

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,
Petitioner,

v.

ACCUSEARCH TECHNOLOGIES LLC,
Patent Owner.

Case No. IPR2026-00287
Patent No. 10,867,001

DECLARATION OF BENJAMIN B. BEDERSON, PH.D.

Google Exhibit 1003 Google v. AccuSearch

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Exhibit	Description
1001	U.S. Patent No. 10,867,001
1002	Prosecution History of U.S. Patent No. 10,867,001
1005	U.S. Patent Application Publication No. 20100145923A1 (“Wang”)
1006	U.S. Patent No. 8,880,547 (“Mills”)
1007	U.S. Patent Application Publication No. 20070168344A1 (“Brinson”)
1008	U.S. Patent Application Publication No. 20090248511A1 (“Mehta”)
1009	U.S. Patent Application Publication No. 20060059126A1 (“Naick”)
1010	U.S. Patent Application Publication No. 20020174118A1 (“Bates”)
1011	U.S. Patent No. 9,098,569 (“Bhagat”)
1012	U.S. Patent Application Publication No. 20090287676A1
1013	U.S. Patent Application Publication No. 20080091834A1 (“Norton”)
1014	U.S. Patent Application Publication No. 20160012050A1 (“Bursey”)
1015	U.S. Patent Application Publication No. 20120191531A1
1016	U.S. Patent Application Publication No. 20090292595A1
1017	U.S. Patent Application Publication No. 20110054998A1
1018	U.S. Patent No. 8,473,492
1019	U.S. Patent Application Publication No. 20070273708A1
1020	U.S. Patent Application Publication No. 20100138293A1
1021	U.S. Patent Application Publication No. 20080150901A1
1022	U.S. Patent Application Publication No. 20110246921A1
1023	U.S. Patent Application Publication No. 20080147638A1
1024	U.S. Patent Application Publication No. 20020057298A1
1025	U.S. Patent No. 7,152,064
1026	U.S. Patent No. 8,095,876
1027	U.S. Patent Application Publication No. 20080071738A1
1028	U.S. Patent No. 5,826,260
1029	U.S. Patent No. 7,200,820
1030	U.S. Patent No. 8,407,217
1031	U.S. Patent Application Publication No. 20080208819A1
1032	U.S. Patent Application Publication No. 20060253431A1
1033	U.S. Patent Application Publication No. 20030105744A1
1034	U.S. Patent No. 7,296,021
1035	U.S. Patent Application Publication No. 20030055810A1
1036	U.S. Patent Application Publication No. 20040162814A1
1037	U.S. Patent No. 7,555,476
1038	U.S. Patent No. 7,693,833

1039	U.S. Patent No. 8,402,032
1040	U.S. Patent No. 8,938,463
1041	U.S. Patent No. 6,718,363
1042	International Application Publication No. WO2011035426A1
1043	U.S. Patent No. 6,012,053
1044	U.S. Patent Application Publication No. 20070112761A1
1045	U.S. Patent Application Publication No. 20080071739A1
1046	U.S. Patent Application Publication No. 20040177064A1
1047	U.S. Patent Application Publication No. 20090187554A1
1048	U.S. Patent No. 5,946,678
1049	U.S. Patent Application Publication No. 20060004734A1
1050	U.S. Patent Application Publication No. 20090276418A1
1051	U.S. Patent Application Publication No. 20080155411A1
1052	U.S. Patent Application Publication No. 20050021512A1
1053	U.S. Patent Application Publication No. 20050120016A1
1054	U.S. Patent Application Publication No. 20080010269A1
1055	U.S. Patent Application Publication No. 20070239662A1
1056	U.S. Patent Application Publication No. 20050177555A1
1057	U.S. Patent Application Publication No. 20080140712A1
1058	U.S. Patent Application Publication No. 20060136400A1
1059	U.S. Patent Application Publication No. 20080208835A1
1060	U.S. Patent Application Publication No. 20080155399A1
1061	U.S. Patent Application Publication No. 20170060856A1
1062	U.S. Patent Application Publication No. 20100262568A1
1063	U.S. Patent No. 5,659,732
1064	Plaintiff's Disclosure of Initial Infringement Contentions, in <i>AccuSearch Techs. LLC v. Google LLC</i> , 25-514-GBW (D. Del. Dec. 17, 2025)
1065	U.S. Patent Application Publication No. 2007/0100804A1
1066	Shneiderman, DESIGNING THE USER INTERFACE: STRATEGIES FOR EFFECTIVE HUMAN-COMPUTER INTERACTION (3d ed. 1998)
1067	RESERVED
1068	U.S. Patent Application Publication No. 20040111467A1
1069	RESERVED
1070	RESERVED
1071	RESERVED
1072	RESERVED
1073	RESERVED
1074	RESERVED
1075	RESERVED

1076	RESERVED
1077	RESERVED
1078	RESERVED
1079	RESERVED
1080	RESERVED
1081	U.S. Patent Application Publication No. 20020194166A1 (“Fowler”)
1082	U.S. Patent Application Publication No. 20070239676A1 (“Stonehocker”)
1083	Chi, Ed H., et al. “Using information scent to model user information needs and actions and the Web,” Proceedings of the SIGCHI conference on Human factors in computing systems (2001)

I, Benjamin B. Bederson, declare:

1. I have been retained by Wolf, Greenfield & Sacks, P.C., counsel for Petitioner Google LLC to assess claims 1-26 (the “challenged claims”) of U.S. Patent No. 10,867,001 (“the ’001 patent”). I am being compensated for my time at my standard rate of \$750.00 per hour, plus actual expenses. My compensation is not dependent in any way upon the outcome of the *inter partes* review of the ’001 patent.

2. For the reasons explained below (§§VIII-XV), it is my opinion that each of claims 1-26 would have been obvious to a person of ordinary skill in the art (“POSA”) (*see* §IV below) in light of the prior-art references that I discuss below.

I. PERSONAL AND PROFESSIONAL BACKGROUND

3. My curriculum vitae, which includes a more detailed summary of my background, experience, and publications, is attached as Exhibit 1004.

4. I received a Bachelor of Science degree in Computer Science with a minor in Electrical Engineering from Rensselaer Polytechnic Institute (“RPI”) in 1986. I received a Master of Science degree and a Ph.D. in Computer Science from New York University (“NYU”) in 1989 and 1992, respectively.

5. Since 1998, I have been a Professor of Computer Science at the University of Maryland (“UMD”), where I have had joint appointments at the

Institute for Advanced Computer Studies and the College of Information Studies (Maryland's "iSchool") and am currently Professor Emeritus. I was also Associate Provost of Learning Initiatives and Executive Director of the Teaching and Learning Transformation Center from 2014 to 2018. I am a member and previous director of the Human-Computer Interaction Lab ("HCIL"), the oldest and one of the best known Human-Computer Interaction ("HCI") research groups in the country. As its name suggests, HCI is the study of how humans interact with computers through, for example, user interfaces (UIs), like the graphical user interfaces (GUIs) presented by Internet search engines and other information-retrieval systems.

6. I am also co-founder and co-director of the International Children's Digital Library ("ICDL"), a web site launched in 2002 that provides the world's largest collection of freely available online children's books from around the world with an interface aimed to make it easy for children and adults to search and read children's books online. I was also co-founder and Chief Scientist of Zumobi, Inc. from 2006 to 2014, a Seattle-based startup that is a publisher of content applications and advertising platforms for smartphones. I was also co-founder and prior Chief Technology Officer of Hazel Analytics from 2014 to 2023, a data analytics company. In addition, I have for more than 25 years consulted for numerous companies in the area of user interfaces, including EPAM, Lockheed

Martin, Logitech, Microsoft, NASA Goddard Space Flight Center, the Palo Alto Research Center, and Sony.

7. For more than 30 years, I have studied, designed, and worked in the field of computer science and human-computer interaction. My experience includes 30 years of teaching and research, with research interests in human-computer interaction and the software and technology underlying today's interactive computing systems. This includes the design and implementation of user interfaces and software applications using a wide range of technologies including web servers and websites, databases, embedded systems, and mobile devices, including smart phones and PDAs.

8. At UMD, my research has been in the area of HCI, a field that relates to the development and understanding of computing systems to serve users' needs. Researchers in this field are focused on making universally usable, useful, efficient, and appealing systems to support people in their wide range of activities. My approach is to balance the development of innovative technology that serves people's practical needs. I have combined my hardware and software skills throughout my career in HCI research, building various interactive electrical and mechanical systems that couple with software to provide an innovative user experience. Example systems that I have built include Pad++ (1994 software for zoomable user interfaces), KidPad (1997 software to support children

collaboratively writing stories), PadPrints (1998 software to graphically show interactive web browsing histories), PhotoMesa (2001 software for end users to browse personal photos), Pocket PhotoMesa (2004 software for browsing of personal photos on a mobile device), DateLens (2002 software for end users to use their mobile devices to efficiently access their calendar information), LaunchTile (2005 “home screen” software for mobile devices to allow users to navigate apps in a zoomable environment), SpaceTree (2001 software for end users to efficiently browse very large hierarchies), ICDL (as described above), and StoryKit (a 2009 iPhone app for children to create stories).

9. Pad++ included a custom web browser that I built from scratch and distributed as open source software at the Pad++ web site. That web browser was described in numerous publications including “Pad++: A Zoomable Graphical Interface for Exploring Alternate Interface Physics.”¹ I implemented a rendering engine from scratch for that web browser which supported the version of HTML available at the time (HTML 1.0) as well as an embedded scripting language. That web browser included the ability to display embedded web pages that could be

¹ Bederson, B. B. & Hollan, J. D. (1994). Pad++: A Zooming Graphical Interface for Exploring Alternate Interface Physics, ACM Conference on User Interface Software and Technology, 17-26.

zoomed along with the rest of the pages. The following images are from that custom web browser that I built, which used a “zoomable user interface” so one page could be shown larger while other recently visited pages would be displayed smaller.²

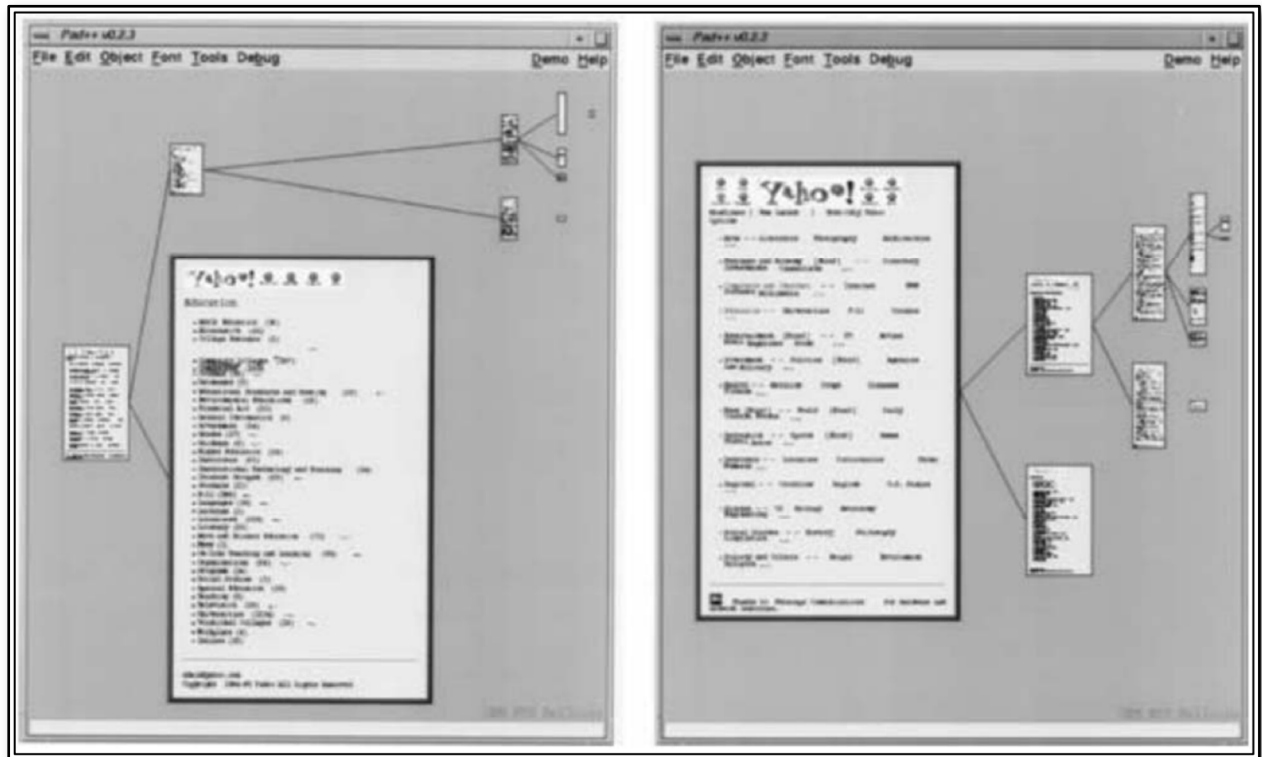


Figure 5 from “Pad++: A Zoomable Graphical Sketchpad for Exploring Alternate Interface Physics”

² Bederson, B. B. et al. (1996). Pad++: A Zoomable Graphical Sketchpad for Exploring Alternate Interface Physics, 7, Journal of Visual Languages & Computing.

10. By 1998, my team had combined Pad++ with Netscape Navigator (a standard web browser of the time) to offer a graphical web history, visually showing what pages a user had visited with an application we called “PadPrints.”³ We did this by implementing a web “proxy,” which was a standard way at the time to modify the built-in behavior of web browsers. Some proxies work by intercepting all web traffic coming from and going to a web browser. Once intercepted, the proxy can do whatever it wants with the traffic, caching it for better performance, simply passing the traffic through and monitoring it, modifying the data itself, or holding that connection and opening new connections. PadPrints’ proxy worked by monitoring the traffic and letting PadPrints know what the user was doing so PadPrints could display the web history.

³ Bederson, B. B. et al. (1998). PadPrints: Graphical Multiscale Web Histories. In Proceedings of the 11th Annual ACM Symposium on User Interface Software and Technology (UIST ‘98). Association for Computing Machinery, New York, NY, USA, 121–122. <https://doi.org/10.1145/288392.288582>.

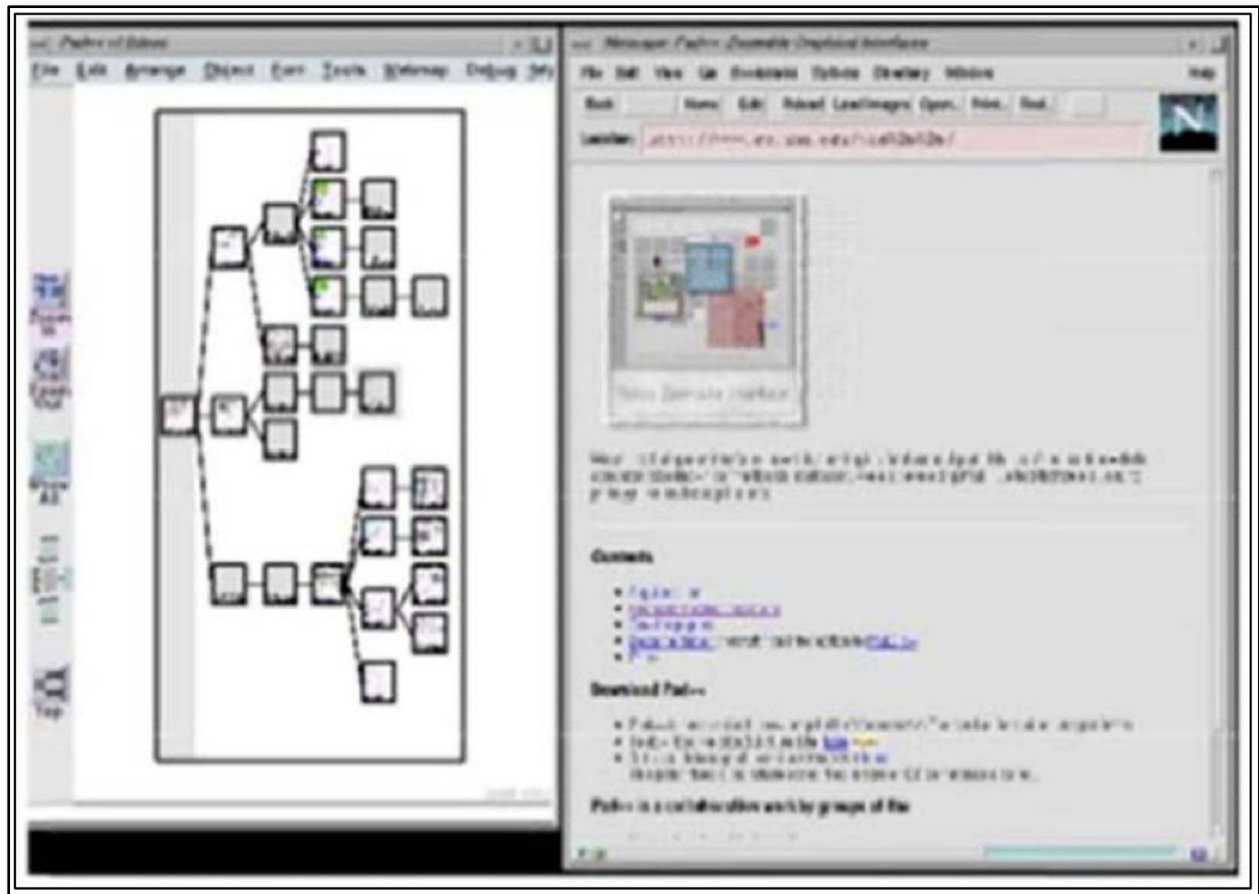


Figure 1 from PadPrints paper

11. In 2000, my team and I published a paper⁴ describing follow-on work to what we had done with PadPrints where we added the ability to search one's web history. "There is a search bar on the top where the user can specify any

⁴ R. Gandhi, G. Kumar, B. Bederson, and B. Shneiderman. 2000. Domain Name Based Visualization of Web Histories in a Zoomable User Interface. In Proceedings of the 11th International Workshop on Database and Expert Systems Applications (DEXA '00). IEEE Computer Society, USA, 591.

string, and DTB then displays all the domain names in the domain panel that contain the query string. For example, if the user types ‘cs’, then all the domain names containing ‘cs’ will be displayed.” (p. 3)

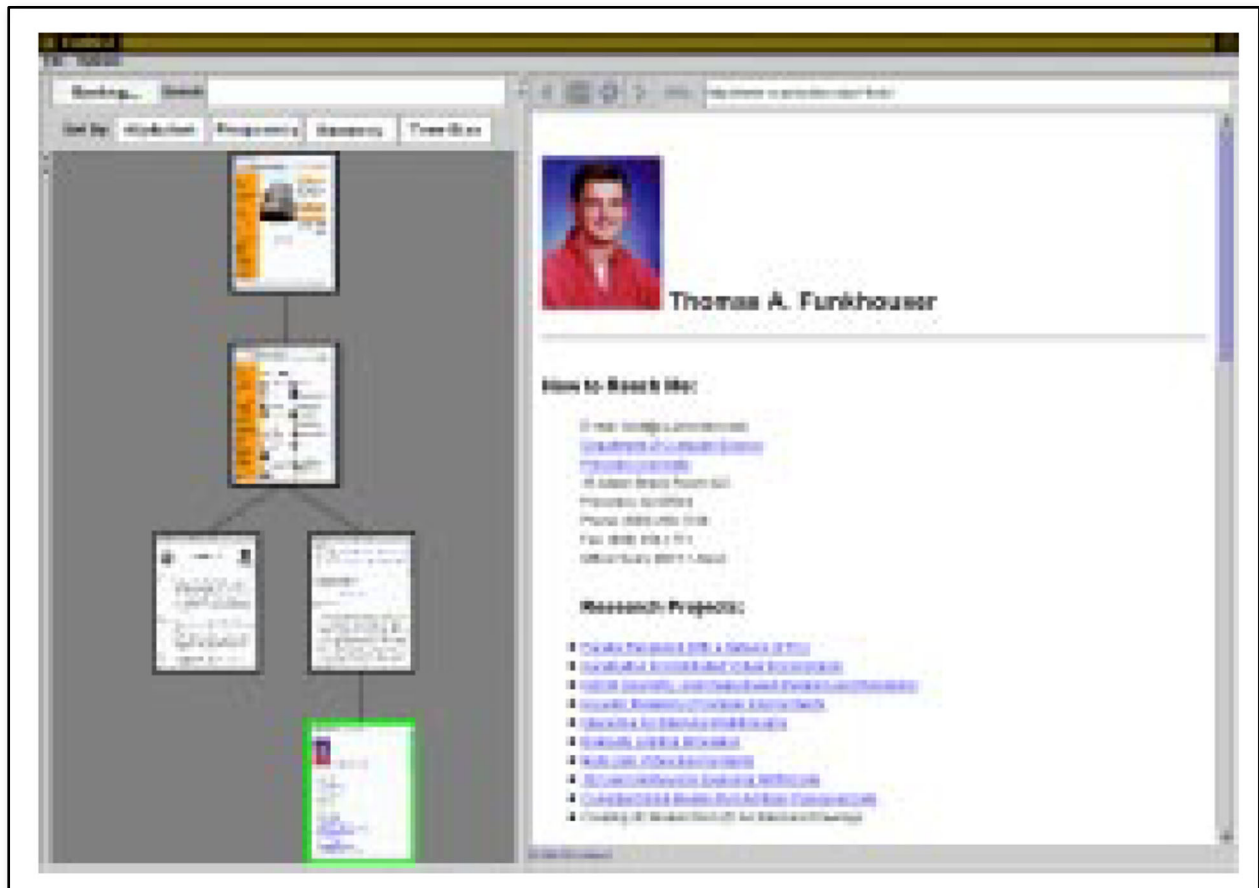


Figure 2 from Domain Name Based Visualization Paper

12. At the International Children’s Digital Library (ICDL), I have since 2002 been the technical director responsible for the design and implementation of the web site, www.childrenslibrary.org (originally at www.icdlbooks.org), which included an Internet Search Engine for searching the content of children’s books. In particular, I have been closely involved in designing the user interface as well as the software architecture for the web site since its inception in 2002.

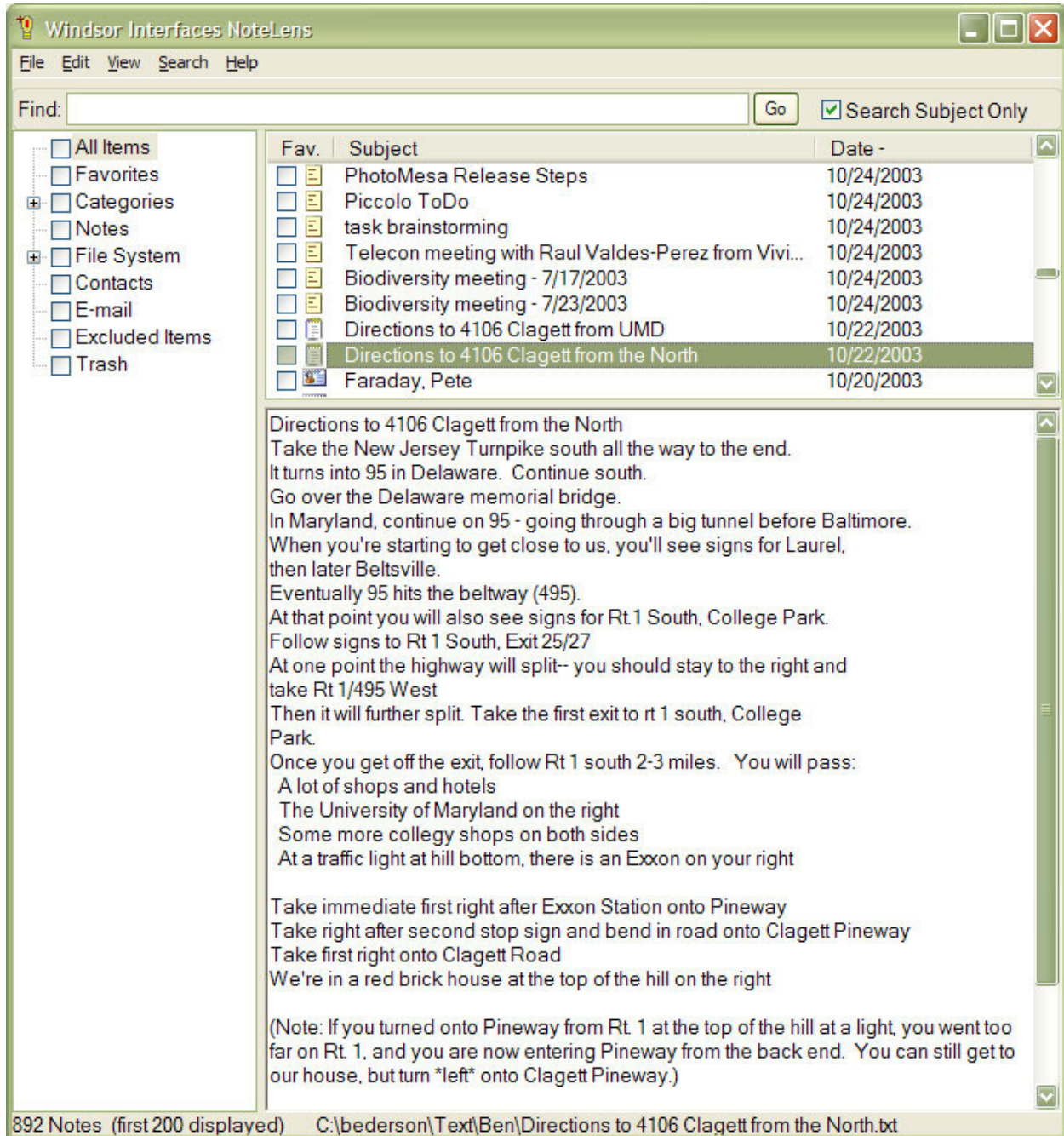


Screenshot taken February 19, 2017 by Benjamin B. Bederson from <http://www.childrenslibrary.org/icdl/SimpleSearchCategory?ids=25&langid=&pnum=1&cnum=1&text=&lang=English&ilang=English>

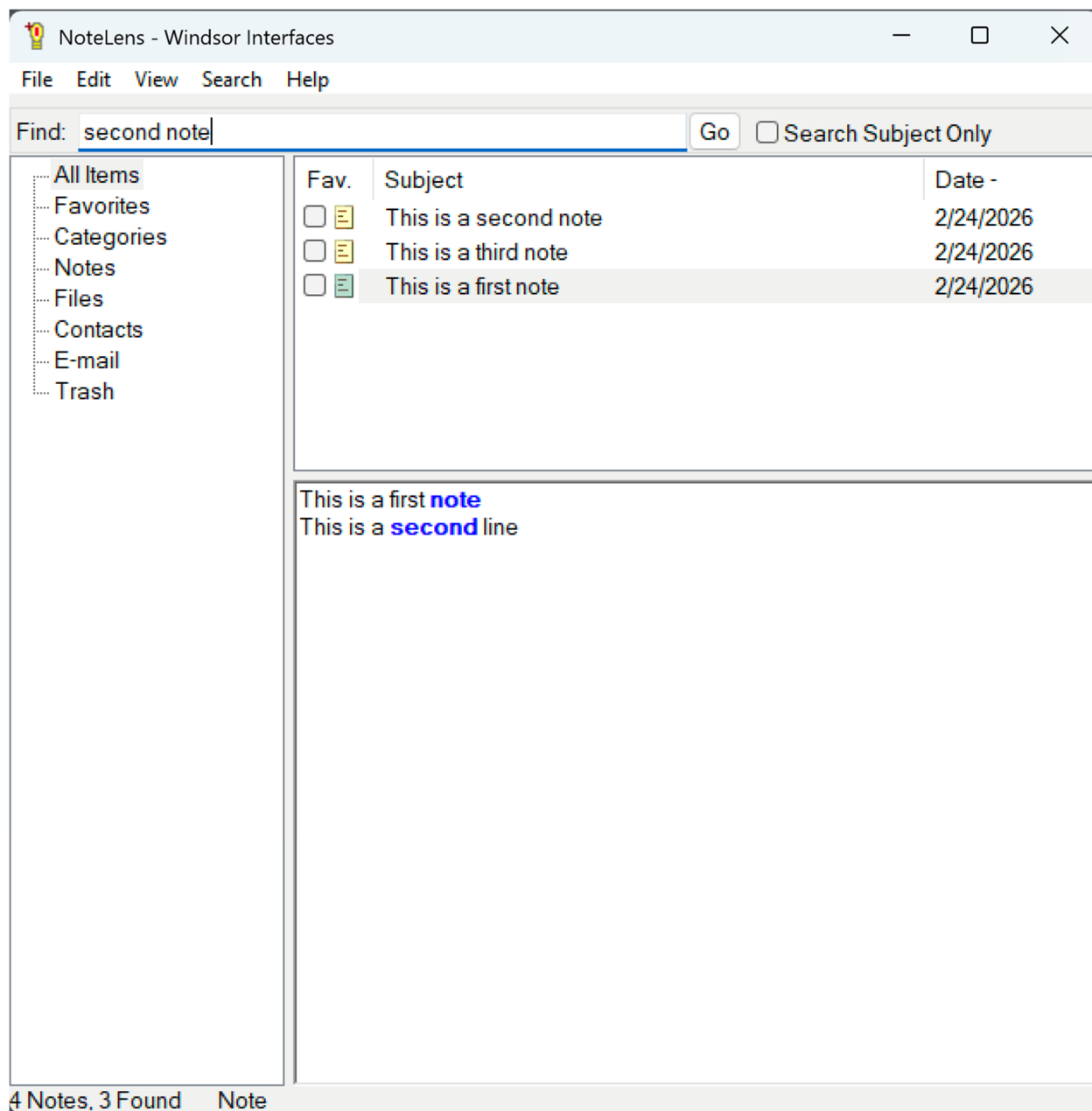
13. In 2004, I designed and wrote NoteLens, an application that supported people to write and quickly search for notes. NoteLens has been available for download at <http://windsorinterfaces.com/notelens.shtml> since 2004, and was described in a New York Times article at that time as well.⁵ NoteLens allows a

⁵ <https://www.nytimes.com/2004/01/22/technology/what-s-next-now-where-was-i-new-ways-to-revisit-web-sites.html>.

user to enter multiple search terms, and it shows search results matching those terms as a user enters each character. It highlights the matching search terms within the found notes.



Screenshot from <http://windsorinterfaces.com/images/notelens.jpg> taken in 2004



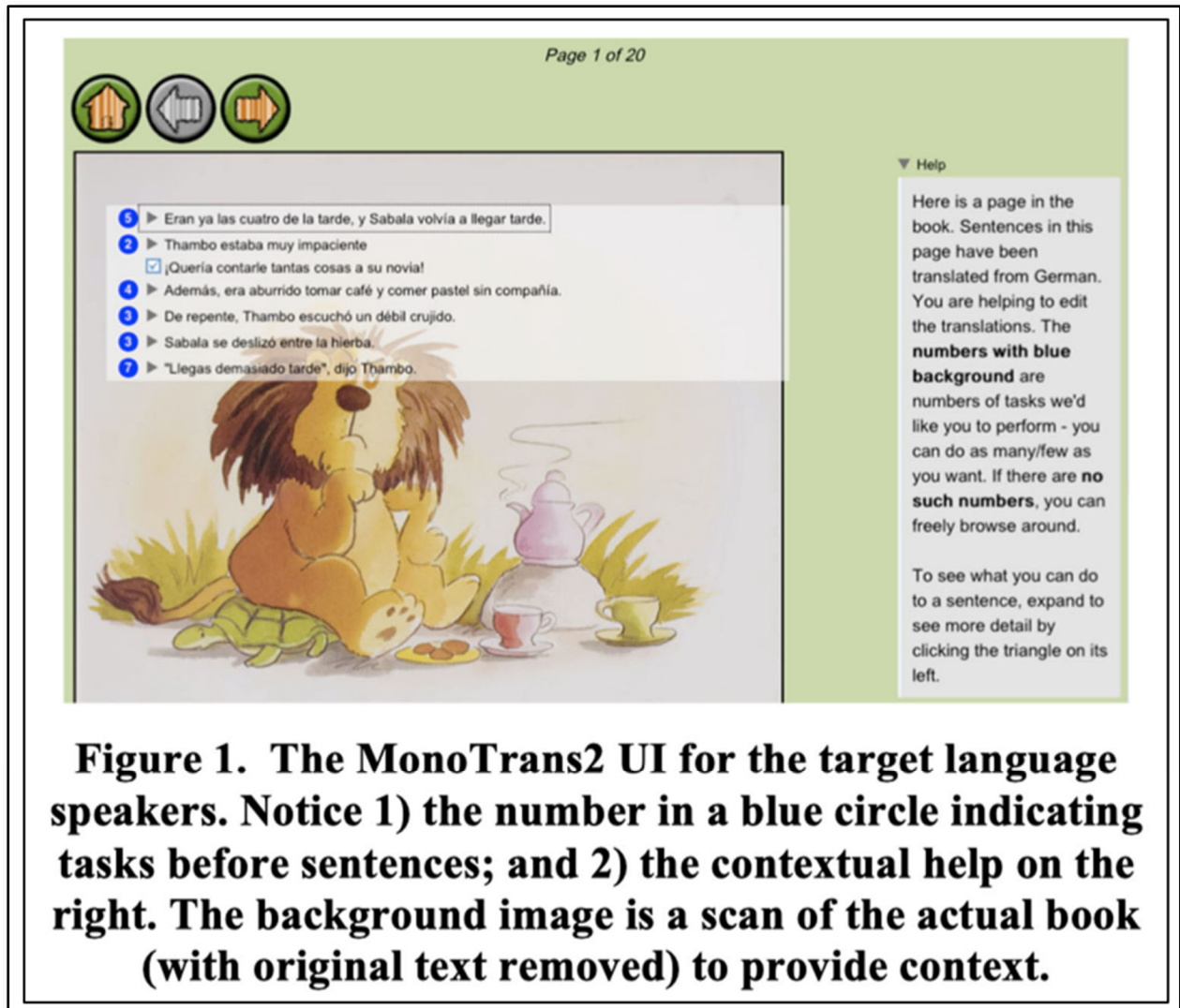
Screenshot taken from running 2003 version 1.07 version of NoteLens on February 24, 2026

14. Beginning in the mid-1990s, I have been responsible for the design and implementation of numerous other web sites in addition to the ICDL. For example, I designed and built my own professional web site when I was an Assistant Professor of Computer Science at the University of New Mexico in 1995

and have continued to design, write the code for, and update both that site (which I moved to the University of Maryland in 1998, currently at <http://www.cs.umd.edu/~bederson/>) as well as numerous project web sites, such as Pad++, <http://www.cs.umd.edu/hcil/pad++/>.

15. I started a new web-based project in 2009 to bring people together on a website to collaboratively translate text for children’s books from one language to another. This resulted in numerous publications, including a 2011 paper⁶ that described a second generation of this work. In the numerous versions of this project, we used several web-based collaboration techniques, including by synchronous and asynchronous collaboration – allowing people to see the work of others on their own views of our website either immediately as others were doing the work (synchronously) or later after they had completed the work (asynchronously).

⁶ Bederson, B. B. et al. (2011). MonoTrans2: a new Human Computation System to Support Monolingual Translation. In Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI ‘11). Association for Computing Machinery, New York, NY, USA, 1133–1136.
<https://doi.org/10.1145/1978942.1979111>.



16. My work has been published extensively in more than 160 technical publications, and I have given about 100 invited talks, including 9 keynote lectures. I have won a number of awards including the Brian Shackel Award for “outstanding contribution with international impact in the field of HCI” in 2007, and the Social Impact Award in 2010 from Association for Computing Machinery’s (“ACM”) Special Interest Group on Computer Human Interaction (“SIGCHI”). ACM is the primary international professional community of

computer scientists, and SIGCHI is the primary international professional HCI community. I have been honored by both professional organizations. I am an “ACM Distinguished Scientist,” which “recognizes those ACM members with at least 15 years of professional experience and 5 years of continuous Professional Membership who have achieved significant accomplishments or have made a significant impact on the computing field.” I am a member of the “CHI Academy,” which is described as follows: “The CHI Academy is an honorary group of individuals who have made substantial contributions to the field of human-computer interaction. These are the principal leaders of the field, whose efforts have shaped the disciplines and/or industry, and led the research and/or innovation in human-computer interaction.” The criteria for election to the CHI Academy are: (1) cumulative contributions to the field; (2) impact on the field through development of new research directions and/or innovations; and (3) influence on the work of others. I have received two “Test of Time” awards from IEEE InfoVis for my 2001 and 2002 work on visualizing hierarchies, including those containing digital photos.⁷ I received the Janet Fabri Memorial Award for

⁷ <https://ieevis.org/year/2021/info/awards/test-of-time-awards;>

[https://ieevis.org/year/2022/info/awards/test-of-time-awards.](https://ieevis.org/year/2022/info/awards/test-of-time-awards)

Outstanding Doctoral Dissertation for my Ph.D. work in robotics and computer vision.

17. I have appeared on radio shows numerous times to discuss issues relating to user interface design and people's use and frustration with common technologies, web sites, and mobile devices. My work has been discussed and I have been quoted by mainstream media around the world over 120 times, including by the New York Times, the Wall Street Journal, the Washington Post, Newsweek, the Seattle Post-Intelligencer, the Independent, Le Monde, NPR's All Things Considered, New Scientist Magazine, and MIT's Technology Review.

18. I have designed, programmed, and publicly deployed dozens of user-facing software products that have cumulatively had millions of users. I am the co-inventor of 14 U.S. patents and 20 U.S. patent applications.

II. MATERIALS REVIEWED AND CONSIDERED

19. My findings, as explained below, are based on my years of education, research, experience, and background in the field of Internet search, as well as my investigation and study of relevant materials for this declaration. When developing the opinions set forth in this declaration, I assumed the perspective of a person having ordinary skill in the art, as set forth in Section IV below. In forming my opinions, I have studied and considered the materials identified in the **Table of Exhibits** listed above.

III. MY UNDERSTANDING OF PATENT LAW

20. In developing my opinions, I discussed various relevant legal principles with Petitioner's attorneys. Though I do not purport to have prior knowledge of such principles, I understood them when they were explained to me and have relied upon such legal principles, as explained to me, in the course of forming the opinions set forth in this declaration. My understanding in this respect is as follows.

21. I understand that "*inter partes* review" (IPR) is a proceeding before the United States Patent & Trademark Office for evaluating the patentability of an issued patent's claims based on prior-art patents and printed publications.

22. I understand that, in this proceeding, Petitioner has the burden of proving that the challenged claims of the '001 patent are unpatentable by a preponderance of the evidence. I understand that "preponderance of the evidence" means that a fact or conclusion is more likely true than not true.

23. I understand that, in IPR proceedings, claim terms in a patent are given their ordinary and customary meaning as understood by a POSA in the context of the entire patent and the prosecution history pertaining to the patent. If the specification provides a special definition for a claim term that differs from the meaning the term would otherwise possess, the specification's special definition controls. If a claim element is expressed as a "means" for performing a specified

function, I understand that it covers the corresponding structure described in the specification and equivalents of the described structure. I have applied these standards in preparing the opinions in this declaration.

24. I understand that determining whether a particular patent or printed publication constitutes prior art to a challenged patent claim can require determining the effective filing date (also known as the priority date) to which the challenged claim is entitled. I understand that for a patent claim to be entitled to the benefit of the filing date of an earlier application to which the patent claims priority, the earlier application must have described the claimed invention in sufficient detail to convey with reasonable clarity to the POSA that the inventor had possession of the claimed invention as of the earlier application's filing date. I understand that a disclosure that merely renders the claimed invention obvious is not sufficient written description for the claim to be entitled to the benefit of the filing date of the application containing that disclosure.

25. I understand that for an invention claimed in a patent to be patentable, it must be, among other things, new (novel—*i.e.*, not anticipated) and not obvious from the prior art. My understanding of these two legal standards is set forth below.

A. Anticipation

26. I understand that, for a patent claim to be “anticipated” by the prior art (and therefore not novel), each and every limitation of the claim must be found, expressly or inherently, in a single prior-art reference. I understand that a claim limitation is disclosed for the purpose of anticipation if a POSA would have understood the reference to disclose the limitation based on inferences that a POSA would reasonably be expected to draw from the explicit teachings in the reference when read in light of the POSA’s knowledge and experience.

27. I understand that a claim limitation is inherent in a prior art reference if that limitation is necessarily present when practicing the teachings of the reference, regardless of whether a person of ordinary skill recognized the presence of that limitation in the prior art.

B. Obviousness

28. I understand that a patent claim may be unpatentable if it would have been obvious in view of a single prior-art reference or a combination of prior-art references.

29. I understand that a patent claim is obvious if the differences between the subject matter of the claim and the prior art are such that the subject matter as a whole would have been obvious to a person of ordinary skill in the relevant field at

the time the invention was made. Specifically, I understand that the obviousness question involves a consideration of:

- the scope and content of the prior art;
- the differences between the prior art and the claims at issue;
- the knowledge of a person of ordinary skill in the pertinent art; and
- if present, objective factors indicative of non-obviousness, sometimes referred to as “secondary considerations.” To my knowledge, the Patent Owner has not asserted any such secondary considerations with respect to the ’001 patent.

30. I understand that in order for a claimed invention to be considered obvious, a POSA must have had a reason for combining teachings from multiple prior-art references (or for altering a single prior-art reference, in the case of obviousness in view of a single reference) in the fashion proposed.

31. I further understand that in determining whether a prior-art reference would have been combined with other prior art or with other information within the knowledge of a POSA, the following are examples of approaches and rationales that may be considered:

- combining prior-art elements according to known methods to yield predictable results;

- simple substitution of one known element for another to obtain predictable results;
- use of a known technique to improve similar devices in the same way;
- applying a known technique to a known device ready for improvement to yield predictable results;
- applying a technique or approach that would have been “obvious to try,” *i.e.*, choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success.
- known work in one field of endeavor 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 one of ordinary skill in the art;
- some teaching, suggestion, or motivation in the prior art that would have led one of ordinary skill to modify the prior-art reference or to combine prior-art reference teachings to arrive at the claimed invention. I understand that this teaching, suggestion or motivation may come from a prior-art reference or from the knowledge or common sense of one of ordinary skill in the art.

32. I understand that for a single reference or a combination of references to render the claimed invention obvious, a POSA must have been able to arrive at the claimed invention by altering or combining the applied references.

IV. PERSON OF ORDINARY SKILL IN THE ART (“POSA”)

33. I have been informed and understand that for purposes of assessing whether prior-art references disclose every element of a patent claim (thus “anticipating” the claim) and/or would have rendered the claim obvious, the patent and the prior-art references must be assessed from the perspective of a POSA to which the patent is related, based on the understanding of that person at the time of the patent claim’s priority date. I have been informed and understand that a POSA is presumed to be aware of all pertinent prior art and the conventional wisdom in the art, and is a person of ordinary creativity. I have applied this standard throughout my declaration.

34. The ’001 patent involves technology in the field of Internet Search. I have been asked to provide my opinions as to the state of the art in this field by mid-2011. I use this timeframe because the face of the ’001 patent indicates an earliest claimed priority date of June 17, 2011. Whenever I offer an opinion in this declaration about the knowledge of a POSA, the manner in which a POSA would have understood the claims of the ’001 patent or its description, the manner in which a POSA would have understood the prior art, or what a POSA would have

been led to do based on the prior art, I am referencing the mid-2011 timeframe, even if I do not say so specifically in each case.

35. I understand that the Patent Owner may attempt to prove that the alleged invention recited in the challenged claims was conceived at some time prior to the earliest claimed priority date on the face of the patent. At the time of this declaration, I am unaware of the Patent Owner having alleged any earlier conception date or produced any evidence to establish any earlier conception date.

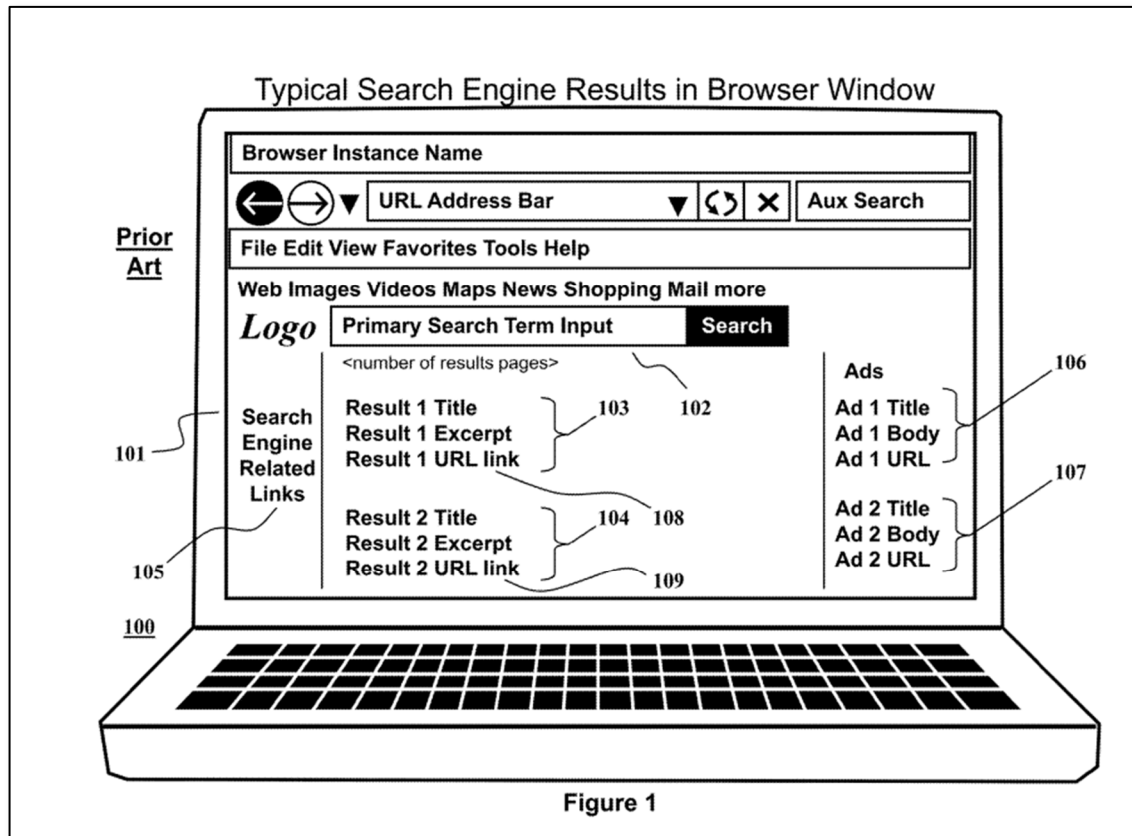
36. In my opinion, a person of ordinary skill in the art in the mid-2011 timeframe (“POSA”) would have had a bachelor’s degree in computer science or a related field, plus at least two years of industry or graduate-level experience with designing user interfaces for Internet search engines. More education could substitute for experience, and vice versa. This person would have been capable of understanding and applying the teachings of the ’001 patent and the prior-art references discussed in this declaration.

37. By 2011, I held a Ph.D. in Computer Science, and I had over 15 years of experience with Internet Search (including my own Internet search engine from 2002 that I discussed above, §I). To-date, I have had over 30 years of experience with Internet Search, including research, design, and implementation of user interfaces for web browsers and Internet search engines and the search algorithms used in those search engines and related information-retrieval systems. Therefore,

I was a person of more than ordinary skill in the art during the relevant timeframe. However, I worked with many people who fit the characteristics of the POSA, and I am familiar with their level of skill. When developing the opinions set forth in this declaration, I assumed the perspective of a person having ordinary skill in the art, as set forth above.

V. THE '001 PATENT (EX1001)

38. As I discuss further below (§V.A), the '001 patent is directed to displaying search-engine results to a user. An interface for a prior-art search-engine webpage is shown in the patent's Figure 1 (reproduced below). As the figure depicts, the prior-art interface includes a search bar into which a user enters search terms, and executing the search identifies a list of search-result webpages that relate to the user-entered search terms.



39. The '001 patent purports to improve this prior-art interface by adding annotations to the list of search results that indicate whether a search-result webpage does or does not include each of the user's search terms. That is, if the user conducts a search using, say, the three-word search query "MANHATTAN CLAM CHOWDER," annotations will be added for each returned search result to indicate whether, for example, the word "MANHATTAN" is missing or included in a particular search-result webpage.

40. Despite the '001 patent's assertion to the contrary, the concept of annotating search-result listings to indicate the presence or absence of search terms was known before 2011, the earliest alleged priority date. For example, Internet

search providers have long **bolded** search terms that are present in a search-result listing, *e.g.*, in a result's title, URL, or summary. As I described above in the section on my qualifications, in 2004, I built a search application that highlighted search terms that were present in a search-result listing.

41. My opinion that it was long known in the prior art to bold search terms that are present in a search-result listing is corroborated by EX1025, which is a U.S. Patent that was filed in 2001 (cover code (22)) and issued in 2006 (cover code (45)). EX1025 “relates to the field of information retrieval, and more specifically to displaying results to a search query,” in particular “searches on the Internet.” EX1025, 1:12-15. EX1025's FIG. 1 “is a display of a searching tool.” EX1025, 5:25. As shown at the top of FIG. 1A, the user entered a two-term search query – “greenhouse effect” – and each of those terms is shown in bold whenever they appear in the title or summary a search result displayed to a user. *See also* EX1025, FIG. 4 (for two-word query “greenhouse effect” bolding either term if it appears in a search-result grouping).

42. My opinion that it was long known in the prior art to bold search terms that are present in a search-result listing is also corroborated by EX1026. EX1026 is U.S. Patent that was filed in 2005 (cover code (22)) and issued in 2012 (cover code (45)). EX1026 “relates generally to information retrieval systems.” EX2026, 1:14-15. EX1026's FIG. 3 “is a screenshot of a user interface for an

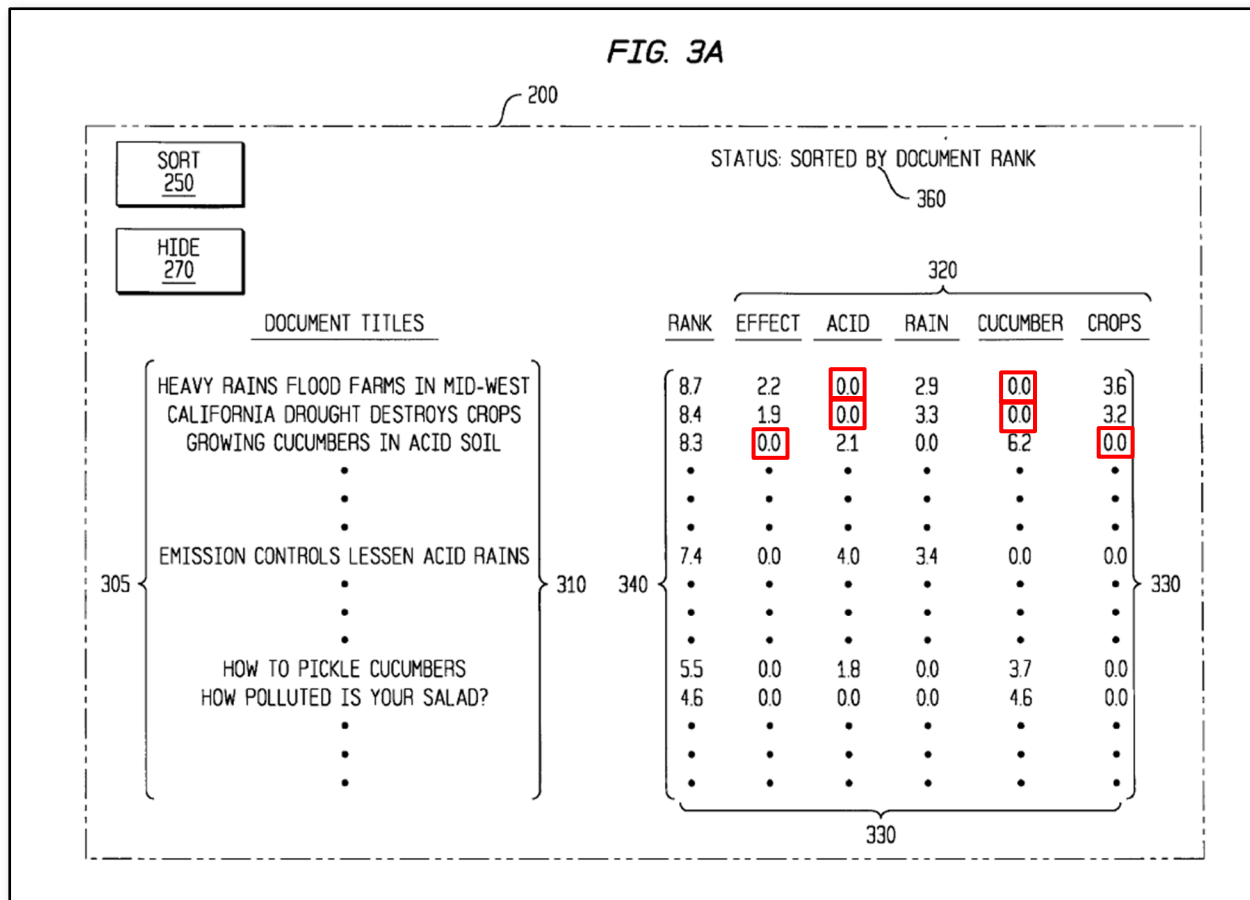
application (e.g., a browser) displaying a set of search results provided by a search engine system 100 in response to a search query.” EX1026, 6:32-34. As shown in FIG. 3, each search result includes a “document title 330[, which] is displayed as a hyperlink, associated with the network address of the primary version of the document” (EX1026, 6:55-58) and “[a] snippet 350 of the primary version of the document” (EX1026, 6:66-67). “The search terms used in the search query are **highlighted in bold font** in the document title 330 and the snippet 350.” EX1026, 7:1-3.

43. Other prior-art references disclose similar annotations used for the purpose of indicating the presence / frequency of search terms in search results. For example, EX1027 is a US patent application publication that published in 2008 (cover code (43)) from an application filed in 2006 (cover code (22)). EX1027 “is in the field of search technologies used by search engines and more specifically methods and systems for displaying the results of searches.” EX1027, [0001]. EX1027 discloses “a method of visually coding search results,” where “for each returned document [e.g., webpage] in the list, determining an occurrence frequency of” each search term and displays an “occurrence indicator” for each search term. EX1027, [0009]. “FIG. 7 illustrates a screen shot of an exemplary interface 500.” EX1027, [0051]. “[E]ach search term of a search query is displayed as a column title 570 and the column located below the column title 570 holds the occurrence

indicators 415 corresponding to that search term.” EX1027, [0057]. “A color shade is assigned to each occurrence indicator 514 based on the occurrence frequency determined for the specific search term in the returned document.” EX1027, [0059]. “[S]earch terms that occur more frequently in a return document (and therefore have a higher occurrence frequency than other search terms) are assigned a color shade that is more intense or rich.” EX1027, [0059]. Conversely, search terms that are **missing** are shown with the lowest intensity (*e.g.*, a faded grey- or white-shaded occurrence indicator 415). EX1027, [0059].

44. As another example, EX1028 is a US patent that issued in 1998 (cover code (45)) from an application filed in 1995 (code (22)). EX1028 “relates to the field of information retrieval,” specifically “using ranking algorithms.” EX1028, 1:8-10. EX1028 says as background information that it was known to rank search results “based on some similarity measure,” such as “whether a particular query element appears in a document or not.” EX1028, 1:63-67. EX1028 also says as background information that there were existing systems that “include[] information about the occurrence of words and the relevance ranking score as a display option with each document.” EX1028, 2:21-25. For example, one known information retrieval system would “show[] which of the ranked documents contain the query terms, in a table format, with individual terms as rows” and “[i]f a term appears in a document, the corresponding position on the table shows an

asterisk,” and “[o]therwise, the position is empty” (thereby indicating that the document is missing that search term). EX1028, 2:26-36. EX1028 says that it was beneficial to help users “understand the relationship among the contributions of various query elements to the overall rank or to change the rank displayed.” EX1028, 3:18-25. EX1028’s Figure 3B “shows the mechanism by which the user selects a new reorder criteria on the display.” EX1028, 4:8-9. As shown in Figure 3A (annotated below), “each of the rows 305” shows the “document titles 210” and “the contribution components 330 (230) of their respective query elements 320 (126).” EX1028, 5:39-44. EX1028 says that the contribution component includes as a factor the “Term Frequency” (EX1028, 5:39-44), and thus users and POSAs would understand that search terms that have a 0.0 contribution component (*e.g.*, some of which I’ve highlighted with red boxes) are terms that have a zero term frequency (*i.e.*, they are terms not found in the corresponding search result).



45. As another example, EX1048 is a US patent that issued in 1999 (cover code (45)) from an application filed in 1995 (code (22)). EX1048 “relates to an improved user interface for a relevance-ranking, abstract or document retrieval computerized system.” EX1048, 1:5-7. EX1048 says it was a “disadvantage” in prior art information-retrieval systems that did not “give the user sufficient information as to how the query words individually contribute or relate to the documents ranked in the results window”:

For instance, if the query words are, for example, A and B, the user cannot see from the display whether a document listed in the results

window is relevant because only A occurs in it, or because only B occurs in it, or because both A and B occur in it.

EX1048, 1:48-57.

46. To address that disadvantage, EX1048 discloses “a user interface” for a “document retrieval computerized system” that “comprises a display with a words window in which each query word is displayed in conjunction with a distinctive representation uniquely associated with each displayed word.”

EX1048, 1:66-2:4. “For the preferred use of color as the distinctive representation, for the example given above of A and B query words, next to each document listed in the results window would be a multi-colored bar of which one color represents the A word and a different color the B word.” EX1048, 2:41-45. EX1048’s Figure 4 shows an example where the user searched for “car sales europe” and “the user can tell at a glance which of the documents s/he may desire to peruse.” EX1048, 5:55-56. For example, “the word ‘car’ is displayed on a lightly shaded background 41.” EX1048, 5:39-40. Figure 4 indicates that “[t]he first document contains the word ‘car’ only,” because the first indicator 49 only contains the lightly shaded background 41 (EX1048, 5:56-58), and thus that first indicator 49 also indicates that the other search terms – “sales” and “europe” – are **not** present in that search result.

47. As another example, EX1049 is a US patent application publication that published in 2006 (cover code (43)) from an application filed in 2004 (cover code (22)). EX1049 relates “to a method and system to search a database for relevant items of information.” EX1049, [0001]. EX1049’s Figure 1 is a “graphical user interface” (GUI) that “provides comparative results of queries in visual form.” EX1049, [0026]. “As terms are added to the query, documents are retrieved and listed in pane 16 alongside the color-segmented bar 52 (respective colors corresponding with the color of subfields 32, 34, and 36) whose length indicates the strength of the term in that document (i.e., extent of relevancy).” EX1049, [0031]. For the example three-term query, “the first item on the list includes all three of the search terms,” as indicated by “all three colored segments [being] shown in bar 52 next to the title 50” and “remaining matches in pane 16 are ordered in such a way that produces an overall pattern (a+b+c, a+b, b+c, c+a), which puts like documents next to each other.” EX1049, [0031]. Thus, the visualization in EX1049 allows the user to see which terms are and are not present in each search result.

48. Thus, it was well-known in the prior art to indicate to a user which of the user’s search terms were and were not present in each search result presented in response to the user’s search query. In my opinion, the only plausible distinction that a person of ordinary skill would see between the annotation system recited in

the '001 patent's challenged claims and those disclosed years earlier in Bates (and others) is the limitation reciting that the annotation itself comprises "*text representing the at least one search term element that is missing*" in the search result.⁸ That is, for missing search terms, the claims require the annotation to include the search term's text itself, whereas Bates's example in its figures displays color-coded bars, without text, to indicate missing (and present) search terms.

49. For example, EX1012 discloses "a word index map 640" that uses "one or more visual aspects corresponding to a metric value, such as frequency or count." EX1012, [0051]; *see also* EX1012, [0043] (disclosing that "word indexes may be provided for each search result"). EX1012 discloses that the "[v]isual aspects that correspond to a metric scale" in a word index "may include color, font type, font size, a shape with a particular size that is associated with each word ..., etc." EX1012, [0051]. In the example word index in FIG. 6D, "a word that has a higher frequency metric may have a larger font than another word that has a lower frequency." EX1012, [0051]. Thus, when the word index is used to indicate "a term frequency (tf) metric" (EX1012, [0038]), the texts of each search term would

⁸ In my declaration, unless noted otherwise, I have italicized the claim language and added any emphasis that appears in quotes.

be included and written in a particular font size (or font color or font type) to indicate its frequency in each search result.

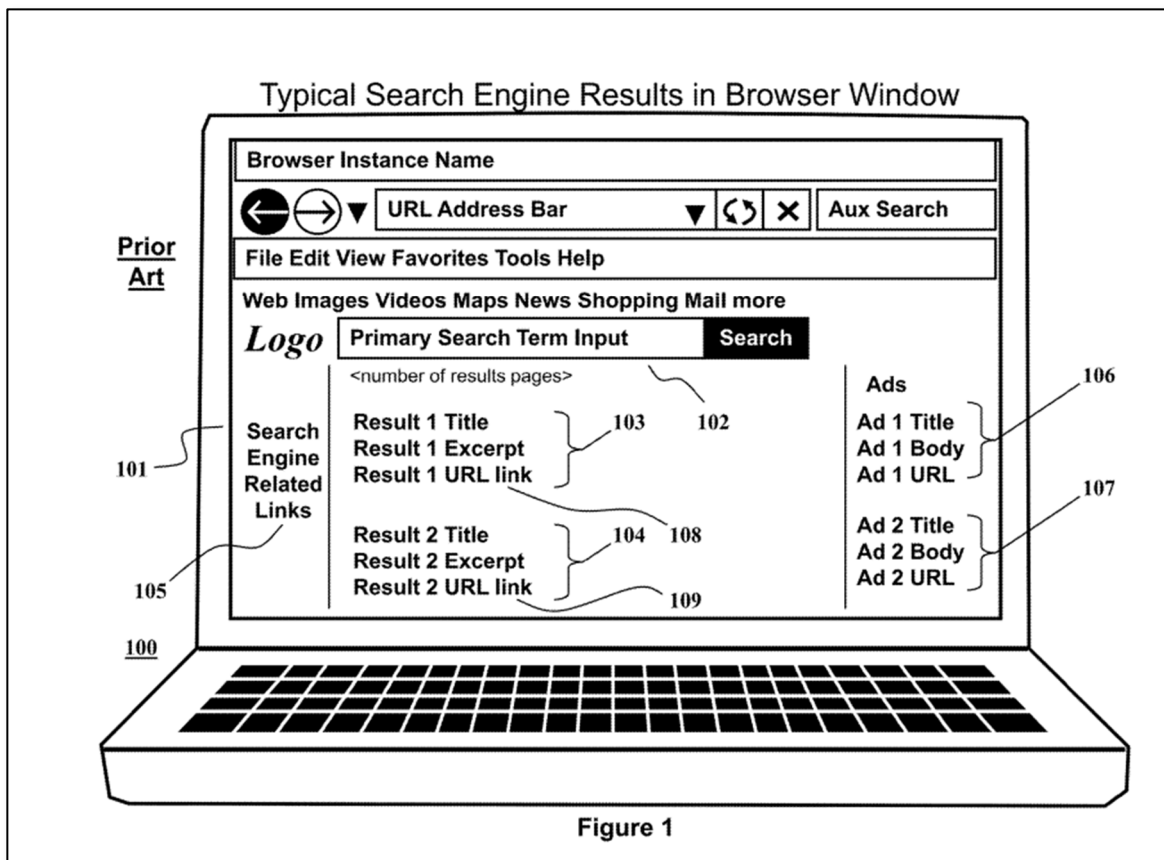
50. Another example of a text-based annotation to indicate the absence of search terms is disclosed in EX1045, which is a US patent application publication that published in 2008 (cover code (43)) from an application filed in 2006 (cover code (22)). In EX1045, “pages that either have no text, or whose text does not contain the search terms, may have been selected and presented as search results because they are referred to by other pages in a manner that uses one or more of the search terms.” EX1045, [0021]. “In such cases, the user can be presented with the referencing information, including the anchor text, in order to relate the user’s query to the result.” EX1045, [0021]. For example, “FIG. 3 illustrates a series of search results 230, 240, 250, 260 and 270, each representing one or more pages deemed relevant to the search string.” EX1045, [0037]. For search result 250, “none of the search terms were found in the page presented as search result 250” but “referencing information 252 is still provided to the user,” where the referencing information is the user’s search term “foobar.” EX1045, [0040], FIG. 3. Thus, a user of this search system would understand that the webpage at search result 250 does not include the search term “foobar,” but is displayed because it is “referred to by other pages in a manner that uses” that search term (EX1045, [0021]).

51. Given the state of the art, in my opinion, a person of ordinary skill would have found the challenged claims to recite nothing more than a predictable combination of known types and uses of text-based search-result annotations to indicate the presence or absence of a search term in a given search result (*e.g.*, as in Bhagat and Mills) with known interface configurations for displaying search results (*e.g.*, as in Bates and Wang). As I discuss further below (§§VIII-XV), it is my opinion that the challenged claims would have been obvious to a person of ordinary skill.

A. Overview of the Specification

52. The '001 patent claims priority to a June 2011 application. The patent alleges that then-existing search engines provided search-result webpages that caused users to waste their time clicking on websites that were “irrelevant or of little inherent use with regard to what the user seeks.” EX1001, 1:54-57. For example, the patent alleges then-existing search engines sometimes returned to users search-result webpages that did not “contain the search terms that [the user] had specified.” EX1001, 2:17-20. The patent says it would be beneficial if users knew “in advance which [search-result] webpages contain which search term elements.” EX1001, 2:35-38. The '001 patent is directed toward that idea.

53. The patent introduces its alleged invention by providing an overview of the prior-art “search engine browser” (EX1001, 2:39-41) depicted in Figure 1 below:



54. As seen above, the browser includes a “search term input bar 102” into which a user enters search terms. EX1001, 2:41-46. A listing of search-result groups 103 and 104 are returned in response to the user’s search terms and each group includes “the title of a search result webpage, some form of excerpt from the webpage, and the URL link at which the webpage is located.” EX1001, 2:41-46.

55. According to the patent, “[i]t would be advantageous if additional information appeared on” the interface that “provides insight to the user on what is contained in the webpage located at each search result URL.” EX1001, 2:56-63. “This foreknowledge of the contents of these webpages could prevent the user from wasting their time reviewing pages that are not relevant to their search.” EX1001, 2:56-63.

56. To provide that “foreknowledge” of what the search-result webpages contain, the patent describes adding annotations that “convey to the user...specific characteristics of the webpage located at the URL corresponding to the search result.” EX1001, 6:22-28. These “characteristics” can include the “presence or lack of presence of the search term elements...in the search results.” EX1001, 6:42-48.

57. Figure 5 (below) shows an example of an “annotated search engine results webpage according to the present invention” with “annotations adjacent each search result grouping to indicate which search term elements are present in the webpage referenced by the search result URL link.” EX1001, 4:30-35.

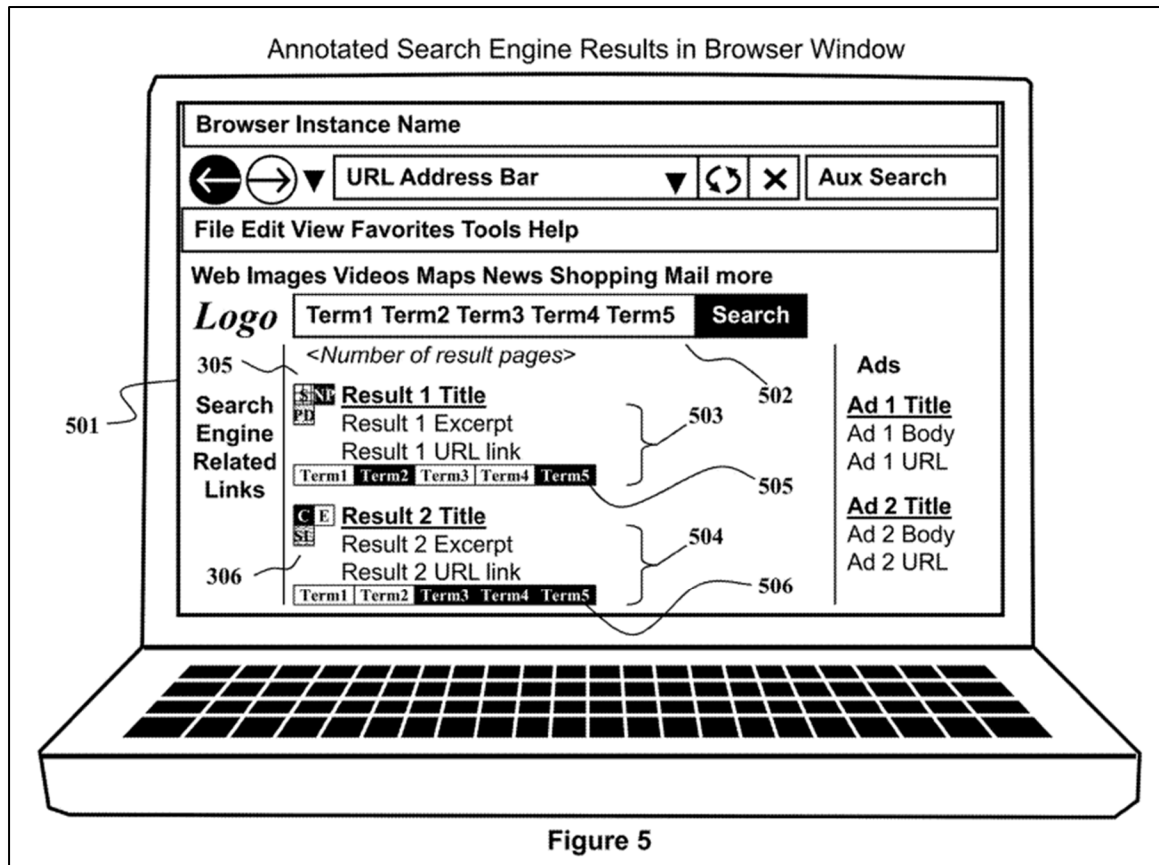


Figure 5

58. As shown above, the prior-art browser has been modified to include “search term elements annotations 505 and 506 indicating for example which search term elements actually appear on the webpage located at the search result URL link.” EX1001, 10:8-12. In Figure 5’s exemplary implementation, “search term elements which are present [are] shown as black text on a white background, with those search term elements that are not present are shown with white text on a black background.” EX1001, 10:12-15. The specific “[c]olors and shadings,” however, “are arbitrary and exemplary.” EX1001, 10:16.

B. The Challenged Claims

59. In the Claim Listing Appendix (§XVI below), I have reproduced the challenged claims with labels added for convenience. Independent claim 1 recites a method that aligns with the embodiment depicted in Figure 5 of the '001 patent. Independent claim 14 (a system claim) mirrors claim 1. Among other limitations of the independent claims, each independent claim requires an Internet search result with an “*annotation*” that comprises “*a text representing the at least one search term element that is missing in the Internet search result’s referenced webpage.*” See, e.g., Claim 1, limitation [1F].

60. Certain dependent claims (e.g., claim 5) require providing “*the annotation*” in response to the presence or absence of a term in “*one or more descendant webpages of the referenced webpage.*” In other words, the system identifies whether another webpage—one accessible via a link within the referenced webpage—includes the search term. For example, if www.uspto.gov is the referenced webpage, then www.uspto.gov/patents is a descendant webpage of the referenced webpage because a link to this webpage is found at www.uspto.gov. The patent’s Figure 6 illustrates such a system that searches for search terms in descendant webpages. EX1001, 4:36-43; 10:26-45.

61. Searching descendant webpages for a search term was also known before 2011. Searching descendant webpages for a search term was also known

before 2011. As far back as 2001, researchers at Xerox Palo Alto Research Center were developing a model of “information scent” to help people use the “scent” of “distal” (or descendant) webpages to decide what links to click on to find webpages that would meet their needs. EX1083, 491. The paper explains: “To calculate the distal scent of a link, we describe that link using words on the distal page (the page at the end of the link).” EX1083, 493.

62. For example, Naick (EX1009) – which I discuss further in §IX.A below – discloses as background information that “a need exists for a system and method for query based searches that provide results wherein at least one of the query terms or parameters may appear on a different page of a web site or domain.” Naick, [0005]. To do that, Naick’s system prepares an “index” that “hold[s] and compare[s] domain information i.e. web site information rather than web page information” to identify search terms that are present in either (or both) of a webpage and another webpage that is part of the same website (e.g., a webpage linked from the homepage of a website). Naick, [0021]; *see also* Naick, FIGS. 5A & 5B, [0025].

63. As another example, EX1041 (a US patent that issued in 2004, *see* cover code (45)), “relates to techniques for determining the relationship between pages on the” Internet, “and more particular to methods of determining if pages belong to the same Web site.” EX1041, 1:5-8. EX1041 discloses that a

“specialized program” (*e.g.*, “a Web robot or Web crawler”) (EX1041, 10:65-67) “may wish to treat two Web pages which are part of a single site as a single unit in adding entries to inverted term lists” (EX1041, 11:12-17), which POSAs understand means that a Boolean search would consider the presence of search terms in a webpage and also, for example, a descendent webpage linked to that webpage.

64. As another example, EX1042 (an International Application published March 2011, *see* cover code (43)), relates “to providing search results based upon weighing and scoring a search of web pages in a sub-domain that takes into account the content of web pages in other sub-domains.” EX1042, p. 1.

65. The remaining dependent claims recite other functionality that was common in prior-art search engines, like annotating search terms that are present (*e.g.*, claim 2), filtering search results by search term (*e.g.*, claim 3), or displaying sponsored links related to search terms (*e.g.*, claim 10). These dependent claims are also unpatentable. These dependent claims would have also been obvious to a person of ordinary skill, as I discuss further in §§VIII-XV below.

C. Prosecution History of the '001 Patent

66. In the first office action, the Examiner rejected all originally filed claims only for non-statutory double-patenting, which the applicants overcame by

filing a so-called terminal disclaimer. EX1002, 93-99, 112-113. The Examiner subsequently allowed the claims. EX1002, 129-138.

VI. CLAIM INTERPRETATION

67. In accordance with the standards for interpreting patent claim terms that I discussed above in Section III, I have interpreted the terms in the claims in accordance with their ordinary and customary meaning as understood by a POSA in the context of the patent (including the descriptions in the specification) and its prosecution history.

VII. SUMMARY OF GROUNDS FOR UNPATENTABILITY

68. I understand that Google requests cancellation of claims 1-26 as follows:

Ground	Reference(s)	Claim(s)	Basis
1A	Bates, Bhagat	1-4, 7-8, 12-17, 20-21, 25-26	Obviousness
1B	Bates, Bhagat, Naick	5-6, 18-19	
1C	Bates, Bhagat, Brinson	9, 22	
1D	Bates, Bhagat, Mehta	10-11, 23-24	
2A	Wang, Mills	1-4, 7-8, 12-17, 20-21, 25-26	
2B	Wang, Mills, Naick	5-6, 18-19	
2C	Wang, Mills, Brinson	9, 22	
2D	Wang, Mills, Mehta	10-11, 23-24	

69. I understand that each of the references listed above is prior art to the '001 patent based on its filing date (or filing date of a related application) and/or its

publication date. None of these references were cited or discussed during prosecution of the challenged patent. *See generally* EX1002.

VIII. GROUND 1A: BATES, BY ITSELF OR COMBINED WITH BHAGAT, RENDERS OBVIOUS CLAIMS 1-4, 7-8, 12-17, 20-21, AND 25-26

A. Bates (EX1010)

70. Bates is a US patent application publication that published in 2002 (cover code (43)) from an application filed in 2001 (cover code (22)).

71. Bates discloses an example of a search-engine interface that uses color to indicate the “occurrence of each keyword” (*i.e.*, a search term) in each search result that the search engine returns and displays in response to a user’s search. Bates, Abstract. Bates teaches that “color coding search results” allows users to conveniently “interpret[] search output.” Bates, [0001].

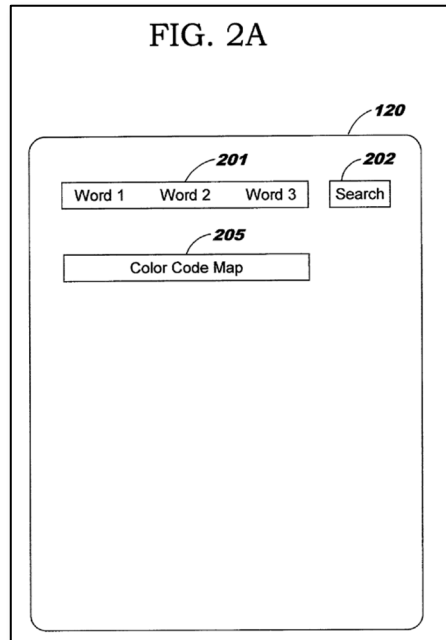
72. Bates explains that keyword-based searches are “often interpret[ed]” by search engines “as requests to find web pages that contain any one or more of the keywords,” which may “return[] an unusably large number of sources.” Bates, [0004]. POSAs would understand that Bates is discussing prior art searches that used as their default a so-called Boolean “OR” logical operation, which is satisfied when a search result contains any of the search terms joined by the “OR.” As Bates says, “[f]or example, a searcher might enter three keywords,” but instead of displaying only results that include all three keywords, the “search engine would [] find sources that include” just one keyword “in isolation,” sources that include any

two of the keywords, and sources that include “all three keywords.” Bates, [0006]. That is, the Boolean OR operator broadens the search results compared to the Boolean AND operator, which narrows the search results. Bates says that the searcher (*i.e.*, user), however, may only “judge[]” a source to be “relevant to the search” if it matches “at least two of the keywords,” *i.e.*, the searcher does not want results that match only one of the three keywords, but instead wants results that contain at least two (*i.e.*, two or three) of the three keywords. Bates, [0006].

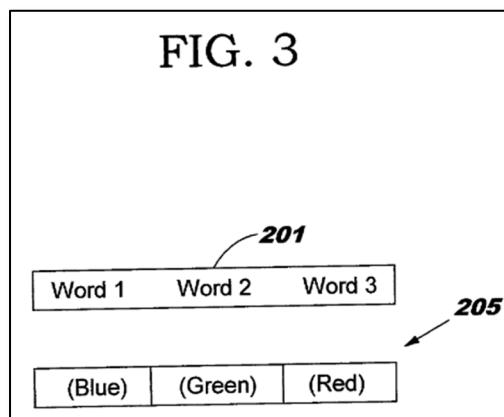
73. Bates therefore identifies “a need for...presenting the results of a search so that the searcher may form an effective picture of the relevance of the sources found by the search engine” without having to “examine sources that lack relevant information” but are nevertheless displayed “in the list of sources.” Bates, [0009]. Bates addresses this need by collecting “occurrence data that report, for example, whether each keyword is present or absent in each web page,” and displaying within each search result “a correlation indicator” that “includes a visual area that is colored according to [a] color code and the occurrence data.” Bates, [0011]-[0012].

74. Bates’s Figure 2A (below) depicts an interface displayed to a searcher, *e.g.*, on a computer screen (*e.g.*, via a web browser). Bates, [0018], [0026]. As seen below, the interface presents a searcher with “an input line 201,

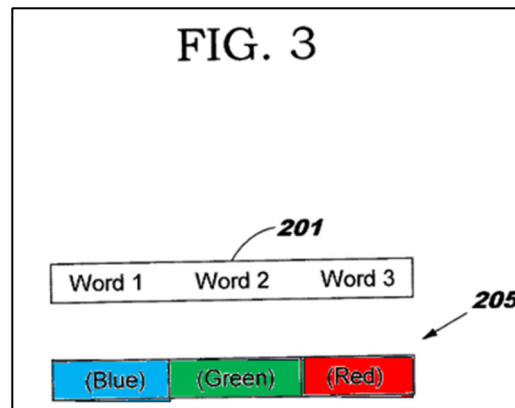
wherein keywords may appear as they are entered.” Bates, [0026]. In Figure 2A, three keywords are shown: “word1, word2, and word3.” Bates, [0026].



75. As seen above, the interface includes “a color code map 205” located beneath the input line, where the map “provide[s] the searcher [] with a visual association between colors and keywords.” Bates, [0026]. Bates’s Figure 3 (below) “shows an exemplary configuration of the color code map” below the input line. Bates, [0029].



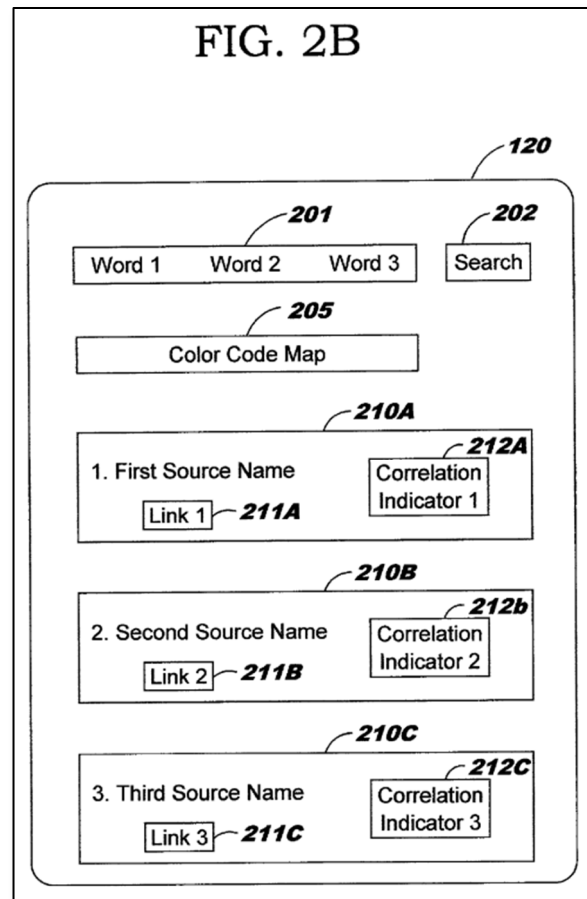
76. The color-code map “visually associate[s] colors with the keywords that appear on the input line 201. For example, keywords word1, word2, and word3 might appear on the input line 201 as shown in FIG. 3, and be associated with the colors blue, green, and red, respectively.” Bates, [0029]. This is seen in the colorized version of Figure 3 below:



77. In one embodiment, Bates does not use a separate color-code map (like color bar 205 depicted in Figures 2A-2B and 3) but instead changes the font color of each search term as it is typed into input line 201. For example, “word1 might appear in blue characters in the input line 201, word2 might appear in green characters, and word3 in red.” Bates, [0031]. Bates refers to using different color font for each search term as an “implicit” color-code map. Bates, [0031]. I have illustrated an example of an implicit color-code map below, where each keyword that is entered into input line 201 are automatically written in a different font color:

Word 1	Word 2	Word 3
--------	--------	--------

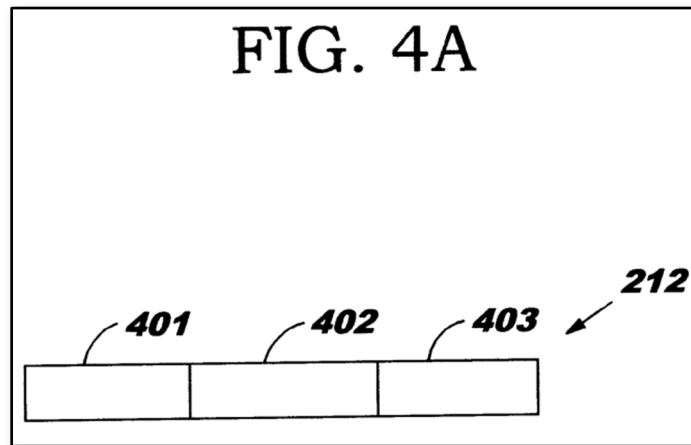
78. Similar to Figure 2A, Bates's Figure 2B (below) depicts an interface for Bates's system. Bates, [0018]. As seen below, the input line 201 and color code map 205 are displayed with an "exemplary presentation of search results," which includes information about webpages 210A-210C that were "found by the search." Bates, [0027].



79. As seen above, each search result 210 includes a correlation indicator 212. "The correlation indicator 212 may have the form of a horizontal bar as shown in FIG. 2B, divided into a number of segments according to the number of keywords on the display line 201. For example, if there are three keywords, the

horizontal bar correlation indicator may have three segments 401, 402, and 403 as shown in FIG. 4A, associated respectively with the keywords and their colors.”

Bates, [0033]. Figure 4A’s correlation indicator is shown below:



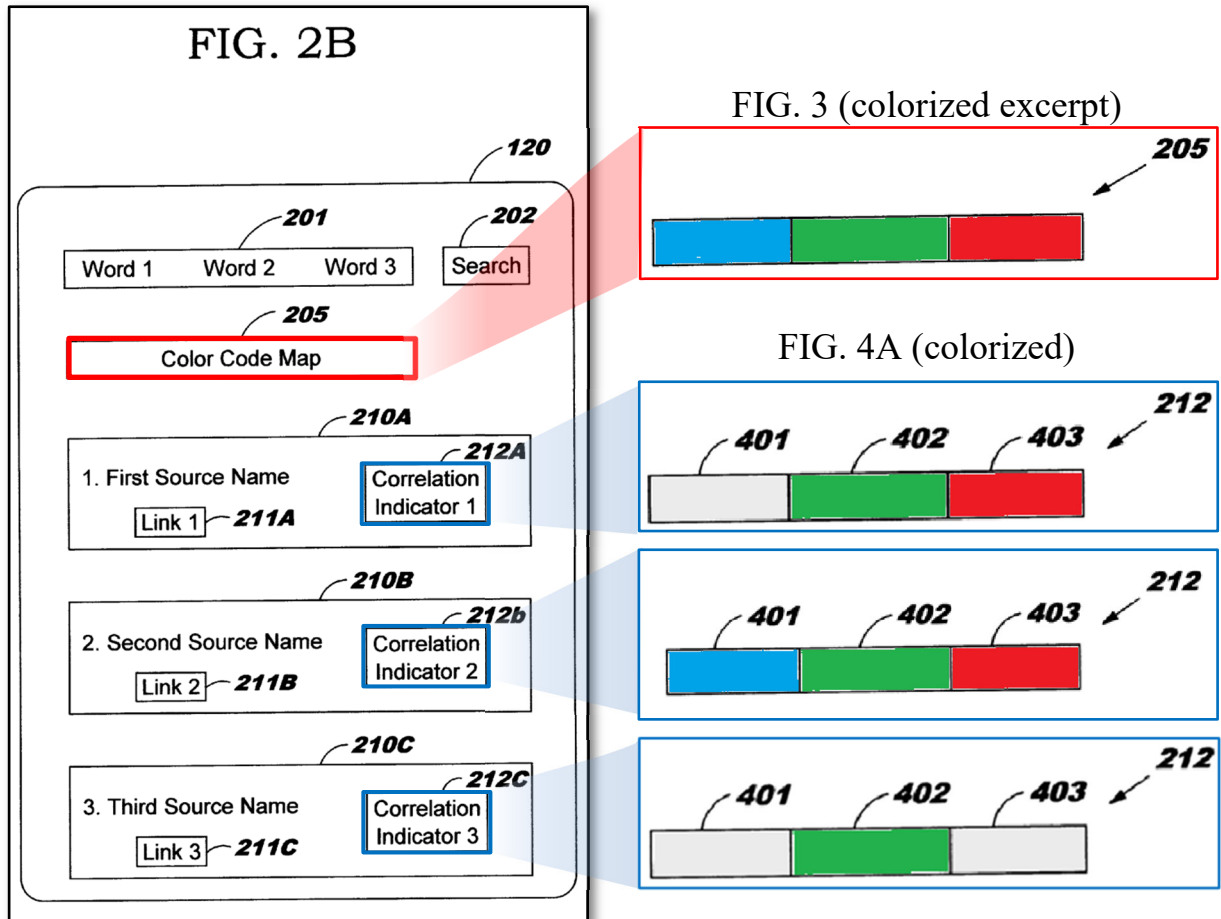
80. Bates explains how this embodiment of its system works as follows:

When a URL returned by the search engine 180 contains keyword word1, for example, the first segment 401 of the horizontal bar correlation indicator may be colored blue. If the web page that is identified by the URL returned by the search engine does not contain keyword word1, then the first segment 401 of the horizontal bar may be left uncolored, or colored according to a background color not associated with any keyword by the color code map 205. When the web page contains keyword word2, the second segment 402 of the bar may be colored green, or left uncolored if the web page does not contain keyword word2, and likewise in kind for keyword word3.

Bates, [0033].

81. The demonstrative below is based on Bates's Figures 2B, 3, and 4A, and illustrates an example of Bates's system where webpage 210B contains all three of the user's keywords, but webpage 210A is missing word1 (as indicated by its correlation indicator having its first segment shaded gray) and webpage 210C is missing word1 and word3 (as indicated by its correlation indicator having its first and third segments shaded gray), where gray is "a background color not associated with any keyword by the color code map 205." Bates, [0033].⁹ "Thus, by glancing at the colors of the correlation indicator 212, the searcher 100 may readily grasp the relevance of the URL to the search." Bates, [0033].

⁹ Bates's specification is a little ambiguous whether the 210 reference labels are intended to be Bates's reference for a "web page" itself or "information about a web page." *See, e.g.*, Bates, [0027] ("The exemplary presentation includes information about a first web page 210A...."). Whether the 210 reference labels (or, alternatively, the 211 reference labels) are the reference to a "web page" or a reference to information associated with a "web page," it is clear from Bates's disclosure that Bates's search engine is searching for and displaying a search results interface for Internet web pages.



82. Bates’s above-depicted embodiment utilizes a correlation indicator that takes the form of a segmented horizontal bar of colors (Bates, [0033]), but Bates teaches that an indicator “may be *any* visual presentation that uses a color code to convey the presence or absence...of keywords in a web page” (Bates, [0036]). Bates thus encourages POSAs to consider alternative designs for its correlation indicators 212.

83. Moreover, as the annotated Figures 2-4 above illustrate, Bates designs its correlation indicators 212 for the search results 210 to mirror the color code map 205 for the input field 201. POSAs would thus have recognized that in the

embodiment in which an “implicit” color map is utilized—*i.e.*, each search term entered into field 201 is coded using a different color font rather than a colored bar (Bates, [0031])—a straightforward matching implementation of the correlation indicator for each search result would have been to use the color-coded search terms themselves as correlation indicators. I discuss this obvious implementation of Bates in more detail below in Section VIII.C.1.

B. Bhagat (EX1011)

84. Bhagat is a US patent that issued August 2015 (cover code (45)) from an application filed in December 2010 (cover code (22)).

85. While Bates describes a color-based approach to indicating the presence or absence of search terms in search results, POSAs would have known that there were other beneficial ways to visually indicate information about the presence and absence of search terms. As I discuss further below, Bhagat provides one such example in the prior art.

86. Like Bates, Bhagat discloses a user interface for a search engine that is based on, *e.g.*, “keyword matching.” Bhagat, 1:6-10; *see* Bhagat, FIGS. 2-4. Though Bhagat’s examples are in the context of searching an electronic commerce system, Bhagat makes clear (and a POSA would understand) that Bhagat’s search and annotation methodology (that I discuss further below) are also applicable more generally for a “general purpose search engine.” Bhagat, 1:54-58, 2:50-67. For

example, Bhagat discloses an application 110 that “is executed to provide for interaction between the applications on the computing device 103 and clients 106 and/or mobile devices 107.” Bhagat, 4:6-12. Bhagat teaches that “the application server 110 may also include, for example, a web server application” and that the “search application 111” executing on the application server can be “in the context of...a general purpose search engine.” Bhagat, 4:12-25.

87. Bhagat explains that some “search queries submitted by a user to a search engine may yield few and/or no search results.” Bhagat, 1:58-62. Rather than leave the user to believe that there are few or no search results available, Bhagat says it would be beneficial to generate “suggested queries” for the user. Bhagat, 1:62-2:4. The suggested queries can be generated, in part, “by removing one or more search term[s] from [a] search query” to determine if a revised search query matches a “historical search query” that Bhagat’s system knows yielded relevant results. Bhagat, 6:4-22. For example, in response to a “four term search query that yields no products” in a data store, “the search application 111 can determine whether there are three term historical search queries 113 using any three of the four terms that are associated with at least one search result.” Bhagat, 6:23-37.

88. In Figure 2’s example (below), the three-word search query “fast racing adventures” typed into a search input line “yields no search results.”

Bhagat, 8:16-22. In response, Bhagat’s system identifies two historical queries related to the initial query by “remov[ing] a search term from the user supplied search query.” Bhagat, 8:29-34.

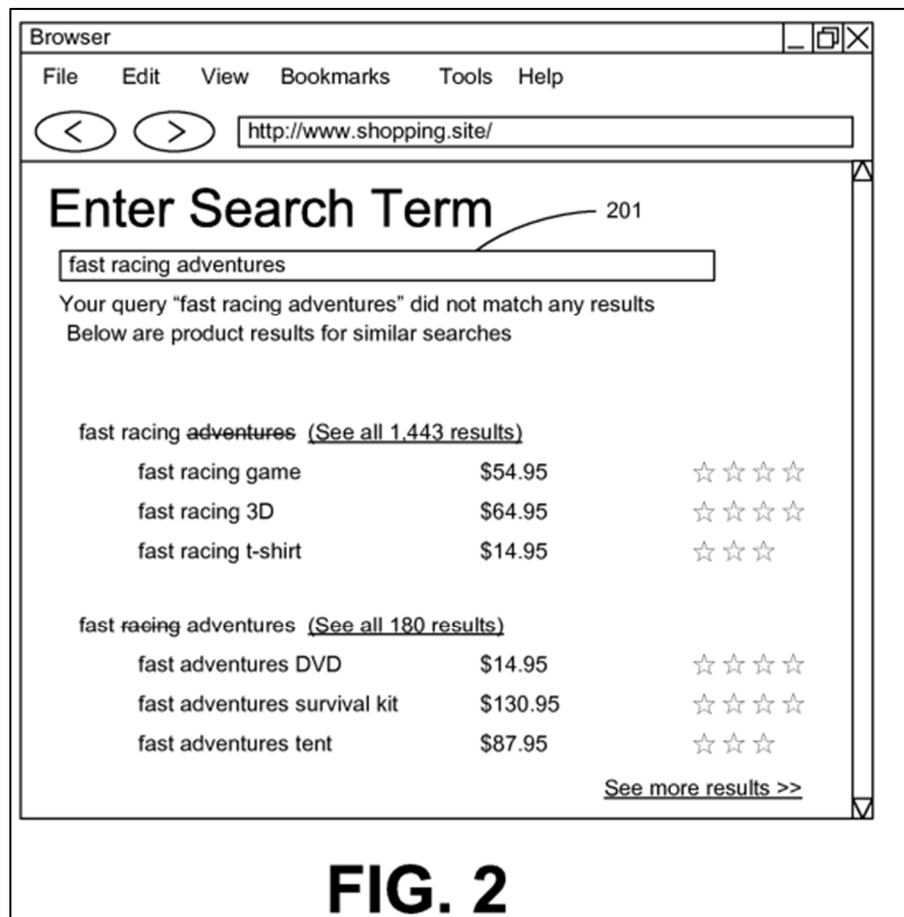


FIG. 2

89. POSAs understood that the strikethrough for the text “~~adventures~~” and “~~racing~~” in the first and second sets of search results above indicates that those search results are missing the search term that has been stricken, but include the search term(s) that are not stricken. A user of Bhagat’s system would understand that a term with a strikethrough means the term is missing from the corresponding search results. This because Bhagat’s Figure 2 says (under box 201) that the

original search “did not match any results.” That means that no results (including the ones shown in Figure 2) matched all three of the user’s search terms, and, therefore, each group of search results matched a subset of the user’s search terms – *i.e.*, the term(s) without a strikethrough – but the group is missing the term with the strikethrough (if they were not missing the stricken term, the original search **would** have matched those results rather than none).

90. Thus, Bhagat taught POSAs that one way to visually indicate to a user that a search term is missing in a particular search result is to display the text of the search term next to the search result in a strikethrough text.

C. Obvious Implementations of Bates and Bates-Bhagat

91. As I discussed above (§VIII.A), the example embodiment illustrated in Bates’s figures utilizes a correlation indicator that has a segmented horizontal bar of colors to indicate the presence or absence of search terms within each search result. Bates, [0033]. Bates expressly teaches, however, that its indicator “may be **any visual presentation** that uses a color code to convey the presence or absence...of keywords in a web page.” Bates, [0036]. Bates thus encourages POSAs to consider alternative techniques for visually indicating to a user that search terms are present or absent in search results. Bates itself plainly suggests one alternative technique to POSAs (*i.e.*, combining color-coding and text, *see* §VIII.C.1 below); Bhagat discloses another alternative technique (*i.e.*,

strikethrough text of missing terms, *see* §VIII.C.2 below). POSAs would have found that implementing Bates’s system using either technique (or both) would have been obvious for the reasons I discuss further below.

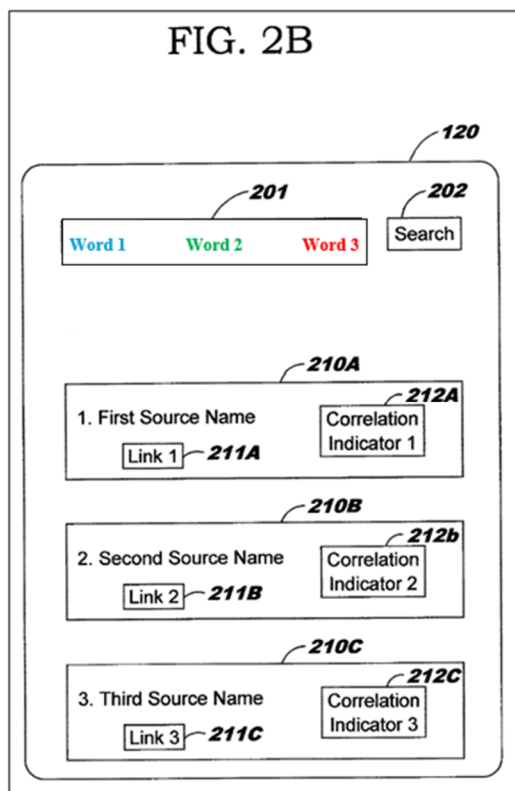
1. Bates Alone

92. In my opinion, POSAs would have had reason to maintain Bates’s preference for “a color code to convey the presence or absence...of keywords” (Bates, [0036]), while nonetheless **also** using a text-based annotation. Bates says “**any visual presentation** that uses a color code to convey the presence or absence...of keywords in a web page” could be used (Bates, [0036]), which suggests to POSAs to consider (and that there exist) other visualizations to convey the present or absence of search terms using color. Indeed, Bates’s disclosure **already suggests** using the text of the search terms as the correlation indicator with different colored font for each term.

93. Specifically, as I discussed above in §VIII.A, Bates discloses an embodiment in which its color-code map is not displayed as a bar of colors, but rather is displayed in an “implicit” manner using font color. Bates, [0031]. In this embodiment, each individual search term typed into the search input line is displayed using different colored text corresponding to an “implicit” color-code map. Bates, [0031]. For example, “word1 might appear in blue characters in the

input line 201, word2 might appear in green characters, and word3 in red.” Bates, [0031]; FIG. 2.

94. The demonstrative below uses Bates’s FIG. 2B to illustrate an implementation of Bates’s “implicit”-color-code embodiment:



Bates FIG. 2B (modified)

95. As seen above, each search term entered into input line 201 is assigned a color and the explicit color code map 205 is not displayed. Bates, [0031] (“It is not necessary, however, that the color code map 205 be a horizontal bar...[instead] the color code map 205 may be implicit rather than explicit.”). And while the corresponding correlation indicator for search results in the “implicit”-color-code embodiment **could** still take the form of segmented horizontal bars of

color, a POSA would have recognized that another obvious implementation of Bates that maintains a color-coded correlation indicator would have been to simply use the color-coded search terms themselves as correlation indicators. Indeed, POSAs would have recognized that Bates's Figures 3 and 4 depict an exemplary correlation indicator that uses essentially the same format as the color-code map that is explicitly displayed to the user, and therefore when an "implicit" color-code map is used it would have also made sense for POSAs to use the format of that implicit mapping—*i.e.*, different colored fonts—as the correlation indicators. Beyond a POSA knowing that that would have been a logical implementation of Bates's own explicit teachings, in my opinion, POSAs would have had several additional reasons to make this change.

96. First, POSAs would have recognized that remembering what search term corresponds to each color in Bates's horizontal bar could be unnecessarily cumbersome, and that this added mental burden would be beneficially avoided by simply displaying the colored search terms themselves in the correlation indicators. For example, while a user **could** memorize Bates's color-code map, that could be challenging for long queries and/or when a user is rapidly revising queries by adding, subtracting, or substituting search terms. Alternatively, while a user **could** repeatedly look up at (or scroll to) the top of Bates's search-results webpage to re-review the color-code map, that could be time-consuming, needlessly annoying,

and/or could potentially cause users to lose their place in a long list of search results.

97. POSAs would thus have recognized that using the text of the search terms directly as correlation indicators would convey the same information but beneficially avoid the need to memorize or repeatedly reference the color-code map. POSAs would have wanted to avoid having a user memorize or repeatedly look back to the color-code map because POSAs knew that in user-interface design generally there are benefits to reducing users' mental processing load, including by eliminating even small incremental mental tasks elicited by the interface design.

98. My opinion in that regard is corroborated by EX1066, which is a prior art textbook on designing user interfaces. EX1066 (at 74-76) notes that one of the "Golden Rules of Interface Design" (at 74) is to "*Reduce short-term memory load*" (at 75; italics original). As Ex1066 notes, there is a "limitation [for] human information processing in short-term memory," which "requires that displays be kept simple" and "window-motion frequency be reduced." EX1066, 75. EX1066 similarly notes that one "objective[] for data display that remain[s] vital" is to have "*Minimal memory load on user.*" EX1066, 80 (italics original). For example, "[u]sers should not be required to remember information from one screen for use on another screen" and "[t]asks should be arranged such that completion occurs with **few actions.**" EX1066, 80.

99. Second, POSAs would have recognized that using color-coded font rather than merely color-coded horizontal bars as the correlation indicators would have beneficially conveyed the presence or absence of search terms using two compatible forms of visual information: text **and** color. My opinion in this regard is corroborated by EX1023, which discloses, as POSAs knew, that “using **multiple visual features to represent the same data attribute**” beneficially “provides redundant coding and results in an increase in the ease, speed, and accuracy in which the users are able to perceive and interpret the information.” EX1023, [0063]. Including search-term text **and** color-coding of search terms in the correlation indicators would have been the use of two, complementary visual indicators for the same attribute (the presence or absence of search terms) that, when used together, would have increased the ease, speed, and accuracy of a user’s understanding of the information being conveyed by each correlation indicator. That Bates’s “implicit”-color-code embodiment already uses a combination of text and color (*i.e.*, different font colors for the text of different search terms) would have further encouraged POSAs to use both of forms of visual communication as a correlation indicator too.

100. Third, POSAs would have recognized that using color-coded text as Bates’s correlation indicator would have been an obvious combination of prior-art search-result annotations (color- and text-based annotations) with Bates’s known

annotation method to yield the predictable result of using color-coding **and** search-term text to indicate the presence/absence of search terms in Internet search results.

101. POSAs would have recognized that a straightforward implementation of Bates’s “implicit”-color-code embodiment would have been to change Bates’s correlation indicator from a color-coded segmented horizontal bar to color-coded text of the search terms themselves. Doing so would have made the format of each search result’s correlation indicator match the format Bates expressly describes as an alternative for the search input field (analogous to how the original color-bar correlation indicator 212 matched the color-bar map 205 in the explicit-code embodiment). Similar to Bates’ horizontal bar correlation indicator, in this obvious alternative the text of each search term would have been displayed using its assigned color when the term is present in the search result, and would have been displayed using an un-assigned color (*e.g.*, a muted-gray font) when the term is not present in the search result. Bates, [0028].

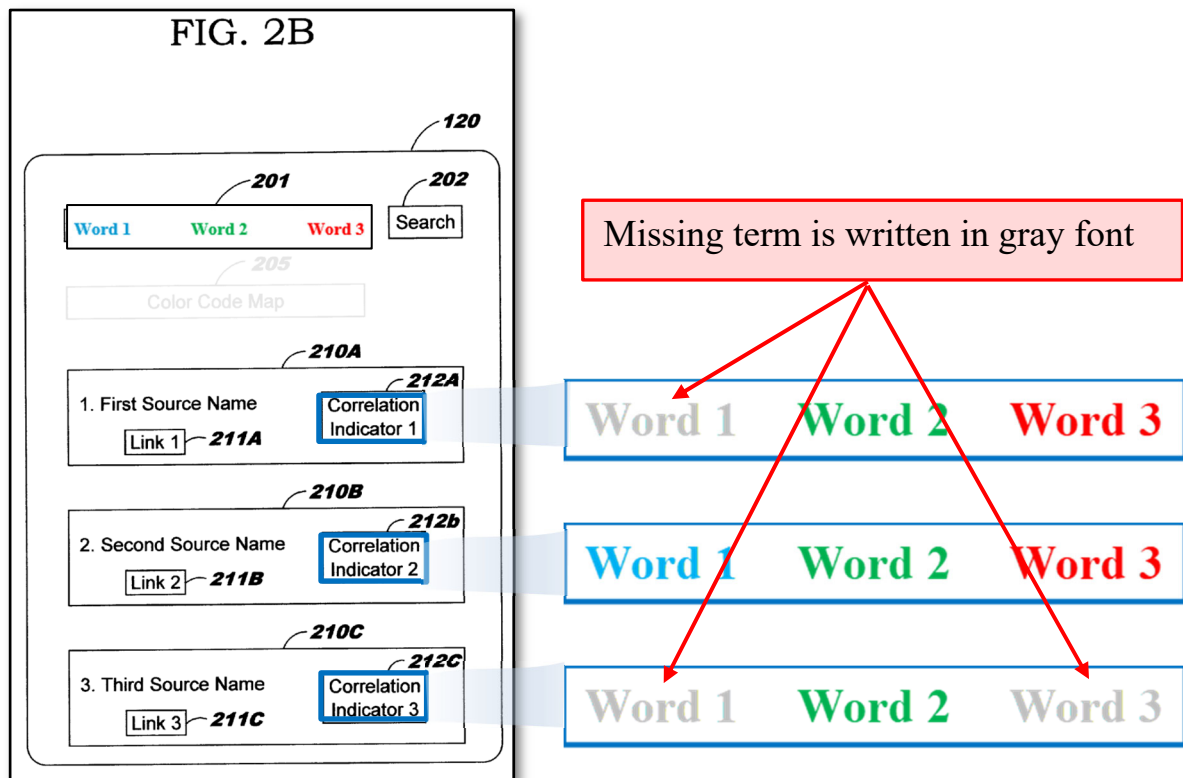
102. POSAs would have found that using a gray / muted-gray font to indicate the absence of search terms in search results would have been a known, beneficial, and easily understood way to indicate the absence of search terms in search results. My opinion in this regard is corroborated by EX1046, which “relates to an input interface for selecting keywords that are effective for use in database searches.” EX1046, [0001]. Figure 6 “show[s] an example of a color

mapping table.” EX1046, [0017]. The color mapping table displays information, like a “hit ratio,” which represents “the number of hits [of a user’s search term in the returned search results] divided by the number of all the documents stored in the document database.” EX1046, [0046]. EX1046 discloses that “the color gray is allocated to a keyword that has a hit ratio of 0.0000” (*i.e.*, a gray-colored keyword has no hits – it is missing in the search results). EX1046, [0047].

103. My opinion is further corroborated by EX1024, which “relates to customized user interfaces, for example, a graphical user interface (GUI).” EX1024, [0001]. EX1024 discloses using “a muted gray-scale” color to indicate functionality that “is presently unavailable” (EX1024, [0005]), which a POSA would have recognized is similar to a search term being missing in a search result (in the sense that the missing term is unavailable from the search result).

104. Thus, EX1046 and EX1024 corroborate my opinion that it would have been obvious to use color gray / muted-gray to indicate missing keywords in Bates.

105. The following demonstrative depicts the obvious implementation of Bates that I described above, where each correlation indicator includes each search-term's text in its assigned color (when the search term is present in the search result) or a gray / muted-gray font (when the search term is missing in the search result):



106. In the above obvious implementation of Bates's correlation indicators, each search term is written in its assigned color when present in a search result and in gray / muted gray when the search term is missing in the search result. Another obvious implementation of Bates's correlation indicators would have maintained Bates's bars of color (*e.g.*, a blue horizontal bar for the first search term; a green

horizontal bar for the second search term; and a red horizontal bar for the third search term; etc.) but with the search terms written within those bars in a contrasting color font (*e.g.*, in white font or some other contrasting font color, based on the background color of the bar). Consistent with Bates’s teaching to use an unassigned or white color for missing search terms (Bates, [0033]), the bar for missing search terms would be colored with an unassigned color (*e.g.*, gray / muted gray / white) with the text of the missing search term written in a contrasting color font (*e.g.*, black font).

2. The Bates-Bhagat Combination

107. In view of Bhagat, an alternative obvious implementation of Bates’s system to a POSA would have been to change Bates’s correlation indicator from a segmented horizontal bar of colors to a text-based indication of whether search terms are present or missing. For example, POSAs would have used the text of the search terms themselves as the correlation indicator with any term missing from a search result being formatted with a strikethrough, as Bhagat teaches (*see* §VIII.B above). In my opinion, POSAs would have had several reasons to make this change.

108. First, as I explained above for “Bates-alone” (§VIII.C.1), POSAs had several motivations to use (or at least add) text-based annotations. As I explained with corroboration, POSAs would have recognized that using (or at least adding)

text-based annotations would make Bates's system more user-friendly as a user would not need to memorize a color-code map or constantly scroll up to remind themselves as to what color corresponds to what search term.

109. Second and relatedly, POSAs would have recognized that colorblind users could have difficulty interpreting Bates's color coding because as the number of search terms increased it would become harder to display easy-to-distinguish colors (*i.e.*, to find enough colors that would have appeared sufficiently different from each other for colorblind users). My opinion in this regard is corroborated by EX1019. EX1019 discloses that "[c]olor blindness" "is the inability to perceive differences between some or all colors that other people can distinguish."

EX1019, [0002]; *id.*, [0003] (explaining that "different kinds of color blindness result from one or more of the different cone systems [in the human eye] either not functioning at all, or functioning in an unusual way"). EX1019 further states that "[t]he most frequent forms of human color blindness" are "collectively referred to as 'red-green color blindness,'" where a person "ha[s] a harder time differentiating between these colors" (*e.g.*, trouble distinguishing a dark red color from a dark green color). EX1019, [0004]. EX1019 further says that there is "evidence that people with red-green color-blindness see reds and greens as yellows, oranges, and beiges," which "means that yellow, oranges, and beiges **can be confused** with greens and reds." EX1019, [0005]. Though EX1019 says its "much rarer than red-

green color blindness,” some people also have “complete color blindness or monochromacy, where one **cannot distinguish any color from grey**, as in a black-and-white movie or photograph.” EX1019, [0010].

110. My opinion that POSAs had motivation to use (or at least add) non-color-based visual indicators for colorblind users is further corroborated by EX1022. EX1022 discloses “[a] sentiment visualization system” “that provides a method for identifying content sentiment visually, and does so in a way that is also relevant to individuals who are colorblind” by “provid[ing] multiple visual cues that identify sentiment.” EX1022, [0012]. “For example, the system may include a displayed indicator that follows a scale of 0 to 1 and **represents sentiment in several ways**, such as a user-defined color scheme, **hover text that provides a text description of the sentiment**, and a notched bar.” EX1022, [0012].

111. My opinion that POSAs had motivation to use (or at least add) non-color-based visual indicators is further corroborated by EX1051. EX1051 discusses aspects of various “World Wide Web Consortium (W3C)” standards that “relate[] to the accessibility, technical validity or other attributes of web content.” EX1051, [0017]. EX1051 includes “excerpt[s] from the W3C’s WAI’s Web Content Accessibility Guidelines,” which advises web content designers to “1. **Provide equivalent alternatives to auditory and visual content**” and “2. **Don’t rely on color alone.**” EX1051, [0028]. POSAs would have recognized that

including the text of the search terms as part of Bates's correlation indicators would satisfy both of those recommendations. EX1051 (at [0026]) further notes that another technical "standard[] for web content accessibility" taught that "(a) A **text equivalent** for every non-text element **shall be provided**" and "(c) Web pages shall be designed so that **all information conveyed with color is also available without color.**"

112. Therefore, POSAs would have recognized that using (or at least adding) search-term text in each of Bates's correlation indicators would have made the indicator easier to understand for colorblind / visually impaired users.

113. Third, POSAs would have known that some devices had black-and-white-only displays, which would have made differentiating between more than two colors difficult (and would have been increasingly difficult as the number of search terms increased). My opinion in that regard is corroborated by EX1020, which "relates to the field of mobile communications and more particularly to improved mobile advertisement syndication for mobile communication facilities." EX1020, [0005]. EX1020 considers its invention in the context of conventional "wireless communication" devices, such as "a mobile phone, cell phone,..., handheld device, personal digital assistant (PDA)" (EX1020, [0044]), some of which were known to have "a black and white LCD" or a "grayscale LCD" (EX1020, [0048]). My opinion is further corroborated by EX1021, which

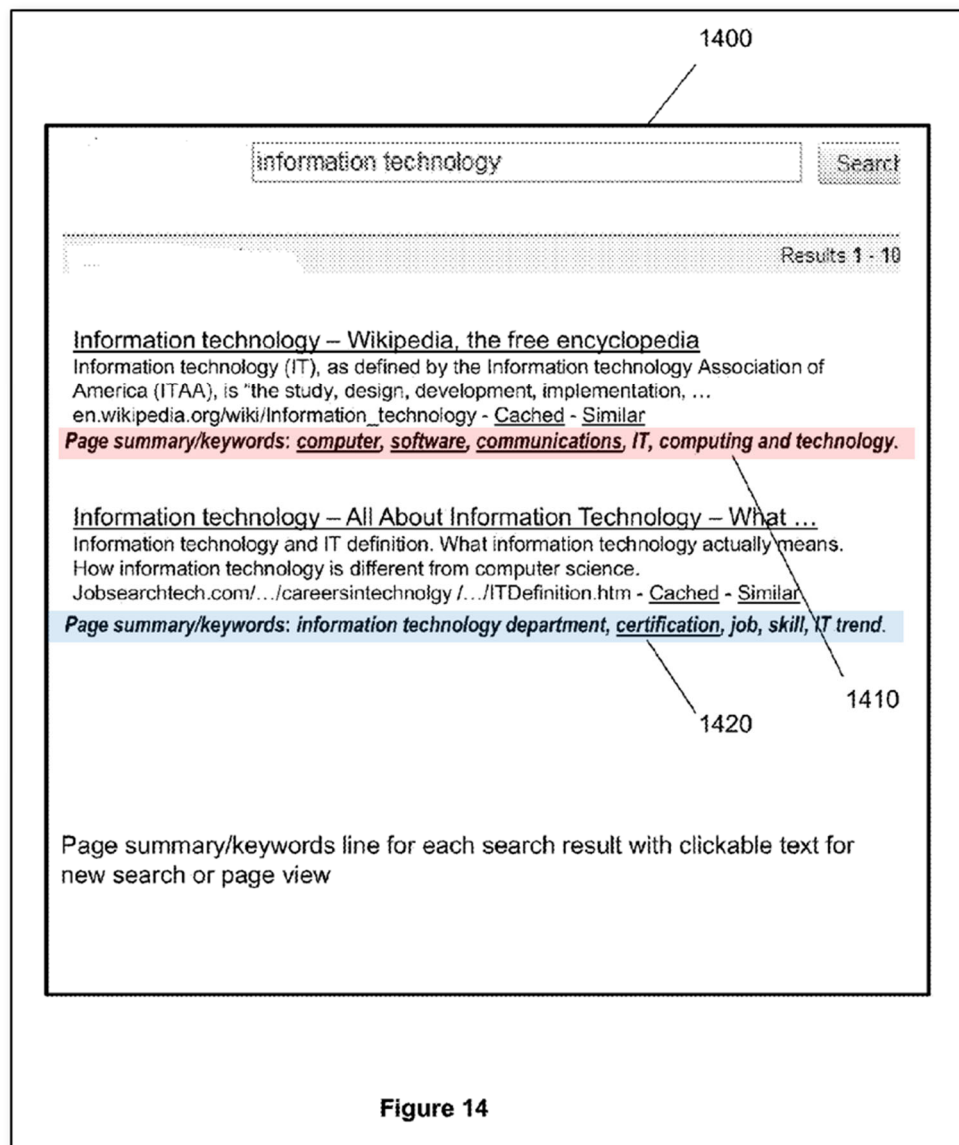
discloses “a handheld electronic device” with a conventional “liquid crystal display” (EX1021, [0030]), which could be “a black and white display (i.e., a monochrome display rather than a colour display)” (EX1021, [0042]).

114. POSAs would have recognized that for devices with black-and-white-only displays, using search-term text as the correlation indicator would have made it easier to display the indicator and easier for the user to understand the indicator.

115. Fourth, using text rather than color (or just color) to convey information regarding a search result would have been the simple substitution of one known element (color-boxes-based annotations) for another (text-based annotations) to obtain predictable results (using search-term text to visually indicate the presence / absence of search terms in individual search results). This is because, as I demonstrate below, using text to convey information about the contents of a search result would have been well known to a POSA.

116. My opinion in this regard is corroborated by EX1030, which “relates to information management technologies, and more particularly, to technologies for automated topic discovery in documents, content highlighting, document search and ranking.” EX1030, 1:22-25. Figure 14 (annotated below) illustrates providing additional “information about the entire content of” “web pages in” “search results.” EX1030, 18:15-21. At the bottom of each search result in Figure 14 are “summary lines 1410 and 1420” (highlighted red and blue, respectively) that

“allow users to immediately have a quick idea about the main topics of the page before committing more time and effort to reviewing the whole page.” EX1030, 18:26-29. Each “summary/keyword[] line” discloses text of “summary/keywords” associated with the search result that the user can review to understand “the main content of the page” “without spending time in opening the page and reading the whole content.” EX1030, 18:34-40.



117. My opinion that POSAs would have been aware of using text-based information to convey information about the contents of a search result is further corroborated by EX1045. EX1045 “relates to providing additional context for search results.” EX1045, [0021]. Figure 3 (annotated below) “is an example of a rendered web page providing search results.” EX1045, [0017]. “FIG. 3 illustrates a series of search results 230, 240, 250, 260, and 270, each representing one or more pages deemed relevant to the search string.” EX1045, [0037]. EX1045 explains that “[s]ome pages” “have no text at all, or no text that contains the search string.” EX1045, [0038]. “Search result 240 illustrates an example of such a page, containing no text in common with the search string.” EX1045, [0038].

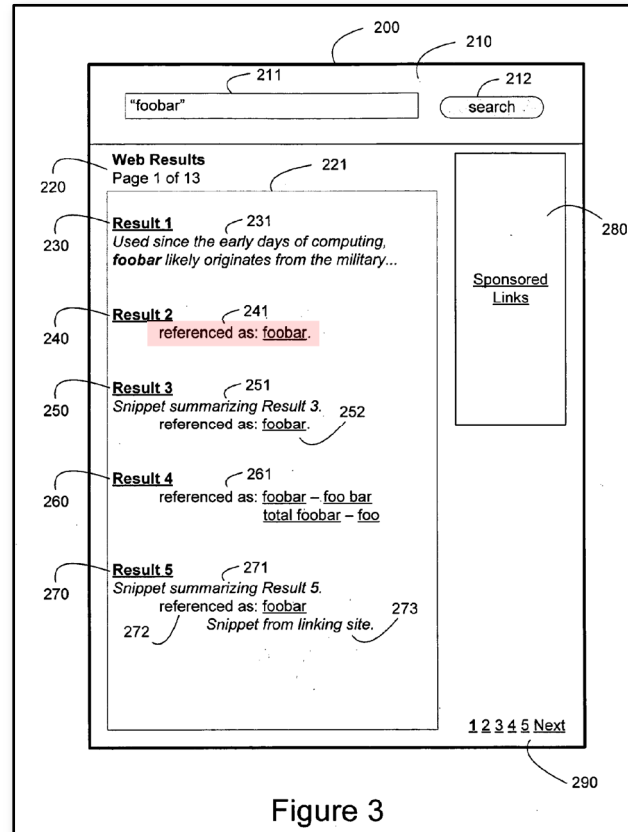


Figure 3

118. “However, as illustrated in FIG. 3, referencing information 241 [red highlight] can be provided in addition to the search result 240, illustrating to the user the connection between their search string and the selection of the page identified by result 240.” EX1045, [0039]. EX1045 elsewhere explains that a page “is determined to be relevant to the user’s search term because of the anchor text in other pages that links to that page, [which] can be presented by including that anchor text.” EX1045, [0008]. In other words, the “referenced as” search term 241 in Figure 3 above is a text-based annotation that identifies a search term (or term related to a search term) that is not in the result’s webpage but is instead text used in another webpage that links to the result’s webpage.

119. Thus, the choice to use text rather than color (or the combination of text and color) to convey information would have been a routine design choice for POSAs as both options accomplish the same predictable result: visually conveying the same information to a user regarding the presence/absence of search terms in search results for an information retrieval system.

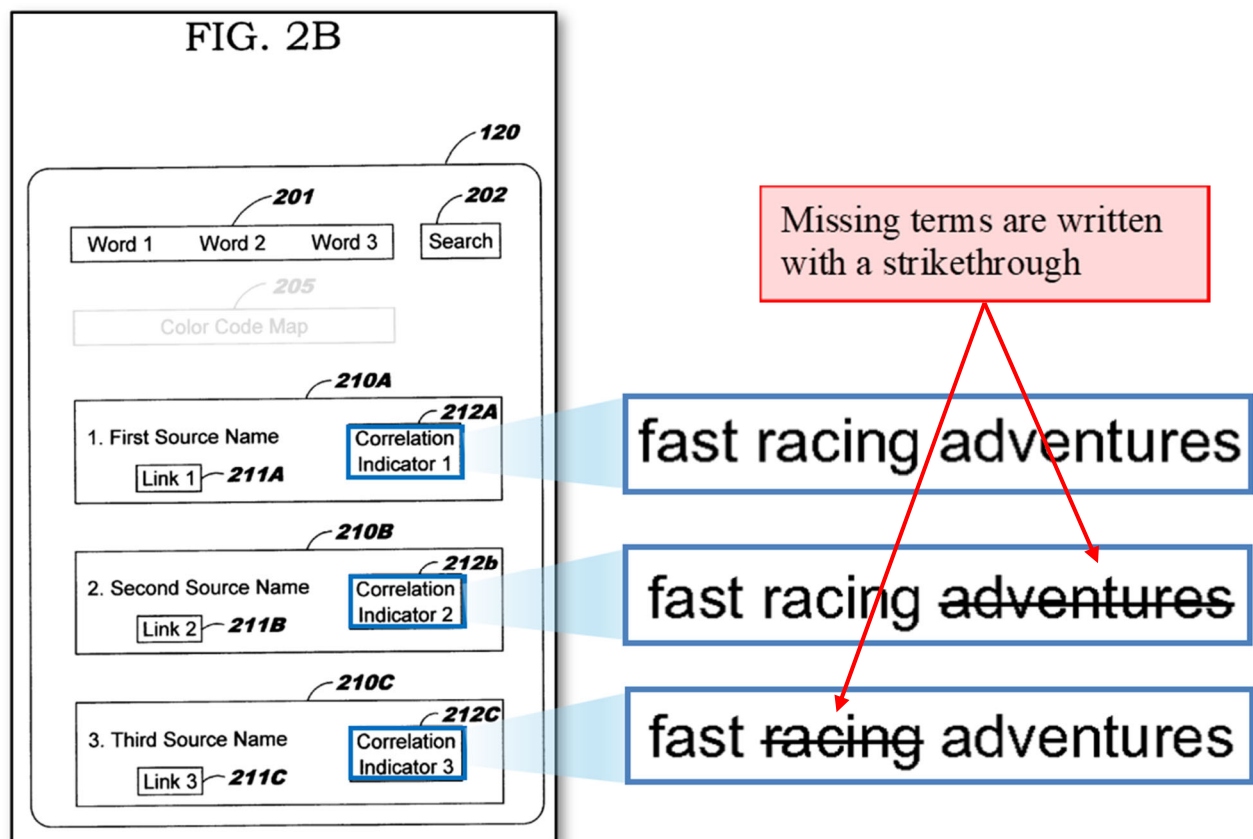
120. Finally, while Bates may express a preference for color-coded correlation indicators to indicate the presence or absence of search terms (Bates, [0036]), POSAs would not have been discouraged from pursuing known alternative techniques for indicating the same information, like Bhagat’s text-based annotations. As I discussed above (§VIII.A), Bates’s correlation indicator uses

different colors in different segments of the correlation indicator to indicate whether each search term is present or missing in each search result (*e.g.*, white or some unassigned color (say gray) to indicate missing terms). As I also discussed above (§VIII.B), Bhagat similarly annotates groups of search results that are responsive to various subsets of the user's search terms by, among other things, writing each search-term element adjacent to its corresponding group of search results, either with or without a strikethrough. Bhagat, FIGS. 2-3, 8:19-34, 8:51-56. And as I discussed above (§VIII.B), like the color-coded boxes in a Bates correlation indicator, POSAs understood that a strikethrough in Bhagat indicates that the term is missing in the corresponding search results and that no strikethrough indicates that the term is present in the corresponding search results. POSAs would have thus recognized that Bhagat's text-based annotations convey the same information as Bates's correlation indicators: the presence or absence of individual search terms in search results. Therefore, POSAs would have known that Bhagat's text annotations could easily be implemented using color font (as Bates suggests [0031]) with added strikethroughs as an alternative to an annotation of black font with added strikethroughs, further confirming that Bates's preference for color would not have discouraged POSAs from pursuing the proposed combination.

121. As I explained above in this section, POSAs would have known that there were several benefits to using text-based correlation indicators and thus would not have been discouraged from using such indicators in a system based on Bates simply because Bates expresses a general preference for color. Indeed, POSAs would have known that Bhagat's text annotations could easily be implemented using color font (as Bates suggests at [0031]) with strikethroughs added to missing terms, as an alternative to Bhagat's black font with added strikethroughs. That alternative modification of Bates in view of Bhagat further confirms that Bates's preference for color would not have discouraged POSAs from pursuing the proposed combination because including the text of the search terms in colored font **and** strikethroughs for missing terms were complementary annotations. Given the motivations to use text-based annotations and Bhagat's disclosure of text-based annotations that convey the same information as that conveyed by Bates's correlation indicators, POSAs would have had reason to apply Bhagat's text-based annotations to Bates's correlation indicators.

122. In the combination (which I will refer to as "Bates-Bhagat" or the "Bates-Bhagat combination"), rather than color-coded horizontal bars, the correlation indicators would use the text of the user's search terms, where (based on Bhagat) a strikethrough indicates a search term is absent from a search result. Using Bates's Figure 2B (annotated below left) as an example based on the search

query and annotations illustrated in Bhagat's Figure 2 (excerpted below right), the correlation indicators in Bates-Bhagat would display the user's search terms, with a strikethrough format used for a search term that is missing from a search result (and, as discussed above, optionally also in greyed-out or colored font). For example, in response to the user's search for "fast racing adventures," the second and third correlation indicators below indicate that "adventures" is missing from the second search result 210B and "racing" is missing from the third search result 210C.



3. Reasonable Expectation of Success

123. In my opinion, POSAs would have reasonably expected success in the two combinations discussed above (§§VIII.C.1-2). This is because, for Bates-alone (§VIII.C.1), Bates explicitly teaches how to replace color-bar coding with text-color coding (Bates, [0033]) and, for Bates-Bhagat (§VIII.C.2), Bates says its correlation indicators can use “**any visual presentation** that uses a color code to convey the presence or absence...of keywords in a web page” (Bates, [0036]) and Bates explicitly collects search-term occurrence data like that used to generate Bhagat’s strikethroughs (*see* Bhagat, 2:15-17). Moreover, both references rely on conventional search-computing technologies, like web browsers and search engines. Bates, [0024]; Bhagat, 2:15-17. Thus, it would have required only POSAs’ ordinary programming skill to implement the obvious implementations of Bates-alone and Bates-Bhagat that I discussed above. That Bates and Bhagat are in the same field (search-result interfaces) and address the same problem (how to provide users with helpful information regarding their searches) further underscores the references’ compatibility.

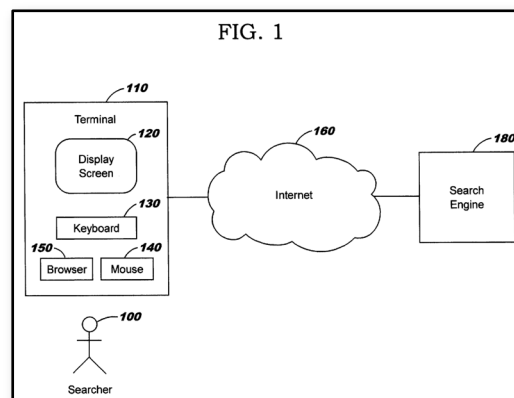
D. Mapping to Challenged Claims

1. Claim 1

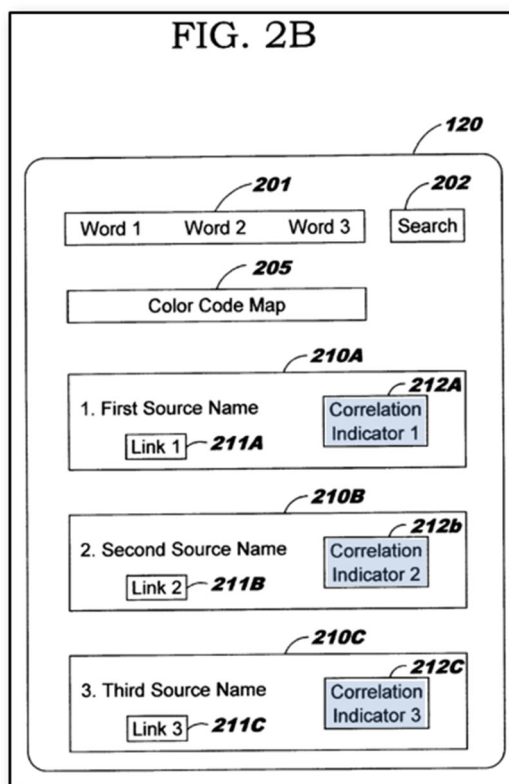
- a. [1PRE] “A method for providing an annotation for an Internet search result for display to a user of an Internet search engine to warn the user when the Internet search result’s referenced webpage is missing one or more search term elements supplied by the user, the method comprising:”

124. Bates discloses “a method...for color coding search results” when “Internet users conduct searches to find pages on the Word World Web.” Bates, [0001]-[0002]. Bates’s method *provides* correlation indicators (which I discuss further below) as *annotations for Internet search results*.

125. Bates’s FIG. 1 (below) “shows an exemplary search environment.” Bates, [0023]. As illustrated in Bates’s FIG. 1, “a searcher [*user*] employs a terminal 110” (Bates, [0023]), which “displays on the display 120 links to the sources [*referenced webpages*]” that are returned by the *Internet* “search engine 180” (Bates, [0039]). *See also* Bates, [0011] (“The search engine executes a search...that identif[ies] web pages....”).



126. As depicted in Bates's Figure 2B (which I highlighted below), each search result has a correlation indicator 212 (blue-highlighted *annotation*), which is *for display to a user of the Internet search engine* as they view display screen 120. Bates, [0026]-[0027]. See also *infra* §VIII.D.1.d (limitation [1C]: demonstrating that “*the Internet search result is displayed on the search results webpage as a search result grouping*”).



127. As I discussed above (§VIII.A), each correlation indicator (*annotation*) allows “the searcher” to “readily grasp the relevance of the URL to the search.” Bates, [0033], [0015], [0009]. For example, when “the web page that is identified by the URL...does not contain keyword word1 [*i.e.*, word1 is

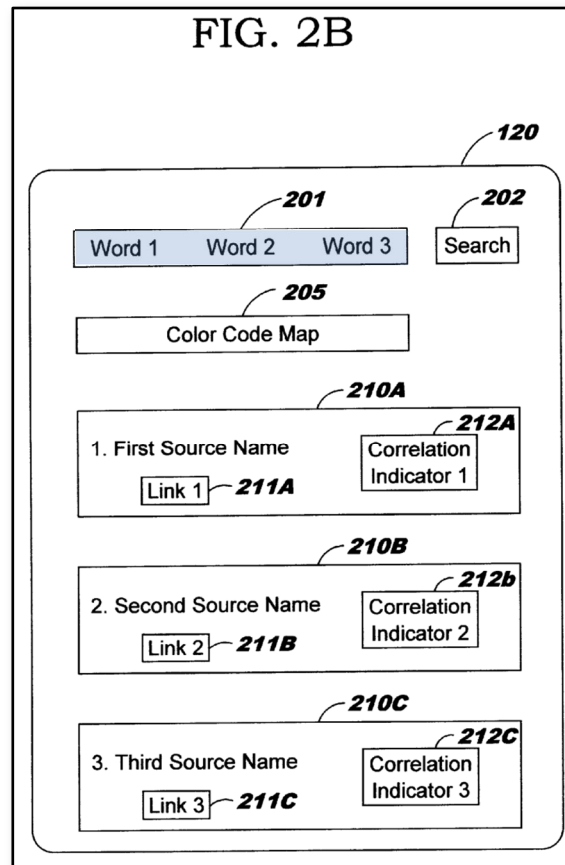
missing], then the first segment 401 of the horizontal bar may be left uncolored, or colored according to a background color not associated with any keyword by the color code map.” Bates, [0033]. Thus, Bates’s correlation indicator *warns the user when the Internet search result’s referenced webpage is missing one or more search term elements supplied by the user. See also infra* §VIII.D.1.g (limitation [1F]; discussing specific annotation format of Bates-alone and Bates-Bhagat).

b. [1A] “receiving one or more search term elements supplied by a user of an Internet search engine from the user’s computing device,”

128. As illustrated in Bates’s FIG. 1 (above), Bates’s “terminal 110” (*the user’s computing device*) includes a “browser 150.” Bates, [0024]. “To conduct a search, the searcher [*user*] 100 may enter keywords into the browser,” which are “sen[t]...over the Internet 160 to the search engine 180.” Bates, [0024], FIG. 1. Bates’s Figure 2B (which I have highlighted below) shows an example search request (blue) comprising three “keywords word1, word2, and word3,” *i.e.*, three *search term elements* are received by the Internet search engine *from the user’s computing device. See* Bates, [0026] (“FIG. 2A shows an example of an image that may appear on the display screen 120. The exemplary image includes **an input line 201, wherein keywords may appear as they are entered into the browser 150 by the searcher 100** with the help of the keyboard 130 or other input device.... Also shown in FIG. 2A are a search button 202, which **the searcher 100**

engages in order to send the keywords to the search engine 180....”); [0027]

(“FIG. 2B shows another example of an image that may appear on the display screen 120. In addition to the input line 201, search button 202, and color code map 205 that are shown in FIG. 2A, FIG. 2B shows a exemplary presentation of search results.”).



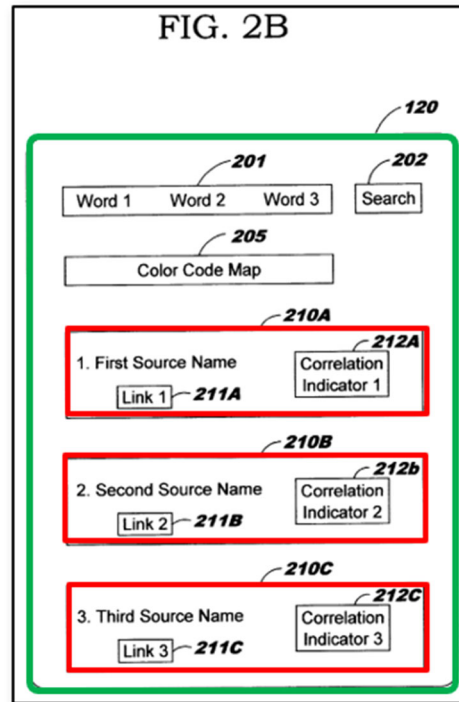
- c. **[1B] “wherein the Internet search engine generates, based at least in part on the supplied search term elements, at least one Internet search result referencing a webpage, for display on a search results webpage on the user’s computing device,”**

129. In Bates’s method, the “search engine executes [the] search, and sends to the browser a set of uniform resource locators (URLs) that identify web pages purportedly relevant to the search, along with occurrence data that report...whether each keyword is present or absent in each web page.” Bates, [0011], FIG. 1. For example, if “a searcher” “enter[s] three keywords, the words ‘alpha,’ ‘beta,’ and ‘gamma,’” “[t]he search engine would then find sources [*webpages*] that include the keyword[s].” Bates, [0006]; *see also* Bates, [0030].

130. Thus, Bates’s *Internet search engine generates, based at least in part on the supplied search term elements, at least one Internet search result referencing a webpage (i.e., a webpage that is identified by the search engine as being “relevant to” one or more user-supplied keywords).*

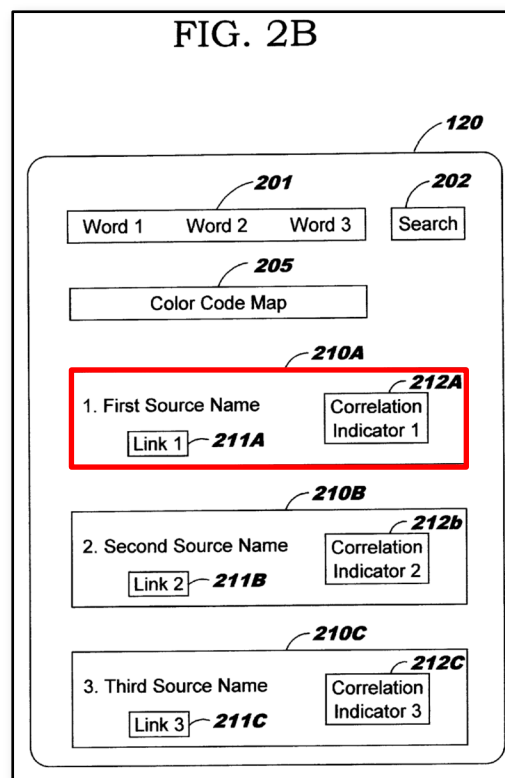
131. “For each URL, the browser” “displays links to the URLs and the associated correlation indicators to the searcher.” Bates, [0012]. Bates’s Figure 2B (highlighted below) “shows...an image” of Internet search results (211A-211C; red boxes) in the *search results webpage* that “appear on” terminal 110’s (*user’s computing device’s*) “display screen 120” (green box) (Bates, [0027]). Thus, the

search results are generated *for display on a search results webpage on the user's computing device.*



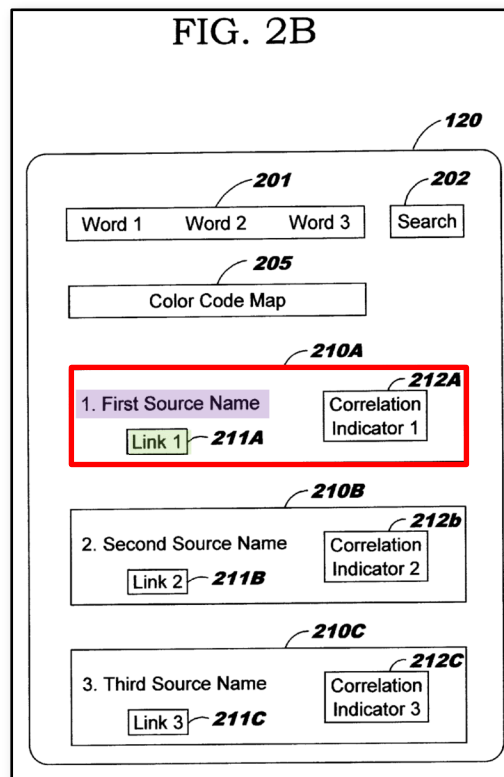
- d. [1C] “wherein the Internet search result is displayed on the search results webpage as a search result grouping, and”

132. Bates’s Figure 2B (which I have highlighted below) shows “an image that may appear on the display screen” as *the search results webpage*. Bates, [0027]. “The exemplary presentation includes information about a first web page 210A [red box],” which is an *Internet search result that is displayed as a search result grouping* (e.g., the first grouping includes “First Source Name,” Link 211A, and Correlation Indicator 212A). Bates, [0027]-[0028].



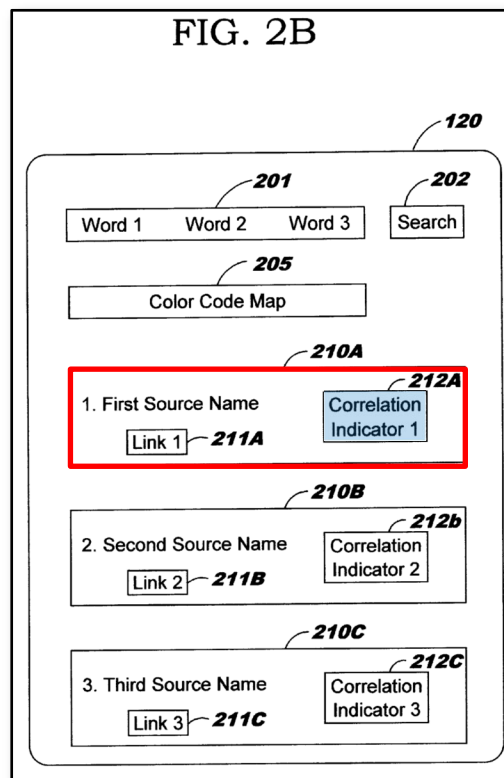
- e. [1D] “wherein the search result grouping is comprised of at least one of: a title for the referenced webpage, an Internet link for the referenced webpage, an excerpt of the referenced webpage, or a URL for the referenced webpage;”

133. As shown in Bates’s Figure 2B (which I have highlighted below), Bates’s *search result grouping* (red box) comprises for the referenced webpage a Source Name, *i.e.*, a title (purple), and a “URL 211A that identifies the first web page,” *i.e.*, an Internet link and/or a URL (green). Bates, [0028].



- f. [1E] “determining whether to generate an annotation for the Internet search result for display on the search results webpage, wherein it is determined to generate the annotation if at least one search term element is missing in the Internet search result’s referenced webpage,”

134. In Bates’s method, the “search engine executes [the] search, and sends to the browser a set of uniform resource locators (URLs) that identify web pages purportedly relevant to the search, along with occurrence data that report...whether each keyword is present or absent in each web page.” Bates, [0011]; FIG. 1. “For each URL, the browser formulates a correlation indicator” (*an annotation*) and, as shown in Bates’s Figure 2B (which I have highlighted below), “displays...the associated correlation indicators [blue] to the searcher.” Bates, [0012].



135. Thus, Bates's method (as used in Bates-alone and Bates-Bhagat) *determines whether to generate an annotation (i.e., whether to generate a correlation indicator of a particular format) for the Internet search result for display on the search result webpage.*

136. "For example, if there are three keywords the horizontal bar correlation indicator may have three segments 401, 402, and 403 as shown in FIG. 4A [below], associated respectively with the keywords and their colors." Bates, [0033].

137. When a search-result webpage "contains keyword word1, for example, the first segment 401 of the horizontal bar correlation indicator may be colored blue," but when the webpage "does not contain keyword word1, then the first segment 401 of the horizontal bar may be left uncolored, or colored according to a background color not associated with any keyword by the color code map 205." Bates, [0033]. For example, Bates's method determines whether to generate a correlation indicator with the first segment colored gray based on whether word1 is missing from the search result.

138. Thus, based on Bates, Bates-alone and Bates-Bhagat determine whether to generate a particular correlation indicator (*annotation*) based on whether *a search term element is missing in the Internet search result's referenced webpage.*

139. My opinion that Bates-alone and Bates-Bhagat meet limitation [1E] is also consistent with AccuSearch’s apparent view of the claim scope. In its preliminary infringement contentions, AccuSearch argues that limitation [1E] is met by “provid[ing] different annotations based upon whether or not a search term element is missing from a search result’s referenced webpage.” *See also* EX1064, (pdf pp. 114-116). Similarly, as I’ve discussed above, each of Bates alone and Bates-Bhagat provide a different annotation depending upon whether or not a search term element is missing from a search result’s referenced webpage.

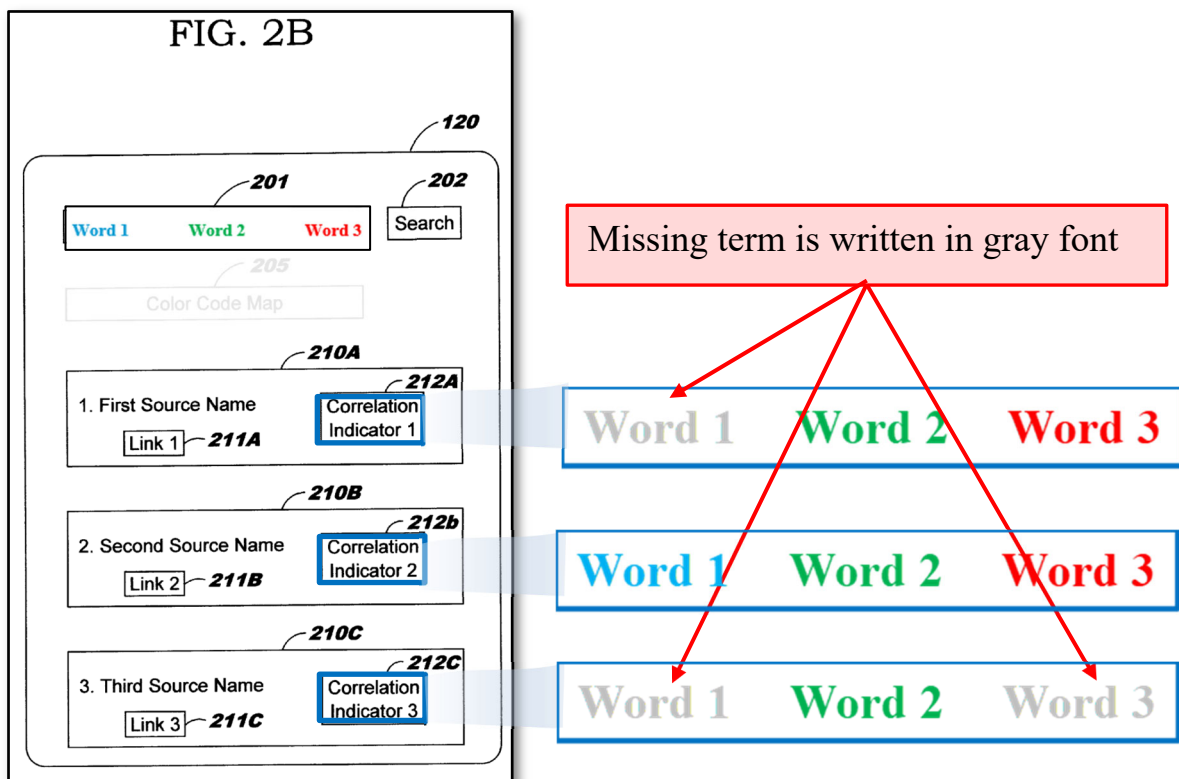
- g. [1F] “wherein the annotation is comprised of a text representing the at least one search term element that is missing in the Internet search result’s referenced webpage; and”**

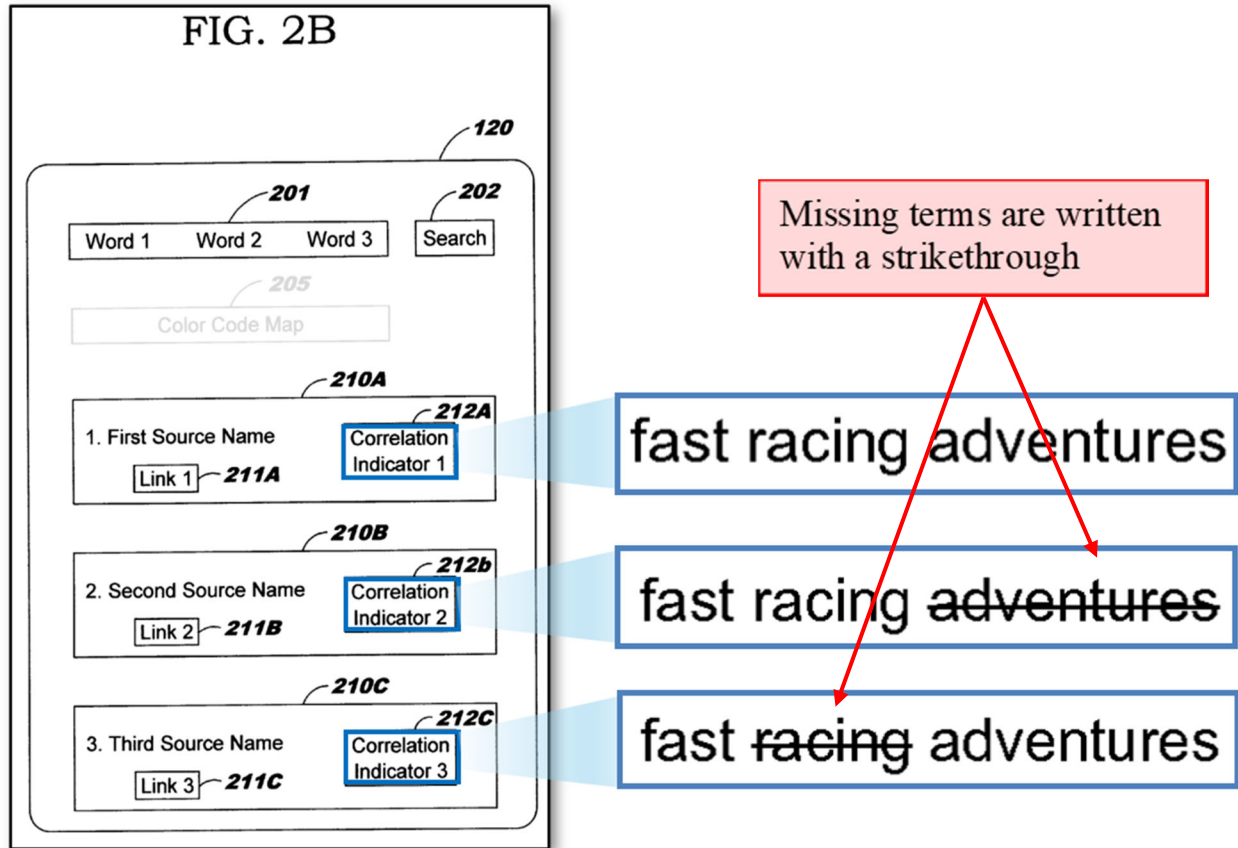
140. As I discussed above (§VIII.D.1.f, limitation [1E]), Bates’s method presents each search result with a correlation indicator (*the annotation*) that indicates the *search-term element(s) that is missing in the Internet search result’s referenced webpage*. Bates, [0033], [0015], [0009]. For example, when “the web page that is identified by the URL...does not contain keyword word1 then the first segment 401 of the horizontal bar may be left uncolored, or colored according to a background color not associated with any keyword by the color code map.” Bates, [0033].

141. As I discussed above (§VIII.C.1-2) and depict again below, based on either Bates’s own teachings or Bhagat’s teachings, the correlation indicators in

Bates-alone or Bates-Bhagat *is comprised of a text representing the missing search term element(s), e.g., the missing search term's text is written in grayed-out font (Bates-alone) and/or written with a strikethrough (Bates-Bhagat). See also infra* §VIII.D.7 (explaining how the annotations in the Bates combinations meet one or more of the text-based formats required by claim 12).

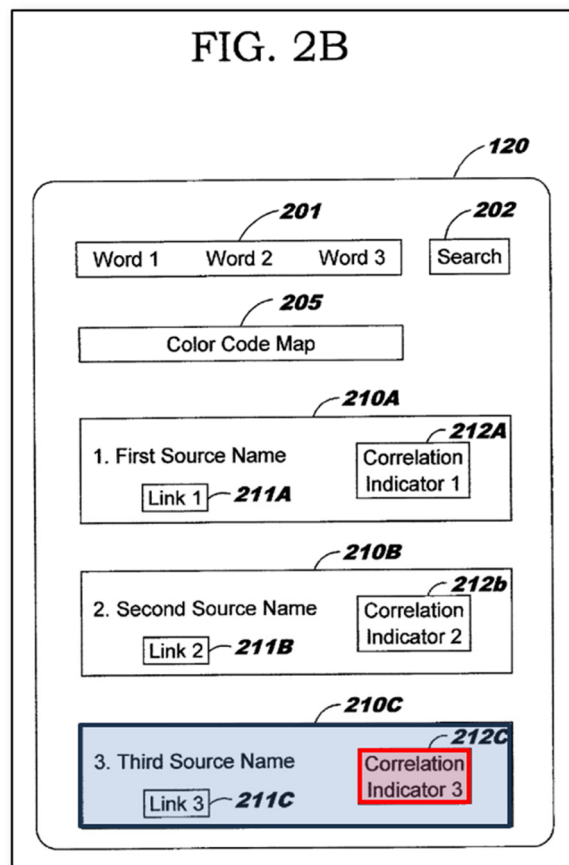
Bates-alone





- h. [1G] “if it is determined to generate the annotation for the Internet search result, causing the annotation to be displayed adjacent to or within the Internet search result’s search result grouping on the search results webpage.”

142. As Bates’s FIG. 2B (which I have highlighted below) and the illustrative figures of Bates-alone and Bates-Bhagat immediately above show, Bates’s method *causes the annotation* (red-highlighted correlation indicator) *to be displayed within and/or adjacent to the Internet search result grouping* (blue-highlighted 210) *on the search results webpage*. Bates, [0028] (“[T]he information about the third web page 210C includes a link to a third URL 211C that identifies the third web page, and a third correlation indicator 212C.”).



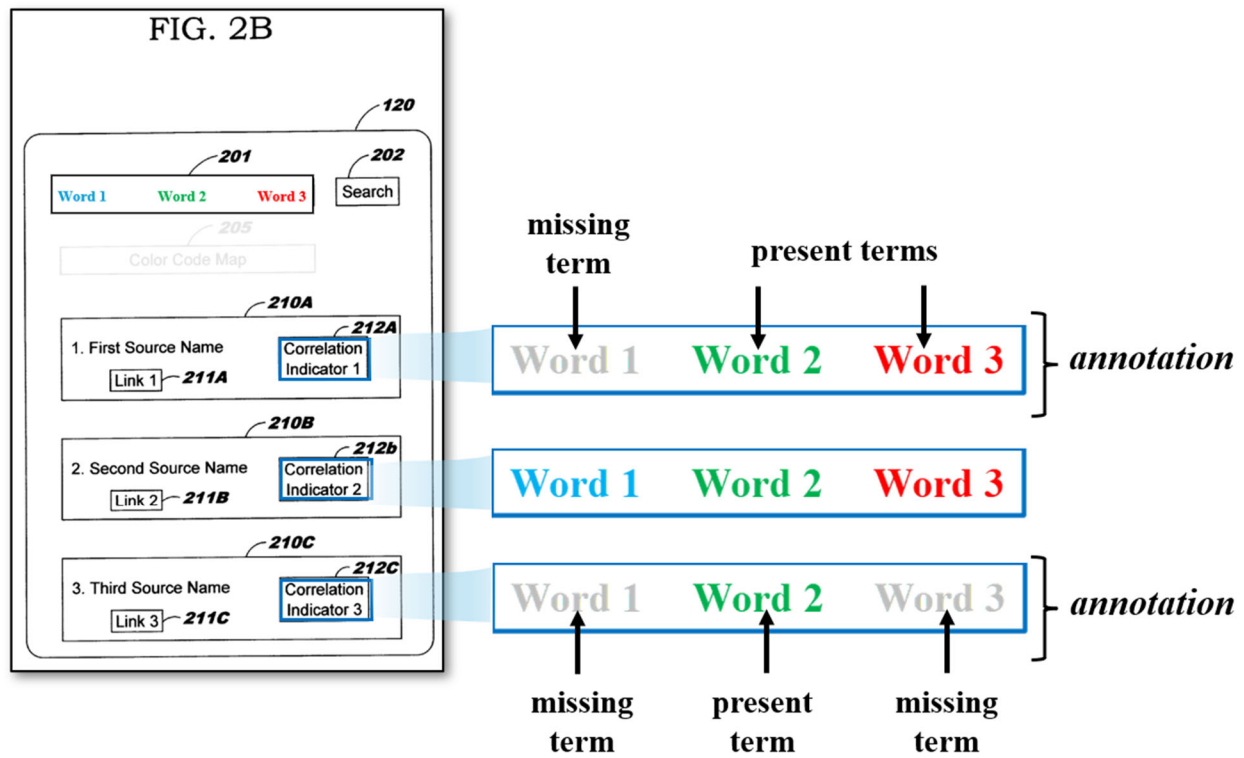
2. Claim 2: “The method of claim 1, wherein the annotation is further comprised of a text representing at least one search term element that is present in the referenced webpage.”

143. The antecedent basis for “*the annotation*” in claim 2 is the annotation recited in limitations [1E]-[1F], *i.e.*, an annotation in the form of a correlation indicator in which the text of missing search terms is written in muted-gray (Bates-alone) and/or in a strikethrough format (Bates-Bhagat).

144. Based on Bates, those *annotations* in Bates-alone and Bates-Bhagat will *further be comprised of a text representing the search term element that is present* because, based on Bates, the correlation indicator will indicate “whether each keyword [*search term element*] ***is present...in each*** [*referenced*] *web page.*” Bates, [0011]. Specifically, based on either Bates’s own teachings or Bhagat’s teachings, the correlation indicator (*the annotation*) in Bates-alone or Bates-Bhagat that I discussed above for limitations [1E]-[1F] *is further comprised of a text representing the search term element that is present* in an assigned colored font like red, green, or blue (Bates-alone) or with no strikethrough (Bates-Bhagat).

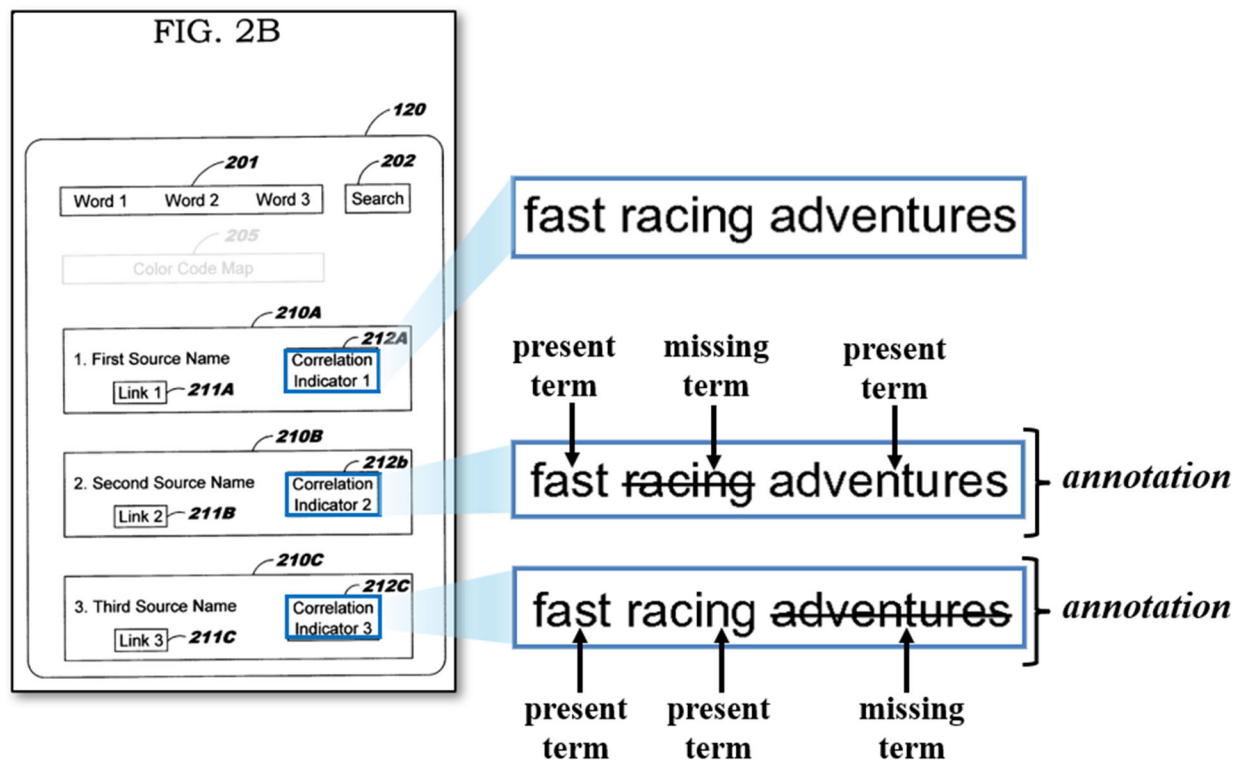
145. For example, in the illustration below, the method of Bates-alone generates “*the annotation*” of limitations [1E]-[1F] for the referenced webpage in the first and third search grouping, and that annotation also comprises the text of search term elements present in each respective webpage, *i.e.*, present search terms are displayed in their assigned color font (*e.g.*, blue, green, or red).

Bates-alone



146. Likewise, in the illustration below, the method of Bates-Bhagat generates “*the annotation*” of limitations [1E]-[1F] for the referenced webpage in the second and third search grouping, and that annotation also comprises the text of search term elements present in each respective webpage, *i.e.*, present search terms are displayed with no strikethrough.

Bates-Bhagat



3. Claim 3: “The method of claim 1, wherein the method of claim 1 is performed by the Internet search engine.”

147. Bates’s *Internet “search engine [] conducts an Internet search* to locate web pages that contain the keywords” received by the search engine that were supplied by the user. Bates, [0024]. As discussed above, as part of the search method, Bates’s *Internet search engine* receives the search term elements from the user’s computing device ([1A], §VIII.D.1.b; Bates, [0024], [0026]-[0027], FIGS. 1, 2A, 2B), generates the Internet search results based on the keywords ([1B], §VIII.D.1.c; Bates, [0006], [0030], [0012], [0027], FIG. 2B), generates keyword occurrence data used to determine whether and which correlation indicators (*annotations*) to display ([1B], §VIII.D.1.c; Bates, [0011], [0012], FIG. 2B), identifies the title, Internet link, and URL for each referenced webpage displayed in the search results ([1C]-[1D], §§VIII.D.1.d-e; Bates, [0027]-[0028], FIG. 2B), and transmits that information to the user’s computing device ([1PRE], §VIII.D.1.a; Bates, [0026]-[0027]).

148. If claim 3 further requires that the determination whether and which correlation indicators (*annotations*) to generate ([1E]-[1G], §§VIII.D.1.f-h) is also made by the Internet search engine, performing that step by the *search engine* would have been an obvious implementation of Bates-alone and Bates-Bhagat as a matter of design choice. Bates itself teaches that the different elements of its system (*e.g.*, the terminal, browser, and search engine) “may be combined in

various combinations and may be either external or internal to the terminal 110.”

Bates, [0025]. For example, Bates says “the search engine 180” can be “built into the terminal 110 but the data to be searched is remote.” Bates, [0025]. Thus, Bates is teaching (or at least suggesting and rendering obvious) having all steps discussed above for claim 1 performed by a single device (*e.g.*, the *Internet search engine*).

149. Moreover, it would have been obvious to POSAs to implement Bates’s search engine to generate the annotation for the search-results webpage because POSAs would have known as part of their background information that it was common and conventional in the prior art for annotations to be generated by, and determinations for annotations to be made by, an *Internet search engine* (*e.g.*, a search-engine server) connected to the user computing devices via the Internet. Having Bates’s server generate the annotations, as opposed to each user’s individual computing device, would have beneficially reduced the processing load on the user computing devices (which would have been especially advantageous for user using less-powerful devices and/or “dumb” terminals) and would have also made updating easier (because the updating would have primarily occurred at a small number of centralized servers as opposed to numerous end-user devices).

150. My opinion in this regard is corroborated by EX1012, which relates “to providing search results and associated information in response to a search

term query.” EX1012, [0001]. EX1012 discloses “a word or phrase index [that] is determined for a set of search results and this index is provided along with the search results.” EX1012, [0021]. The “word index may also be displayed with one or more metrics,” which “can be displayed as numbers or by some form of visual representation or map.” EX1012, [0042]; EX1012, [0051] (disclosing that “visual aspects corresponding to a metric value, such as frequency or count” “may include color, font type, font size,..., etc.”). EX1012 further discloses that the “word indexes may be determined by [a] search and index server” that is part of or separate from a “search server” accessible over the Internet. EX1012, [0029].

151. My opinion in this regard is further corroborated by EX1034, which “provid[es] a visual indication of [search] results that include both an identification of matching data objects and an extent to which the objects match respective ones of the search parameters.” EX1034, 4:11-14. Figure 1 “shows a graphical user interface that may be used in accordance with one aspect of the present invention.” EX1034, 4:42-43. Figure 3 “illustrates modules of the server” used in EX1034’s system and Figure 4 “illustrates logical operations of the server.” EX1034, 4:47-50. EX1034 discloses that the server includes “a User Interface Display Handler,” which “is invoked to calculated and return the results display user interface (previously described with reference to FIG. 1).” EX1034, 6:52-7:21.

4. **Claim 4: “The method of claim 1, wherein the method of claim 1 is performed on the user’s computing device by one or more of: a plug-in or a software program.”**

152. Bates says its “invention applies to all kinds of search environments, including...searches conducted locally by a workstation or terminal” (*i.e., on the user’s computing device*), “wherein the search engine 180 is...**built into the terminal 110.**” Bates, [0025]. Bates’s claims similarly disclose implementing its method with “**programmable software.**” *See, e.g.,* Bates, claim 1. Based on Bates, it would have been obvious to POSAs for Bates-alone and Bates-Bhagat to *perform* claim 1’s method *on the user’s computing device* using a software program.

5. **Claim 7: “The method of claim 1, wherein it is determined not to generate the annotation for the Internet search result if all of the supplied search term elements are present in the Internet search result’s referenced webpage.”**

153. Claim 7 recites *determining not to generate **the** annotation for the Internet search result if all of the search term elements are present.* The antecedent basis for **the** annotation in claim 7 is the annotation recited in limitations [1E]-[1F], *i.e.,* an annotation that I discussed above in the form of a correlation indicator in which the text of missing search terms is written in muted-gray (in Bates-alone) or with a strikethrough format (in Bates-Bhagat). Therefore, to meet claim 7, when all supplied search terms are present in a search result, the method does not generate **the** annotation of limitations [1E]-[1F] (though the

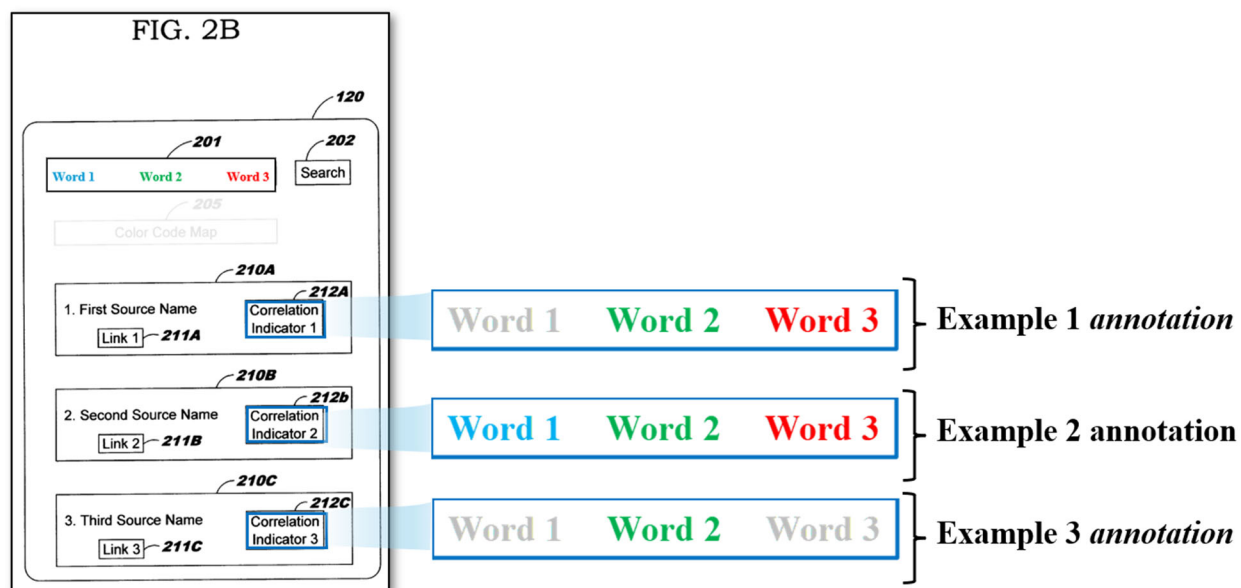
method could generate a different form of annotation because that annotation would not be *the annotation* that meets claim 1).

154. Bates-alone and Bates-Bhagat meet claim 7. For example, *if all of the search term elements are present in the Internet search result's referenced webpage*, then Bates's method—as used in Bates-alone and Bates-Bhagat—will *not* generate the annotations that I discussed above as meeting limitations [1E]-[1F] (§§VIII.D.1.f-g). Instead, *if all of the search term elements are present*, Bates's method will generate a different annotation, *i.e.*, an annotation where *all of the* search-term elements are shown in **an assigned colored font**, *e.g.*, red, blue, green (Bates-alone) or **without** a strikethrough format (Bates-Bhagat). In other words, Bates-alone and Bates-Bhagat *determine not to generate the annotation* that meets limitations [1E]-[1F] if all *supplied search term elements are present in the referenced webpage*.

155. For example, in the illustration demonstrative of Bates-alone below, three different annotations are shown. As I discussed above (§§VIII.D.1.f-g), either the first example *annotation* or the third example *annotation* below meets the annotation recited in limitations [1E]-[1F]. Neither of those annotations is generated for a search result *if all of the search term elements are present* in that search result. Instead, the second *annotation* depicted below – where each search

term is written in its assigned colored font – is generated for that search result because the referenced webpage comprises all of the search terms.

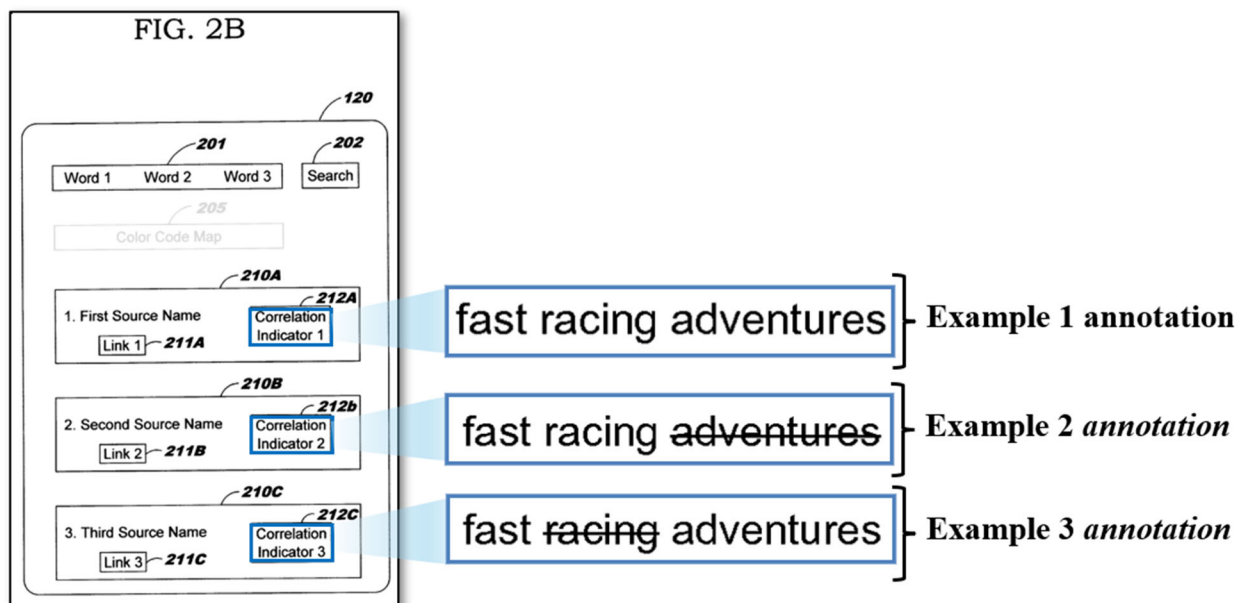
Bates-alone



156. Likewise, in the illustration demonstrative of Bates-Bhagat below, three different annotations are shown. As I discussed above (§§VIII.D.1.f-g), either the second example *annotation* or the third example *annotation* below meets the annotation recited in limitations [1E]-[1F]. Neither of those *annotations* is generated for a search result *if all of the search term elements are present* in that search result. Instead, the first *annotation* depicted below – where each search

term is written without a strikethrough format – is generated for that search result because the referenced webpage comprises all of the search terms.

Bates-Bhagat



157. Thus, Bates-alone and Bates-Bhagat each meet claim 7.

158. I note further that my opinion that Bates-alone and Bates-Bhagat meets claim 7 is also consistent with AccuSearch’s apparent view of the claim scope. AccuSearch’s infringement contentions map claim 7 to a search engine that allegedly generates “different annotations based upon whether or not a search term element is missing from a search result’s referenced webpage.” EX1064, 117. As I explained above, Bates-alone and Bates-Bhagat generate different annotations based on whether or not a search term element is missing from a search result’s referenced webpage.

159. In my opinion, POSAs alternatively had reason for Bates-alone and Bates-Bhagat not to generate **any** search-term annotation **at all** when all search-term elements are present in a referenced webpage. As I discussed above (§§VIII.C.1-2), the annotations in both Bates-alone and Bates-Bhagat include the text of each search-term element, including when all search-term elements are present. POSAs would have recognized that only generating an annotation when a search-term element is missing (*i.e.*, generating no annotation when all search term elements are present) would have been an alternative, efficient way to convey the same information to the user, because POSAs would have recognized that it would have been simple and straightforward to instruct users generally that an annotation appears only when a search-term element is missing (and thus the default understanding is that all search-term elements are present in the corresponding webpage in the absence of an annotation).

6. **Claim 8: “The method of claim 7, wherein a search term element is considered present in a webpage if the webpage contains at least one of: the search term element, a synonym of the search term element, or a misspelled version of the search term element.”**

160. As I discussed above (§§VIII.C.1-2; §VIII.D.1.c), in the method of Bates-alone or Bates-Bhagat *a search term element is considered present if the webpage contains the search term element* itself. For example, Bates discloses that the prior art search methods that Bates improves upon found “sources that

include” one or more of the keywords entered by the user (*i.e.*, the search term element is present). Bates, [0006]. *See also* Bates, [0024].

161. In my opinion, POSAs had reason also to *consider* a search-term element to be *present if the webpage contains a synonym or a misspelled version of the search term element*. POSAs would have recognized that considering *synonyms* and/or *misspelled versions* of search terms in webpages would have been obvious to use as a beneficial, conventional technique in prior-art search-engine methods.

162. My opinion in this regard is corroborated by EX1059, which discloses **“a search tool provides the user with the ability to search for one or both of synonyms”** of “search terms” entered by users. EX1059, [0014]-[0015]. My opinion in this regard is further corroborated by EX1060, which discloses “indexing...a webpage that includes **one or more misspelled words**” and “automatically correcting a spelling” in the index that is being searched. EX1060, [0005].

163. Thus, considering synonyms and/or misspelled versions would have been obvious to a POSA as a known technique used to improve Bates-alone’s and Bates-Bhagat’s similar search-term engines in the same way as was known in background art, by beneficially ensuring that webpages were not excluded because of a spelling error and/or missing a user’s keyword but including another word

with the same/similar meaning. *See* EX1060, [0002] (background information that “it is desirable...to better index...webpages according to the **meaning intended by the author of the webpage when...words are not spelled correctly** in the webpage), [0005]; EX1059, [0014]-[0015]).

7. **Claim 12: “The method of claim 1, wherein the text representing the at least one search term element is shown in one or more of the following formats: (i) a font representing the text has been altered; (ii) the text is shown with one or more lines merged with the text; (iii) the text is shown with one or more lines superimposed thereupon; (iv) the text is shown within a shaded area; or (v) the text is shown with a reversed format.”**

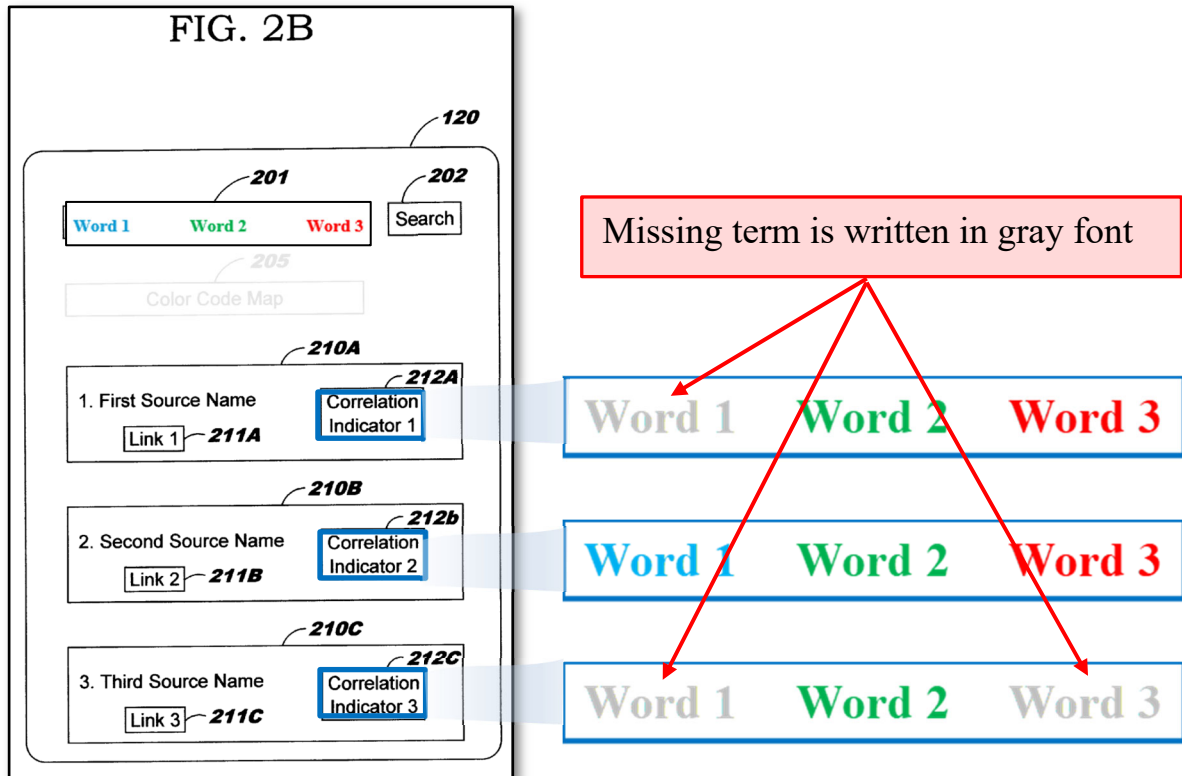
164. As discussed below, Bates-alone and Bates-Bhagat meet claim 12 because their correlation indicators use *text representing the at least one search term element [] shown in one or more of the four formats* recited in claim 12.

165. Starting with Bates-alone, as I discussed above (§VIII.C.1) and illustrate again below, each missing *search term element* is written in a font “color not associated with any keyword by the color code map 205” (Bates, [0033]) (*e.g.*, muted-gray), which meets *(i) a font representing the text has been altered* at least because the font for the element has been *altered* from its initially assigned color (*e.g.*, “blue” or “red”) to a different color (*e.g.*, muted-gray).

166. As I discussed above (§VIII.C.1), EX1046 and EX1024 corroborate my opinion that using a gray/muted-gray color would have been a conventional

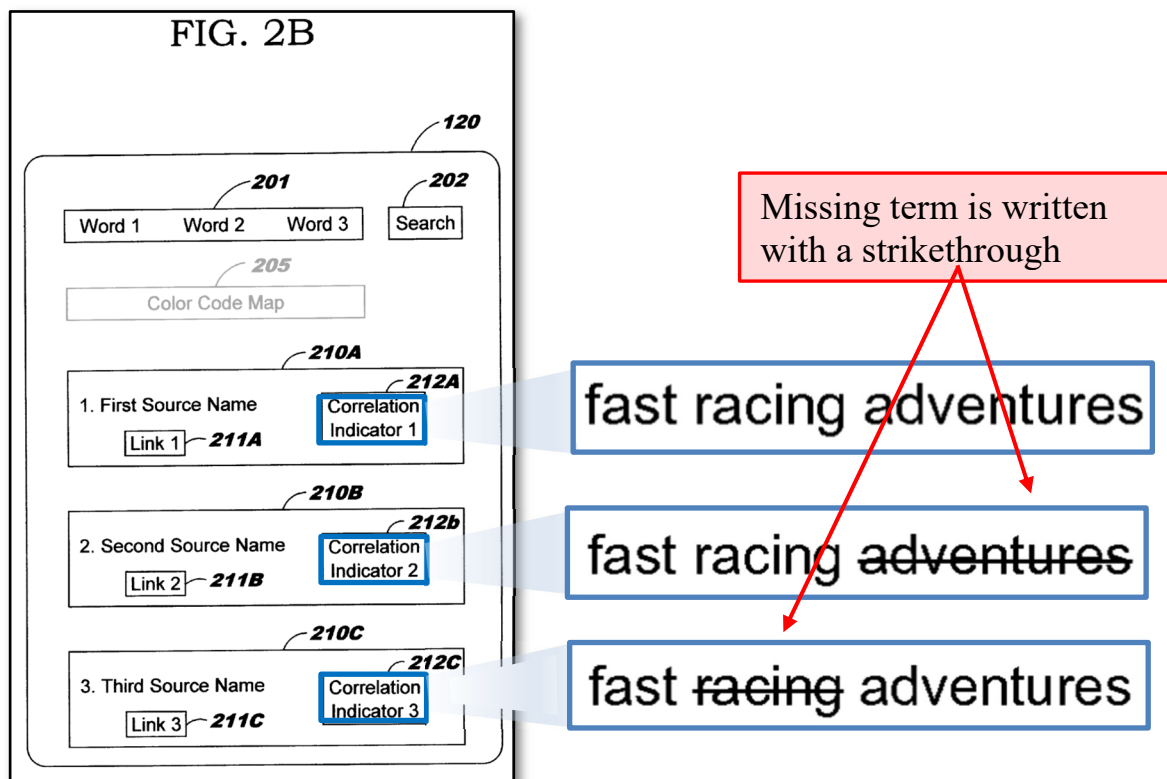
way to indicate a metric that has a presence of zero (*i.e.*, is missing) or unavailable in a search result. See EX1046, FIG. 6, [0046]-[0047]; EX1024, [0005].

Bates-alone



167. As for Bates-Bhagat, as I discussed above (§VIII.C.2) and illustrate again below, each missing *search term element* is written with a strikethrough, which meets at least the *formats* of (i) *a font representing the text has been altered*; (ii) *the text is shown with one or more lines merged with the text*; and/or (iii) *the text is shown with one or more lines superimposed thereupon*.¹⁰

Bates-Bhagat



¹⁰ The '001 patent does not explain or illustrate distinct *formats* for text having *lines merged* versus *lines superimposed thereupon*; however, POSAs understand Bates-Bhagat's strikethrough meets at least one (if not both) of those formats because the

8. Claim 13: “The method of claim 1, wherein the annotation enables the user to reduce lost time, thereby speeding an Internet search process.”

168. As I discussed above ([1PRE], §VIII.D.1.a), Bates’s correlation indicator (*the annotation*) allows “the searcher [*user*]” to “**readily grasp the relevance** of the URL to the search.” Bates, [0033], [0015]. As Bates says, a “**searcher may** now readily grasp the relevance of each source such as a web page from visual presentation of colors by the correlation indicators, and **no longer need waste time** and communication bandwidth **accessing and viewing sources** that lack relevant information but appear nevertheless in the list provided by the search engine.” Bates, [0040].

169. Thus, Bates’s method *enables the user to reduce lost time, thereby speeding an Internet search process* because it indicates which search-term element(s) are missing from each search result and indicates the presence of other search terms thereby allowing a user to avoid lengthening the search process by having to click on each website to ascertain that information.

170. My opinion is further corroborated by EX1027, which discloses as background information that in typical search results it is “hard for a user to

strikethrough line is either merged or superimposed (or both) with the search term text.

determine which of the search results may or may not be relevant to the information the user is looking for,” and when “hundreds of documents are returned, it is inefficient if not completely impractical to have a user review all of the[] results to determine the most relevant documents located in the search.” EX1027, [0005]-[0006]. The correlation indicators in the Bates combination address this problem of potentially being time consuming to identify the most relevant results because, as I’ve discussed above (§VIII.A), the correlation indicator allows the user to identify which search terms are and are not present in each search result.

171. My opinion is further corroborated by EX1048, which (as I discussed above, §V), uses a color-coded indicator, similar to the correlation indicator in the Bates combinations, that allows a user to “tell at a glance [i.e., quickly] which of the documents s/he may desire to peruse” (thereby speeding their Internet search process). EX1048, 5:45-6:7.

9. Claim 14

172. Claim 14 recites *a system* with limitations that largely mirrors claim 1’s method, where the method steps (*receiving*: [1A]-[1D]; *determining*: [1E]-[1F], and *causing the annotation to be displayed*: [1G]) are performed by respective modules—a *receiving module* [14A]-[1D]; a *determining module* [14E]-[14F]; and an *annotating module* [14G].

173. POSAs understood a module to be hardware and/or software. My opinion in this regard is corroborated by EX1061, which discloses that “[i]n general, **the word ‘module’ or ‘engine,’ as used herein, refers to logic embodied in hardware or firmware, or to a collection of software instructions,** possibly having entry and exit points, written in a programming language, such as, for example, Java, Lua, C or C++.” EX1061, [0073]. EX1063 further discloses that “that hardware modules may be comprised of connected logic units” and that “[t]he **modules and engines described herein are preferably implemented as software modules or engines, but may be represented in hardware or firmware.**” EX1061, [0073].

174. Bates discloses that its “invention applies” to a system using “computer programs, software, logic, and configurations that provide the functions described” in Bates. Bates, [0037]. Thus, Bates teaches (or at least suggests) implementing its system as one or more modules that perform the method’s steps that I discussed above for claim 1.

175. Bates-alone and Bates-Bhagat meet the following limitations of claim 14 for the reasons discussed in the corresponding sections above. *Supra* §VIII.D.1.

Limitation	Addressed in Section:
[14PRE]	§VIII.D.1.a ([1PRE])
[14A]	§VIII.D.1.b ([1A]; in an obvious implementation where the receiving is implemented in hardware and/or software (<i>i.e., a receiving module</i>) for the reasons I discussed above)
[14B]	§VIII.D.1.c ([1B])
[14C]	§VIII.D.1.d ([1C])
[14D]	§VIII.D.1.e ([1D])
[14E]	§VIII.D.1.f ([1E]; in an obvious implementation where the determining is performed by hardware and/or software (<i>i.e., a determining module</i>) for the reasons I discussed above)
[14F]	§VIII.D.1.g ([1F])
[14G]	§VIII.D.1.h ([1G]; in an obvious implementation where the annotating is performed by hardware and/or software (<i>i.e., an annotating module</i>) for the reasons I discussed above)

10. Claims 15-17, 20-21, and 25-26

176. Bates-alone and Bates-Bhagat meet the limitations added by the claims below for the reasons discussed in the corresponding sections above, where the system is implemented using the *modules* that I discussed above for claim 14 (§VIII.D.9).

Claim	Addressed in Section:
15	§VIII.D.2 ([claim 2])
16	§VIII.D.3 ([claim 3]; in an obvious implementation where the receiving, determining, and annotating are respectively implemented by the <i>receiving module</i> , <i>determining module</i> , and <i>annotating module</i> that I discussed above, §VIII.D.9).
17	§VIII.D.4 ([claim 4]; in an obvious implementation where the receiving, determining, and annotating are respectively implemented by the <i>receiving module</i> , <i>determining module</i> , and <i>annotating module</i> that I discussed above, §VIII.D.9).
20	§VIII.D.5 ([claim 7])
21	§VIII.D.6 ([claim 8])
25	§VIII.D.7 ([claim 12])
26	§VIII.D.8 ([claim 13])

IX. GROUND 1B: THE GROUND 1A COMBINATIONS IN VIEW OF NAICK RENDER OBVIOUS CLAIMS 5-6 AND 18-19

177. Ground 1B challenges dependent claims 5 and 18 (and their dependent claims 6 and 19), each of which directly (or via dependency) require *determin[ing] not to generate the annotation for the Internet search result if each search term element that is missing in the referenced webpage is present in one or more descendant webpages of the referenced webpage, wherein a descendant webpage of the referenced webpage is a webpage linked directly one level from the referenced webpage* (which I will refer to as “the descendant-webpage limitation”). The antecedent basis for “*the annotation*” in claim 5 (and its dependent claim 6) is *the annotation* that meets limitations [1E]-[1F], which I discussed above (§§VIII.D.1.f-g). The antecedent basis for “*the annotation*” in claim 18 (and its dependent claim 19) is *the annotation* that meets limitations [14E]-[14F], which I discussed above (§VIII.D.9).

178. A “*descendant webpage*” is a webpage to which a search-result webpage links; for example, if www.uspto.gov is the search-result webpage, then www.uspto.gov/patent is a “*descendant webpage*” because a link to this webpage is found at www.uspto.gov. See EX1001, 10:26-11:16, FIGS. 6-7.

179. I note that claims 5 and 18 do not exclude additionally considering the presence of search term elements in descendent webpages linked by additional levels from the referenced webpage as long as *it is determined not to generate the*

annotation for the Internet search result if each search term element that is missing in the referenced webpage is present in a webpage linked directly one level from the referenced webpage.

180. Searching descendant webpages based on a user's keyword search was known by 2011, as I discussed above in §V.B, discussing EX1041 and EX1042. *See, e.g.*, EX1041, 3:14-32; EX1042, p. 9. Furthermore, I searched descendant webpages myself as I described in the section on my qualifications regarding my 2000 publicly available paper describing visualization of web histories. In that paper, we described a visualization of a person's history of browsing the web. It generated a visual tree showing pages that were visited by following links from other pages (*i.e.*, descendant webpages). Then the system supported searching not only the current page but also the descendant webpages in the visualization.

181. As I discuss below (§IX.B), POSAs would have had reason to incorporate such known functionality into Ground 1A's combinations (Bates-Bhagat and Bates-alone), thereby rendering claims 5-6 and 18-19 obvious to a POSA (*see* §IX.C below).

A. Naick (EX1009)

182. Naick is a US patent application publication that published in 2006 (cover code (43)) from an application filed in 2004 (cover code (22)).

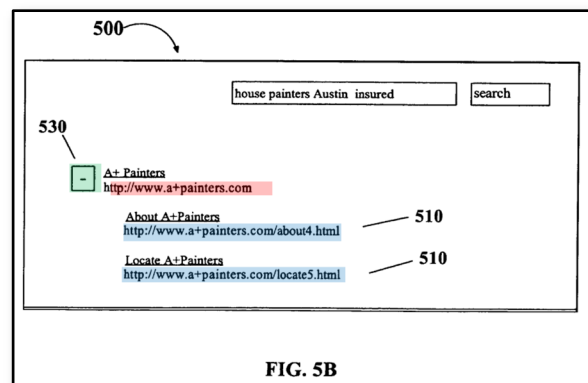
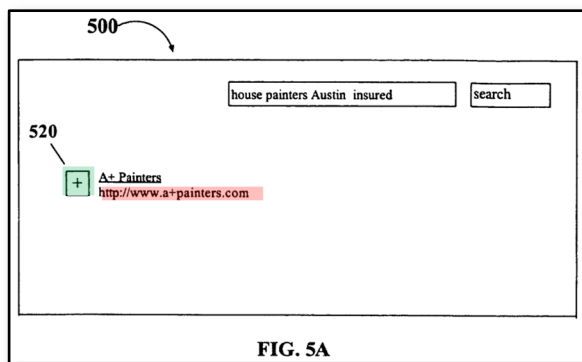
183. Naick concerns “query based Internet searching.” Naick, [0001].

Naick teaches that some “conventional search systems fail to return web sites that may contain the requested information” because the website “do[es] not have all search terms located on **a single page** of the site.” Naick, [0004]. A website may be relevant to the user’s query, but because no single page on the website includes all the search terms, it is not returned as a search result, which prevents the user “from receiving possibl[y] relevant information.” Naick, [0004]; [0023].

184. Naick addresses this potential deficiency by disclosing “query based searches that provide results wherein at least one of the query terms...may appear on a different page of a web site or domain.” Naick, [0005], [0018] (“A web site...is generally assigned a domain name, such as ‘www.ibm.com.’”). With Naick’s search, “grouped pages may be evaluated as a single searchable entity, and search results may be grouped according to domain.” Naick, [0006]. Naick’s search technique evaluates a keyword index that “hold[s] and compare[s] domain information *i.e.* web site information rather than web page information.” Naick, [0021]. Thus, rather than indexing search terms only for individual webpages, Naick indexes search terms based on their presence in at least one of multiple, related webpages from the same website.

185. As shown in Naick’s Figure 5A (highlighted below left), search results initially display only the relevant website’s homepage/top-level domain

(e.g., “http://www.a+painters.com” highlighted red). Naick, [0025]-[0026], [0018]-[0019] (explaining that “other pages within a web site” are identified by “follow[ing] links to other pages on a home page”). Clicking the “+/- icon” (green) shows descendant webpages (highlighted blue in Figure 5B below right) that contributed to the top-level website being identified in the results, *i.e.*, Naick can display the descendant webpages that contained one or more of the search terms. Naick, [0002].



B. The Bates-Naick and Bates-Bhagat-Naick Combinations

186. Naick teaches that providing search results based only on matching keywords for individual webpages, rather than considering related webpages within the same website, may fail to provide the user and miss “possibl[y] relevant information.” Naick, [0004]. Thus, POSAs would have had motivation to include in the methods/systems in Ground 1A’s Bates-alone and Bates-Bhagat combinations the ability to identify potentially relevant results based on whether search terms are found on the webpage itself or a related webpage (e.g., a website’s

homepage and descendant webpages). In these Ground 1B combinations (which I will refer to as “Bates-Bhagat-Naick,” “Bates-Naick,” or “Ground 1B Naick combinations”), based on Naick’s teaching, Bates’s search engine would have identified a webpage as relevant based on the presence of keywords in the webpage itself and/or in its descendant webpage(s), including descendent webpages that are linked one level from the webpages itself.

187. This implementation of searching descendent webpages that are linked (at least) one level from the webpage itself is consistent with Naick’s Figure 5B, which only depicts descendant webpages (*e.g.*, “<http://www.a+painters.com/about4.html>”) that are one level away from the referenced webpage (“<http://www.a+painters.com/>”), which teaches or at least suggests that they are linked one level away from the homepage. Naick, [0024]-[0025].

188. It would have also been an obvious implementation to limit the searching to descendent webpages that linked one level from the webpage of interest. (However, as I discussed above (§IX), the claims challenged by Ground 1B do not require considering **only** descendent webpages one level from the referenced webpage.)

189. Naick says “domains with all or most search terms located on a homepage or root node of a web site may be returned first” and “[d]omains with

terms located a distance apart may be returned further down the result list.” Naick, [0027]. Because Naick is contrasting sites with all search terms on a single page with sites where search terms are “located a distance apart,” POSAs understood that “distance” in this context refers to the number of link “hops” required to travel between webpages of the web site to find the search terms.

190. Naick also teaches that “[a] user may set search parameters to include or discard results based on distance between search terms within a domain.” Naick, [0027]. POSAs understood that means that the number of descendant-webpage levels to search for a term missing from the initial page (*i.e.*, the “distance between search terms”) was a design option (*e.g.*, searching just descendant webpages one link away from the parent page versus including multiple descendant levels).

191. Thus, POSAs would have recognized that it would have been a valid design choice to have the search engine search only one descendant level, as POSAs knew this would have been a reasonable design tradeoff that may be desirable in situations where speed (*i.e.*, reducing the number of levels to aggregate and search across) was prioritized over finding all potentially relevant websites (*e.g.*, by searching all possible descendant levels). Making a tradeoff between speed and breadth of search would have been a well-understood design tradeoff to POSAs. POSAs understood that a line would have to be drawn somewhere for

how many descendent levels to search and that searching one descendent level would have been a reasonable design choice.

192. My opinion that POSAs would have found the number of descendant webpage levels to search to be a well-understood design choice is corroborated by EX1058. EX1058 is a publication of a U.S. patent application that published in 2006 (cover code (43)) from an application filed in 2005 (cover code (22)). EX1058 relates “to a method of retrieving information.” EX1058, [0006]. EX1058’s “process retrieves data and data structures” that “concern the URL’s which should form the basis of the retrieval and the key words which should be search for once the page referenced by the URL has been retrieved.” EX1058, [0056]. EX1058 searches for keywords in a URL (*e.g.*, a webpage) and URLs at “hyperlinks from the URL.” EX1058, [0056]. The “depth to which hyperlinks from the URL should be followed” (and “whether hyperlinks should be followed if they are outside the domain of the starting URL”) is a configurable parameter. EX1058, [0056]; *see* FIG. 8, [0067] (“An interface 706 is for inputting the depths to which hyperlinks in the URL should be followed by the fetch node 1024.”), [0059]-[0060] (describing “the logic for retrieving one page of data from a network” and “the process” for how “the list of key words to be searched within the extracted text is retrieved”).

193. In my opinion, POSAs would have reasonably expected success in Bates-Naick and Bates-Bhagat-Naick because Naick says its “[s]earch logic may be substantially similar to that of conventional search systems” (Naick, [0026]) and only requires a “search engine,” like Bates’s, with “conventional components” (Naick, [0027]-[0029]).

C. Mapping to Challenged Claims

1. Claims 5 and 18

194. Claims 5 and 18 depend, respectively, from independent claims 1 and 14, which were claims that I discussed in Ground 1A (§VIII above). Claims 5 and 18 add the *descendent-webpage* limitation (which I defined in §IX above).

195. Ground 1B’s Naick combinations build on Ground 1A’s combinations (*i.e.*, Bates-alone and Bates-Bhagat), and therefore meet those independent claims for the same reasons Ground 1A’s combinations meet those claims. *Supra* Ground 1A.

196. As I discussed above in §IX.B, each Ground 1B Naick combination includes the *annotations* and *modules* used in either Bates-alone or the Bates-Bhagat combination. *See supra* Ground 1A, limitation [1E]-[1F] (§§VIII.D.1.f-g, discussing the annotations in each combination), [14A] (§VIII.9; *receiving module*), [14E] (§VIII.9; *determining module*), [14F] (§VIII.9; annotation for missing terms), [14G] (§VIII.9; *determining module*). Based on Naick, these

annotations for a webpage also consider the presence or absence of search-term elements in the webpage's descendant webpage(s). Naick, [0004]-[0006], [0022]-[0023]. As I also discussed above in §IX.B, POSAs would have had reason to limit the search to only search descendant webpages that are linked directly one level from the referenced webpage. Therefore, the Ground 1B Naick combinations meet and render obvious claims 5 and 18.

2. Claims 6 and 19

197. Claims 6 and 19 depend from dependent claims 5 and 18, respectively. *See supra* Ground 1A. Ground 1B's Naick combinations meet dependent claims 5 and 18 for the reasons I discuss above in §IX.C.1.

198. Claims 6 and 19 add to dependent claims 6 and 18, respectively, the same limitation that claim 8 adds to claim 7, which requires that *the annotation* take at least one of the formats recited in those claims. In Ground 1A, I established that *the annotations* displayed in the Bates-alone and Bates-Bhagat each meet at least one of the formats recited in claim 8. *See* §VIII.D.6 *supra* (Ground 1A, **claim 8**).

199. Ground 1B's Naick combinations (*i.e.*, Bates-Naick and Bates-Bhagat-Naick) maintain the same *annotation* discussed for Ground 1A (*i.e.*, Bates-alone and Bates-Bhagat), and thus Ground 1B's Naick combinations meet the limitation added by claims 6 and 19 for the reasons that I discussed in Ground 1A

that Bates-alone and Bates-Bhagat meet the limitation added by claim 8, thereby rendering claims 6 and 19 obvious over the Ground 1B Naick combinations.

X. GROUND 1C: THE GROUND 1A COMBINATIONS IN VIEW OF BRINSON RENDER OBVIOUS CLAIMS 9 AND 22

200. The claims challenged in Ground 1C each require that the claimed method/system include *a selectable filtering function that, when selected by the user, causes the search-result webpages missing the at least one search term element to be removed from being displayed* (which I will refer to as “the *selectable-filtering-function* limitation”).

201. The ’001 patent’s filtering functionality is discussed primarily in connection with Figures 10 and 11. *See* EX1001, 4:63-5:4. Figure 11 shows an example of “a filtering criteria table” that includes “radio buttons” that “provide a ‘check box’ indication of which characteristics a user wishes to include in the filtering process and which they do not.” EX1001, 13:20-30. The patent says that after “a user first performs [] a normal web search,” “certain search results URLs and related search results groupings...are automatically removed according to a predetermined filter selection criteria.” EX1001, 12:53-63. That is, the user’s filtering criteria is selected before the user’s search is performed (*i.e.*, it is “predetermined”).

202. As I discuss below, POSAs would have had reason to incorporate such known filtering functionality into Ground 1A’s combinations (Bates-alone or

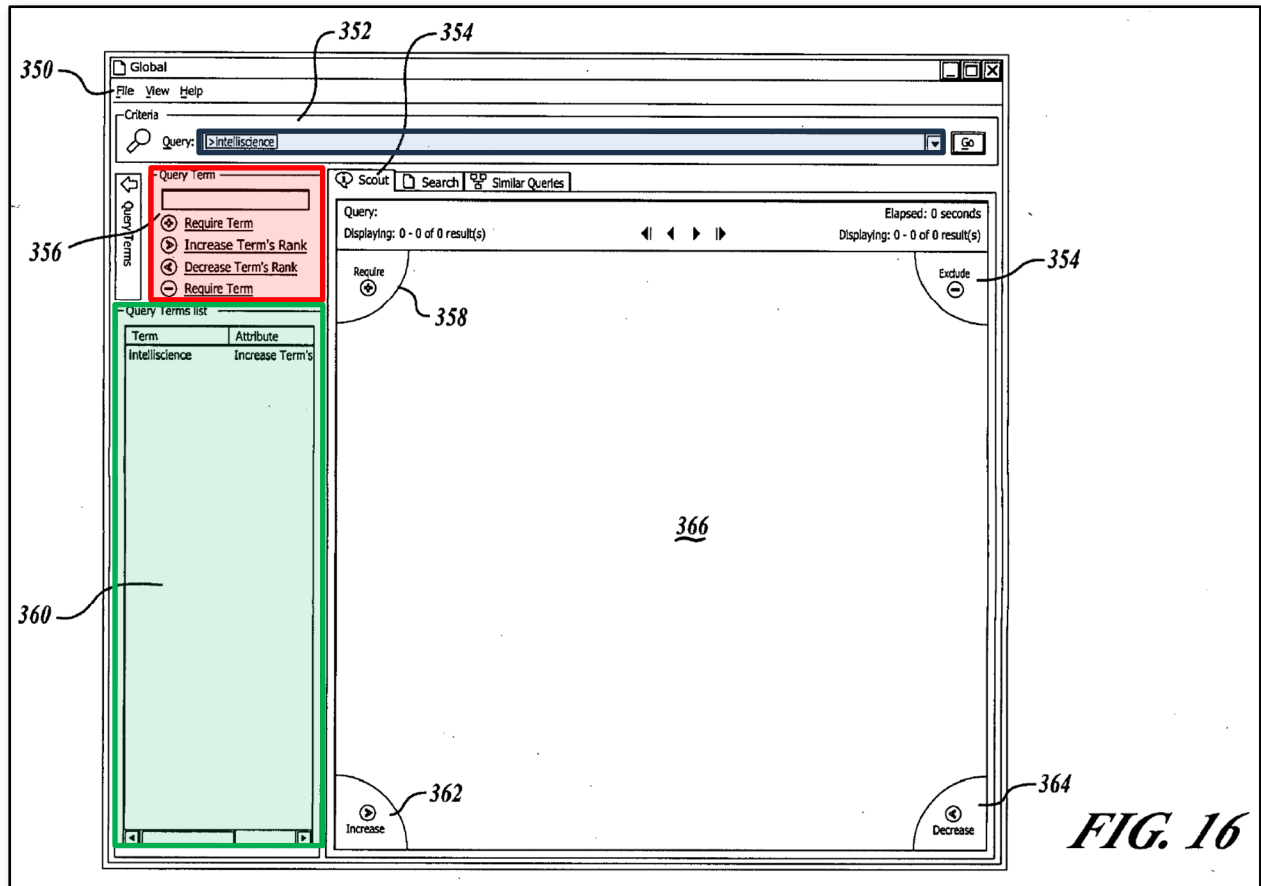
Bates-Bhagat) and Ground 1B’s Naick combinations (Bates-Naick or Bates-Bhagat-Naick), rendering the claims challenged in Ground 1C obvious.

A. Brinson (EX1007)

203. Brinson is a US patent application publication that published in 2007 (cover code (43)) from an application filed in 2006 (cover code (22)).

204. Brinson discloses a graphical user interface (GUI) for search engines that allows users to designate a search term’s “weight” to indicate its “significance” to a search. Brinson, [0044]. If a user designates a term “required” as its “weight value,” then “any data product [*e.g.*, a webpage] included in the results **must** include this term.” Brinson, [0045]; Brinson, [0030] (“data products...includ[e]...web page[s]”). At the other end of the spectrum, if a user designates a term “exclude” as its “weight value” then “any data product included in the results must not include this term.” Brinson, [0048].

205. Brinson’s Figure 16 (annotated below) “shows a screen shot of” the GUI, which includes, among other elements, “a query text box 352” [blue] “where a user enters terms for a query,” “a text box 356 [red] that allows a user to enter additional query terms” with a designated weight, and a “list box 360” [green] that “includes a list of terms currently used in the query.” Brinson, [0069]-[0071].



206. As shown above, “text box 356 allows a user to enter a term and then further select, as an example, ‘require term,’” which adds the term to “text box 352 with the character ‘+’ preceding the entered term,” which “signifies to the system that the term directly following the ‘+’ is a required term.” Brinson, [0070].

“[L]ist box 360 [green] includes a list of terms currently used in the query,” each of which can be “selected by a user,” which places a selected term in box 356 “to allow a user to further modify the term[’s]” weight (*e.g.*, to make the term a “Require[d] Term”). Brinson, [0071], [0075]; *see also id.*, claims 7, 24.

207. A similar example is depicted in Bates's Figure 18 (below). In this example, certain terms that appear in each data product (which could be websites, Brinson, [0030]) are listed below each data product and a user can select a listed term to designate its weight, *e.g.*, to make it a required term. Brinson, [0073] (“The terms shown under a data product in the list 380 can be selected by the user to refine the present search, adding them to the query either as Required, Increase Decrease or Excluded.”).

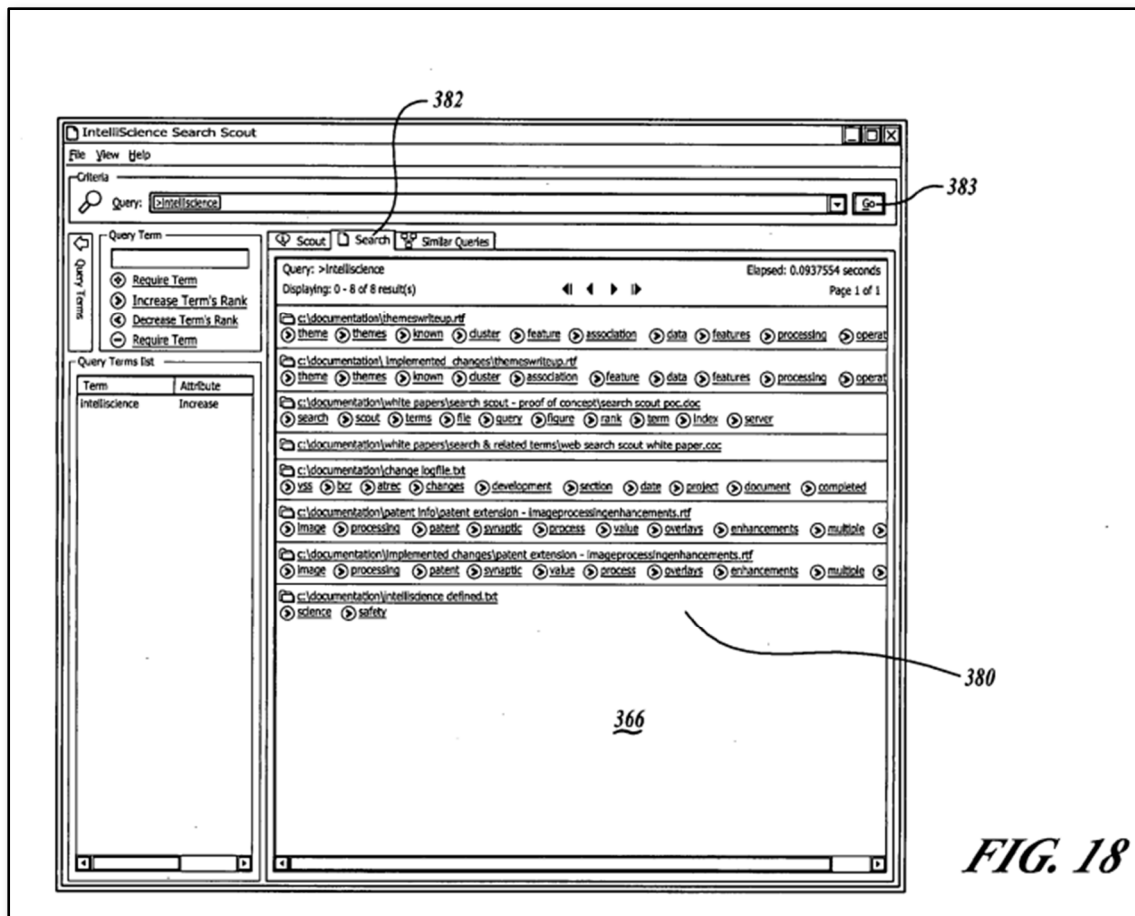


FIG. 18

B. The Bates-Brinson and Bates-Bhagat-Brinson Combinations

208. As discussed in Ground 1A (§VIII.A), Bates’s search engine may return search results missing one or more search terms. However, POSAs knew users sometimes only wanted results that included a particular term, and therefore it was conventional for “search engines” to “support[] ‘include’ and ‘exclude’ Boolean operators,” where “the include operator” means “a document is a match *only if* the documents includes that word.” EX1035, [0009]; *see also* EX1036, [0024].

209. As I discussed in the section immediately above (§X.A), Brinson discloses a search-engine GUI that includes a user-friendly way—an example of user-selectable GUI elements—to allow a user to indicate that a search term is ““required”” so that “the results must include this term.” Brinson, [0045]; *see also* Brinson, FIGS. 16 & 18, [0069]-[0071], [0073].

210. In view of Brinson and their background knowledge that it was conventional to allow users to make search terms mandatory, POSAs would have had reason to augment the Ground 1A combinations (Bates-alone and Bates-Bhagat) to include aspects of Brinson’s user-selectable GUI discussed above (or another conventional user-selectable GUI element) that would have allowed the user to designate a search term as “required” (*i.e.*, mandatory). For example, POSAs would have found it obvious to include in Bates’s search-engine interface

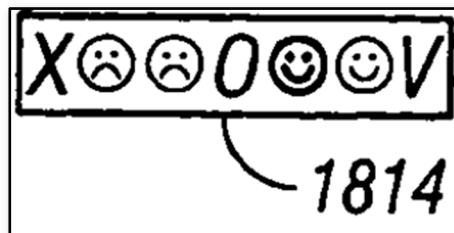
one or more user-selectable GUI elements—similar in functionality to the “Require Term” options implemented in boxes 356 and 360 in Brinson’s Figure 16—that allow the user to select a previously-entered search term as a “require[d] term,” thereby “signif[ying] to the system that the term...is [now] a required term.” Brinson, [0069]-[0070], [0075].

211. One obvious way to apply Brinson’s teachings to the Bates-alone and Bates-Bhagat combinations would have been to make the individual search terms presented next to each search result selectable so that the individual term’s weight could be designated as required. This implementation would have been similar to how Brinson’s Figure 18 example allows individual terms presented next to individual search results to be selected and designated as required. Brinson, [0073] (“The terms shown under a data product in the list 380 can be selected by the user to refine the present search, adding them to the query either as Required, Increase Decrease or Excluded.”).

212. POSAs would have also been aware of other user-friendly GUI elements for allowing a user to indicate the weight/importance of search-term elements (*e.g.*, a drop-down box or pop-up window).

213. For example, EX1068 discloses a GUI for search results where “user preferences” “may be input by a user by way of a pop-up window with which the user may express a level of interest, or disinterest, with respect to a particular

term.” EX1068, [0017]. EX1068 teaches that “inputting preference information in this way” provide the user “a more convenient and streamlined approach” for, *e.g.*, “an Internet search.” EX1068, [0018], [0198] (noting that with this approach “the user may perform searches quickly, easily, and efficiently”). EX1068 says that a pop-up window “may be obtained...by the user clicking on a particular discussion object [*e.g.*, a term in a search result] or simply by ‘hovering’ a cursor over the desired discussion object, using the user’s mouse.” EX1068, [0195]. As shown below in an excerpt of EX1068’s FIG. 18, the example pop-up window “includes a range of preference information which may be selected by the user, ranging from ‘never show information about this discussion object,’ represented by the ‘x’ at the left side of the pop-up window 1814, all the way to ‘always show information about this discussion object,’ represent by the ‘v’ on the right side of the pop-up window 1814.” EX1068, [0195] (noting that “other preference information could be incorporated within the pop-up window”), FIG. 21 (“V” replaced by a checkmark).



214. In response to selecting a preference, “a new search result page” “may be generated accordingly.” EX1068, [0196]. For example, “[t]he new search

215. The search results shown in FIG. 21 differs from those shown in FIG. 20 to reflect the user's slight negative preference for "ORCL" (the stock symbol for the Oracle Corporation). EX1068's FIGS. 22-23 illustrate using the pop-up window on the term "Intel" with an "input preference that information about [that] discussion object [] should never be included in future result sets, by selecting a box 2204 marked 'X,'" which adds that term to the search bar "with an asterisk (*) 2302, indicating that it is a discussion object not to be included in future search results." EX1068, [0206]-[0207]. In contrast, a POSA would understand that the checkmark option in the pop-up window would add the term to the search bar as an always include (*i.e.*, mandatory term) with a plus sign.

216. POSAs would have been aware of other conventional GUI elements for entering a preference / weight to search-term elements. *See also, e.g.*, EX1047, FIG. 1D, [0020] ("a slider control can be provided in lieu of a textual field for entering variable weights for corresponding search terms in a search term entry user interface"); EX1050, FIG. 9, [0071]-[0072] (disclosing "a GUI [with drop-box selection boxes] displayed on a display...when the user inputs specifying-condition information," where "the conditions include 'must include' a keyword")).

217. Thus, adding a user-friendly GUI element to permit a user to identify a search-term element as required (*i.e.*, mandatory) would have also been obvious as a POSA applying aspects of Brinson's (or other) known GUI elements for

making a search term required (*i.e.*, mandatory) to known search engines ready for the improvement of making a term mandatory, to yield the predictable result of Bates's search engine providing an interface that allows users to make a search term mandatory. Adding Brinson's functionality to Bates would have also furthered Bates's goal of providing an interface that allows a user to "form an effective picture of the relevance of the sources found by the search engine" (Bates, [0009]), by allowing users to refine their searches to eliminate irrelevant results.

218. In Ground 1C's Bates-based Brinson combinations, Bates's search engine—as implemented in the Ground 1A combinations—is augmented, based on Brinson, to include user-selectable GUI elements that allow a user to designate a search term as a required (*i.e.*, mandatory) term such that the term must be included in each search result.

219. A known, beneficial technique for implementing what Brinson describes would have applied the "required"-term designation to the already-identified search results (rather than execute a new search), thereby causing the system to display an updated set of search results by removing, from the already-identified search results, references to webpages that are missing one or more terms from the user's query. POSAs would have understood that Brinson's "required term" functionality — which mandates that search results include a

specific term — could be implemented without re-executing an Internet search because the system would have already possessed, in memory or local storage, the information needed to know which websites contain which terms. As discussed below, designating a term as “required” eliminates already-retrieved results, where the remaining search results would have been the same results that would be identified by re-executing the same search with one term identified as “required.” Thus, when the user designated a term as “required,” rather than reformulating and resubmitting the query, it would have been obvious for the system to apply a filter to the already-loaded website list – retaining only those websites that included the now-required term – and re-render the search-results webpage. A POSA would have recognized that filtering already-retrieved search results without executing a new search would have beneficially produced updated results faster than having to execute and re-rank an entirely new search and beneficially reduced computational load on the server because filtering required minimal processing compared to a new search (which would have required parsing the new query, reexamining the search engine indices, scoring the results, and recompiling the results). And having the server filter out search results, as opposed to the user’s local computing device, would require less processing and storage/memory by the user’s local device.

220. My opinion that it was known to filter search results by applying a user's filter conditions to already-identified search results (rather than execute a new search query based on the filter conditions) is corroborated by EX1081 ("Fowler"). Fowler discloses what it calls a "sifting operation" for a search engine that "aids the user in sifting through a list of search results from a search query on a collection of documents" by "allowing the user to select keywords and apply sifting operations to those keywords and" "producing a sifted list from the original list of search results using the user's selections." Fowler, Abstract. As shown in Fowler's FIG. 1 (c), after an initial search has been conducted, the keywords that the user has designated as keywords to include (*i.e.*, required) or exclude are processed without performing a new search, and the sifting operation will exclude results that do not include the term without running a new search. *See also* Fowler, FIG. 2 (displaying that it is optional whether to (i) "Form new search" or (n) "Display result" without executing the new search), [0022] (discussing, among other steps, step "5) **sifting** and reordering **the list of search results according to the user's choice of keywords** and sifting operations; and 6) **optionally** resubmitting a more targeted, more refined version of the original search query by adding to the original query the user's choice of keywords to include or exclude"), [0038]-[0041] (explaining the "sifting process" illustrated in FIG. 2, which "will exclude certain results based on the selected keywords and sifting

operations” and “[a]fter sifting the list of search results, the present invention then re-displays them to the user”; *e.g.*, the ““require”” sifting operation is “represented [as] a Boolean AND between the selected keyword and each document’s list of keywords,” similar to Brinson’s required designation).

221. My opinion in this regard is further corroborated by EX1082 (“Stonehocker”). Stonehocker discloses a “method of providing search results” that “provid[es] a first list of results responsive to the search request, provid[es] a list of selectable terms based on content included in the first list of results, receiv[es] a user-selected term from the list of selectable terms, and provid[es] a second list of results.” Stonehocker, [0005]. Similar to the search results that would be displayed after applying Brinson’s “required” designation to a search term, Stonehocker’s “second list of results excludes results having content related to the user-selected term.” Stonehocker, [0005]. As shown in Stonehocker’s FIG. 6, the second list of web pages is presented to the user (610) without performing the search again (602). *See* Stonehocker, [0041]-[0043] (“FIG. 6 is a flow diagram illustrating a method 600 of providing focused search results,” where [a]t a step 606, a list of selectable terms based on content included in the first list of results may be provided,” and “[t]he user-selected terms may be used to eliminate less relevant search results and focus on more relevant search results,” which is provided in “a second list of results”).

222. The above-described implementation would have used the same Bates-alone and Bates-Bhagat graphical user interfaces that I illustrated previously, except the text of the search terms in each search-result grouping (*e.g.*, in the correlation indicators) would have been selectable so that each term could be designated as a “required” search term.

223. In my opinion, POSAs would have reasonably expected success in Ground 1C’s Bates-based Brinson combinations because it would have required only ordinary programming skill to adapt the term-requiring aspects of Brinson’s GUI (which uses conventional user-selectable GUI elements, like clickable text and buttons) or other conventional GUI elements to be implemented in the search engines of the Ground 1A combinations.

C. Mapping to Challenged Claims

1. Claims 9 and 22

224. Claims 9 and 22 depend from independent claims 1 and 14, respectively, which I discussed above in Ground 1A. Ground 1C’s Bates-based Brinson combinations build on the combinations in Ground 1A (*i.e.*, Bates-alone and Bates-Bhagat) and thus meet independent claims 1 and 14 for the same reasons that the Ground 1A’s combinations do. *Supra* §VIII.D.1 (**claim 1**), §VIII.D.9 (**claim 14**).

225. Dependent claims 9 and 22 add to those previously-discussed independent claims 1 and 14, respectively, the *selectable-filtering-function* limitation (which I defined in §X above). As I discussed above (§X.B), POSAs had motivation to augment the combinations in Ground 1A (*i.e.*, Bates-alone and Bates-Bhagat) to include, based on Brinson, user-selectable GUI elements (*e.g.*, clickable buttons or text) that allow users to designate a search term as a mandatory search term. As I also discussed above (§X.B; citing corroboration), a known, beneficial way to implement what Brinson describes would have applied the “required”-term designation to the already-identified search results, rather than execute a new search.

226. Once augmented in this manner, the Ground 1C Bates-based Brinson combinations meet the *selectable-filtering-function* limitation because selecting the GUI element to designate a search term as “required” *causes* the search-result(s) that have a *referenced webpage missing that search term...to be removed from being displayed*. The search results with a *referenced webpage* that is *missing* a required search-term element will be removed from being displayed because those search results, by definition, do not include the search-term element that the user has now designated as a term that **must** be found in a search result for it to be a valid search result to the user.

227. As I discussed above (§VIII.D.9, **claim 14**), Bates teaches (or at least suggests) implementing its system as one or more *modules*. Bates, [0037]; EX1061, [0073]. Brinson similarly teaches that its system is implemented by “an application program run by the server” (*i.e.*, a combination of hardware and software), which teaches or suggests using a *module*. Brinson, [0028]. Thus, the Ground 1C combinations would have included hardware and/or software to implement the above-discussed filtering function—*i.e.*, a *filtering module*, as recited in claim 22.

228. Brinson’s process for making a search term a “required” term – selecting the term to make “required” and then selecting the search button to apply that filter – works similar to the patent’s filtering functionality that I discussed above (§X), where the user selects filtering criteria that is then applied to a subsequent search executed by the user. But if claims 9 and 22 were to require the search results to be updated in response to a single click by the user, that would have also been obvious to a POSA as a simple, beneficial design option that would have provided additional user convenience (*e.g.*, the added convenience of not requiring the user to select multiple filter buttons before the system updates the search results to reflect the user’s selection of a mandatory term).

229. My opinion that it would have been known to POSAs to use a single click to update the display of search results in response to a selection that

designates a search term as mandatory is corroborated by EX1068. As I discussed above (§X.B), EX1068 discloses a pop-up window that allows a user to mark a preference (a search weight) for a search term and that “[t]he new search result set may be **generated automatically upon inputting preference information** from the pop-up window.” EX1068, [0196].

230. My opinion that it would have been known to POSAs to use a single click to update the display of search results in response to a selection that designates a search term as mandatory is also corroborated by Bhagat (EX1011). Bhagat’s FIG. 2 depicts a user interface that displays the results of (*e.g.*, two) “historical search queries” that were used “to generate search results for a user” (Bhagat, 8:16-19) when the user’s original search – in FIG. 2’s example “fast racing adventures” – “did not match any results” (Bhagat, FIG. 2). Bhagat further discloses that the “user interface...includes hyperlinks to historical search queries 113,” which the user can “follow[]” (*i.e.*, click on to display a new webpage). Bhagat, 9:1-15. Two examples of those hyperlinks are shown in Bhagat’s FIG. 2 – “(See all 1,443 results)” and “(See all 180 results).” POSAs understand that if a user clicks on the hyperlink for one of the historical queries, the system automatically generates a new search-results webpage that shows only the results related to the selected query. As discussed above (§VIII.B), the search results related to each historical search query are results that are missing the search

term(s) indicated by the strikethrough. Thus, each hyperlink is a *selectable filtering function that, when selected by the user as a single click causes one or more Internet search results referencing webpages that are missing one or more search term elements* (the search-term element with a strikethrough) *to be removed from being displayed on the search results webpage on the computing device.*

231. My opinion in this regard is also corroborated by Mills (EX1006). Mills, like Bhagat, includes a search-results page with clickable hyperlinks to generate a new results webpage that only displays results that are responsive to a particular “Alternative Search,” which, as I discuss further below (§XII.B), are results that are missing a search term that is shown with a strikethrough on the original search-results webpage. Mills, FIG. 2, 6:49-53 (“link 166 is associated with the respective group 153 that may be manipulated by the user in order to view a subsequent network page 149 that includes all of the results for the respective group 153 that are presented apart from the other groups 153 of items 136”), 6:53-57 (“each altered search string 163 may be presented as a link that may be clicked upon to facilitate a selection of such group 153 to be presented in a separate network page 149 apart from other groups 153 of items 136”).

232. Thus, Mills discloses *selectable filtering function that, when selected by the user as a single click causes one or more Internet search results referencing webpages that are missing one or more search term elements* (the search-term

element with a strikethrough) *to be removed from being displayed on the search results webpage on the computing device. See also* Mills, FIG. 2, 6:53-58.

233. My opinion in this regard is further corroborated by EX1031, which discloses a “system [that] allows a user to define and refine search intent and enhance the user’s search experience.” EX1031, [0004]. EX1031’s GUI includes a “‘Result Presentation’ control (RP),” which “is used to present search results.” EX1031, [0022]. Figure 4 shows “an exemplary GUI that responds to user expression of search intent by adjusting rankings of search results.” EX1031, [0009]. EX1031 discloses that “manipulation of the user input graph 310 can cause the RP control to **automatically** update the search results” (*i.e.*, in response to a single click). EX1031, [0042].

234. My opinion in this regard is also corroborated by EX1068, which discloses a GUI for “sample search result page” for a search engine. EX1068, [0194]. EX1068 discloses a “pop-up window” that “may be obtained...by the user clicking on a particular discussion object” (*e.g.*, a word in a search result) that presents “a range of preference information which may be selected by the user,” like “never show information about this discussion object” “all the way to ‘always show information about this discussion object’” (*i.e.*, make it mandatory in the search results). EX1068, [0195]. EX1068 discloses that once the user “has expressed additional preference information about” “the discussion objects []

within the [search results] page” a “new search result set may be generated **automatically upon inputting preference information** from the pop-up window” as opposed to “be[ing] generated upon a ‘refresh’ command from the user.” EX1068, [0196].

235. Thus, claims 9 and 22 would have also been obvious over Ground 1C’s Bates-based Brinson combinations if the *selectable-filter-function* limitation requires the search results to be updated in response to a single click identifying a search term as a mandatory term.

XI. GROUND 1D: THE GROUND 1A AND 1B COMBINATIONS IN VIEW OF MEHTA RENDER OBVIOUS CLAIMS 10-11 AND 23-24

236. Ground 1D challenges dependent claims that require the claimed method (claims 10-11) or system (claims 23-24) to further comprise on the search-results webpage *one or more sponsored links [that] are related to one or more of the supplied search term elements* (which I will refer to as “the *sponsored-links* limitation”). As the ’001 patent concedes (and POSAs would have independently understood), displaying sponsored links (*i.e.*, advertisement links) with search results that are related to one or more search term elements was “common” in the art. EX1001, 2:51-55, FIG. 1.

237. As I discuss below (§XI.B), POSAs would have had reason to incorporate such common advertising functionality into the Ground 1A

combinations (*i.e.*, Bates-alone and Bates-Bhagat) and the claims challenged in Ground 1D would have been obvious to POSAs (*see* §XI.C below).

A. Mehta (EX1008)

238. Mehta is a US patent application publication that published in 2009 (cover code (43)) from an application filed in 2008 (cover code (22)).

239. Mehta explains that advertisers “lure a consumer to the advertiser’s website...by strategically placing [an] advertisement in [a] search results webpage.” Mehta, [0005]. Mehta says “advertisers define their advertisements based on one or more keywords that they believe will be used by consumers searching for products/services similar to the ones offered by the advertisers.” Mehta, [0005]. “The search engine” “searches an ad inventory to determine if the [consumer’s] keywords match keywords that define an advertisement” and “the relevant advertisement[s] will be included in with search results” by “appear[ing] next to or above the search results on search results webpage.” Mehta, [0005]. Mehta says that “[t]hese advertisements [are] called ‘Sponsored links’ or ‘sponsored advertisements.’” Mehta, [0005]. These are **links** because users can click on them to navigate to a webpage “provided in the advertisement,” as selected by the advertiser’s sponsor (*e.g.*, a link to a website selling a particular brand of sneaker searched by the user). *See* Mehta, [0006] (noting that an “advertiser is able to determine the effectiveness of the advertisement by tracking

advertising metrics, such as user interactions (for e.g. **number of clicks**) at the **link** provided in the advertisement”).

240. As shown in Mehta’s Figure 2, potential advertisement results are stored in a separate repository (320) from the repository for potential search results (330). That is because, as Mehta suggests and would have been conventional, the search engine identifies advertising results in parallel with and separately from identifying non-sponsored search results. The search engine will try to identify advertising results based on all of the user’s search terms and may identify advertising results responsive to all search terms even if the search engine cannot identify non-sponsored search results that include all search terms. For example, if the user searches for the terms “A,” “B,” and “C,” the system will preferably identify and display advertisements related to “A,” “B,” and “C” and that part of the system is agnostic to whether (or how many) non-sponsored search results are related to all three search terms.

241. Mehta’s Figure 3A (highlighted below) depicts a search-result webpage with “sponsored advertisements” (*i.e.*, “[s]ponsored links”) (red) displayed “along with a plurality of search results.” Mehta, [0033], [0005]. As seen below, the webpage includes both “sponsored advertisements that match the search parameters,” *i.e.*, the user’s initial search query, as well as the search results that match the query. *Id.*

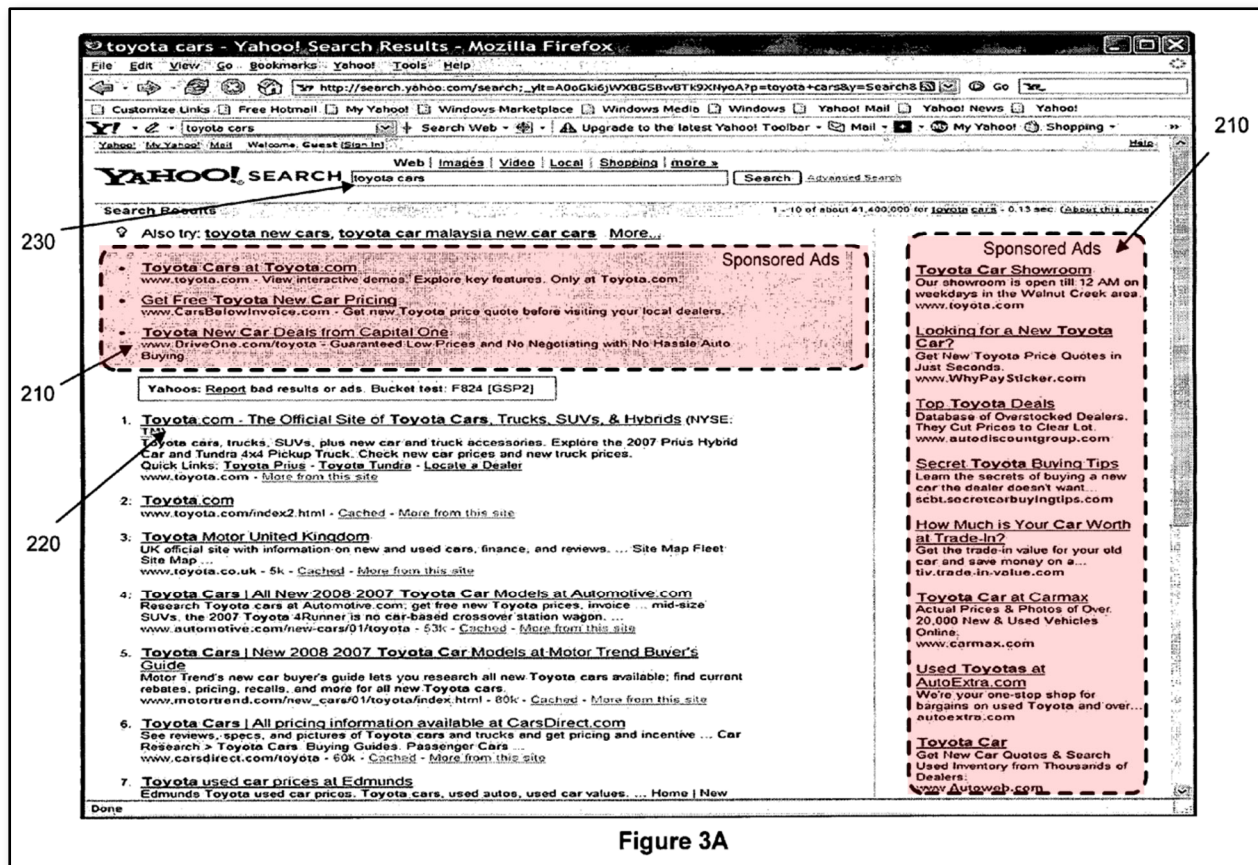


Figure 3A

B. The Bates-Mehta and Bates-Bhagat-Mehta Combinations

242. Mehta demonstrates that displaying “relevant advertisement[s]” as “[s]ponsored links” that appear alongside search results was known. Mehta, [0005]. The ’001 patent itself recognizes this fact too. EX1001, 2:51-55; FIG. 1. And POSAs knew that search-engine providers typically displayed sponsored links related to the user’s search terms to generate revenue. My opinion in this regard is corroborated by EX1015 (at [0004]), which discloses as background information that “search engine providers need to offer advertising opportunities [to] finance their operating costs” and EX1016 (at [0006]), which discloses as background

information that search-engine providers derive “significant amount[s]” of revenue from advertisements.

243. In view of Mehta, POSAs would have had a motivation—*e.g.*, to generate revenue—to implement the combinations set forth in Ground 1A (Bates-alone and Bates-Bhagat)—such that the search-engine interface in each combination (*i.e.*, an interface like the one depicted in Bates’s Figure 2B) displays sponsored links related to the user’s search terms.

244. These implementations would have also been a POSA’s use of a known technique (*i.e.*, search-term-based sponsored links) to improve similar systems (*i.e.*, search engines) in the same way (*e.g.*, allowing for the search-engine provider to generate revenue). POSAs would have had a reasonable expectation of success in implementing the combinations with Mehta because it would have required only ordinary programming skill to include conventional sponsored-link functionality (like Mehta’s) into Bates’s search engine and user interface.

C. Mapping to Challenged Claims

1. Claims 10 and 23

245. Claims 10 and 23 depend from independent claims 1 and 14, respectively, which I addressed above in Ground 1A (§VIII.D). Ground 1D’s Bates-based Mehta combinations (§XI.B) build on Ground 1A’s combinations (*i.e.*, Bates-alone and Bates-Bhagat) and meet independent claims 1 and 14 for the same

reasons I discussed above that the combinations in Ground 1A meet claims 1 and 14. *See supra* §VIII.D.1 (**claim 1**), §VIII.D.9 (**claim 14**).

246. Dependent claims 10 and 23 add to those previously-discussed independent claims 1 and 14 the *sponsored-links* limitation (which I defined in §XI above). As I discussed above, Mehta provides POSAs with motivation to augment the combinations in Ground 1A such that the method/system would display *one or more sponsored links on the search results webpage with the Internet search result for which the annotation is generated, where the one or more sponsored links are related to one or more of the supplied search term elements*. Mehta, [0005]-[0006]. Once augmented in this manner, Ground 1D’s Bates-based Mehta combinations meet the *sponsored-links* limitation.

247. Based on Mehta, the Ground 1D’s combinations would have included “a rendering rules **module** 340 used” “to determine where and how the advertisements [*i.e., sponsored links*] are to be rendered [*displayed*] on the search results webpage” (Mehta, [0030])—*i.e.*, the combinations would have included *an advertising module*, as recited in claim 23.

248. Thus, Ground 1D’s Bates-based Mehta combinations meet and render claims 10 and 23 obvious.

2. Claims 11 and 24

249. Claims 11 and 24 depend from dependent claims 10 and 23, respectively, and further recite that the *sponsored link(s)* discussed in the section directly above (§XI.C.1) are *related to the at least one search element missing in the Internet search result's referenced webpage*.

250. Mehta's sponsored-link advertisements that I discussed above (§XI) are "based on one or more keywords that the[advertisers] believe will be used by consumers" and the sponsored link(s) that are displayed are selected when the user-supplied "keywords match keywords that define an advertisement." Mehta, [0005]. In other words, what determines whether a sponsored link will be selected for display is triggered by the user-supplied keywords (search terms) in the input search string, independent of how they match the non-sponsored search results. Thus, the *sponsored links* displayed by Ground 1D's combinations are *related to all* user-supplied search terms, even if *at least one search term element is missing in one of the (non-sponsored) search result's referenced webpage(s)*.

251. It would have also been conventional, and POSAs had reason for the *sponsored links* to be related to all user-supplied search-term elements, even if *at least one search term element* were *missing* in a non-sponsored link, because those are the terms the user identified as being of interest.

252. My opinion in this regard is corroborated by EX1065. EX1065 discloses as background information that “[m]any **Internet search engines also provide predetermined results** based on the search terms included in the query and **without explicitly considering the content of the web documents included in the results**. For example, the results of a search may include **sponsored links** or other paid listings that are **based on an inclusion in the search of a particular keyword or keywords**.” EX1065, [0004].

253. Thus, Ground 1D’s Bates-based Mehta combinations meet and render obvious claims 11 and 24.

XII. GROUND 2A: WANG-MILLS RENDERS OBVIOUS CLAIMS 1-4, 7-8, 12-17, 20-21, AND 25-26

A. Wang (EX1005)

254. Wang is a US patent application publication that published in 2010 (cover code (43)) from an application filed in 2008 (cover code (22)).

255. Wang concerns keyword-based search engines. Wang, [0001], [0014], [0016]. Wang says “[m]ost keyword-based search engines operate on the assumption that the user intends to only find documents that contain all of the [user-selected] search terms.” Wang, [0002]. Wang calls this “and-based searching.” Wang, [0002]. POSAs would understand that Wang is describing prior art searches that use as their default search strategy a so-called Boolean “AND” logical operation, which is satisfied when a search result contains all of the search terms joined by the “AND.” For example, if the search query is “A AND B,” only a search result that contains A and B (as opposed to just A or just B) will be identified as satisfying the user’s search query.

256. Wang says that a problem with “and-based searching” occurs when a user “over-specifies a query by including unnecessary terms.” Wang, [0002]. When the user over-specifies (over-constrains) the search query, Wang says relevant search results that are “missing one or more of the extra terms will not be located.” Wang, [0002]. For example, if a user searches for “dentists in Seattle Wash,” the search engine “will not return documents that do not include all four

keywords” even though there may be relevant webpages that hit only some of those keywords, *e.g.*, three out of four.¹¹ Wang, [0001]-[0002].

257. To reduce the risk of excluding potentially relevant documents, Wang teaches a technique called “relaxed searching” where a search engine identifies search results “that include only a subset of the keywords submitted by a user.” Wang, [0014], [0031]. “The subset of keywords equals the total number of keywords (N) minus a given number (K) less than N.” Wang, [0014]. “For example, if a query” contained four keywords – “[1] Seattle [2] dentists [3] in [4] Washington” – “and K was equal to 1, documents would only have to include any three of the above words to be included on the results list.” Wang, [0014], [0031].

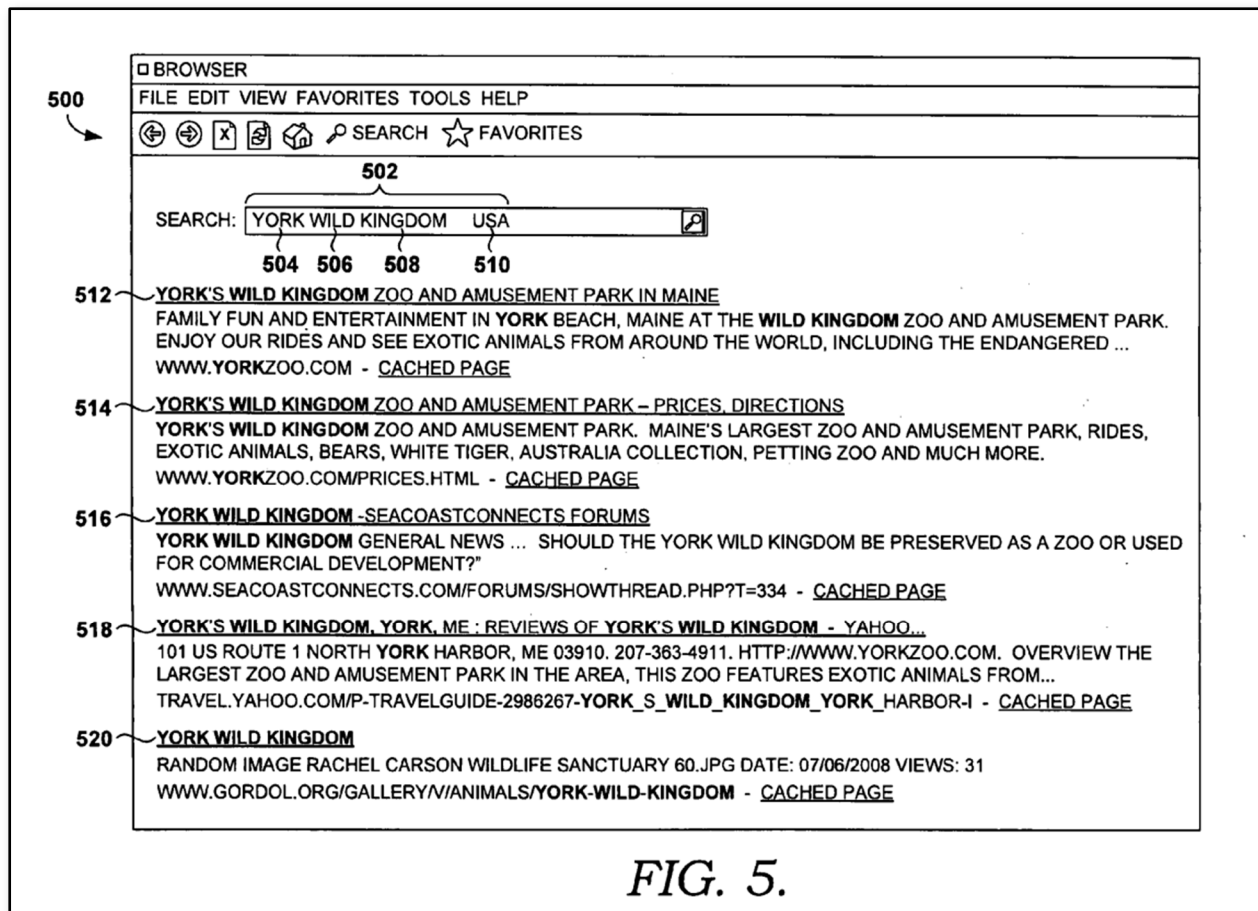
258. Wang’s Figure 5 (below) illustrates “a search-results list from a search engine performing relaxed searching.” Wang, [0053].¹² In the Figure 5 example, a

¹¹ In Wang, “documents” include Internet webpages. Wang, [0030].

¹² A POSA would recognize that Wang has a typographical error in Paragraph [0053] in referring to a “FIG. 6.” *See* Wang, [0053] (“Specifically, FIG. 6 illustrates a screen shot of a web browser window 500 rendering a web site for the search engine.”). Wang does not include a Figure 6 and it would be readily apparent to a POSA that the reference to “FIG. 6” in [0053] was intended to refer

user submitted a four-word query (“york,” “wild,” “kingdom,” and “USA”), and the search engine “returned a list of results that contained N-K keywords,” where N=4 and K=1. Wang, [0053]. “The resulting documents thus have at least 3 of the 4 keywords,” which is illustrated in Figure 5, where a user’s keyword is also emphasized in bold within each search result wherever a keyword appears in the result’s title, URL, or summary text. Wang, [0053]. POSAs would have understood that it was conventional in prior art search engines to bold (or otherwise annotate) search terms that are shown in a search-results webpage (*e.g.*, in a search result’s title, summary, and/or URL). *See, e.g.*, EX1026, 6:62-7:3 (disclosing that “search terms used in the search query are highlighted in bold font in the document title 330 and the snippet 350”).

to “FIG. 5” as the rest of the paragraph refers to reference numbers that all begin with a “5” and that those reference numbers are shown in FIG. 5 and only FIG. 5. A POSA would have also understood FIG. 5 (and only FIG. 5) to be consistent with “illustrat[ing] a screen shot of a web browser window 500 rendering a web site for the search engine.”



259. As shown above, Wang emphasizes search terms that **appear** in each search-result grouping (*e.g.*, with bold font), which explicitly informs the user that those search terms are present in the corresponding search result's webpage and thereby **suggests** which search term(s) is/are missing (terms that are not shown in bold in a search result). However, a search term that is **not** bolded is not necessarily missing from a search result: that search term may or may not be present in that search result's webpage. For example, POSAs and possibly more-sophisticated searchers would know that "USA" could be present on one or more of the webpages displayed in the above search results even though "USA" is not

shown in any of the search-result groupings on the search-results webpage. “USA” does not appear in any of these webpage’s title or URL or paragraph displayed by the search engine, but “USA” could be present in another portion of one or more of these webpages (*e.g.*, in a portion of the webpage that is not shown in the text selected to be displayed by the search engine).

260. Wang reinforces that understanding by disclosing that “**As is shown, results 512, 514, 516, 518, and 520 all contain at least 3 of keywords 504, 506, 508, and 510**” (Wang, [0053]), but notably Wang does not say that Figure 5 shows that these results contain **only** those three keywords. A POSA would understand that it is consistent with Wang’s disclosure (including what’s shown in Figure 5) if one or more of these websites also included the keyword “USA.” Indeed, some prior art search systems “automatically generated [a] summary that is **independent of the search terms entered by the user** (*[i.e.,]* the search terms are used to determine which documents are retrieved, **but not the summary**).” *See* EX1056, [0005]. For example, even in Wang’s FIG. 5, the snippets for results 518 and 520 do not include **any** of the user’s search terms, which corroborates my opinion that the snippet is not necessarily indicative of which search terms are and are not present in a search-result’s webpage.

261. My opinion in this regard is further corroborated by EX1055, which notes as background information that typically the “snippet” on a search-results

webpage “includes a small portion of the web page that **often contains one or more of the search terms** of the search query.” EX1055, [0006]. That is, though search engines often displayed snippets that contained at least some of the user’s search terms, it was known that the snippets can also contain fewer than all of the search terms – *e.g.*, because one of the search terms is far apart from the other search terms on the same webpage and thus it would have required displaying an excessively long snippet that included every one of the user’s search terms.

262. My opinion that a search-engine’s “snippet” does not necessarily display each of the user’s search terms that appear on the corresponding webpage is further corroborated by EX1057. EX1057 (at [0002]) discloses as background information that “search engines” “typically return a snippet of the context text that includes, **or is near** the submitted keywords”; displaying context text that is merely “near” the submitted keywords means that the snippet may not include any (let alone) all of the submitted keywords present in the webpage.

263. As I discuss further below (§XII.C), because Wang may display search results that contain fewer than all search terms but does not make clear which search term (if any) is missing in each search result, POSAs would have been motivated to extend Wang by making explicit which search terms are missing in each search result.

B. Mills (EX1006)

264. Mills is a US patent that issued in 2014 from an application filed in July 2009 (cover code (22)).

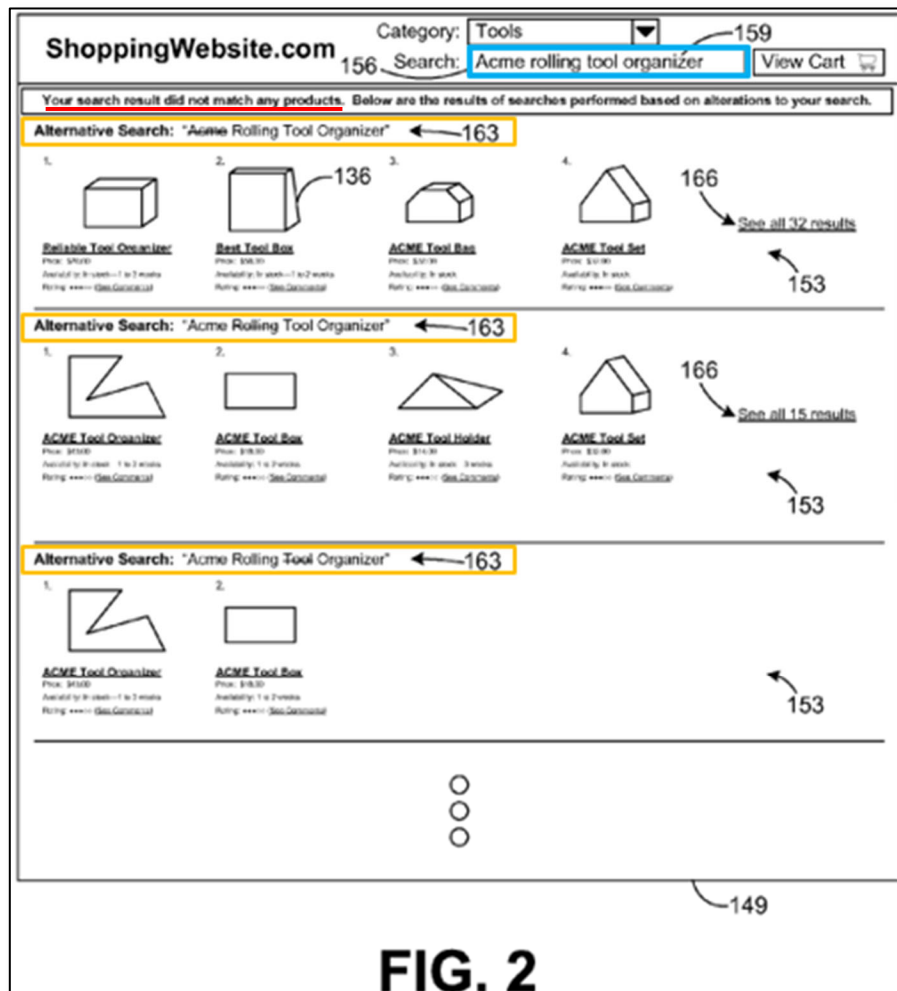
265. Mills relates to keyword searching, including for general-purpose Internet searches. Mills discusses examples where the search is “to identify... products for purchase,” but also says this is just “one example” and the described techniques are applicable more generally, such as “to perform a web search.” Mills, 2:40-44, 4:16-19. *See also* Mills, 1:39-45 (disclosing that Mills “relat[es] to the enhancement of word searching using a search string in the context of an online marketplace or **any other search context**”), 3:26-28 (disclosing that “the user may be performing a search for items 136 **other than products** in some other context as can be appreciated”), 4:16-19 (disclosing that “the user may enter a search string **for some other purpose** other than identifying items 136 for purchase,” *e.g.*, “the search string may be used **to perform a web search** or for some other purpose”). Performing a “web search” teaches (or at least suggests) that rather than an “item” (a product) each search result is a webpage.

266. Like Wang, Mills observes a problem when a “customer...enter[s] a word search that has too many terms”: the search engine may return few (if any) results because of the “overly constrained” search parameters. Mills, 1:8-11; *see also id.* 3:29-56. For example, Mills is considering the problem when the search

engine only displays results that include all of the user's search terms but none (or too few) match all of the user's search terms.

267. To address this problem, Mills discloses a search engine that “detects when a query that is generated from a search string fails to identify at least a predefined threshold number of items,” *e.g.*, at least 10 “items” or even just one result, which in a web-search embodiment would be search results from a “web search.” Mills, 4:39-47; *see also* Mills, 2:40-44, 4:16-19. When this happens, “the search engine [] is configured to generate one or more altered versions of the search string by making various modifications to the search string.” Mills, 4:48-53. Mills's “altered” search strings can be generated by removing one or more keywords from the original search string. Mills, 5:60-63.

268. Mills's Figure 2 (which I have annotated below) illustrates an interface for Mills's search engine. Mills, 1:25-27. As seen below, the user inputs a search string into a search box 156. Mills, 6:29-33. I have highlighted blue the example search string—“acme rolling tool organizer.”



269. In this example, Mills's Figure 2 says the user's four-word search string "does not provide any results for a search" (as shown by the notification text that I have underlined in red above). Mills, 6:33-36. Because no results were found for the user's original search string, the search engine "generates a plurality of altered versions of the search string 159 that are displayed as altered search strings 163" on the user interface. Mills, 6:38-46. I have added orange boxes to the three altered search strings above, and each is the original four-word search string with one word removed (*i.e.*, these example alternative searches used

different combinations of 3 of the 4 original search terms). For example, the second altered search string is “Acme ~~Rolling~~ Tool Organizer,” which indicates that the original search string was altered by removing the word “Rolling” and based on just the three search terms “Acme,” “Tool,” and “Organizer.”

270. “Each altered search string is graphically associated with a group 153 of items identified based upon a second query generated from the altered search string 163 itself.” Mills, 6:43-46. For example, the second resulting “group 153” identifies results that matched the three-word search “acme tool organizer.” The strikethrough annotation (“~~Rolling~~”) indicates that in each result in the second group the search engine found three of the search terms – “Acme,” “Tool,” and “Organizer” – but did **not** find “Rolling” in any of those results because, otherwise, the original search **would** have found products that matched all four terms.

271. Mills says that Mills’s system ensures that a “user advantageously receives results to a search even though the search string 159 that they entered would result in no identified items 136” and “educate[s] users...as they can compare and contrast” the results of their original search with the results from various altered searches. Mills, 7:32-40.

272. I note that the first set of search results above have a strikethrough to “~~ACME~~” but the third and fourth results include “ACME” in their title. Keyword-based search engines often identified search results based on so-called inverted

indexes that listed keywords and, for each keyword, which items (*e.g.*, products, webpages, etc.) in the index include that keyword. POSAs knew that including an item's title as part of the index to be searched was a design option and thus some search engines would not include titles as part of their search space.

273. My opinion in this regard is corroborated by EX1052, which “discusses conventional text and image retrieval systems.” EX1052, [0003]. EX1052 discloses as background information that “Internet search engines” typically had “the whole text of the web pages held on various web servers [] indexed automatically” by so-called “‘robots’ or ‘spiders.’” EX1052, [0004]. EX1052 teaches that “[t]he way in which” documents are indexed “is dependent on the respective robot,” wherein “**some index the HTML title or the first paragraphs** in a document, while **others sift through the entire document** and index each individual word letter by letter.” EX1052, [0005]. Thus, EX1052 corroborates my opinion that it was known that indexes for search engines may or may not include an item's / webpage's “title” as part of the index being searched by the search engine.

274. My opinion in this regard is also corroborated by EX1053, which similarly discloses as background information that “[e]ach search robot has its own strategy for crawling the Internet,” and “**may either** parse the entire document, **the**

title of the document **or** the first paragraph” (*i.e.*, whether to include the title as part of a search was a design choice). EX1053, [0003].

275. My opinion in this regard is further corroborated by EX1054, which discloses a search engine that “determines whether a result contains the selected term by scanning the title and abstract of each result” or “[a]lternatively” the search engine “can examine the actual web content associated with the result” (*i.e.*, not the title and abstract). EX1054, [0039].

276. The example shown in Mills’s Figure 2 informs POSAs that the search engine in this example does not consider titles when determining whether a potential result includes the user’s keywords. Thus, to this search engine, the third and fourth items in the first group of results above do not include “ACME” even though “ACME” is in the product title shown in the search-result webpage.

C. The Wang-Mills Combination

277. In view of Mills, in my opinion POSAs would have had reason to modify Wang’s interface to annotate each search result with the user’s keywords and to identify the keyword(s) (if any) missing in each corresponding webpage of the search result.

278. Wang and Mills relate to a common problem: preparing search results based on over-constrained search strings. They address that problem in similar ways: displaying search results of altered (and broadened) versions of the user’s

original search string (*e.g.*, search results that are responsive to a search with one of the user's original keywords removed).

279. Mills, however, recognizes a potential problem with altering and broadening the user's search query: "irrelevant items [] may be included in a search result generated based upon part [*i.e.*, subset] of [an] entire search string." Mills, 3:61-64. By increasing the likelihood of adding irrelevant results, it may cause a user to "lose faith that" the search engine "will reveal relevant results," which may "discourage further user participation" with the search engine. Mills, 3:64-4:4.

280. To mitigate that problem (while maintaining the benefits of broadening the user's search), Mills annotates search results by "graphically associat[ing]" the search results with the altered search strings that yielded those results. Mills, 6:43-46. Mills identifies at least two principal benefits to its annotations.

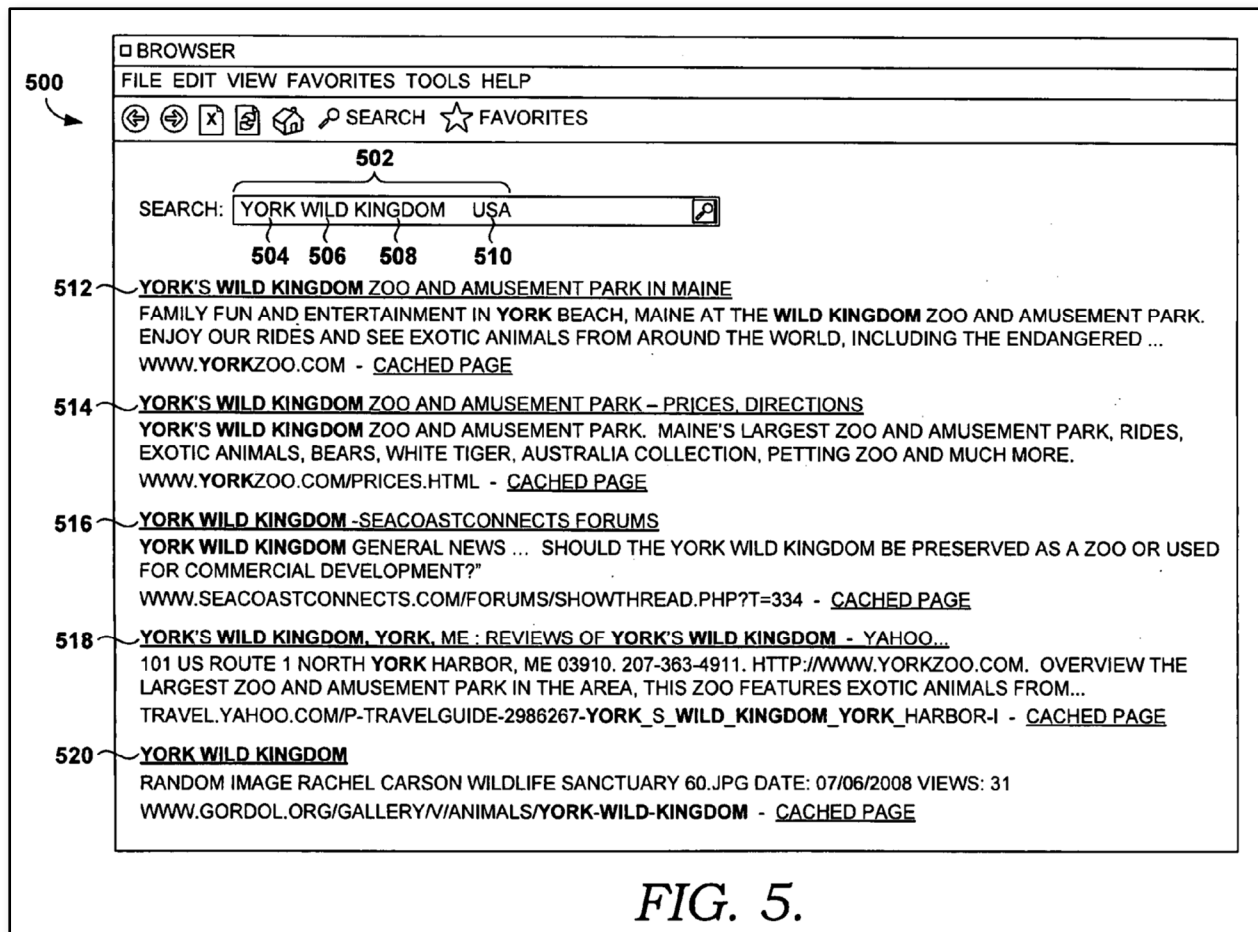
281. First, Mills teaches that displaying search results "along with the associated altered search strings 163 allows a user to see how other permutations of the original search string" yielded results whereas the original search string did not. Mills, 7:18-23. Mills teaches that this "disabuse[s]" the user of the belief that there are no search results relevant to the user's original search string. Mills, 7:23-25.

282. Second, Mills teaches that because “the altered search strings 163 are displayed in association with” their respective search results, “a user can see how the alteration made to the respective altered search string 163 may have resulted in” search results “that are not particularly relevant” to the user’s original search string. Mills, 7:25-31. That is, displaying annotations like Mills’s annotations informs the user what term(s) was removed to identify corresponding search result and thus what term is missing in those results, which may make those results less relevant to the user (*e.g.*, if the missing term is particularly important to the user). The inverse is also true—the annotation allows a user to see that removing a certain term caused additional relevant search results to be returned. *See also* Mills 7:35-40 (explaining that the annotations “serve[] to educate users”), 5:18-28 (the user is “informed that the search string entered was problematic” because it was “too narrow” while also allowing the user to “not select” a group when another “appear[s] to be more relevant”).

283. POSAs would have recognized that Mills’s teaching to annotate search results to identify which of the user’s terms are present and missing in the corresponding webpages is applicable to any system that displays search results that can match only a subset of a user’s search terms. As I discussed above, Wang is such a system that displays search results based on a subset of the user’s search terms. For that reason, POSAs would have recognized that Wang suffers the

potential problems that Mills identified in broadening a user’s search query: some of Wang’s search results might only match a subset of the user-supplied search terms, as I discussed above (§XII.A), but (without Mills) Wang does not indicate to the user which search terms have been removed for each broadened search result.

284. As I discussed above (§XII.A), Wang’s Figure 5 example (below) includes four keywords—YORK WILD KINGDOM USA—and Wang says “[t]he resulting documents...have at least 3 of the 4 keywords.” Wang, [0053]. Each of these search result groupings includes in **bold** “YORK,” “WILD,” and “KINGDOM,” and thus each corresponding result clearly includes those keywords. However, it would be unclear to the user whether any result’s webpage also includes “USA” because even though “USA” is not displayed in the search results “USA” could still be present somewhere in the webpage (*e.g.*, somewhere other than in the title, URL, or excerpt displayed by the search engine). *See* Wang, [0053] (“**As is shown**,...all [results] contain **at least 3** of [the] keywords.”).



285. Because Wang's search-results webpage can be unclear whether and which un-displayed keyword is actually missing from each webpage (and which webpages are missing the keyword and which are not), POSAs would have recognized that Wang's system is ready for improvement via the above-described benefits of Mills's annotations (*e.g.*, helping the user ignore potentially irrelevant results), which would have been achieved in Wang's system (based on Mills) by graphically depicting the specific keywords that Wang used to identify each search result and crossing out keywords that are missing in the associated webpage. The combination would have thus been the use of a known technique (Mills's

graphically-displayed altered search string annotation) to improve a similar device (Wang’s search engine) in the same way (providing users with additional search-term information that improves their searching experience).

286. Wang displays a single list of results that are ordered based on conventional ranking methodologies, such as the frequency with which a particular result has been accessed previously or the user’s geographic location. Wang, [0050] (explaining that “other alternatives are [] possible”). POSAs would have also been aware of various known search-result ranking methodologies that rank results individually, as in Wang. Thus, under a conventional ranking methodology (including Wang’s examples), the first-ranked search result might only have three of the four search terms (but rank particularly high under some other metrics), the second-ranked search result might match a different combination of three search terms, and maybe only the third-ranked search result matches all four search terms, etc.

287. Thus, to support Wang’s (and other conventional) search-ranking methodologies, in one obvious combination of Wang and Mills (which I will refer to as “Wang-Mills” or the “Wang-Mills combination”) **each** search result would include a search-term annotation specific to that search result. Including the annotations adjacent to (or below) each search result is consistent with Wang’s FIG. 5, which already bolds search terms present in each search result and would

be consistent with how known search engines annotated search results on a per-search-result basis, as opposed to a single annotation for a group of search results, as discussed below.

288. For example, EX1029 (a US patent that issued in 2002) “relates to a system and method for viewing search results.” EX1029, 1:7-8. EX1029 discloses as background information that some prior art search results webpages made it “difficult to analyze” “because many users have no choice but to, manually and laboriously, verify that the website contains data in which he is interested by reading each Web address, the few words surrounding the keywords, and, in some cases, the short summary.” EX1029, 1:42-49. EX1029’s FIG. 3 (color-annotations added below) shows a search results webpage with a text-based annotation added to the bottom of each search result grouping that provides “a view showing data and content metadata associated with each of two websites resulting from a search of a network” (*e.g.*, various “metadata” associated with each website). EX1029, 5:63-6:49. For example, “[f]irst and second pages 316 and 348 preferably include the number of typical computer screens needed to display the typically displayed text associated with first website 372 and second website 374, respectively.” EX1029, 3:53-56. The “[f]irst and second styles 328 and 360 preferably include the number of different styles (such as a particular ‘look and feel,’ a cascading style sheet, or use of particular fonts, text sizes,

images, and page layouts) used within first and second websites 372 and 374, respectively.” EX1029, 4:36-40. *See also* EX1029, 3:49-7:4 (describing the various other information provided by EX1029’s annotations).

302

CONTENT VIEW

372

304
Title: 306
Description:
URL/Size:
308

PhDSurvey: R. Todd Stephens Ph.D. Web Site for The Nova ...
The default.htm page is the home page for **PHdSurvey.com**. ... This means that **Phdsurvey.com** is no longer needed and a new requirement has emerged. ...
www.phdsurvey.com/ - 26k - Cached - Similar pages
Verification View: Relationship - Image - Seal

340 342 346

316	Pages: 1,452	324	Document: 156	332	Avg. Size: 15k
318	Images: 45	326	Scripts: 3	334	Avg. Download: 3 Sec
320	Links: 458	328	Styles: 4	336	Avg. White Space: 40%
322	Advertisements: 2	330	Technology: XML	338	Avg. Metadata Score: 4.50

310
Title: 312
Description:
URL/Size:
314

Washington Trust Trust Accounts
... If you do not have an access ID, or if you have forgotten it (or your PIN), please contact your Washington **Trust** Relationship Officer at 401-348-1238 or 1-800 ...
www.washtrust.com/trust/htm - 11k - Cached - Similar pages
Verification View: Relationship - Image - Seal

376 378 380

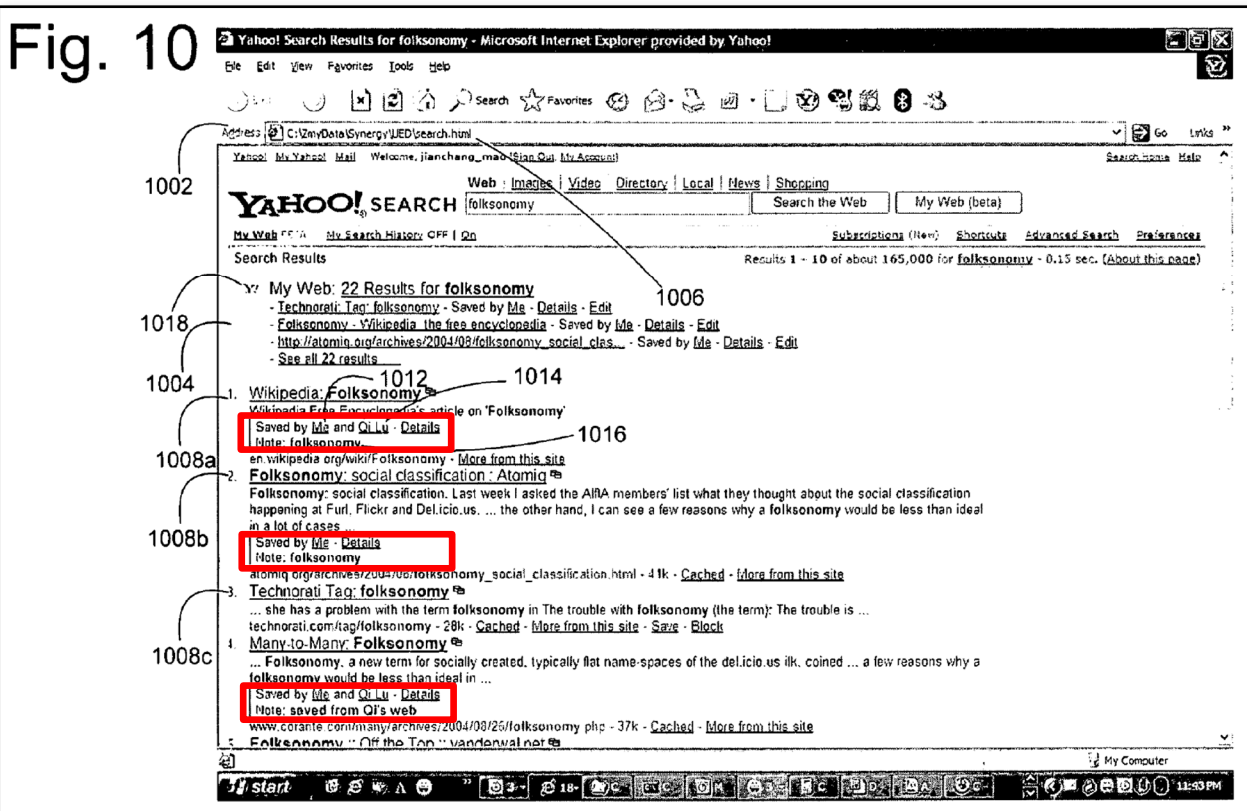
348	Pages: 152	356	Document: 15	364	Avg. Size: 5k
350	Images: 5	358	Scripts: 0	366	Avg. Download: 13 Sec
352	Links: 48	360	Styles: 0	368	Avg. White Space: 10%
354	Advertisements: 20	362	Technology: HTML	370	Avg. Metadata Score: 2.50

374

EX1029, FIG 3 (red boxes added)

289. As another example, EX1043 (a US patent that issued in 2000) “relate[s] to the searching of collections of information.” EX1043, 1:7-10. EX1043’s Figures 7-9 “are illustrations of search results presented by one embodiment of the invention.” EX1043, 3:6-7. As shown in EX1043’s Figures 7-9, “scores are shown for each item” (i.e., an annotation is shown at the bottom of each search result grouping). EX1043, FIGS. 7-9, 13:9-31.

290. As another example EX1044 (a US patent application published in 2007) “relates to systems and methods for improving the reliability of search results.” EX1044, [0003]. EX1044’s Figure 10 “illustrat[es] the ranked output of a search provider according to one embodiment of the present invention.” EX1044, [0034]. As shown in EX1044’s Figure 10 (color-annotations added below), each search result grouping includes text-based annotations, specifically “content item 1012 and 1014 [which are annotations], as well as **annotations** that users have associated with a given content item.” EX1044, FIG. 10, [0095].



291. As another example, EX1049 taught as background information the “need for a system or method that takes a compound query” and provides “an indication [an annotation] of how closely each data object matches each of the compound query’s search terms.” EX1049, [0015], [0019] (disclosing a way to indicate “an extent to which the objects [e.g., websites] match respective one of the search parameters”).

292. As another example, EX1027 discloses that providing information (an annotation) about the frequency of each search term in **each** search result helps a user to determine “the potential relevance of **each** displayed returned document.” EX1027, [0021], [0064]-[0065].

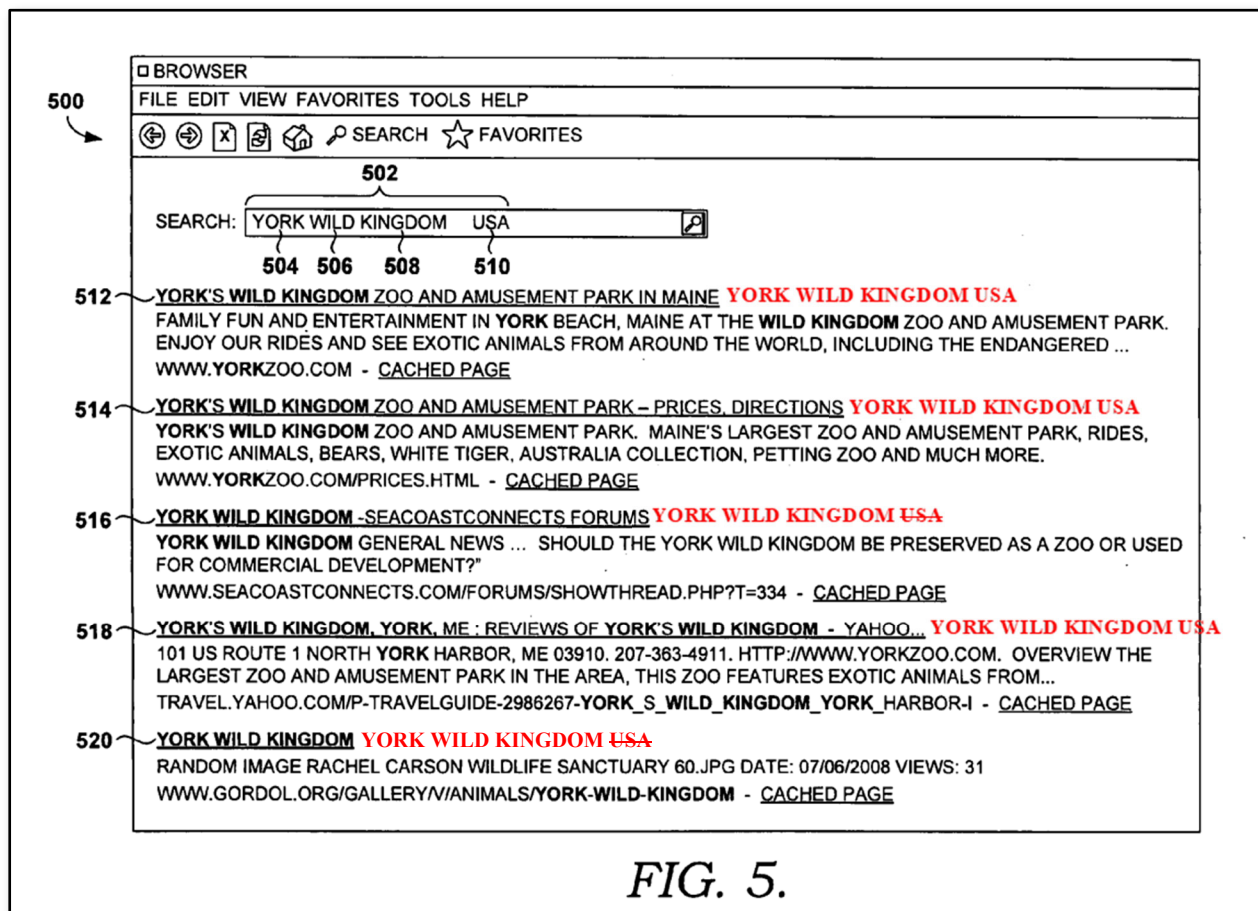
293. As another example, EX1048 discloses as background information that it is a “disadvantage” not to help the user determine “whether a document listed in the results window is relevant” by indicating which search term(s) are present/missing in each result. EX1048, 1:48-56, 4:37-40.

294. As I discussed above, Wang’s FIG. 5 example is consistent with one or more search results missing “USA” on their corresponding webpage. In Wang-Mills, the interface would have displayed the altered search string adjacent to (or below) each search result, with a strikethrough applied to any term(s) missing from the corresponding search result. As a consequence of Wang’s ranking methodology, one search result to the next might match a different subset of the original search query—say, one result matches “york, wild, kingdom” (but not “USA”) whereas another result matches “york, wild, USA” (but not “kingdom”). For example, in the hypothetical example below, “USA” is missing from the webpages at results 516 and 520 (as indicated by the strikethrough to “USA”) but “USA” is present in the webpages at results 512, 514, and 518.¹³ *See also*

¹³ As I discussed above, a user understands that “USA” may or may not be present in each search result in Wang’s Figure 5. Of course, even if “USA” were present in Wang’s FIG. 5 example, POSAs would understand that Wang’s search does not **require** each search term to be present in every result and, at least sometimes, it

EX1028, 2:52-3:26 (explaining that POSAs would have understood that the search-ranking methodology “criteria for importance of a term ... may differ from those of the user”).

Wang-Mills



295. In my opinion, POSAs would have had a reasonable expectation of success in Wang-Mills. Wang and Mills both relate to search engines that identify

would be unclear from Wang’s search-result page which search term(s) is/are missing from which search result(s).

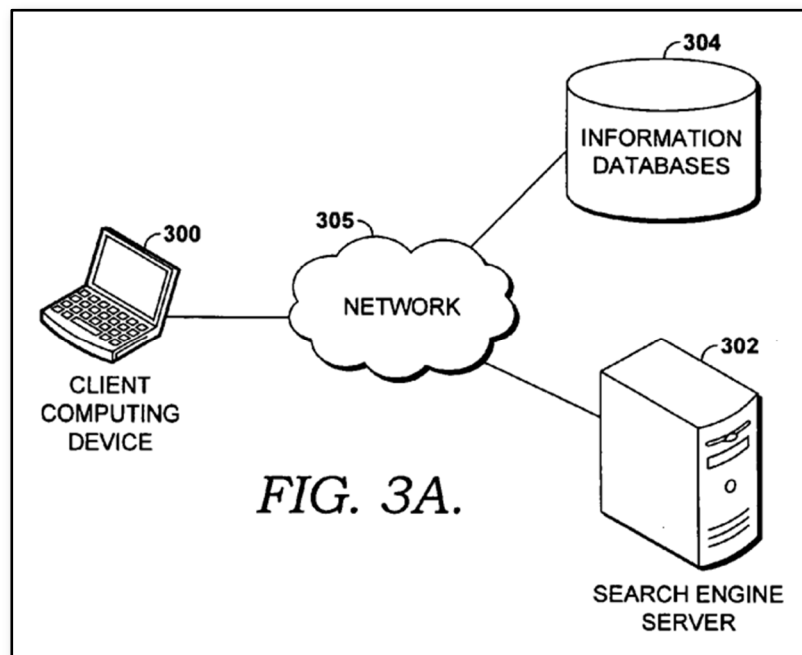
search results that match a subset of a user's multi-word search query; modifying Wang's interface to display keywords used in an altered query with each search result would have required only routine software programming skills. Mills, 10:26-45.

D. Mapping to Challenged Claims

1. Claim 1

- a. [1PRE] **“A method for providing an annotation for an Internet search result for display to a user of an Internet search engine to warn the user when the Internet search result's referenced webpage is missing one or more search term elements supplied by the user, the method comprising:”**

296. Wang discloses *a method* “for performing relaxed searching on a search engine...connected to a network” (Wang, [0032], FIG. 4), *e.g.*, “the Internet” (Wang, [0030], FIG. 3A (below)).

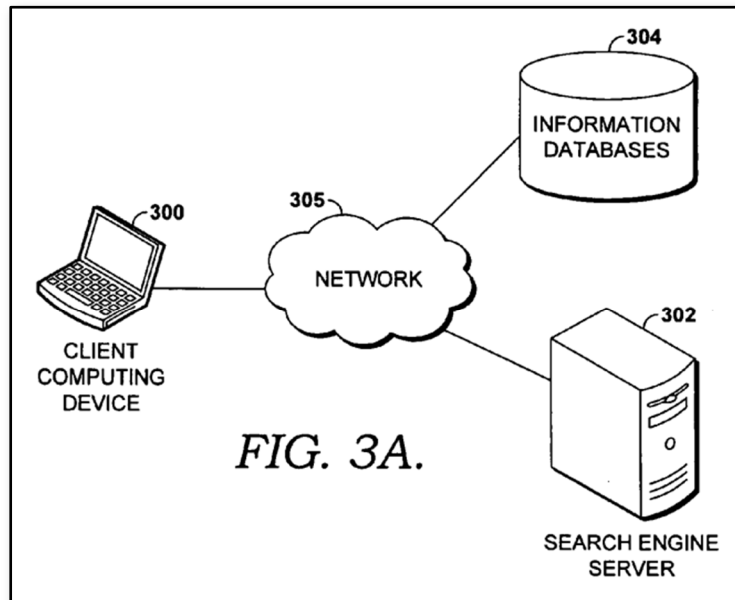


297. Wang’s *Internet* “search engine [] creates a list of results for a search-engine query by identifying documents [e.g., webpages] that include only a subset of the keywords [*search term elements*] submitted by *a user*” of the *search engine*. Wang, [0013]; *see also* Wang, [0035]. “Once the web pages are located, their URLs are transmitted back to the client computing device [] and displayed as hyperlinks” (*Internet search results*). Wang, [0035]; *see also* Wang, FIG. 5 (illustrating an example search result webpage).

298. As I discussed above (§XII.C) and further below (§§XII.D.1.f-g), in the Wang-Mills combination, the *method provides an annotation for the Internet search results displayed to a user to warn the user when the Internet search result’s referenced webpage is missing one or more of the search term elements supplied by the user*, wherein a missing term is displayed and annotated with a strikethrough (*infra* §§XII.D.1.f-g, limitations [1E]-[1F]).

- b. [1A] “receiving one or more search term elements supplied by a user of an Internet search engine from the user’s computing device,”

299. As shown in Wang’s Figure 3A (below), the user’s computing device “communicates with the search-engine server.” Wang, [0038].



300. “[T]he user can submit keywords to the search engine, and the client computing device 300, in turn, transmits the keywords to the search engine server 302.” Wang, [0039]. “[T]he search engine server 302 receives the query and parses the query into one or more keywords.” Wang, [0040].

301. Thus, Wang’s “keywords” are *received as search term elements supplied by a user of the Internet search engine from the user’s computing device*. Wang, [0035] (“search-engine server 302 hosts **a search engine designed to receive queries from remote computing devices**...and locate information on the Web...to satisfy the queries”), [0002], [0004].

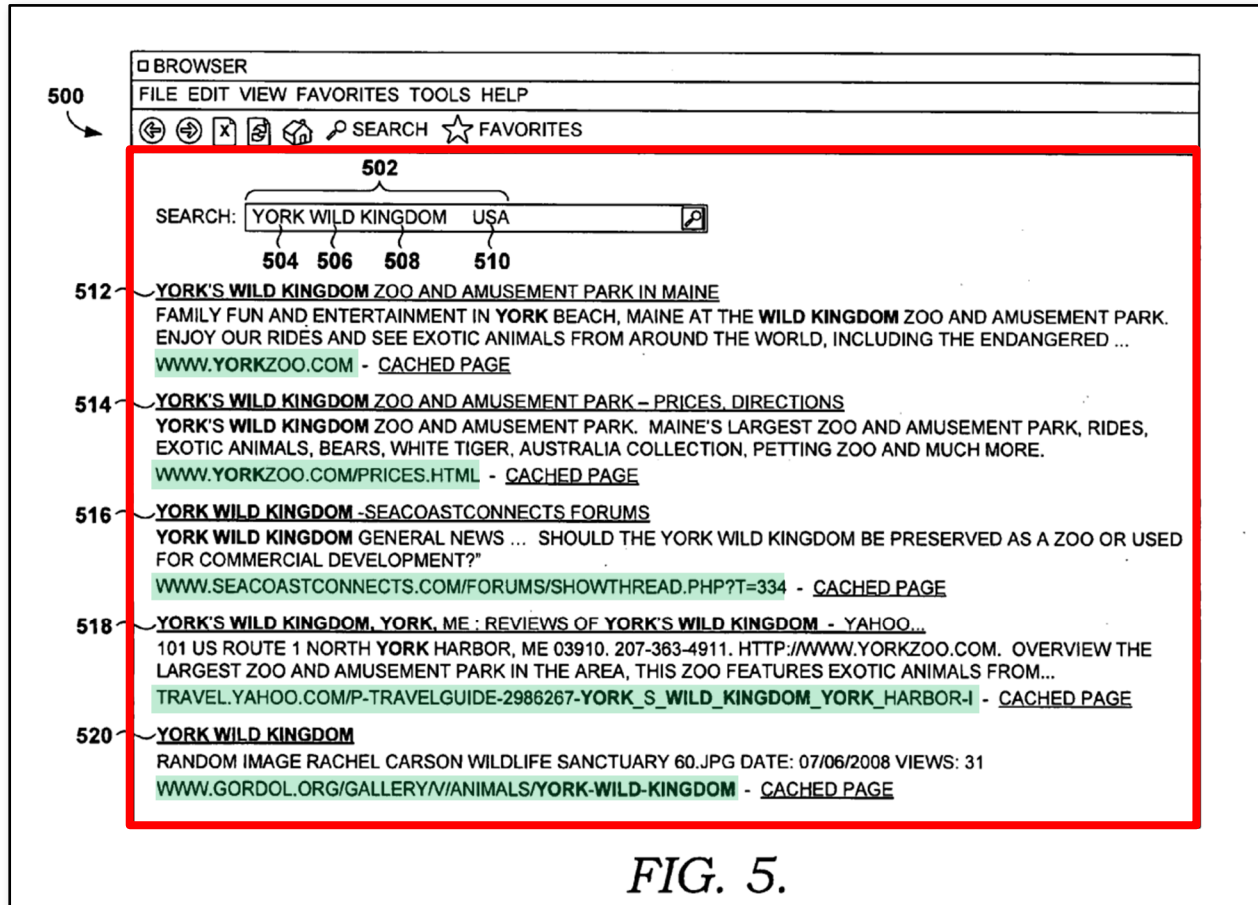
- c. [1B] “wherein the Internet search engine generates, based at least in part on the supplied search term elements, at least one Internet search result referencing a webpage, for display on a search results webpage on the user’s computing device,”

302. Wang’s “search engine server 302 receives the query and parses the query into one or more keywords” and “searches one or more inverted indexes for documents that contain” at least a subset of the “keywords” (*i.e.*, Wang’s search results are *based on the supplied search term elements*). Wang, [0040], FIG. 5 (search request 502).

303. Search results identified using inverted indexes, as in Wang, are *Internet search results* because each “inverted index is prepared by web [*i.e.*, *Internet*] crawlers browsing documents stored in the information databases 304,” which “may be hosting a web page comprising numerous online documents.” Wang, [0041], [0035] (“search-engine server 302 hosts **a search engine designed to receive queries from remote computing devices...and locate information on the Web...to satisfy the queries**”), [0016] (“A search-engine query, as discussed herein, refers to any **keyword search of the Web by a search engine.**”).

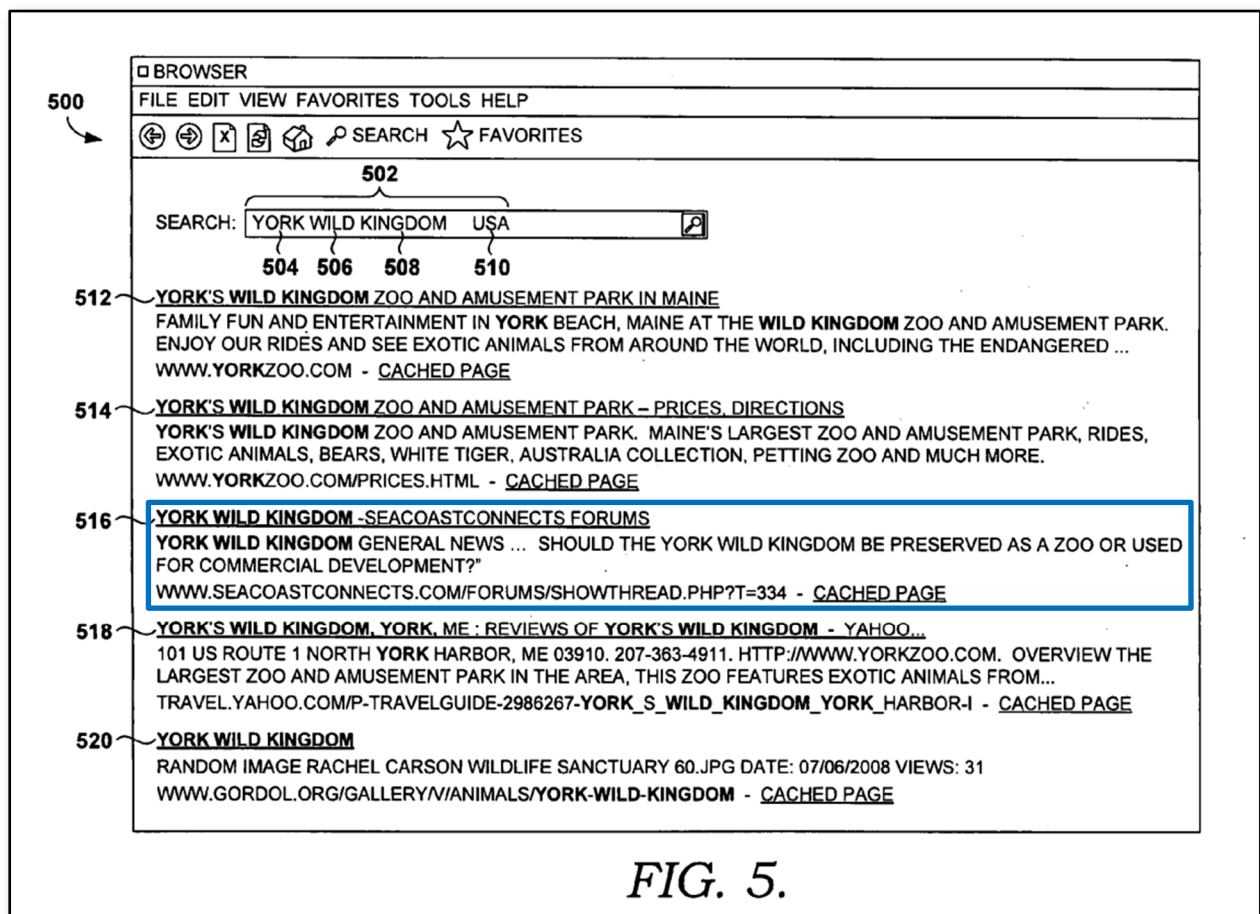
304. Wang’s Figure 5 (which I have highlighted below) depicts “a web browser window 500 rendering a web site for the search engine” that is *generated by the search engine* (Wang, [0053]) and includes *Internet search results*

referencing webpages that are “displayed as hyperlinks” (green) on a search-
results webpage (red) on the user’s computing device (Wang, [0035]).



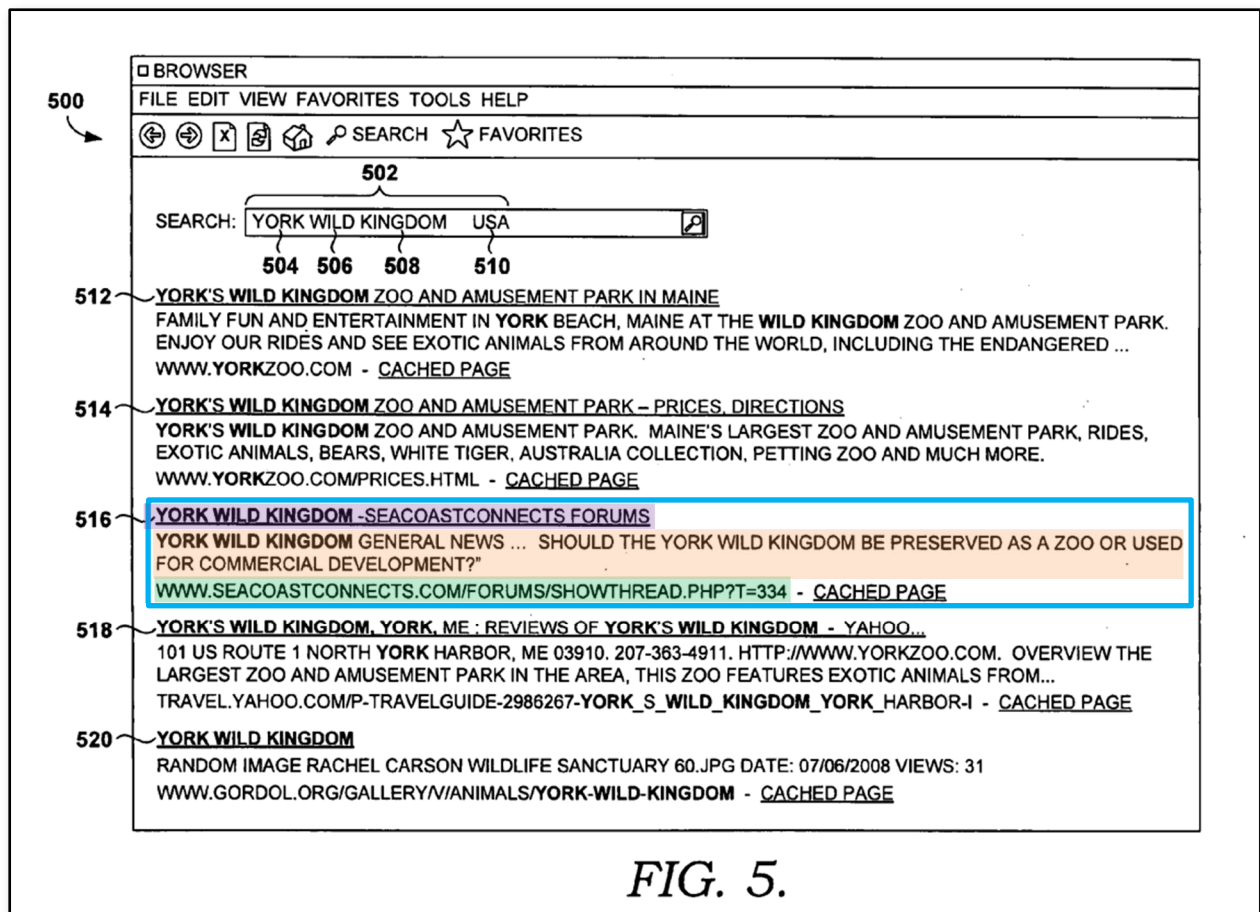
- d. [1C] “wherein the Internet search result is displayed on the search results webpage as a search result grouping, and”

305. Wang’s Figure 5 (which I have highlighted below) shows that each *Internet search result* that I discussed above (§XII.D.1.c, [1B]) is *displayed on the search results webpage* as a *distinct search result grouping*, like the one that I have highlighted with a blue box below.



- e. [1D] “wherein the search result grouping is comprised of at least one of: a title for the referenced webpage, an Internet link for the referenced webpage, an excerpt of the referenced webpage, or a URL for the referenced webpage;”

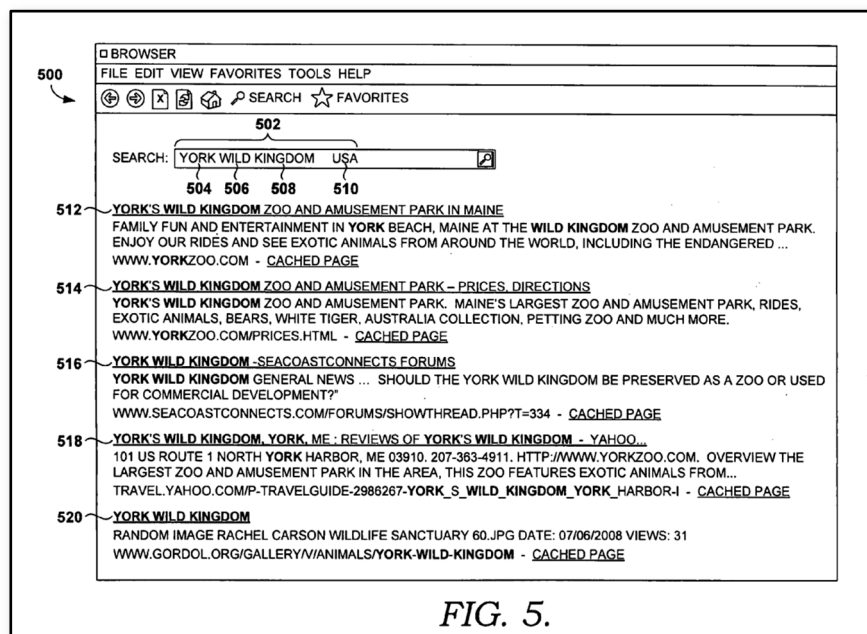
306. Wang’s Figure 5 (which I have highlighted below) shows that each search result grouping comprises for the referenced webpage a title (purple), an Internet link for a URL (green), and an excerpt (orange). See Wang, [0035] (“URLs are transmitted back to the client computing device 202 and displayed as hyperlinks”).



- f. [1E] “determining whether to generate an annotation for the Internet search result for display on the search results webpage, wherein it is determined to generate the annotation if at least one search term element is missing in the Internet search result’s referenced webpage,”

307. In the Wang-Mills combination (§XII.C), “web documents that have been known to contain at least a portion of the query’s keywords” “are identified” by the method and “transmitted back to the client computer device” “for presentation to the user.” Wang, [0052], [0035] (“Once the web pages are located, their URLs are transmitted back to the client computing device 202 and displayed as hyperlinks.”).

308. Wang’s Figure 5 (below) depicts “a web browser window 500 rendering a web site for the search engine” (*i.e.*, the search-results webpage). Wang, [0053].

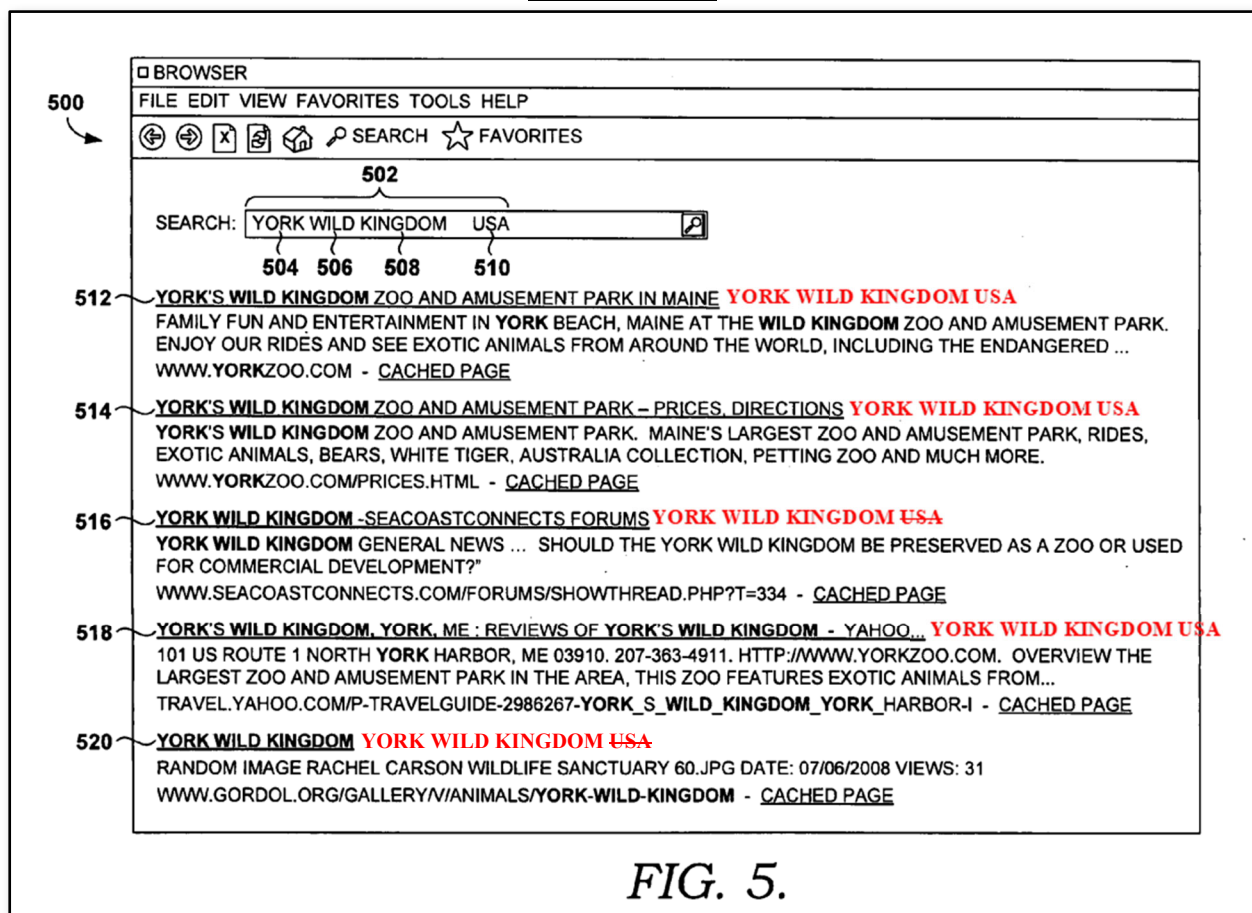


309. In this example, the “user submitted a search-engine query 502 with [four] keywords ‘york,’ ‘wild,’ ‘kingdom,’ and ‘USA.’” Wang, [0053]. Wang’s “relaxed search[]” identified “documents,” *i.e.*, websites, that “have at least 3 of the 4 keywords.” Wang, [0053]. As I discussed above (§XII.A), POSAs understood each result shown above includes at least the search-term keywords “york,” “wild,” and “kingdom” because those keywords are bolded in each search result, but each search result may or may not include “USA.”

310. As I discussed above (§XII.C), in Wang-Mills, the method augments Wang’s search results with the text of the search terms based on Mills. As I illustrate below based on Wang’s Figure 5 (annotated below), each search result is annotated (red) as shown below.¹⁴

¹⁴ The example annotations that I demonstrate using Wang’s Figure 5 are shown in red font and next to each result’s title; however, POSAs would have understood that the annotation’s color and location in each search-result grouping would have been a conventional design choice to POSAs.

Wang-Mills



In the Wang-Mills example above, the method determines to generate an annotation consisting of a strikethrough wherein it is determined to generate the annotation if at least one search term element is missing in the Internet search result's referenced webpage (e.g., an annotation that writes "USA" as "USA," as in results 516 and 520).

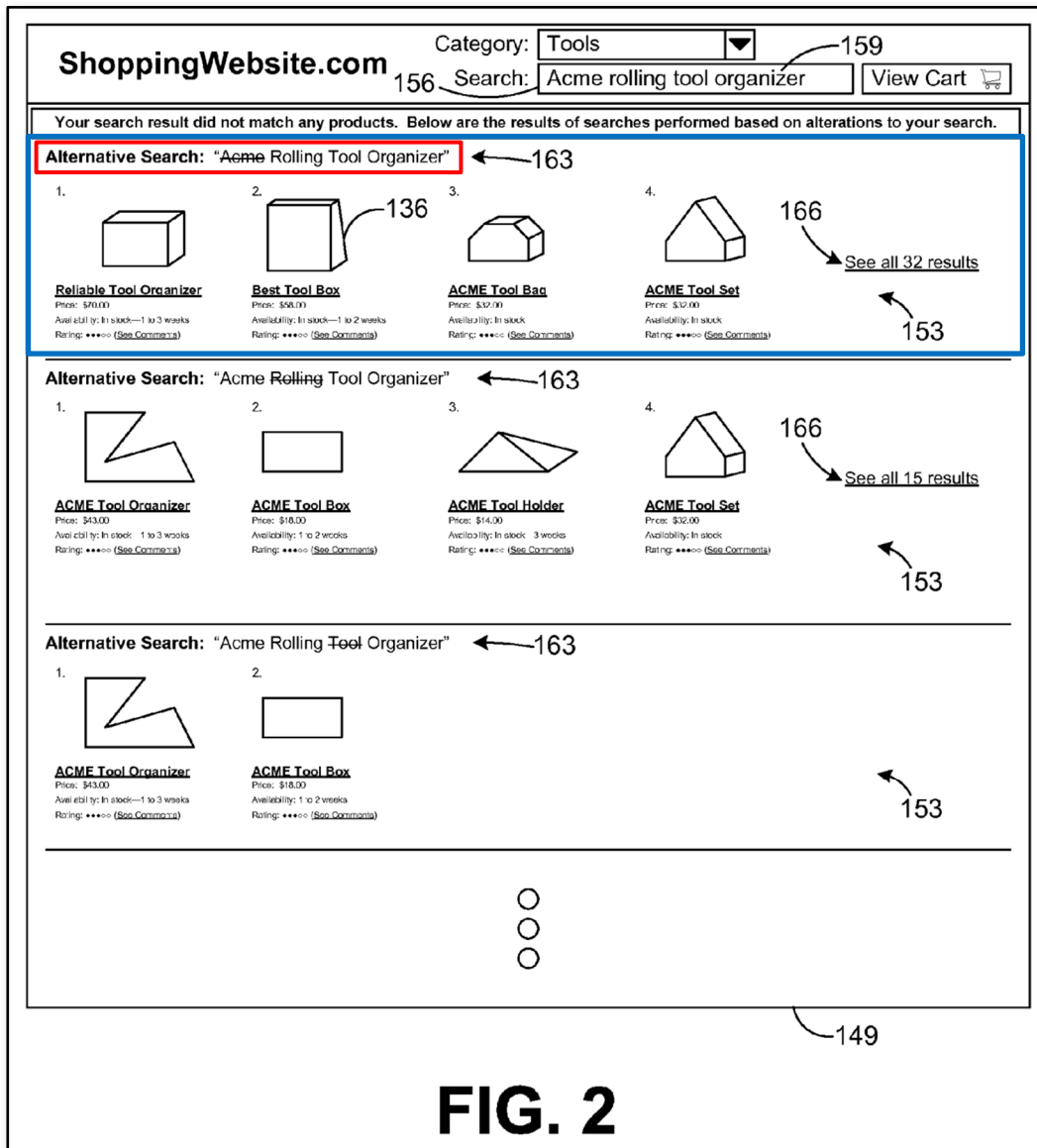
- g. [1F] “wherein the annotation is comprised of a text representing the at least one search term element that is missing in the Internet search result’s referenced webpage; and”**

311. As I illustrated above (§XII.D.1.f, [1E]), Wang-Mills’s annotation *is comprised of a text representing the at least one search term element that is missing in the Internet search result’s referenced webpage* (e.g., the search term element “USA” is displayed as “~~U~~SA” in the annotations for results 516 and 520 above).

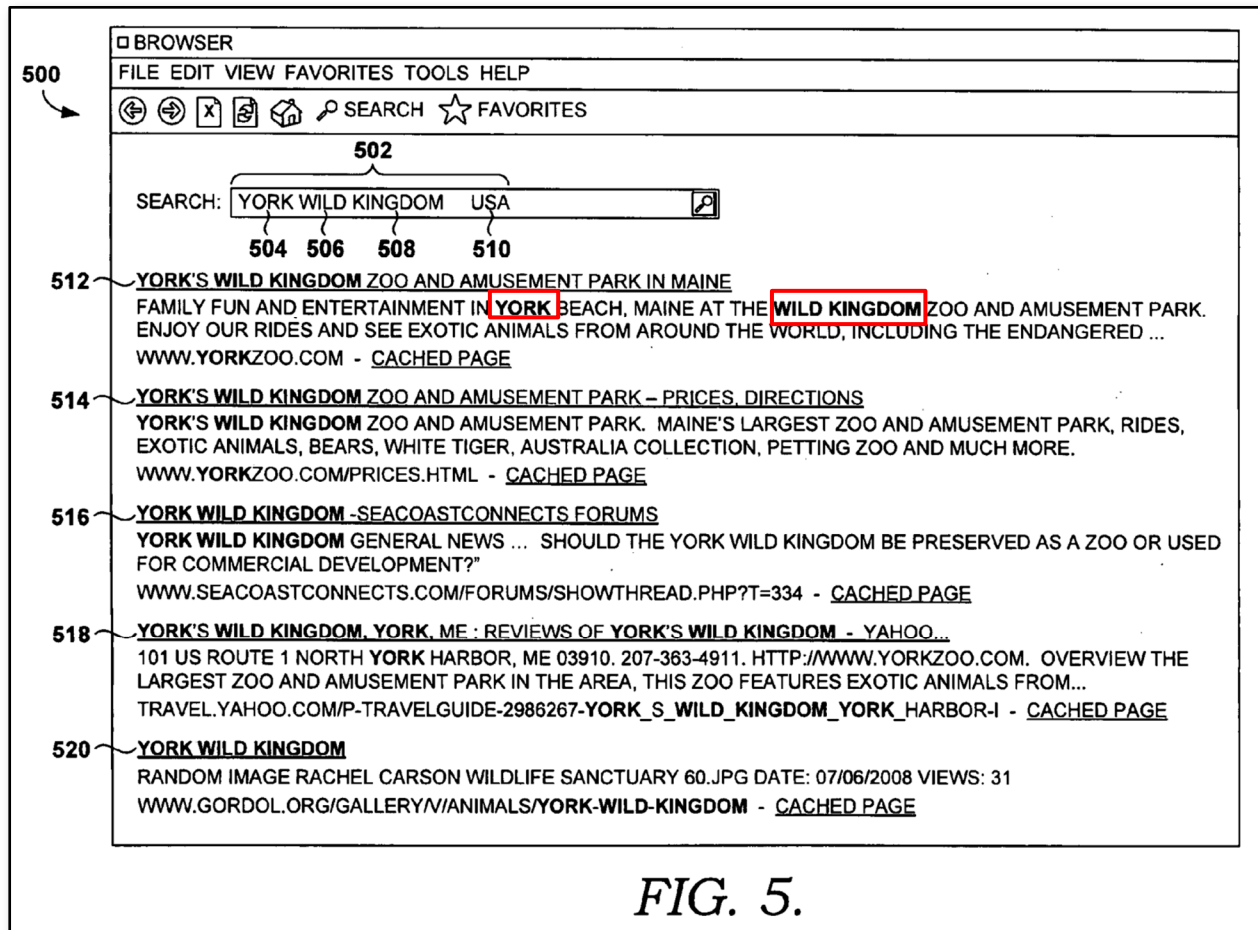
- h. [1G] “if it is determined to generate the annotation for the Internet search result, causing the annotation to be displayed adjacent to or within the Internet search result’s search result grouping on the search results webpage.”**

312. In my opinion, POSAs would have understood that the location (and color) of the annotation for a search result grouping in Wang-Mills would have been a design choice. Moreover, as I discussed above, POSAs had reason to display Wang-Mills’s annotation adjacent to, above, or below each search result grouping, which were conventional locations to display text-based annotations like those in Wang-Mills. *See supra* §XII.C (citing and discussing EX1029, FIG. 3; EX1043, FIG. 7).

313. Wang-Mills's annotation are based on Mills's FIG. 2 (which I have annotated below), which displays search term annotations 163 (red) adjacent to and/or within a grouping of search results (blue).



314. Adding the annotation within a search-result grouping is also consistent with Wang's Figure 5 (below), which already bolds search terms present within each search-result grouping.



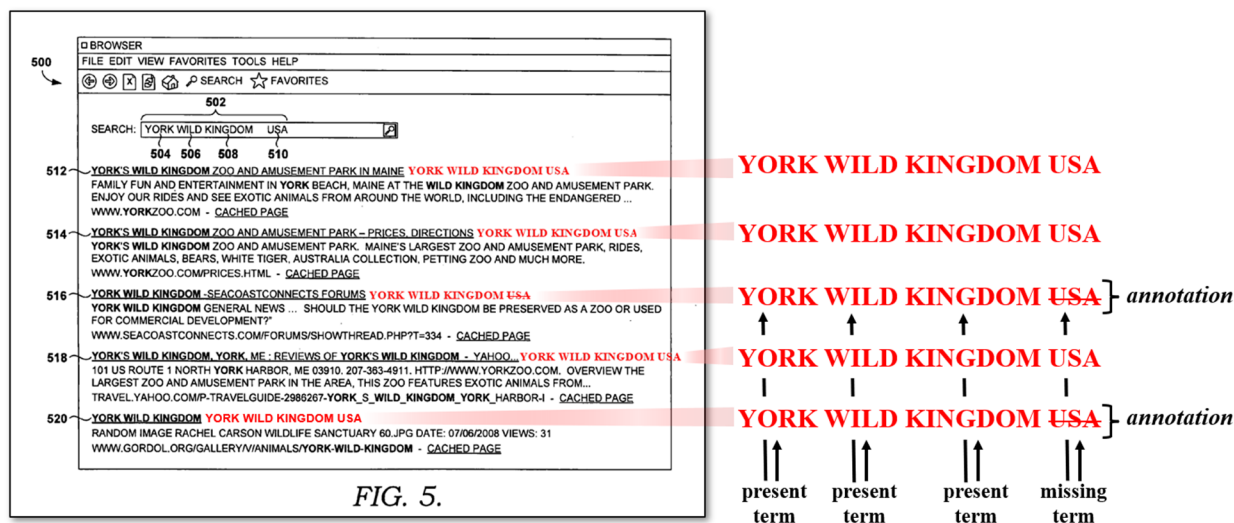
315. Consistent with Mills and Wang and as the Wang-Mills example that I illustrated above shows (see §XII.D.1.f, [1E]), Wang-Mills *causes the annotation to be displayed adjacent to and/or within the Internet search result's search result grouping, e.g., placed next to the webpage title, to help ensure that a searcher associates a search result with its annotation.*

2. Claim 2: “The method of claim 1, wherein the annotation is further comprised of a text representing at least one search term element that is present in the referenced webpage.”

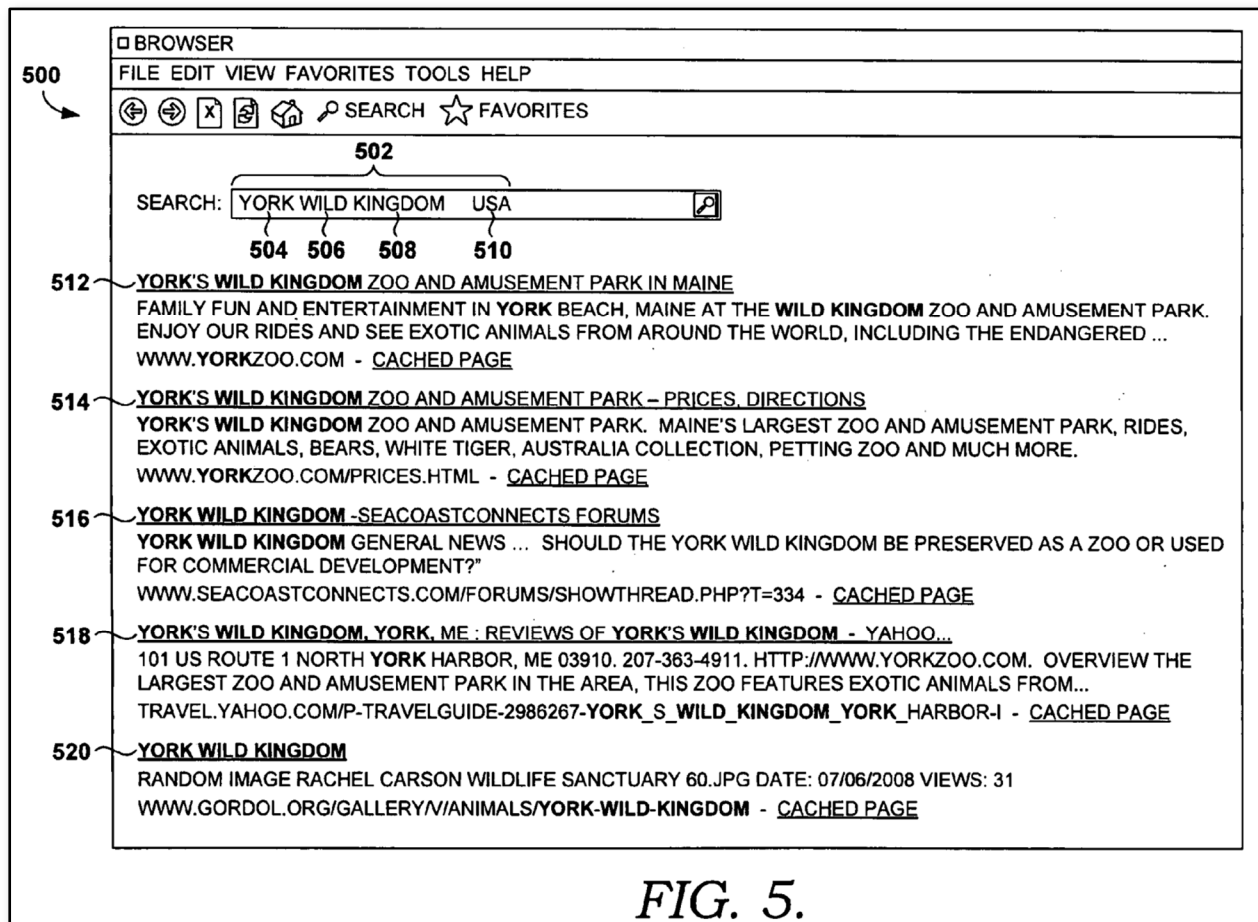
316. As I discussed above (§§XII.D.1.f-g, [1E]-[1F]), based on Mills, Wang-Mills’s annotations comprise the text representing each search term element, where terms *present in the referenced webpage* are displayed **without** a strikethrough. Thus, Wang-Mills’s *annotation is further comprised of a text representing at least one search term element that is present in the referenced webpage* and renders obvious claim 2.

317. For example, in the Wang-Mills illustration below, “*the annotation*” of limitations [1E]-[1F] is met by the third or fifth search grouping, which comprises the text of missing search terms in each respective webpage (in strikethrough font) and the text of present search terms in each respective webpage (without strikethroughs).

Wang-Mills



318. Based on Wang, Wang-Mills also **bolds** search term elements *present in the referenced webpage* (e.g., “WILD” and “KINGDOM” in the first-referenced webpage 512), which meets Claim 2 under the claim scope that Patent Owner alleges in litigation. *See* Wang’s FIG. 5 (highlighted below). *See* EX1064, 126-128 (Patent Owner arguing that claim 2 is met by “bolding a term that is present in the referenced webpage”).



3. Claim 3: “The method of claim 1, wherein the method of claim 1 is performed by the Internet search engine.”

319. Based on Wang, Wang-Mills’s *Internet search engine* “server is configured to receive the search-engine query from the client computing device” and “determine whether any documents contain the subset of keywords.” Wang, [0005].

320. Based on Mills, Wang-Mills’s search engine server would also determine whether and how to annotate search results. In Mills, the “search engine 129 generates” the “altered versions of the search string 159 that are displayed as altered search strings 163,” *i.e.*, *annotations*. Mills, 6:39-41, FIG. 1. That is, the search engine generates the annotated Internet search results and transmits them via the Internet to the user’s computing device. Based on Mills, it would have thus been obvious for Wang-Mills to likewise transmit to the computing device information comprising the annotated Internet search results both because that is what Mills does and because having that information provided to the computing device from a server on the Internet would have been a conventional, beneficial design choice (*e.g.*, to reduce the processing load at the computing device). *See also* Mills, 2:6-7 (“Various applications and/or engines are executed in the server”), 4:48-53 (“[T]he search engine...generate[s] one or more altered versions of the search string by making various modifications to the search string....”), FIG. 3.

321. Thus, it would have been obvious as a conventional design choice for claim 1's method to be *performed by Wang-Mills's Internet search engine*.

4. Claim 4: “The method of claim 1, wherein the method of claim 1 is performed on the user’s computing device by one or more of: a plug-in or a software program.”

322. Wang says the user's computing device and search engine do not have to be “separate computer units” (Wang, [0042]), which suggests and renders obvious to POSAs having Wang-Mills's method *performed on the user's computing device*, where *a plug-in or a software program* would have been the conventional way to do so. *See also* EX1063, 1:54-2:5, 2:9-15, 2:23-48 (“a computation is made by the client software, using its own algorithm, of a score for each document”); Bates, [0025], cl. 1 (which, as I discussed above in §VIII.D.4 (Ground 1A, **claim 4**), teach or suggest implementing the method of claim 1 on the user's computing device by a plug-in or software program).

5. Claim 7: “The method of claim 1, wherein it is determined not to generate the annotation for the Internet search result if all of the supplied search term elements are present in the Internet search result's referenced webpage.”

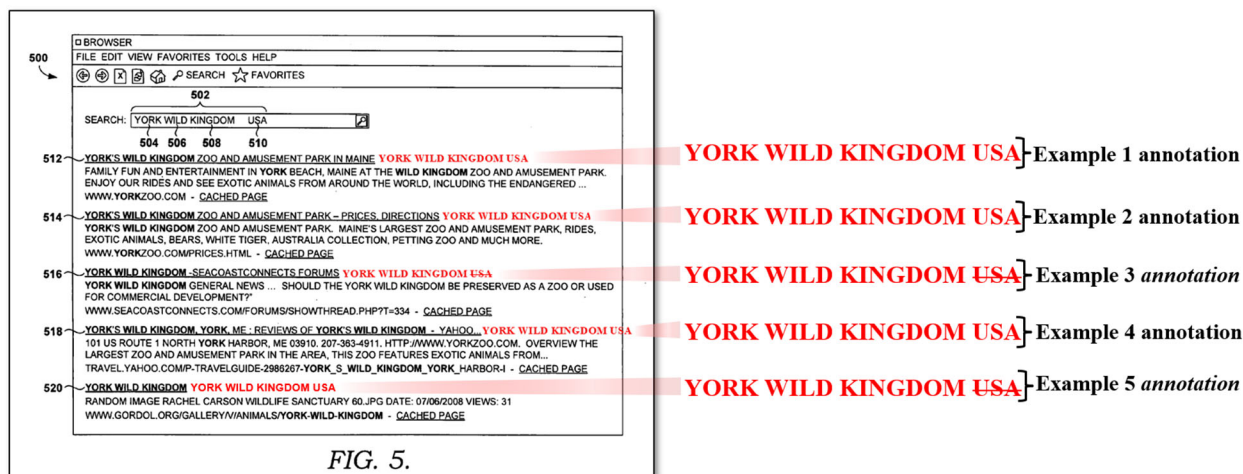
323. As I discussed above (§VIII.D.5; Ground 1A), claim 7 is met when the method generates an annotation that is different from “*the annotation*” that meets limitations [1E]-[1F]. As I discussed above, “*the annotation*” that meets limitations [1E]-[1F] in Wang-Mills is an annotation that includes the text of

missing search terms written with a strikethrough format. *See supra* §§XII.D.1.f-g.

324. *If all supplied search term elements are present in the Internet search result's referenced webpage*, Wang-Mills will not generate “*the annotation*” that meets limitations [1E]-[1F], and will instead generate a different annotation, *i.e.*, an annotation in which all the user's search terms will be written **without** a strikethrough because all those terms appear in a particular search-result webpage.

325. In the example below, Wang-Mills's method does not generate “*the annotation*” of limitations [1E]-[1F] for the *referenced webpages* (e.g., the third and fifth *annotations* for search groupings 516 and 520) in the first, second, and fourth search groupings (*i.e.*, search groupings 512, 514, and 520). Thus, Wang-Mills meets and renders obvious claim 7.

Wang-Mills



326. POSAs would also have known that another design choice for implementing Wang-Mills would have been to generate **no** annotation when all

terms are included in the search result. This alternative implementation is consistent with Wang’s teaching that search-engine users already assumed that all terms would be present in a search result. Wang, [0002]. Thus, POSAs would have recognized that users would have similarly assumed that all search terms were present if a search result had no annotation.

6. **Claim 8: “The method of claim 7, wherein a search term element is considered present in a webpage if the webpage contains at least one of: the search term element, a synonym of the search term element, or a misspelled version of the search term element.”**

327. As I discussed above (§XII.C; XII.D.1.c), a search term element in Wang-Mills is considered present in a webpage if the webpage contains the search term element itself. Wang, [0004] (“One aspect of the invention is directed to locating web documents that satisfy a subset of the words in a search-engine query.... [T]he search engine may query the words against an inverted index of terms found by a web crawler and check the documents the terms were found in.”), [0014] (“In one embodiment, once the user submits the search-engine query, the search engine checks an inverted index to **locate documents that contain each separate keyword in the query.**”).

328. For the reasons I discussed above (Ground 1A, **claim 8**), it would have also been obvious to POSAs as beneficial and conventional for a search engine (like Wang-Mills’s) to consider a search term to be present if *a synonym or*

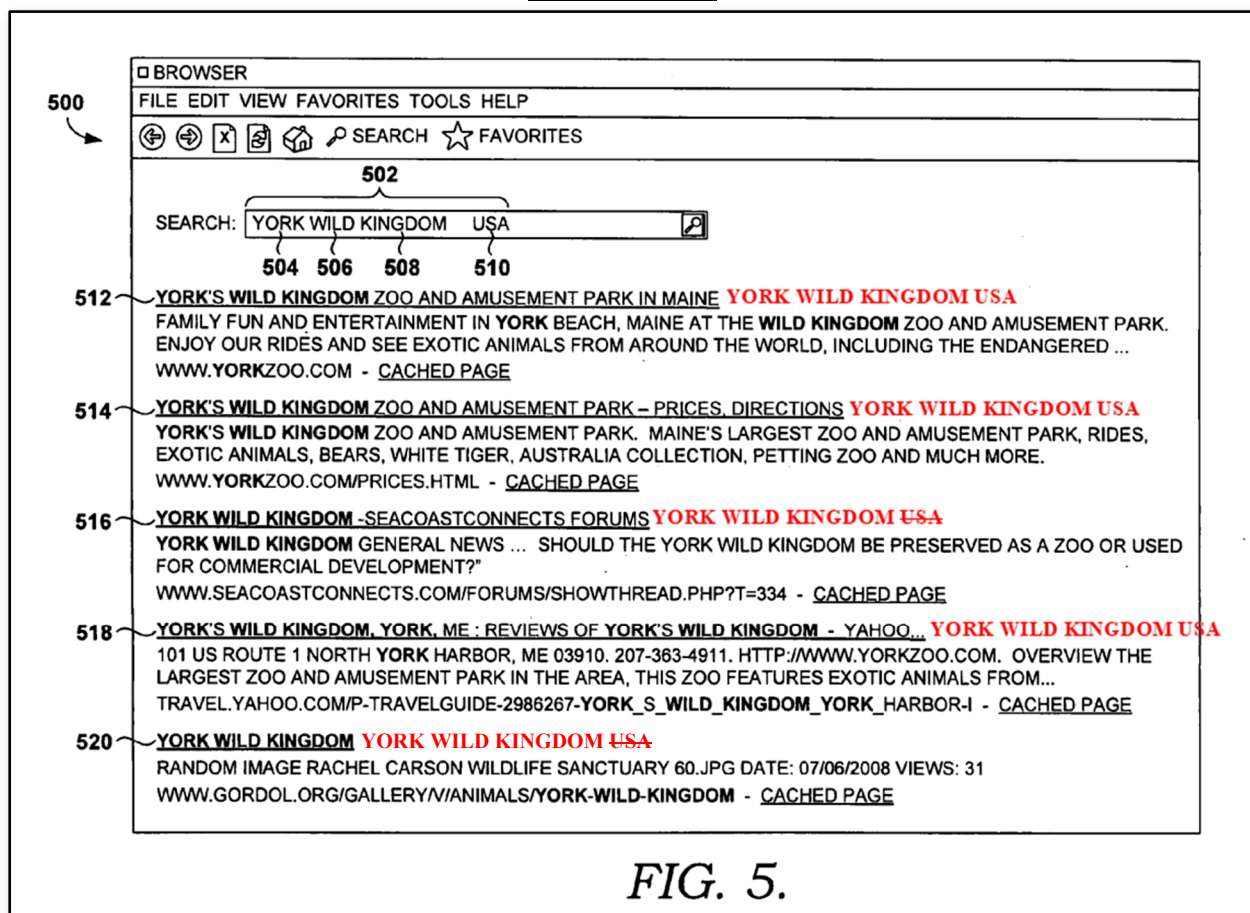
a misspelled version of the search term element is present in the webpage. *See supra* §VIII.D.6 (citing and discussing EX1059 and EX1060).

7. **Claim 12: “The method of claim 1, wherein the text representing the at least one search term element is shown in one or more of the following formats: (i) a font representing the text has been altered; (ii) the text is shown with one or more lines merged with the text; (iii) the text is shown with one or more lines superimposed thereupon; (iv) the text is shown within a shaded area; or (v) the text is shown with a reversed format.”**

329. As shown again below, Wang-Mills’s annotation comprises *text representing the at least one search term element* (e.g., “USA”) with a strikethrough (e.g., in the annotations for results 516 and 520), which is *in one or more of the following formats* (i) *a font representing the text has been altered*, (ii) *the text is shown with one or more lines merged with the text* and/or (iii) *the text is shown with one or more lines superimposed thereupon*.¹⁵

¹⁵ As I discussed above (§VIII.D.7, Ground 1A, **claim 12**), the ’001 patent does not explain the difference between text with “merged” lines versus “superimposed” lines. However, POSAs understood Wang-Mills’s strikethrough text meets at least one (if not both) of those formats.

Wang-Mills



8. **Claim 13: “The method of claim 1, wherein the annotation enables the user to reduce lost time, thereby speeding an Internet search process.”**

330. POSAs would have understood that Wang-Mills’s *annotation* (which I discussed above §§XII.D.1.f-g) *enables the user to reduce lost time, thereby speeding an Internet search process* because, without having to lengthen the process by clicking on each website to review it, *the annotation* indicates which search-term elements are present and missing from each search result’s referenced webpage and some users want to review results that include all the terms and/or a particular search term before reviewing (or ignoring entirely) results that are

missing that particular term. For example, the strikethrough of “~~USA~~” in the example above indicates that the resulting webpages are less relevant to the user than webpages that explicitly include “USA” and the other user-specified keywords. *See also* Mills, 5:25-26 (explaining that search-term annotations like those in Mills help user device to “not select such a group [of results] where other groups appear to be more relevant” (because they are not missing a search term that the user deems important)).

331. My opinion that Wang-Mills’s *annotation enables the user to reduce lost time, thereby speeding an Internet search process* is further corroborated by EX1030 (at 18:26-48), Bates (at [0008]-[0009]), and Mills (at 5:25-26: disclosing that the search-term annotations allow user to “not select such a group [of results] where other groups appear to be more **relevant**”).

9. Claim 14

332. As I discussed above (Ground 1A, §VIII.D.9), claim 14’s system largely mirrors claim 1’s method, with the method steps implemented by various *modules*, which POSAs understood to be hardware and/or software. *See, e.g.*, EX1061, [0073]. Wang says its “search-engine server” comprises server hardware “to execute the software described” as implementing Wang’s system/method. Wang, [0032]. For example, Wang’s FIG. 3B illustrates a “front end 308” that “represents the software components that interact with the client computing

device” (Wang, [0046]) and the front end comprises a “parser 312, which is software that splits the search-engine query A into individual keywords” (Wang, [0047]).

333. Mills’s FIG. 4 similarly discloses a server, which includes “memory 306” that comprises “several components and/or applications that are executable” by a processor to perform Mills’s annotation system/method. Mills, 9:22-43.

334. Thus, Wang and Mills teach (or at least suggest and render obvious) implementing the system components / method steps that would have been used in Wang-Mills as *modules*.

335. Wang-Mills meets the following limitations of claim 14 for the reasons discussed in the corresponding sections above.

Limitation	Addressed in Section:
[14PRE]	§XII.D.1.a ([1PRE])
[14A]	§XII.D.1.b ([1A]; in an obvious implementation where the receiving is implemented in hardware and/or software (<i>i.e., a receiving module</i>)). Bates, [0037] (“invention applies” to using “computer programs, logic, and configurations that provide the functions described”)
[14B]	§XII.D.1.c ([1B])
[14C]	§XII.D.1.d ([1C])

[14D]	§XII.D.1.e ([1D])
[14E]	§XII.D.1.f ([1E]; in an obvious implementation where the determining is performed by hardware and/or software (<i>i.e., a determining module</i>)). Bates, [0037]
[14F]	§XII.D.1.g ([1F])
[14G]	§XII.D.1.h ([1G]; in an obvious implementation where the annotating is performed by hardware and/or software (<i>i.e., an annotating module</i>)). Bates, [0037]

10. Claims 15-17, 20-21, and 25-26

336. Wang-Mills meet the limitations added by the claims below for the reasons discussed in the corresponding sections above, where the system is implemented using the *modules* that I discussed above (§XII.D.9).

Claim	Addressed in Section:
15	§XII.D.2 ([claim 2])
16	§XII.D.3 ([claim 3])
17	§XII.D.4 ([claim 4])
20	§XII.D.5 ([claim 7])
21	§XII.D.6 ([claim 8])
25	§XII.D.7 ([claim 12])
26	§XII.D.8 ([claim 13])

XIII. GROUND 2B: GROUND 2A’S WANG-MILLS COMBINATION IN VIEW OF NAICK RENDERS OBVIOUS CLAIMS 5-6 AND 18-19

337. Ground 2B challenges dependent claims 5 and 18 (and their dependent claims 6 and 19), which each require the *descendant-webpage limitation* (which I defined in §IX above in Ground 1B).

A. The Wang-Mills-Naick Combination

338. As I discussed above in Ground 1B (§IX.A), in identifying a webpage as a search result, Naick’s search technique considers whether the user’s search terms are found on either (or both) the webpage and its descendant webpage(s) because doing so can better ensure that the search engine identifies “possible relevant information.” Naick, [0004]-[0005]. Naick is thus directed to the same basic goal as Wang and Mills that I discussed above (§§XII.A-B)—providing users with relevant search results that conventional search engines may miss.

339. Thus, in my opinion, POSAs would have had the same reasons to augment Wang-Mills based on Naick in the same ways that I discussed above in Ground 1B (§IX.B) that POSAs would have had reason to augment Bates-alone and Bates-Bhagat based on Naick.

340. It would have also been an obvious implementation to limit the searching to descendent webpages that linked one level from the webpage of interest, for the same reason I discussed above in Ground 1B (§IX.B). (However, as I discussed above (§IX), the claims challenged by Ground 2B (5 and 18, and

their dependent claims 6 and 19) do not require considering **only** descendent webpages one level from the referenced webpage.)

341. In my opinion, POSAs would have had a reasonable expectation of success because Naick says its “[s]earch logic may be substantially similar to that of conventional search systems” (Naick, [0026]) and only requires a “search engine” with “conventional components” (Naick, [0028]-[0029]).

B. Mapping to Challenged Claims

1. Claims 5 and 18

342. Claims 5 and 18 depend, respectively, from independent claims 1 and 14. Wang-Mills-Naick meets those independent claims for the reasons I discussed above (§XII.D.1, §XII.D.9). Ground 2B’s Wang-Mills-Naick combination builds on Ground 2A’s Wang-Mills combination, and meets those independent claims for the same reasons I discussed above that Wang-Mills does.

343. As I discussed above in §XIII.A, Wang-Mills-Naick includes the *annotations* used in Wang-Mills that I discussed above (§§XII.D.1.f-g, Ground 2A, limitation [1E]-[1F]), implemented using the modules that I discussed above (§XII.D.9, Ground 2A, **claim 14**). As I discussed above for claim 7 (§XII.D.5), Wang-Mills *determines not to generate the annotation* that meets [1E]-[1F] (§§XII.D.1.f-g) and [14E]-[14F] (§XII.D.9) *if all search term elements are present in the referenced webpage*. In Ground 2B, based on Naick, *all search terms are*

considered *present* (and *the annotation* that meets claim 7, which identifies a missing search term, is **not generated**) if each *search term* is present in either *the referenced webpage* **or** *a descendent webpage linked one level therefrom*. Naick, [0004]-[0006], [0022]-[0023].

2. Claims 6 and 19

344. Claims 6 and 19 depend, respectively, from claims 5 and 18, and add the same limitation that claim 8 adds to dependent claim 7. As I discussed above, the added limitation requires that the annotation take at least one of a particular format recited in the limitation. *See supra* §XII.D.6 (Ground 2A, **claim 8**).

345. Ground 2B's Wang-Mills-Naick combination (§XIII.A) maintains the same annotations that I discussed above for Wang-Mills in Ground 2A (§XII.D.6, **claim 8**), and thus Ground 2B's Wang-Mills-Naick combination meets claims 6 and 19 for the same reasons that I discussed above in Ground 2A that Wang-Mills meets claim 8 and in Ground 2B that Wang-Mills-Naick meets claims 5 and 18.

XIV. GROUND 2C: GROUND 2A’S WANG-MILLS COMBINATIONS IN VIEW OF BRINSON RENDER OBVIOUS CLAIMS 9 AND 22

346. Ground 2C challenges claims that recite the *selectable-filtering-function* limitation (which I defined in §X above in Ground 1C).

A. The Wang-Mills-Brinson Combination

347. As I discussed above in Ground 2A (§XII.C), Wang-Mills uses Wang’s relaxed search, which identifies search results containing a subset, but potentially not all, of the user’s search terms. But Wang also says “certain keywords in the search-engine query may be designated not to be relaxed, meaning all retrieved documents **must include** the non-relaxed word.” Wang, [0045]. However, Wang does not say how the user can identify a mandatory term to the search engine, *i.e.*, to indicate that a particular search term is not allowed to be absent from a search result.

348. As I discussed above for Ground 1C (§X.A), Brinson discloses a user-friendly GUI that allows a user to identify a search term as a “Require[d] Term,” which means search “results must include this term” (*i.e.*, the term is mandatory). Brinson, [0045], [0070]-[0071], [0075]. For example, as I discussed above (§VIII.C), Brinson’s Figure 18 suggests making each search term listed next to a search-result grouping selectable to designate its weight; for example, each individual keyword displayed adjacent to search results “can be selected by the user to refine the present search,” e.g., by designating them “Required.” Brinson,

[0073]; FIG. 18. This is also consistent with Mills, which teaches that its altered-search strings “may be clicked upon” to refine the search results. Mills, 6:53-57. As I also discussed above (§X.B; citing Fowler and Stonehocker as corroboration), a known, beneficial technique for implementing what Brinson describes would have applied the “required”-term designation to the already-identified search results, rather than execute a new search.

349. Thus, in my opinion, in view of Brinson, POSAs would have had reason to augment Wang-Mills (Ground 2A) to include a user-selectable GUI element (*e.g.*, clickable buttons or text) for “designat[ing]” that a search term “must [be] include[d]” in the search results by adapting aspects of Brinson’s (or another conventional) GUI for adjusting the importance/weight of search term elements. Wang, [0045]. Doing so would have also been obvious to a POSA applying aspects of Brinson’s known GUI (or aspects of other conventional GUIs, like clickable pop-up menus, drop-down boxes, and/or slider controls) for beneficially making a search term mandatory to known search engines ready for the improvement (of being able to make a term mandatory) to yield the predictable result of Wang’s search engine providing an interface that lets users make a search term mandatory (as Wang says to do). *See* EX1068, FIGS. 21-23, [0195]-[0207]; EX1047, FIG. 1D, [0020]; EX1050, FIG. 9, [0071]-[0072].

350. In Ground 2C's Wang-Mills-Brinson combination, the search engine is augmented to include a user-selectable GUI element that allows a user to select a previously entered search term and make it a required (mandatory) term that must be included in each search result. *See also* §X.B *supra* (citing corroboration of other conventional GUI elements in the prior art for adjusting search-term weight/importance).

351. In my opinion, POSAs would have had a reasonable expectation of success in the combination because, as I discussed above, Wang expressly supports the ability to make a search term mandatory (Wang, [0045]), and it would have required only ordinary programming skill to adapt weight-selecting aspects like those in Brinson's GUI (which used conventional webpage elements, like clickable text and buttons) to be implemented in Wang-Mills's search engines.

B. Mapping to Challenged Claims

1. Claims 9 and 22

352. Claims 9 and 22 depend from independent claims 1 and 14, respectively. Ground 2C's Wang-Mills-Brinson combination (§XIV.A) builds on Ground 2A's Wang-Mills combination (§XII.C) and thus meets claims 1 and 14 for the same reasons I discussed above that Wang-Mills does.

353. Claims 9 and 22 add the *selectable-filtering-function* limitation to claims 1 and 14. As I discussed above, POSAs would have had motivation to

augment Wang-Mills to include, based on Brinson, user-selectable GUI elements (*e.g.*, clickable buttons or text) that allow users to designate a search term as mandatory. As I discussed above (§XIV.A), Wang-Mills-Brinson would have applied the “required”-term designation to the already-identified search results, rather than execute a new search. Once augmented in this manner, Wang-Mills-Brinson meets the *selectable-filtering-function* limitation because selecting the GUI element to designate a **missing** search term as “required” *causes* the search-result webpages **missing** that search term *to be removed from being displayed* because those webpages are missing the now-required search term.

354. As I discussed above (§XII.D.9, **claim 14**), Wang and Mills teach (or at least suggest) implementing their systems as one or more *modules*. Wang, FIG. 3B, [0032], [0046]-[0047]; Mills, FIG. 4, 9:22-43; EX1061, [0073]. Brinson similarly teaches that its system is implemented by “an application program run by the server” (*i.e.*, a combination of hardware and software), which teaches or suggests using a *module*. Brinson, [0028]. Thus, the Ground 2C combinations would have included hardware and/or software to implement the above-discussed filtering function—*i.e.*, a *filtering module*, as recited in claim 22.

355. If claims 9 and 22 require the search results to be updated in response to a single click by the user, that would have been obvious as a simple, beneficial design option for user convenience (*e.g.*, the added convenience of not requiring

the user to select multiple filter buttons before updating the search results), for the reasons I discussed above with corroboration (§X.C.1; Ground 1C, **claims 9 & 22**).

XV. GROUND 2D: GROUND 2A’S WANG-MILLS COMBINATION IN VIEW OF MEHTA RENDER OBVIOUS CLAIMS 10-11 AND 23-24

356. Ground 2D challenges claims which require the claimed system (claims 10-11) or method (claims 23-24) to include the *sponsored-links* limitation (which I defined in §XI above in Ground 1D).

A. The Wang-Mills-Mehta Combination

357. As I discussed above in Ground 1D (§XI.A), Mehta teaches displaying “relevant advertisement[s]” as “[s]ponsored links” alongside Internet search results. Mehta, [0005]. *See also* EX1001, FIG. 1, 2:51-55 (the ’001 patent itself recognizing that displaying advertisements that relate to a user’s search terms was conventional in the prior art). For the same reasons I discussed in Ground 1D (with corroboration from EX1015, [0004] and EX1016, [0006]), POSAs would have had motivation to include in the Ground 1A and Ground 1B combinations advertisements relating to a user’s search terms based on Mehta and POSAs’ background knowledge (*e.g.*, to generate revenue). In my opinion, based on the same teaching in Mehta and POSAs’ corroborated background knowledge, POSAs would have had the same reasons to display advertisements relating to a user’s search terms in Ground 2A’s Wang-Mills combination.

358. Based on Mehta, Wang-Mills-Mehta would have included advertisement “[s]ponsored links” that are “relevant to [the user’s] search criteria” that would have been displayed on Wang-Mills-Mehta’s search-engine interface. Mehta, [0005]-[0006]; *see also* EX1017, [0006]; EX1018, 1:25-30 (“[T]he user can be presented with **advertisements related to the search query.**”).

359. In my opinion, POSAs would have had a reasonable expectation of success in Wang-Mills-Mehta because, as I discussed above (§XI.B; citing EX1015 and EX1016 as corroboration), displaying such sponsored links was conventional in the field and required only ordinary programming skill to implement in a search-engine user interface.

B. Mapping to Challenged Claims

1. Claims 10 and 23

360. Claims 10 and 23 depend from independent claims 1 and 14, respectively. Ground 2D’s Wang-Mills-Mehta combination (§XV.A) builds on Ground 2A’s Wang-Mills combination and meets claims 1 and 14 for the reasons that Wang-Mills meets claims 1 and 14 (*see* §XII.D.1, §XII.D.9, Ground 2A).

361. Dependent claims 10 and 23 add the *sponsored-links* limitation to claims 1 and 14, respectively. As I discussed above (§XV.A), Mehta provides POSAs with motivation to augment Wang-Mills to display “[s]ponsored links” related to the user’s search terms. Mehta, [0005]-[0006]. Once augmented in this

manner, Wang-Mills-Mehta meets the *sponsored-links* limitation in the same way that the Bates-based Mehta combinations meets that limitation (see §XI.C.1, Ground 1D, above).

362. Based on Mehta, Wang-Mills-Mehta would have included “a rendering rules **module** 340 used” “to determine where and how the advertisements [*i.e., sponsored links*] are to be rendered [*displayed*] on the search results webpage” (Mehta, [0030])—*i.e., an advertising module*, as recited in claim 23.

363. Thus Wang-Mills-Mehta renders claims 10 and 23 obvious.

2. Claims 11 and 24

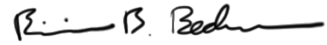
364. Claims 11 and 24 depend from dependent claims 10 and 23, respectively, and further recite that the *sponsored link(s)* discussed in the section directly above (§XV.B.1) are *related to the at least one search element missing in the Internet search result’s referenced webpage*.

365. Ground 2D’s Wang-Mills-Mehta combination meets dependent claims 10 and 23 for the reasons discussed above (§XV.B.1). Wang-Mills-Mehta meets the additional limitation added by dependent claims 11 and 24 for the reasons Bates-Mehta and Bates-Bhagat-Mehta meet that limitation based on Mehta, as I discussed above for Ground 1D, claims 11 and 24 (§XI.C.2). Thus, Wang-Mills-Mehta renders obvious claims 11 and 24.

I declare that all statements made herein of my own knowledge are true, 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 are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

I declare under penalty of perjury that the foregoing is true and correct.

Dated: March 13, 2026



Benjamin B. Bederson

XVI. CLAIM LISTING APPENDIX

Claim 1
[1PRE] A method for providing an annotation for an Internet search result for display to a user of an Internet search engine to warn the user when the Internet search result's referenced webpage is missing one or more search term elements supplied by the user, the method comprising:
[1A] receiving one or more search term elements supplied by a user of an Internet search engine from the user's computing device,
[1B] wherein the Internet search engine generates, based at least in part on the supplied search term elements, at least one Internet search result referencing a webpage, for display on a search results webpage on the user's computing device,
[1C] wherein the Internet search result is displayed on the search results webpage as a search result grouping, and
[1D] wherein the search result grouping is comprised of at least one of: a title for the referenced webpage, an Internet link for the referenced webpage, an excerpt of the referenced webpage, or a URL for the referenced webpage;
[1E] determining whether to generate an annotation for the Internet search result for display on the search results webpage, wherein it is determined to generate the annotation if at least one search term element is missing in the Internet search result's referenced webpage,
[1F] wherein the annotation is comprised of a text representing the at least one search term element that is missing in the Internet search result's referenced webpage; and
[1G] if it is determined to generate the annotation for the Internet search result, causing the annotation to be displayed adjacent to or within the Internet search result's search result grouping on the search results webpage.
Claim 2
The method of claim 1, wherein the annotation is further comprised of a text representing at least one search term element that is present in the referenced webpage.
Claim 3
The method of claim 1, wherein the method of claim 1 is performed by the Internet search engine.

Claim 4
The method of claim 1, wherein the method of claim 1 is performed on the user's computing device by one or more of: a plug-in or a software program.
Claim 5
The method of claim 1, wherein it is determined not to generate the annotation for the Internet search result if each search term element that is missing in the referenced webpage is present in one or more descendant webpages of the referenced webpage, wherein a descendant webpage of the referenced webpage is a webpage linked directly one level from the referenced webpage.
Claim 6
The method of claim 5, wherein a search term element is considered present in a webpage if the webpage contains at least one of: the search term element, a synonym of the search term element, or a misspelled version of the search term element.
Claim 7
The method of claim 1, wherein it is determined not to generate the annotation for the Internet search result if all of the supplied search term elements are present in the Internet search result's referenced webpage.
Claim 8
The method of claim 7, wherein a search term element is considered present in a webpage if the webpage contains at least one of: the search term element, a synonym of the search term element, or a misspelled version of the search term element.
Claim 9
The method of claim 1, further comprising providing a selectable filtering function that, when selected by the user, causes the Internet search result whose referenced webpage is missing the at least one search term element to be removed from being displayed on the search results webpage.
Claim 10
The method of claim 1, further comprising displaying one or more sponsored links on the search results webpage with the Internet search result for which the annotation is generated, where the one or more sponsored links are related to one or more of the supplied search term elements.

Claim 11

The method of claim 10, wherein one or more of the sponsored links is related to the at least one search term element missing in the Internet search result's referenced webpage.

Claim 12

The method of claim 1, wherein the text representing the at least one search term element is shown in one or more of the following formats: (i) a font representing the text has been altered; (ii) the text is shown with one or more lines merged with the text; (iii) the text is shown with one or more lines superimposed thereupon; (iv) the text is shown within a shaded area; or (v) the text is shown with a reversed format.

Claim 13

The method of claim 1, wherein the annotation enables the user to reduce lost time, thereby speeding an Internet search process.

Claim 14

[14PRE] A system for providing an annotation for an Internet search result for display to a user of an Internet search engine to warn the user when the Internet search result's referenced webpage is missing one or more search term elements supplied by the user, the system comprising:

[14A] a receiving module for receiving one or more search term elements supplied by a user of an Internet search engine from the user's computing device,

[14B] wherein the Internet search engine generates, based at least in part on the supplied search term elements, at least one Internet search result referencing a webpage for display on a search results webpage on the user's computing device,

[14C] wherein the Internet search result is displayed on the search results webpage as a search result grouping, and

[14D] wherein the search result grouping is comprised of at least one of: a title for the referenced webpage, an Internet link for the referenced webpage, an excerpt of the referenced webpage, or a URL for the referenced webpage;

[14E] a determining module for determining whether to generate an annotation for the Internet search result for display on the search results webpage, wherein the determining module determines to generate the annotation if at least one search term element is missing in the Internet search result's referenced webpage,

[14F] wherein the annotation is comprised of a text representing the at least one search term element that is missing in the Internet search result's referenced webpage; and
[14G] an annotating module for causing the annotation to be displayed adjacent to or within the Internet search result's search result grouping on the search results webpage if the determining module determines to generate the annotation for the Internet search result.
Claim 15
The system of claim 14, wherein the annotation is further comprised of a text representing at least one search term element that is present in the referenced webpage.
Claim 16
The system of claim 14, wherein the receiving module, the determining module, and the annotating module are part of the Internet search engine.
Claim 17
The system of claim 14, wherein the receiving module, the determining module, and the annotating module reside on the user's computing device and are part of one or more of: a plug-in or a software program.
Claim 18
The system of claim 14, wherein the determining module determines not to generate the annotation for the Internet search result if each search term element that is missing in the referenced webpage is present in one or more descendant webpages of the referenced webpage, wherein a descendant webpage of the referenced webpage is a webpage linked directly one level from the referenced webpage.
Claim 19
The system of claim 18, wherein a search term element is considered present in a webpage if the webpage contains at least one of: the search term element, a synonym of the search term element, or a misspelled version of the search term element.
Claim 20
The system of claim 14, wherein the determining module determines not to generate the annotation for the Internet search result if all of the supplied search term elements are present in the Internet search result's referenced webpage.

Claim 21
The system of claim 20, wherein a search term element is considered present in a webpage if the webpage contains at least one of: the search term element, a synonym of the search term element, or a misspelled version of the search term element.
Claim 22
The system of claim 14, wherein the system is further comprised of a filtering module for providing a selectable filtering function that, when selected by the user, causes the Internet search result whose referenced webpage is missing the at least one search term element to be removed from being displayed on the search results webpage.
Claim 23
The system of claim 14, wherein the system is further comprised of an advertising module that causes one or more sponsored links to be displayed on the search results webpage with the Internet search result for which the annotation is generated, where the one or more sponsored links are related to one or more of the supplied search term elements.
Claim 24
The system of claim 23, wherein one or more of the sponsored links is related to the at least one search term element missing in the Internet search result's referenced webpage.
Claim 25
The system of claim 14, wherein the text representing the at least one search term element is shown in at least one of the following formats: (i) a font representing the text has been altered; (ii) the text is shown with one or more lines merged with the text; (iii) the text is shown with one or more lines superimposed thereupon; (iv) the text is shown within a shaded area; or (v) the text is shown with a reversed format.
Claim 26
The system of claim 14, wherein the annotation enables the user to reduce lost time, thereby speeding an Internet search process.