

The ECLIPSE feature is an electronic clipping service that allows you to follow the development of topics of interest to you. You can have *lexis.com* automatically save and re-run searches for updates at daily, business daily, weekly, or monthly intervals. ECLIPSE results can be viewed online or e-mailed to you.

Each time your search is processed, an ECLIPSE search only gives you the new, updated information and doesn't retrieve the documents you've already seen.

Name:
Source: Congressional Bills and Bill Tracking - Current Congress - LEGIS,BILLS
Terms: s 33

Frequency
☐ Daily ☐ Weekly
☐ Business Days (M-F) ☐ Monthly
Delivery
☒ Online only

☒ *Email
Ex: john.doe@yourcompany.com

Notification
☐ *Email
Ex: john.doe@yourcompany.com

* Email Distribution is subject to [Terms and Conditions](#)

Click "Save As ECLIPSE" at the top of the document you are viewing to set up a new ECLIPSE search.

Ex. 1011, at 26 (red box added).

154. Learning Lexis also discloses that documents from search results may be emailed "to yourself or to others."

Email Delivery

To email documents in your search results to yourself or to others click “Email” on any search results page to specify the documents you want to delivery, the format, and the email address or addresses (separate addresses with commas or spaces). You can also add a brief note that will appear at the top of the email, and specify whether you want a cover page and end page.

Ex. 1011, at 34 (red box added).

155. In the case where a user specifies an email address of another person to receive updates generated using the ECLIPSE Feature, Learning Lexis discloses "establishing a communication channel with a second user based at least in part on the data extracted from the at least one monitored data source," as claimed.

156. To the extent this element is not expressly taught by Learning Lexis, it would have been obvious in view of Lucovsky. As explained in Section XI(A)(1)(g), Lucovsky (Ex. 1015) discloses a first user sharing search results with a second user via an email, message board, instant messaging and a blog. Learning Lexis and Lucovsky are both directed to search query technology. It would have been obvious to incorporate Lucovsky's search results sharing techniques with Learning Lexis so that a first user could share updates with a second user.

157. Thus, Claim 1 is obvious over Learning Lexis, Kirsch and Lucovsky.

3. Claims 10 and 19

158. As noted in Section XI(A)(2), Claim 10 further recites "a memory unit" and "at least one processor ... configured" to perform the recited functions, and Claim

19 further recites "a non-transitory computer-readable medium having program code recorded thereon" to perform the recites functions. These limitations would have been obvious over Learning Lexis. The images on Learning Lexis are of a user interface on a computer screen. Ex. 1011, e.g., at 4. A POSITA would have understood that such a computer screen is coupled to a processor and memory, and that the search tools in Learning Lexis would have been implemented in software code stored in memory and executed by a processor.

159. Accordingly, Claims 10 and 19 are obvious over Learning Lexis, Kirsch and Lucovsky.

4. Claims 2, 11 and 20

160. As explained above in Section XI(A)(3), the additional limitations of Claims 2, 11 and 20 are taught by Lucovsky and/or Kirsch. It would have been obvious to apply the techniques for analyzing data and providing feedback in Kirsch and Lucovsky to Learning Lexis, in order to permit users to communicate with each other about search results.

161. Thus, Claims 2, 11 and 20 are obvious over Learning Lexis, Kirsch and Lucovsky.

5. Claims 5, 14 and 21

162. Learning Lexis teaches adding terms to refine a query. Ex. 1011, at 23. Learning Lexis also describes a "FOCUS Feature" which allows a user to identify

"words within the documents in your search results even if those words were not part of your original search request." *Id.* These aspects of Learning Lexis map to "refining the search terms based at least in part on the executed query." Furthermore, it would have been obvious to apply the monitoring and alert features of Learning Lexis to the refined query.

163. To this extent this element is not expressly taught in Learning Lexis, this element is taught by Luckovsky. As explained above in Section XI(A)(5), the additional limitations of Claims 5, 14 and 21 are taught by Lucovsky.

164. Thus, Claims 5, 14 and 21 are obvious over Learning Lexis, Kirsch and Lucovsky.

6. Claims 6 and 15

165. As explained in Section XI(A)(6), the additional limitations of Claims 6 and 15 are taught by Kirsch. It would have been obvious to apply the teachings of Learning Lexis to document collections that include both public use and proprietary information, as taught in Kirsch. Ex. 1009, 1:33-42. A POSITA would have been motivated to implement these aspects of Kirsch in Learning Lexis in order to allow for searching of both public and private collections.

166. Thus, Claims 6 and 15 are obvious over Learning Lexis, Kirsch and Lucovsky.

7. Claims 8 and 17

167. As explained above in Section XI(A)(7), the additional limitations of Claims 8 and 17 are taught by Kirsch.

168. Thus, Claims 8 and 17 are obvious over Learning Lexis, Kirsch and Lucovsky.

J. Ground 10 - Claims 4 And 13 Are Obvious Over Learning Lexis, Kirsch And Lucovsky, In View Of Schultz

169. As explained in Section XI(C)(1), the additional limitations of Claims 4 and 13 are taught by Schultz. It would have been obvious to incorporate Schultz's query expansion techniques with Learning Lexis, Lucovsky and Kirsch so that a user could apply an expanded query including synonyms to Kirsch's and/or Learning Lexis's document collections. Thus, Claims 4 and 13 are also obvious over Learning Lexis, Kirsch and Lucovsky, in view of Schultz.

K. Ground 11 - Claims 3 and 12 Are Obvious Over Learning Lexis, Kirsch And Lucovsky, In View Of Liang

170. As explained in Sections XI(I)(2) and XI(I)(3), the limitations of Claims 1 and 10 are rendered obvious by Learning Lexis, Kirsch and Lucovsky. In addition, as explained in Section XI(E), the additional limitations of Claim 3 and 12 (visualizing search results) are taught by Liang. Learning Lexis, Kirsch and Liang are all directed to search query technology. It would have been obvious to

incorporate Liang's visualization techniques with Learning Lexis and Kirsch so that a user could visualize search results.

L. Ground 12 - Claims 7 and 16 Are Obvious Over Learning Lexis, Kirsch, Lucovsky And Moulinier

171. Claims 7 and 16 depend from Claims 1 and 10, respectively. As explained in Sections XI(I)(2) and XI(I)(3) above, the limitations of Claims 1 and 10 are met by Learning Lexis, Kirsch and Lucovsky. As explained above in Section XI(I)(1)(b), natural language searching (as recited in Claims 7 and 16) is taught by Learning Lexis. Moulinier taught translation of a natural language query from one language to another. Ex. 1021, 4:10-14 and 6:3-57.

172. Learning Lexis, Kirsch, Lucovsky and Moulinier are directed to search query technology. It would also have been obvious to apply Moulinier's language translation techniques to Learning Lexis's natural language query. In a case where Learning Lexis's/Kirsch's document collections are indexed in English and the first user had French as her/her native language, a POSITA would have been motivated to use Moulinier's language translation techniques with Learning Lexis/Kirsch, so the user could submit a natural language query in his/her native language.

173. Thus, Claims 7 and 16 are obvious over Learning Lexis, Kirsch, Lucovsky and Moulinier.

M. Ground 13 - Claims 9 and 18 Are Obvious Over Learning Lexis, Kirsch, And Lucovsky, And Further In View Of Vinsonneau

174. As explained in Sections XI(I)(2) and X(I)(3), the limitations of Claims 1 and 10 are rendered obvious by Learning Lexis, Kirsch and Lucovsky. In addition, as explained in Section XI(G), the additional limitations of Claims 9 and 18 are taught by Vinsonneau. It would have been obvious to combine Vinsonneau's dynamic scaling techniques with the monitoring techniques in Learning Lexis in order to improve the performance of the Lexis system as traffic volume varied.

175. Thus, Claims 9 and 18 are obvious over Learning Lexis, Kirsch, Lucovsky in view of Vinsonneau.

N. Ground 14 - Claims 1, 3, 4, 10, 12, 13 And 19 Are Obvious Over Liang And Lucovsky

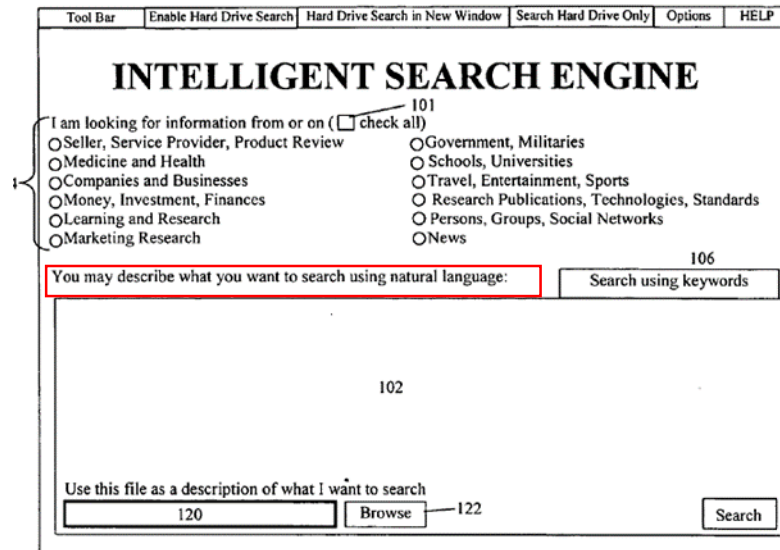
1. Claim 1

a. Element 1.1 - “A method of analyzing data”

176. To the extent the preamble is limiting, Liang teaches a method of analyzing data. *See*, Ex. 1010, at [0167] (“this invention uses the natural language understanding module 202, the search keyword string extraction module 204 and the search keyword string generation module 206 to analyze search results ...”)

b. Element 1.2 - “generating, via a first user, a query based at least in part on a topic of interest”

177. Figure 1 of Liang teaches an “Intelligent Search Engine” that a user can search using a natural language query:



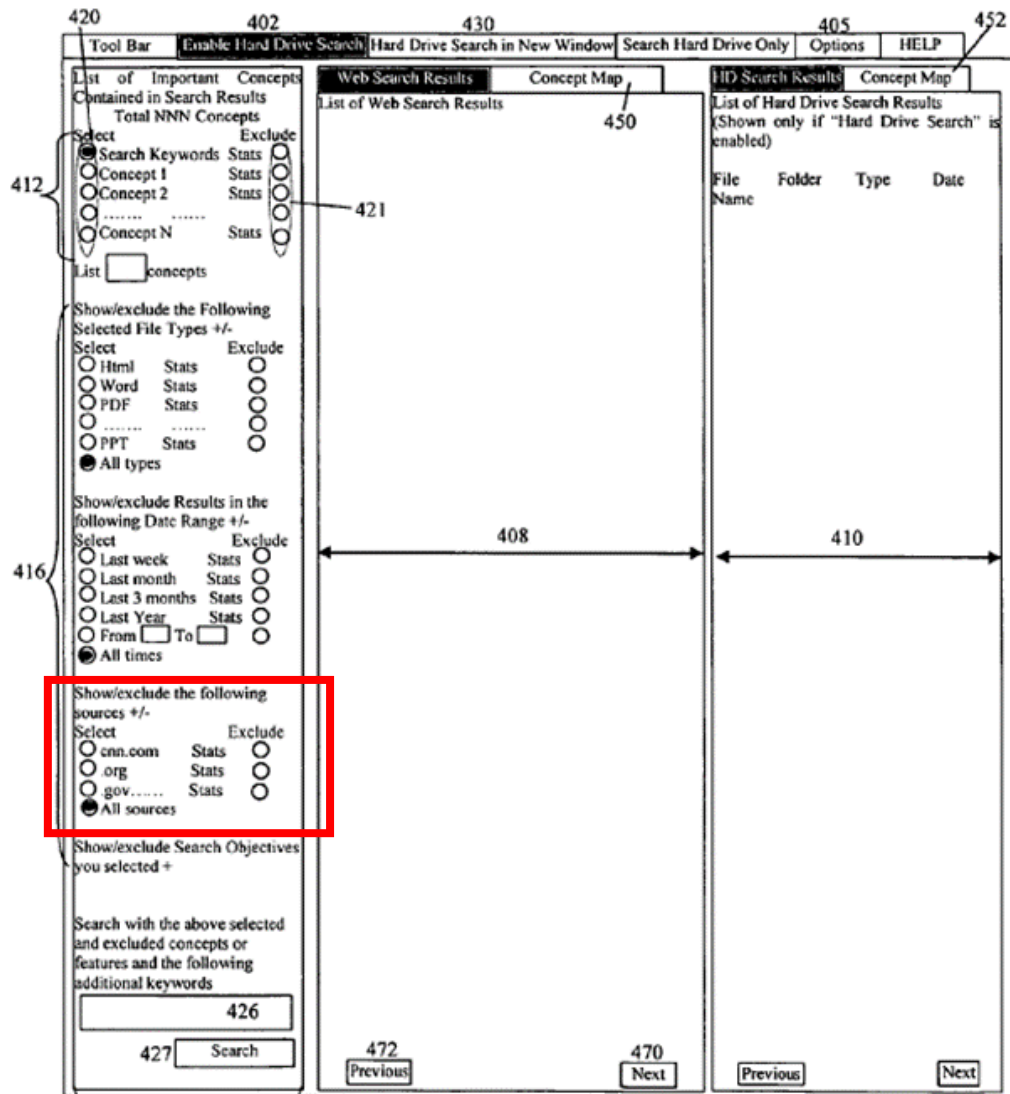
Id., Fig. 1 (annotations added). The natural language search query entered by the user in Liang maps to “generating, via a first user, a query based at least in part on a topic of interest” in the claim.

c. Element 1.3 - “expanding search terms of the query”

178. Liang “broadens a search by expanding search keywords into concepts comprising of the synsets, hypemym, and/or hyponym/troponym of a keyword ...,” which maps to “expanding search terms of the query” in the claim. *Id.*, [0013].

d. Element 1.4 - “executing the query on a plurality of data sources”

179. Liang teaches execution of a query on multiple sources (see red box below). Liang suggests initially executing the query on a plurality of data sources, after which the user is provided with the option to narrow the number of data sources used for the query.

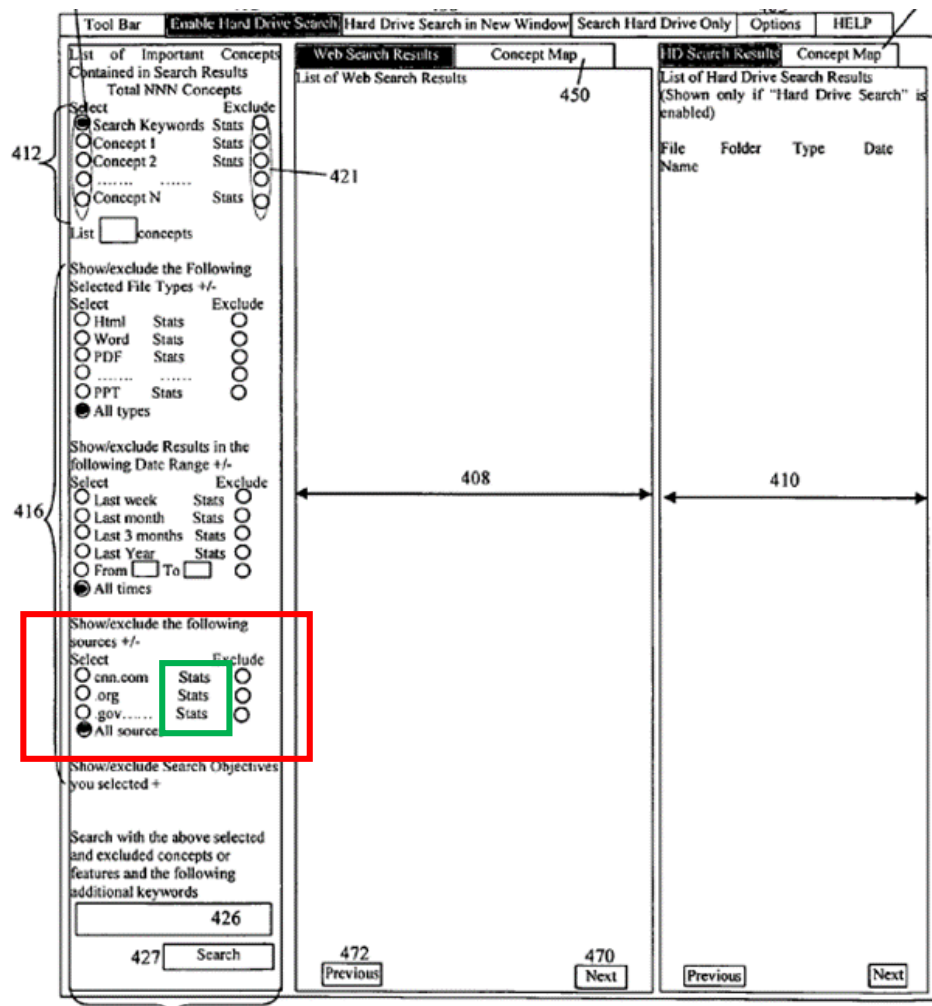


Ex. 1010, Figure 4 (annotations added). In describing Figure 4, Liang states that the “sections 416 allow a user to filter the search results by other filtering features such as file types, dates of modification, sources, among other things.” Ex. 1010, [0178] (emphasis added). In order for a user to be able to filter based on sources (plural) in Liang, the query would first need to have been executed on a plurality of sources. The fact that the “All Sources” box is checked in Figure 4 further suggests that the initial query is applied to multiple data sources in Liang. In any event, it would have

been obvious for a user of Liang to direct an initial search to multiple sources, so as to identify relevant information from multiple sources.

- e. **Element 1.5 - “selecting at least one data source from the plurality of data sources, the at least one data source being selected when results of the query are greater than or equal to an accuracy thresholds”**

180. Liang provides “Stats” (green box) for each of the data sources that were searched:



Ex. 1010, Figure 4 (annotations added). Liang explains that these “Stats” correspond to statistics, such as “the total number of appearances of an important concept in the

search results.” Ex. 1010, [0184]. The number of appearances of a concept for a particular source corresponds to an “accuracy” parameter for each source. Liang's system automatically "selects the first S, where S is a positive integer and can be set by default or by user" sources "from which the most number of web pages and files are retrieved in the search results." Ex. 1012, [0229]. These selected sources in Liang correspond to sources with query results (e.g., number of retrieved web pages and files) greater than or equal to an accuracy threshold (the top "S" sources).

- f. Element 1.6 - “monitoring, based on a set schedule, the at least one data source to extract data from the at least one data source when at least an update to stored data that matches the query, newly added data that matches the query, or a combination thereof”**

181. Figure 1 of Liang teaches alerting a user by email when “changes are detected.”

INTELLIGENT SEARCH ENGINE

Tool Bar Enable Hard Drive Search Hard Drive Search in New Window Search Hard Drive Only Options HELP

I am looking for information from or on (☐ check all) 101

104 { ☐ Seller, Service Provider, Product Review
☐ Medicine and Health
☐ Companies and Businesses
☐ Money, Investment, Finances
☐ Learning and Research
☐ Marketing Research

☐ Government, Militaries
☐ Schools, Universities
☐ Travel, Entertainment, Sports
☐ Research Publications, Technologies, Standards
☐ Persons, Groups, Social Networks
☐ News

You may describe what you want to search using natural language: 106 Search using keywords

102

Use this file as a description of what I want to search

120 Browse 122 Search

More Options:

Search for information that was updated ☐ Anytime ☐ Past Week ☐ Past Month ☐ Past 3 months } 108
☐ Past 6 Months ☐ Past Year ☐ Past 3 Years

You want this search to be active from Today or Month Day Year to Month Day Year } 110
(If no date is selected, it is treated as a one-time search)

You will receive an alert on your desktop when new sources or changes are detected. If you want also to receive an email alert, please enter your email address 112

☐ Check here to enable Concept Following to expand the search } 116
Select depth: Following Concepts for Level(s).

☐ Check here to enable Link Following to expand the search } 118
Select depth: Following Links for Level(s).

Search

Ex. 1010, Figure 1 (annotations added). With respect to Figure 1, Liang states that “it offers a user ... the option to keep his search active for a period of time to monitor for new sources and changes to existing sources by specifying a date range in 110, and when a change is detected, the option to alert the user on his local PC or send an email to an email account that the user provides in 112.” Ex. 1010, [0052] (emphasis added). Liang also teaches that “[b]oth the time period and the monitoring frequency may be chosen by a pull-down menu, or text box and check boxes.” Ex. 1010, [0347]

(emphasis added). The “monitoring frequency” set by the user in Liang maps to “monitoring, based on a set schedule” in the claim.

g. Element 1.7 - “establishing a communication channel with a second user based at least in part on the data extracted from the at least one monitored data source”

182. As explained in Sections VI and XI(A)(1)(g), *supra*, (i) sending an email alert with updated query results is an example of “establishing a communication channel ... based at least in part on the data extracted from the at least one monitored data source,” and (ii) this element covers establishing the communication channel with the second user “via the first user.” *See also*, Section VII, *supra*.

183. Lucovsky (Ex. 1015) discloses a first user sharing search results with a second user via an email (Figures 4-6), message board (Figure 7), instant messaging (Figure 8) and a blog (Figure 9). Liang and Lucovsky are both directed to search query technology. It would have been obvious to incorporate Lucovsky's search results sharing techniques with Liang, so that a first user could share updates with a second user. A POSITA would have had a reasonable expectation of success in incorporating Lucovsky's search results sharing techniques with Liang, so that a first user could share updates with a second user, as the combination involves nothing more than the routine combination of existing software functionality.

184. Accordingly, Claim 1 is obvious over Liang and Lucovsky.

2. Claims 10 and 19

185. As noted in Section XI(A)(2), *supra*, Claim 10 further recites "a memory unit" and "at least one processor ... configured" to perform the recited functions, and Claim 19 further recites "a non-transitory computer-readable medium having program code recorded thereon" to perform the recited functions. These aspects of Claims 10 and 19 are met by Liang. Ex. 1010, [0039] ("the corresponding apparatus element may be configured in hardware, software, firmware or combinations thereof.") A POSITA would have understood "hardware, software" or "combinations thereof" to include memory that stored software code executed by a processor.

186. Accordingly, Claims 10 and 19 are also obvious over Liang and Lucovsky.

3. Claims 3 and 12

187. As explained above, the additional limitations of Claims 3 and 12 recite visualization of search results. As explained in Section XI(E), *supra*, Liang (Ex. 1010) teaches visualization of search results using graphical diagrams.

188. Thus, Claims 3 and 12 are also obvious over Liang and Lucovsky.

4. Claims 4 and 13

189. The additional limitations of Claims 4 and 13 recite "expanding the search terms to include ... synonyms." Liang states that it "broadens a search by

expanding search keywords into concepts comprising of the synsets, hypemym, and/or hyponym/troponym of a keyword ...” Ex. 1010, [0013]. A “synset” is a synonym set.

190. Thus, Claims 4 and 13 are obvious over Liang and Lucovsky.

O. Ground 15 - Claims 1-6, 8, 10-15, 17 And 19-21 Are Obvious Over Liang, Lucovsky And Kirsch

1. Claims 1, 10 and 19

191. As set forth in Sections XI(N)(1) and (2), *supra*, all of the limitations of Claims 1, 10 and 19 are obvious in view of Liang and Lucovsky.

a. Element 1.4

192. With respect to Element 1.4 (*see* Section XI(N)(1)(d)), *supra*, to the extent Liang does not expressly teach executing the query on multiple data sources, it would have been obvious to do so in view of Kirsch (Ex. 1009). As described in Section XI(A)(1)(d), *supra*, Kirsch teaches that a query is initially directed against multiple document collections (which map to “a plurality of data sources” in the claim.) *See*, Ex. 1009, at 14:48-50. Kirsch further teaches that “a user query 12 is used to select a qualified set of most likely relevant document collections.” Ex. 1009, 6:29-30. The selection of “a qualified set” of document collections in Kirsch maps to “selecting at least one data source from the plurality of data sources.”

193. Liang and Kirsch are both directed to search technology. A POSITA would have been motivated to apply Liang's query to Kirsch's different document

collections in order to identify (from a larger set of document collections) a subset of document collections most relevant to the query, as taught in Kirsch. A POSITA would have had a reasonable expectation of success in applying Liang's query to Kirsch's different document collections in order to identify (from a larger set of document collections) a subset of document collections most relevant to the query, as the combination involves nothing more than the routine combination of existing software functionality.

b. Element 1.5

194. With respect to Element 1.5 (*see* Section XI(N)(1)(e)), *supra*), to the extent this feature is not expressly taught in Liang, it would have been obvious in view of Kirsch. Kirsch teaches that in order for a document collection to be selected, the document collection must meet a “minimum level of relevance.” *Id.*, 2:12; 9:67-10:4. A further “post-search constraint” in Kirsch required a selected collection to rank high enough to fall within a “maximum number of collections returned.” *Id.*, 12:11-12. The “minimum level of relevance,” “minimum relevancy ranking threshold” and requirement that a selected collection rank high enough to fall within a “maximum number of collections returned” in Kirsch, individually or collectively, map to “an accuracy thresholds.”

195. It would have been obvious to use the collection selection techniques in Kirsch to narrow the sources searched in Liang to ones selected using Kirsch's

techniques. A POSITA would have been motivated to use the metrics from Kirsch to narrow the set of sources in Liang in order to filter out less relevant sources. A POSITA would have had a reasonable expectation of success in incorporating the collection selection techniques in Kirsch into Liang in order to narrow the sources searched in Liang to ones selected using Kirsch's techniques, as the combination involves nothing more than the routine combination of existing software functionality.

c. Element 1.6

196. It would have been obvious to apply Liang's monitoring to the “qualified set” of data sources selected using Kirsch's collection selection techniques. A person would have been motivated to limit the number of data sources used for monitoring to those data sources meeting Kirsch's metrics in order avoid identification of less relevant results during the monitoring. A POSITA would have had a reasonable expectation of success in applying Liang's monitoring techniques to the “qualified set” of data sources selected using Kirsch's collection selection techniques, as the combination involves nothing more than the routine combination of existing software functionality.

197. Accordingly, Claims 1, 10 and 19 are also obvious over Liang in combination with Kirsch.

2. Claims 2, 11 and 20

198. Claims 2, 11 and 20 contain substantively identical limitations. The analysis below of Claim 2 applies identically to Claims 11 and 20.

a. Element 2.1 - “analyzing the extracted data”

199. Liang taught analyzing search results which maps to “analyzing the extracted data” in the claim. *See*, Ex. 1010, at [0167]. Alternatively, it would have been obvious to apply Liang's techniques for analyzing search results to “the extracted data” resulting from Liang's monitoring techniques. As a further alternative, as set forth in Section XI(A)(3)(a), *supra*, this claim element is taught by Kirsch.

b. Element 2.2 - “receiving feedback from the user based at least in part on the established communication channel”

200. As mentioned above in Section XI(A)(3)(b), *supra*, Lucovsky discloses a first user sharing search results with a second user via an email, followed by the recipient of the email responding to the first user. Such a response maps to “receiving feedback from the user based at least in part on the established communication channel” in the claim.

201. Liang, Kirsch and Lucovsky are all directed to search technology. It would have been obvious to apply Lucovsky's email techniques for sharing search results with Liang and Kirsch so as to permit a first user to share search results with

a second user. A POSITA would have had a reasonable expectation of success in applying Lucovsky's email techniques for sharing search results with Liang and Kirsch so as to permit a first user to share search results with a second user, as the combination involves nothing more than the routine combination of existing software functionality.

202. Accordingly, Claims 2, 11 and 20 are obvious over Liang, Kirsch and Lucovsky.

3. Claims 3 and 12

203. As explained above, the additional limitations of Claims 3 and 12 (visualization of search results) are met by Liang. See, Section XI(E)(1), *supra*. Thus, Claims 3 and 12 are also obvious over Liang, Lucovsky and Kirsch.

4. Claims 4 and 13

204. As explained in Section XI(N)(4), *supra*, the additional limitations of Claims 4 and 13 are taught by Liang. Alternatively, as explained in Section XI(A)(1)(c), *supra*, Kirsch teaches expanding the search terms to include synonyms. Thus, Claims 4 and 13 are also obvious over Liang, Lucovsky and Kirsch.

5. Claims 5, 14 and 21

205. As explained in Section XI(A)(5), *supra*, the additional limitations of Claims 5, 14 and 21 are met by Lucovsky. It would have been obvious to incorporate Lucovsky's search refinement techniques into Liang and Kirsch, so that a user could

refine search terms based on the query and monitor for matches to the refined query. A POSITA would have had a reasonable expectation of success in incorporating Lucovsky's search refinement techniques into Liang and Kirsch, so that a user could refine search terms based on the query and monitor for matches to the refined query, as the combination involves nothing more than the routine combination of existing software functionality. Thus, Claims 5, 14 and 21 are obvious over Liang, Kirsch and Lucovsky.

6. Claims 6 and 15

206. As explained in Section XI(A)(6), *supra*, the additional limitations of Claims 6 and 15 are taught by Kirsch. It would have been obvious to apply Liang's teachings to document collections that include both (i) “information available through the Internet [that] is free for public use” (which maps to “open-source data sources that are publicly available” in the claim,) and (ii) “proprietary or fee-based access document collections” (which map to “closed-source data sources that are not publicly accessible” in the claim), as taught in Kirsch. Ex. 1009, 1:33-42. A POSITA would have been motivated to implement these aspects of Kirsch in Liang in order to allow Liang to search both public and private collections. A POSITA would have had a reasonable expectation of success in incorporating these aspects of Kirsch in Liang in order to allow Liang to search both public and private collections, as the combination involves nothing more than the routine combination of existing

software functionality.

207. Thus, Claims 6 and 15 are obvious over Liang, Lucovsky and Kirsch.

7. Claims 8 and 17

208. As explained in Section XI(A)(7), *supra*, the additional limitations of Claims 8 and 17 are met by Kirsch. It would have been obvious to use Kirsch's "list of most relevant collections" with Liang in order to streamline the identification of relevant data sources in Liang. A POSITA would have had a reasonable expectation of success using Kirsch's "list of most relevant collections" with Liang in order to streamline the identification of relevant data sources in Liang, as the combination involves nothing more than the routine combination of existing software functionality.

209. Thus, Claims 8 and 17 are obvious over Liang, Lucovsky and Kirsch.

P. Ground 16 - Claims 1, 10 And 19 Are Obvious Over Liang, Kirsch And Mellin

210. As explained in Section XI(O)(1), *supra*, Elements 1.1 - 1.6 of Claim 1 are met by Liang and Kirsch. Ground 10 maps Element 1.7 ("establishing a communication channel with a second user based at least in part on the data extracted from the at least one monitored data source") to Mellin which taught the use of a group email address to facilitate collaboration among members of a group. *See*, Mellin (Ex. 1016), at 3:24-26. In a case where the author of the query (mapped to "a first user" in the claim) was part of a group collaboration, it would have been

obvious for the author to designate a group email address to receive search result updates so that the updated search results were distributed to all collaborators. Any collaborator on the group email address other the author of the search query maps to “a second user” in the claim.

211. Accordingly, Claim 1 is obvious over Liang, Kirsch and Mellin.

212. As set forth in Section XI(N)(2), *supra*, the additional limitations of Claims 10 and 19 are met by Liang. Accordingly, Claims 10 and 19 are also obvious over Liang, Kirsch and Mellin.

Q. Ground 17 - Claims 2, 5, 11, 14 And 20-21 Are Obvious Over Liang, Kirsch And Mellin, In View Of Schultz

1. Claims 2, 11 and 20

213. Claims 2, 11 and 20 contain substantively identical limitations. The analysis below of Claim 2 applies identically to Claims 11 and 20.

214. The elements of Claim 1 are met by Liang, Kirsch and Mellin, as set forth in Section XI(P), *supra*.

a. Element 2.1 - “analyzing the extracted data”

215. This feature is taught by, or obvious in view of both Liang and Kirsch as set forth in Section XI(O)(2)(a) above.

b. Element 2.2 - “receiving feedback from the user based at least in part on the established communication channel”

216. As explained above in Section XI(B), *supra*, it would have been obvious in view of Mellin (Ex. 1016) for an author of a query to designate a group email address to receive search result updates so that the updated search results were distributed to all collaborators. Any collaborator on the group email address other the author of the search query maps to “a second user” in the claim.

217. As explained in Section XI(D)(2), *supra*, Schultz (Ex. 1017) teaches “feedback” sent back to the server using the same communication channel that the server used to send the search results list to the user, which maps to feedback that is received based in part on the established communication channel.

218. Liang, Kirsch and Schultz are all directed to search query technology. It would have been obvious to incorporate Schultz's retrieval techniques with the other references so that a user could retrieve individual documents responsive to query using the same platform that provided the query results to the user. A POSITA would have had a reasonable expectation of success in incorporating Schultz's retrieval techniques with the other references so that a user could retrieve individual

documents responsive to query using the same platform that provided the query results to the user, as the combination involves nothing more than the routine combination of existing software functionality.

219. Thus, Claims 2, 11 and 20 are therefore also obvious over Liang, Kirsch and Mellin, and further in view of Schultz.

2. Claims 5, 14 and 21

220. Claims 5, 14 and 21 contain substantively identical limitations. The analysis below of method Claim 5 applies identically to Claims 14 and 21.

221. The elements of Claim 1 are met by Liang, Kirsch and Mellin, as set forth in Section XI(P), *supra*.

222. Schultz teaches performance of a “recursive” search, i.e., a search query “performed only on the results of a prior query.” Ex. 1017, 14:4-7. A POSITA would have understood the recursive query to include “refined” search terms that are directed to searching within the prior search results.

223. Liang, Kirsch and Schultz are all directed to search query technology. It would have been obvious to apply a refined (narrowed) query as taught in Schultz to the querying and monitoring taught in Liang and/or Kirsch in order to narrow the updates to those reflected by the refined query. A POSITA would have had a reasonable expectation of success in applying a refined (narrowed) query as taught in Schultz to the querying and monitoring taught in Liang and/or Kirsch in order to

narrow the updates to those reflected by the refined query, as the combination involves nothing more than the routine combination of existing software functionality.

224. Thus, Claims 5, 14 and 21 are also obvious over Liang, Kirsch, Mellin and Schultz.

R. Ground 18 - Claims 7 and 16 Are Obvious Over Liang, Lucovsky And Moulinier

225. Claims 7 and 16 depend from Claims 1 and 10, respectively, and further recite that the query is a natural language query and the query is translated into a system understood language. As explained in Section XI(N)(1)(b), Figure 1 of Liang teaches an “Intelligent Search Engine” that a user can search using a natural language query. Moulinier taught translation of a natural language query from one language to another. Ex. 1021, 4:10-14 and 6:3-57.

226. Liang, Lucovsky and Moulinier are all directed to search query technology. It would have been obvious to apply Moulinier's language translation techniques to Liang's natural language query. In a case where Liang's document collections were indexed in one language (e.g., English) and the first user had French as her/her native language, a POSITA would have been motivated to use Moulinier's language translation techniques with Liang, so as to permit the user to submit a natural language query in his/her native language. A POSITA would have had a reasonable expectation of success in incorporating Moulinier's language translation

techniques with Liang's natural language query, as the combination involves nothing more than the routine combination of existing software functionality.

227. Thus, Claims 7 and 16 are obvious over Liang, Lucovsky and Moulinier.

S. Ground 19 - Claims 7 and 16 Are Obvious Over Liang, Lucovsky, Kirsch And Moulinier

228. Claims 7 and 16 depend from Claims 1 and 10, respectively, and further recite that the query is a natural language query and the query is translated into a system understood language. As explained in Section XI(N)(1)(b), Figure 1 of Liang teaches an “Intelligent Search Engine” that a user can search using a natural language query. Moulinier taught translation of a natural language query from one language to another. Ex. 1021, 4:10-14 and 6:3-57.

229. Liang, Lucovsky, Kirsch and Moulinier are all directed to search query technology. It would also have been obvious to apply Moulinier's language translation techniques to Liang's natural language query. In a case where Kirsch's/Liang's document collections were indexed in one language (e.g., English) and the first user had French as her/her native language, a POSITA would have been motivated to use Moulinier's language translation techniques with Liang, so as to permit the user to submit a natural language query in his/her native language. A POSITA would have had a reasonable expectation of success in incorporating Moulinier's language translation techniques with Liang's natural language query, as

the combination involves nothing more than the routine combination of existing software functionality.

230. Thus, Claims 7 and 16 are obvious over Liang, Lucovsky, Kirsh and Moulinier.

T. Ground 20 - Claims 9 and 18 Are Obvious Over Liang, Lucovsky And Vinsonneau

231. Claims 9 and 18 contain substantively identical limitations. The analysis below of method Claim 9 applies identically to Claim 18.

232. As set forth in Section XI(N), *supra*, the limitations of Claim 1 are taught by Liang and Lucovsky. In addition, as set forth in Section XI(G), *supra*, the additional limitations of Claims 9 and 18 are taught in Vinsonneau. It would have been obvious to combine Vinsonneau's dynamic scaling techniques with Liang's monitoring techniques in order to improve the performance of Liang as traffic volume varied. A POSITA would have had a reasonable expectation of success in dynamically scaling the number of extractors in Liang for a particular data source based on traffic volume in order to improve the performance of Liang as traffic volume varied, as the combination involves nothing more than the routine combination of existing software functionality.

233. Thus, Claims 9 and 18 are also obvious over Liang, Lucovsky and Vinsonneau.

U. Ground 21 - Claims 9 and 18 Are Obvious Over Liang, Lucovsky And Kirsch In View Of Vinsonneau

234. Claims 9 and 18 contain substantively identical limitations. The analysis below of Claim 9 applies identically to Claim 18.

235. As set forth in Section XI(O), *supra*, the limitations of Claim 1 are taught by Liang, Lucovsky and Kirsch. In addition, as set forth in Section XI(D), *supra*, the additional limitations of Claims 9 and 18 are taught in Vinsonneau. It would have been obvious to combine Vinsonneau's dynamic scaling techniques with Liang's monitoring techniques in order to improve the performance of Liang as traffic volume varied. A POSITA would have had a reasonable expectation of success in dynamically scaling the number of extractors in Liang for a particular data source based on traffic volume in order to improve the performance of Liang as traffic volume varied, as the combination involves nothing more than the routine combination of existing software functionality.

236. Thus, Claims 9 and 18 are also obvious over Liang, Lucovsky and Kirsch in view of Vinsonneau.

XII. DECLARATION

237. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of tile 18 of the United States Code.

Dated: September 16, 2024



Dr. Jaideep Srivastava, Ph.D.