

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,
Petitioner,

v.

ACCUSEARCH TECHNOLOGIES LLC,
Patent Owner.

Case No. IPR2026-00288
Patent No. 11,100,184

**PETITION FOR *INTER PARTES* REVIEW
UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. § 42.1 et seq**

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37 C.F.R. § 42.100(b)	4
37 C.F.R. § 42.104(a)	1

APPENDIX LISTING OF EXHIBITS

Exhibit	Description
1001	U.S. Patent No. 11,100,184
1002	Prosecution History of U.S. Patent No. 11,100,184
1003	Declaration of Benjamin B. Bederson, Ph.D. (“Bederson-Decl.”)
1004	Curriculum Vitae of Benjamin B. Bederson, Ph.D.
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

Exhibit	Description
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 (“Sauls”)
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	U.S. Patent Application Publication No. 20080221887A1
1068	U.S. Patent Application Publication No. 20040111467A1
1069	U.S. Patent Application Publication No. 20040162814A1
1070	Declaration of Robert Osann, Jr., in <i>AccuSearch Techs. LLC v. Google LLC</i> , 25-514-GBW (D. Del. July 11, 2025)
1071	U.S. Patent Application Publication No. 20020156917A1

Exhibit	Description
1072	U.S. Patent Application Publication No. 20110119243A1
1073	U.S. Patent Application Publication No. 20100198821A1
1074	U.S. Patent No. 8,515,731
1075	U.S. Patent Application Publication No. 20090210404A1
1076	U.S. Patent Application Publication No. 20110035401A1
1077	U.S. Patent No. 8,165,972
1078	U.S. Patent No. 8,055,669
1079	U.S. Patent No. 6,999,959
1080	Chang, et al., “Search Engines’ Help Systems,” Fifth International Conference on Information Technology: New Generations (IEEE 2008)
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)

MANDATORY NOTICES

A. Real Party-In-Interest

Petitioner Google LLC (“Google”) is the real party-in-interest.¹

B. Related Matters

1. United States Patent & Trademark Office

The application from which U.S. Patent No. 11,100,184 (“the ’184 patent”) issued (U.S. Patent Application No. 17/114,305) is a Continuation of U.S. Patent Application No. 16/790,057 (U.S. Patent No. 10,867,001) filed February 13, 2020, which is a Continuation of U.S. Patent Application No. 16/553,900 (U.S. Patent No. 10,585,959) filed August 28, 2019, which is a Continuation of U.S. Patent Application No. 16/199,192 (U.S. Patent No. 10,437,900) filed November 25, 2018, which is a Continuation of U.S. Patent Application No. 15/383,907 (U.S. Patent No. 10,140,374) filed December 19, 2016, which is a Continuation of U.S. Patent Application No. 14/820,433 (U.S. Patent No. 9,529,920) filed August 6, 2015, which is a Continuation of U.S. Patent Application No. 13/163,614 (U.S. Patent No. 9,104,765) filed June 17, 2011.

¹ Google LLC is a subsidiary of XXVI Holdings Inc., which is a subsidiary of Alphabet Inc. XXVI Holdings Inc. and Alphabet Inc. are not real parties-in-interest to this proceeding.

The following applications are Continuations of U.S. Patent Application No. 17/114,305 (U.S. Patent No. 11,100,184):

- U.S. Patent Application No. 17/395,078 filed August 5, 2021 (*abandoned*);
- U.S. Patent Application No. 18/195,882 (U.S. Patent No. 11,971,937) filed May 10, 2023;
- U.S. Patent Application No. 18/600,949 (U.S. Patent No. 12,292,942) filed March 11, 2024;
- U.S. Patent Application No. 19/054,481 filed February 14, 2025 (*pending*).

2. United States Patent Trial and Appeal Board

Petitioner has filed a petition for *inter partes* review of U.S. Patent No. 10,585,959, which is related to the '184 patent. *See* IPR2026-00286, Paper No. 2 (March 6, 2026).

With this filing, Petitioner is contemporaneously filing petitions for *inter partes* review of U.S. Patent Nos. 10,867,001 and 11,971,937, each of which is also related the '184 patent. Those proceedings are IPR2026-00287 and IPR2026-00289.

3. U.S. District Court for the District of Delaware

The '184 patent is currently asserted in *AccuSearch Technologies LLC v. Google LLC*, Civil Action No. 1:25-cv-00514 (D. Del.).

C. Counsel and Service Information - § 42.8(b)(3) and (4)

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A power of attorney is submitted with the Petition. Counsel for Petitioner consents to service of all documents via electronic mail.

I. CERTIFICATION

Google certifies that the '184 patent is available for, and Google is not barred or estopped from requesting, *inter partes* review. 37 C.F.R. §42.104(a).

II. UNPATENTABILITY GROUNDS

Google requests cancellation of claims 1-22 as follows:

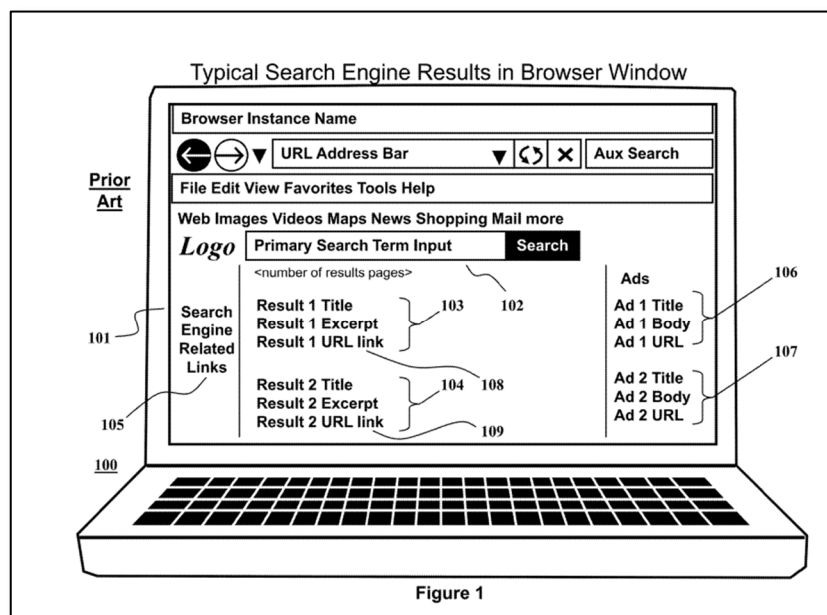
Ground	Reference(s)	Claim(s)	Basis
1A	Bates-Bhagat	1-2, 6-7, 11-12, 16	§103
1B	Bates-Bhagat-Brinson	3-4, 8-9, 13-14	
1C	Bates-Bhagat-Mehta	5, 10, 15, 17-20	
1D	Bates-Bhagat-Mehta-Brinson	21-22	
2A	Wang-Mills	1-2, 6-7, 11-12, 16	
2B	Wang-Mills-Brinson	3-4, 8-9, 13-14	
2C	Wang-Mills-Mehta	5, 10, 15, 17-20	
2D	Wang-Mills-Mehta-Brinson	21-22	

Bates, Wang, Brinson, and Mehta are prior art under pre-AIA §102(b). Mills and Bhagat are prior art under pre-AIA §102(e). None were cited during prosecution.

III. THE '184 PATENT

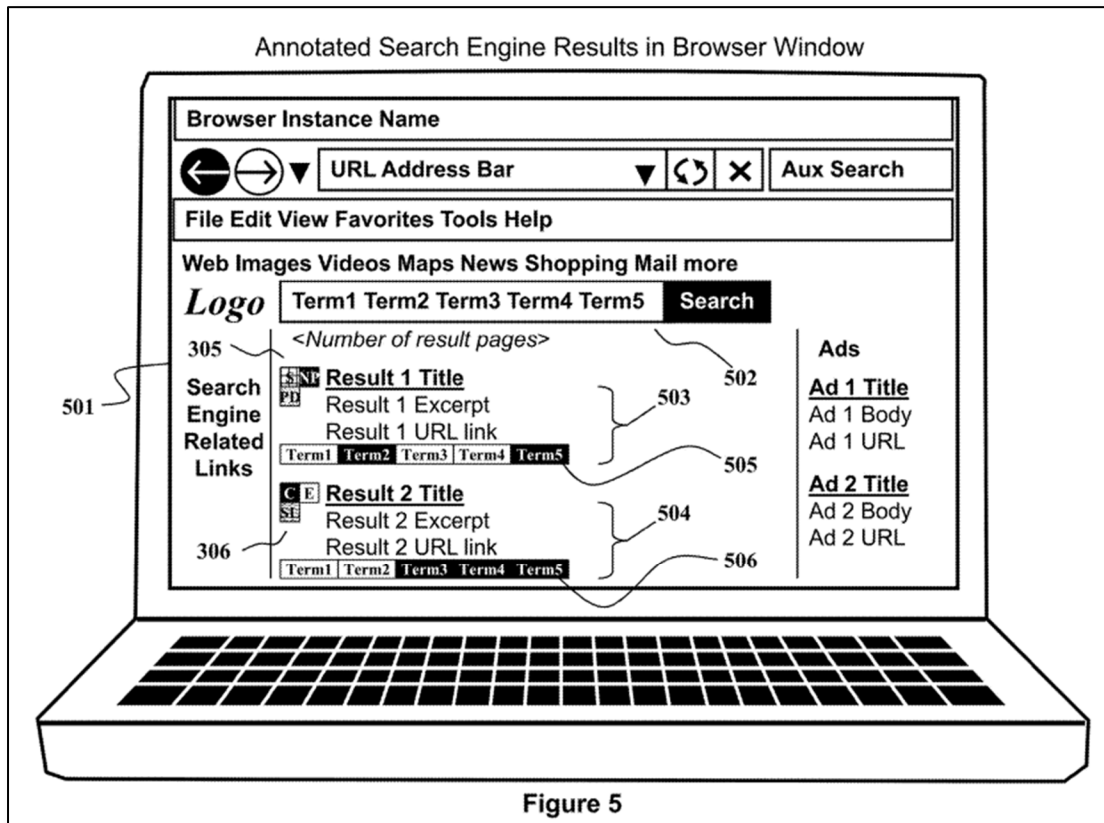
A. Overview

The '184 patent claims priority to June 2011. Figure 1 (below) depicts a user interface for a prior-art search-engine webpage, which includes a search bar for entering search terms.



The patent alleges then-existing search engines could waste a user's time by returning webpages missing "search terms that [the user] had specified." EX1001, 2:20-23. The patent says it would be beneficial if users knew "in advance which [search-result] webpages contain which search term elements." *Id.*, 2:38-41. "This foreknowledge...could prevent the user from wasting their time reviewing pages that are not relevant to their search." *Id.*, 2:64-66.

To provide that “foreknowledge,” the patent annotates each search-result grouping “to indicate which search term elements are present in the webpage referenced by the search result.” *Id.*, 4:33-38.



Above, each search-result grouping includes “annotations 505 and 506,” which “indicat[e]...which search term elements actually appear” on the respective search-result webpages. *Id.*, 10:15-19. In Figure 5’s “exemplary” implementation, “present” “search term elements” are “shown as black text on a white background,” and missing terms are “shown with white text on a black background.” *Id.*, 10:19-23. See EX1003 (“Bederson-Decl.”), ¶¶38-58.

B. Challenged Claims

The challenged claims are reproduced in Section XIV. Independent claim 1's system aligns with Figure 5's embodiment. Bederson-Decl., ¶59. Independent claims 7, 12, 17, and 19 largely mirror claim 1. Each independent claim requires, *inter alia*, a search-result "*annotation*" comprising "*text representing the at least one search term*" that is "*missing*."²

C. Person of Ordinary Skill in the Art (POSA)

POSAs 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. Bederson-Decl., ¶¶33-37.

D. Prosecution History

After an initial amendment, all claims (1-25) were rejected for obviousness-type double-patenting, while claims 12-14 were also rejected as obvious over certain prior art not used herein. EX1002, 74-86, 94-101. The applicant canceled claims 12-14, filed a terminal disclaimer, and claims 1-11 and 15-25 (renumbered as 1-22) were allowed. EX1002, 148-171.

IV. CLAIM INTERPRETATION

Claim terms are given their ordinary meaning in light of the specification and prosecution history. 37 C.F.R. §42.100(b).

² Claim language italicized and bold-italics emphasis added throughout.

V. **GROUND 1A: BATES, BY ITSELF OR COMBINED WITH BHAGAT, RENDERS OBVIOUS CLAIMS 1-2, 6-7, 11-12, 16**

A. **Bates (EX1010)**³

Bates discloses an annotated search-engine interface that uses color to indicate the “occurrence of each keyword” (*i.e.*, search term) in each search result. Abstract. Bates teaches that “color coding search results” helps users “interpret[] search output.” [0001].

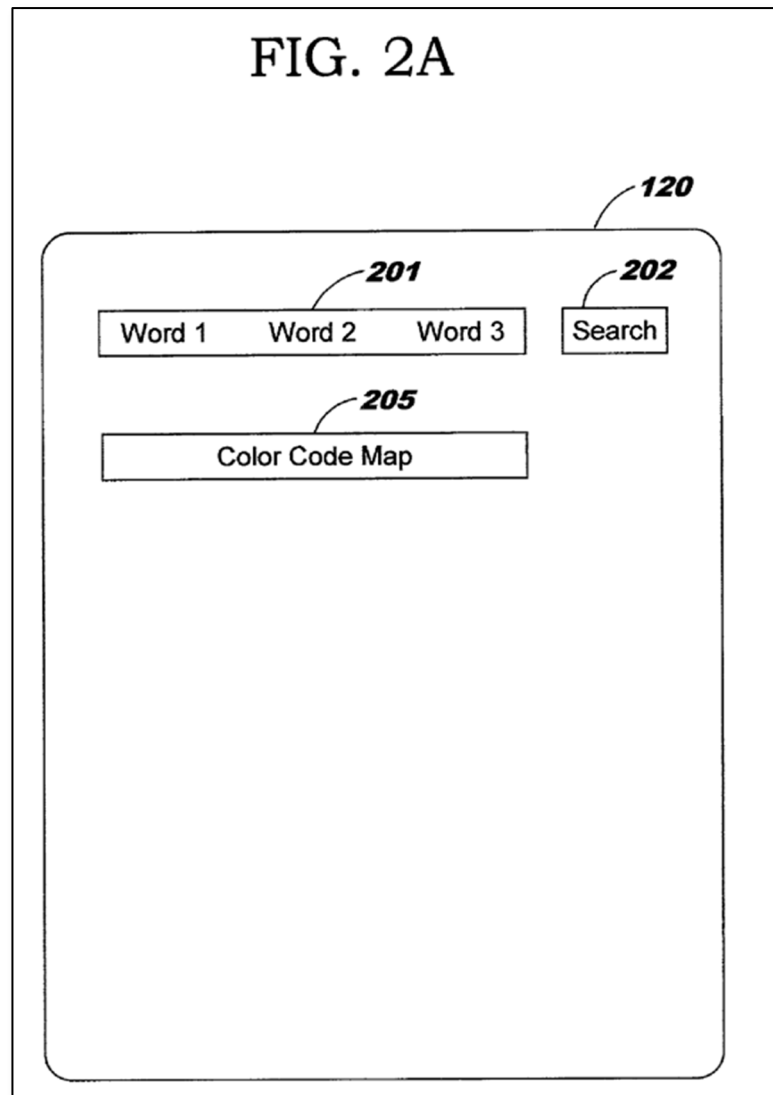
Bates says keyword-based searches are “often interpret[ed]” by search engines “as requests to find web pages that contain any...of the keywords,” which may “return[] an unusably large number of sources.” [0004]; Bederson-Decl., ¶¶64-66. “For example, a searcher might enter three keywords,” but instead of requiring all three keywords, the “search engine would” “find sources that include” just one keyword “in isolation.” [0006]. The user, however, may only “judge” a source as “relevant” if it matches “at least two of the [three] keywords.” [0006].

Bates therefore identifies “a need for...presenting the results...so that the searcher may form an effective picture of the relevance” of search results without having to “examine [results] that lack relevant information” but are nevertheless displayed “in the list of [results].” [0009]. Bates addresses this need by collecting “occurrence data” identifying “whether each keyword is present *or absent in each*

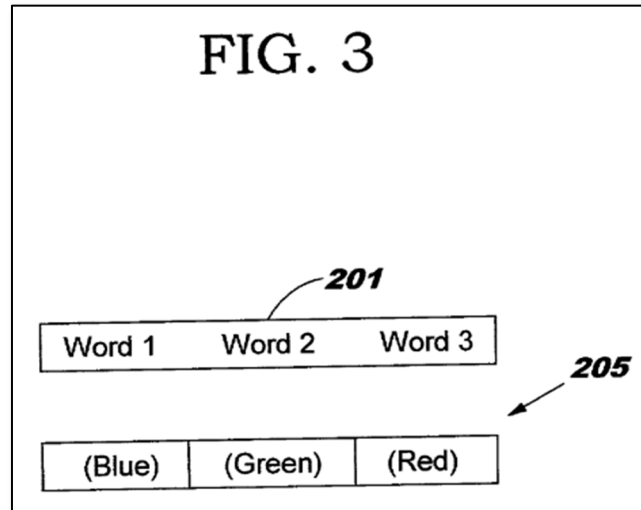
³ Citations in § V.A are to Bates unless indicated otherwise.

web page,” and providing that information in “a correlation indicator” displayed within each search result. [0011]-[0012].

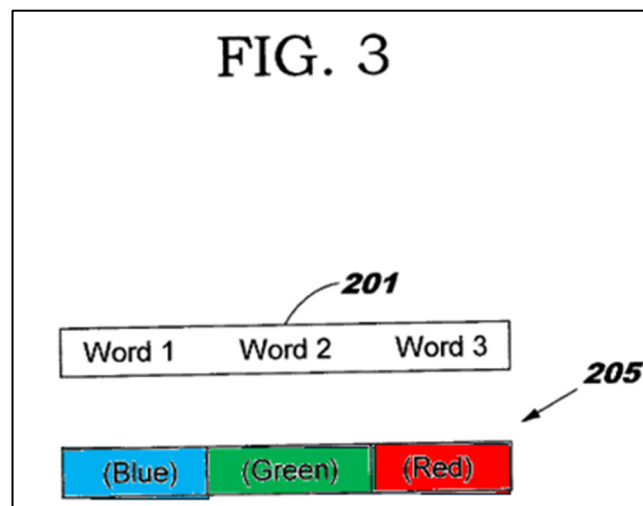
The interface in Bates’s Figure 2A (below) includes “input line 201, wherein keywords may appear as they are entered [by a searcher].” [0018], [0026]. This example shows three keywords: “word1, word2, and word3.” [0026].



A “color code map 205” beneath the input line “provide[s] the searcher with a visual association between colors and keywords.” [0026]. Bates’s Figure 3 (below) “shows an exemplary...color code map 205.” [0029].



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...associated with the colors blue, green, and red, respectively.” [0026]. This is seen in the colored version of Figure 3 below:



In one embodiment, Bates does not use a separate color-code map (like color bar 205 above) 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.” [0031]. Bates calls this an “implicit” color-code map ([0031]), and an example is illustrated below. Bederson-Decl., ¶¶67-71.

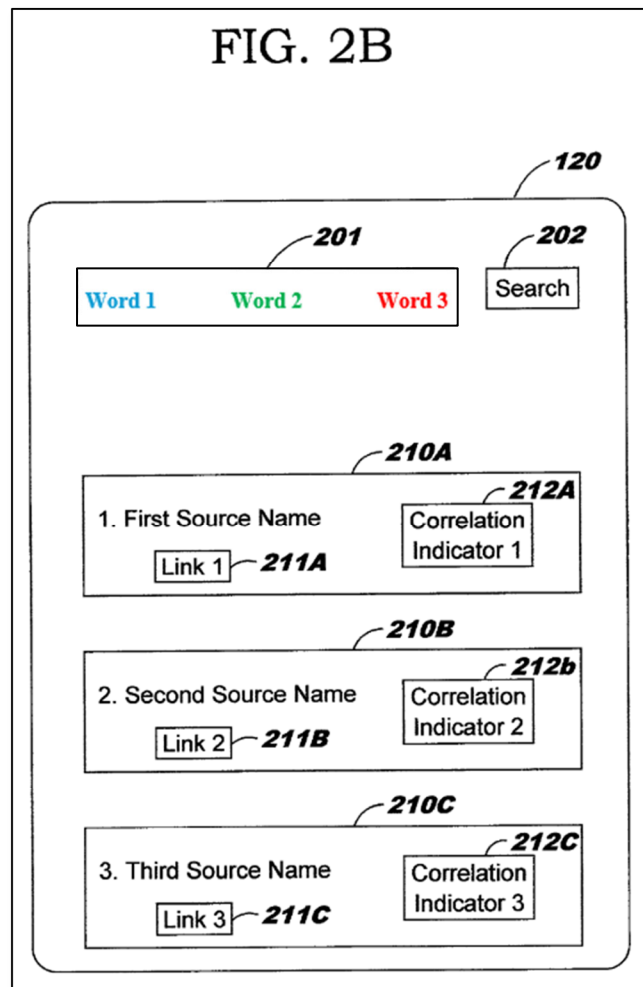
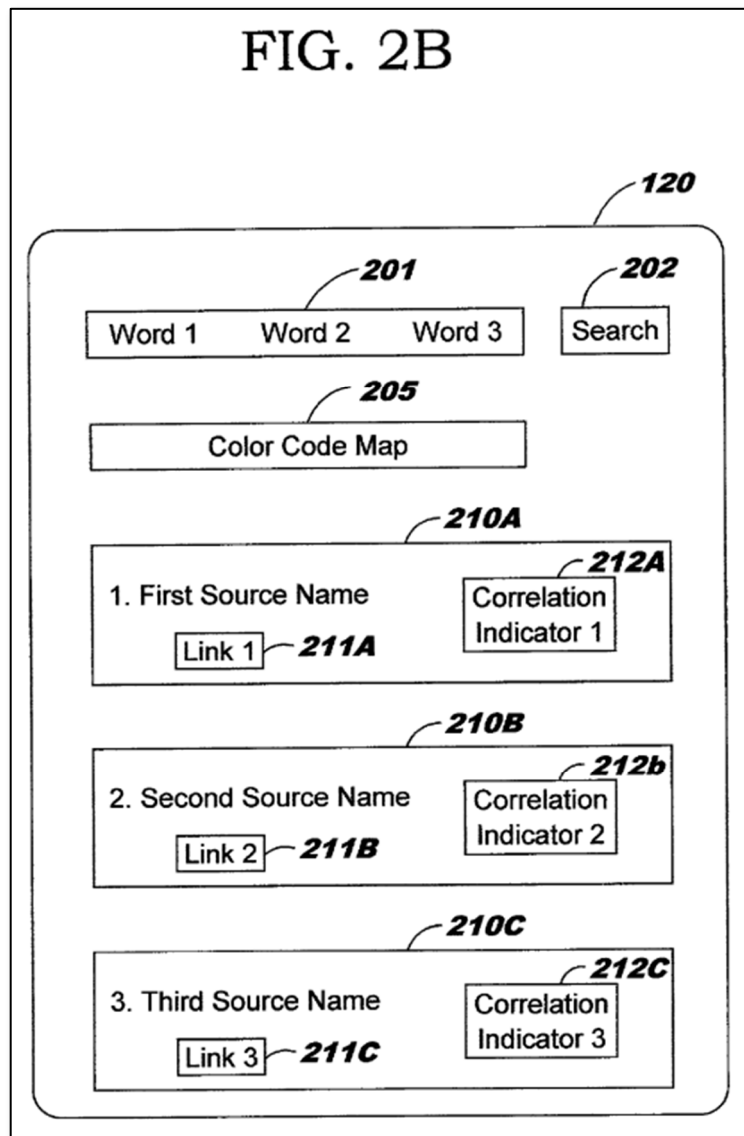
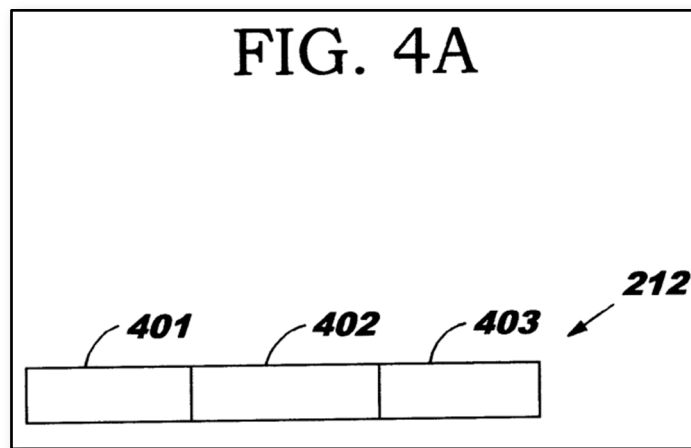


Figure 2B (below) depicts Bates's interface with an "exemplary presentation of search results" with information about webpages 210A-210C "found by the search." [0027], [0018].



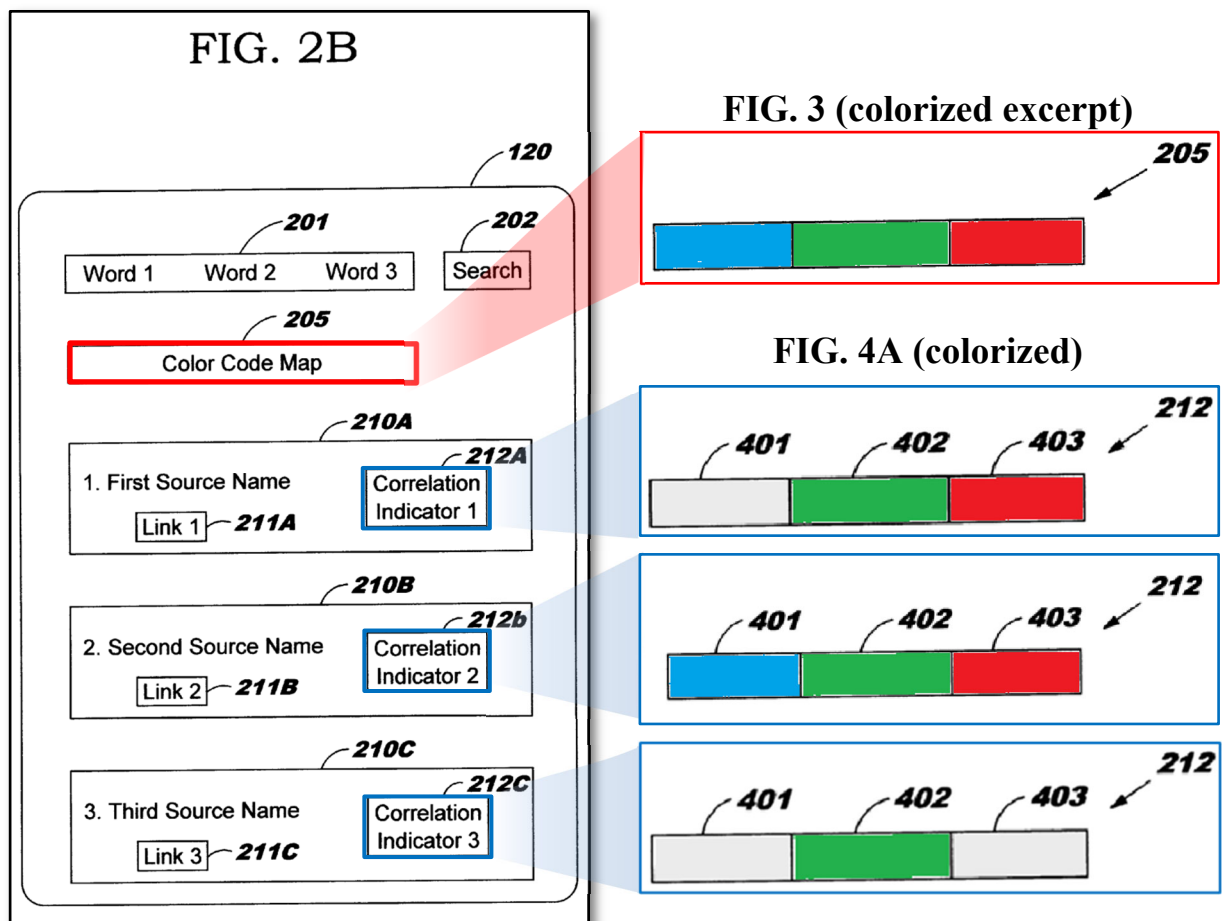
Each search result 210 includes a correlation indicator 212 in “the form of a horizontal bar as shown in FIG. 2B, divided into a number of segments according to the number of keywords on the display line 201. For example, if there are three keywords, the horizontal bar correlation indicator may have three segments 401, 402, and 403 as shown in FIG. 4A [below], associated respectively with the keywords and their colors.” [0033].



Using FIG. 4A’s example, Bates says if keyword word1 is present in a webpage, then segment 401 is colored blue; if keyword word2 is present, then segment 402 is colored green; etc. [0033]. But when a keyword is *not* present, then its segment is “left uncolored, or colored according to a background color not associated with any keyword by the color code map.” [0033].

The demonstrative below illustrates an example where webpage 210B contains all three keywords, but 210A’s webpage is missing word1 and 210C’s webpage is missing word1 and word3 as indicated by the gray-shaded segments (a

“background color not associated with any keyword”—[0033]). “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.” *Id.* Bederson-Decl., ¶¶72-75.



Rather than segmented horizontal bars of colors ([0033]), Bates says the correlation indicator “may be *any* visual presentation that uses a color code to convey the presence or absence...of keywords” ([0036]). Bates thus encourages POSAs to consider alternative designs for its correlation indicators. Bederson-Decl., ¶¶76-77. One obvious alternative implementation based on Bates’s “implicit”-color-code embodiment is discussed *infra* §V.C.1.

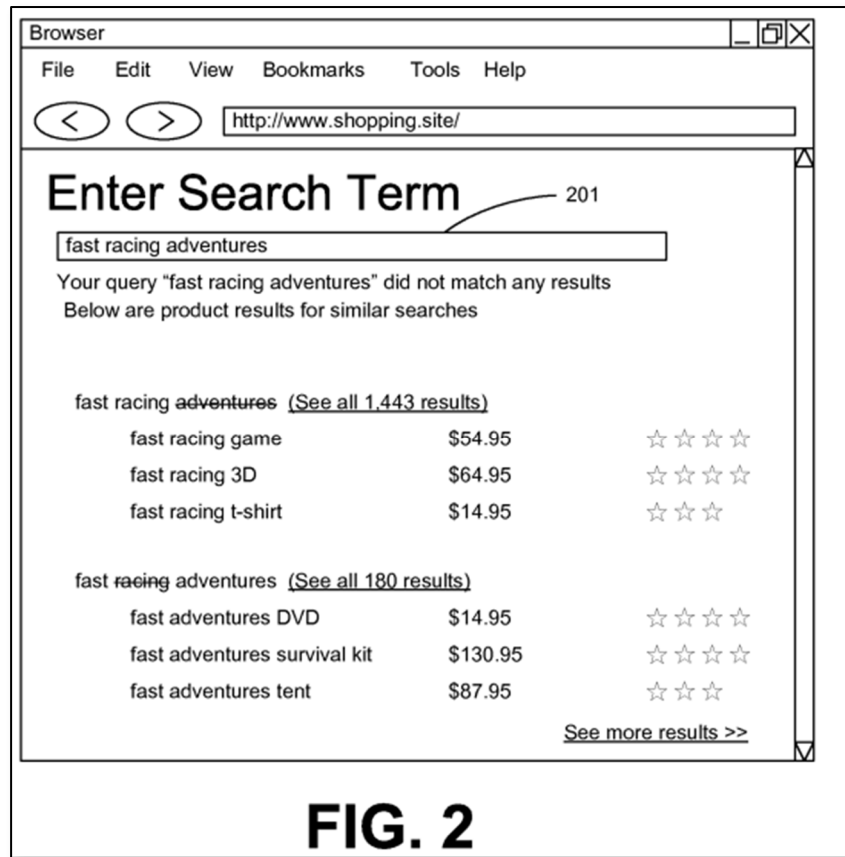
B. Bhagat (EX1011)

While Bates indicates the presence or absence of search terms using colors, POSAs would recognize other ways to visually indicate such information. Bederson-Decl., ¶¶78-79. Bhagat provides one example.

Like Bates, Bhagat discloses a user interface for a “keyword matching” search engine. Bhagat, 1:6-10; FIGS. 2-4. Bhagat’s examples “locate products in an electronic commerce system,” but Bhagat says its techniques also apply to “a general purpose search engine.” Bhagat, 1:54-58, 2:50-67, 4:6-25.

Bhagat says some “search queries...may yield few and/or no search results.” Bhagat, 1:58-62. Rather than display few or no search results, Bhagat says it would be beneficial to generate “suggested queries.” Bhagat, 1:62-2:4; Bederson-Decl., ¶¶80-81. Suggested queries can be generated “by removing one or more search term[s] from [a] search query” to determine if a revised query matches a “historical search query” that Bhagat’s system knows yielded relevant results. Bhagat, 6:4-22; *see also* 6:23-37.

In Figure 2’s example (below), the three-word query “fast racing adventures” “yields no search results.” Bhagat, 8:16-22. In response, Bhagat’s system identifies two, related historical queries by “remov[ing] a search term” from the initial query. Bhagat, 8:29-34.



POSAs understood the strikethrough text “~~adventures~~” and “~~racing~~” above indicates that the corresponding search results are missing the stricken term, but include the other search term(s). Bederson-Decl., ¶¶81-83. Thus, Bhagat taught POSAs that one way to visually indicate to users that a search term is missing in a search result is to display the search term adjacent the search result in strikethrough text. Bederson-Decl., ¶84.

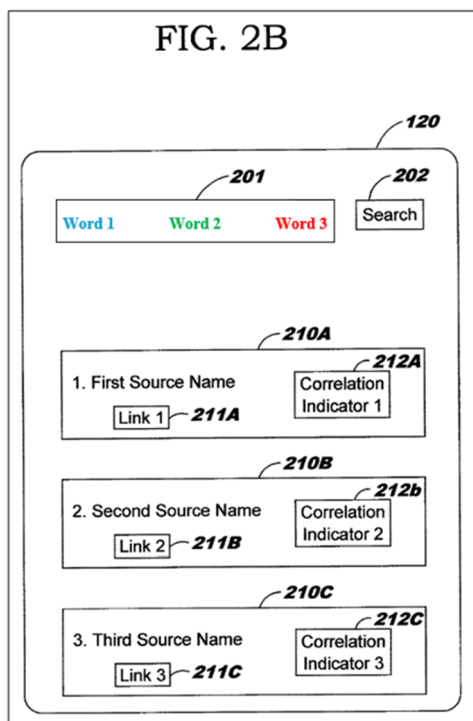
C. Obvious Implementations of Bates and Bates-Bhagat

In Bates’s examples, each correlation indicator segments a horizontal bar with colors to indicate the presence or absence of search terms. Bates, [0033]. However, Bates’s indicator “may be *any visual presentation* that uses a color code to convey

the presence or absence...of keywords in a web page.” *Id.*, [0036]. Bates thus encourages POSAs to consider alternative techniques for visually indicating that search terms are present or absent. Bates itself suggests one alternative (font color), and Bhagat discloses another alternative (stricken text). Implementing Bates’s system using either technique was obvious. Bederson-Decl., ¶85.

1. Bates Alone

As discussed (§V.A) and illustrated below, Bates discloses an embodiment where each search term in the input field is displayed using different colored text, which provides an “implicit” color-code map rather than a separate color bar. 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.” *Id.*; FIG. 2B; Bederson-Decl., ¶¶86-88.



While the correlation indicator 212 for each search result above *could* still comprise segmented horizontal bars of color, another obvious implementation would have simply used the color-coded search terms themselves as correlation indicators. Bederson-Decl., ¶89. Indeed, Bates’s Figures 3 and 4 depict an exemplary correlation indicator that uses essentially the same format as an explicit color-code map, and therefore when an “implicit” color-code map is used it would have made sense to POSAs to use the format of that implicit mapping—*i.e.*, different colored fonts—as correlation indicators. *Id.*

Beyond being a logical implementation of Bates’s explicit teachings, POSAs would recognize several additional reasons for this implementation.

First, remembering what search term corresponds to each color in Bates’s horizontal bar could be unnecessarily cumbersome, and this added mental burden would be beneficially avoided by simply displaying the colored search terms themselves as the correlation indicators. For example, while users *could* memorize the color-code map, that could be challenging for long queries and/or when users are rapidly revising search terms. Bederson-Decl., ¶90. 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 potentially cause users to lose their place in the search results. *Id.* POSAs would 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. Bederson-Decl., ¶¶91. POSAs knew that in user-interface design there are benefits to reducing users' mental-processing load, including by eliminating even small mental tasks elicited by the interface design. Bederson-Decl., ¶¶91-92 (citing EX1066, 73-75, 80).

Second, using color-coded font rather than merely color-coded horizontal bars would have beneficially conveyed the presence or absence of search terms using two compatible forms of visual information: text and color. 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]; Bederson-Decl., ¶¶93. That Bates's “implicit”-color-code embodiment already combines text and color (*i.e.*, different font colors for the text of different search terms) would have further encouraged POSAs to use both forms of visual communication as a correlation indicator too. Bederson-Decl., ¶¶93.

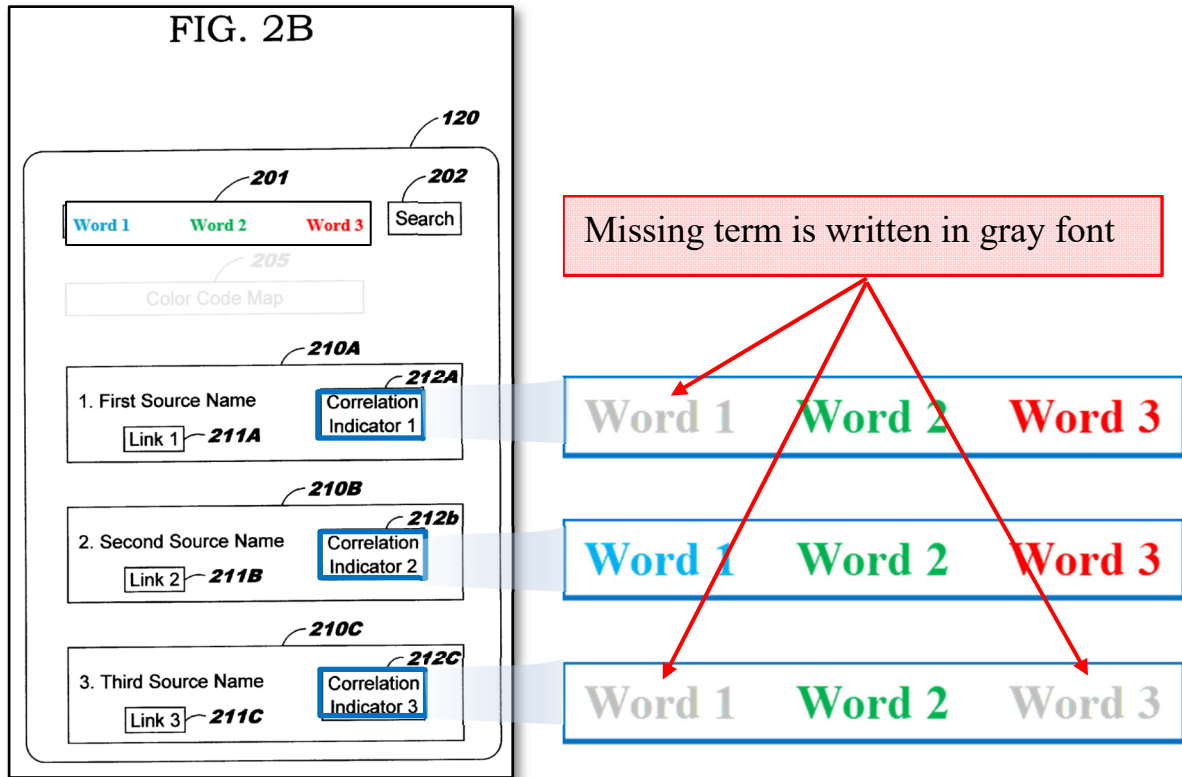
Third, using color-coded text as Bates's correlation indicator would have combined prior-art search-result annotations (color- and text-based annotations) with Bates's known annotation method to yield the predictable result of using color-coding *and* search-term text to indicate the presence/absence of search terms in

search results. *KSR Int’l. Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007); Bederson-Decl., ¶94.

POSAs would have recognized that a straightforward implementation of Bates’s “implicit”-color-code embodiment would change Bates’s correlation indicators from color-coded horizontal bars to color-coded text of the search terms themselves, making the format of each correlation indicator match the format Bates expressly describes for the search input field (analogous to how the original color-bar correlation indicator 212 matched the color-bar map 205 in the explicit-color-code embodiment).⁴ Bederson-Decl., ¶95. Similar to Bates’s horizontal bar, each search term’s text would be displayed using its assigned color when the term is present, and using an un-assigned color (*e.g.*, muted-gray) when the term is not present. Bates, [0028]; Bederson-Decl., ¶¶95-99 (citing EX1024, [0005]; EX1046, [0047], FIG. 6).

⁴ Another obvious implementation would have maintained Bates’s bars of color, but written the search terms within those bars, *e.g.*, in white or black font. Bederson-Decl., ¶100.

The following demonstrative depicts this obvious implementation:



2. Bates-Bhagat

In view of Bhagat, an alternative obvious implementation of Bates would have changed Bates's correlation indicators from bars of colors to text-based indicators of whether search terms are present or missing. For example, POSAs would have used the text of the search terms as correlation indicators, with missing terms formatted with a strikethrough as Bhagat teaches. *Bederson-Decl.*, ¶101. POSAs had several reasons to make this change.

First, as explained for Bates-alone, using text-based annotation would be more user-friendly because a user would not need to memorize a color-code map or scroll

up to remind themselves what color corresponds to what search term. *Supra* §V.C.1 (citing corroboration). Bederson-Decl., ¶102.

Second, 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. Bederson-Decl., ¶103; EX1019, [0002]-[0005], [0010]. Therefore, using search-term text would have made the correlation indicators easier to understand for colorblind users. Bederson-Decl., ¶¶103-106 (citing EX1022, [0012]; EX1051, [0026]-[0028]).

Third, some devices had black-and-white-only displays, which made differentiating between multiple colors difficult. For black-and-white-only displays, using search-term text would have made the correlation indicators easier to understand. Bederson-Decl., ¶107 (citing EX1020, [0044], [0048]; EX1021, [0030], [0042]).

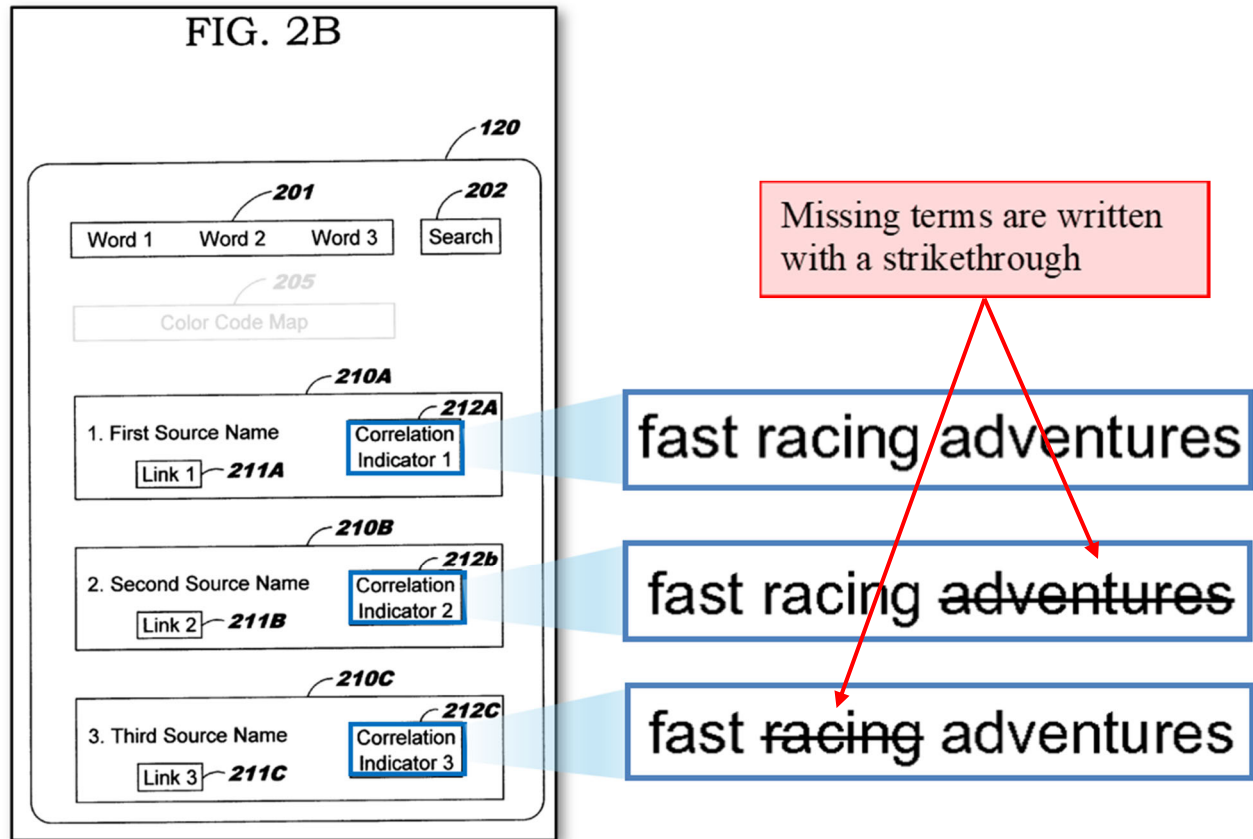
Fourth, using text rather than color to convey information regarding a search result would have been the simple substitution of one known element for another to obtain predictable results. *KSR*, 550 U.S. at 417. Using text to convey information about the contents of a search result was well known. Bederson-Decl., ¶¶109-112 (citing examples, including EX1030, EX1045). Using text rather than color to convey information would have been a routine design choice for POSAs as both

options accomplish the same predictable result: visually conveying information regarding the presence/absence of search terms to users. Bederson-Decl., ¶113.

Finally, given the numerous benefits text-based correlation indicators offer (§V.C.1), POSAs would not have been discouraged from using such indicators simply because Bates ([0036]) expresses a general preference for color. Bederson-Decl., ¶114 (highlighting similarities between indicating a missing term using white/gray color (Bates) and using strikethrough text (Bhagat)); *UCB, Inc. v. Actavis Lab'ys UT, Inc.*, 65 F.4th 679, 692 (Fed. Cir. 2023). Indeed, POSAs would have also known that Bhagat's text annotations could easily be implemented using color font (as Bates, [0031] suggests) with added strikethroughs rather than black font with added strikethroughs, further confirming that Bates's preference for color would not have discouraged POSAs from pursuing the proposed combination. Bederson-Decl., ¶¶114-115.

Using Bates's Figure 2B (annotated below left) as an example of the Bates-Bhagat combination 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 (in black or colored font), using strikethrough format for a term missing from a search result. For example, in response to searching for "fast racing adventures," the second and third correlation indicators below

indicate that “adventures” is missing from result 210B and “racing” is missing from result 210C. Bederson-Decl., ¶116.



POSAs would have reasonably expected success in the two implementations discussed above because Bates ([0031]) explicitly teaches how to replace color-bar coding with text-color coding, Bates ([0033]) explicitly collects search-term occurrence data like that used to generate Bhagat’s strikethroughs, and both references rely on conventional search-computing technologies, like web browsers and search engines (Bates, [0024]; Bhagat, 2:15-17). Bederson-Decl., ¶117. Thus, it would have required only POSAs’ ordinary programming skill to implement Bates-alone and Bates-Bhagat as 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. *Id.*

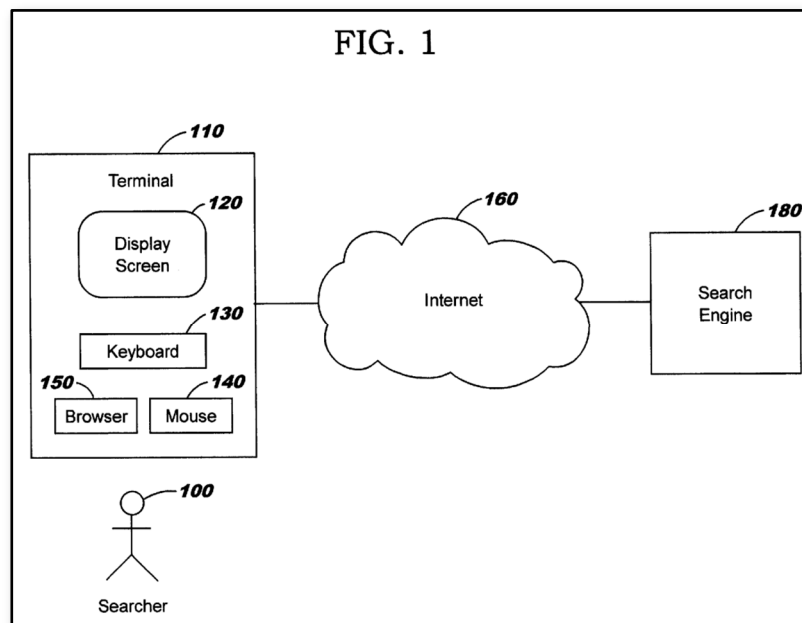
D. Mapping to Claims

1. Claim 1

a. [1PRE] (Internet search system)

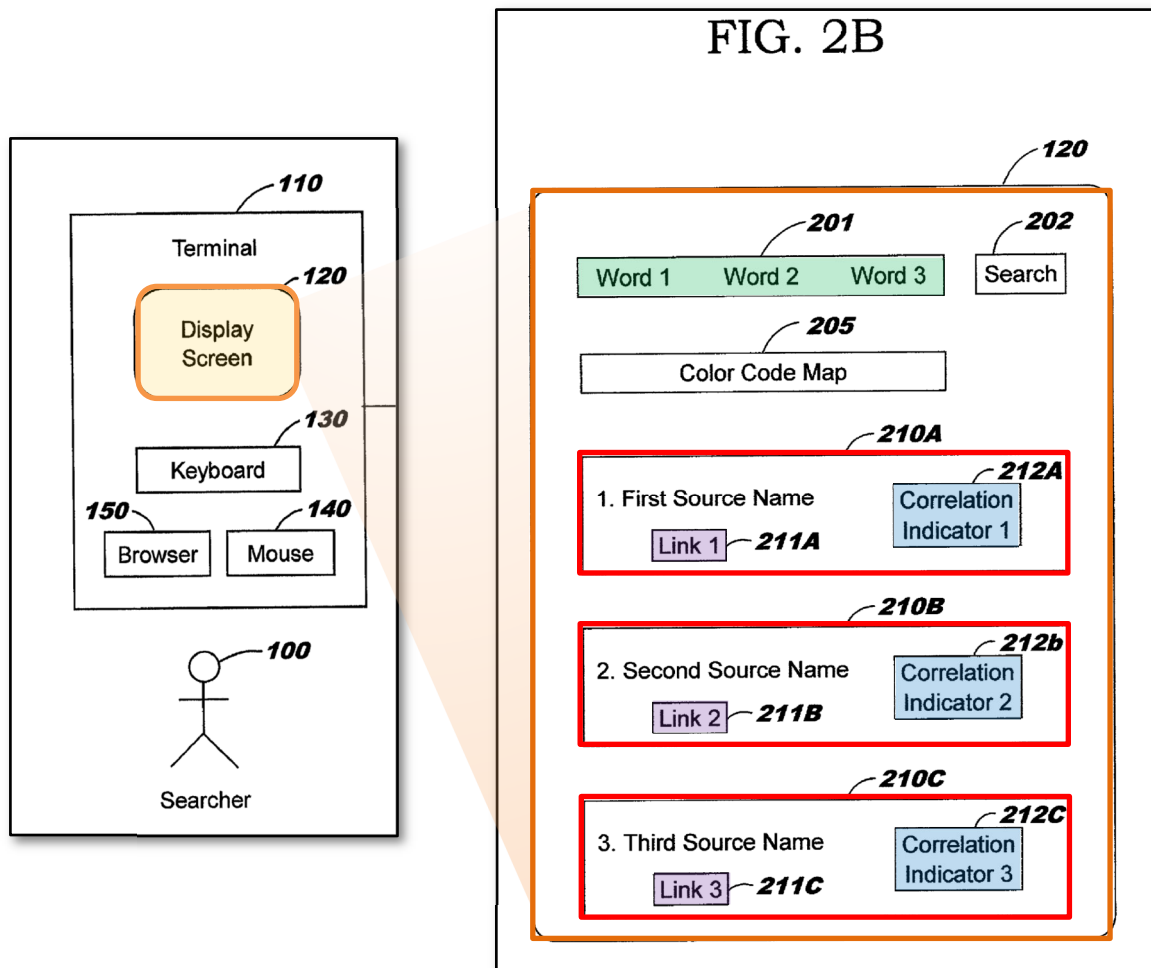
Bates's *system* “cod[es] search results” for “Internet users conduct[ing] searches to find [web]pages” (*i.e.*, is an *Internet search system*). Bates, [0001].

In Bates's FIG. 1 (below), “a searcher employs a terminal 110” ([0023]) to find webpages using “search engine 180” ([0039]). *See also* [0011] (“search engine executes a search...that identif[ies] web pages....”); Bederson-Decl., ¶¶118-119.



“To conduct a search, the searcher 100 may enter keywords” (*i.e.*, *user-specified search term elements*) “into the [terminal’s] browser.” Bates, [0024]. As

illustrated in Figure 1 (highlighted excerpt below left), the terminal's "display screen" (orange) displays the search engine's *interactive graphical user interface* (GUI) illustrated in Figure 2B (highlighted below right). Bates, [0024]; EX1001, 5:15-17 ("user interface...appears...in a browser window"). The example search below comprises "keywords word1, word2, and word3," *i.e.*, three *search term elements* (green), and the GUI displays "information about" three *search results* (210A-210C; red) that *reference webpages* at links 211A-211C (purple), respectively. Bates, [0026]-[0027].



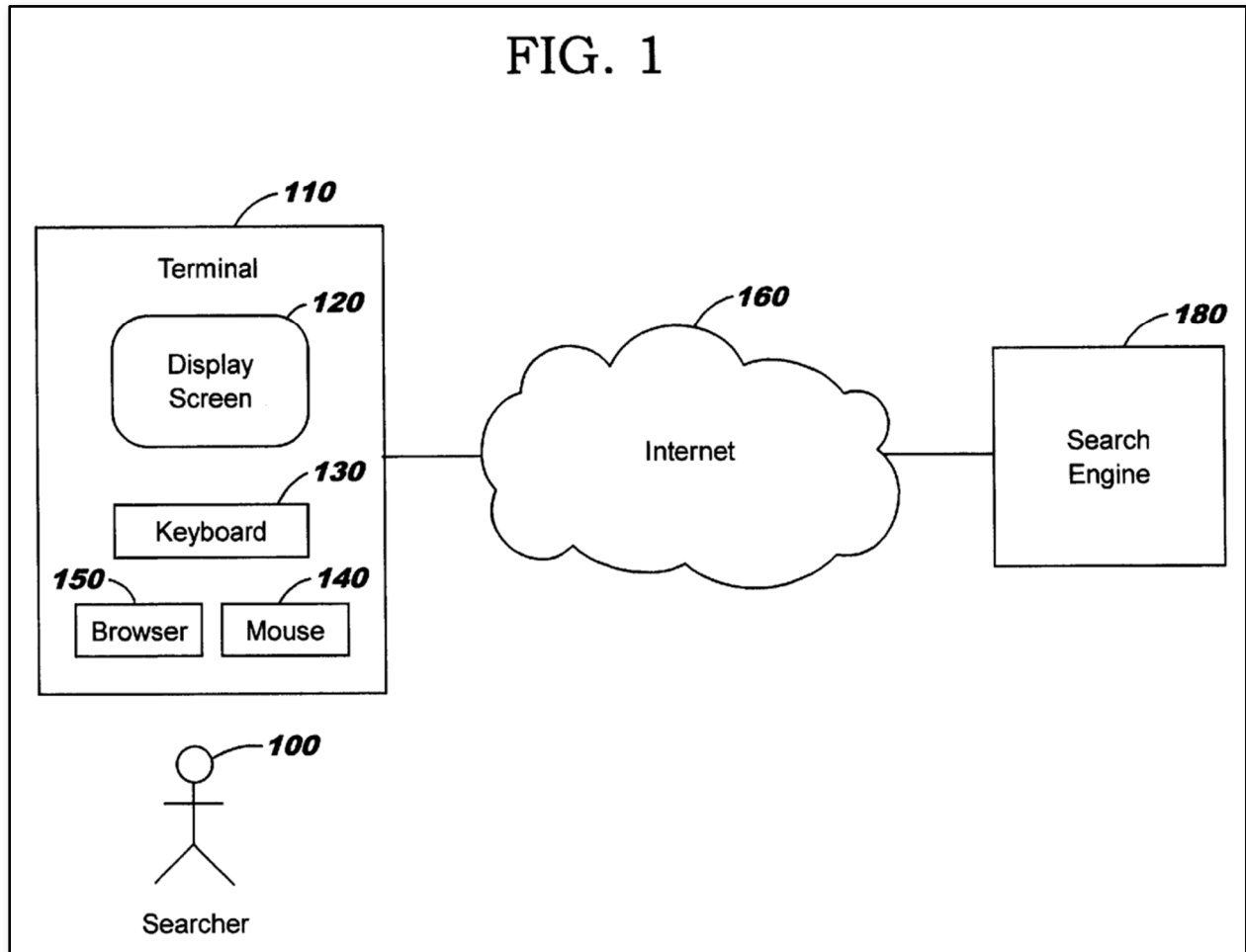
The *search results* are generated based on the *user-specified search term elements*. For example, if “a searcher” “enter[s] three keywords,” “[t]he search engine would then find sources [*webpages*] that include the keyword[s].” Bates, [0006]; [0024]. Bederson-Decl., ¶¶120-121.

Each search result above has a correlation indicator 212 (blue) that indicates when a *search result references a webpage...missing at least one search term*. For example, when “the web page...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]. The correlation indicator, therefore, allows “the searcher” to “readily grasp the relevance of the URL to the search.” Bates, [0033], [0015], [0009], [0040]; *supra* §V.A.

Thus, Bates’s *interactive GUI* allows *the user to readily discern a search result* that is missing a search term *without opening its referenced webpage* because the user can see the correlation indicator identifying the missing term without clicking each webpage. *Infra* §§V.D.d-e (discussing annotation formats); Bederson-Decl., ¶¶122-123.

b. [1A] (first search request)

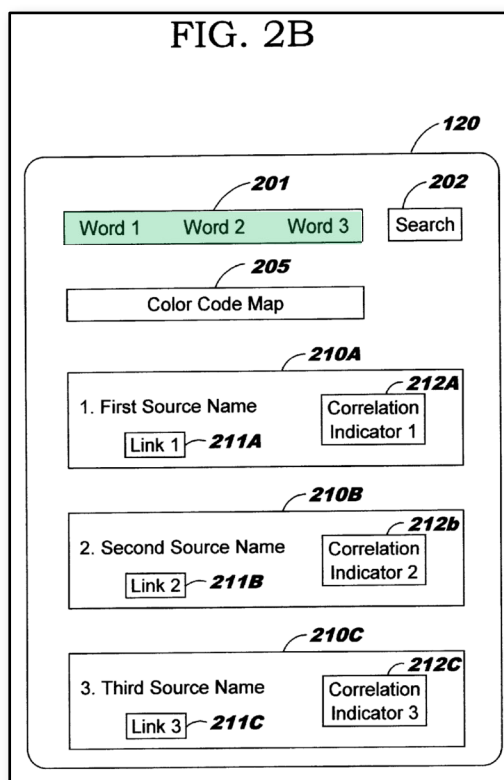
Bates's FIG. 1 (below) shows Bates's "terminal 110" (user-operated *computing device*) with a "display screen 120" and "browser 150." Bates, [0024].



"To conduct a search, the searcher 100 may enter keywords into the browser," which are "sent over the Internet" "to the search engine." Bates, [0024], FIG. 1. Because Bates's search engine "executes a search" (Bates, [0011]) using search terms received over the Internet, it would have been conventional, beneficial, and

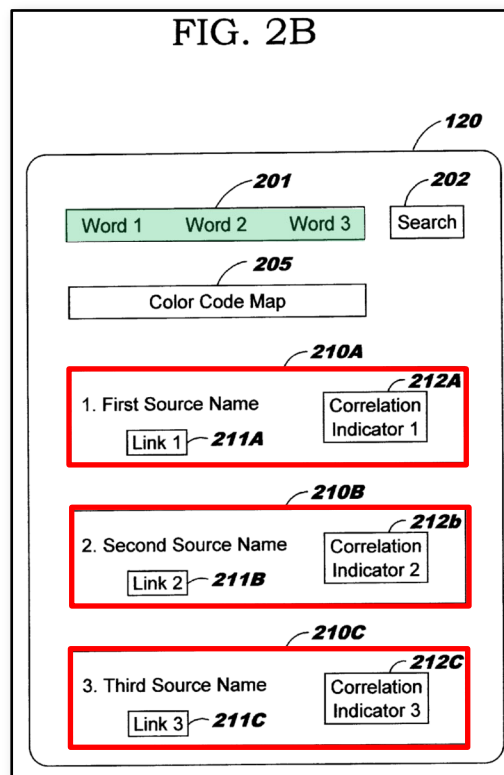
obvious for the search engine to be *on a server*. Bederson-Decl., ¶¶124-126 (citing EX1032, [0067]; EX1037, 6:32-40).

Bates's Figure 2B (highlighted below) shows an example *first search request* (green) *comprising* three “keywords word1, word2, and word3,” *i.e.*, three *search term elements submitted via the Internet by a user for receiving on the search engine's server*. Bates, [0026]-[0027]. Bederson-Decl., ¶127.



c. [1B] (generating search results)

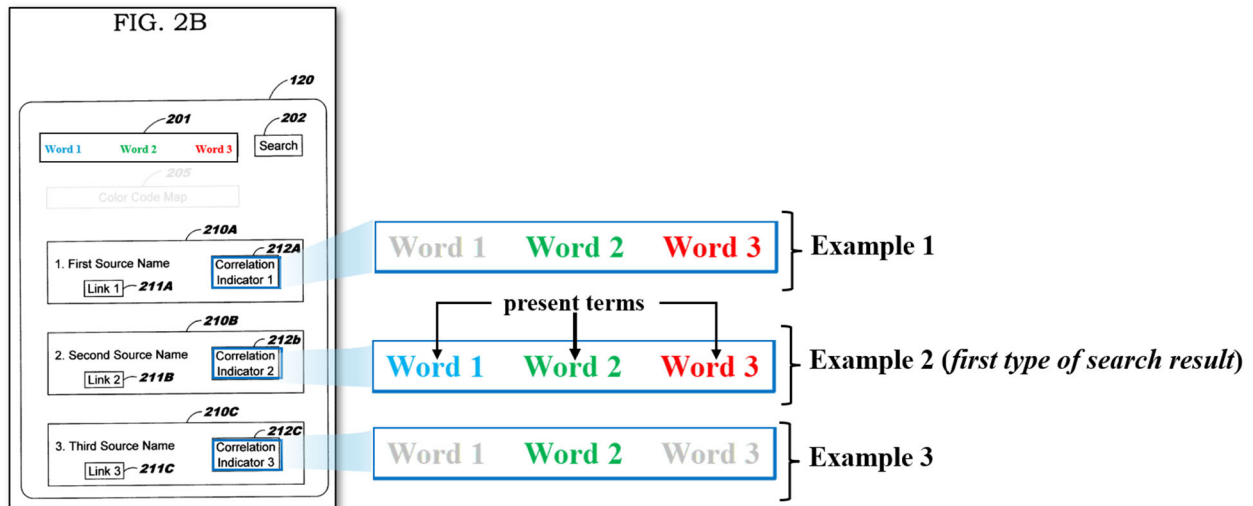
Bates's "search engine executes [the] search, and sends to the browser" information for "web pages purportedly relevant to the search." Bates, [0011], FIG. 1. For example, if "a searcher" "enter[s] three keywords" "[t]he search engine would then find sources [webpages] that include the keyword[s]." Bates, [0006]; [0024]. Bates's Figure 2B (highlighted below) shows "information about" three *search results* (210A-210C; red) *generated by the search engine based at least in part on* ("relevant to"; Bates, [0011]) *the submitted first search request*. Bates, [0026]-[0027]. Bederson-Decl., ¶128.



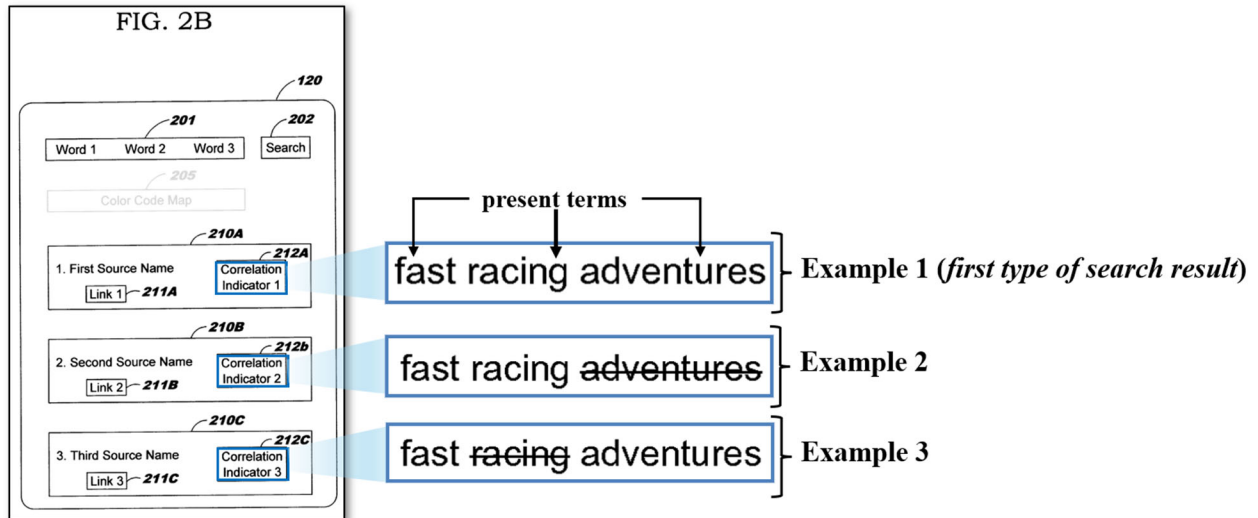
d. [1C] (first type of search result containing all search term elements)

Bates recognizes that with, *e.g.*, three keywords (*search term elements*) the search results will include some “sources that include *all three keywords*.” Bates, [0006]; Bederson-Decl., ¶129.

The illustration of Bates-alone below shows three search results. Result 210B (Example 2) meets *a first type of search result which references a first webpage* (at link 211B) *that contains all submitted search term elements*, as indicated by its correlation indicator displaying all search terms in their respective colors. Bederson-Decl., ¶130. *Supra* §V.C.1.



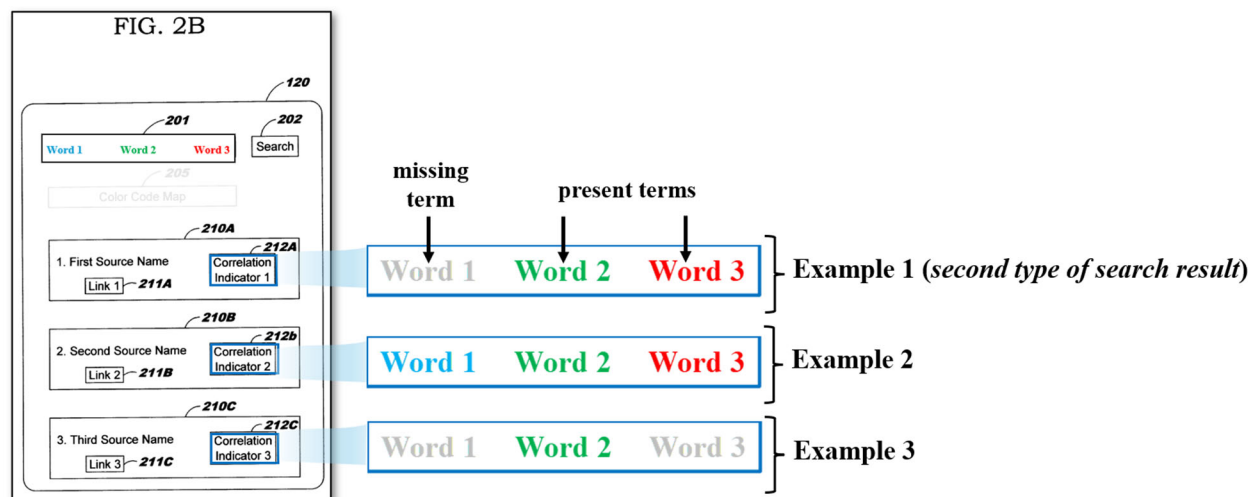
Likewise, the illustration of Bates-Bhagat below shows three search results. Result 210A (Example 1) meets [1C], as indicated by its correlation indicator displaying all search terms without strikethrough. *Supra* §V.C.2. Bederson-Decl., ¶131.



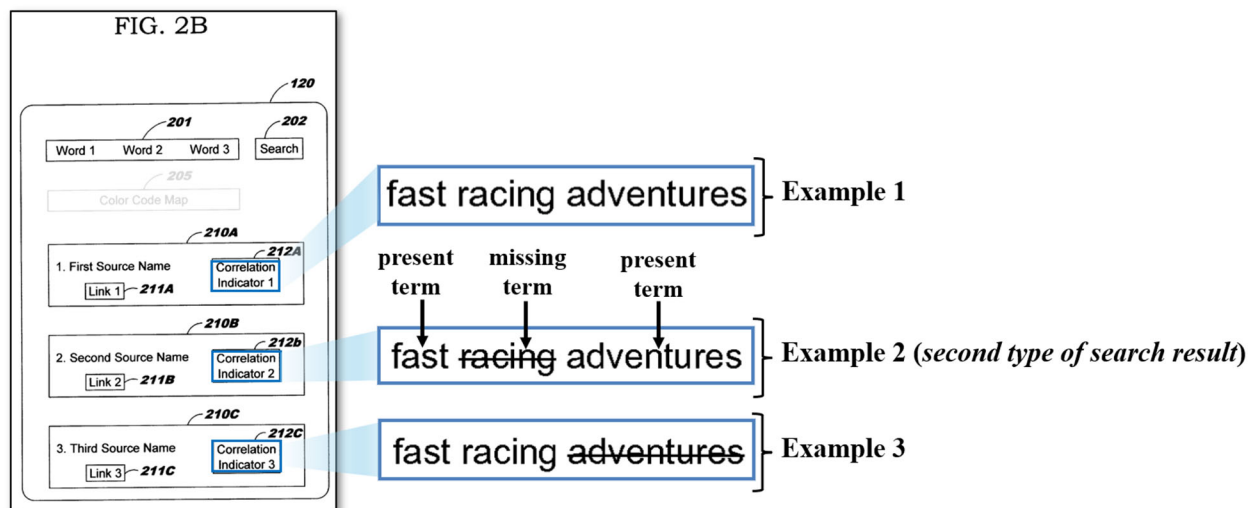
e. [1D] (second type of search result missing search term element(s))

Bates's search results will also include webpages that “*do[] not contain [a] keyword.*” Bates, [0033]. Bederson-Decl., ¶132.

In Bates-alone below, search result 210A (Example 1) meets *a second type of search result which references a second webpage (at link 211A) that is missing at least one submitted search term element* (“Word 1” in grayed-out font). *Supra* §V.C.1. Bederson-Decl., ¶133.



Likewise, in Bates-Bhagat below, search result 210B (Example 2) meets [1D] as indicated by “~~rac~~ing” being in strikethrough format. *Supra* §V.C.2; Bederson-Decl., ¶134.



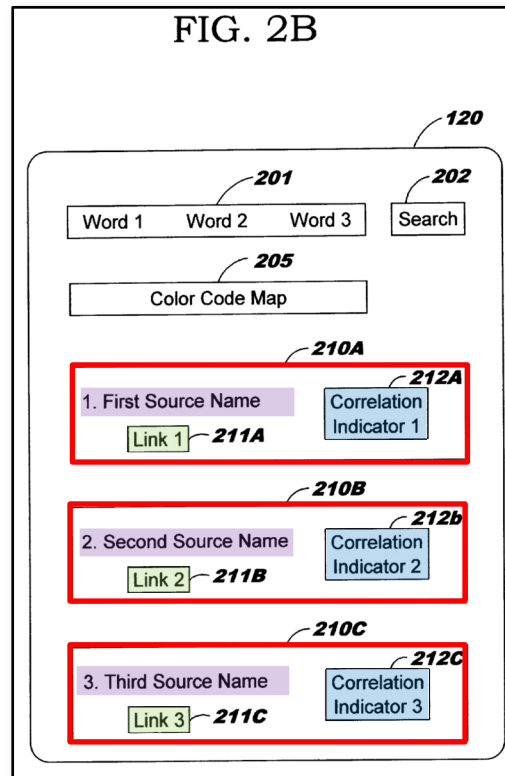
f. [1E] (display search results)

As illustrated above ([1C]-[1D]), in Bates-alone and Bates-Bhagat, *the first and second types of search results* “appear on the display screen” in a *search results webpage* displayed in the terminal’s browser. Bates, [0026]-[0027], FIG. 2B; [0023]. Bederson-Decl., ¶135.

g. [1F] (display first type of search result as first search result grouping comprised of one or more of: title, Internet link, excerpt, or URL, wherein the grouping does not include any annotation for missing search term elements)

Bates’s FIG. 2B (annotated below) shows “an image...on the *display screen*” for the search-results webpage. Bates, [0027]. The “information about” each “web page” is *organized* as a *search result grouping* (red-boxes) that comprises a Source

Name (*i.e.*, a *title* (purple)), a “**URL** 211[] that identifies” “the web page” (green), which is both an *Internet link* (e.g., “**Link 1**” in FIG. 2B) and a *URL*, and a correlation indicator (blue). Bates, [0028]. Bederson-Decl., ¶136.

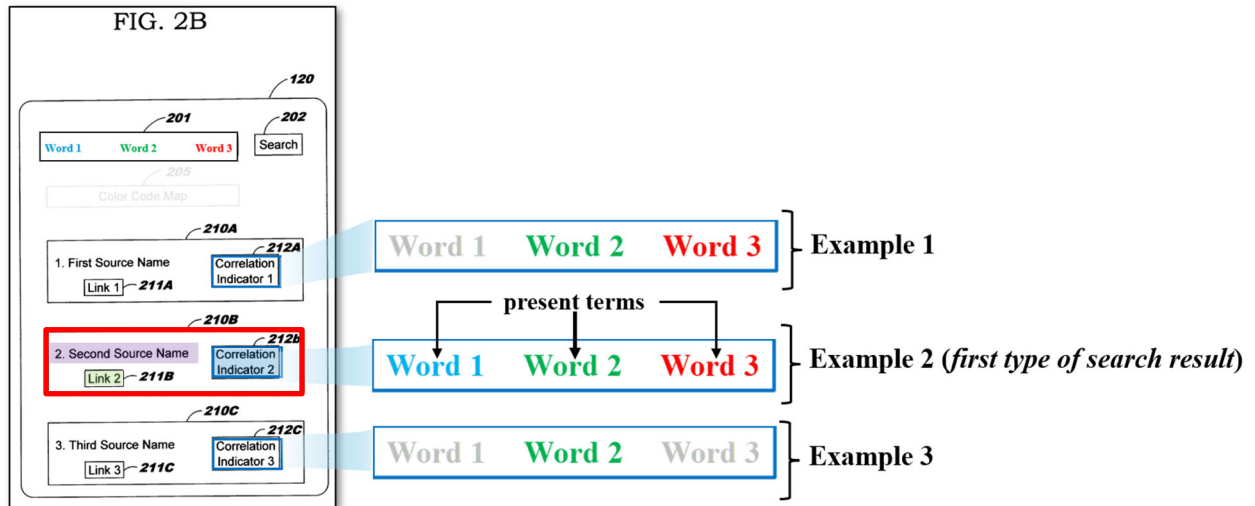


Using the illustrations of Bates-alone and Bates-Bhagat discussed above, in each *first type of search result* ([1C]), the *grouping* (red box) *does not include any annotation for missing search term elements* because there are no missing search terms in the *first type* of search result. Bederson-Decl., ¶137. The corresponding correlation indicator (blue) displays each search term in its assigned color (Bates-alone) and/or without strikethrough (Bates-Bhagat), and thus is not an annotation *for*

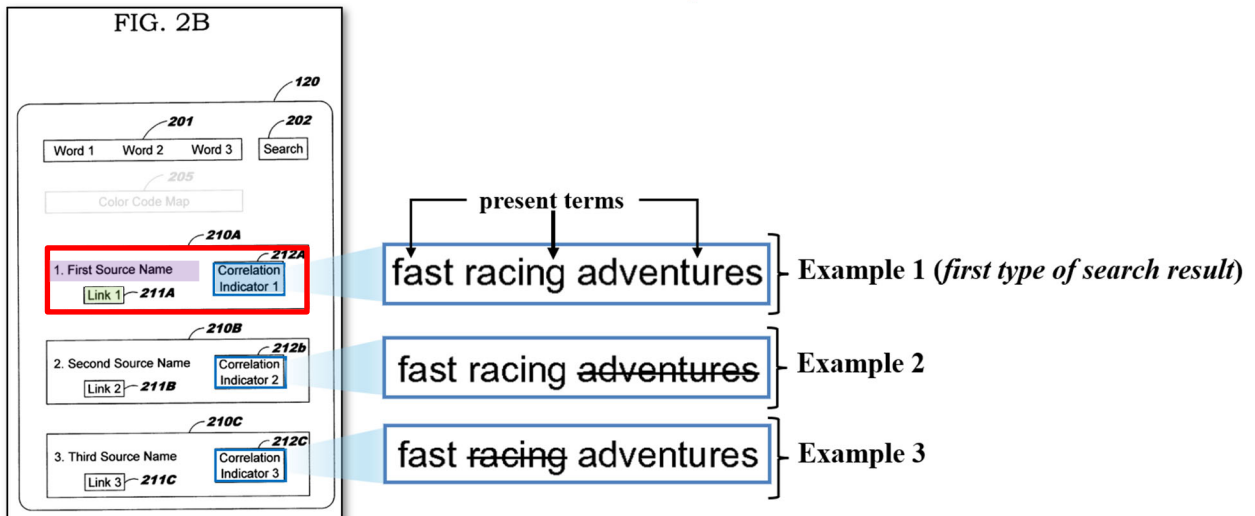
missing search term elements; instead, it indicates that all search terms are present.

Bederson-Decl., ¶¶137-141.

Bates-alone



Bates-Bhagat



- h. [1G] (display second type of search result as second search result grouping comprised of an annotation showing the missing search term element(s) and one or more of: title, Internet link, excerpt, or URL, wherein the annotation is comprised of a text representing the search term element(s))**

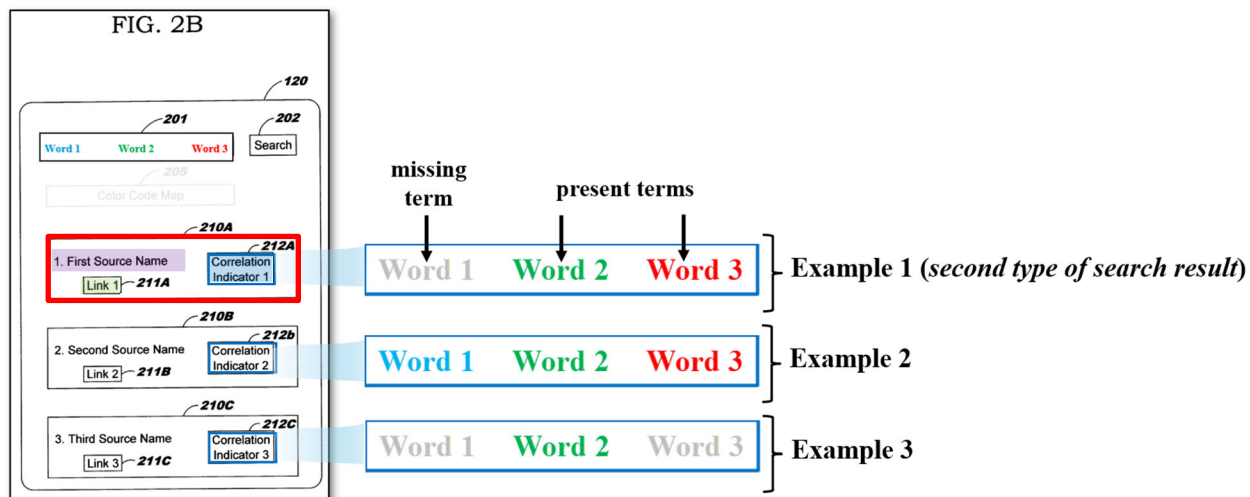
Like each *first type* ([1F]), Bates's method *causes the display screen to display each second type of search result* ([1D]) *as a second search result grouping that comprises a Source Name (title), an Internet "link to a" "URL 211[] that identifies the [second] web page," and a correlation indicator.* Bates, [0027]-[0028]. As illustrated above ([1D]) and discussed below, those correlation indicators meet [1G]'s *annotation*. Bederson-Decl., ¶142.

Bates's search engine transmits "occurrence data that report...whether each keyword is present *or absent in each source* [webpage]." Bates, [0024], [0011]. Using that data, Bates's correlation indicator will visually indicate which terms are present or absent in each search result. Bates, [0032]-[0033]; Bederson-Decl., ¶143; *supra* §V.A. Thus, the correlation indicator will *show when the at least one search term element is missing in a webpage.* Bederson-Decl., ¶144.

In Bates-alone below, *the annotation* for the example *second type* of search result (Example 1) *comprises text representing the missing search term element*

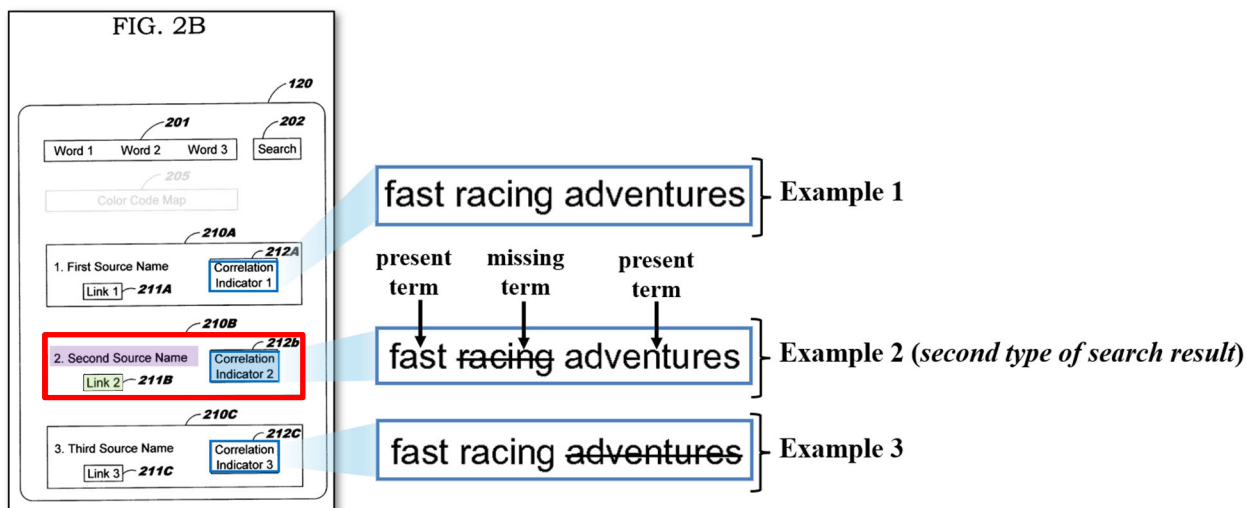
(“Word 1”) written in a font “color not associated with any keyword by the color code map 205” (Bates, [0033]) (e.g., muted-gray). Bederson-Decl., ¶145.

Bates-alone



In Bates-Bhagat below, *the annotation* for the example *second type* of search result (Example 2) *comprises text representing the missing search term element* (“racing”) in a strikethrough format (that may also use gray color). Bederson-Decl., ¶146.

Bates-Bhagat



- i. **[1H] (the annotation enables the user to readily discern that the webpage is missing the search term(s), and not opening the webpage enables faster execution)**

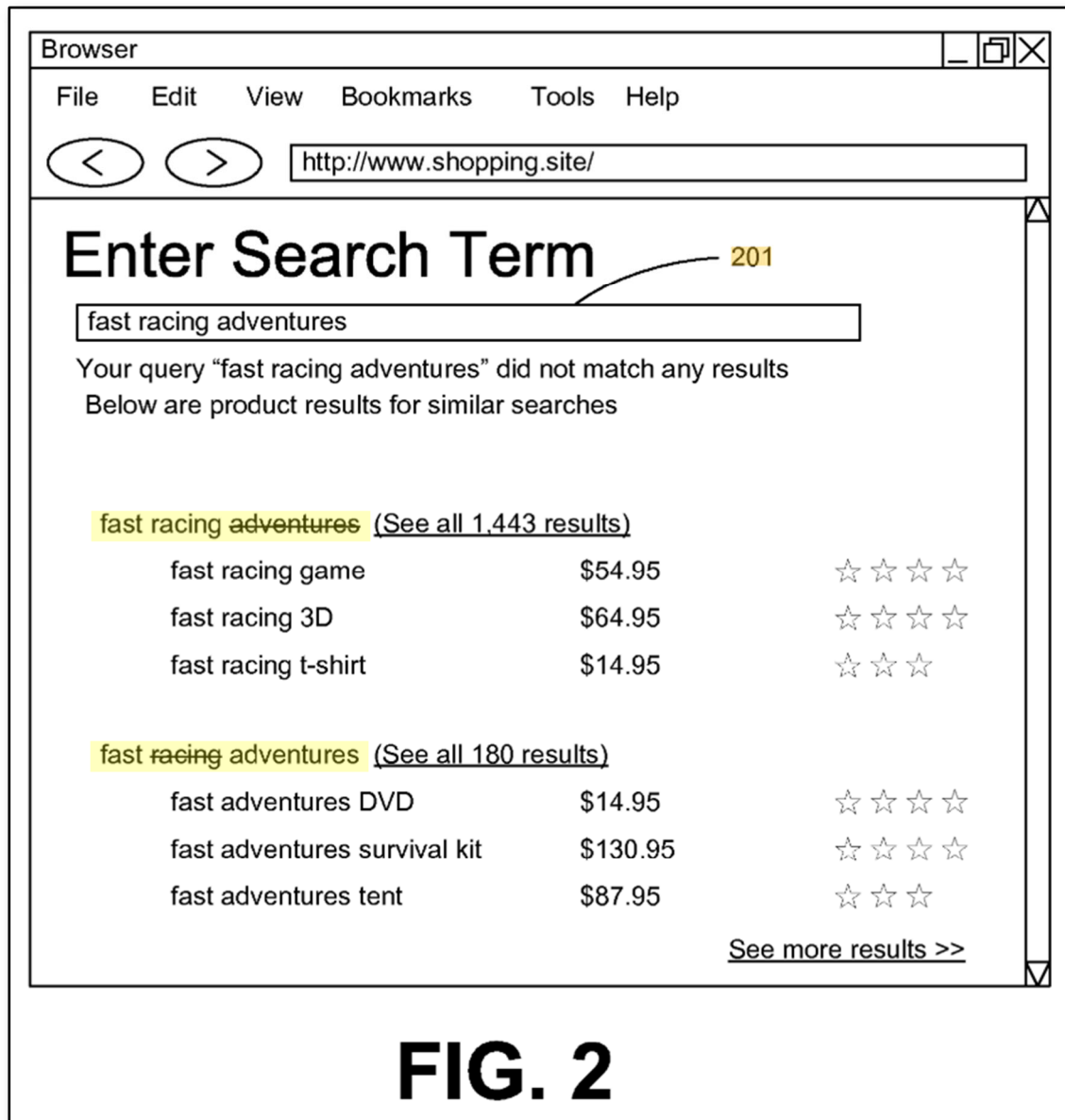
The correlation indicator (*annotation*) allows “the searcher” (*user*) to “*readily grasp the relevance* of the URL to the search” (Bates, [0033]), so the user “*no longer need waste time...accessing and viewing* sources that lack relevant information” (Bates, [0040]). *See also* Bates, [0015], [0009], [0033]. As illustrated above ([1G]), *the annotation for the second webpage enables the user to readily discern, without opening the second webpage and navigating away from the search results webpage, that the second webpage is missing the at least one search term element* because the missing term is written in an unassigned color, *e.g.*, gray-font (Bates-alone) and/or with a strikethrough format (Bates-Bhagat). Thus, *a faster execution is enabled for the Internet search process* because the user need not spend time opening the second webpage. Bederson-Decl., ¶147.

2. **Claim 2 (the annotation is displayed as one or more standalone lines at the bottom of the grouping)**

Though Bates’s example embodiments display correlation indicators on the righthand-side of each search-result grouping, POSAs understood that was an aesthetic design choice and it would have been obvious as a conventional, alternative design choice to display text-based annotations (as in Bates-alone and Bates-Bhagat)

as one or more standalone lines in the search result grouping at the bottom of a search result grouping. Bederson-Decl., ¶148.

For example, Bhagat’s FIG. 2 (highlighted below) displays a text-based annotation (yellow) as a standalone line above each group of search results. Bederson-Decl., ¶149.



POSAs, given their background knowledge, would have considered displaying an annotation *below* each group to be a simple and well-known alternative design choice. For example, EX1029’s FIG. 3 (highlighted below) corroborates POSAs’ background knowledge that “one of the many possible ways for” a “search engine to arrange” “content metadata” (*e.g.*, text-based annotations; yellow below) *as one or more standalone lines that is displayed at the bottom of each search-result grouping*. EX1029, 3:22-30 (“various orientations, prominence, and detail” are possible). Bederson-Decl., ¶150.

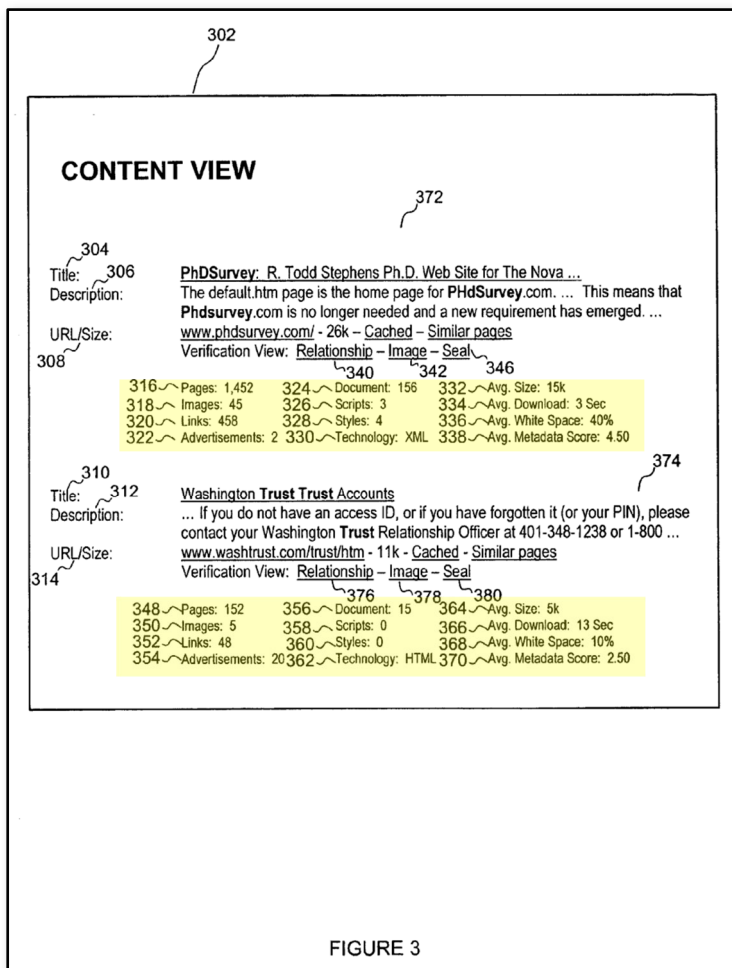
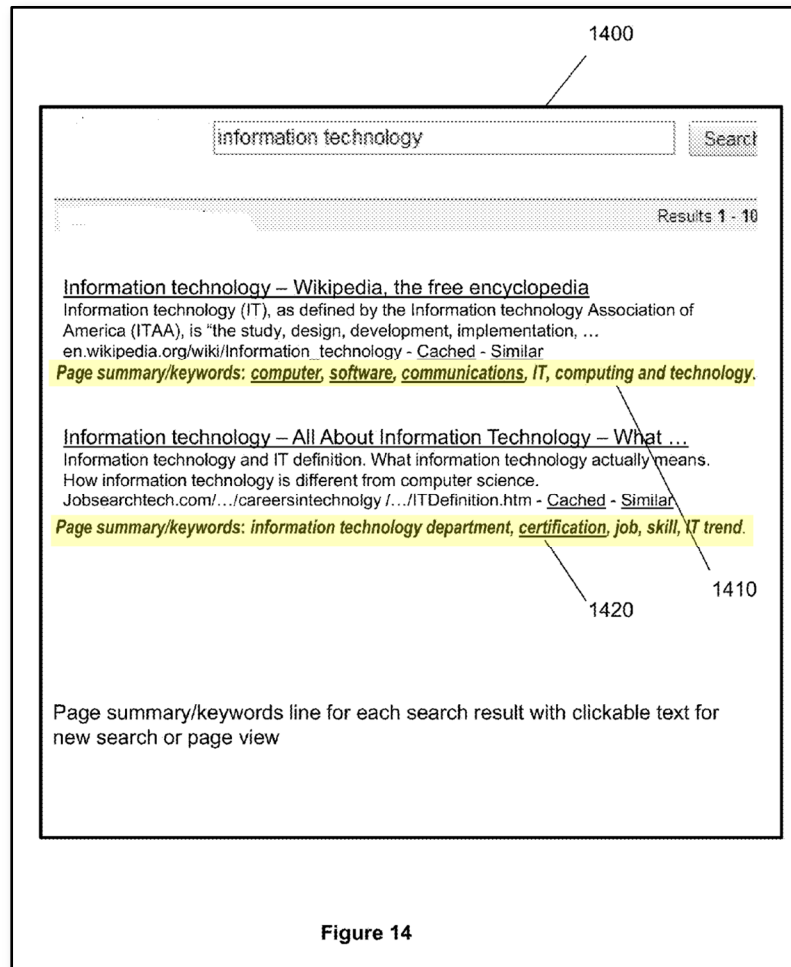


FIGURE 3

Likewise, EX1030's FIG. 14 (highlighted below) shows a *standalone* “summary line” (yellow) – a text-based annotation – “displayed at the bottom part of each search result.” EX1030, 18:22-26. Bederson-Decl., ¶¶151-152.



It was thus background knowledge for POSAs (as EX1029-EX1030 demonstrate) that displaying text-based annotations *as standalone lines at the bottom of search-result groupings* was a well-known aesthetic design choice. Thus, in Bates-alone and Bates-Bhagat, it would have been obvious as a conventional design choice and/or a simple substitution one of one known location for an annotation for

a search result grouping (adjacent thereto) for another (at the bottom thereof) to obtain the predictable result of *displaying* each correlation indicator *at the bottom of* each *search result grouping*. *KSR*, 550 U.S. at 417. Bederson-Decl., ¶¶153-155.

3. Claim 6

Claim 6 depends from claim 1 and requires *third* and *fourth types of search result* that reference respective webpages that each have one or more *descendant webpages* that are *linked directly one level from* the referenced webpage. 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/patents is a “*descendant webpage linked directly one level*” from www.uspto.gov because a direct link to www.uspto.gov/patents is found at www.uspto.gov. EX1001, 10:24-11:11, FIGS. 6-7; Bederson-Decl., ¶156.

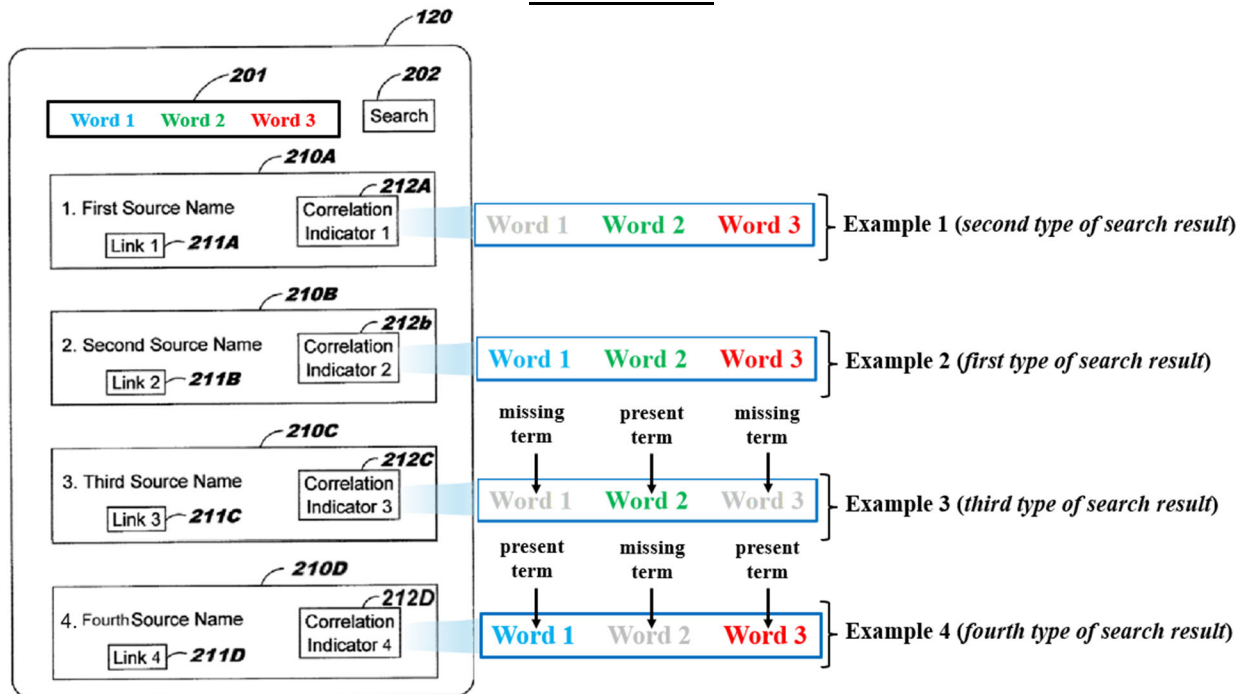
Limitation [6A] requires the *third type of search result* to reference a webpage that is itself missing a search term but has a *descendant webpage* that contains the missing term, whereas limitation [6B] requires the *fourth type of search result* to reference a webpage that is itself missing a search term *and* whose *descendant webpages* are also all missing that term. Limitation [6C] then requires that the *fourth type of search result* be displayed like limitation [1D]’s *second type of search result* (which references a webpage missing a search term, and is displayed with an annotation). Bederson-Decl., ¶157.

Although claim 6 requires the existence of *descendant webpages* that do or do not contain a search term, the claim does **not** require that the search term's presence or absence in the *descendant webpage* impacts how the *third* or *fourth type of search results* are displayed. Bederson-Decl., ¶158. Claim 6 does not specify how the *third type* is displayed. And as shown below, because the webpage for the *fourth type of search result* in each Ground 1A combination is itself missing a claim term, it will be displayed in the same manner as the *second type of search result* (with an annotation) regardless of the content of the *fourth type's* descendant webpage(s).

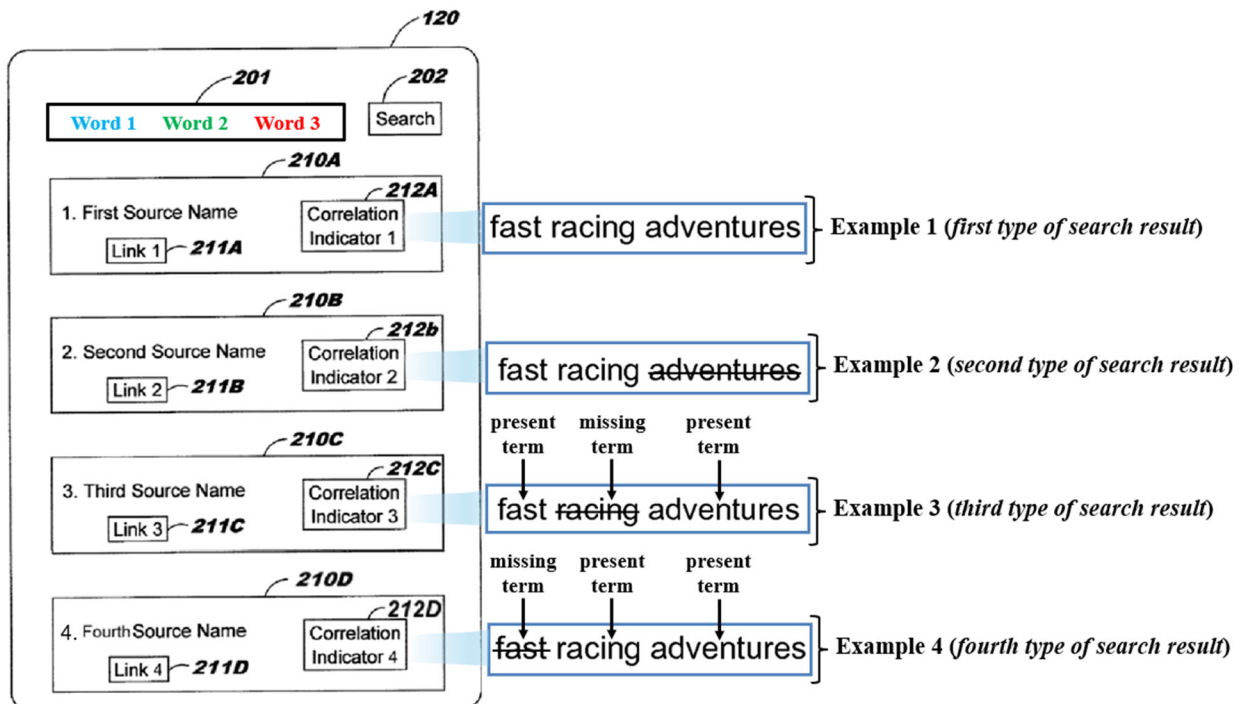
a. [6A] (third type of search result webpage missing search term element(s) but having level-one descendant webpage containing the missing element(s))

Bates's FIG. 2B shows "three web pages," but Bates's invention applies "to more than three." Bates, [0028]. The Bates-alone and Bates-Bhagat illustrations below each show four search results, where search result 210C (Example 3) in each illustration meets *a third type of search result which references a third webpage (at link 211C) that is missing at least one search term element*. Bederson-Decl., ¶159.

Bates-alone



Bates-Bhagat



POSAs understood it would have been commonplace for a *third webpage* discussed above (e.g., a website’s homepage) to *have a descendent webpage* that is *linked directly one level* therefrom and *contains the search term element* that is *missing from the third webpage* (e.g., “racing” could be missing from a website’s homepage but contained in a descendant webpage). Bederson-Decl., ¶160 (citing EX1029, 3:65-4:5; EX1009 (“Naick”), [0003]-[0004]).

b. [6B] (fourth type of search result webpage missing search term element(s), wherein all level-one descendant webpages are also missing the element(s))

Bates-alone and Bates-Bhagat illustrated above ([6A]) each comprise a *fourth type of search result which references a fourth webpage* (at respective links 211D) *that is missing at least one search term element*, which is shown in gray-font (Bates-alone) and/or strikethrough format (Bates-Bhagat). Bederson-Decl., ¶161.

Like the *third type* ([6A]), it would have been commonplace for each *fourth type of search result* to have *descendant webpages linked directly one level from the fourth webpage*. Bederson-Decl., ¶162. It would have also been commonplace that those *descendant webpages* would sometimes *also be missing the at least one search term element* (e.g., website’s webpages are all missing the term “fast”). *Id.*

c. [6C] (display the fourth type in same manner as the second)

As illustrated above ([6A]), in Bates-alone and Bates-Bhagat, *the fourth type of search result* is displayed in a same manner as the second search result

grouping—*i.e.*, as a search result grouping comprising a Source Name (*i.e.*, title), an Internet “link” that is a “*URL* 211[] that identifies the [*fourth*] *web page*,” and a correlation indicator comprising text representing the missing search term(s). Bates, [0027]-[0028]; Bederson-Decl., ¶163.

4. Claim 7

Independent claim 7 recites a system comprising components that perform steps largely mirroring the method recited in independent claim 1. As shown in the table below, most limitations in claim 7 are met by Bates-alone and Bates-Bhagat for the same reasons discussed above for similar limitations in claim 1. Bederson-Decl., ¶164.

Limitation	Addressed in Section:
[7PRE]	§V.D.1.a ([1PRE])
[7A]	§V.D.1.b ([1A])
[7C]	§V.D.1.c ([1B])
[7D]	§V.D.1.d ([1C])
[7F]	§V.D.1.f ([1E]) If [7F] requires the server (as opposed to the browser) to generate annotations (<i>e.g.</i> , their html code), that was an obvious alternative implementation of Bates’s

	search engine. Bates, [0025] (“elements” of Bates’s system “may either be external or internal to the terminal”). Moreover, it was common for prior-art search-engine servers to generate annotations, which beneficially reduced processing load on user devices. Bederson-Decl., ¶¶188-192 (citing EX1012, [0029]; EX1034, FIGS. 1 & 3-4, 6:52-7:21; EX1049, FIGS. 1, 3-4, [0031], [0040]).
[7G]	§V.D.1.g ([1F], <i>first search result grouping</i>), §V.D.1.h ([1G], <i>second search result grouping</i>)
[7H]	§V.D.1.g ([1F])
[7I]	§V.D.1.h ([1G])
[7J]	§V.D.2.b ([2B])
[7K]	§CITE ([1H])

Two limitations in claim 7 – [7B] and [7E] – are not found in claim 1. [7B] requires that *the first search request is comprised of a plurality of search term elements for performing AND operations according to search logic guidelines published by the search engine provider*, while [7E] requires that the *second type of*

search result references a second webpage that is, contrary to the search logic guidelines for AND operations...missing at least one search term element.

POSAs had reason to implement Bates-alone and Bates-Bhagat in a manner that meets [7B] and [7E]. Bates observes that OR-based searching often “returns an unusably large number of sources.” Bates, [0004]. Although Bates’s color-coding technique helps users navigate OR-based search results, POSAs would have known that an alternate and conventional search approach—an AND-based search—would often yield a more manageable number of sources. Bederson-Decl., ¶¶165-168; EX1071, [0096] (“Most search engines insert a Boolean ‘AND’ between each search term..., which mean[s] that all of these keywords must be present...to produce a ‘match.’”); Wang, [0002] (similar); EX1001, 2:23-28, FIGS. 3-7.

For example, Bhagat’s default search is AND-based. This is exemplified by Bhagat’s Figure 2, which found no search results for the three-word query “fast racing adventures,” and was only able to find search results when the query was reduced to two words “fast racing” or “fast adventures.” Bederson-Decl., ¶169 (explaining that Bhagat’s default search would have found results for that three-word query if the search were OR-based). Thus, making Bates use an AND-based search by default (*e.g.*, in situations where enough search results include all of the query’s search terms) would have been the simple substitution of one default Boolean

operation (OR) for another default Boolean operation (AND) to yield the predictable result of fewer returned search results. Bederson-Decl., ¶¶170-171.

However, Bhagat teaches a potential drawback if a system *always* uses AND-based searches: depending on the query, sometimes there may be “few and/or no search results” that match all the query’s terms. Bhagat, 1:58-61. To address this circumstance, Bhagat broadens the user’s original query using historical queries that each remove one search term from a multi-word query. Bhagat, 6:23-37 (“only remov[ing] one search term” “reduce[s]” “the likelihood” of irrelevant results).

Thus, when implementing Bates to default to an AND-operation (for the reasons discussed above), in scenarios when the default search yielded too “few” results (Bhagat, 1:61), POSAs would have augmented the results using alternative search queries that each removed one search term (as in Bhagat). Bederson-Decl., ¶¶172-173. *See also* Bates, [0006] (example where the user only deems a result “relevant” if it is missing no more than one keyword).

The resulting combinations would be little different than the previously-depicted illustrations of Bates-alone and Bates-Bhagat. *Supra* §§V.C.1-2. The principal modification is discussed above: using a default AND-based search and, when that yields too few results, using Bhagat’s technique of removing one word from the query. Bederson-Decl., ¶174. The combinations would still include annotations indicating the presence or absence of search terms in search results

because some results—those returned from removing one query word—are missing a search term and the annotations would inform the user of that fact. *Id.*

a. [7B] (search request is for performing AND operations according to search logic guidelines published by search engine provider)

As discussed immediately above, an obvious implementation of Bates-alone and Bates-Bhagat uses an AND-based, rather than OR-based, search as the system’s default. Bederson-Decl., ¶175.

By 2011, POSAs knew that search-engine providers typically published search guidelines (*e.g.*, a help page) for default and/or constructing queries. For example, EX1036 (at [0008]) corroborates POSAs’ background knowledge that “[c]onventionally, query languages are determined” by “reading the *help pages associated with a given search interface*.” EX1080 (at 309) similarly corroborates that “HELP Systems” were “a standard feature of almost all IR [information-retrieval] systems.” Bederson-Decl., ¶¶176-178 (citing Bates, [0003]).

Therefore, it would have been routine and expected (and thus obvious) for the search-engine provider in Bates-alone and Bates-Bhagat to *publish search logic guidelines* that explained the default search logic and/or helped users execute the *first search request* using default *AND operations*. Bederson-Decl., ¶179.

b. [7E] (second type of search result missing search element(s), contrary to the search logic guidelines for AND operations)

As discussed above (§V.D.4), an obvious implementation of Bates-alone and Bates-Bhagat would join search terms with an AND operation by default, but sometimes *also* include results *missing a search term, contrary to the AND operation*. Bhagat, 8:45-56, FIG. 3 (displaying search results that included both search terms and results missing at least one search term). Thus, those obvious implementations of Bates-alone and Bates-Bhagat meet [7E]. Bederson-Decl., ¶180.

Separately, even without including queries that remove a search term, it would have been conventional and beneficial to include a result if it contains a term's synonym rather than the term itself. Bederson-Decl., ¶¶181-183 (citing, *e.g.*, EX1073, [0005]; EX1074, 1:6-12; EX1078, 1:51-57). For example, Sauls (EX1059) corroborates POSAs' background knowledge that a conventional technique for returning search results would return results containing a search-term's synonym rather than an "exact match[]" of the term. Sauls, [0025]-[0026], [0014]-[0015], [0048]-[0049]. Bederson-Decl., ¶182.

Implementing Bates-alone and Bates-Bhagat, like Sauls, to similarly consider synonyms, would have been a conventional design choice that POSAs routinely made, to provide users with relevant search results that might otherwise be excluded

from an AND-based search. Bederson-Decl., ¶184. This alternative implementation also meets [7E] because the results would include webpages *missing at least one search term element (contrary to AND operations)* for referenced webpages containing a synonym. Bederson-Decl., ¶¶185-187 (citing Sauls, [0025]-[0026]; EX1075, [0022]; EX1076, [0096]; EX1077, 1:11-28).

5. Claim 11

See claim 6, *supra* §V.D.3. Bederson-Decl., ¶¶193-195.

6. Claim 12

Independent claim 12 recites a system for providing a GUI for an Internet search that largely mirrors the search-engine-provider system recited in independent claim 7. Bates-alone and Bates-Bhagat meet the following limitations of claim 12 for the reasons discussed in the corresponding sections above. Bederson-Decl., ¶196.

Limitation	Addressed in Section:
[12PRE]	§V.D.4 ([7PRE])
[12A]	§V.D.4 ([7A], [7F]) Bates’s <i>user-operated computing device</i> is a “computer terminal” (which teaches or suggests a <i>desktop computer</i>) or “web-enabled cellular

	telephone” (which teaches or suggests <i>a smart phone</i>). Bates, [0023]-[0024].
[12B]	§V.D.4 ([7A]), §V.D.4.a ([7B])
[12C]	§V.D.4 ([7C])
[12D]	§V.D.4 ([7D])
[12E]	§V.D.4.b ([7E])
[12F]	§V.D.4 ([7F]-[7G])
[12G]	§V.D.4 ([7H])
[12H]	§V.D.4 ([7I])
[12I]	§V.D.4 ([7J])
[12J]	§V.D.4 ([7K])

7. Claim 16

See claim 6, *supra* §V.D.3. Bederson-Decl., ¶¶197-199.

VI. GROUND 1B: THE GROUND 1A COMBINATIONS IN VIEW OF BRINSON RENDER OBVIOUS CLAIMS 3-4, 8-9, 13-14

Ground 1B challenges claims requiring *a selectable filtering function that...automatically causes search results missing a search term to be removed* (hereinafter “the *selectable-filtering-function* limitation”). Bederson-Decl., ¶¶200-202.

A. Brinson (EX1007)

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 term’s “weight value” is designated “required” then “any data product [*e.g.*, webpage] included in the results ***must*** include this term.” Brinson, [0045]; [0030] (“data products...includ[e]...web page[s]”). Brinson discloses several ways to designate search terms as “required.”

In Figure 16’s example (highlighted below), search terms entered into “query text box 352” (blue) are also displayed in “list box 360” (green). Brinson, [0069]-[0071]. “[D]isplay area 366” provides a list of data products (webpages) relevant to the search. Brinson, [0072]. The user can subsequently designate an initial search term’s weight by selecting it from list box 360, which sends the term to “text box 356” (red) where the term’s weight can be designated, *e.g.*, as a required term. Brinson, [0071]; *see also id.*, claims 7, 24; Bederson-Decl., ¶¶203-206.

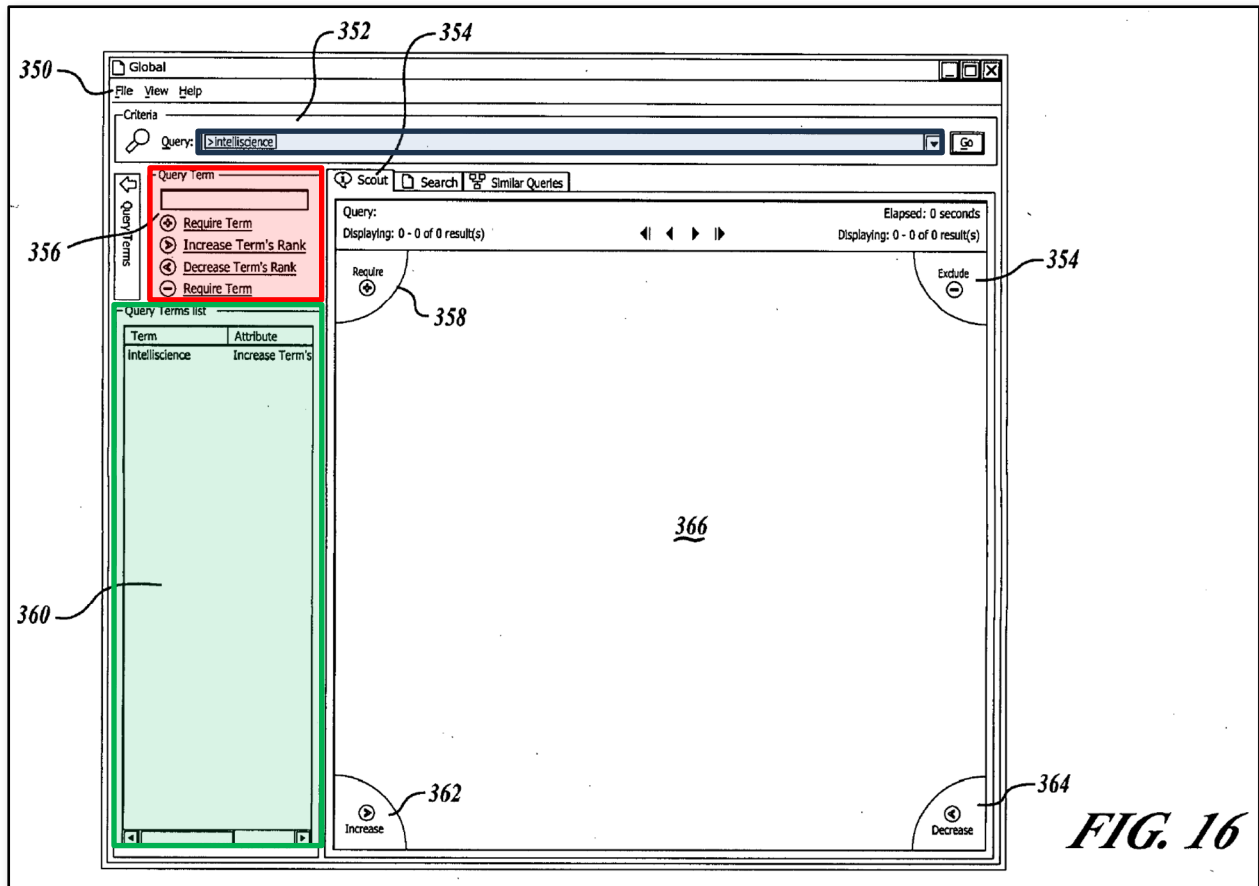
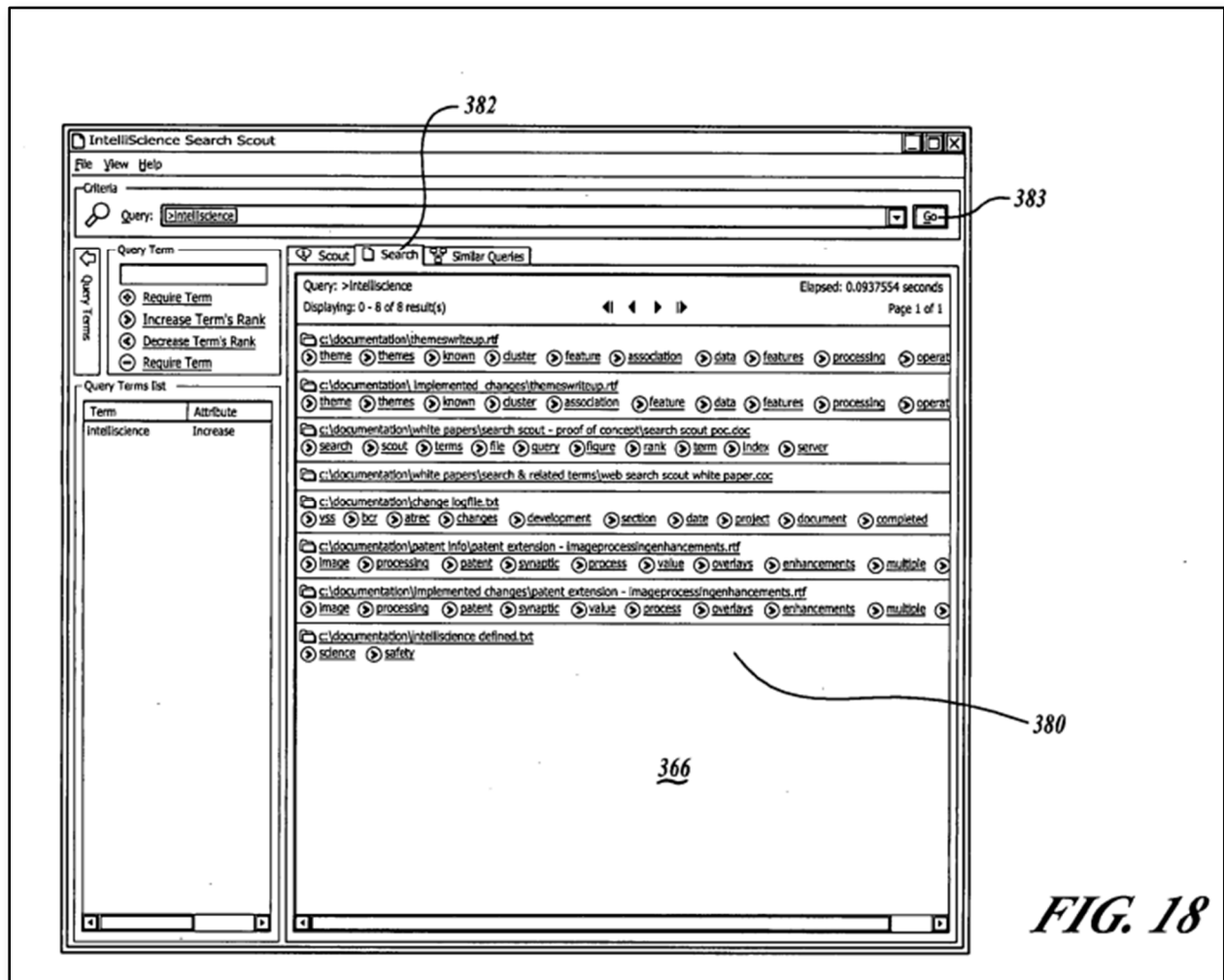


Figure 18 (below) is similar. Certain terms that appear in each data product (website) are listed below each data product and each term can be selected to designate its weight, *e.g.*, as a required term. Brinson, [0073] (“terms shown under a data product in list 380 can be selected by the user to refine the present search”); Bederson-Decl., ¶1207.



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

As discussed in Ground 1A, Bates’s search engine may return search results missing search terms.⁵ 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,” which required search results to include/exclude a search term(s). EX1035, [0009]; *see also* EX1036, [0024]; Bederson-Decl., ¶208.

Brinson discloses a search-engine GUI that includes a user-friendly way—*i.e.*, user-selectable GUI elements—to indicate that a search term is “‘required’” so that “the results must include this term.” Brinson, [0045]; *see also* FIGS. 16, 18, [0069]-[0071]; Bederson-Decl., ¶209.

In view of Brinson, POSAs had reason to augment the search-engine interface in Bates-alone and Bates-Bhagat to include user-selectable GUI elements to allow the user to designate a search term as a required or excluded term. Brinson, [0069]-[0070]. Bederson-Decl., ¶210. Doing so would have also been applying aspects of Brinson’s known GUI elements for making a search term required/excluded, to known search-engine interfaces ready for the improvement, to yield the predictable

⁵ This is true whether the default search is OR- or AND-based. *Supra* §V.D.4 (claim 7).

result of Bates’s interface allowing users to designate a search term as required/excluded. *KSR*, 550 U.S. at 417. Adding Brinson’s functionality to Bates would have furthered Bates’s goal of providing an interface that allows a user to “form an effective picture of the sources found by the search engine” (Bates, [0009]), by allowing users to refine their initial searches to eliminate irrelevant results. Bederson-Decl., ¶210.

One obvious way to apply Brinson’s teachings to Bates-alone and Bates-Bhagat would have made the search terms presented next to each search result selectable so that an individual term’s weight could be designated. Bederson-Decl., ¶211. 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/excluded. Brinson, [0073]; Bederson-Decl., ¶¶211-217 (citing additional examples).

A known technique for implementing what Brinson describes would have applied the “required”-term designation to the already-identified search results (rather than execute an entirely 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. Bederson-Decl., ¶¶218-219. For example, Fowler (EX1081) corroborates POSAs’ knowledge of a “sifting operation” for a search engine in which—after

conducting an initial search—a user can designate keywords as “include” (*i.e.*, required) and the sifting operation will exclude results that are missing the term, without running a new search. Fowler, FIGS. 1-2, [0022]; [0038]-[0041]. Stonehocker (EX1082) similarly corroborates the known technique of providing an option to exclude results that are missing a required term from already-identified search results. Stonehocker, FIG. 6, [0005], [0041]-[0043]. Bederson-Decl., ¶¶220-221. Beyond being a routine, known design choice, this implementation would have beneficially avoided the need to re-run an entire search, which would require additional time and server computations. Bederson-Decl., ¶219.

POSAs would have reasonably expected success because it required only ordinary programming skill to add the weight-selecting aspects of Brinson’s GUI elements (*e.g.*, selectable text) to Bates-alone and Bates-Bhagat. Bederson-Decl., ¶¶222-223.

C. Mapping to Claims

1. Claims 3, 8, 13

Claims 3, 8, and 13 depend from independent claims 1, 7, and 12, respectively, and add the *selectable-filtering-function* limitation. Ground 1B’s combinations build on Ground 1A’s combinations (Bates-alone and Bates-Bhagat) and meet claims 1, 7, and 12 for the same reasons Ground 1A’s combinations do. *Supra* Ground 1A; Bederson-Decl., ¶¶224-225.

As discussed above, POSAs had motivation to augment Ground 1A's combinations to include, based on Brinson, user-selectable GUI elements (*e.g.*, clickable search-term text displayed within each search-result grouping) for designating a search term's weight. Bederson-Decl., ¶226 (citing Bhagat, FIG. 2). Once augmented, Ground 1B's combinations meet the *selectable-filtering-function* limitation because the search terms *within the second search result group* are now selectable and can be designated "required." Bederson-Decl., ¶227.

In Ground 1B's combinations, if the missing search term in the *second search result group*—*i.e.*, the term in gray and/or strikethrough—is designated as ***required***, that action *automatically causes the second result grouping to be removed* from the interface because that grouping's referenced webpage lacks the now-required term. *Id.*

In this scenario, the *selectable filtering function*—displayed as the selectable search terms—is displayed "*in combination with the annotation*" because the filter function is accessed from *the annotation* itself—*e.g.*, by clicking the text of the missing term in [1G]. *Id.*

If claims 3/8/13 require removing results in response to a single click, that would have been obvious as a simple, convenient design option, *e.g.*, to achieve the benefit of not requiring multiple filter button presses to update search results.

Bederson-Decl., ¶¶228-235 (citing Bhagat, FIG. 2, 9:1-16; Wang, FIG. 2, 6:6:53-58; EX1031, [0042]; EX1068, [0196]).

2. Claims 4, 9, 14

a. [4A]/[9A]/[14A] (smart phone with smaller display screen)

Bates’s “terminal” (*user-operated computing device*) can be “a web-enabled cellular telephone” (Bates, [0023]), which discloses (or at least renders obvious) *a smart phone with a smaller display screen than* the other recited devices in claims 4/9/14. Bederson-Decl., ¶¶236-237 (citing EX1067, [0007], [0031]).

b. [4B]/[9B]/[14B] (removing second search result grouping enables smaller display screen to display increased number of first type of search results)

POSAs understood that removing *the second search result grouping* discussed above (§VI.C.1) *enables the smaller display screen to display an increased number of first type of search results (i.e., results containing all search terms)* because removing the *second grouping* provides additional screen space for other groupings. Bederson-Decl., ¶¶238-241.

VII. GROUND 1C: THE GROUND 1A COMBINATIONS IN VIEW OF MEHTA RENDER OBVIOUS CLAIMS 5, 10, 15, 17-20

Ground 1C challenges dependent claims 5, 10, and 15 and independent claims 17 and 19 (and their dependent claims 18 and 20, respectively), which require *one or more selectable advertisements...related to...the search term elements* (hereinafter “the *selectable-advertisement* limitation”). Bederson-Decl., ¶¶242-243.

A. Mehta (EX1008)

Mehta explains that “advertisers define their advertisements based on one or more keywords that they believe will be used by consumers searching for products/services.” 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...appear next to or above the search results webpage.” *Id.*

Mehta’s Figure 3A (highlighted below) depicts a search-result webpage with selectable “sponsored advertisements [red] that match the search parameters.” Mehta, [0033], [0006] (ad is selectable by “clicking” its “link”). Bederson-Decl., ¶¶244-247.

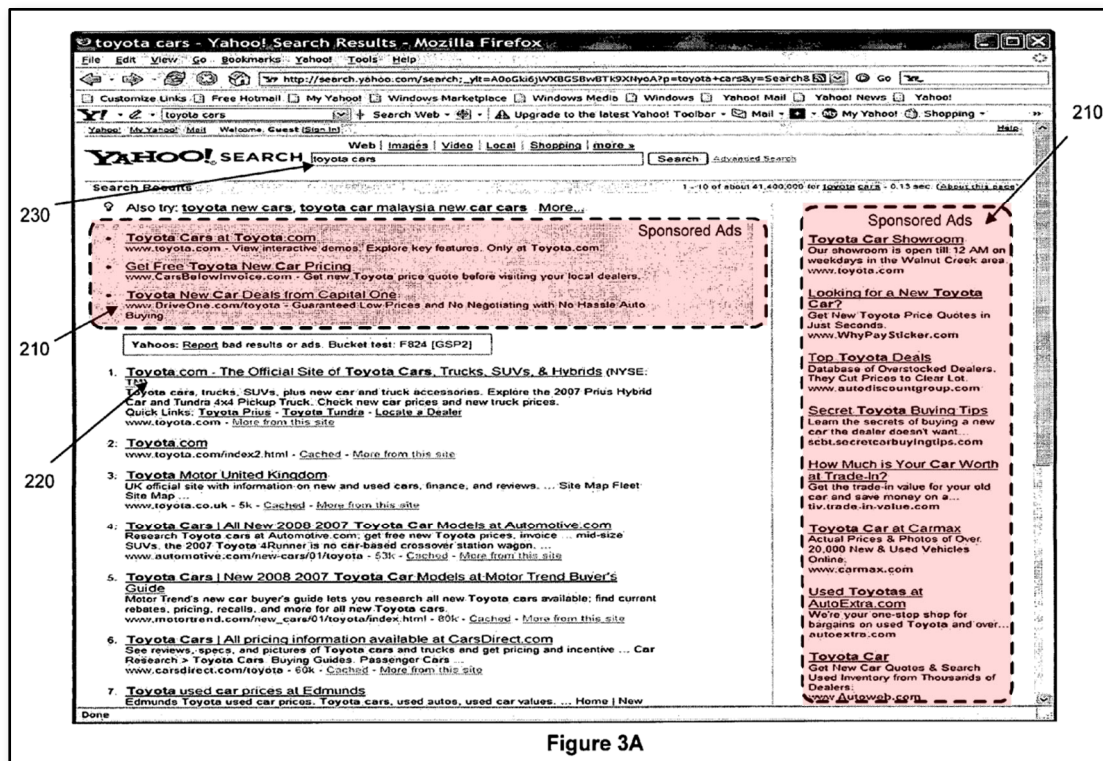


Figure 3A

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

Mehta demonstrates that displaying “relevant advertisement[s]” as selectable “links” alongside search results was known. Mehta, [0005]. The ’184 patent recognizes this fact too. EX1001, 2:54-58, FIG. 1. And POSAs knew that search-engine providers displayed selectable advertisements to generate revenue. Bederson-Decl., ¶248. Thus, POSAs had motivation—*i.e.*, to generate revenue—to implement Ground 1A’s combinations (Bates-alone and Bates-Bhagat) to display selectable advertisements related to the user’s search terms. Bederson-Decl., ¶249.

These implementations would have been using a well-known technique (search-term-based selectable advertisements) to improve similar systems (search engines) in the same way (generating revenue). Bederson-Decl., ¶250. POSAs would have expected success because it would have required only ordinary programming skill to include Mehta’s conventional advertising functionality in Bates’s user interface. *Id.*

C. Mapping to Claims

1. Claims 5, 10, 15

Claims 5, 10, and 15 depend from independent claims 1, 7, and 12, respectively, and add the *selectable-advertisement* limitation. Ground 1C’s combinations build on Ground 1A’s combinations (Bates-alone and Bates-Bhagat) and meet claims 1, 7, and 12 for the same reasons Ground 1A’s combinations do. *Supra* Ground 1A; Bederson-Decl., ¶251.

As discussed above, Mehta provides POSAs motivation to augment Ground 1A’s combinations to display “advertisements” *related to* at least *one search term*, with selectable links that, when “click[ed],” open an advertised webpage. Mehta, [0005]-[0006]. Once augmented, the combinations meet the *selectable-advertisement* limitation. Bederson-Decl., ¶252.

2. Claim 17

Independent claim 17 recites a system that largely mirrors the system recited in independent claim 7, though it also includes limitations found in dependent claim 5 (*advertisements*) and dependent claim 6 (*third* and *fourth* search results). Bates-Mehta and Bates-Bhagat-Mehta meet the following limitations of claim 17 for the reasons discussed in the corresponding sections above. Bederson-Decl., ¶253.

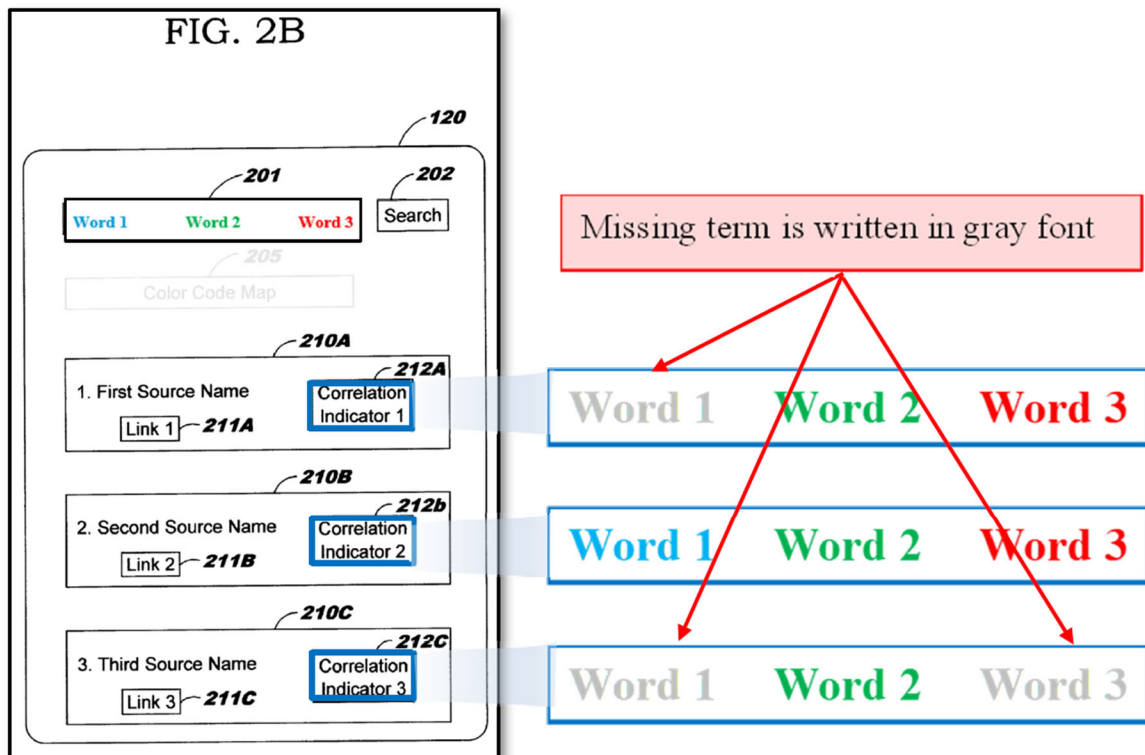
Limitation	Addressed in Section:
[17PRE]	§V.D.4 ([7PRE])
[17A]	§V.D.4 ([7A])
[17B]	§V.D.4.a ([7B])
[17C]	§V.D.4 ([7C])
[17D]	§V.D.4 ([7D])
[17E]	§V.D.4.b ([7E])

[17F]	§V.D.4 ([7F])
[17G]	§V.D.4 ([7G])
[17H]	§V.D.4 ([7H])
[17I]	§V.D.4 ([7I])
[17J]	§V.D.4 ([7J])
[17K]	§VII.C.1 (claim 5)
[17L]	§V.D.3.a ([6A])
[17M]	§V.D.3.b ([6B])
[17N]	§V.D.3.c ([6C])
[17O]	§V.D.4 ([7K])

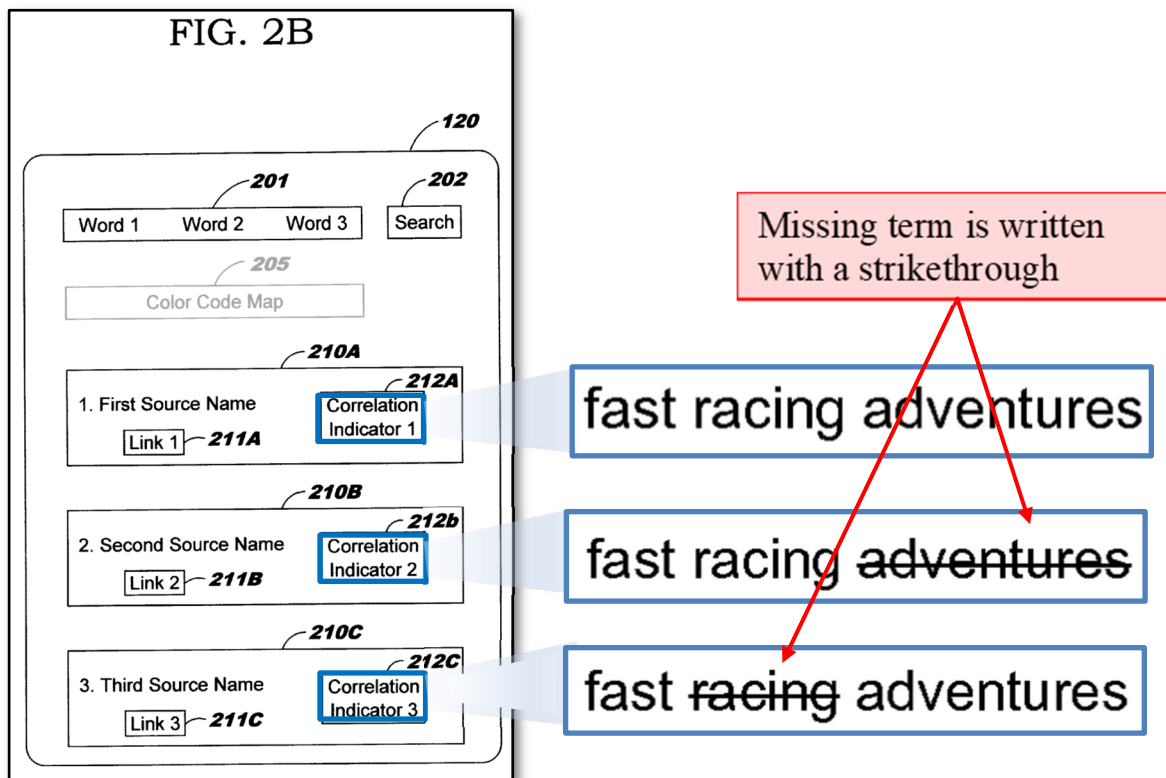
3. Claim 18

Claim 18 requires that *each missing search term annotation* recited in [17I], [17L]-[17N] take one of five specified formats. As discussed below, in Bates-Mehta and Bates-Bhagat-Mehta, *the missing search term annotations* (see *supra* §§V.C.1-2) *comprise text representing the missing search term in a format* recited in claim 18. Bederson-Decl., ¶254.

In Bates-Mehta, illustrated 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* from its initially-assigned color (e.g., “blue” or “red”) to a different color (e.g., muted-gray). Bederson-Decl., ¶¶255-256.



In Bates-Bhagat-Mehta, illustrated below, each missing *search term element* is written with a strikethrough, which is a *format of text* shown with (i) its *font...altered*, (ii) *one or more lines merged with the text*, and/or (iii) *one or more lines superimposed thereupon*. Bederson-Decl., ¶257.



4. Claim 19

Independent claim 19 recites a method that largely mirrors the system recited in independent claim 7 and certain dependent claims discussed previously. Bates-Mehta and Bates-Bhagat-Mehta meet the following limitations of claim 19 for the reasons discussed in the corresponding sections above. Bederson-Decl., ¶258.

Limitation	Addressed in Section(s):
[19PRE]	§V.D.4 ([7PRE]) §VII.C.1 (claims 5/10/15 ; advertisements displayed based on <i>submitted search terms</i> , independent of whether <i>some search results...do[] not contain all...terms</i>)
[19A]	§V.D.4 ([7PRE]) (<i>interactive GUI</i>) §V.D.4 ([7A]), §V.D.4.a ([7B]) (<i>server receiving search request</i>)
[19B]	§V.D.4 ([7C]) §V.D.4.b ([7E])'s <i>second type</i> meets [19B]'s <i>first search result</i>)
[19C]	§V.D.4 ([7F])

[19D]	§V.D.4 ([7I]’s <i>second grouping</i> meets [19D]’s <i>first grouping</i>)
[19E]	§V.D.4 ([7J])
[19F]	§VII.C.1 (claims 5/10/15)
[19G]	§V.D.4 ([7K])

5. Claim 20

Ground 1C’s combinations meet claim 20 for the same reasons Ground 1A’s combinations meet claim 6, with claim 20’s *second* and *third search results* corresponding to claim 6’s third and fourth types of search results. *Supra* §V.D.3; Bederson-Decl., ¶¶259-261.

VIII. GROUND 1D: THE GROUND 1C COMBINATIONS IN VIEW OF BRINSON RENDERS OBVIOUS CLAIMS 21-22

A. Bates-Mehta-Brinson and Bates-Bhagat-Mehta-Brinson

Ground 1D challenges claim 21 (and its dependent claim 22), which requires claim 19's method to include the *selectable-filtering-function* limitation defined above (§VI). Bederson-Decl., ¶262.

For the same reasons POSA had to incorporate such known filtering functionality into Ground 1A's combinations based on Brinson (§VI.B), POSA would have incorporated such known filtering functionality into Ground 1C's combinations (Bates-Mehta and Bates-Bhagat-Mehta). POSAs would have reasonably expected success in Ground 1D's Bates-Mehta-Brinson and Bates-Bhagat-Mehta-Brinson combinations for the same reasons they reasonably expected success in Ground 1B's combinations (§VI.B). Bederson-Decl., ¶263.

B. Mapping to Claims

1. Claim 21

Claim 21 depends from independent claim 19 and adds the *selectable-filtering-function* limitation. Ground 1D's combinations build on Ground 1C's Bates-Mehta and Bates-Bhagat-Mehta combinations, respectively, and meet claim 19 for the reasons Ground's 1C combinations do. *Supra* Ground 1C. Bederson-Decl., ¶264.

As discussed above (§VI.B), for the same reasons POSAs would have augmented Ground 1A’s combinations to include, based on Brinson, user-selectable GUI elements (*e.g.*, clickable search-term text displayed within each search result grouping) for designating a search term as “required,” POSAs would have added that functionality to Ground 1C’s combinations. Bederson-Decl., ¶265. Once augmented, Ground 1D’s combinations meet claim 21 for the same reason Ground 1B’s combinations meet claim 3 (*supra* §VI.B.1), with claim 21’s *first search result grouping* corresponding to claim 3’s *second search result grouping*. Bederson-Decl., ¶265.

2. Claim 22

Ground 1D’s combinations meet claim 22 for the same reasons Ground 1B’s combinations meet claim 4, with claim 22’s *first search result grouping* corresponding to claim 4’s *second search result grouping*. *Supra* §VI.C.2; Bederson-Decl., ¶266.

IX. GROUND 2A: WANG-MILLS RENDERS OBVIOUS CLAIMS 1-2, 6-7, 11-12, 16

A. Wang (EX1005)

Wang concerns keyword-based search engines. Wang, [0001], [0014], [0016]. Wang says “[m]ost keyword-based search engines...assum[e] 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.” *Id.*; Bederson-Decl., ¶¶268-269 (discussing Boolean “AND” operator).

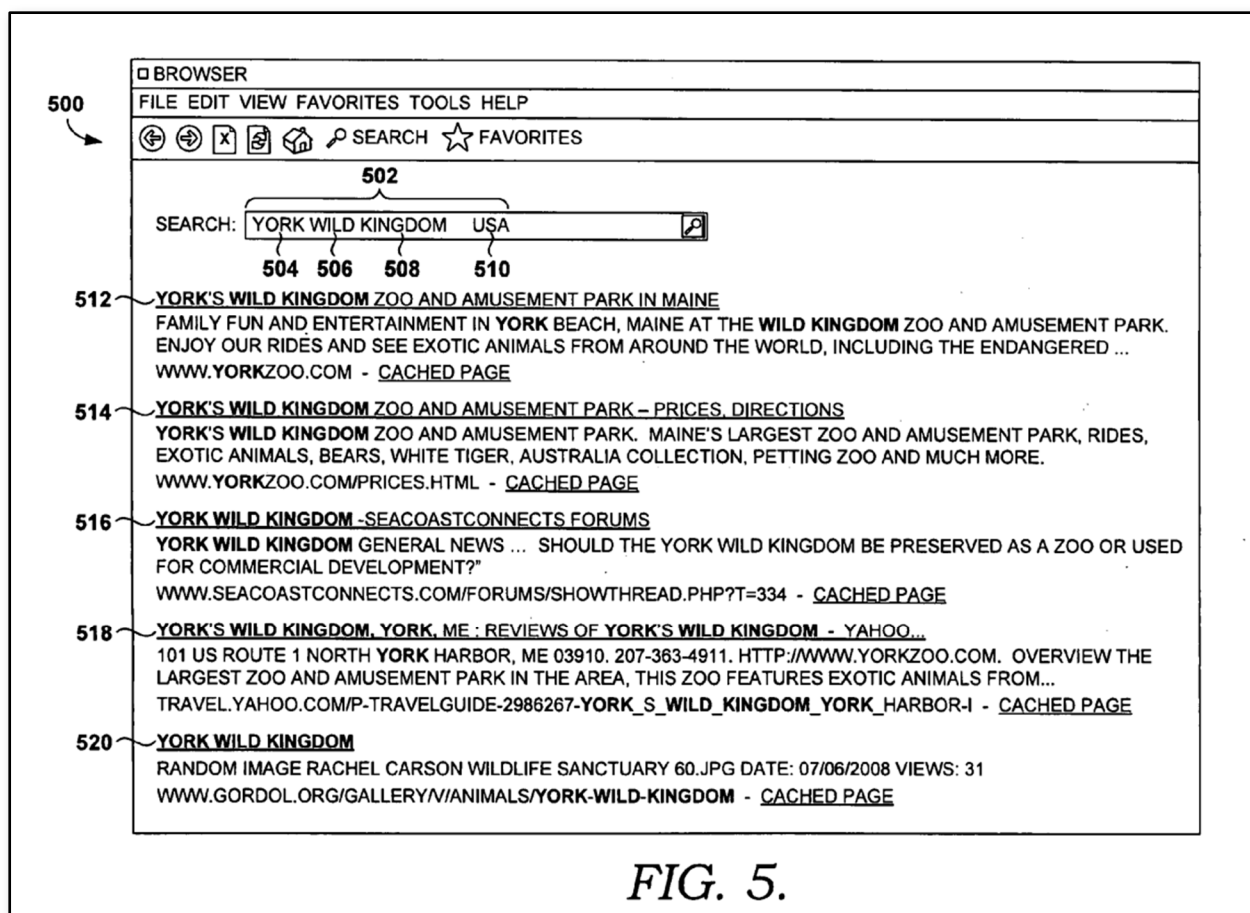
A problem with “and-based searching” occurs when a user “over-specifies a query by including unnecessary terms.” Wang, [0002]. When this happens, relevant search results “missing one or more of the extra terms will not be located.” *Id.* For example, with a four-keyword query, the search engine “will not return documents that do not include all four keywords” even where a webpage is otherwise relevant.⁶ *Id.*; Bederson-Decl., ¶270.

To reduce the risk of excluding potentially relevant documents, Wang teaches “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.” *Id.* “For example, if a query” contained four keywords “and K was equal

⁶ Wang’s “documents” include Internet webpages. Wang, [0030].

to 1, documents would only have to include any three of the” “words to be included on the results list.” Wang, [0014], [0031].

Wang’s Figure 5 (below) illustrates “a search-results list from a search engine performing relaxed searching.” Wang, [0053]. This 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. *Id.* “The resulting documents thus have at least 3 of the 4 keywords.” *Id.*; Bederson-Decl., ¶¶271-272.



Above, Wang emphasizes (in bold) search terms that *appear* in each search-result grouping, explicitly informing the user that those terms are present in the

corresponding search result, and thereby *suggesting* which search term(s) is/are missing. Bederson-Decl., ¶273. POSAs would have been motivated to extend Wang by making explicit which search terms are missing. Bederson-Decl., ¶¶273-277.

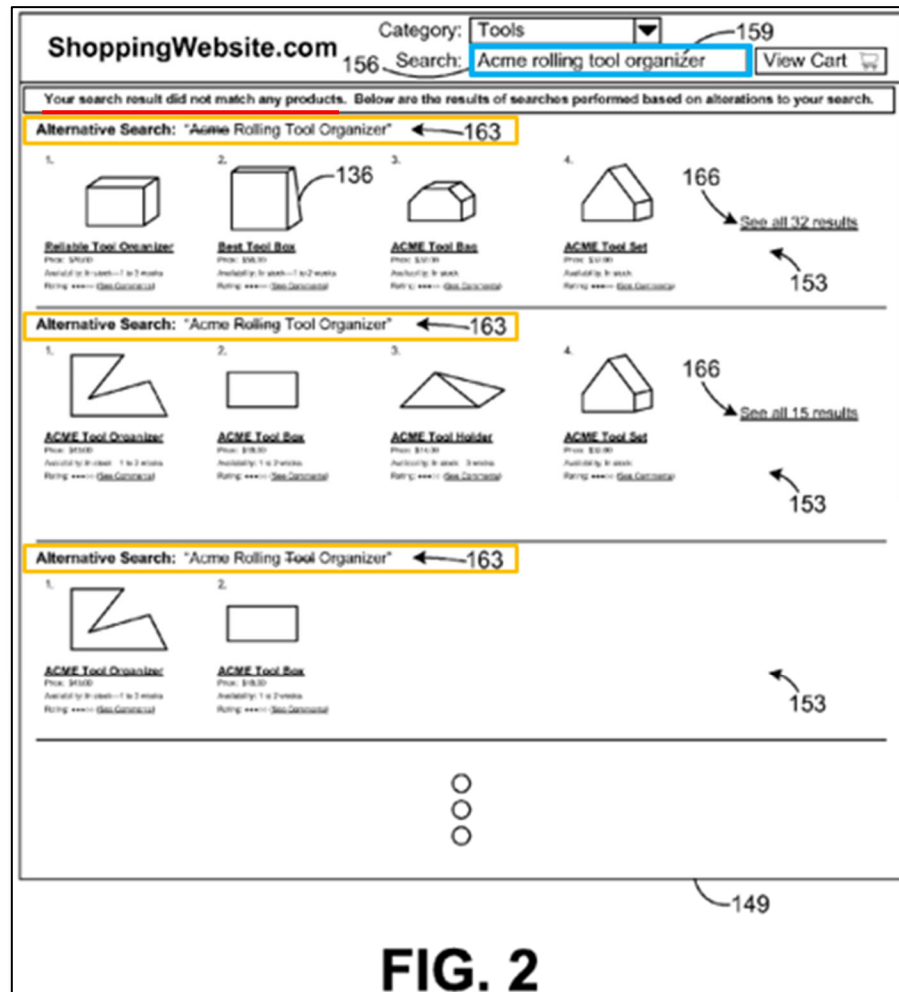
B. Mills (EX1006)

Mills relates to keyword searching. Mills, 1:39-45, 3:26-28, 4:16-19. Mills discusses examples of searching “to identify...products for purchase,” but 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.

Like Wang, Mills observes a problem when a searcher uses “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* 3:29-56.

To address this problem, Mills’s search engine “detects when a query...generated from a search string fail[ed] to identify at least a predefined threshold number of items,” *e.g.*, at least 10 “items,” which in a web-search embodiment would be “web search” results. Mills, 4:39-47; *see also* 2:40-44, 4:16-19; Bederson-Decl., ¶¶278-281. When the threshold is not met, “the search engine...generate[s] 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 are generated by removing one or more keywords from the original search string. Mills, 5:60-63.

Figure 2 (annotated below) illustrates an interface for Mills’s search engine. Mills, 1:25-27. The example search string—“acme rolling tool organizer”—is highlighted blue below. Mills, 6:29-33.



This example four-word search string “does not provide any results for a search” (see red-underlined notification above). Mills, 6:33-36. Because no results were found for the 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.” Mills, 6:38-46. Each altered search string (orange boxes above) is the original

four-word search string with one word removed. Bederson-Decl., ¶¶281-283. For example, the second altered search string is “Acme ~~Rolling~~ Tool Organizer,” which indicates that “Rolling” was removed from the original search string. Bederson-Decl., ¶283.

“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.” Bederson-Decl., ¶284. The strikethrough annotation (“~~Rolling~~”) indicates that in each result in the second group the search engine found three 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. *Id.*

Mills 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” 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. Bederson-Decl., ¶¶285-290.

C. Wang-Mills Combination

Given Mills, POSAs 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. Bederson-Decl., ¶291.

Wang and Mills relate to a common problem: preparing search results based on over-constrained search strings. Bederson-Decl., ¶292. They address that problem in similar ways: displaying search results of altered (and broadened) versions of the user's original search string (*e.g.*, with one of the user's original keywords removed). *Id.*

Mills, however, recognizes a potential problem: "irrelevant items" "may be included in a search result generated based upon part [*i.e.*, a subset] of [an] entire search string." Mills, 3:61-64. That may cause a user to "lose faith that" the search engine "will reveal relevant results," which may "discourage further user participation." Mills, 3:64-4:4. Bederson-Decl., ¶293.

To mitigate that problem, Mills annotates search results by "graphically associating," *i.e.*, annotating, the search results with the altered search strings that yielded those results. Mills, 6:43-46. Mills identifies two principal benefits to its annotations. Bederson-Decl., ¶294.

First, displaying search results "along with the associated altered search strings 163 allows a user to see how other permutations of the original search string"

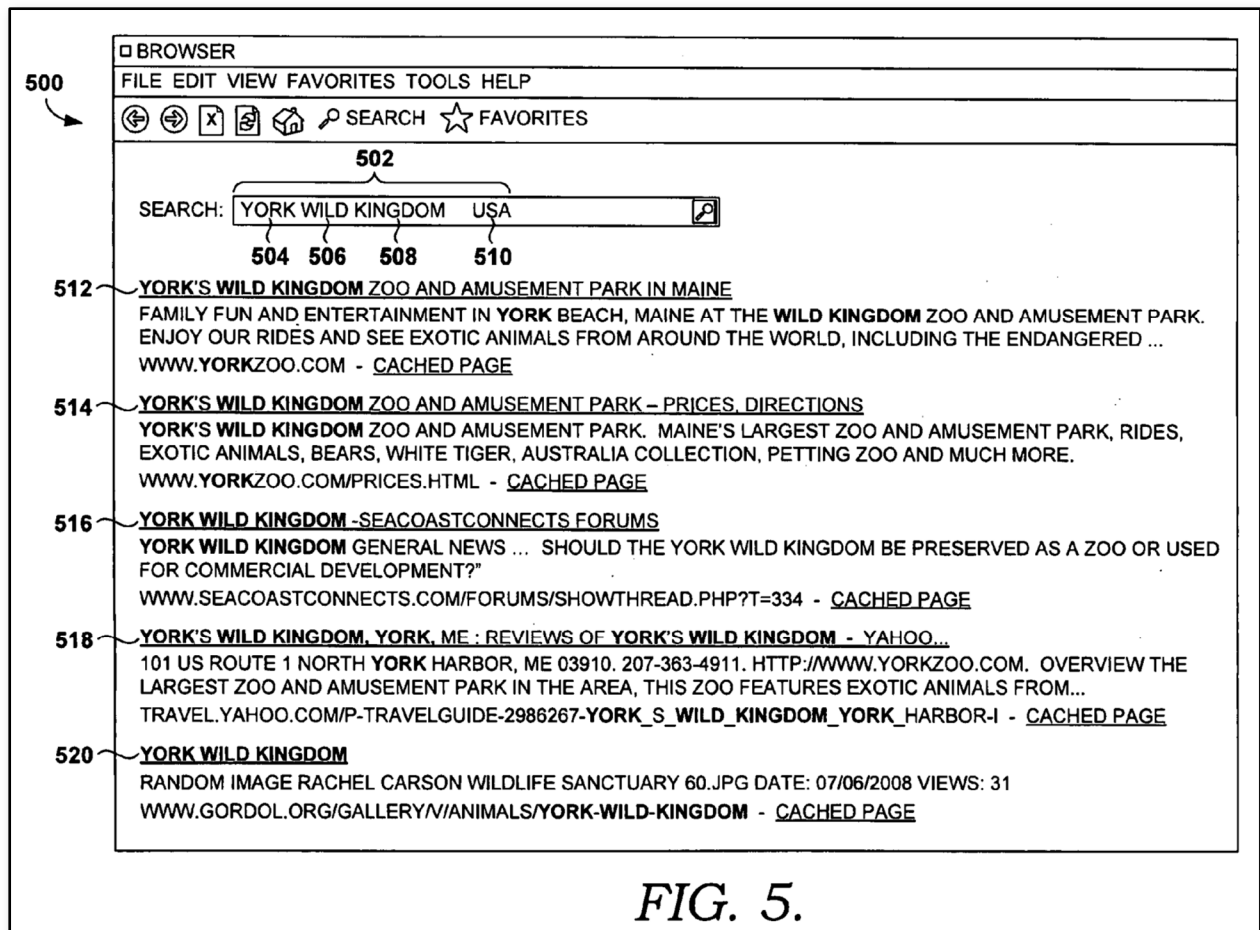
yielded results whereas the original search string did not. Mills, 7:18-23. This “disabuse[s]” the user of the belief that there are no search results relevant to the user’s original search string. Mills, 7:23-25. Bederson-Decl., ¶295.

Second, because “the altered search strings 163 are displayed in association with” their respective search results, “a user can see how the alteration...may have resulted in” results “that are not particularly relevant” to the user’s original search string. Mills, 7:25-31. That is, the annotations identify what term was removed to identify a result and thus what term is missing, which may change the result’s relevance to the user. Mills 7:35-40 (annotations “serve[] to educate users”), 5:18-28 (annotations help identify results that may “be more relevant”). Bederson-Decl., ¶296.

POSAs would have recognized that Mills’s search-term annotations are applicable to any search system that displays results that can match only a subset of search terms. As discussed above, Wang is such a system, and thus suffers the potential problems Mills identified: some of Wang’s search results might match only a subset of user-supplied search terms but (without Mills) Wang does not indicate which search terms have been removed for each broadened search result.

Wang’s Figure 5 example (below) includes four keywords—YORK WILD KINGDOM USA. Wang says “[t]he resulting documents...have at least 3 of the 4 keywords.” Wang, [0053]. Each search-result grouping includes in **bold** “YORK,”

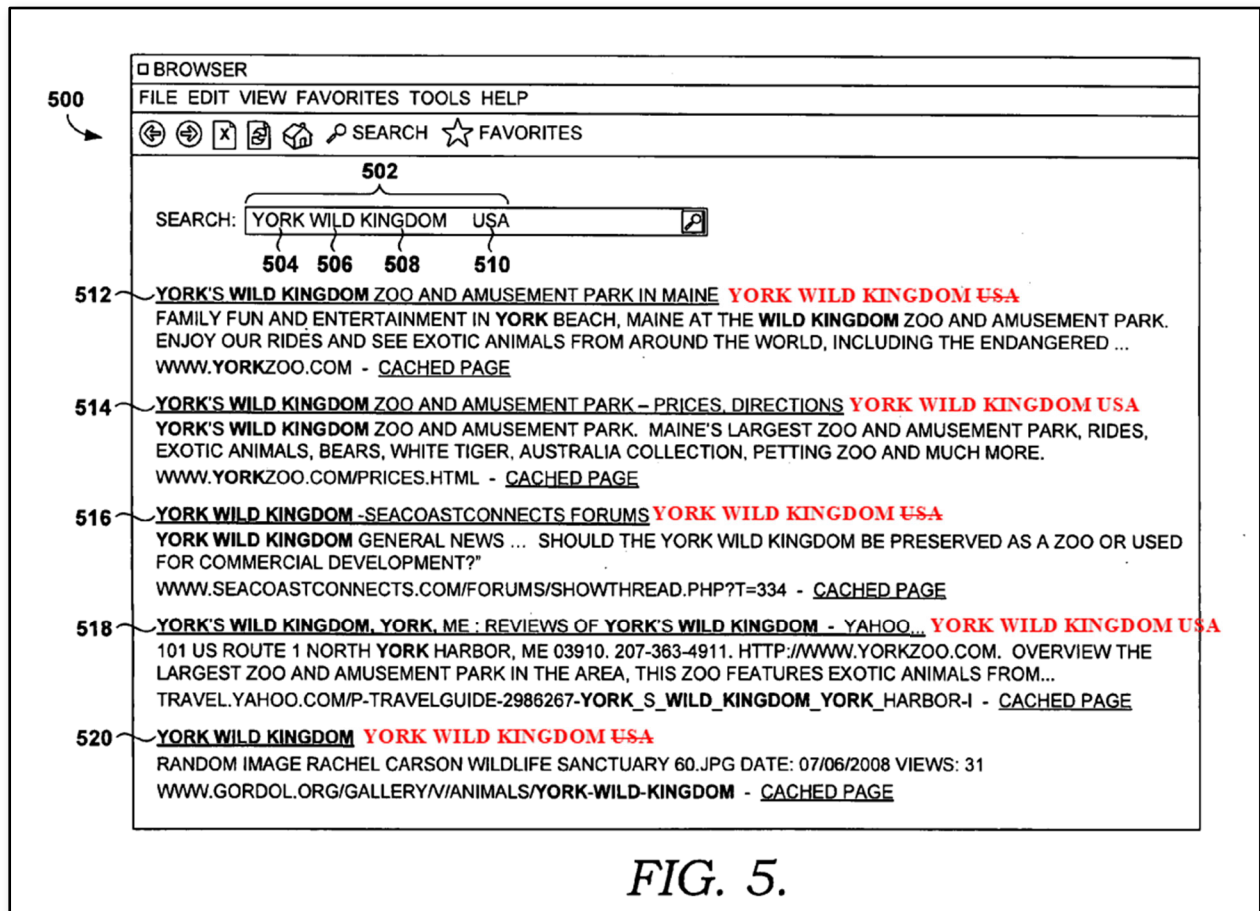
“WILD,” and “KINGDOM,” and thus each corresponding result clearly includes those keywords. Bederson-Decl., ¶¶297-298. However, it is unclear whether any result’s webpage also includes “USA” because even though “USA” is not displayed in the search-result grouping it could still be present somewhere in the webpage (e.g., somewhere other than its title, URL, or excerpt). Wang, [0053] (“*As is shown*,...all [results] contain at least 3 of [the] keywords.”). Bederson-Decl., ¶298, ¶¶274-276 (citing EX1055-EX1057).



Because it is unclear whether any un-displayed keyword is actually missing from each webpage (and, if so, which webpage(s)), POSAs would have recognized that Wang 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 by displaying the specific keywords that Wang used to identify each search result and crossing out keywords that are missing in the associated webpage. Bederson-Decl., ¶299. The combination would have thus been using a known technique (Mills's displayed altered search strings) to improve a similar device (Wang's search engine) in the same way (providing users with additional information that improves their searching experience). Bederson-Decl., ¶¶299-301; *KSR*, 550 U.S. at 417.

Using Wang's Figure 5's example, Wang-Mills's interface would have displayed the altered search string adjacent to each search result, with a strikethrough applied to any term(s) missing from the corresponding search result. Bederson-Decl., ¶308. Including the annotations adjacent 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. Bederson-Decl., ¶¶301-307 (citing, as examples of per-search-result annotations, EX1029, FIG. 3, 5:63-6:49; EX1043, FIGS. 7-9, 13:9-31; EX1044, FIG. 10, [0095]).

As discussed above, Wang’s FIG. 5 is consistent with one or more search results missing “USA” on their corresponding webpage. In the hypothetical example below, “USA” is missing from the webpages of results 512, 516, and 520 (as indicated by the strikethrough to “USA”) but “USA” is present in the webpages of results 514 and 518. Bederson-Decl., ¶308.



POSAs would have reasonably expected success in Wang-Mills. Wang and Mills both relate to search engines that identify search results that match a subset of a user’s multi-word search query; modifying Wang’s interface to display keywords

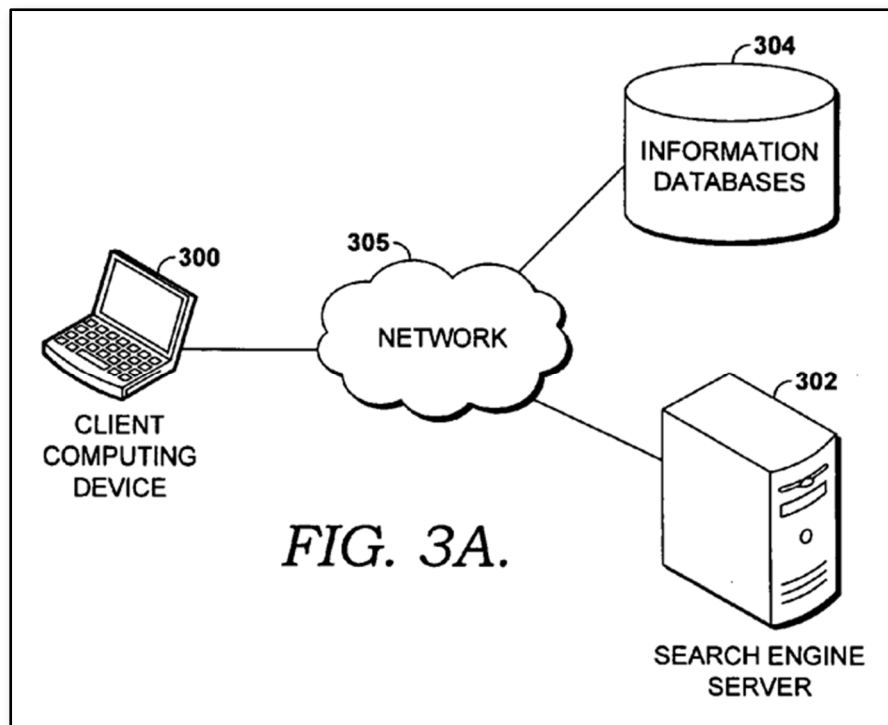
used in an altered query with each search result would have required only routine software-programming skills. Bederson-Decl., ¶309; Mills, 10:26-45.

D. Mapping to Claims

1. Claim 1

a. [1PRE]

Wang discloses “a networked environment [a *system*] for performing relaxed searching on a search engine” (Wang, [0009]) connected to “the Internet” (Wang, [0042])—*i.e., an Internet search system*. See also Wang, [0020], [0032], FIG. 3A (below), FIG. 4, FIG. 5 (search request 502). Bederson-Decl., ¶310.



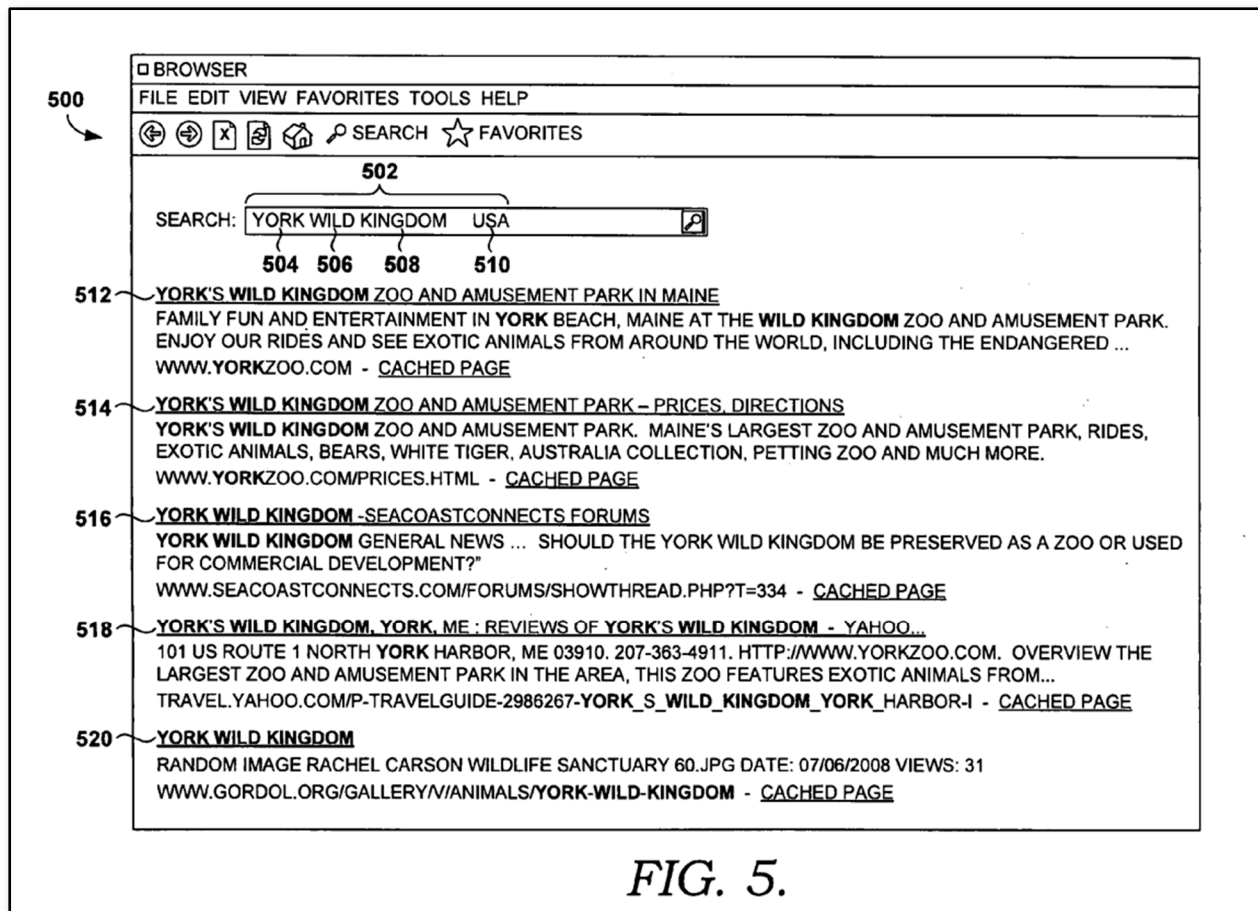
In Wang’s *method*, the “search engine” “creates a list of results for a search-engine query by identifying documents [*e.g., webpages*] that include only a subset

of the keywords [*search term elements*] submitted by *a user*.” Wang, [0014]; *see also* [0035]. Wang’s search engine identifies webpages by “search[ing] one or more inverted indexes for documents that contain” at least a subset of the search query’s “keywords.” Wang, [0040], FIG. 5 (search request 502). Bederson-Decl., ¶311.

Searching inverted indexes, as in Wang, is *an Internet search process* 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...receive[s] queries...and locate[s] information on the Web...to satisfy the queries”), [0016] (“accessing web pages via the Internet”); Bederson-Decl., ¶312.

“Once the web pages are located, their URLs are transmitted back to the client computing device” “and *displayed* as hyperlinks” (*i.e.*, *search results* are generated based on the *user-specified search term elements*). Wang, [0035]; FIG. 5; Bederson-Decl., ¶313.

Wang’s Figure 5 (below) depicts “web browser window 500 rendering a web site for the search engine,” which provides the example *interactive GUI* below. Wang, [0035], [0053]. Bederson-Decl., ¶314.



As discussed above (§IX.C) and further below ([1G]), based on Mills, Wang-Mills enhances Wang's GUI by annotating search results *missing at least one search term element*, by displaying those terms with a strikethrough. Bederson-Decl., ¶315

Thus, Wang-Mills enables *readily discern[ing] such search result without opening its referenced webpage* because the annotation allows the user to identify a missing term without having to click on each website to ascertain that information. Bederson-Decl., ¶316.

b. [1A]

Wang's "search-engine server" "receive[s] queries from remote *computing devices*...and locate[s] information on the Web...that satisfy the query." Wang, [0035], FIG. 3B.

The user's computing device is "equipped with a web browser" (and *display screen*) that "*display[s]*...information located on the Web" and "communicates with the search-engine server." Wang, [0038]. "The 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]) *via "the Internet"* (Wang, [0032], [0042], FIG. 3A (above)).

Thus, Wang's "query" is *a first search request submitted via the Internet by a user operating a computing device that is receiv[ed] on the server and comprised of search term elements ("keywords")*. Wang, [0035], [0002], [0004]; Bederson-Decl., ¶¶317-319.

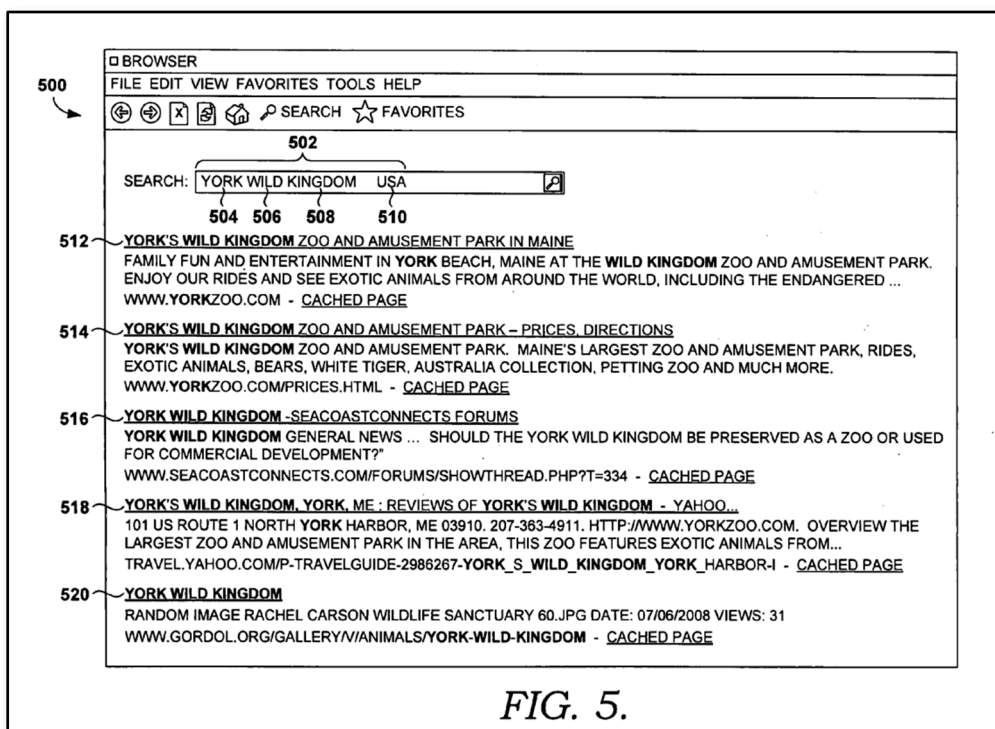
c. [1B]

After a user *submits the first search request*, "web documents" "contain[ing] at least a portion of the query's keywords" "are identified" by the system 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."), [0040]

(“search engine server 302 receives the query” and “searches one or more inverted indexes for documents [*e.g.*, webpages] that contain N–K keywords”).

Wang’s Figure 5 (below) depicts “a web browser window 500 rendering a web site for the search engine,” which shows the *generated search results* (512-520).

Wang, [0053], FIG. 3B (Result Generator 322); Bederson-Decl., ¶¶320-321.



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” (websites) that “have at least 3 of the 4 keywords” (*i.e.*, the results are *generated based on the submitted search request*). Wang, [0053]. Bederson-Decl., ¶322.

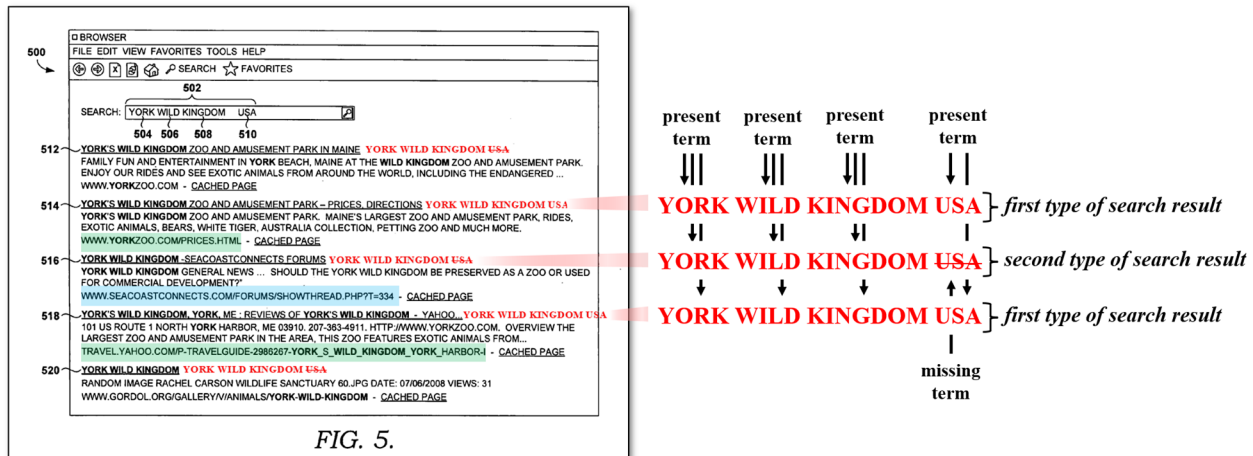
- d. [1C]: (first type of search result)
[1D]: (second type of search result)

Though Wang’s “relaxed” search does not *require* all search terms, it does not preclude results containing all search terms and thus POSAs would have expected Wang-Mills’s search to often include at least one *first type of search result which references a first webpage that contains all submitted search term elements* as that was the conventional expectation at that time. Wang, [0049], [0052]-[0053]; *see also* [0002] (explaining that prior-art search engines required “all...search terms”). Bederson-Decl., ¶323.

As discussed above (§IX.C) and illustrated below based on Wang’s Figure 5 (annotated), Wang-Mills augments Wang’s search results with search-term-text annotations, based on Mills.

Results 514 and 518 below meet [1C]: *a first type of search result which references a first webpage (green) that contains all submitted search term elements (red) displayed without strikethroughs.*

Result 516 meets [1D]: *a second type of search result which references a second webpage (blue) that is missing at least one submitted search term element (red) displayed in strikethrough format.* Bederson-Decl., ¶¶324-326.



e. [1E]

As illustrated above ([1C]-[1D]), the first and second types of search results are “listed in a search-results list and transmitted...to the client computing device 300 for *display* to the user.” Wang, [0040], FIG. 3B (Web Browser 306), FIG. 5; *see also* [0035], [0038]. Bederson-Decl., ¶327.

f. [1F]

Each example *first type of search result* (514 or 518 below) is *displayed as a first search result grouping* (blue boxes), *comprising a title* (purple), *Internet link* (URL) (green), and *excerpt* (orange). Wang, [0035], [0053]. Those results *do not include any annotation for missing search term elements* because their webpages are not missing any search terms. Their annotations display all the search terms (red) without strikethrough; they are not annotations *for missing search term elements*. Bederson-Decl., ¶328.

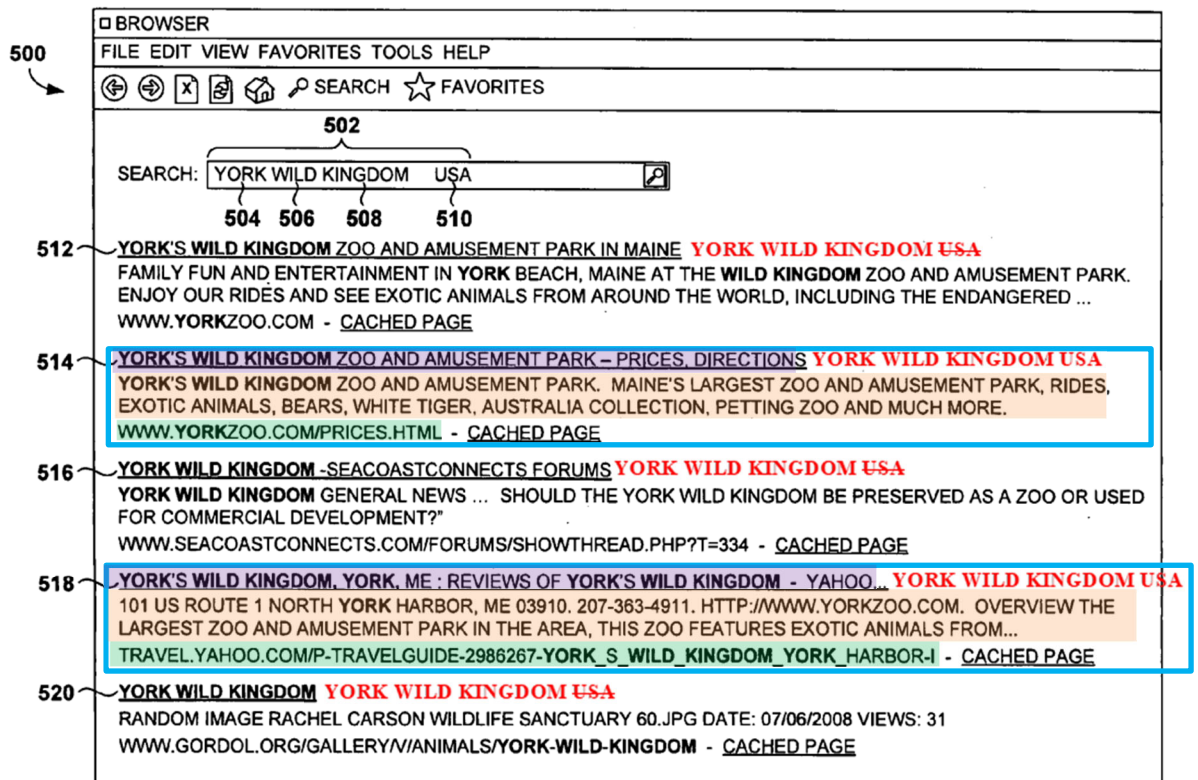
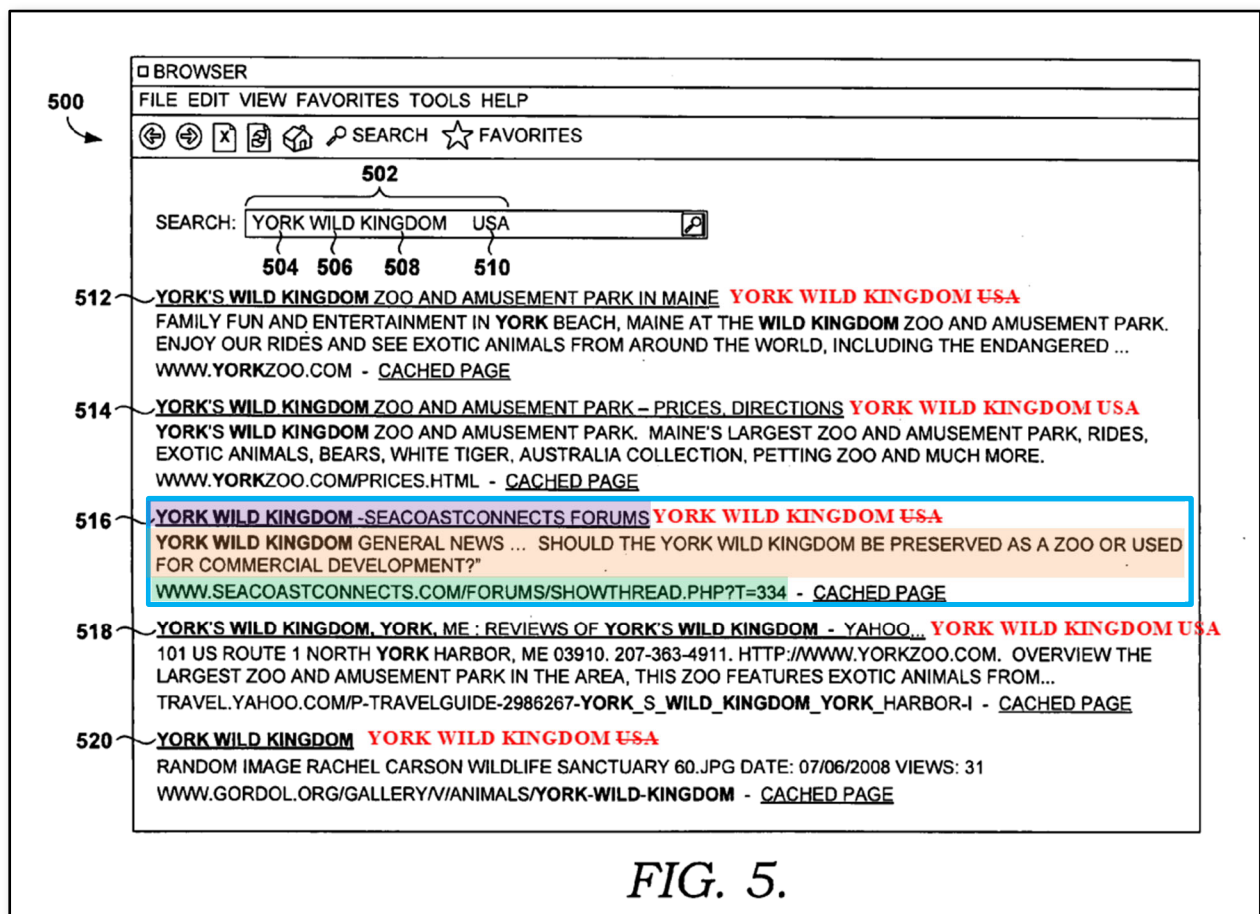


FIG. 5.

g. [1G]

The example *second type of search result* (516 below) is *displayed as a second search result grouping* (blue box), *comprising a title* (purple), *Internet link (URL)* (green), *excerpt* (orange), and *annotation* (red) *showing the at least one search term element missing comprising a text representing the term* (“USA” written as “USA”).

Wang, [0035], [0053]; Bederson-Decl., ¶329.

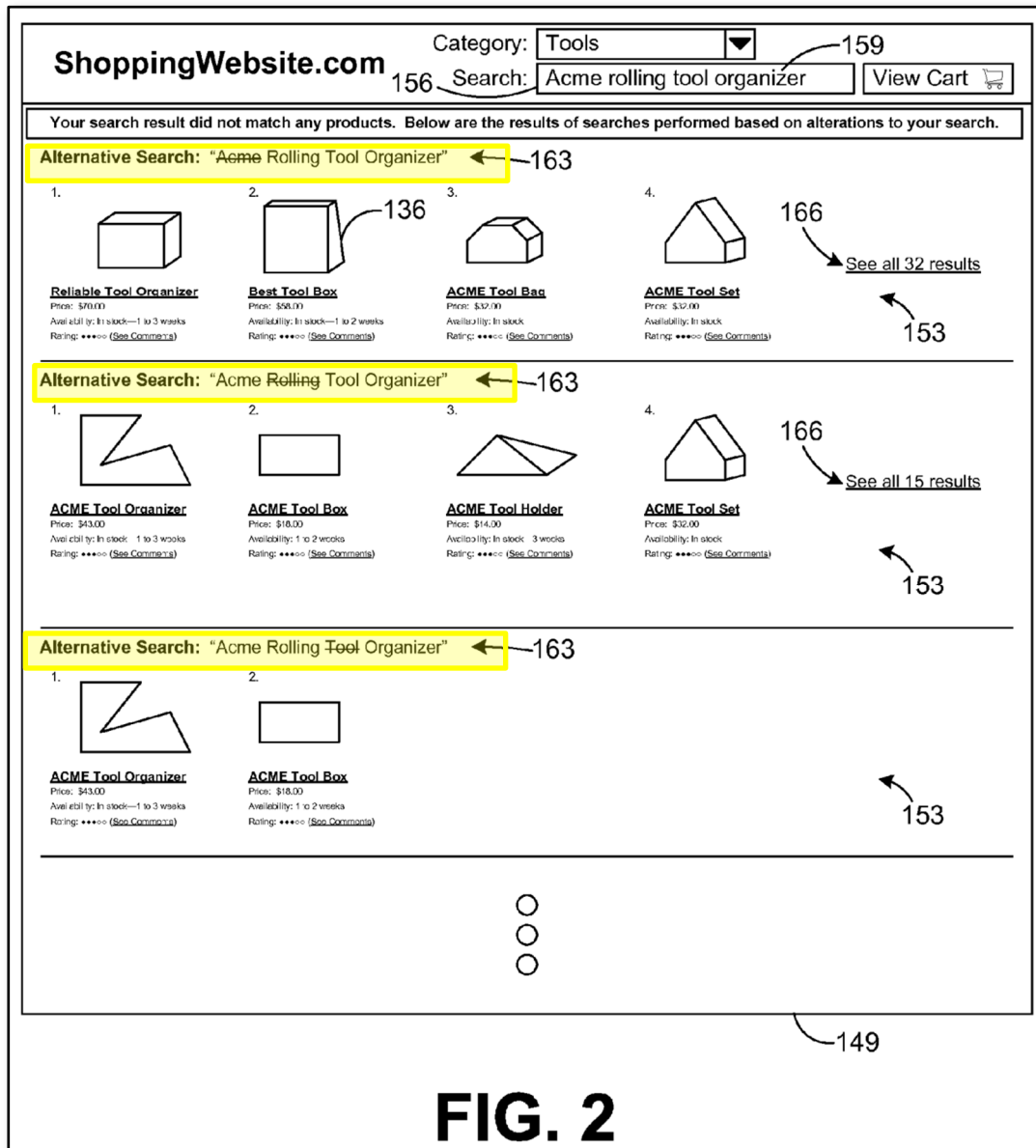


h. [1H]

As illustrated above ([1G]), *the annotation for the second webpage enables the user to readily discern, without opening the second webpage and navigating away from the search results webpage, that the second webpage is missing the at least one search term element* because the missing term is written in strikethrough format. *See Mills, 5:25-26* (search-term annotations allow user to “not select such a group [of results] where other groups appear to be more relevant”). Thus, *a faster execution is enabled for the Internet search process* because the user need not spend time opening the second webpage. *Bederson-Decl., ¶330.*

2. Claim 2

Wang-Mills's annotations are based on Mills. *Supra* §§IX.B-C. Mills's FIG. 2 (highlighted below) displays each text-based annotation 163 (yellow) as a *standalone line in* (above) each group of search results. Bederson-Decl., ¶331.



As demonstrated *supra* §V.D.2 with corroboration (Ground 1A), displaying text-based annotations (like Wang-Mills's) *at the bottom of a search result grouping*

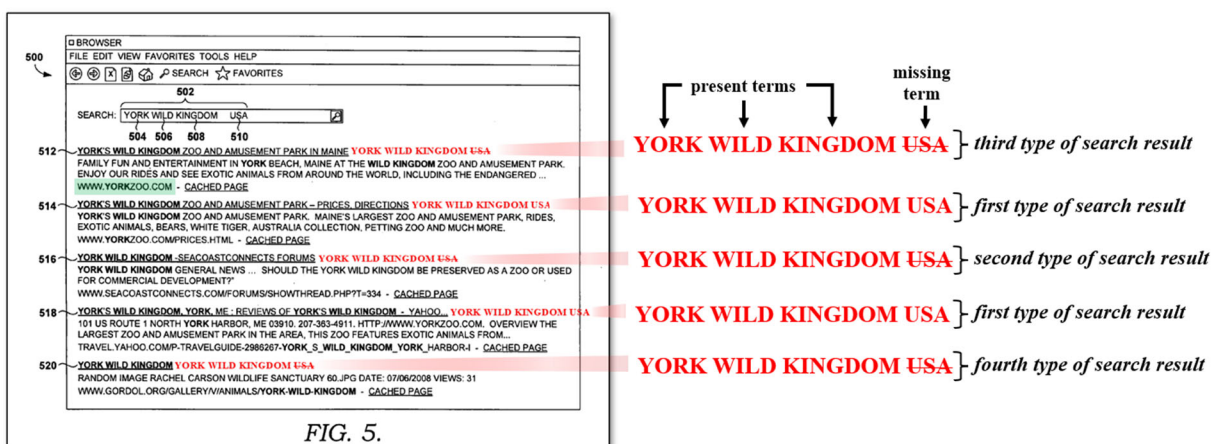
was a well-known aesthetic design choice and would have been an obvious, logical alternative location for displaying additional information in Wang’s search-results interface (FIG. 5). Bederson-Decl., ¶332.

Thus, *displaying* text-based annotations like Wang-Mills’s annotations *as one or more standalone lines at the bottom of the search result grouping* would have been a conventional design choice, based on Mills and the reasons discussed *supra* §V.D.2. Bederson-Decl., ¶333.

3. Claim 6

a. [6A]

In the Wang-Mills illustration below, *search result 512* meets a *third type of search result which references a third webpage* (green) *that is missing at least one search term element* (“USA”) shown in strikethrough format (“~~USA~~”). Bederson-Decl., ¶334.

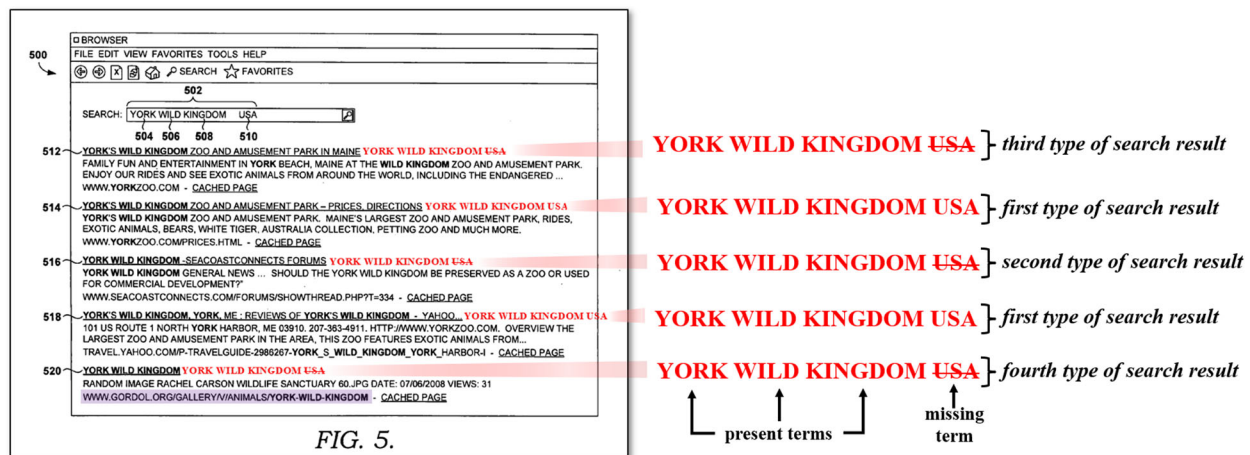


As discussed above (Ground 1A, [6A]), it would have been commonplace for a webpage (e.g., a website’s homepage) to have a *descendant webpage linked*

directly one level therefrom that contains the at least one missing search term element (“USA”). For example, in Wang’s FIG. 5 (annotated above), result 514’s webpage (“**WWW.YORKZOO.COM/PRICES**”) teaches (or at least renders obvious) a descendant webpage linked directly one level from result 512’s webpage (“**WWW.YORKZOO.COM**”) and webpage 514 in the hypothetical example above contains “USA,” which is missing from webpage 512. Bederson-Decl., ¶335.

b. [6B]

Wang-Mills’s example (copied again below) comprises a fourth type of search result (520) which references a fourth webpage (purple) that is missing at least one search term element (“USA”) shown in strikethrough format (“~~USA~~”). Bederson-Decl., ¶336.



For the same reasons discussed above for the third type of search result (Ground 2A, [6A]), it would have been commonplace for the fourth type of search result to have descendant webpages linked directly one level from the fourth

webpage. As discussed above (Ground 1A, [6B]), it would have also been a commonplace scenario for *all* of a webpage’s *descendant webpages* to *also* be *missing the at least one search term element* that’s missing from the parent page. Bederson-Decl., ¶337.

c. [6C]

In Wang-Mills above ([6A]), *the fourth type of search result* is displayed in a *same manner as the second search result grouping* (e.g., with the same type of annotation including “USA”). Wang, FIG. 5, [0035], [0053]; *supra* §IX.D.1.h ([1G]); Bederson-Decl., ¶338.

4. Claim 7

Wang-Mills meets the following limitations of claim 7 for the reasons discussed in the corresponding sections above. Bederson-Decl., ¶339.

Limitation	Addressed in Section:
[7PRE]	§IX.D.1.a ([1PRE])
[7A]	§IX.D.1.b ([1A])
[7C]	§IX.D.1.c ([1B])
[7D]	§IX.D.1.d ([1C])
[7F]	§IX.D.1.e ([1E])

	<i>See also</i> Mills, 6:39-41 (“search engine 129 generates” the “displayed” “altered search strings 163,” <i>i.e.</i> , the annotations). Bederson-Decl., ¶¶348-349.
[7G]	§IX.D.1.f ([1F], <i>first search result grouping</i>), §IX.D.1.g ([1G], <i>second search result grouping</i>)
[7H]	§IX.D.1.f ([1F])
[7I]	§IX.D.1.g ([1G])
[7J]	§IX.D.2.b ([2B])
[7K]	§IX.D.1.h ([1H])

POSAs had reason to implement Wang-Mills in a manner that meets [7B] and [7E]. As Wang observes, “[*m*]ost keyword-based search engines operate” by assuming “the user intends to only find documents that contain *all* of the search terms....This is typically referred to as ‘and-based searching.’” Wang, [0002]. Wang recognizes that “and-based searching” can have problems “[w]hen a user over-specifies a query by including unnecessary terms” such that enough documents containing all the specified terms may not exist. *Id.* But by the same token, POSAs would have known that these problems only arise when not enough search results match all the terms (*e.g.*, when the query is over-specified), and that when there *are* enough search results matching all terms, those are the results the user would prefer

to receive. Bederson-Decl., ¶¶340-341. Mills confirms that this problem only needs addressing “[i]n some situations.” Mills, 4:38-47.

POSAs therefore would have been motivated to implement Wang-Mills to first look for any documents matching all N terms of the user’s query—*i.e.*, to first try an AND-based search—and then proceed to Wang’s invention’s relaxed search for documents matching N-K terms in cases where not enough results matching all N terms were found. For example, as taught by Mills, the search engine may initially try an AND-based search, and follow with Wang’s relaxed search if the AND-based search “fails to identify at least a predefined threshold number of” results—*e.g.*, “10” results. Mills, 4:38-61; Bederson-Decl., ¶342.

The resulting combination would still include annotations indicating the presence or absence of search terms in search results because some searches—those proceeding to Wang’s relaxed-search technique when the initial AND-based search produces too few results—will return webpages that are missing a search term and the annotations would inform the user of that fact. Bederson-Decl., ¶343.

a. [7B]

As discussed immediately above, an obvious implementation of Wang-Mills is one in which Wang’s search engine uses an AND-based search as its initial default before determining to proceed to a relaxed search.

As discussed above (Ground 1A, [7B]; citing corroboration), by 2011, POSAs knew as background knowledge that it was conventional for search-engine providers to publish their search guidelines, *e.g.*, on a help page, to inform users about how the search engine treats queries. Therefore, when implementing Wang-Mills to perform AND-based searches by initial default, it would have been routine, expected, and obvious to publish guidelines informing users that the default initial treatment of a multi-word query is an AND-based search. Bederson-Decl., ¶¶344-345.

POSAs therefore had reason for Wang-Mills to *publish search logic guidelines* explaining how to *perform AND operations*, *e.g.*, for the initial default search in which each term is treated as being connected with an AND operator. Bederson-Decl., ¶346. For example, the exemplary four-term search query executed in Mills’s Figure 5, *i.e.*, *the first search request*, would have been treated initially as: “york” AND “wild” AND “kingdom” AND “USA.” *Id.*

b. [7E]

As discussed above, an obvious implementation of Wang-Mills joins terms with an AND operation for an initial search but, *contrary to the AND operation*, *also* returns relaxed search results *missing a search term* when too few results are returned from the initial AND-based search. *Supra* §IX.D.4; Mills, 4:38-39. That alternative, obvious implementation of Wang-Mills meets [7E]. Bederson-Decl., ¶347.

5. Claim 11

See claim 6, *supra* §IX.D.3. Bederson-Decl., ¶¶350-352.

6. Claim 12

Wang-Mills meets the following limitations of claim 12 for the reasons discussed in the corresponding sections above. Bederson-Decl., ¶353.

Limitation	Addressed in Section:
[12PRE]	§IX.D.4 ([7PRE])
[12A]	§IX.D.4 ([7A], [7F]) Wang’s <i>user-operated “computing device” “may be a...desktop computer,...[or] smartphone” ([0037])</i>
[12B]	§IX.D.4 ([7A]), §IX.D.4.a ([7B])
[12C]	§IX.D.4 ([7C])
[12D]	§IX.D.4 ([7D])
[12E]	§IX.D.4.b ([7E])
[12F]	§IX.D.4 ([7F], [7G])
[12G]	§IX.D.4 ([7H])
[12H]	§IX.D.4 ([7I])

[12I]	§IX.D.4 ([7J])
[12J]	§IX.D.4 ([7K])

7. Claim 16

See claim 6, *supra* §IX.D.3; Bederson-Decl., ¶¶354-356.

X. GROUND 2B: WANG-MILLS-BRINSON

A. Wang-Mills-Brinson Combination

As discussed in Ground 2A, Wang-Mills uses Wang’s relaxed search, which identifies search results containing a subset, but potentially not all, 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 designate a “must include” term. Bederson-Decl., ¶¶357-358.

As discussed in Ground 1B, Brinson discloses a user-friendly GUI that allows a user to designate a search term “Require[d],” which means “results must include this term.” Brinson, [0045], [0070]-[0071], [0075]. Bederson-Decl., ¶359.

Thus, in view of Brinson, POSAs had reason to augment Wang-Mills to include user-selectable GUI elements (*e.g.*, clickable text) for “designat[ing]” that a search term “must [be] include[d]” in the search results. Wang, [0045]. Doing so would have also been applying aspects of Brinson’s known GUI for beneficially making a search term mandatory to known search engines ready for that

improvement 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). *KSR*, 550 U.S. at 417.

In the Wang-Mills-Brinson combination, the search engine is augmented to include a user-selectable GUI element in each search-result grouping that allows a user to select a search term and designate it a required term that must be included in each search result. Bederson-Decl., ¶¶360-361. For example, as discussed *supra* §VI.A, Brinson’s Figure 18 suggests making each search term listed next to a search-result grouping selectable to designate its weight. 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. Bederson-Decl., ¶359. As discussed above (§VI.B; citing corroboration), a known, beneficial way to implement what Brinson describes was to filter already-identified results, without executing another search. Bederson-Decl., ¶359.

POSAs would have reasonably expected success because, as discussed above, Wang expressly supports the ability to make a search term mandatory, and it would have required only ordinary programming skill to adapt weight-selecting aspects of Brinson’s GUI (*e.g.*, clickable text) for Wang-Mills. Bederson-Decl., ¶362.

B. Mapping to Challenged Claims

1. Claims 3, 8, 13

Claims 3, 8, and 13 depend from independent claims 1, 7, and 12, respectively, and add the *selectable-filtering-function* limitation. Ground 2B’s combinations build on Ground 2A’s Wang-Mills combinations and meet claims 1, 7, and 12 for the same reasons Wang-Mills does. *Supra* Ground 1A; Bederson-Decl., ¶¶363-364.

As discussed above, based on Brinson, Wang-Mills-Brinson includes user-selectable GUI elements (*e.g.*, clickable text displayed within each search-result grouping) for designating a search term mandatory. Bederson-Decl., ¶365. Thus, Wang-Mills-Brinson meets the *selectable-filtering-function* limitation because selecting the GUI element to designate a search term “required” *automatically causes* the search-result webpages *missing* that search term (*e.g.*, *the second search result grouping*) *to be removed from the search results webpage. Id.*

If claims 3/8/13 require results to be removed in response to a single click, that would have been obvious as a simple, convenient design option, for the reasons discussed above (Ground 1B, claims 3/8/13). Bederson-Decl., ¶366 (citing corroboration).

2. Claims 4, 9, 14

a. [4A]/[9A]/[14A]

Wang’s “computing device...may be a...smartphone” (Wang, [0019], [0037]), which has *a smaller display screen than a laptop*, etc. *See also* Mills, 2:48-54; Bederson-Decl., ¶367.

b. [4B]/[9B]/[14B]

POSAs understood that *the automatic removal of the second search result grouping* discussed above (§X.B.1) *enables the smaller display screen to display an increased number of first type of search results (i.e., results with all terms)* because removing results provides additional screen space. Bederson-Decl., ¶¶368-371.

XI. GROUND 2C: WANG-MILLS-MEHTA

A. Wang-Mills-Mehta Combination

As discussed in Ground 1C, Mehta displays “relevant advertisement[s]” as “links” (*selectable advertisements*) alongside Internet search results. Mehta, [0005]. *See also* EX1001, 2:54-58. POSAs had the same reasons discussed in Ground 1C (e.g., generating revenue) to display selectable advertisements based on Mehta in Ground 2A’s Wang-Mills combinations. Bederson-Decl., ¶¶372-374 (citing EX1015, [0004]; EX1016, [0006]).

Based on Mehta, Wang-Mills-Mehta displays selectable advertisements with “[s]ponsored links” that are “relevant to [the user’s] search criteria.” Mehta, [0005]-[0006]; Bederson-Decl., ¶375. POSAs would have reasonably expected success

because, as discussed above (§VII.B, Ground 1C), displaying such selectable advertisements was conventional. Bederson-Decl., ¶376.

B. Mapping to Claims

1. Claims 5, 10, 15

Claims 5, 10, and 15 depend from independent claims 1, 7, and 12, respectively, and add the *selectable-advertisement* limitation. Ground 2C’s Wang-Mills-Mehta builds on Ground 2A’s Wang-Mills and meets claims 1, 7, and 12 for the same reasons Wang-Mills does. *Supra* Ground 1A; Bederson-Decl., ¶377.

As discussed above, Wang-Mills-Mehta displays “advertisements” *related to* at least *one search term*, with *selectable* links that users “click[]” to open an advertised webpage. Mehta, [0005]-[0006]. Bederson-Decl., ¶378. Thus, Wang-Mills-Mehta meets the *selectable-advertisement* limitation. *Id.*

2. Claim 17

Wang-Mills meets the following limitations of claim 17 for the reasons discussed in the corresponding sections above. Bederson-Decl., ¶379.

Limitation	Addressed in Section:
[17PRE]	§IX.D.4 ([7PRE])
[17A]	§IX.D.4 ([7A])
[17B]	§IX.D.4.a ([7B])

[17C]	§IX.D.4 ([7C])
[17D]	§IX.D.4 ([7D])
[17E]	§IX.D.4.b ([7E])
[17F]	§IX.D.4 ([7F])
[17G]	§IX.D.4 ([7G])
[17H]	§IX.D.4 ([7H])
[17I]	§IX.D.4 ([7I])
[17J]	§IX.D.4 ([7J])
[17K]	§XI.B.1 (claim 5)
[17L]	§IX.D.3.a ([6A])
[17M]	§IX.D.3.b ([6B])
[17N]	§IX.D.3.c ([6C])
[17O]	§IX.D.4 ([7K])

3. Claim 18

Wang-Mills’s *annotation comprises text representing at least one search term element* (e.g., “USA”) with a strikethrough, which is a *format where the text is shown with (i) ...font...[that] has been altered, (ii) ...one or more lines merged with the text and/or (iii) ...one or more lines superimposed thereupon*. Bederson-Decl., ¶¶380-381.

4. Claim 19

Wang-Mills-Mehta meets the following limitations of claim 19 for the reasons discussed in the corresponding sections above. Bederson-Decl., ¶382.

Limitation	Addressed in Section:
[19PRE]	§IX.D.4 ([7PRE]) §XI.B.1 (claims 5/10/15 ; advertisements displayed based on <i>submitted search terms</i> , independent of whether <i>some search results...do[] not contain all...terms</i>)
[19A]	§IX.D.4 ([7PRE]) (<i>interactive GUI</i>) §IX.D.4 ([7A]), §IX.D.4.a ([7B]) (<i>server receiving search request</i>)

[19B]	§IX.D.4 ([7C]) §IX.D.4.b ([7E]’s <i>second type</i> meets [19B]’s <i>first search result</i>)
[19C]	§IX.D.4 ([7F])
[19D]	§IX.D.4 ([7I]’s <i>second grouping</i> meets [19D]’s <i>first grouping</i>)
[19E]	§IX.D.4 ([7J])
[19F]	§XI.B.1 (claims 5/10/15)
[19G]	§IX.D.4 ([7K])

5. Claim 20

Wang-Mills-Mehta meets claim 20 for the same reasons Wang-Mills (Ground 2A) meets claim 6 with claim 20’s *second* and *third search results* corresponding to claim 6’s *third* and *fourth* type of search results, respectively. *Supra* §IX.D.3; Bederson-Decl., ¶¶383-385.

XII. GROUND 2D: WANG-MILLS-MEHTA-BRINSON

A. Wang-Mills-Mehta-Brinson Combination

Ground 2D challenges claim 21 (and its dependent claim 22), which requires the *selectable-filtering-function* limitation defined above (§VI). Bederson-Decl., ¶386.

For the same reasons POSAs had to incorporate such known filtering functionality into Wang-Mills based on Brinson (§X.A), POSAs would have incorporated it into Ground 2C’s Wang-Mills-Mehta. POSAs would have reasonably expected success in this Wang-Mills-Mehta-Brinson combination for the same reasons as in Wang-Mills-Brinson (§X.A). Bederson-Decl., ¶387.

B. Mapping to Claims

1. Claim 21

Claim 21 depends from claim 19 and adds the *selectable-filtering-function* limitation. Ground 2D’s Wang-Mills-Mehta-Brinson builds on Ground 2C’s Wang-Mills-Mehta and meets claim 19 for the reasons Wang-Mills-Mehta does. *Supra* Ground 2C, §XI.B.4. Bederson-Decl., ¶388.

As discussed above (§XII.A), for the same reasons POSAs would have augmented Ground 2A’s Wang-Mills to include, based on Brinson, user-selectable GUI elements (*e.g.*, clickable buttons or text in each search-result grouping) that allow users to designate a search term mandatory, POSAs would have added that functionality to Wang-Mills-Mehta. Bederson-Decl., ¶389. Wang-Mills-Mehta-Brinson then meets the *selectable-filtering-function* limitation for the same reason Ground 2B’s combinations meet claim 3 (*supra* §X.B.1), with claim 21’s *first search result grouping* corresponding to claim 3’s *second search result grouping*. Bederson-Decl., ¶389.

2. Claim 22

Wang-Mills-Mehta-Brinson meets claim 22 for the same reasons Wang-Mills-Brinson (Ground 2B) meets claim 4, with claim 22's *first search result grouping* corresponding to claim 4's *second search result grouping*. *Supra* Ground 2B, §X.B.2; Bederson-Decl., ¶¶390-391.

XIII. CONCLUSION

The Board should institute review and cancel claims 1-22.

Dated: 2026-03-13

Respectfully submitted,
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XIV. CLAIM LISTING APPENDIX

Claim 1
[1PRE] In an Internet search system for displaying search results during an Internet search process, the search results being generated based on user-specified search term elements, where at least one search result references a webpage that is missing at least one search term element, a method for providing an interactive graphical user interface for the user to readily discern such search result without opening its referenced webpage, the method comprising:
[1A] receiving, on a server, a first search request submitted via the Internet by a user operating a computing device with a display screen, wherein the first search request is comprised of one or more search term elements;
[1B] generating a plurality of search results based at least in part on the submitted first search request, wherein the plurality of search results is comprised of:
[1C] (i) a first type of search result which references a first webpage that contains all submitted search term elements; and
[1D] (ii) a second type of search result which references a second webpage that is missing at least one submitted search term element;
[1E] causing the display screen to display the first and second types of search results on a search results webpage;
[1F] causing the display screen to display the first type of search result as a first search result grouping, wherein the first search result grouping is comprised of one or more of: a title for the first webpage, an Internet link for the first webpage, an excerpt of the first webpage, or a URL for the first webpage, and wherein the first search result grouping does not include any annotation for missing search term elements;
[1G] causing the display screen to display the second type of search result as a second search result grouping, wherein the second search result grouping is comprised of an annotation showing the at least one search term element missing in the second webpage and one or more of: a title for the second webpage, an Internet link for the second webpage, an excerpt of the second webpage, or a URL for the second webpage, and wherein the annotation is comprised of a text representing the at least one search term element; and

[1H] wherein the annotation enables the user to readily discern, without opening the second webpage and navigating away from the search results webpage, that the second webpage is missing the at least one search term element, and by not opening the second webpage a faster execution is enabled for the Internet search process.

Claim 2

The method of claim 1, wherein the annotation is displayed as one or more standalone lines in the second search result grouping; and wherein the annotation is displayed at the bottom of the second search result grouping.

Claim 3

The method of claim 1 further comprising: causing the display screen to display, in combination with the annotation within the second search result grouping, a selectable filtering function that, when selected, automatically causes the second search result grouping to be removed from the search results webpage.

Claim 4

[4A] The method of claim 3, wherein the user's computing device is a smart phone with a smaller display screen than a laptop, desktop, notebook, or tablet computer's display screen, and

[4B] wherein the automatic removal of the second search result grouping enables the smaller display screen to display an increased number of first type of search results.

Claim 5

The method of claim 1 further comprising: causing the display screen to display one or more selectable advertisements on the search results webpage, wherein the one or more selectable advertisements are related to one or more of the search term elements.

Claim 6

[6A] The method of claim 1, wherein the plurality of search results is further comprised of: (i) a third type of search result which references a third webpage that is missing at least one search term element, wherein a descendant webpage linked directly one level from the third webpage contains the at least one missing search term element; and

[6B] (ii) a fourth type of search result which references a fourth webpage that is missing at least one search term element, wherein all descendant webpages linked directly one level from the fourth webpage are also missing the at least one search term element; and

[6C] further comprising: causing the display screen to display the fourth type of search result in a same manner as the second search result grouping.

Claim 7

[7PRE] A system for an Internet search engine provider to provide an interactive graphical user interface for a user during an Internet search process to readily discern a search result that references a webpage that is missing a search term element, without requiring the user to open the search result's referenced webpage, the system comprising:

[7A] one or more servers, wherein the one or more servers receive a first search request via the Internet from a user-operated computing device,

[7B] wherein the first search request is comprised of a plurality of search term elements for performing AND operations according to search logic guidelines published by the search engine provider;

[7C] wherein in response to the first search request, the one or more servers perform an Internet search to produce a search results webpage comprising a plurality of search results, wherein the plurality of search results is comprised of:

[7D] (i) a first type of search result which references a first webpage that contains all search term elements; and

[7E] (ii) a second type of search result which references a second webpage that is, contrary to the search logic guidelines for AND operations published by the search engine provider, missing at least one search term element;

[7F] wherein the one or more servers provide the search results webpage via the Internet for displaying the plurality of search results on a display screen of the user-operated computing device;

[7G] wherein the first type of search result is displayed as a first search result grouping and the second type of search result is displayed as a second search result grouping;

[7H] wherein the first search result grouping is comprised of one or more of: a title for the first webpage, an Internet link for the first webpage, an excerpt of the first webpage, or a URL for the first webpage; and wherein the first search result grouping does not include an annotation indicating one or more missing search term elements in the first webpage;

[7I] wherein the second search result grouping is comprised of a missing search term annotation and one or more of: a title for the second webpage, an Internet link for the second webpage, an excerpt of the second webpage, or a URL for the second webpage; wherein the missing search term annotation is comprised of a text representing at least one search term element missing in the second webpage;

[7J] wherein the missing search term annotation is placed on the display screen at the bottom of the second search result grouping; and

[7K] wherein the missing search term annotation warns the user that the second webpage is missing the at least one search term element, and wherein the missing search term annotation enables the user to readily discern that the second webpage is missing the at least one search term element without opening the second webpage, thereby saving time and enabling a faster execution of the Internet search process.

Claim 8

The system of claim 7, wherein the display screen displays, in combination with the annotation within the second search result grouping, a selectable filtering function that, when selected, automatically causes the second search result grouping to be removed from the search results webpage.

Claim 9

[9A] The system of claim 8, wherein the user-operated computing device is a smart phone with a smaller display screen than a laptop, desktop, notebook, or tablet computer's display screen, and

[9B] wherein the automatic removal of the second search result grouping enables the smaller display screen to display an increased number of first type of search results.

Claim 10

The system of claim 7, wherein the display screen displays one or more selectable advertisements on the search results webpage, where the one or more selectable advertisements are related to one or more of the search term elements.

Claim 11

[11A] The system of claim 7, wherein the plurality of search results is further comprised of: (i) a third type of search result referencing a third webpage that is missing at least one search term element, wherein a descendant webpage linked directly one level from the third webpage contains the at least one missing search term element; and

[11B] (ii) a fourth type of search result references a fourth webpage that is missing at least one search term element, wherein all descendant webpages linked directly one level from the fourth webpage are also missing the at least one search term element; and

[11C] wherein the display screen displays the fourth type of search result in a same manner as the second search result grouping.

Claim 12

[12PRE] A system for operating an interactive graphical user interface during an Internet search process that enables a user to readily discern a search result that references a webpage that is missing a search term element without requiring the user to open the search result's referenced webpage, the system comprising:

[12A] a user-operated computing device capable of sending information to and receiving information from a search engine provider via the Internet, and also capable of operating an interactive graphical user interface for interacting with the search engine, wherein the device is any one of: a desktop computer, a laptop computer, or a notebook computer; a smart phone; or a tablet computer;

[12B] wherein the interactive graphical user interface interacts with, and enables, the user to submit a first search request via the Internet to the search engine provider, the first search request comprising a plurality of search term elements for performing AND operations according to published search logic guidelines;

[12C] wherein in response to the first search request, the device receives from the search engine provider a search results webpage comprising a plurality of search results, wherein the plurality of search results is comprised of:

[12D] (i) a first type of search result which references a first webpage that contains all search term elements; and

[12E] (ii) a second type of search result which references a second webpage that is, contrary to the published search logic guidelines for AND operations, missing at least one search term element;

[12F] wherein the first type of Internet search result is displayed on a display screen of the device as a first search result grouping and the second type of search result is displayed on the display screen as a second search result grouping;

[12G] wherein the first search result grouping is comprised of one or more of: a title for the first webpage, an Internet link for the first webpage, an excerpt of the first webpage, or a URL for the first webpage; and wherein each first search result grouping does not include an annotation indicating one or more missing search term elements in the first webpage;

[12H] wherein the second search result grouping is comprised of a missing search term annotation and one or more of: a title for the second webpage, an Internet link for the second webpage, an excerpt of the second webpage, or a URL for the second webpage; wherein the missing search term annotation is comprised of a text representing at least one search term element missing in the second webpage, and

[12I] wherein the missing search term annotation is placed on the display at the bottom of the second search result grouping; and

[12J] wherein the missing search term annotation enables the user to readily discern that the second type of search result is missing a desired search term element without opening the second webpage, and that by warning the user with respect to such search result, less time is wasted thereby enabling faster execution of the Internet search process.

Claim 13

The system of claim 12, wherein the display screen displays, in combination with the annotation within the second search result grouping, a selectable filtering function that, when selected, automatically causes the second search result grouping to be removed from the search results webpage.

Claim 14

[14A] The system of claim 13, wherein the user-operated computing device is a smart phone with a smaller display screen than a laptop, desktop, notebook, or tablet computer's display screen, and

[14B] wherein the automatic removal of the second search result grouping enables the smaller display screen to display an increased number of first type of search results.

Claim 15

The system of claim 12, wherein the display screen displays one or more selectable advertisements on the search results webpage, where the one or more selectable advertisements are related to one or more of the search term elements.

Claim 16

[16A] The system of claim 12, wherein: a third type of search result references a third webpage that is missing at least one search term element, and a descendant webpage linked directly one level from the third webpage contains the at least one missing search term element;

[16A] a fourth type of search result references a fourth webpage that is missing at least one search term element, and all descendant webpages linked directly one level from the fourth webpage are also missing the at least one search term element; and

[16B] wherein the display screen displays the fourth type of search result in a same manner as the second search result grouping.

Claim 17

[17PRE] A system for an Internet search engine provider to provide an interactive graphical user interface for a user during an Internet search process to readily discern a search result that references a webpage that is missing a search term element, without requiring the user to open the search result's referenced webpage, the system comprising:

[17A] one or more servers operated by a search engine provider, wherein the one or more servers receive a first search request via the Internet from a user-operated computing device;

[17B] wherein the first search request is comprised of a plurality of search term elements for performing AND operations according to search logic guidelines published by the search engine provider;

[17C] wherein in response to the first search request, the one or more servers perform an Internet search to produce a search results webpage comprising a plurality of search results, wherein the plurality of search results is comprised of:

[17D] (i) a first type of search result which references a first webpage that contains all search term elements; and

[17E] (ii) a second type of search result which references a second webpage that is, contrary to the search logic guidelines for AND operations published by the search engine provider, missing at least one search term element;

[17F] wherein the one or more servers provide the search results webpage via the Internet for displaying the plurality of search results on a display screen of the user-operated computing device;

[17G] wherein the first type of search result is displayed as a first search result grouping and the second type of search result is displayed as a second search result grouping;
[17H] wherein the first search result grouping is comprised of one or more of: a title for the first webpage, an Internet link for the first webpage, an excerpt of the first webpage, or a URL for the first webpage; and wherein each first search result grouping does not include an annotation indicating one or more missing search term elements in the first webpage;
[17I] wherein the second search result grouping is comprised of a missing search term annotation and one or more of: a title for the second webpage, an Internet link for the second webpage, an excerpt of the second webpage, or a URL for the second webpage; wherein the missing search term annotation is comprised of a text representing at least one search term element missing in the second webpage;
[17J] wherein the missing search term annotation is placed on the display screen at the bottom of the second search result grouping;
[17K] wherein the display screen displays one or more selectable advertisements on the search results webpage, where the one or more selectable advertisements are related to one or more of the search term elements;
[17L] wherein a third type of search result references a third webpage that is missing at least one search term element, and wherein a descendant webpage linked directly one level from the third webpage contains the at least one missing search term element;
[17M] wherein a fourth type of search result references a fourth webpage that is missing at least one search term element, and wherein all descendant webpages linked directly one level from the fourth webpage are also missing the at least one search term element;
[17N] wherein the display screen displays the fourth type of search result in a same manner as the second search result grouping; and
[17O] wherein any missing search term annotation enables the user to readily discern, without opening its associated referenced webpage and navigating away from the search results webpage, that the associated referenced webpage is missing the at least one search term element, and by not opening the respective referenced webpage a faster execution is enabled for the Internet search process.

Claim 18

The system of claim 17 wherein each missing search term annotation comprises text representing at least one search term element 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; and (v) the text is shown with a reversed format.

Claim 19

[19PRE] A method for advertising in conjunction with Internet search, wherein one or more advertisements related to submitted search term elements are placed on a search results webpage even though some search results displayed on that webpage reference a corresponding webpage that does not contain all the submitted search term elements, the method comprising:

[19A] receiving at a server at a first location, a first search request submitted via the Internet from an interactive graphical user interface on a user-operated computing device at a second location, the first search request comprising one or more search term elements for performing AND operations according to search logic guidelines published by the search engine provider;

[19B] performing an Internet search to produce one or more search results, each search result referencing a webpage, wherein the one or more search results includes a first search result referencing a first webpage that is, contrary to the guidelines for AND operations published by the search engine provider, missing one or more of the search term elements in the first webpage;

[19C] transmitting to the computing device via the Internet, a first search results webpage comprising the one or more search results, the first search results webpage being displayed on the interactive graphical user interface on the computing device's display screen;

[19D] wherein the first search result is displayed as a first search result grouping; wherein the first search result grouping is comprised of a missing search term annotation and one or more of: a title for the first webpage, an Internet link for the first webpage, an excerpt of the first webpage, or a URL for the first webpage; wherein the missing search term annotation is comprised of a text representing at least one search term element missing in the first webpage;

[19E] wherein the annotation is located on the display at the bottom of the first search result grouping;

[19F] wherein the first search results webpage also comprises one or more selectable advertisements related to one or more of the search term elements; and

[19G] wherein the annotation warns the user that one or more search term elements are missing on the first webpage, and that not selecting the first search result will speed the Internet search process by reducing wasted time.

Claim 20

[20A] The method of claim 19, wherein the one or more search results further includes: (i) a second search result which references a second webpage that is missing at least one search term element, wherein a descendant webpage linked directly one level from the second webpage contains the at least one missing search term element; and

[20B] (ii) a third search result which references a third webpage that is missing at least one search term element, wherein all descendant webpages linked directly one level from the third webpage are also missing the at least one search term element; and further comprising:

[20C] causing the display screen to display the third search result in a same manner as the first search result grouping.

Claim 21

The method of claim 19, wherein the display screen displays, in combination with the annotation within the first search result grouping, a selectable filtering function that, when selected, automatically causes the first search result grouping to be removed from the search results webpage.

Claim 22

[22A] The method of claim 21, wherein the user-operated computing device is a smart phone with a smaller display screen than a laptop, desktop, notebook, or tablet computer's display screen, and

[22B] wherein the automatic removal of the first search result grouping enables the smaller display screen to display an increased number of first type of search results.

CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24, the undersigned certifies that the foregoing Petition for *Inter Partes* Review contains 13,882 words excluding a table of contents, a table of authorities, Mandatory Notices under § 42.8, a certificate of service or word count, or appendix of exhibits or claim listing. Petitioner has relied on the word count feature of the word processing system used to create this paper in making this certification.

Date: March 13, 2026

/Dara Del Rosario/
Dara Del Rosario
Paralegal
WOLF, GREENFIELD & SACKS, P.C.

CERTIFICATE OF SERVICE UNDER 37 C.F.R. § 42.6 (E)(4)

I certify that on March 13, 2026, a copy of the foregoing document, including any exhibits or appendices filed therewith, is being served via Overnight FedEx at the following correspondence address of record for the patent:

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