

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

American Airlines, Inc., and Hilton Domestic Operating Company, Inc.,
Petitioners

v.

R2 Solutions LLC,
Patent Owner

Case IPR2023-TBD
U.S. Patent No. 7,698,329

**PETITION FOR *INTER PARTES* REVIEW OF
U.S. PATENT NO. 7,698,329**

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Ex-1002	Certified Copy of the Prosecution History of U.S. Patent No. 7,698,329 (dated July 29, 2021)
Ex-1003	Claim Construction Memorandum Opinion and Order, <i>R2 Solutions LLC v. Deezer S.A.</i> , No. 4:21-cv-00090 (E.D. Tex. Jan. 4, 2022), ECF No. 45
Ex-1004	U.S. Patent No. 6,285,999 to Page (“Page”)
Ex-1005	Various FusionBot Website Pages (“FusionBot”), including: • Frequently Asked Question #26, FusionBot, https://web.archive.org/web/20030905065727/http://www.fusionbot.com/faqs/faq26.asp?pp=&p (archived by Wayback Machine Sept. 5, 2003) (“FBFAQ #26”); • Frequently Asked Question #29, FusionBot, https://web.archive.org/web/20051230082546/http://www.fusionbot.com:80/faqs/faq29.asp (archived by Wayback Machine Dec. 30, 2005) (“FBFAQ #29”); • Frequently Asked Question #47, FusionBot, https://web.archive.org/web/20051125113020/http://www.fusionbot.com:80/faqs/faq47.asp (archived by Wayback Machine Nov. 25, 2005) (“FBFAQ #47”); and • What’s New, FusionBot, https://web.archive.org/web/20051218033318/http://www.fusionbot.com:80/whatsnew.asp (archived by Wayback Machine Dec. 18, 2005) (“FB What’s New”)
Ex-1006	U.S. Patent No. 6,295,559 to Emens et al. (“Emens”)
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Ex-1008	U.S. Patent Publication No. 2007/0214131 to Cucerzan et al. (“Cucerzan”)
Ex-1009	U.S. Patent No. 7,509,344 to Kamvar et al. (“Kamvar”)
Ex-1010	U.S. Patent Publication No. 2005/0091580 to Kamholz et al. (“Kamholz”)
Ex-1011	Corporate Information: Technology Overview, Google, https://web.archive.org/web/20041217011837/http://www.google.com/corporate/tech.html (archived by Wayback Machine Dec. 17, 2004) (“Google Technology Overview”)
Ex-1012	Scott Nicholson, Indexing and Abstracting on the World Wide Web: An Examination of Six Web Databases, 16 Info. Tech. & Librs. (1997) (“Nicholson”)
Ex-1013	Shian-Hua Lin & Jan-Ming Ho, Discovering Informative Content Blocks from Web Documents, Proc. Eighth ACM SIGKDD Int’l Conf. on Knowledge Discovery & Data Mining 588 (2002) (“Lin”)
Ex-1014	Ling Ma et al., Extracting Unstructured Data from Template Generated Web Documents, Proc. 2003 ACM CIKM Int’l Conf. Info & Knowledge Mgmt. (2003) (“Ma”)
Ex-1015	Zoltan Milosevic, FDSE Help: How to Prevent Sections of Your Page from Being Indexed, XAV.com, https://web.archive.org/web/20060105100607/http://www.xav.com:80/scripts/search/help/1048.html (archived by Wayback Machine Jan. 5, 2006) (“Milosevic”)
Ex-1016	Peter Janes, Robot Exclusion Profile, https://web.archive.org/web/20060104033238/http://microformats.org:80/wiki/robots-exclusion (archived by Wayback Machine Jan. 4, 2006) (“Janes”)
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Ex-1019	U.S. Patent No. 6,526,440 to Bharat (“Bharat”)
Ex-1020	Lawrence Page et al., The PageRank Citation Ranking: Bringing Order to the Web (Jan. 29, 1998) (“PageRank Paper”)
Ex-1021	Sergey Brin & Lawrence Page, The Anatomy of a Large-Scale Hypertextual Search Engine, 30 Comput. Networks & ISDN Sys. 107 (1998) (“Anatomy Paper”)
Ex-1022	U.S. Patent Publication No. 2008/0071773 to Gross (“Gross”)
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Ex-1024	Eric Enge, Using Google Webmaster Tools to Increase Your Link Juice, Search Engine Watch (Feb. 16, 2007), https://www.searchenginewatch.com/2007/02/16/using-google-webmaster-tools-to-increase-your-link-juice/ (“Enge”)
Ex-1025	Discussion: Noindex, Follow, Digital Point (Sept. 17, 2004), https://forums.digitalpoint.com/threads/noindex-follow.3118/ (“Digital Point”)
Ex-1026	Eric Enge, Eric Enge Interviews Google’s Matt Cutts, Perficient (Oct. 8, 2007), https://blogs.perficient.com/2007/10/08/eric-enge-interviews-googles-matt-cutts/ (“Cutts Interview”)
Ex-1027	Declaration of Benjamin B. Bederson, Ph.D.
Ex-1028	Curriculum Vitae of Benjamin B. Bederson, Ph.D.
Ex-1029	Declaration of Nathaniel E. Frank-White
Ex-1030	Declaration of Matthew Fordham

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Ex-1031	Scheduling Order, <i>R2 Solutions LLC v. American Airlines Inc.</i> , No. 4:22-cv-00353, Dkt. 20 (E.D. Tex. Oct. 7, 2022)
Ex-1032	Plaintiff's Complaint for Patent Infringement, <i>R2 Sols. LLC v. Hilton Domestic Operating Company, Inc.</i> , No. 3:22-cv-02761, Dkt. 1 (N.D. Tex. Dec. 12, 2022)
Ex-1033	Plaintiff's Disclosure of Asserted Claims and Infringement Contentions, 4:22-cv-00353 (E.D. Tex. Oct. 13, 2022)
Ex-1034	Docket Navigator Report for U.S. Patent No. 7,698,329 (last updated August 28, 2022)
Ex-1035	Joint Claim Construction Statement in <i>R2 Solutions LLC v. American Airlines Inc.</i> , No. 4:22-cv-00353, Dkt. 32 (E.D. Tex. Jan. 13, 2023)
Ex. 1036	Plaintiff's Proposed Constructions in <i>R2 Solutions LLC v. American Airlines Inc.</i> , No. 4:22-cv-00353, Dkt. 32-1 (E.D. Tex. Jan. 13, 2023)
Ex. 1037	Defendant's Proposed Constructions in <i>R2 Solutions LLC v. American Airlines Inc.</i> , No. 4:22-cv-00353, Dkt. 32-2 (E.D. Tex. Jan. 13, 2023)
Ex. 1038	<i>Building a Website for Dummies</i> , 2nd ed., David Crowder, 2004.
Ex. 1039	<i>Adding Search for Website: A Study of Remote Search Engines</i> , Pujar S. M., Mundgod M. B., and Munnolli Satish, 2002, INFLIBNET Centre, http://ir.inflibnet.ac.in/handle/1944/21 .
Ex. 1040	Plaintiff's Opening Claim Construction Brief in <i>R2 Solutions LLC v. American Airlines Inc.</i> , No. 4:22-cv-00353 (E.D. Tex. Feb. 21, 2023)

TABLE OF AUTHORITIES

	Page(s)
Cases	
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I. Introduction

The '329 patent purports to improve on the search results of prior art search engines by ranking search results using, at least in part, a section of a document that was ignored by a search engine when recalling the documents for a query. Contrary to the '329 patent's assertions, this purported improvement was known long before the '329 patent was filed. Page—a patent awarded to Google's co-founder—teaches recalling documents by title only, and thus ignoring all other document sections during recall. Page then discloses ranking the recalled documents by considering *all* document sections, including sections other than the title that were ignored for recall. FusionBot—a website publicly accessible years before the '329 patent—discloses specific <noindex> tags that flag sections that are to be ignored for recall purposes.

In one embodiment, the '329 patent describes delineating the sections to be ignored during recall using tags embedded in the document. But this concept was also known in the art. Indeed, the FusionBot prior art cited herein disclosed a method for doing precisely this and was readily combinable with Page's methods. Page and FusionBot render obvious nearly all claims of the '329 patent.

The other prior art references in this petition—Emens, Li, and Cucerzan— teach the remaining elements recited in the '329 patent's remaining dependent claims that are not rendered obvious by Page and FusionBot alone. The Board should institute *inter partes* review and cancel claims 1-14 of the '329 patent.

II. Precise Relief Requested

Petitioners request review of claims 1-14 and cancellation of those claims as unpatentable in view of the following prior art:

Prior Art
U.S. Patent No. 6,285,999 to Page (“Page”); filed January 9, 1998 and issued September 4, 2001; prior art under pre-AIA 35 U.S.C. §§ 102(a), (b), and (e)
FusionBot Website Pages (“FusionBot”), including: • Frequently Asked Question #26, FusionBot, https://web.archive.org/web/20030905065727/http://www.fusionbot.com/faqs/faq26.asp?pp=&p (archived by Wayback Machine Sept. 5, 2003) (“FBFAQ #26”); • Frequently Asked Question #29, FusionBot, https://web.archive.org/web/20051230082546/http://www.fusionbot.com:80/faqs/faq29.asp (archived by Wayback Machine Dec. 30, 2005) (“FBFAQ #29”); • Frequently Asked Question #47, FusionBot, https://web.archive.org/web/20051125113020/http://www.fusionbot.com:80/faqs/faq47.asp (archived by Wayback Machine Nov. 25, 2005) (“FBFAQ #47”); and • What’s New, FusionBot, https://web.archive.org/web/20051218033318/http://www.fusionbot.com:80/whatsnew.asp (archived by Wayback Machine Dec. 18, 2005) (“FB What’s New”); prior art under pre-AIA 35 U.S.C. §§ 102(a) and (b)
U.S. Patent No. 6,295,559 to Emens et al. (“Emens”); filed Aug. 26, 1999; issued September 25, 2001; prior art under pre-AIA 35 U.S.C. §§ 102(a), (b), and (e)
WO Patent Publication No. 1997/049048 to Li (“Li”); filed June 17, 1997; published Dec. 24, 1997; prior art under pre-AIA 35 U.S.C. §§ 102(a), (b), and (e)

U.S. Patent Publication No. 2007/0214131 to Cucerzan et al. (“Cucerzan”); filed March 13, 2006; published September 13, 2007; prior art under pre-AIA 35 U.S.C. § 102(e)

Grounds of Unpatentability	
1	Page in view of FusionBot renders obvious claims 1-3, 5, 8-10, and 12 under 35 U.S.C. § 103.
2	Page in view of FusionBot and Emens renders obvious claims 4 and 11 under 35 U.S.C. § 103.
3	Page in view of FusionBot and Li renders obvious claims 6 and 13 under 35 U.S.C. § 103.
4	Page in view of FusionBot and Cucerzan renders obvious claims 7 and 14 under 35 U.S.C. § 103.

III. Overview of the Subject Matter

A. Overview of the '329 Patent

The '329 patent presents “[a] method and apparatus for improving search results” by ignoring sections of documents for recall purposes, but ranking the documents based on their full content. '329 patent, Abstract; Ex-1027, ¶¶36, 42-45. Terms in a document’s “no-recall sections” are excluded from consideration when the document is recalled by a search engine in response to a query. '329 patent, Abstract; Ex-1027, ¶¶42-45. However, “[t]he results are ordered at least in part by the rankings attributed to the identified no-recall sections.” '329 patent, Abstract. The '329 patent concedes that its embodiments are

implemented with generic hardware and software. *Id.*, 4:62-6:52; Ex-1027, ¶36.

The '329 patent explains that a search engine—well known by the 2007 filing date—comprises “software and computational resources [that] are dedicated to searching a set of information resources” in response to queries. '329 patent, 1:18-25. A search engine’s response to a query may include several steps. First, a “search engine index,” which the search engine will use “to search for documents,” may be built. *Id.*, 1:45-51; Ex-1027, ¶37. “[C]rawlers” often build search engine indexes while “explor[ing] information over the Internet” and “summariz[ing] [the documents] in databases,” but indexing can also be performed manually. '329 patent, 1:47-57; Ex-1027, ¶37. Second, upon receiving a query, the search engine examines its index for responsive documents. '329 patent, 1:57-59; Ex-1027, ¶37. Finally, the search engine generates a “list of [responsive] documents,” which “may contain summary information about” them. '329 patent, 1:60-62; Ex-1027, ¶37. As the '329 patent notes, search engines like YahooTM and GoogleTM were “widely used” well before the '329 patent’s priority date. '329 patent, 1:25-32; Ex-1027, ¶37. Generating the list of responsive documents is referred to as “*recall*.”

After recall, the list of documents undergoes a *ranking*. The '329 patent also states that the search engine may order the generated list of documents after “assign[ing] a rank to each document in the list.” '329 patent, 1:62-67; Ex-1027, ¶38. The search engine may rank the documents based on their “relevance to a search query”—i.e., “how closely the

subject matter of a document matches a search query's terms.” ’329 patent, 1:67-2:3; Ex-1027, ¶38. **Ranking** a document is therefore different from **recalling** a document, which refers to “[t]he inclusion of a document within the search engine results generated by a search engine for a search engine query.” ’329 patent, 2:3-5; Ex-1027, ¶38.

According to the ’329 patent, search engines are vulnerable to “search engine spamming” techniques that “trick search engines into recalling documents and inflating their rank.” ’329 patent, 2:6-8; Ex-1027, ¶39. The patent notes that problems posed by search engine spam are exacerbated when webmasters seek to avoid indexing certain content in their documents, as that content can be used to “hid[e] search engine spam.” ’329 patent, 2:28-34; Ex-1027, ¶39. To counter these problems, the ’329 patent presents mechanisms for “affect[ing] the recall and ranking of documents to more accurately reflect [their] relevance ... to search engine queries.” ’329 patent, 3:1-3; Ex-1027, ¶39. These mechanisms use the structure of each document to identify sections that *should not be indexed* by the search engine—and therefore *should not be used to recall the document* in response to a query—but *should be used to rank the document* when it has been recalled. ’329 patent, 3:7-31; Ex-1027, ¶39.

The ’329 patent explains that “document[s]” are “unit[s] of information that may be indexed by search engine indexes” and may include “plain or formatted text, inline graphics, and other multimedia data, and hyperlinks to other documents.” ’329 patent, 1:33-38; Ex-1027, ¶40. Although the ’329 patent lists HTML, XML, WordTM, and

Adobe™ PDF documents as document formats, '329 patent, 1:38-43, it also uses webpage 100 as an example, *id.*, Fig. 1, 3:32-39; Ex-1027, ¶40.

Webpage 100 is divided into title section 101, navigation pane 102, main content section 103, copyright notice section 104, related blogs section 105 (i.e., a section with regularly changing content), and advertising section 106. '329 patent, 3:33-37; Ex-1027, ¶41. As discussed *infra* in Section IV.A, dividing webpages into sections was known to those skilled in the art. Ex-1027, ¶41. Figure 2 illustrates this structure as it might appear to a user viewing the webpage through a browser:

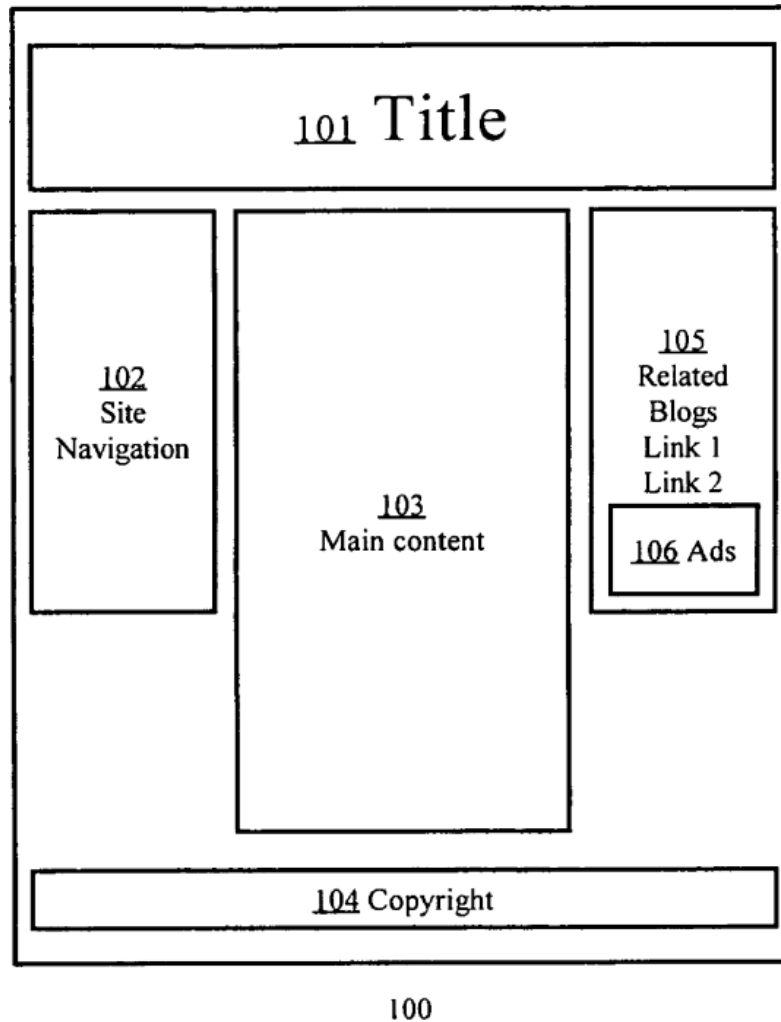


Figure 1.

'329 patent, Fig. 1; Ex-1027, ¶41. This structure may be implemented by the following exemplary HTML code, which incorporates tags and nested tables to identify (1) the type of HTML used to generate the document; (2) the locations of document content; and (3) the positions of the webpage's sections:

```

200 <HTML>
201 <HEAD>
202 ...
203 </HEAD>
204 <BODY>
205     <TABLE>
206         <TR>
207             <TD> Title </TD>
208         </TR>
209         <TR>
210             <TD>
211                 <TABLE>
212                     <TR>
213                         <div class="robots-noindex" >
214                             <TD> Navigation </TD>
215                         </div class="robots-noindex" >
216                     </TR>
217                     <TR>
218                         <TD> Main Content </TD>
219                     </TR>
220                     <TR>
221                         <div class="robots-noindex" >
222                             <TD> Related Blogs, Ads</TD>
223                         </div class="robots-noindex" >
224                     </TR>
225                 </TABLE>
226             </TD>
227         </TR>
228         <TR>
229             <div class="robots-noindex" >
230                 <TD> Copyright </TD>
231             </div class="robots-noindex" >
232         </TR>
233     </TABLE>
234 </BODY>
235 </HTML>

```

Figure 2.

'329 patent, Fig. 2, 3:40-50; Ex-1027, ¶41.

The '329 patent discloses that a search engine crawler “identifies certain sections to ignore, that is, to not index in search engine indexes and[/]or otherwise use for recalling the document.” '329 patent, 3:7-11; Ex-1027, ¶42. The '329 patent calls these ignored sections “no-recall sections.” '329 patent, 3:11-12; Ex-1027, ¶42. The remaining sections of the document, which the search engine indexes, are called “recall sections.” '329 patent, 3:12-14; Ex-1027, ¶42. The '329 patent discusses two embodiments for

identifying no-recall sections. Ex-1027, ¶42. In the first embodiment, “a tag,” such as a `<div class=“robots-noindex”>` tag, “demarcate[s]” or “delimit[s]” no-recall sections in the document’s HTML code. ’329 patent, 3:14-15, 3:51-52; Ex-1027, ¶43. For example, as shown in Figure 2, such a tag delimits navigation pane 102, copyright notice section 104, related blogs section 105, and ad section 106. ’329 patent, 3:14-15, 3:51-54; Ex-1027, ¶43. The `<div class=“robots-noindex”>` tag causes any content it encloses “to be ignored for purposes of recalling the document.” ’329 patent, 3:55-57; Ex-1027, ¶43. Thus, even if a query term falls within a section demarcated by such a tag, the document will not be recalled based on that instance of the query term. ’329 patent, 3:55-62; Ex-1027, ¶43. However, while “a `<div class=“robots-noindex”>` element ... is not indexed by a search engine index,” the tag does not preclude the section from being “considered for spam and relevancy analysis.” ’329 patent, 4:7-16; Ex-1027, ¶43. Instead, “[a]ll the attributes in all of the sections of [the] document such as ‘links’, frequency of terms, coloring, font, etc. are ... considered for spam and relevancy analysis.” ’329 patent, 4:13-16; Ex-1027, ¶43.

In the second embodiment, “no-recall section[s] may be identified by analyzing section content” and assigning “[s]ection rating scores” based on their relevance to “the main topic of the page.” ’329 patent, 3:15-17; 4:17-53; Ex-1027, ¶44. Scores may be assigned based on section attributes like “the number, frequency and order of appearance of terms, fonts, and colors” or characteristics of outgoing links, like “link text and link quantity and quality,” in each section. ’329 patent, 4:25-29, 4:43-50; Ex-1027, ¶44. Figure

3 shows an example of this second embodiment. '329 patent, Fig. 3, 4:17-53; Ex-1027, ¶44.

The '329 patent discloses that, because the search engine does not index no-recall sections, terms within those sections “do not contribute to the document term frequency counts and are not used for recalling the documents in response to search engine queries.” '329 patent, 3:17-20; Ex-1027, ¶45. However, their content—including the quality and quantity of links or advertisements they contain and/or other features—still impacts document ranking. '329 patent, 3:20-31; Ex-1027, ¶45.

The search engine may also return a list of documents ordered by document rank. *See* '329 patent, 1:60-67; Ex-1027, ¶46. This list may include “short descriptive paragraphs” or “abstracts”—i.e., concise descriptions of the documents—for each document. '329 patent, 4:54-57; Ex-1027, ¶46. However, “the contents of [all] no-recall sections are excluded from the abstract[s].” *Id.*, 4:57-60; Ex-1027, ¶46.

B. Prosecution History

The Examiner twice rejected the claims of the application leading to the '329 patent as obvious over various references, including Matt Cutts, “Handling noindex meta tags” (Aug. 30, 2006) (“Cutts”). Ex-1002, 35-43, 85-93; Ex-1027, ¶48.

Responding to the first rejection, Applicant amended then-claims 1, 2, and 4; canceled other claims; and added new claims. Ex-1002, 72-76; Ex-1027, ¶49. The new claims were substantively identical to the existing claims, except they recited a

“computer-readable storage medium” instead of a “method.” Ex-1002, 72-76; Ex-1027,

¶49. Applicant argued that the following claim element distinguished the art:

wherein ranking a plurality of documents includes ranking said plurality of documents based, at least in part, on the one or more sections of said certain documents not used by said search engine to recall documents

Ex-1002, 77-81; Ex-1027, ¶49.

After the second rejection on the same grounds, Applicant and the Examiner conducted an interview, *see* Ex-1002, 114-22, and Applicant amended the claims for “clarity,” *id.*, 102-10; Ex-1027, ¶50. Applicant emphasized that, during the interview, the Examiner apparently “indicat[ed] that the use of data within noindex metatags for recall or ranking is contrary to industry standards and is generally frowned upon.” Ex-1002, 107; Ex-1027, ¶50. Applicant argued that the prior art did not teach “ranking a plurality of documents includes ranking said plurality of documents based, at least in part, on the one or more sections of said certain documents *not used by said search engine* to recall documents,” noting that “Cutts [made] no distinction between the use of noindex data for recall and ranking.” Ex-1002, 108 (emphasis in original); Ex-1027, ¶50. Applicant argued that, in contrast, “Claim 1 teaches ignoring the data contained within a noindex metatag for the purposes of recall but using the data contained within a noindex metatag for the purposes of ranking.” Ex-1002, 108; Ex-1027, ¶50. To reinforce this position, Applicant presented the table below to “illustrate[] the differences in the treatment of the *data within a noindex tag* for the search engines tested by Cutts and the treatment of the *noindex*

sections recited by Claim 1”:

Search Engine	Use noindex data for recall?	Use noindex data for ranking?	Difference Comparison
Google	No	No	No/No
Ask	No	No	No/No
MSN	Yes	Yes	Yes/Yes
Yahoo!	Yes	Yes	Yes/Yes
Claim 1	No	Yes	No/Yes

Ex-1002, 109 (emphases added); Ex-1027, ¶50. Applicant concluded that “none of the search engines tested by Cutts *ignore (do not use) the noindex data for recall and use the noindex data for ranking.*” Ex-1002, 109 (emphasis added); Ex-1027, ¶50.

The Examiner determined that the claims were allowable because they claimed “reading the ignored (or the ‘noindex’) section and using that section for purposes of ranking the web page.” Ex-1002, 127; Ex-1027, ¶51.

Applicant’s chart above implicitly concedes that there are only *four* discrete options for resolving the problem of how to account for content within noindex sections during search engine recall and ranking processes. Ex-1027, ¶52. These options are reflected in the table below:

	Noindex Data Used for Recall	Noindex Data Used for Ranking
Option 1	No	No
Option 2	No	Yes
Option 3	Yes	No
Option 4	Yes	Yes

Ex-1027, ¶52.

C. The Level of Ordinary Skill in the Art

Based on the relevant factors, *see In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995), a person of ordinary skill in the art (“POSITA”) pertinent to the ’329 patent as of its earliest priority date would have had at least a four-year degree in computer science, computer engineering, or a closely related field and at least one year of experience in researching, designing, or developing computerized search systems such as search engines. Ex-1027, ¶35. Additional formal education could substitute for professional experience, and significant professional experience could substitute for formal education. *Id.*

D. Claim Construction

In unrelated cases, the Eastern District of Texas construed several ’329 patent terms as follows:

Claim Term	Claim(s)	District Court's Construction
“document”/“documents”	1-14	“any unit of information that may be indexed by search engine indexes”
“each document of said certain documents containing at least one section that is not used by said search engine for recall and one or more sections that are used by said search engine for recall”	1, 8	plain and ordinary meaning; “recall” means “generating results for a search engine query”; “section” means “defined portion within the structure of a document”
“wherein ranking a plurality of documents includes ranking said plurality of documents based, at least in part, on the at least one section of said certain documents not used by said search engine to recall documents”	1, 8	plain and ordinary meaning; “recall” means “generating results for a search engine query”; “section” means “defined portion within the structure of a document”
“said data includes an abstract describing each document of said plurality of documents”	4, 11	plain and ordinary meaning
“for each respective abstract of each document of said certain documents, said abstract excludes terms from the respective at least one section not used by said search engine to recall said each document”	4, 11	plain and ordinary meaning; “recall” means “generating results for a search engine query”; “section” means “defined portion within the structure of a document”

Ex-1003, 42-53.

In the District Court dispute between Petitioner American Airlines, Inc. (“AA”) and Patent Owner, the Patent Owner and AA have agreed to the above constructions of “document[s],” “recall,” and “section.” Ex-1035 at 2. At the time of filing of this Petition, the Patent Owner and AA are still engaging in claim construction briefing (*see* EX-1040) and AA has proposed¹ the following constructions for the ’329 patent:²

Claim Term	Claim(s)	AA’s Proposal
“each document of said certain documents containing at least one section that is not used by said search engine for recall”	1, 8	“each document of said certain documents containing a <noindex> tag”
“ranking”	1, 8	plain and ordinary meaning, which is “assigning a rank”
“abstract”	4, 11	“a concise description of a document”
“search engine index”	5, 12	“an ordered list of information accompanied with the location of the information”

Ex-1037 at 12-13.

The Board need not expressly construe these terms, however, because the Petition

¹ R2 asserts no terms in the ’329 patent need construction. Ex-1036 at 6-7; Ex-1040.

² In the District Court dispute between Petitioner Hilton Domestic Operating Company, Inc. (“Hilton”) and Patent Owner (the “Hilton Litigation”), Hilton and Patent Owner have not yet engaged in claim construction.

shows that the '329 patent claims are invalid under any plausible construction, including AA's proposed constructions.

IV. Overview of the Prior Art

A. Background and State of the Art

The '329 patent describes concepts that were known long before its priority date. *See* Ex-1027, ¶55. POSITAs knew that “crawlers” (also known as “spiders” or “robots”) could collate documents (e.g., webpages) into indexes so that search engines could recall those documents in response to search queries. *Id.*; *see* Kamvar, 1:21-26; Kamholz, ¶¶5-6. A crawler would find documents by following hyperlinks, review the content of documents it found, and build an index using portions of that content. Ex-1027, ¶55; *see* Kamvar, 1:24-31; Kamholz, ¶¶6-7. The search engine, upon receiving a query from a user, would examine the index constructed to identify and recall documents responsive to the query and generate results presenting the documents to the user. Ex-1027, ¶55; *see* Kamvar, 1:31-37; Kamholz, ¶6; Google Technology Overview, 2; Nicholson, 6-14. Consequently, POSITAs knew that the documents a search engine could recall were generally restricted to those in the search engine's index. Ex-1027, ¶55.

POSITAs also knew that documents such as webpages were generally divided into sections, and that both webmasters and search engine developers used these sections to improve their webpages and search engines. *Id.*, ¶56 (citing Lin, 588-90, 593; Ma, 2-3). Moreover, POSITAs knew that search engines could exclude whole documents or sections

of documents from their indexes, and that excluding certain sections of documents from search engine indexes could improve the relevance and quality of search engine results. Ex-1027, ¶¶57-58; *see* FBFAQ #29, 1; Milosevic, 1; Janes, 1; Kamholz, ¶¶9-11; Lin, 588. For example, POSITAs knew to incorporate meta tags or attributes into a document's HTML code to prevent search engines from indexing sections of documents. Ex-1027, ¶¶58-59; FBFAQ #29, 1; Milosevic; Janes; Kamholz, ¶¶35-45. Likewise, POSITAs knew they could use templates to identify document content that should not be indexed. Ex-1027, ¶58; *see* Lin; Ma.

Particularly well understood in the art was the use of HTML tags to identify content to be excluded from a search engine's index. Ex-1027, ¶59 (citing FBFAQ #29, 1; Milosevic, 1-2; Janes, 1-3; Kamholz, ¶¶35-41). For example, POSITAs knew to use <noindex> tags to preclude crawlers from indexing certain document content. Ex-1027, ¶59; *see* FBFAQ #29, 1; Milosevic, 1-2; Janes, 1-3; Kamholz, ¶¶35-41. Similarly, POSITAs knew to include <nofollow> tags to preclude crawlers from following particular hyperlinks within documents. Ex-1027, ¶59; *see* FBFAQ #47; Milosevic, 1-2; Janes, 1-2; Kamholz, ¶¶35-41.

POSITAs also knew that search engines often ranked results generated in response to queries. Ex-1027, ¶60; *see* Kamvar, 1:37-40; Kamholz, ¶6. Various techniques were used in the art to rank search results—particularly by relevance to queries. Ex-1027, ¶60; *see* Kamholz, ¶6; Page; Acharya; Pant; Bharat. Several such techniques incorporated the

analysis of hyperlinks between documents to identify “authoritative” or “trusted” documents. Ex-1027, ¶60; *see* Page; Bharat; PageRank Paper; Anatomy Paper. Moreover, it was known that relevance rankings could be improved by designing search engines to use multiple ranking techniques. Ex-1027, ¶60; *see* Page, 8:42-46; Li, 22:23-23:15; Cucerzan, ¶71.

POSITAs also understood that webmasters could modify document content to improve document relevance rankings via search engine optimization (“SEO”) techniques. Ex-1027, ¶61. Certain types of SEO, called search engine spamming, bore a negative connotation in the art. *Id.*; *see* Gross, ¶10; Acharya, ¶8. A webmaster could “spam” a search engine by, for example, integrating into documents keywords that were invisible to users but recognizable by crawlers to boost the relevance rankings of the documents for queries incorporating those keywords, or by using interconnected document structures called link farms or spam farms. Ex-1027, ¶61; *see* Gross, ¶10; Kamvar, 4:59-5:6.

Because of the above, POSITAs knew of the various ways search engines could be designed to account for different kinds of search engine spam. Ex-1027, ¶62. For example, it was known that some search engines excluded documents from their indexes upon identifying spam within said documents, while others reduced the rank of documents upon encountering spam within them. *Id.*, ¶62; *see* Gross, ¶27; Acharya, ¶39.

B. Page

Page, filed almost a decade before the '329 patent's filing date, describes search and ranking functionalities developed by Google co-founder Larry Page. Page, Cover; Ex-1027, ¶63. Page describes a Google search engine ranking method, called "PageRank," that heavily influenced search engine development, webpage development, and SEO before the '329 patent's priority date. Ex-1027, ¶63; *see* Google PageRank Information; Google Technology Overview, 1. To improve their websites' rankings, webmasters and SEO companies continuously sought better ways to acquire (and maintain) their "PageRank." Ex-1027, ¶63; *see* Enge, 1; Digital Point, 1-2.

Page discloses "assign[ing] importance ranks to nodes in a linked database," which may be "any database of documents containing citations, the world wide web, or any other hypermedia database." Page, Abstract; Ex-1027, ¶64. Page combatted a problem common to search engines searching large databases like the web, which often "contain[ed] many low-quality documents" and caused "searches [to] typically return hundreds of irrelevant or unwanted documents which camouflage[d] the few relevant ones." Page, 1:36-39; Ex-1027, ¶64.

Page explains that its ranking methods may be used to "enhanc[e] the quality of results from web search engines." Page, 8:6-8; Ex-1027, ¶70. To this end, Page explains that when recalling documents, the search engines may search the full text of documents or may search only certain document sections, such as "titles only." Page, 8:21-23; Ex-1027, ¶71. Upon recalling responsive documents, the search engine can return ranked

documents, “with high ranking documents first and low ranking documents last.” Page, 8:42-44; Ex-1027, ¶71. The documents are ranked using Page’s methods, which are discussed in additional detail below, and may also be based on other factors like “objective ranking” and “textual matching.” Page, 8:16-20, 8:44-47; Ex-1027, ¶¶70-71.

Page’s ranking methods determine a document’s importance by counting the number of citations (or backlinks) to the document, recognizing that the more a document is cited, the more relevant it is. Page, 2:20-29; Ex-1027, ¶66. Page’s method “tak[es] advantage of the linked structure of a database to assign a rank to each document in the database, where the document rank is a measure of [its] importance.” Page, 2:51-54; Ex-1027, ¶66. To account for “extreme variations in the quality and importance of documents” in databases like the web, the method ranks documents based not only on the number of citations to them, but also on the importance of the documents in which those citations are found. Page, 2:29-35, 2:61-3:2; Ex-1027, ¶66. The ranks are calculated using an iterative procedure. Page, 3:2-3; Ex-1027, ¶66.

Page’s method generates a “directed graph of N nodes” from the contents of a linked database like the web, wherein “each node corresponds to a webpage document and ... the directed connections between nodes correspond to links from one document to another.” Page, 3:56-63; Ex-1027, ¶67. Each node has a set of *forward links* and *backlinks* connecting it to other nodes (i.e., documents). Page, 3:63-4:4; Ex-1027, ¶67. As shown in Figure 1, a forward link is evidenced by hyperlink text in a document pointing to another

document. *See* Page, Fig. 1, 3:67-4:3; Ex-1027, ¶67. For example, hyperlink text in each of Documents B and C points to Document A, so Document A would be a forward link of Documents B and C, and Documents B and C would be backlinks of Document A. Page, 3:67-4:3; Ex-1027, ¶67.

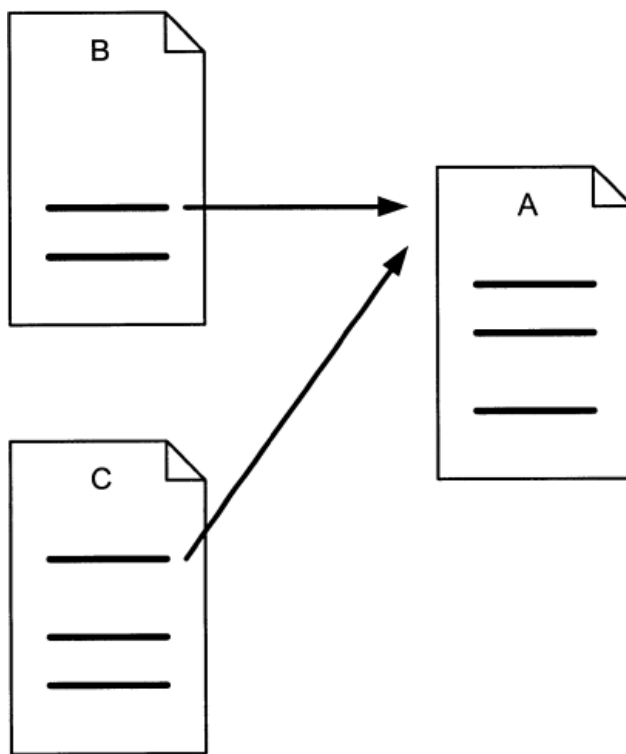


FIG. 1

Page, Fig. 1.

Through a process that iterates until convergence, *id.*, 5:20-59, Page’s method calculates a rank for each document based on both (1) the number of backlinks the document has; and (2) the ranks of all documents to which it backlinks, *id.*, 4:25-37; Ex-1027, ¶68. When summed across all documents in the database, “[t]he ranks form a

probability distribution over webpages, so that the sum of ranks over all webpages is unity.” Page, 4:38-40; Ex-1027, ¶68. A document’s rank represents the probability that a database surfer will find the document after following many forward links. Page, 4:40-42; Ex-1027, ¶68.

Page describes potential modifications to its formulas and calculations that may improve the method’s performance for certain purposes. Page, 6:61-7:36; Ex-1027, ¶69. For instance, it notes that such performance may be improved by weighting the relative importance of links based on their positioning or formatting within documents. Page, 7:28-32; Ex-1027, ¶69. As an example, “highly visible links that are near the top of a document”—e.g., near a document title—“can be given more weight.” Page, 7:29-30; Ex-1027, ¶69.

C. FusionBot

1. Substantive Overview

FusionBot (Ex-1005) comprises a collection of webpages published on the FusionBot website hosted by LOGIKA Corporation, a company offering web search solutions. Ex-1027, ¶72; *see* FB What’s New. Three such webpages answer “Frequently Asked Questions” about FusionBot’s capabilities. FBFAQ #26; FBFAQ #29; FBFAQ #47; Ex-1027, ¶¶72-77. Two of them explain that FusionBot enabled users to selectively tag webpage content to instruct search engine crawlers on (1) whether the content should be indexed, FBFAQ #29; or (2) whether hyperlinks within the content should be followed,

FBFAQ #47; Ex-1027, ¶73. FusionBot explains that these tagging features afforded webmasters control over the types of content search engine crawlers could discover and/or index and helped them improve the relevance of results returned by search engines on their websites. *See* FBFAQ #29, 1; FBFAQ #47; Ex-1027, ¶73.

FusionBot describes “surrounding” content of a webpage “with the `<noindex>...</noindex>` tags” to prevent crawlers from indexing the content surrounded, as shown below:

```
<noindex>  
This is the content you wish  
to be excluded from your index  
within a particular page.  
</noindex>
```

FBFAQ #29, 1; Ex-1027, ¶74. Upon encountering the tags in the webpage’s HTML code, crawlers would identify and ignore the tagged material during the search engine’s indexing process. *See* FBFAQ #29, 1; Ex-1027, ¶74. Consequently, this content would not be indexed or searched by the search engine in response to a query. FBFAQ #29, 1; Ex-1027, ¶74.

FusionBot explains that a webmaster may want to use these tags to exclude from indexes elements like “common footer bar[s] or navigation bar[s]” appearing on every page of a website. FBFAQ #29, 1; Ex-1027, ¶75. Doing so would prevent terms within those elements from “caus[ing] every page [on the website] to be returned” (and thereby

avoid generating irrelevant results) for a query should the terms be included in the query.

FBFAQ #29, 1; Ex-1027, ¶75.

FusionBot notes that including noindex-type tags would “only prevent the indexing of actual words on [the] page” and would “**NOT** prevent [the] spider from following a specific link or links ... included between the <NOINDEX> tags.” FBFAQ #29, 1 (emphasis in original); Ex-1027, ¶76. A user could prevent crawlers from *following* specific links on webpages by using separate nofollow-type tags, as shown below:

<pre><NOFOLLOW>Click Here</NOFOLLOW></pre>
- OR -
<pre><NOFOLLOWFB>Click Here</NOFOLLOWFB></pre>

FBFAQ #47; Ex-1027, ¶76. Consequently, FusionBot explains that enclosing content in noindex-type tags would preclude crawlers from indexing the content *without* preventing them from following hyperlinks within that content and discovering how webpages were interconnected. *See* FBFAQ #29, 1; FBFAQ #47; Ex-1027, ¶76.

2. FusionBot Is a Prior Art Printed Publication

FusionBot constitutes prior art under pre-AIA 35 U.S.C. §§ 102(a) and (b) because it is a printed publication published more than one year before the '329 patent's priority date. *See Blue Calypso, LLC v. Groupon, Inc.*, 815 F.3d 1331, 1348 (Fed. Cir. 2016) (“A reference is publicly available if it was ‘disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art exercising

reasonable diligence, can locate it.”) (quoting *Kyocera Wireless Corp. v. Int’l Trade Comm’n*, 545 F.3d 1340, 1350 (Fed. Cir. 2008)).

The four cited webpages that comprise FusionBot were publicly accessible no later than Dec. 30, 2005. For example, FAQ#26 was archived by the WayBack Machine on September 5, 2003. Ex-1029 at 12-13. Matt Fordham, the CEO of LOGIKA Corporation—the company that runs FusionBot—notes that FAQ#26 was added to the public website no later than November 25, 2002. Ex-1030, ¶7. FAQ#29 was similarly archived by the WayBack Machine on December 30, 2005. Ex-1029 at 16-17. Mr. Fordham notes that FAQ#29 was added to the public website no later than February 6, 2003. Ex-1030, ¶8. FAQ#47 was also archived by the WayBack Machine on November 25, 2005. Ex-1029 at 20-21. Mr. Fordham notes that FAQ#47 was added to the public website no later than February 5, 2003. Ex-1030, ¶9. And the What’s New page was archived by the WayBack Machine on December 18, 2005. Ex-1029 at 25-28. Mr. Fordham notes that the What’s New page was added to the public website no later than February 6, 2003. Ex-1030, ¶5. Furthermore, each page, as archived by the Wayback Machine, bears copyright indicia indicating dates ranging from 2003-2005 depending on the archival date. *See generally* Ex-1005, bottom of each webpage.

FusionBot was accessible to the interested public. The webpages bear indicia that they were intended for public viewing. The What’s New page, for example, instructs readers to “Check this page often to learn about the newest innovations implemented by

the FusionBot team.” Ex-1005 at 5. The What’s New page “was designed to document updates and improvements made to the features and capabilities of the FusionBot product line” and “keep subscribers apprised of the newest FusionBot innovations so that they could take full advantage of their subscriptions.” Ex-1030, ¶5. The FAQ pages, furthermore, contain answers to “Frequently Asked Question[s]” about the product. Ex-1005 at 1-4.

The FusionBot website itself was accessible to the interested public. For example, the 2004 book *Building a Web Site for Dummies* provides a table of “Online Sources for Improving Site Navigation,” which includes, at the very top, a reference to FusionBot and the URL www.fusionbot.com. Ex-1038 at 71. FusionBot and its URL were also referenced in a 2002 paper as an exemplary “[r]emote search engine[] available on the web.” Ex-1039 at 5-6. The cited pages were also accessible from the FusionBot home page. Ex-1030, ¶10. Mr. Fordham notes that “[n]one of these pages ever required a login or subscription to access them.” *Id.* Further, the FusionBot website itself included a search function that would allow users to search “All of FusionBot” for content of interest. *See* Ex-1005 at 1-2, 4-5.

The above evidence is more than sufficient to demonstrate that FusionBot was publicly accessible by December 30, 2005. For example, the Federal Circuit has determined that archival via the Wayback Machine can sufficiently demonstrate the public availability of non-patent literature. *See Valve Corp. v. Ironburg Inventions Ltd.*, 8 F.4th

1364, 1374-75 (Fed. Cir. 2021) (citing cases and stating that confirmation of a reference’s publication using the Wayback Machine was “highly persuasive evidence of public accessibility ... by that date”). The Board has repeatedly done the same. *See, e.g., Fellowes, Inc. v. Treefrog Devs., Inc.*, IPR2020-01435, 2021 WL 707179, at *16 (Feb. 22, 2021) (finding Petitioner “made a threshold showing of public accessibility” based on Wayback Machine evidence); *Int’l Bus. Machs. Corp. v. Intell. Ventures II LLC*, IPR2015-00089, 2016 WL 3598306, at *26-30 (Apr. 25, 2016); *Huawei Techs. Co. v. Wsou Invs., LLC*, IPR2021-00223, 2021 WL 2350050, at *14-15 (June 7, 2021); *see also* M.P.E.P. §2128(II)(E) (“Prior art obtained via the Wayback Machine® sets forth a *prima facie* case that the art was publicly accessible at the date and time provided in the time stamp.”).

The Federal Circuit and the Board have found declarations of document authors and custodians, such as that of Mr. Fordham, to be persuasive, “‘impartial evidence’ sufficient to establish a *prima facie* case” of public availability. *In re Natures Remedies, Ltd.*, 315 F. App’x 300, 301-05 (Fed. Cir. 2009); *see Apple Inc. v. MemoryWeb, LLC*, IPR2022-00032, Paper 12, at 14- 17 (July 8, 2022) (finding that testimony of a content manager with “personal knowledge of how [a reference] was prepared and distributed” online sufficiently demonstrated the public availability of the reference).

3. FusionBot Qualifies as a Single Printed Publication

The FusionBot webpages qualify as a single printed publication. The Board has previously determined that a “collection of pages describ[ing] a single product from a

single source” constitutes one printed publication because the pages “are linked by their content, source, and organization” in such a way that a POSITA “would have readily combined the multiple pages and considered them as a whole.” *Apple*, IPR2022-00032, Paper 12, at 12-14; *see Haliburton Energy Servs., Inc. v. Dynamic 3d Geosolutions LLC*, IPR2014-01186, 2015 WL 5565065, at *8-10 (Jan. 12, 2015) (finding webpages “downloaded from, and thereby exist[ing] on, the [same] website” and describing the same software system/product, as evidenced by Wayback Machine records, constituted a single printed publication because “ordinarily skilled artisans interested in the Recon software ... would have been interested in reading the ... pages, all collected at a single location, to obtain an understanding of a single coherent system”). Here, the FusionBot webpages are structurally connected and discuss various aspects of the same software; a POSITA would logically seek to review each and consider them as a whole to obtain a fuller understanding of said software.³ Ex-1027, ¶78.

³ The fact that the FusionBot pages were archived on different dates does not undermine this point. The proximity of archival dates may bear on whether two or more pages originate from a “single source.” *See, e.g., BMW of N. Am., LLC v. Stragent, LLC*, IPR2017-01522, 2018 WL 6433554, at *12-13 (Dec. 6, 2018). However, where, as here, the webpages describe updatable features of identical software, one would expect POSITAs to return to the website periodically, review the webpages, and consider those

For similar reasons, a POSITA alternatively would have been motivated to combine the FusionBot webpages, as doing so would enable exploitation of all of FusionBot’s functionalities. Ex-1027, ¶79; *see Haliburton*, 2015 WL 556065, at *10, *11 n.20 (noting that “under a flexible approach,” “even if the Recon Website constitute[d] multiple prior art documents, ... a person of ordinary skill readily would have combined them, and considered them as a whole, under an obviousness analysis” because a POSITA “would have recognized that the related webpages ... describe the Recon software” and “would have considered [them] together in order to gain a more complete understanding” of the system); *BMW*, 2018 WL 6433554, at *13 (agreeing that “Petitioner articulate[d] sufficient reasoning to combine the teachings of the four documents” even though they could not be considered a single prior art reference).

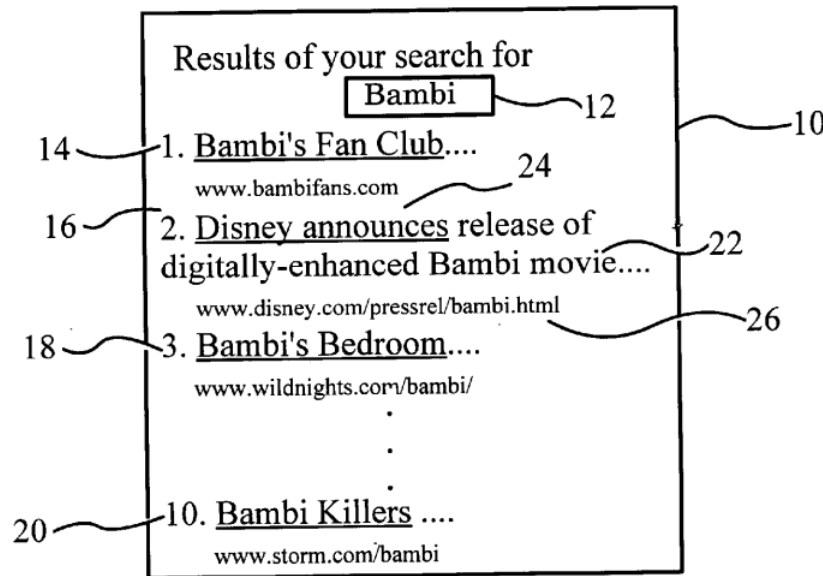
D. Emens

Emens discloses methods for rating hypermedia content based on how objectionable it is. Emens, Abstract; Ex-1027, ¶80. Emens’s methods take “raw search result page[s]” and supply users with rated versions of those search results. Emens, Abstract; Ex-1027, ¶80.

Emens explains that when a search engine receives a query, it “search[es] an index to find applicable documents” and “create[s] a search result page listing a number of the

webpages as a whole to fully appreciate the improvements made.

located documents.” Emens, 1:56-58, 3:60-4:1, 4:59-67, 6:57-62; Ex-1027, ¶86. This search result page will often present, for each document, “summary information ..., which may include a title and short abstract or extract,” and a URL, as shown below:



Prior Art

FIG. 1

Id., Fig. 1, 2:59-3:7, 4:1-7, 1:58-61; Ex-1027, ¶81. Emens explains that this summary information may be stored in the search engine’s index. Emens, 1:56-61, 3:60-4:7, 4:59-67, 5:15-20, 6:57-62; Ex-1027, ¶82.

E. Li

Li is directed to search engine search and ranking techniques. Li, Abstract, 1:3-5, 8:17-9:2; Ex-1027, ¶¶83, 86. Li explains that prior art ranking techniques typically “depend[ed] on the frequency of query terms in a given document,” but that factors like “how many documents contain[ed] the [query] term[s]” could also be considered. Li, 3:18-

4:1; Ex-1027, ¶84. These factors could be determined and input into one of “various models[,] such as the vector space model, probab[i]listic model, fuzzy logic models, etc.,” to rank documents. Li, 4:1-6; Ex-1027, ¶84.

Li demonstrates how a vector space model might be used to rank documents based on how frequently query terms appear within them:

[I]n the vector space model, a user query Q is represented as a vector where each query term (qt) is represented as a dimension of a query vector.

$$Q = \langle qt_1, qt_2, \dots, qt_m \rangle$$

Documents in the database are also represented by vectors with each term or key word (dt) in the document represented as a dimension in the vector.

$$D = \langle dt_1, dt_2, \dots, dt_m \rangle$$

The relevance score is then calculated as the dot product of Q and D.

Li, 4:7-14; Ex-1027, ¶85. Li explains that the relevance rankings could be improved by weighting query terms and/or vectors or normalizing query term weighting based on the lengths of documents in which query terms were found. Li, 4:15-5:11; Ex-1027, ¶85. However, it noted that these mechanisms improved rankings little and recognized a need to further enhance relevance ranking strategies for search engines. *See id.*, 5:11-7:8; Ex-1027, ¶85.

Consequently, Li sets forth a “method of ranking documents ... based on the document[s’] relevance to a query,” wherein a document’s rank is determined by comparing query terms to terms in the anchor text of hyperlinks pointing to the document.

Li, 8:17-9:2; Ex-1027, ¶86. This determination can be achieved using a vector space model in which (1) “[t]he query may be represented by a query vector ... contain[ing] a dimension of each term in the query”; (2) the “document may be represented by document link vectors for each hyperlink pointing to the document,” with each document link vector “contain[ing] a dimension for each term in the corresponding hyperlink pointing to that document”; and (3) “[c]omparing the words in the query to the words in the hyperlinks includes calculating [a] dot product of the query vector with the document link vector for [each] hyperlink” and “summing the dot products.” Li, 9:3-15, 19:21-22:7; Ex-1027, ¶86. Li discloses that results could be “sorted so that the documents having higher summed relevance rankings are listed above those with lower rankings.” Li, 22:8-10; Ex-1027, ¶86.

F. Cucerzan

Cucerzan discloses methods for “improving the relevance of search results” using “a query log.” Cucerzan, Abstract; Ex-1027, ¶87. Cucerzan observes that the relevance of search engine results was hamstrung because users often could not precisely convey their needs and/or intent through search queries or lacked user profiles that could facilitate more relevant searches. *See* Cucerzan, ¶¶3-7; Ex-1027, ¶88. It further notes that, for ambiguous searches, measures of “absolute relevance of web pages or web sites (such as page rank) may not be indicative of how relevant those pages or sites are.” Cucerzan, ¶7; Ex-1027, ¶88. Consequently, Cucerzan presents techniques for (re-)ranking search results by relevance to a target query, which can be judged based on queries in the query

log that are related to the target query. Cucerzan, Abstract, ¶11; Ex-1027, ¶88.

Cucerzan discloses a “query log component” that receives a list of results generated by a search engine for a target query. Cucerzan, ¶¶33, 41, 50, 58, 62, 76, 85; Ex-1027, ¶89. The query log component builds a language model—e.g., “a vector of terms” or probability distribution—for the target query using stored or retrieved information about the target query and related queries stored in a query log. Cucerzan, ¶¶35, 41-42, 62-63, 77, 86, Claim 1; Ex-1027, ¶89. A matching component compares the language model with “lexical properties of the search results for the target query” to determine a “match score” from all or a subset of the search results, which it can do by tokenizing a “segment of a document or web page” and creating a word vector or generating “a language model for every search result” using properties obtained after “processing a URL, page title(s), page content (body, text), snippets of the results of a document query pair, etc.” Cucerzan, ¶¶36-37, 43, 50-51, 62-63, 65-66, 77, Claim 1; Ex-1027, ¶89. A ranking component then “rank[s] or re-rank[s] the search results based on the original ranking” the search engine provided and/or the match score, at which point the ranked or re-ranked search results can be provided to the user. Cucerzan, ¶¶37, 43, 52, 63, 71, 77, Claim 1; Ex-1027, ¶89.

V. Ground 1: Page and FusionBot Render Obvious Claims 1-3, 5, 8-10, and 12

A. Claim 1

1. [1p] A method, comprising:

To the extent the preamble is limiting, Page discloses it. For example, Page

discloses “a computer implemented method ... for scoring linked database documents.”

Page, 3:17-19; *see id.*, 2:39-50 (summarizing “systems and methods for ranking documents in a linked database”); Ex-1027, ¶90.

2. [1a] ranking a plurality of documents recalled by a search engine for a query;

Page discloses this element. Ex-1027, ¶91. Page describes “methods for assigning ranks to nodes in a linked database, such as any database of documents containing citations, the world wide web or any other hypermedia database.” Page, 1:18-22; *see id.*, 2:39-3:33 (summarizing Page’s disclosures as “provid[ing] systems and methods for ranking documents in a linked database”). Page’s disclosure of ranking “documents” (plural) teaches ranking a “plurality of documents.” Ex-1027, ¶91. Moreover, a POSITA would have understood that, in applying its document ranking methods to “extremely large databases such as the world wide web,” Page, 2:45-50, Page discloses ranking a plurality of documents, Ex-1027, ¶91.

Page discloses ranking documents “recalled by a search engine for a query.” *Id.*, ¶92. Page explains that its “invention is directed to enhancing the quality of results from web search engines.” Page, 8:6-8. “A search engine employing [Page’s] ranking method” uses a crawler that “explores the web and creates an index of the web content” and “a directed graph of nodes corresponding to the structure of hyperlinks. The nodes of the graph (i.e., pages of the web) are then ranked according to importance.” Page, 8:13-20. Page discloses that “[t]he search engine” identifies documents “that match the search

terms,” and then sorts the documents “with high ranking documents first and low ranking documents last.” Page, 8:21-22, 8:42-44.

Page’s disclosures of a search engine locating responsive documents are consistent with the ’329 patent’s description of “document recall” as “[t]he inclusion of a document within ... search engine results generated by a search engine for a search engine query,” ’329 patent, 2:3-5, as well as with the district court’s construction of “recall” as “generating results for a search engine query,” *see supra* Section III.D; Ex-1003, 49, 51; Ex-1027, ¶93.

3. [1b] wherein the plurality of documents contain certain documents, each document of said certain documents containing at least one section that is not used by said search engine for recall

A POSITA would have understood that a plurality of documents would “contain certain documents” because it must contain at least two documents. Ex-1027, ¶94. Moreover, Page discloses this by identifying groups of certain “high ranking documents” and certain “low ranking documents” within the entire “set of documents.” Page, 8:42-44; Ex-1027, ¶94.

Page discloses that each document of the certain documents contains at least one section not used by a search engine for recall because Page discloses a search engine that can “locate documents that match specified search criteria, either by searching full text, *or by searching titles only.*” Page, 8:21-23 (emphasis added); Ex-1027, ¶95. POSITAs understood that webpages typically comprise sections (e.g., title, navigation, copyright

and privacy announcement, advertisement, and main content sections), which may be partitioned using tags. *See supra* Section IV.A; *see also* Ex-1027, ¶95. Thus, by explaining that its exemplary search engine can search on **only titles** of webpages, Page discloses a search engine that recalls documents using **only** content in the documents' **title sections**. Ex-1027, ¶95. Page therefore simultaneously discloses to a POSITA the inverse: a search engine that uses **no** content found in other, **non-title sections** of documents for recall. *Id.*, ¶¶95-96.

Moreover, a POSITA would have found it obvious⁴ to implement Page's disclosure of selectively excluding document sections from recall by enclosing those sections within <noindex> tags, as was known in the art. Ex-1027, ¶97.

Page explains that a search engine may include a “crawler” that “explores the web and creates an index of the web content, as well as a directed graph of nodes corresponding to the structure of hyperlinks.” Page, 8:11-16. As explained above, a POSITA would have understood that, to respond to a query, the search engine would use the index it created to recall responsive documents. *See supra* Section IV.A; *see also* Ex-1027, ¶98/; Kamvar, 1:31-37; Kamholz, ¶6. Thus, a POSITA would have understood that any sections of a document that were not indexed would not be searchable—i.e., would not be used by the search engine to recall the document for a query—as Page expressly contemplates.

⁴ As used herein, the phrases “found it obvious” and “motivated to combine” are used as shorthand to refer to a POSITA's motivation to combine with a reasonable expectation of success.

Ex-1027, ¶98.

FusionBot describes the `<noindex>` tags known in the art. Ex-1027, ¶99. Specifically, FusionBot explains that “[y]ou can prevent a particular section of your page from being indexed by surrounding the content you wish to exclude with the `<noindex>...</noindex>` tags.” FBFAQ #29, 1. As explained above, the `<noindex>` tags caused the crawler to ignore the data they enclose during indexing. *See supra* Section IV.C. FusionBot demonstrates how to implement `<noindex>` tags to exclude a section of a document from an index—and therefore preclude it from being used for recall:

`<noindex>`

**This is the content you wish
to be excluded from your index
within a particular page.**

`</noindex>`

FBFAQ #29, 1; Ex-1027, ¶99.

A POSITA would have been motivated to combine Page’s and FusionBot’s teachings with a reasonable expectation of success. Ex-1027, ¶100. Doing so would have combined two known elements (FusionBot’s `<noindex>` tags for excluding parts of a document from an index and Page’s search engine that excludes document sections from recall) to achieve the predictable result of an efficient web crawler that indexed only those document portions to be used for recall. *Id.* The `<noindex>` tag was known to POSITAs, and its functions were taught by FusionBot and other references. *See supra* Section IV.A; *see also* Ex-1027, ¶100; Milosevic, 1-2; Janes, 1; Kamholz, ¶¶37-41.

Given Page’s disclosure of a search engine embodiment that uses only document title sections for recall, a POSITA would have been motivated and found it obvious to implement systems and methods that accounted for FusionBot’s <noindex> tags when they were placed around non-title sections in documents to be ignored during indexing, and thus recall. Ex-1027, ¶101. Doing so would have enabled a crawler to index web content efficiently because it would only index the portions of those documents it would use for recall—e.g., the title sections. *Id.* This would (1) significantly reduce a search engine’s indexing time, and (2) lessen storage requirements and computational burdens imposed by indexing as compared to search engines designed to index each document in its entirety. *Id.* The resulting time and cost savings would have motivated a POSITA to implement this design. *Id.*

FusionBot also provides express motivation for combining it with Page. *Id.*, ¶102. Whereas Page suggests excluding non-title sections from recall, FusionBot explains that one may want to avoid indexing (and using for recall) only “common footer bar[s]” or “navigation bar[s]” that “may skew the search results.” FBFAQ #29, 1. Viewing this disclosure, a POSITA would have been motivated and found it obvious to modify Page’s search engine embodiment that searches on “full text” to exclude document navigation bar and/or common footer bar sections from the search engine’s index—and therefore from recall. Ex-1027, ¶102. Page already contemplates ignoring certain document sections in searches (by excluding them from indexes), and FusionBot teaches that navigation bar and

common footer bar sections are examples of sections that one may wish to exclude or ignore to avoid “skew[ing]” search results. *Id.* This would have been a straightforward combination of two known elements (Page’s search engine, which contemplates excluding document sections from recall, and FusionBot’s <noindex> tags and teaching that navigation bar and/or common footer bar sections should be excluded/ignored) to achieve the predictable result of improving search results, as expressly taught by FusionBot. *Id.*

4. [1c] and one or more sections that are used by said search engine for recall;

As explained, *see supra* Section V.A.3, Page discloses that one or more sections (e.g., a title section) of each document of said certain documents are used by said search engine for recall because Page discloses that “[t]he search engine is used to locate documents that match the specified search criteria, either by searching full text, *or by searching titles only*,” Page, 8:21-23; Ex-1027, ¶103.

The combination of Page and FusionBot (“Page-FusionBot”) also teaches this limitation. Ex-1027, ¶¶103-04.

As discussed above, a POSITA would have found it obvious to use FusionBot’s <noindex> tags to exclude certain document sections—e.g., the main content and other non-title sections or navigation bars and common footer bars—from a search engine’s index (and thus from recall). *See supra* Section V.A.3; *see also* Ex-1027, ¶104. However, in each example, the remaining document sections (i.e., those not enclosed within

<noindex> tags) would be indexed and used by the search engine for recall. Ex-1027, ¶104.

5. [1d] wherein ranking a plurality of documents includes ranking said plurality of documents based, at least in part, on the at least one section of said certain documents not used by said search engine to recall documents; and

Page discloses this element. Ex-1027, ¶¶105-10. Page discloses an embodiment where the search engine uses only the title section of each document for recall; the rest of the document, including the main content section, is not used for recall. *See supra* Sections V.A.3-4; *see also* Ex-1027, ¶106. Page, however, discloses using the entire document for ranking and therefore teaches ranking recalled documents “based, at least in part, on the at least one section of said certain documents not used by said search engine to recall documents.” Ex-1027, ¶106.

Specifically, Page describes ranking recalled documents by an algorithm where “document rank is a measure of the importance of a document.” Page, 2:51-54. Page recognizes that documents like webpages may contain hyperlinks to other documents, and that a document’s importance (and hence its rank) depends on both “the number of citations it has” and “the importance of the citing documents.” Page, 2:51-3:16, 3:56-4:4; Ex-1027, ¶107. Consequently, Page’s method recursively ranks each webpage in a set of search engine results based on (1) the number of backlinked webpages it connects to; and (2) the ranks of the backlinked webpages, which may be determined from the number of forward links from still other webpages to each of the backlinked webpages.

Page, 3:56-4:48; Ex-1027, ¶107.

Page’s link-based relevance ranking is similar to the link-based ranking the ’329 patent discloses. ’329 patent, 3:20-31; Ex-1027, ¶108. Notably, the ’329 patent discloses ranking documents based on “[*o*]***utgoing links***” and “link characteristics,” such as “***where the links lead***, the link text and ***link quantity and quality***,” and “readily identif[ying]” “low quality links” and ranking documents accordingly. ’329 patent, 3:28-31, 4:17-31 (emphases added). This is unsurprising because, when the ’329 patent was filed, Google’s link-based relevance ranking methods (e.g., PageRank) were widely known. Ex-1027, ¶108.

Page’s ranking method accounts for hyperlinks in all sections of all documents—not just their titles. Ex-1027, ¶109. For example, Page discloses a simplified embodiment involving just three search results (Documents A, B, and C), wherein the links used for ranking are clearly not located at the tops of the webpages, and thus are clearly not in the webpages’ title sections:

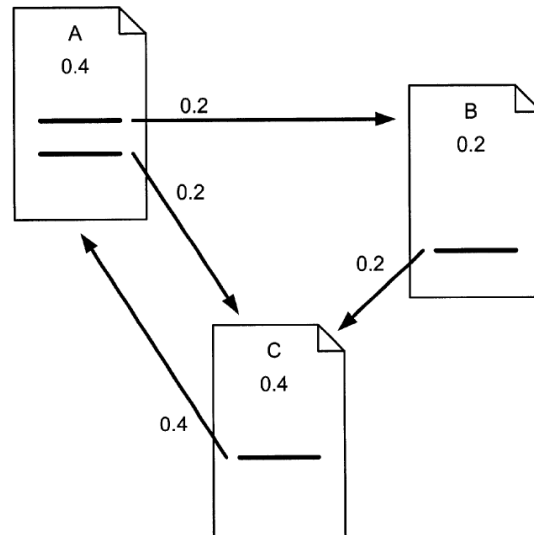


FIG. 2

Page, Fig. 2, 4:49-6:11; Ex-1027, ¶109. In describing this example, Page clearly refers to each document in its entirety (i.e., not just its title section), explaining that “Document A has a single backlink to document C, and this is the only forward link of document C,” and that “Document B has a single backlink to document A, but this is one of two forward links of document A.” Page, 4:49-5:8; Ex-1027, ¶109.

Page confirms that more than the title section of each document is used for ranking by disclosing that “highly visible links that are near the top of a document can be given more weight.” Page, 7:28-32; Ex-1027, ¶110. This disclosure would have conveyed to a POSITA that hyperlinks not “near the top of a document”—e.g., not in the title section—would also be used in ranking, though in one embodiment their contributions to rankings would be given less weight. Ex-1027, ¶110. Page therefore

discloses to a POSITA a search engine capable of using the contents of *non-title sections* of documents for ranking, even when they were not used for recall. *Id.*

Moreover, Page-FusionBot teaches this element, and a POSITA would have found it obvious to implement Page's link-based ranking method to rank documents based at least in part on the content of document sections enclosed within <noindex> tags. Ex-1027, ¶¶111-13.

As explained above, Page discloses a method of assigning ranks to documents in search results based on the backlinks to each document in the results, *see supra* Section V.A.5, wherein a document's rank "can be interpreted as the probability that a surfer will be at the page after *following* a large number of forward links," Page, 4:39-42 (emphasis added). Moreover, Page discloses that "a web crawler explores the web and creates an index of the web content, *as well as* a directed graph of nodes corresponding to the structure of hyperlinks. The nodes of the graph (i.e. pages of the web) are then ranked according to importance" using Page's ranking method. Page, 8:12-20 (emphasis added). In this manner, Page's method ranks documents not "only from the intrinsic content of [the] document[s]" (i.e., what is in the index), but also based on "the extrinsic relationships between documents" (i.e., what is represented by the directed graph of nodes). Page, 2:51-59; Ex-1027, ¶112. Based on these disclosures, a POSITA would have understood that Page's ranking method relies on a crawler's ability to *follow* hyperlinks on webpages, build a directed graph of nodes based on the hyperlinks it follows, and rank webpages

based on that directed graph. Ex-1027, ¶112. A POSITA would have further understood that indexing and building the directed graph of nodes are processes a crawler would contemporaneously yet independently perform as it followed hyperlinks to explore the web. *Id.*; cf. Cutts Interview, 2-3 (explaining that “a NoIndex page can accumulate PageRank” and pass PageRank “because the links are still followed outwards from a NoIndex page”).

As noted above, a POSITA would have found it obvious and would have been motivated to enclose within FusionBot’s <noindex> tags certain sections of webpages (e.g., non-title sections or navigation bar and/or common footer bar sections). *See supra* Section V.A.3; *see also* Ex-1027, ¶113. FusionBot expressly discloses that <noindex> tags “will only prevent the indexing of actual words on a page, but will **NOT** prevent [a] spider from following a specific link or links that may be included between the <NOINDEX> tags.” FBFAQ #29, 1 (emphasis in original); Ex-1027, ¶113. Thus, in Page-FusionBot, a crawler would still follow any hyperlinks within document sections surrounded by <noindex> tags and account for them in the directed graph of nodes on which its ranking method is based. Ex-1027, ¶113. Page-FusionBot would therefore incorporate backlink information associated with those hyperlinks into its rankings, even though the sections in which the hyperlinks were found were not indexed and therefore not considered (i.e., ignored) for purposes of recall. *Id.*

This combination thus renders obvious element [1d] and is the same as the ’329

patent's disclosure that "[t]he terms inside no-recall sections ... are not used for recalling the documents," but that "the no-recall sections are included as input to forms of analysis of the document that affect, for example, the document's ranking" because "[l]inks inside the no-recall sections as well as the rest of the document may be followed," and "low quality links will be readily identified and ranked accordingly." '329 patent, 3:17-31; Ex-1027, ¶114.

Moreover, a POSITA would have found it obvious to implement Page's link-based ranking method to rank documents based at least in part on the content of document sections enclosed within <noindex> tags because doing so would have been one of a "finite number of identified, predictable solutions" (here, four) to the problem of how a search engine should account for content within noindex sections during search engine recall and ranking processes. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007); Ex-1027, ¶115; *see supra* Section III.B. In fact, this implementation would have particularly appealed to a POSITA, who would have been incentivized by the need to further "reduc[e] the size of [search engine] index[es]" while simultaneously "increasing the precision of [document] retrieval" and improving the relevance of search engine results. Lin, 593; Ex-1027, ¶115.

6. [1e] wherein the method is performed by one or more computing devices.

Page discloses this element by describing and claiming "a *computer implemented method*" for performing its disclosed steps. Page, 3:17-30, Claims 1, 8, 9, 10, 18, 19; Ex-

1027, ¶116. Moreover, Page explains that its method is performed by a “web search engine,” Page, 8:6-48, “using current processors,” *id.*, 7:37-40, both of which a POSITA would have understood to refer to implementation on one or more computing devices. Ex-1027, ¶117.

B. Claim 2: The method of claim 1, wherein said at least one section of said certain documents not used by said search engine to recall documents are demarcated by a tag of an element having a name from a set of one or more names.

Page-FusionBot teaches this element. Ex-1027, ¶118. For example, FusionBot explains that “[y]ou can prevent a particular section of your page from being indexed by surrounding the content you wish to exclude with the <noindex>...</noindex> tags.” FBFAQ #29, 1. FusionBot demonstrates how <noindex> tags can be implemented to exclude a document section from a search engine index:

<noindex>

**This is the content you wish
to be excluded from your index
within a particular page.**

</noindex>

Id. Here, <noindex> tags demarcate a document section that is not indexed by the search engine and therefore not used by the search engine for recall. Ex-1027, ¶118. The tag bears the name “<noindex>” from a set of one or more names (e.g., “<noindex>,” “<noindexfb>,” “<nofollow>,” “<noarchive>”). FBFAQ #29, 1; Ex-1027, ¶118. Notably, the ’329 patent’s illustrative tag bears a strikingly similar name: “<div class =“robots-

noindex”>.” ’329 patent, 3:51-67 (emphasis added).

C. Claim 3: The method of claim 1, wherein at least one document of said certain documents does not comprise data that contains element tags.

Page-FusionBot teaches this element. Ex-1027, ¶119. As discussed, Page discloses a search engine embodiment that searches only on document titles. *See supra* V.A.3; Ex-1027, ¶119. Moreover, FusionBot teaches that a webmaster may optionally add <noindex> tags to document sections the webmaster does not want indexed and used for recall. FBFAQ #29, 1 (explaining that “[y]ou *can*,” but do not have to, “prevent a particular section of your page from being indexed by surrounding the content you wish to exclude with the <noindex>...</noindex> tags” (emphasis added)); Ex-1027, ¶119. A POSITA would have understood that, if a search engine searched only on document titles, a webmaster *could*—but *need not*—enclose non-title sections in his or her webpages within <noindex> tags to preclude them from being used for recall. *See supra* V.A.3; *see also* Ex-1027, ¶119. A POSITA also would have understood that, because each webmaster had the option to include <noindex> tags on his or her webpages, for reasons specific to each webmaster, some documents would contain <noindex> tags, and others would not. Ex-1027, ¶119. Regardless of whether such tags were included, the search engine would use only the title of each document for recall. *Id.* However, a POSITA would have been motivated to generate systems and methods that accounted for <noindex> tags where they were included, as noted above, because doing so would help optimize the storage

capacity and analytical efficiency of a search engine that searched on titles only. *See supra* V.A.3; *see also* Ex-1027, ¶119.

Moreover, whether documents contain or do not contain <noindex> tags is a binary choice. Ex-1027, ¶120. It thus presents only two possible approaches to this problem, each of which a POSITA could have implemented with a reasonable expectation of success. *Id.* Because of this, the combination would have at least been obvious to try. *Id.*

D. Claim 5

- 1. [5a] The method of claim 1, said search engine using a search engine index to recall said plurality of documents; and**

As discussed above, Page-FusionBot presents a search engine that uses an index to recall a plurality of documents. *See supra* Sections V.A; *see also* Ex-1027, ¶121.

- 2. [5b] wherein said search engine index does not index any term in said certain documents that is found only in one or more sections of said certain documents established as a no-recall section.**

As previously noted, Page-FusionBot renders obvious excluding document sections from a search engine index by demarcating them with <noindex> tags. *See supra* Sections V.A.3, V.B; *see also* Ex-1027, ¶122. A POSITA would have understood that tagging sections in this manner establishes them as “no-recall sections.” Ex-1027, ¶122. Indeed, this is virtually identical to the embodiment the ’329 patent discusses with reference to Figure 2, which uses a <div class=“robots- noindex”> tag to “delimit the no-recall sections of [a] webpage.” *See* ’329 patent, Fig. 2, 3:51-4:16; Ex-1027, ¶122.

A POSITA would have understood that any term appearing only in a section

demarcated by <noindex> tags—i.e., any term “found only in one or more [no- recall] sections”—would not be indexed. Ex-1027, ¶123.

E. Claim 8

Claim 8 recites “[a] computer-readable storage medium that stores instructions which, when executed by one or more processors, cause performance of” steps identical to elements [1a]-[1d] of claim 1. *See supra* Sections V.A.2-5. The combination of Page and FusionBot discloses the steps of claim 8 for the reasons articulated above regarding elements [1a]-[1d], and it discloses the claimed “computer-readable storage medium” for the reasons discussed above regarding element [1e], which similarly requires that claim 1 is performed by one or more computing devices. *See supra* Sections V.A.[1a]-[1e]; *see also* Ex-1027, ¶124.

Moreover, a POSITA would have understood that, because Page’s methods were performed by computing devices and designed to enhance web search engines, they would be performed by one or more processors executing programs stored on computer-readable storage media. Ex-1027, ¶124. Page confirms this understanding by reciting in claims “[a] computer-readable medium that stores instructions executable by one or more processors to perform” its methods. Page, Claims 18-19.

F. Claims 9-10 and 12

Claims 9-10 and 12 are substantively identical to claims 2-3 and 5, respectively, but recite “[t]he computer-readable storage medium of claim 8” instead of “[t]he method of

claim 1.” Page-FusionBot renders obvious claims 9-10 and 12 for the reasons discussed above regarding claims 2-3, 5, and 8. Ex-1027, ¶¶125-27.

VI. Ground 2: Page, FusionBot, and Emens Render Obvious Claims 4 and 11

Emens discloses methods for rating hypermedia content based on how objectionable it is. Emens, Abstract. Emens’s methods take “raw search result page[s]” and generate rated versions of search results. Emens, Abstract.

A POSITA would have understood that Emens’s methods improve the quality and utility of search results for certain user populations. Ex-1027, ¶¶129-30. Similarly, Page “is directed to enhancing the quality of results from web search engines.” Page, 8:6-8. FusionBot likewise presents a means of customizing search results to maximize their relevance and utility for users. FBFAQ #26; Ex-1027, ¶130. Accordingly, a POSITA would have looked to Emens and combined its disclosures with those of Page and FusionBot to optimize search results for all user populations. Ex-1027, ¶130. Combining Emens with Page-FusionBot would have been the application of known techniques (i.e., Emens’s techniques for rating hypermedia content and presenting rated search results) to known systems and/or methods (i.e., Page’s search engine and ranking methodology and FusionBot’s techniques for customizing search results) to yield predictable results (i.e., improved methods for displaying relevant and useful search results). *Id.*, ¶131.

Moreover, a POSITA would have found it obvious to combine Emens’s teachings regarding the indexing of titles and abstracts and the customization of search results with

Page-FusionBot’s teachings of a search engine that permits customizing the types of content displayed in search results. *Id.*, ¶132; *see supra* Section IV.D. Doing so would have been the combination of known elements (Emens’s user-configurable display of titles and abstracts and FusionBot’s search results display options) to yield the predictable result of a more customizable system for displaying content to users. Ex-1027, ¶132. A POSITA would have recognized that this combination would be useful both in achieving Emens’s stated goal of protecting certain user populations and FusionBot’s broader goal of ensuring all users are presented with the most relevant and useful search results displays. *Id.*

A. Claim 4

- 1. [4a] The method of claim 1, further including said search engine generating data representing results of said query, wherein: said data includes an abstract describing each document of said plurality of documents; and**

Emens discloses this element. Ex-1027, ¶133. Emens explains that a “search result page typically contains summary information ..., which may include a title and short abstract or extract,” “along with the [URL], for each retrieved document.” Emens, 1:59-61, 4:1-10. A POSITA would have recognized that the “title” and “short abstract” in Emens teach the claimed “abstract” as that term is used in the ’329 patent. Ex-1027, ¶133; *see supra*, Section III.D. A POSITA would have been motivated to combine Emens’s teachings of an abstract with Page-FusionBot’s teachings to provide a user with a useful and concise summary of the recalled results. Ex-1027, ¶133.

2. **[4b] for each respective abstract of each document of said certain documents, said abstract excludes terms from the respective at least one section not used by said search engine to recall said each document.**

Emens discloses this element. Ex-1027, ¶134. Emens notes that search results typically include summary information (e.g., titles and abstracts or extracts), which is stored with other “meta-information” in the search engine’s index. Emens, 1:59-61, 2:61-64, 4:1-10, 5:15-20. Emens explains that when a search engine receives a search query, it “locates entries in [the] index ... that match [the] search query ... to create a search result set.” Emens, 2:64-67. A POSITA would have understood that, by building search results from summary information in the index, the search engine would exclude from any titles, abstracts, or extracts in the search results terms not included in the index— and therefore not used for recall. Ex-1027, ¶134.

Emens therefore confirms Page’s and FusionBot’s disclosures that document titles are included in a search engine’s index. *Id.*, ¶135. And based on Page’s, FusionBot’s, and Emens’s disclosures, a POSITA would understand that the combination of Page, FusionBot, and Emens would generate abstracts that exclude terms from the no-recall section(s) of each document. *Id.*

B. Claim 11

Page-FusionBot and Emens teach claim 11’s limitations for the same reasons discussed above regarding claims 4 and 8. *Id.*, ¶136.

VII. Ground 3: Page, FusionBot, and Li Render Obvious Claims 6 and 13

Li describes methods for “searching databases distributed over wide-area networks[,] such as the World Wide Web,” that can be organized into non-linear arrays of hyperlinked nodes. Li, Abstract, 1:3-14. Specifically, it presents “method[s] of *ranking documents ... based on the document[s]’ relevance* to a query” that uses vector space models to compare query terms to terms in the anchor text of hyperlinks pointing to each document. Li, 8:17-9:2 (emphasis added). Li thus attempts to fight a problem almost identical to the one Page identifies by, like Page, relying on the interconnectedness of databases like the web. *See* Page, 1:18-22; Ex-1027, ¶138.

With this knowledge and the understanding that relevance rankings could be improved by incorporating multiple ranking techniques into a search engine, *see supra* Section IV.A, a POSITA would have been motivated and found it obvious to combine Li’s ranking techniques with Page-FusionBot’s disclosures to enhance search engine relevance rankings, Ex-1027, ¶139. To this point, Google used *both* PageRank and “hypertext-matching analysis”—a ranking methodology resembling Li’s method—in its ranking algorithms. Google Technology Overview, 1 (“Google also analyzes the content of neighboring web pages to ensure the results returned are the most relevant to a user’s query.”). Importantly, Page expressly contemplates combining its ranking method with other “factors such as ... objective ranking and textual matching” to further improve relevance rankings, and therefore provides express motivation for combining Li with

either Page-FusionBot. Page, 8:44-46. In addition, combining Li with Page-FusionBot would have been the application of known techniques (i.e., Li's ranking techniques) to known systems and/or methods (i.e., Page's search engine and ranking methodology) to yield predictable results (i.e., improved search engine ranking methods). Ex-1027, ¶139.

A. Claim 6: The method of claim 1, wherein ranking a plurality of documents recalled by a search engine for a query depends in part on a vector space model associated with each of said documents.

POSITAs knew of and implemented “vector space models” in search engine ranking methodology long before the '329 patent's filing date. Ex-1027, ¶140. Notably, the '329 patent provides no details on the vector space model, stating only that “[i]n an algebraic approach, terms inside a section or document can be represented by multidimensional vectors having direction and magnitude, [and] the relevancy can be ascertained by the magnitude of vector deviations.” '329 patent, 4:32-36.

Predating the '329 patent's filing by nearly a decade, Page discloses that “variations of a standard vector space model” were used by prior art search engines to rank documents. Page, 1:51-67. Page explains that while vector space model-based methods alone would produce results of “relatively low quality,” ranking by such models was “better than ... no[t] ranking at all.” Page, 1:56-58. Thus, Page teaches that this method was known in the art and that it would have been obvious to combine it with Page's ranking protocol to influence document rankings. *See* Page, 1:51-58; Ex-1027, ¶141.

Li also discloses this feature. Ex-1027, ¶142. Li explains that, by Li's filing date,

“[a]lmost all ranking techniques of search engines depend[ed] on the frequency of query terms in a given document,” and that factors like “document frequency, i.e.,] how many documents contain the term, [could] also be taken into account in determining a relevance score.” Li, 3:18-4:1. Li further discloses that, “[o]nce the various factors ... have been determined for a particular query, various models such as the vector space model” could be “used to develop a numerical relevance ranking.” Li, 4:1-5. Li explains how known vector space models could be used to calculate the rank of a document. Li, 4:8-5:11. Moreover, Li discloses “a method of ranking documents ... based on the document’s relevance to a query” using a vector space model that accounts for query terms and the anchor text of hyperlinks associated with each document. Li, 8:17-9:21, 19:22-22:13. In sum, Li emphasizes that methods of ranking recalled documents depending in part on vector space models associated with each of the recalled documents was well known in the art. Ex-1027, ¶142.

B. Claim 13

Page-FusionBot and Li teaches claim 13’s limitations for the same reasons discussed above regarding claims 6 and 8. Ex-1027, ¶143.

VIII. Ground 4: Page, FusionBot, and Cucerzan Render Obvious Claims 7 and 14

Cucerzan discloses methods for “improving the relevance of search results.” Cucerzan, Abstract. Cucerzan observes that the relevance of search results was necessarily limited by users’ inability to precisely convey their needs through search queries, *see*

Cucerzan, ¶¶3-7, and that, for ambiguous queries, measures of “absolute relevance of web pages or web sites (such as *page rank*) may not be indicative of how relevant those pages or sites are,” *id.*, ¶7 (emphasis added). Consequently, Cucerzan presents techniques for (re-)ranking search results by relevance to a target query, wherein relevance is “judged based on one or more queries in [a query] log that are related to the target query temporally and/or lexically.” *Id.*, Abstract, ¶11.

As noted previously, a POSITA would have understood that relevance rankings could be improved by incorporating multiple ranking techniques into a search engine. *See supra* Section IV.A; *see also* Ex-1027, ¶146. Cucerzan explicitly confirms this understanding by proposing a method for “*re-ranking the top search results returned* by a search engine” using a “ranking component” that “can be configured to rank or *re-rank the search results based on the original ranking* provided by the search engine ... or based on [a] match score.” Cucerzan, ¶¶10, 37 (emphases added); *see id.*, ¶¶41, 58. Cucerzan even acknowledges that the search engine may initially provide a ranking based on “page rank.” Cucerzan, ¶7. Cucerzan therefore ties directly into Page’s express disclosure that Page’s ranking method can be combined with other factors to further improve its relevance rankings, *see* Page, 8:44-46, and *actively encourages* POSITAs to combine Cucerzan’s teachings with Page’s and other ranking methods, Ex-1027, ¶146.

In addition, combining Cucerzan with Page-FusionBot would have been the application of known techniques (i.e., Cucerzan’s ranking techniques) to known systems

and/or methods (i.e., Page's search engine and ranking methodology) to yield predictable results (i.e., improved search engine ranking methods). *Id.*, ¶147. A POSITA would have been motivated and found it obvious to combine Cucerzan's ranking techniques with Page-FusionBot's disclosures to further improve relevance rankings for search engine results. *Id.*

A. Claim 7: The method of claim 1, wherein ranking a plurality of documents recalled by a search engine for a query depends in part on a language model associated with each of said documents.

Cucerzan discloses this feature by disclosing a method for “improving the relevance of search results” using query log information in conjunction with language models. Cucerzan, Abstract, Fig. 3; Ex-1027, ¶148. In Cucerzan's method, a “system ... for re-ranking search results retrieved by a search engine” “build[s] a language model ... for a target query” and compares that language model “with a language model for every search result,” which may be generated based on “one or more properties of the search results” like “URL[s], page title(s), [and] page content (body, text).” Cucerzan, ¶¶33, 35, 37, 41, 43, 50-51, 58, 62-63, 76, 85. The language models compared can be “a vector of terms, an associated probability distribution, and/or a probability distribution over query terms extracted.” Cucerzan, ¶¶42, 77. The comparison is used to “determine a match score” that can be communicated to another part of the system and used to “rank or re-rank the search results,” potentially in conjunction with an “original ranking provided by the search engine.” Cucerzan, ¶¶36-37, 43, 51-52, 63, 77, Claim 1; Ex-1027, ¶148.

B. Claim 14

Page and Cucerzan or Page-FusionBot and Cucerzan teach claim 14's limitations for the same reasons discussed above regarding claims 7 and 8. Ex-1027, ¶149.

IX. The Board Should Institute *Inter Partes* Review

The Board shall not deny institution based on the *Fintiv* factors “where a petition presents compelling evidence of unpatentability.” Memorandum from Director Vidal, Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation, 2 (USPTO June 21, 2022). Here, the Board need not apply the *Fintiv* factors because the evidence presented in Grounds 1-4, would plainly lead to a conclusion that one or more claims are unpatentable by a preponderance of the evidence.

Moreover, all *Fintiv* factors favor institution or are neutral. Factor 1 is neutral because no party has requested a stay. *See, e.g., Sand Revolution II, LLC v. Cont'l Intermodal Grp.-Trucking LLC*, IPR2019-01393, Paper 24, at 7 (June 16, 2020) (informative). Factor 2 favors institution because no trial date is scheduled in either R2's suit against Petitioner American Airlines, Inc. (“American Airlines Litigation”) (Ex-1031 at 4) or the Hilton Litigation⁵, and any comparison to a projected final written decision would require speculation. The Board routinely institutes in such circumstances, even if trial is scheduled before issuance of a final written decision. *See, e.g., Sand Revolution*, IPR2019-01393, Paper 24, at 7-14 (five months before); *Netnut Ltd., v. Bright Data Ltd.*,

⁵ A scheduling order has not yet been entered in the Hilton Litigation.

IPR2021-01492, Paper 12, at 9-16 (Mar. 21, 2022) (six months before, no stipulation); *Volkswagen Group of Am., Inc. v. Arigna Tech. Ltd.*, IPR2021-01321, Paper 10, at 7-9 (Feb. 15, 2022) (three months before, no stipulation).

Factor 3 favors institution because the parties have expended few resources in litigation and Petitioners acted expeditiously by filing the Petition before *Markman* briefing, in the early stages of fact discovery, and before expert discovery in the American Airlines Litigation and within six weeks of the answer being filed in the Hilton Litigation. *See* Ex-1031, 2-3; *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12, at 16-17 (Dec. 1, 2020) (precedential). Factor 4 favors institution because Petitioners challenge all claims of the '329 patent, while Patent Owner asserts only a subset in the litigation. Ex-1033 at 2 (asserting "Claims 1, 4-5, 8, and 11-12"). Petitioners also stipulate that, if the Petition is instituted, Petitioners will not pursue the grounds identified in the Petition in litigation. *Sand Revolution*, IPR2019-01393, Paper 24, at 11-12. Factor 5 favors institution because, while Petitioners are the defendants in the parties' respective litigations, Patent Owner has asserted the '329 patent in 22 different litigations since January 2021. Ex-1034. Given Patent Owner's pattern of early settlement (with thirteen defendants so far), *id.*, 2-4, and the patent's term extending into 2028, Ex-1001, Cover, Patent Owner's campaign is likely to continue. Institution will promote judicial efficiency and integrity by reducing the number issues to be addressed in numerous parallel

litigations. Factor 6 favors institution because Petitioners have set forth a strong case of unpatentability. *Sand Revolution*, IPR2019-01393, Paper 24, at 13.

X. Mandatory Notices Under 37 C.F.R. § 42.8

A. Real Party-in-Interest

The real parties-in-interest for this Petition are American Airlines, Inc. and Hilton Domestic Operating Company, Inc.

B. Related Matters

To the best of Petitioners' knowledge, the '329 patent is or has been involved in the following proceedings:

Name	N o.	Court	Filed	Status
<i>R2 Solutions LLC v. 7-Eleven, Inc.</i>	3:22-civ-2868	N.D. Tex.	Dec. 21, 2022	Pending
<i>R2 Solutions LLC v. Southwest Airlines Co.</i>	3:22-civ-2869	N.D. Tex.	Dec. 21, 2022	Pending
<i>R2 Solutions LLC v. GameStop Corp. et al</i>	3:22-civ-2870	N.D. Tex.	Dec. 21, 2022	Pending
<i>R2 Solutions LLC v. Hilton Domestic Operating Company Inc.</i>	3:22-cv-2761	N.D. Tex.	Dec. 12, 2022	Pending
<i>FedEx, Inc. v. R2 Solutions LLC</i>	IPR2022-01457	P.T.A.B.	Aug. 31, 2022	Terminated prior to POPR

<i>Roku, Inc. v. R2 Solutions LLC</i>	IPR2021-01581	P.T.A.B.	Oct. 4, 2021	Terminated prior to POPR
<i>Allegiant Travel Company v. R2 Solutions LLC</i>	2-22-cv-00828	D. Nev.	May 24, 2022	Pending
<i>R2 Solutions LLC v. American Airlines, Inc.</i>	4-22-cv-00353	E.D. Tex.	Apr. 28, 2022	Pending
<i>R2 Solutions LLC v. CVS Health Corporation et al.</i>	4-22-cv-00354	E.D. Tex.	Apr. 28, 2022	Closed
<i>R2 Solutions LLC v. Hilton Worldwide Holdings Inc. et al.</i>	4-22-cv-00356	E.D. Tex.	Apr. 28, 2022	Closed
<i>R2 Solutions LLC v. Citigroup Technology, Inc.</i>	4-22-cv-00357	E.D. Tex.	Apr. 28, 2022	Closed
<i>R2 Solutions LLC v. FedEx Corporate Services, Inc.</i>	4-21-cv-00940	E.D. Tex.	Nov. 29, 2021	Closed
<i>R2 Solutions LLC v. State Farm Mutual Automobile Insurance Company</i>	4-21-cv-00941	E.D. Tex.	Nov. 29, 2021	Closed
<i>R2 Solutions LLC v. Booking.com BV</i>	4-21-cv-00942	E.D. Tex.	Nov. 29, 2021	Closed
<i>R2 Solutions LLC v. Booking.com Transport Limited</i>	4-21-cv-00943	E.D. Tex.	Nov. 29, 2021	Closed
<i>R2 Solutions LLC v. Agoda Company</i>	4-21-cv-00944	E.D. Tex.	Nov. 29, 2021	Closed

<i>Pte. Ltd.</i>				
<i>R2 Solutions LLC v. Redfin Corporation</i>	4-21-cv-00945	E.D. Tex.	Nov. 29, 2021	Pending
<i>R2 Solutions LLC v. Expedia Group, Inc.</i>	6-21-cv-00628	W.D. Tex.	Jun. 17, 2021	Closed
<i>R2 Solutions LLC v. iHeartMedia, Inc.</i>	6-21-cv-00552	W.D. Tex.	Jun. 1, 2021	Closed
<i>R2 Solutions LLC v. Roku, Inc.</i>	6-21-cv-00553	W.D. Tex.	June 1, 2021	Closed
<i>R2 Solutions LLC v. Deezer SA</i>	4-21-cv-00090	E.D. Tex	Jan. 29, 2021	Closed
<i>R2 Solutions LLC v. Walmart Inc.</i>	4-21-cv-00091	E.D. Tex.	Jan. 29, 2021	Closed
<i>R2 Solutions LLC v. Target Corporation</i>	4-21-cv-00092	E.D. Tex.	Jan. 29, 2021	Closed
<i>R2 Solutions LLC v. Workday, Inc.</i>	4-21-cv-00093	E.D. Tex.	Jan. 29, 2021	Closed

C. Lead and Backup Counsel

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D. Service Information

Please address all correspondence to lead and backup counsel at the addresses shown above. Petitioners also consent to electronic service by e-mail.

XI. Grounds for Standing

Petitioners certify that the '329 patent is available for *inter partes* review and that Petitioners are not barred or estopped from requesting *inter partes* review to challenge the claims on the grounds identified herein. Petitioners filed this Petition within one year of service of the original complaints against Petitioners.

XII. Conclusion

Petitioners have established a reasonable likelihood of prevailing with respect to the challenged claims and requests institution of *inter partes* review and cancellation of said claims.

Date: March 6, 2023

Respectfully submitted,

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CERTIFICATE OF COMPLIANCE

The undersigned hereby certifies that the foregoing Petition for *Inter Partes* Review contains 13,081 words, excluding those portions identified in 37 C.F.R. § 42.24(a), as measured by the word-processing system used to prepare this paper.

Date: March 6, 2023

/ John Campbell/
John Campbell (Reg. No. 54,665)

CERTIFICATE OF SERVICE

The undersigned certifies that, in accordance with 37 C.F.R. § 42.6(e) and 37 C.F.R. § 42.105, **Petition for *Inter Partes* Review of U.S. Patent No. 7,698,329, the associated Power of Attorney, and associated exhibits were served via FedEx Priority Overnight® on the correspondence address of record with the USPTO as follows:**

Hickman Palermo Becker Bingham
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