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Paper 77
Date: August 13, 2024

PUBLIC VERSION

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,
Petitioner,

v.

VALTRUS INNOVATIONS LIMITED,
Patent Owner.

IPR2022-01497
Patent 6,738,764 B2

Before NORMAN H. BEAMER, KEVIN C. TROCK, and SHARON FENICK, *Administrative Patent Judges.*

FENICK, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining All Claims Unpatentable
Denying Petitioner's Motion to Exclude
Granting Petitioner's and Patent Owner's Motions to Seal
Granting Patent Owner's Motion for Entry of Protective Order
35 U.S.C. § 318(a)

I. INTRODUCTION

A. Background and Summary

Google LLC ("Petitioner") filed a Petition requesting an *inter partes* review of claims 1–19 ("the challenged claims") of U.S. Patent No. 6,738,764 B2 (Ex. 1001, "the '764 patent"). Paper 2 ("Pet."). Valtrus Innovations Limited ("Patent Owner") filed a Preliminary Response opposing institution. Paper 6. With the Board's permission, Petitioner filed a Preliminary Reply (Paper 8) and Patent Owner filed a Preliminary Sur-Reply (Paper 10). We determined that the information presented in the Petition established that there was a reasonable likelihood that Petitioner would prevail with respect to its unpatentability challenges. Pursuant to 35 U.S.C. § 314, we instituted this *inter partes* review on April 12, 2023, as to all challenged claims and all grounds of unpatentability. Paper 12 ("Dec. on Inst."). Patent Owner filed a Request for Rehearing of the Decision on Institution (Paper 15), which we denied (Paper 39).

After institution, Patent Owner filed a Response (Paper 32 (Parties and Board Version), Paper 34 (Public Version), "PO Resp."); Petitioner filed a Reply (Paper 43 (Parties and Board Version), Paper 46 (Public Version), "Pet. Reply"); and Patent Owner filed a Sur-reply (Paper 52 (Parties and Board Version), Paper 53 (Public Version), "PO Sur-reply"). The parties presented oral arguments via a video hearing on February 8, 2024, and the Board entered a transcript into the record. The Hearing Transcript is included in the record in two parts, as Paper 70 (first portion) and Paper 69 (second portion, filed as Parties and Board).

For the reasons discussed herein, we determine that Petitioner has shown, by a preponderance of the evidence, that claims 1–19 are unpatentable.

B. Real Parties-in-Interest

As required by 37 C.F.R. § 42.8(b)(1), each party identifies the real party-in-interest. Petitioner identifies itself as a real party-in-interest. Pet. 5. Patent Owner identifies itself as a real party-in-interest. Paper 7, 1. In addition, Patent Owner identifies Key Patent Innovations Limited and Valinvest LLC as "financially interested in the outcome of the litigation between Valtrus and Google." *Id.*

C. Related Proceedings

As required by 37 C.F.R. § 42.8(b)(2), Petitioner and Patent Owner identify the judicial or administrative matters that would affect or be affected by a decision in this proceeding. The parties indicate that the '764 patent is the subject of *Valtrus Innovations Ltd. v. Google LLC*, Case No. 3:22-cv-00066 (N.D. Tex.). Pet. 5; Paper 7, 1. In addition, Patent Owner identifies as relevant *Valtrus Innovations Ltd. v. Google LLC*, Case No. 4:22-cv-00020 (N.D. Tex.). Paper 7, 1.

D. Overview of the '764 Patent (Ex. 1001)

The '764 patent is titled "Apparatus and Method for Adaptively Ranking Search Results." Ex. 1001, code (54). The '764 patent describes a method of adaptively ranking search results that includes producing a relevance score for a document in view of a query, a similarity score that characterizes attributes and query words associated with the document, and a rank value based upon the relevance score and the similarity score. *Id.* at 1:6–10, code (57).

According to the '764 patent, search engines may use static or adaptive search methods. Ex. 1001, 1:28–55. A "static" search method attempts to rank documents by assigning them a score, which is based on relatively time-invariant characteristics of the documents, such as their text, links, or other features. *Id.* Using these features to compute a relevance score is called a "static" method because the search is time-invariant and the same document receives the same score even when searched at different times. *Id.* at 1:44–45.

An "adaptive" search method allows the search engine to "learn" over time based on the actions of its users. Ex. 1001, 1:28–45. The '764 patent explains that, for example, the search engine can learn that a document is relevant based on the number of times the document is viewed by a user. *Id.* Viewing a document indicates potential interest by the user, and thus relevance to a query. *Id.* This search approach is called "adaptive" because it is time-variant and will provide different orderings of search results for the same query at different times. *Id.*

The '764 patent explains that it is possible to combine the scores from traditional static and adaptive methods, and use the composite score for ranking. Ex. 1001, 1:46–55. This is often useful because the static methods perform well for certain queries while the adaptive method corrects any deficiencies of the static score over time for other queries. According to the '764 patent, however, "it is impossible to predict a priori, for any corpus of documents and any associated search engine, on which queries the static method is satisfactory and on which other queries the adaptive method is satisfactory." *Id.* at 1:51–55.

The '764 patent seeks to solve this problem by providing a method of ranking search results based on a rank value, which in turn is based on a relevance score and a similarity score. Ex. 1001, 1:63–2:2.

The '764 patent uses a search engine and a query to produce relevant search results that include a list of documents and a relevance score associated with each document. *Id.* at 2:4–21. The relevance score may be based on a static ranking method. *Id.* at 4:4–13.

A viewed-document database stores viewed-document indicia corresponding to documents viewed in response to the search results. *Id.* at 2:4–21. A viewed-document processor associates the viewed-document indicia with different queries. *Id.* A vector constructor forms a "feature vector," which characterizes attributes and query words associated with each selected viewed document. *Id.* at 4:33–36. These attributes constitute document signatures and "may be in the form of a list of keywords or other document indicia." *Id.* A similarity processor calculates the "similarity score" for the query utilizing the feature vector of the selected viewed document. *Id.* at 2:4–21. A ranking processor assigns the "rank value" for the selected viewed document based upon a function that incorporates the "relevance score" and the "similarity score" for the selected viewed document. *Id.*

E. Illustrative Claim

As mentioned above, Petitioner challenges claims 1–19 of the '764 patent. Claims 1, 7, and 14 are independent. Claim 1 is reproduced below.[1] Ex. 1001, 6:49–57.

1. [1a] A method of ranking search results, comprising:

[1b] producing a relevance score for a document in view of a query;

[1c] calculating a similarity score for said query utilizing a feature vector that characterizes attributes and query words of a different query associated with said document; and

[1d] assigning a rank value for said document based upon said relevance score and said similarity score.

F. Evidence

Petitioner relies upon the following evidence:

(1) US 7,231,381 B2, issued June 12, 2007 ("Li," Ex. 1004); and

(2) US 6,546,388 B1, issued April 8, 2003 ("Edlund," Ex. 1005).

Petitioner also relies upon declarations from Padhraic Smyth, Ph.D. (Ex. 1002) and Chris Schmandt (Ex. 1040).

Patent Owner relies upon declarations from Eric Cole, Ph.D. (Ex. 2049) and Thomas W. Barr, Ph.D. (Ex. 2050). Patent Owner also relies on deposition testimony from inventors Michel Tourin and Mani Abrol (Exs. 2052, 2053).

[1] For ease of reference, we use Petitioner's claim numbering scheme as indicated by the bracketed numbers.

G. *Asserted Grounds*

Petitioner asserts that the challenged claims of the '764 patent are unpatentable on the following grounds (Pet. 6):

Ground	Claim(s) Challenged	35 U.S.C. §[2]	Reference(s)/Basis
1	1–19	103	Li
2	1–19	103	Edlund and Li

II. ANALYSIS

A. *Legal Standards*

"In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring [*inter partes*] review petitions to identify "with particularity . . . the evidence that supports the grounds for the challenge to each claim")). This burden never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (citing *Tech. Licensing Corp. v. Videotek, Inc.*, 545 F.3d 1316, 1326–27 (Fed. Cir. 2008)) (discussing the burden of proof in *inter partes* review). Furthermore, Petitioner must explain with particularity how the prior art would have rendered the challenged claims unpatentable. 35 U.S.C. § 312(a)(3); 37 C.F.R. § 42.104(b)(4) ("The

[2] The relevant sections of the Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112–29, 125 Stat. 284 (Sept. 16, 2011), took effect on March 16, 2013. Because the '764 patent issued from an application filed before this date, our citations to 35 U.S.C. § 103 in this Decision are to the pre-AIA version. Our decision is not impacted, however, by which version of the statute applies.

petition must specify where each element of the claim is found in the prior art patents or printed publications relied upon.").

As mentioned above, Petitioner's challenges are based on obviousness. Pet. 6. A claim is unpatentable under 35 U.S.C. § 103 if the differences between the claimed subject matter and the prior art are such that the claimed subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the claimed subject matter pertains. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved based on underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when in the record, objective evidence of nonobviousness.[3] *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

B. Level of Ordinary Skill in the Art

The level of ordinary skill in the art is "a prism or lens" through which we view the prior art and the claimed invention. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). The person of ordinary skill in the art is a hypothetical person presumed to have known the relevant art at the time of the invention. *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). In determining the level of ordinary skill in the art, we may consider certain factors, including the "type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made;

[3] Neither party presents arguments or evidence relating to such objective evidence of nonobviousness.

sophistication of the technology; and educational level of active workers in the field." *Id.*

Petitioner states a person of ordinary skill in the art would have been "a person having a Bachelor's Degree in Computer Science or a related field and five years of experience in search technology, where a higher level of education may substitute for experience." Pet. 17–18 (citing Ex. 1002 ¶¶ 26–28). We adopted this definition for the purposes of the Decision on Institution. Dec. on Inst. 8. Patent Owner adopts Petitioner's level of ordinary skill in the art. PO Resp. 3; Ex. 2049 ¶¶ 21–22.

We again adopt Petitioner's definition, which is consistent with the level of skill as reflected in the prior art. *See Okajima*, 261 F.3d at 1355.

C. Claim Construction

In an *inter partes* review, the claims are construed using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. § 282(b). *See* 37 C.F.R. § 42.100(b) (2021). This claim construction standard includes construing the claim in accordance with the ordinary and customary meaning of such claims as would have been understood by one of ordinary skill in the art. *Id.*; *see Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc). In construing claims in accordance with their ordinary and customary meaning, we consider intrinsic evidence such as the specification and the prosecution history of the patent. *Phillips*, 415 F.3d at 1315–17. Extrinsic evidence, including expert and inventor testimony, dictionaries, and treatises, may also be used but is less significant than the intrinsic record. *Id.* at 1317. Usually, the specification is dispositive, and it is the single best guide to the meaning of a disputed term. *Id.* at 1316. Any special definitions for claim terms

must be set forth in the specification with reasonable clarity, deliberateness, and precision. *See In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

In the Decision on Institution, we determined that no claim term required construction for the purposes of institution. Dec. on Inst. 9.

Patent Owner proposes that "[a] POSA would understand the term 'attributes' recited in independent claims 1, 7, and 14 to mean document indicia or to otherwise refer to the contents of the document." PO Resp. 3 (citing Ex. 2049 ¶ 27). Patent Owner asserts that this construction is "consistent with Petitioner's litigation position that the claimed 'attributes' refer to 'word(s) within a/the document,'" but further specifies that "'attributes' would include non-word forms of content as well." *Id.* at 4 (citing Ex. 2016, 33; Ex. 2049 ¶ 27). Under this construction, Patent Owner asserts that a webpage's URL would be "outside the scope of the claim term" because it "does not refer to or indicate anything about the web page's content." *Id.* at 50.

Petitioner does not propose a different explicit construction for the term "attributes," but notes that the claim phrase "'[c]haracterizing attributes' is also a vague term, and [claim 1] does not state that the feature vector must *contain* attributes, but rather simply characterize them." Pet. Reply 29.

Only those terms that are in controversy need be construed, and only to the extent necessary to resolve the controversy. *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) ("The Board is required to construe 'only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.'" (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

We do not provide any claim construction in this Decision because it is not necessary for us to construe any claim terms to resolve the controversy before us. *Realtime Data*, 912 F.3d at 1375; *see* PO Resp. 44–45, 50–53 (presenting arguments relating to the argued construction of "attributes" only in relation to Li/Edlund grounds).

D. Ground 1: Asserted Obviousness of Claims 1–19 Over Li

Petitioner asserts that claims 1–19 are unpatentable under 35 U.S.C. § 103 as being obvious over Li (Ex. 1004). Pet. 10–44; Pet. Reply 7–27.

1. Overview of Li (Ex. 1004)

Li is a U.S. patent titled "Media Content Search Engine Incorporating Text Content and User Log Mining." Ex. 1004, code (54). Li describes techniques for searching media content and, more particularly, for incorporating text content and user log mining in a media content search engine. *Id.* at 1:6–9.

Li's client can search a media content store for pieces of media content that match a set of search criteria. *Id.* at 2:63–3:12. This search criteria includes both low-level features and high-level features. *Id.* Low-level features are features that describe various low-level characteristics of the media content piece. *Id.* For example, low-level features for image content may include color, texture, and shape features. *Id.* High-level features are text features (e.g., one or more words) that are extracted from text associated with the media content piece. *Id.* Data collection and indexing locates and indexes pieces of media content, extracting the low- and high-level features and generating low- and high-level vectors, which are made available for searching. *Id.* at 1:52–63, 3:53–7:64, 8:5–33, Fig. 3.

When a search is performed, the low-level and high-level features corresponding to media content pieces are compared to the set of search criteria to determine how closely the respective features match the set of search criteria. *Id*. at 2:63–3:12, 8:37–10:46. The results of these comparisons are then combined and the value resulting from the combination is used to determine how well media content matches the set of search criteria. *Id*.

According to another aspect of Li, relevance feedback is received from users identifying the relevance of pieces of media content rendered to the users in response to the users' search requests. *Id.* at 1:64–2:9, 10:47–64. The relevance feedback is logged and used to determine how to respond to subsequent search requests. *Id*. at 1:64–2:9, 8:49–51, 10:48–11:16. One example is to modify query vectors corresponding to the pieces of media content for which relevance feedback is received. *Id*. at 10:65–11:16. Another example is to weight different elements of feature vectors differently based on the manner in which the elements were extracted. *Id*. at 1:64–2:9, 13:33–64. Another example is to weight different types of feature vectors differently. *Id*. at 1:64–2:9, 14:4–18.

2. Availability of Li as Prior Art

Petitioner argues that "Li is a U.S. patent that was filed on March 13, 2001, and is thus prior art under pre-AIA 35 U.S.C. §102(e)." Pet. 10. Patent Owner argues that Li does not qualify as prior art because the '764 patent claims are entitled to an earlier filing date. PO Resp. 6–16; PO Sur-reply 1–11.

a) Legal Standards

An inventor can antedate a reference by showing that the invention was conceived before the effective date of the reference, with diligence to actual or constructive reduction to practice. *In re Steed*, 802 F.3d 1311, 1320 (Fed. Cir. 2015) (citing 37 C.F.R. § 1.131); *Purdue Pharma L.P. v. Boehringer Ingelheim GmbH*, 237 F.3d 1359, 1365 (Fed. Cir. 2001). In an *inter partes* review, "a patent challenger has the burden of producing evidence to support a conclusion of unpatentability under § 102 or § 103," but a patentee that "affirmatively seek[s] to establish a proposition not relied on by the patent challenger and not a necessary predicate for the unpatentability claim asserted," such as establishing the benefit of an earlier priority date, bears the burden with respect to establishing that proposition. *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1375–76 (Fed. Cir. 2016) (citing *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1379 (Fed. Cir. 2015)).

"Priority of invention and its constituent issues of conception and reduction to practice are questions of law predicated on subsidiary factual findings." *Singh v. Brake*, 317 F.3d 1334, 1340 (Fed. Cir. 2003). To establish an actual reduction to practice, Patent Owner must prove that: (1) an embodiment of the invention was performed that met all the limitations of the claims at issue; and (2) the inventor determined that the invention would work for its intended purpose. *Cooper v. Goldfarb*, 154 F.3d 1321, 1327 (Fed. Cir. 1998).

b) Parties' Contentions

Petitioner contends Li qualifies as prior art as it was filed on March 13, 2001, prior to the filing of the application that issued as the '764 patent. Pet. 10; Ex. 1004, code (22).

Patent Owner contends the invention of the '764 patent was actually reduced to practice prior to Li's filing date, namely, "in the form of the [redacted] software." PO Resp. 6. Specifically, relying on the testimony of inventors Mani Abrol and Michel Tourn, as well as the declaration of Dr. Cole, Patent Owner asserts the record shows "the availability of a complete product in 2001 in the form of Verity® K2 Catalog and Verity® K2 Enterprise." *Id.* at 7 (citing Ex. 2053, 18:21–19:12; Ex. 2052, 45:21–24, 50:2–21; Ex. 2049 ¶¶ 34–40); *see also id.* at 8–16 (providing a chart with citations to evidence relating to individual claims and claim limitations). Moreover, Patent Owner asserts that Dr. Barr reviewed "certain [redacted] source code which was in existence in [redacted]," and that "Dr. Barr's analysis indicates that the source code provides substantial evidence of the functionality of the [redacted] software in [redacted]." *Id.* at 7–8 (citing Ex. 2050 ¶¶ 3–12, 15). Patent Owner contends Dr. Barr and Dr. Cole's testimony demonstrates actual reduction to practice of "the method of at least claim 1," and, similarly, "the computer readable memory of claims 7 and 14." *Id.* at 8 (citing Ex. 2050 ¶ 16; Ex. 2049 ¶ 40).

Petitioner replies that Dr. Barr's review of source code does not support reduction to practice prior to the '764 patent because "the source code was not from [] [redacted], but rather from **2006**." Pet. Reply 8. In particular, Petitioner asserts that Micro Focus, the custodian of the reviewed source code, "informed Valtrus that it had only managed to locate

code from 2006," and that counsel for Micro Focus reported that "'it does not appear to us that the 2006 code is responsive, as it **would not show "the content and operation of Verity K2 software . . . as it existed on or before March 12, 2001**," as requested in the subpoena.'" *Id.* at 9 (quoting Ex. 1052, 007).

Aside from the issue concerning the date of the code reviewed, Petitioner argues "Dr. Barr admits that he found [redacted]," made several incorrect interpretations of the code, and performed analysis that "draws from [redacted] to one another." *Id.* at 13 (citing Ex. 2050 ¶ 4; Ex. 1038, 22:4–24:1; Ex. 1040 ¶¶ 19–42, 65–72). Petitioner further notes that Dr. Barr's analysis was limited to claim 1, and "so his testimony does not support prior invention for [redacted]." *Id.* at 7–8.

Petitioner also replies that the evidence underlying Dr. Cole's testimony fails to demonstrate an actual reduction to practice. *See* Pet. Reply 13–16. Specifically, Petitioner argues that Patent Owner's evidence "is a hodgepodge of statements about *different* products, at *different* times," and does not "show that a *single product*, at a *relevant time*, practiced *all elements* of any claim." *Id.* at 13–15. Even if the evidence related to "one product and bore relevant dates," Petitioner argues that the evidence presented does "not necessarily correspond to working products, because named inventor Tourn testified that such documents were often forward-looking." *Id.* at 15. Further, Petitioner asserts there is no clear mapping between the evidence and the elements of the claims. *See id.*

In addition, Petitioner asserts the inventors' testimony "fares no better" than the documentary evidence, because it is unreliable as to the

timeframes of specific features and versions of software. Pet. Reply 15–16. Also, Petitioner argues that Patent Owner's reliance on the testimony of only two of the inventors is insufficient to show reduction to practice by the named inventors, and, moreover, that Patent Owner fails to show "the named inventors determined that the alleged reductions to practice worked for their intended purpose." *Id.* at 7 (citing *Cooper v. Goldfarb*, 154 F.3d at 1327).

In response to Petitioner's arguments, Patent Owner argues that the 2006 date of the reviewed source code is incorrect, and that the Windows metadata associated with files in the source code is unreliable. PO Sur-reply 3–5. Rather, Patent Owner proposes that Dr. Barr relied on information provided by [redacted] *Id.* at 5. Patent Owner also asserts that there is no requirement that the reduction to practice of the invention be performed by the inventors, and, in any case, "each of the named inventors worked on Verity K2, including 'writing code' and 'designing major software products at Verity.'" *Id.* at 2.

c) Analysis and Conclusion

We determine that the evidence before us does not support a finding that any claims of the '764 patent were reduced to practice before the filing date of Li.

With respect to the evidence relating to Verity K2 products, we find that the preponderance of the evidence does not show that a specific product embodied the features of any of the claims prior to Li's filing date. While Patent Owner argues, using testimony of inventors Tourn and Abrol and product literature, that a product was available on January 29, 2001, that met all the limitations of the claims, we do not find sufficient clarity in the

literature and the testimony to support such a finding. As discussed above, Patent Owner argues that Tourn and Abrol "confirmed the availability of the Verity K2 software with the patented features before Li's filing date," which "is confirmed by the availability of a complete product in 2001 in the form of Verity® K2 Catalog and Verity® K2 Enterprise." PO Resp. (citing Ex. 2053 (Abrol deposition), 18:21–19:12; Ex. 2052 (Tourn deposition), 45:21–24, 50:2–21; Ex. 2004, 37; Ex. 2049 ¶¶ 34–40). But with respect to specifics, the evidence does not provide the requisite support.

For example, we focus on limitation 1c, "calculating a similarity score for [a] query utilizing a feature vector that characterizes attributes and query words of a different query associated with said document." Ex. 2049 ¶ 34. This limitation is claimed in somewhat similar form in independent claims 7 and 14, and Dr. Cole supports the similar limitations in those claims solely with reference to his cited support for limitation 1c. *Id.* For limitation 1c, Patent Owner's evidence is taken from Exhibits 2024 and 2025 and from Mr. Tourn's deposition. *Id.* But Patent Owner lists Exhibits 2024 and 2025 as documents from the year 2003. PO Resp. vi (Exhibit List); *see* Pet. Reply 14. And the cited portions of Mr. Tourn's deposition (Ex. 2052, 45:21–24, 47:11–48:11, 48:23–49:3, 50:2–21) also do not provide support for the date. His testimony regarding vectors does not appear to relate to specific versions of the software, and Mr. Tourn specifically testifies that he did not "really remember in which order things were done" and, additionally, that with

respect to the "vector feature" it was "a late add-on, not part of the core . . . technology." Ex. 2052, 45:21–46:19, 47:11–48:22.[4]

Furthermore, as Patent Owner notes, the inventors each testified that Verity continued to update the "Verity K2 software" including after 2001, as each worked at Verity through 2005 (Ms. Abrol) and 2002 (Mr. Tourn). Pet. Reply 15 (citing Ex. 1033, 34:9–36:1; Ex. 1034, 66:19–67:12). Each inventor testified that they were not sure when any specific feature was implemented in the software. *See id.* at 15–16 (citing Ex. 1033 (final transcript of Ms. Abrol's deposition), 36:2–5 (Q: "How confident are you that you could say which features were in which release at which point in time? A: I don't recall that at all."), 30:14–22 ("I don't recall exactly when that feature vector concept was introduced in the Verity K2"), 33:4–12; Ex. 1034, 70:25–71:10). While Patent Owner contends that "Inventors Abrol and Tourn did recall when some specific features became available," these do not include the feature vector. PO Sur-reply 11 (citing Ex. 1033, 19:18–22, 21:20–22:11).

The issues with disparate dates on documents and determining when features were included in a version of Verity K2 software also apply to the balance of the presentation of support in Dr. Cole's declaration. This is not contradicted by Patent Owner's additional evidence presented with the Sur-reply. And specifically with respect to limitations regarding the feature vector, we find that the evidence cited by Dr. Cole does not support a

[4] Patent Owner and Dr. Cole cite Ex. 2052, the preliminary deposition transcript available when the Patent Owner's Response was filed. *See* Ex. 2049 ¶ 34. We cite to that document here; our cites correspond to the final transcript of Mr. Tourn's deposition, Ex. 1034, 50:13–51:12, 52:5–53:18.

conclusion that a version of software existing at the time of Li's filing date included the use of feature vectors as recited in each independent claim of the '764 patent.

Patent Owner additionally argues that "Dr. Barr found evidence of each limitation being implemented in the source code." PO Sur-reply 3. The parties argue about the proper timing to be accorded to the code document [redacted] Dr. Barr bases many of his conclusions on, and the third party that provided the code represented that the code Dr. Barr examined was from 2006, and no older version of the code could be located. Ex. 1052, 7. Dr. Schmandt discusses evidence of [redacted] in any case Dr. Barr agrees that [redacted] Ex. 1040 ¶¶ 45–52 (citing Ex. 1034, 70:17–24, 66:19–23); Ex. 2050 ¶ 9. Even if we assume [redacted] as Dr. Barr asserts (Ex. 2050 ¶¶ 4, 12), the evidence does not support a reduction to practice at that time. First, we do not find that the evidence supports that such a date would support a conclusion that this document would "be the last step in creating a functioning product," and thus a conclusion of reduction to practice in [redacted] Ex. 2050 ¶ 5. Rather, we credit Dr. Schmandt's testimony that [redacted] Ex. 1040 ¶ 36. Dr. Barr himself testifies that "For each line in [redacted] dozens or hundreds of lines of [redacted] would be written along with human readable

documentation." Ex. 2050 ¶ 6. Additionally, Dr. Barr testifies that [redacted] *Id.* ¶ 9. Thus, we do not find that, even if the [redacted] document was finalized as of [redacted], it would have corresponded to a specific identified version of a product or what the date of that product would have been.

With respect to the feature vector of limitation 1c, Dr. Barr testifies that [redacted] Ex. 2050 ¶ 16 (citing Ex. 1041/1042, line 1074). He further testifies that [redacted] *Id.* (citing Ex. 1041/1042, line 1505). But, as Dr. Schmandt testifies, Dr. Barr does not identify [redacted] Ex. 1040 ¶¶ 69–70. We additionally credit Dr. Schmandt's testimony that, [redacted] *Id.* ¶¶ 20, 70. Again, Dr. Barr testified that each line would have been associated with "dozens or hundreds of lines" of code and with human readable documentation. Ex. 2050 ¶ 6. With respect to "feature vector," Dr. Barr found the term discussed in [redacted] which Dr. Barr asserts were "last edited between [September of 1996] and [March of 2002]." *Id.* ¶ 10.

While we recognize the difficulty of marshalling and presenting evidence decades after the fact, when we consider the evidence before us, including the testimony of fact and expert witnesses, as discussed above, the

evidence before us does not show that a version of the Verity software available before the filing date of Li included a "feature vector that characterizes attributes and query words of a different query associated with said document" (as per limitation 1c of claim 1). We find that the preponderance of the evidence does not support a conclusion that the claims were reduced to practice prior to the filing date of Li, and thus Li is available as prior art in this proceeding.

3. Independent Claim 1

Petitioner, relying on Dr. Smyth's testimony, contends claim 1 would have been obvious over Li, as modified in light of the knowledge of one of ordinary skill in the art. Pet. 19–31. Patent Owner argues that Li does not teach certain limitations, and that it would not have been obvious to modify Li as proposed by Petitioner. PO Resp. 16–29, 31–40; PO Sur-reply 11–20.

a) Parties' Contentions

(1) Modification of Li

In this ground, Petitioner posits that, while Li's search engine allows users to search for images *within* webpages and presents the images to the user as search results, it would have been obvious to present links to the webpages containing the images themselves as search results, together with the related images, ranking the webpages and associated images in the same manner as Li already provides. Pet. 14–15 (citing Ex. 1002 ¶ 44); *see* PO Reply 16. Petitioner explains, for example, that it would have been obvious to provide a list of search results containing a clickable link with text (such as the title of the webpage or relevant text within the webpage), together with a copy of a relevant image within the site, in the order specified by Li's ranking. *Id*. at 15 (citing Ex. 1002 ¶ 44). Petitioner further explains that, in

this way, the webpages containing the images are the "documents" required by claim 1. *Id.*

This description of the modification is presented here in order to provide context for the positions with respect to this claim, immediately below, in subsections (2)–(5). Petitioner's assertions regarding the propriety of this proposed modification and Patent Owner's arguments regarding it are set forth afterwards, in subsection (6).

(2) [1a] A method of ranking search results

Petitioner contends that, to the extent the preamble is limiting,[5] Li renders obvious the claimed method of ranking search results, as discussed below under limitations 1b–1d. Pet. 19 (citing Ex. 1002 ¶ 58).

(3) [1b] producing a relevance score for a document in view of a query

Petitioner contends that Li, as modified, renders obvious this limitation. Pet. 19. According to Petitioner, Li teaches receiving a query, and parsing the query into low-level and high-level query vectors. *Id.* at 19–20 (citing Ex. 1004, 8:57–9:9, 11:36–44, Fig. 2; Ex. 1002 ¶ 59). The low-level and high-level query vectors are then compared to document feature vectors in a "document space model" to determine how similar the media content piece is to the query. *Id.* at 20 (citing Ex. 1004, 9:28–41 ("A matching module 184 compares the query vectors to the feature vectors in a document space model 186 and determines how closely the query vectors match the feature vectors in document space model 186."), 11:36–44, Fig. 5,

[5] We do not determine whether the preamble is limiting, as we find Petitioner has shown persuasively that Li, as modified, discloses a method of ranking search results.

4:9–24, 5:34–47; Ex. 1002 ¶ 59). Petitioner explains that, during the process of "determin[ing] how closely the query vectors match the feature vectors," Li calculates "'the similarity between the low-level query vector and the low-level feature vector of the image Di', thus producing a *low-level similarity score*, $S_l(q_l, D_{il})$." *Id.* (citing Ex. 1004, 9:41–67, 10:1–13; Ex. 1002 ¶ 59).

To avoid confusion, Petitioner explains that "Li's *low-level similarity score* is the **relevance score for a document in view of a query**" as recited in limitation 1b. Pet. 20 (citing Ex. 1002 ¶ 60). The relevance score of limitation 1b is met by "Li's *low-level* similarity[] because a similarity is a specific way of calculating the relevance of a document to a query, used by standard search engines in the relevant timeframe." *Id.* (citing Ex. 1002 ¶ 60 (citing Ex. 1008, 1:35–50)). Petitioner notes that, as discussed below, the requirement of "similarity score" recited in claim limitation 1c is met by "Li's *high-level* similarity." *Id.* at 21.

Petitioner further explains that the low-level similarity score "is calculated by matching a low-level feature vector of a document to a low-level feature vector of a query" (Pet. 21 (citing Ex. 1004, 9:41–67, 10:1–13; Ex. 1002 ¶ 61)), and "is a **relevance score,** because the score represents a similarity of a document and a query, and thus measures the relevance of a document to the query" (*id.* (citing Ex. 1002 ¶ 61)).

According to Petitioner, Li, as modified, produces a relevance score "**for a document**." Pet. 21 (citing Ex. 1002 ¶ 62). Specifically, "the **document** is the Web page that contains the image." *Id.* (citing Ex. 1002 ¶ 62). Petitioner explains that "Li's system works by methodically searching through ('crawling') Web pages" and "[w]hen the system encounters a new

page, it indexes both the text features and images." *Id*. (citing Ex. 1004, 4:9–35, 6:28–36; Ex. 1002 ¶ 62). Both the text features and images from the webpage are used to search. *Id.*

Petitioner explains that, if a user of Li's system searches for an image, "Li's method will attempt to locate the image by matching the user's query to features of a Web page that contains an image, including both 'low-level' features of the image itself, and high-level features incorporating text from the Web page." Pet. 21–22 (citing Ex. 1004, 9:1–62; Ex. 1002 ¶ 62). "This Web page, because it contains a relevant image and related text, is also relevant to the user's query." *Id*. at 22 (citing Ex. 1002 ¶ 62).

Petitioner states, in one of its examples, that "if the user uses the system of Li for images of a 'rose' on the Web, both [the] image of the rose itself, and the Web page that contains the image of the rose and text that describes it, are relevant to the user's query." Pet. 22 (citing Ex. 1002 ¶ 62). "The low-level similarity score, by identifying an image relevant to a user's query, also identifies that the web page containing the image is relevant in the same way (because it contains the image)." *Id*. (citing Ex. 1002 ¶ 62). "Li's low-level similarity emphasizes features of the Web page that the user has indicated are of interest (low-level features of images in the page)." *Id*. (citing Ex. 1002 ¶ 62). Petitioner explains that this "is no different in principle from any other approach to ranking pages, because all approaches use a subset of information from a page designed to produce an evaluation that best matches the user's interests as reflected in a query," and here, "that subset of information is low-level information about an image on the page." *Id*. (citing Ex. 1002 ¶ 62). Petitioner states that the "low-level similarity is thus a **relevance score for** both an image and the Web page that contains the

image, which is a **document**." *Id.* (citing Ex. 1004, 3:18–19 ("Web pages are documents . . . ."); Ex. 1002 ¶ 62).

Patent Owner argues that any alleged scoring in Li is for images, not webpages, i.e., documents. PO Resp 17 (citing Ex. 1004, 10:29–42). According to Patent Owner, "Petitioner fails to present any evidence that Li's 'low-level similarity' is a 'relevance score' for the web page that contains the image, as well as for the image itself," aside from conclusory reasoning from Dr. Smyth. *Id.* at 18–19 (citing Ex. 2049 ¶ 60). In particular, Patent Owner argues Petitioner fails to show that the low-level features that form the basis of the low-level similarity in Li "would shed any light on the 'relevance' of the overall web page (document) containing the image." *Id.* at 19 (citing Ex. 1004, 2:66–3:3, 5:19–29; Ex. 2051, 53:24–54:2). For instance, regarding Petitioner's example in which both an image of a rose and the webpage containing the image of the rose are determined to be relevant, Patent Owner argues that two different webpages that contain the same rose image would have the same relevance score, even though the content of the webpages would be very different. *Id.* at 20–21 (citing Ex. 2014; Ex. 2015; Ex. 2049 ¶ 63). Rather, noting that "Li is an image search engine, not a web page search engine," Patent Owner asserts that "Petitioner's proposal of using only low-level image features (color, shape, texture) to evaluate web page relevance would be wholly ineffective, and therefore not what a POSA would do." *Id.* at 22 (citing Ex. 1004, 1:7–9; Ex. 2049 ¶ 65; Ex. 2051, 79:17–20, 79:24–80:1). Further, Patent Owner argues "Li discourages the use of document relevance," because Li ignores portions of documents not associated with a relevant image." *Id.* at 22–23 (citing Ex. 2049 ¶ 66).

Petitioner replies that, within the scope of the claim language, it matters not that in Li two different webpages with the same image might be determined to have the same low-level similarity score, and thus both be deemed relevant. Pet. Reply 17. Further, Petitioner argues that Li does not discourage determining relevance as pertaining to a document, because Li in fact "makes text 'associated' with an image or media content piece available for searching." *Id.* at 17–18 (citing Ex. 1004, 7:35–59, 8:11–25). And, even if "there may be parts of the webpage that will not be included in Li's feature vectors," Petitioner argues this does not change the fact that "Li searches **documents** to identify **relevant** images." *Id.* 18–19 (citing Ex. 1002 ¶ 62; Ex. 2049 ¶ 65; Ex. 2051, 65:9–20, 66:25–67:10).

In response, Patent Owner argues that Petitioner's contention that Li's low-level similarity score teaches a relevance score for an image as well as the web page containing the image "is rooted in the unstated theory of inherency," but falls short of meeting the standard to prove inherency. PO Sur-reply 12–13. Patent Owner further argues that Petitioner's reliance on Li's low-level similarity score effectively reads the limitations "score" (in "relevance score") and "for a document" out of claim 1 because Petitioner asserts Li teaches a web page is either relevant or not relevant (citing Pet. Reply 17), which is different than a measure of degree as required by the term "score," and because Li's low-level similarities cannot be modified for computing similarities for a document, given they pertain to "low-level image features, such as color, shape, and texture." *Id.* at 13–14. Finally, Patent Owner argues that Petitioner's reliance on Li's description of making associated text available for searching is improperly relied on for interpreting Li's low-level similarity score because "Li considers associated

text only as high-level features . . . which the Petition explicitly relies on for a different limitation"—i.e., the "similarity score" in limitation 1c. *Id.* at 14 (citing Ex. 1004, Fig. 3).

> *(4) [1c] calculating a similarity score for said query utilizing a feature vector that characterizes attributes and query words of a different query associated with said document*

Petitioner contends that Li renders obvious this limitation. Pet. 23–28. Petitioner explains that "Li teaches indexing Web pages into a 'document space model', where document is represented by feature vectors" and these "feature vectors are then compared to queries, in order to produce two similarity scores for each document." *Id.* at 23 (citing Ex. 1004, 4:9–24, 5:34–47, 9:28–41, Fig. 5; Ex. 1002 ¶ 63). During this process, "Li produces a *high-level similarity score* $S_h(q_h, D_{ih})$, which is the 'the similarity between the high-level query vector and the high-level feature vector of the image Di.'" *Id.* (citing Ex. 1004, 9:41–67, 10:14–24; Ex. 1002 ¶ 63).

According to Petitioner, Li's high-level similarity score is the recited "**similarity score for said query**" because "it is calculated by matching a high-level portion of the query to the high-level feature vector of a document." Pet. 23 (citing Ex. 1004, 9:1–67; Ex. 1002 ¶ 64).

Petitioner contends that Li's calculation of a similarity score teaches using "a feature vector that characterizes attributes and query words of a different query associated with said document" as recited in limitation 1c by disclosing that Li calculates "the similarity using a high-level **feature vector**" and the "high-level feature vector is a vector formed for a document that contains a value for every word in Li's database." Pet. 23–24 (citing Ex. 1004, 9:58–60, 7:35–59; Ex. 1002 ¶ 65) (emphasis omitted). Petitioner

explains that "Li uses feature vectors for each document, where each feature vector contains a numerical value for each word in Li's database, and where certain word values are zero because they have not yet been associated with the document" and these "numerical values **characterize attributes** of the document, specifically, they characterize keywords associated with the document." *Id.* at 24–25 (citing Ex. 1002 ¶ 65).

Petitioner further contends that Li's feature vector also "characterizes . . . query words of a different query associated with said document" as recited in limitation 1c by disclosing that Li's user can provide feedback concerning the relevance of the search results to its query, which is "then used to modify the feature vectors [used by Li] to calculate its high-level similarity score." Pet. 25–26 (citing Ex. 1004, 10:48–64, 11:61–63; Ex. 1002 ¶¶ 66–67) (emphasis omitted). Petitioner explains that "Li uses data from the user log to form a user space model" and the "user space model, like the document space model, contains feature vectors with a numerical score for each word in the database." *Id.* at 26 (citing Ex. 1004, 12:19–56; Ex. 1002 ¶ 67). However, "the numerical values in the user space model characterize prior **query words** that were used to find an image that was indicated to be relevant or irrelevant . . . from all users." *Id.* (citing Ex. 1004, 12:14–18; Ex. 1002 ¶ 67).

Petitioner further explains that "[u]sing the *user space model*, which contains numerical values for words in prior *queries* used to find a document, Li updates the *document space model*." Pet. 26 (citing Ex. 1004, 13:9–27; Ex. 1002 ¶ 68). "Li does this by combining the feature vectors from the *user* space model with the relevant feature vector in the *document* space model." *Id.* According to Petitioner, "Li performs a vector addition,

where the relevant user space model vector (containing values for keywords from past queries) and the document space model vector (initially containing words from a Web site) for an image are added term-by-term" and this "results in a new high-level feature vector D_{new} that **characterizes . . . query words of a different query associated with said document,** namely all prior queries that retrieved the document." *Id.* (citing Ex. 1002 ¶ 68). "The new feature vector is then used for further searches, *i.e.* it is used for calculating the high-level similarity." *Id.* (citing Ex. 1002 ¶ 68).

Patent Owner argues that Li, even if modified, fails to teach calculating a similarity score for a document based on a different query associated with that document for similar reasons already noted above, namely, that Li relates to searching for images, not documents. *See* PO Resp. 31–32. More specifically, Patent Owner argues that Li, in fact, "does not disclose any **document** queries," and that "Petitioner fails to argue that a **query for an image** is somehow equivalent to a **query for a document**, within the meaning of the '764 Patent." *Id.* at 32.

Petitioner replies that Patent Owner's argument regarding limitation 1c is not based on the actual claim language, which requires that the "feature vector must characterize **query words** and the claimed **different query** must be one that is **associated with said document**." Pet. Reply 25. Petitioner argues that "Li's queries are **associated with documents** because Li's images are associated with the documents, and because Li's queries search both the text and the images contained within documents." *Id.* at 25–26 (citing Ex. 1002 ¶¶ 52–53; Ex. 1004, 4:9–35, 5:16–18, 6:28–54, 9:42–67; Ex. 1036, 182:5–19, 216:20–25; Ex. 2051, 67:13–16).

In response, Patent Owner argues that "Li's queries are no more 'associated with documents' . . . than Li's queries are associated with the cameras from which the images originated," and that even though "an image may have originated from somewhere else, like a webpage, [this] does not somehow transform Li's image queries into queries associated with webpages." PO Sur-reply 17.

> *(5) [1d] assigning a rank value for said document based upon said relevance score and said similarity score*

Petitioner contends that Li teaches this limitation by "combining its **relevance score** (low-level similarity) and **similarity score** (high-level similarity) to assign an overall similarity (relevance), which is the claimed **rank value**." Pet. 28. Petitioner explains that the "'combined' high-level and low-level scores indicate the 'probability of being relevant' to a query and are thus a **rank value**" and it would have been obvious "to present the documents to a user in order of their relevance, so that the highest relevance documents appear first, thus also assigning a **rank** based on the relevance score." *Id*. at 29 (citing Ex. 1004, 9:45–60, 11:39–49; Ex. 1002 ¶¶ 70–72).

Patent Owner argues that even if one combines Li's low-level similarity and high-level similarity to assign "'rank values,' those rank values are assigned to the individual **images**, not to the web page (**documents**)." PO Resp. 24 (citing Ex. 1004, 11:39–49; Ex. 2049 ¶ 69). Patent Owner asserts that Petitioner has not even attempted to show that it would have been obvious for one to modify Li so as to assign rank values to webpages, as opposed to images. *Id.* at 24–25. Patent Owner alleges a flaw in any such modification, however, in that "a web page can have multiple

images, some more relevant than others." *Id.* at 27. In this case, "the relevance of any one image will diverge form the relevance of the web page itself." *Id.*

Petitioner replies that "in the proposed modification, Li's combined score is used to rank not only the returned images, but also links to the webpages containing the images." Pet. Reply 19 (citing Ex. 1002 ¶ 44). Petitioner points to Dr. Smyth's explanation that "if the image is the most relevant, then the web page that the image is on is also the most relevant in the sense that it contains the most relevant image, the most relevant media content piece." *Id.* at 19–20 (quoting Ex. 2051, 90:3–6) (citing Ex. 2051, 89:21–91:11, 92:8–10). Regarding Patent Owner's argument that ranking a webpage that contains multiple images would be problematic because the relevance of an image would diverge form the relevance of the webpage, Petitioner argues that "[t]here is no 'relevance of the webpage separate from the context of a specific query," and that "[w]here a query is one seeking an image, a webpage is relevant to the query because it contains a relevant image." *Id.* at 20 (citing Ex. 2051, 91:24–94:4).

In response, Patent Owner maintains its position that "for a webpage that includes multiple relevant images . . . [Petitioner's] reasoning that the score for an image necessarily is the webpage's 'rank value' cannot explain how that single webpage would be processed using multiple different rank values or different probabilities of being relevant." PO Sur-reply 15. Rather, Patent Owner asserts Petitioner "leaves it to the Board to surmise how such a system would or even could operate." *Id.* at 16. Further, Patent Owner argues that Petitioner's contention that it would have been obvious to present documents in their order of relevance "runs counter to Li's express

purpose, which is to present ***images*** 'with the highest probability of being relevant.'" *Id.* (quoting Ex. 1004, 11:44–49).

(6) Obviousness of Modification to Li

With respect to the obviousness of its proposed modification of Li, Petitioner argues that search engines providing links of webpages as results were well known in the art at the time of the invention. Pet. 15–16 (citing, *inter alia*, Ex. 1001, 3:1–12; Ex. 1002 ¶¶ 45–51). Petitioner asserts that one of ordinary skill would have wanted a link to the webpage containing Li's image result, to understand where the image could be found, to see if other relevant images were on the page, to find surrounding information including text that might be relevant to the user, and to find the source, for attribution or other reasons. *Id.* at 16–17 (citing Ex. 1002 ¶ 52). Petitioner further asserts that this would have been a modification that could have been implemented with no unpredictable results by one of ordinary skill at the time of the invention. *Id.* at 17 (citing Ex. 1002 ¶ 53).

Patent Owner argues that one of ordinary skill in the art would not have been motivated to present webpage links with Li's image search results. PO Resp. 32. Patent Owner identifies four bases for this modification proposed by Petitioner, and argues against them in turn. *Id.* at 33 (quoting Pet. 15), 34 (quoting Pet. 16), 37 (quoting Pet. 16), 38–39 (quoting Pet. 17).

First, Patent Owner argues that Petitioner's assertion that it was well known to produce a list of search results including links to webpages "only establishes that a POSA ***could*** have included web page links, but does not establish that a POSA ***would*** have use[d] the image to score the link." PO Resp. 33 (citing Ex. 2049 ¶ 41). Patent Owner argues the fact "that results

from a **web page search engine** would have included links to web pages does not evidence that it would have been obvious for results from an **image search engine** to include links to web pages." *Id.* (citing Ex. 2049 ¶ 42).

Second, Patent Owner argues that Petitioner's assertion that linking to a web site would allow a user to potentially view other images in addition to the image relevant to a user query, is supported only by conclusory reasoning. PO Resp. 34–35. Patent Owner argues that Li already allows a user to access a link to an image on a webpage, and that "Petitioner has not explained why a user would be interested in a link to a web page when the user is already being provided with a pinpoint link to the searched image itself." *Id.* at 35–36 (citing Ex. 1004, 4:36–50, 7:13–16, 10:42–46; Ex. 2049 ¶¶ 46, 47). Further, Patent Owner argues Petitioner has not explained why a user would want to navigate to a webpage for images that are less relevant than the original image that was particularly relevant. *Id.* at 36 (citing Ex. 1004, 11:44–49; Ex. 2049 ¶ 50).

Third, Patent Owner argues that Petitioner's assertion that a user would want to access other surrounding information that is relevant to the user fails to provide an explanation as to "why a POSA would have used Li's image search engine in the first place if they were interested in the non-image information." PO Resp. 37 (citing Ex. 2049 ¶ 52). In fact, Patent Owner asserts, "Li intentionally processes and stores only web page information that is directly associated with the image [, which would] frustrate any user that is actually interested in the web page's surrounding information." *Id.* at 38 (citing Ex. 2049 ¶ 50). Although Patent Owner acknowledges that "in Li surrounding information is already subsumed within Li's high-level feature analysis," Patent Owner asserts "a POSA

would understand that any such surrounding information is either redundant of Li's image scoring process, or irrelevant to the image research results." *Id.* (citing Ex. 2049 ¶ 54).

Fourth, Patent Owner argues that Petitioner's assertion regarding a user's desire to know the origin of an image "is the height of conjecture," and, in any case, Li's user already has access to the image URL. PO Resp. 38–39.

In addition, Patent Owner argues that a "basic defect" in Petitioner's proposed modification of Li is that "Li already has a mechanism for addressing higher level information about the image, because the URL of the image can be parsed as part of the high-level information collected." PO Resp. 39 (citing Ex. 1004, 6:13–17). Patent Owner further offers reasons against the proposed modification, namely, "the slow internet connection speed in the relevant time would have discouraged a POSA from modifying Li to include 'links to Web pages containing images, together with the images themselves'" (*id.* (citing Ex. 2049 ¶ 56)), and Li's "concern about the ever-expanding universe of media that would need to be logged for meaning," where in Li, "if media does not meet its low-level criteria, the media is discarded" (*id.* at 40 (citing Ex. 1004, 1:39–43, 4:65–67; Ex. 2049 ¶ 57)).

Petitioner replies to each of Patent Owner's arguments. First, Petitioner asserts that Dr. Smyth relies on evidence "describing a search engine that returns both text and images," contrary to Patent Owner's "attempt[] to portray Dr. Smyth's testimony to suggest that evidence on which he relied does not relate to searching for images." Pet. Reply 22 (citing Ex. 1002 ¶ 50; Ex. 1010; Ex. 2051, 96:16–97:6, 97:20–98:13).

Second, Petitioner addresses Patent Owner's argument that there is no support for the rationale that one would desire to view additional images on a webpage. Pet. Reply 23. In particular, Petitioner asserts that this argument is contradicted by Patent Owner's example of different webpages containing an image of a rose, in which one webpage "has more potentially relevant images" than the other webpage. *Id.*

Third, with respect to the proposed interest of a user in surrounding information in a webpage, Petitioner asserts that, for example, in the case of a "user who, upon reviewing an image, wants to determine whether or not it is in the public domain," "[s]imply providing the URL for that *image* may not be sufficient." Pet. Reply 24 (citing Ex. 1036, 166:22–167:9). Further on this point, Petitioner disagrees with Patent Owner's characterization of Li as "discard[ing] content not relevant to the image," because the pertinent feature in Li—the classification module 132—"merely sets aside images that are not meaningful, such as blank images." *Id.* (citing Ex. 1004, 4:57–5:11; Ex. 2051, 57:1–58:8, 58:22–60:1).

Fourth, Petitioner asserts that Patent Owner's "own declarant recognizes, an image URL may not clearly identify the origin of an image to a user," in reply to Patent Owner's argument that the image URL in Li suffices for this purpose. Pet. Reply 25 (citing Ex. 1004, 4:36–56, 5:47–56; Ex. 1036, 165:13–167:15, 180:22–181:8; Ex. 2049 ¶ 96).

Finally, Petitioner argues that Patent Owner's argument against providing webpage links in Li, as modified, due to slow Internet speeds at the time, is unavailing because "in order to present a *link* to a webpage, the webpage itself did not need to be loaded." Pet. Reply 25 (citing Ex. 1036, 169:17–170:20).

In response, Patent Owner argues that 1) Petitioner's reliance on search engines for websites being well known "does not establish that such website search engines would be suitable for image searching," and Petitioner's evidence on this point (Ex. 1010) is confirmed by Petitioner's expert as "relat[ing] to website search engine[s], not image search engine[s]" (PO Sur-reply 18–19 (citing Ex. 2051, 98:10–13)); (2) a user would not need to navigate the entirety of a webpage to view potentially relevant images because the images would already be part of Li's image search results, if they were relevant (*id.* at 19 (citing Ex. 1004, 11–20; Ex. 2049 ¶ 49)); (3) Petitioner's assertion that a user would want to determine if an image was in the public domain was improperly introduced in Petitioner's Reply, and, in any case, "if the search engine was able to identify the image (presumably because it is public), the webpage from which the image was extracted would presumably also be public" (*id.* at 19–20); and (4) Petitioner mischaracterizes Patent Owner's expert as suggesting an image URL does not identify the origin of an image (*id.* at 20). Further, Patent Owner argues that Petitioner does not dispute the fact of "slow internet connection speed in the relevant time." *Id.*

b) Analysis

(1) Modification of Li

We first address Patent Owner's contentions that one of ordinary skill in the art would not have modified Li in the manner proposed in the Petition. While Patent Owner argues that the Petition does not establish that one of ordinary skill would have included links to webpages on an image search engine, such as Li, Petitioner presents compelling evidence regarding why one of ordinary skill would have wanted to do so—in order to understand the

source and to potentially find additional images or information. Pet. 16–17 (citing Ex. 1002 ¶ 52). Patent Owner's declarant states that, because Li was a media content search engine, including webpage links would have detracted from the purpose of Li and required additional overhead (Ex. 2049 ¶¶ 42, 48), that having the URL for the image itself (a "pinpoint link") as Li provides would have satisfied a user's desire for information regarding the image (Ex. 2049 ¶¶ 45–47), and that the webpages might have had only other, irrelevant information that would have been excluded by Li's system when it discarded information not directly associated with the image (Ex. 2049 ¶¶ 49–54). However, we credit the argument that Li teaches the use of some text found within the page, and that this suggests that surrounding information on a web site might be useful to a user. Ex. 1002 ¶ 52 (citing Ex. 1004, 6:37–54, 9:42–67); Pet. Reply 23 (discussing Patent Owner's argument regarding a webpage with a rose image having relevant images). Additionally, with respect to the fact that Li sets aside certain webpage information while scoring, Petitioner is correct that this is described as, in part, relating to non-meaningful images. Ex. 1004, 4:57–5:11. While Patent Owner argues that Li provides a way to score other images on the same page, and that a user could find additional relevant images through Li's system, we credit Dr. Smyth's testimony that looking at a webpage that contained the result image could be an additional way to find additional relevant images. Ex. 1002 ¶ 52 (cited at Pet. 16).

Additionally, we credit Petitioner's argument and Dr. Smyth's testimony that a user would desire to know the origin of an image for

attribution or context purposes.[6] Ex. 1002 ¶ 52. While a user may have access to an image URL, as Patent Owner notes, additional information may not be available from the pinpoint image URL. Pet. Reply 25 (citing, *inter alia*, Ex. 1036, 166:8–167:15 (Dr. Cole testifying that a URL from an image would not provide context information regarding its use on a webpage, whether the image is public domain, or what web site the image was found on).

While Patent Owner is correct that it is uncontroverted that, at the time of the invention, slow connection speeds would have meant that the difference between the time it would have taken to load an image and the time it would have taken to load a webpage, providing a link to the webpage would not have incurred this time cost, and we do not see providing additional information to a user (even if that information might be onerous to use) to weigh significantly against the proposed modification. *See* PO Resp. 39; Pet. Reply 25; PO Sur-reply 20; Ex. 1036, 169:17–170:20.

Thus, we determine that a preponderance of the evidence shows that one of ordinary skill in the art would have modified Li, as Petitioner argues,

[6] While Patent Owner contends that the argument regarding the public domain status of an image was improperly introduced in reply (PO Sur-reply 19), the argument appears to be directly responsive to questions raised regarding why information other than the image on a webpage might be useful to a user (PO Resp. 35–36, 37–38) and, additionally, related to Petitioner's position concerning Li that "a user would often desire to know the origin of an image, for example, for attribution purposes" (Pet. 17). For these reasons, we do not agree that this argument was improperly introduced in reply. *Rembrandt Diagnostics, LP v. Alere, Inc.*, 76 F.4th 1376, 1385 (Fed. Cir. 2023) (reply argument not new if responsive to argument raised in response and is a fair extension of previously raised argument).

in order to present links to webpages containing the images themselves together with the images, as search results.

(2) Limitation 1b

The parties' disagreement regarding limitation 1b centers on whether Petitioner's proposed modification of Li to include links to webpages in results along with the image yields a modified Li that produces a relevance score for a document. Patent Owner's arguments are that the modified version of Li proposed by Petitioner would produce scores relating to images, and not relating to the webpage on which they are found. PO Resp. 17–24. This line of argument is inapposite, because Petitioner's argument is that the relevance being calculated for the webpage is based on the relevance of the image: "The low-level similarity score, by identifying an image relevant to a user's query, also identifies that the web page containing the image is relevant in the same way (because it contains the image)." Pet. 22. Patent Owner's argument that this calculation would not "shed any light on the 'relevance' of the overall web page (document) containing the image" (PO Resp. 19) may be true in some cases, but in Petitioner's proposed modification it is still the relevance of the image that controls, the webpage is provided along with the image and with the same relevance.

The "rose" example discussed by the parties (Pet. 22; PO Resp. 20–21) is instructive. Patent Owner contends that two webpages with the same image would have the same relevance score in Petitioner's proposed modification of Li (Li's low-level similarity score for the image). PO Resp. 20–21. But this does not contradict the showing in the Petition, which notes that the relevance of a webpage containing an image of a certain relevance "is relevant in the same way (because it contains the image)." Pet. 22. It is,

in Petitioner's showing, the query for an image that is being responded to with the responsive image and its associated webpage, and this meets the limitation of providing a relevance score "for a document" even if a different relevance calculation might show that the webpages are not similarly relevant to a query, or if the relevance calculation assigns the same relevance to two different documents. *See* Pet. Reply 20 (arguing that the claims do not require a "most accurate" ranking, just that they be ranked by relevance, and that a webpage with an image is relevant when the image is relevant). As discussed, we agree that one of ordinary skill would have been motivated to make the modification in Li, and having done so, using the relevance of the image to present the results as in Li, "in the order specified by Li's ranking," with the addition of including the webpage where the image was found would have resulted. Pet. 15.

We find the preponderance of the evidence supports a conclusion that Li's teaching of similarity between a low-level query vector and a low-level feature vector (the low-level similarity score) for an image teaches or suggests producing a relevance score for a document in view of a query. Ex. 1004, 8:57–9:9, 9:28–67, 10:1–13, 11:36–44, Fig. 2; Ex. 1002 ¶ 59).

(3) Limitation 1c

Petitioner's showing with respect to limitation 1c relies on the high-level similarity score in Li. Pet. 23–26. Patent Owner presents a similar argument as addressed above; that Li does not calculate this score using "a different query associated with" a webpage, but rather that Li only relates to queries for images. PO Resp. 31–32. But, again, Petitioner's showing regarding Li as modified provides high-level similarity scoring as per Li, asserting that the high-level similarity score for an image is being used for

the query. Pet. 23 (citing Ex. 1004, 9: 1–67, 10:14–24; Ex. 1002 ¶¶ 63–64). Petitioner additionally shows that the high-level similarity scoring may relate to words appearing on the webpage containing the image in relation to an image. Pet. 25 (citing Ex. 1004, 7:10–59; Ex. 1002 ¶ 65). Petitioner shows persuasively that the high-level scoring is based on query words of a different query, because the feature vectors being used to calculate high-level similarity includes relevance feedback regarding prior queries in its user space model, which is used to update the document space model. Pet. 25–28 (citing Ex. 1004, 10:48–64, 11:61–63, 12:14–18, 12:19–56, 13:9–27; Ex. 1002 ¶¶ 66–69). Thus, we are persuaded that Petitioner has shown by a preponderance of the evidence that the modified version of Li teaches the calculation of a similarity score for a document based on a feature vector that characterizes attributes and query words of a different query associated with that document.

(4) Limitation 1d

Li, as modified, teaches or suggests a matching module that calculates an overall similarity score (Sim) for an image given a query, including using the low-level and high-level vectors. Ex. 1004, 9:41–60. Patent Owner argues that this does not explain how the system would assign rank value to a single webpage with multiple images having different assigned similarity scores in the modified version of Li. PO Sur-reply 15. However, the calculation of different scores for a document when considering different images contained in it, and how such different scores would be handled, on the present record, does not render Li, as modified, inoperable "during the majority of operation" as Patent Owner contends. *See* PO Sur-reply 15–16 (quoting *Intel Corp. v. Qualcomm Inc.*, 21 F.4th 784, 796 (Fed. Cir. 2021)).

Rather, as required by claim limitation 1d, Li, as modified, teaches a way to assign a similarity score for a webpage containing an image. Ex. 1004, 9:41–60. Neither the claim limitation nor the claim as a whole requires that only one rank value be calculated for a document, and the question of how ranking values for documents are used in the ranking of search results (as per the preamble of claim 1, if limiting) is not specified in the claim. We determine that Li's teachings with respect to what is required in limitation 1d are shown in the Petition and supported by the preponderance of the evidence. *See* Pet. 14–15, 30–31; Ex. 1004, 11:44–49; Ex. 1002 ¶¶ 44, 73.

For these reasons and those discussed with respect to prior limitations, we are persuaded that Petitioner has shown by a preponderance of the evidence that the modified version of Li teaches limitation 1d.

c) Conclusion

Having considered the record evidence and the arguments of the parties, we find that Petitioner has shown by a preponderance of the evidence that claim 1 would have been obvious to one of ordinary skill in the art in view of Li.

4. Independent Claims 7 and 14

Independent claims 7 and 14 recite limitations similar to the limitations recited in independent claim 1, and Petitioner relies on its analysis addressing claim 1 to address these similar limitations in claims 7 and 14. *See* Ex. 1001, 6:49–57 (claim 1), 7:8–31 (claim 7), 8:13–21 (claim 14); Pet. 35–39 (addressing claim 7), 41–42 (addressing claim 14). For the limitations in claims 7 and 14 that are similar to those in claim 1, Patent Owner relies on the same arguments addressed above in the context of claim 1. *See* PO Resp. 16–29, 31–40; PO Sur-reply 11–20.

In addition, claim 7 recites further limitations for which Petitioner provides separate contentions and Patent Owner presents separate arguments responding to certain contentions, as follows.

a) Parties' Contentions

(1) [7b] a search engine to produce relevance search results based upon a query

Petitioner contends Li teaches this limitation by describing a search engine that takes search criteria and produces search results based on relevance. Pet. 35 (citing Ex. 1004, code (54), 1:7–9, 11:37–39, 11:44–49, Fig. 2; Ex. 1002 ¶ 82).

(2) [7c] said relevance search results including a list of documents

Petitioner contends that while Li does not expressly teach providing documents in list form, this limitation would have been obvious based on Li, as modified. Pet. 36. Specifically, Petitioner asserts that Li's "user is interested in the most relevant results," and so "it would have been obvious to provide the search results in the order from most relevant to least relevant by score, because that approach would have been the most useful for the user." *Id.* (citing Ex. 1004, 11:44–48; Ex. 1002 ¶ 84). In addition, Petitioner relies on the contentions made with respect to limitations 1b and 1d. *Id.*

(3) [7e] a viewed document database storing viewed document indicia corresponding to selected documents viewed in response to said relevance search results

Petitioner contends that Li teaches two viewed document databases in the form of user log 190 and user space model 232. Pet. 37. In particular, Petitioner contends that user log 190 stores indications relating to each

image and whether it was marked relevant or irrelevant, and these indications teach the claimed "viewed document indicia." *Id.* (citing Ex. 1004, 10:57–62; Ex. 1002 ¶ 87). Petitioner also contends user space model 232 stores a vector for each image in user log 190 that represents the relevance of keywords of queries that resulted in retrieving the relevant or irrelevant image, and that these vectors too teach the claimed "viewed document indicia." *Id.* (citing Ex. 1004, 12:19–56; Ex. 1002 ¶ 88). Petitioner further contends it would have been obvious for user log 190 and user space model 232 to be implemented as standard databases. Pet. 38 (citing Ex. 1002 ¶ 89). In addition, Petitioner relies on the contentions made with respect to limitation 1c. *Id.* at 37.

Patent Owner argues Petitioner's reliance on Li's description of a user log 190 is unavailing because this "at best describes viewed ***image*** indicia, not 'viewed ***document*** indicia,' as recited in claim 7." PO Resp. 29–30 (citing Ex. 2049 ¶ 78). Even if the image indicia in Li's user log 190 were considered to be "viewed document indicia," Patent Owner argues that the image indicia do not "specifically 'correspond[] to ***selected documents viewed in response to said relevance search results***,'" as also recited in claim 7, because no documents are viewed in response to search results in Li. *Id.* at 30. Further, Patent Owner argues modified Li, which "presents links to the Web pages," also does not meet limitation 7e because Li only provides a mechanism for providing feedback on a per image basis, not on a per webpage basis. *See id.* at 30–31.

Petitioner replies that (1) Li's "images form a part of a website, and thus an 'indication of the image' and an 'indication of whether it was marked as relevant or irrelevant' . . . are **document indicia corresponding**

to . . . documents—i.e., the webpages on which the images reside" (Pet. Reply 21 (citing Ex. 1004, 10:57–62; Ex. 2051, 79:3–11, 81:10–24)), and "the image is **viewed** by visiting the webpage (**document**) containing the image" (*id.*); and (2) "it would have been obvious to have 'the mechanism of viewing [be] clicking a link tagged to text from a Web site and to an image within the Web site,' such that "the webpages *are* selected, and the indicia correspond to them" (*id.* at 22 (citing Ex. 1002 ¶¶ 79, 87)). In addition, Petitioner notes that Patent Owner did not present arguments regarding Petitioner's reliance on Li's user space model 232 with respect to limitation 7e. *Id.* at 21 n.5.

In response, Patent Owner asserts that Petitioner "presumes that a user views an image by visiting the webpage containing the image," in contradiction to Petitioner's positions elsewhere that "the modified Li returns results with images, independent from 'a link to the webpage containing [each returned] image,' and that 'the webpage itself did not need to be loaded.'" PO Sur-reply 16.

(4) [7f] a viewed document processor to associate said viewed document indicia with different queries

Petitioner contends Li teaches this limitation by describing "a computer processor executing code that produces the user log 190 and the user space model 232." Pet. 38 (citing Ex. 1004, 10:47–64, 12:4–14, 16:38–42, 16:47–53, Fig. 6; Ex. 1002 ¶ 90).

> *(5) [7g] a vector constructor to form a feature vector for each viewed document, each feature vector characterizing attributes associated with a selected viewed document and query words of said different queries associated with said selected viewed document*

Petitioner contends Li's "computer processor executing code in Li's media content indexer 136 that forms high-level features vectors" teaches the claimed "vector constructor to form a feature vector." Pet. 39 (citing Ex. 1004, 7:21–58, 16:38–42, 16:47–53, Figs. 2, 6; Ex. 1002 ¶ 91). In addition, Petitioner relies on the contentions made with respect to limitation 1c. *Id.*

Patent Owner argues that Petitioner "fails to address how the 'computer processor executing code in Li's media content index 136' forms a feature vector 'characterizing . . . ***query words of said different queries*** associated with said selected viewed document,' as required by Element [7g]." PO Resp. 40–41 (citing Ex. 2049 ¶ 83). Additionally, Patent Owner argues Petitioner's reliance on contentions made with respect to limitation 1c for this limitation is unavailing. *Id.* at 41. Patent Owner also argues Petitioner fails to show that Li teaches "a vector constructor to form a feature vector for ***each*** viewed document . . . ." *Id.* at 42. In particular, Patent Owner asserts that because Li describes "the user is ***given the opportunity*** via user feedback interface 188 to indicate, for each returned image, whether the image is relevant or irrelevant," one of ordinary skill in the art would understand that the "feedback is *optional* in Li, and it is highly improbable that a user would necessarily mark each and every viewed image as relevant or irrelevant." *Id.* (quoting Ex. 1004, 10:48–51) (citing Ex. 2049 ¶ 85).

Petitioner replies by disagreeing with Patent Owner's "suggest[ion] that the Petition did not explain how Li "uses query words of multiple different queries." Pet. Reply 26. Petitioner also argues that "Li discloses a vector constructor forms a feature vector in the document space model for *every* document (viewed or not), and adds user feedback data to these vectors as a new document-space vector D*new* as selection data become available." *Id.* at 27 (citing Ex. 1002 ¶¶ 40–45, 63; Ex. 1004, 9:28–40, 12:9–32).

In response, Patent Owner argues that "[w]hile Li teaches storing 'relevance feedback . . . in a user log 190' and then using the stored user feedback 'to generate a user space model' . . . it does not disclose or suggest that this user space model contains any information for ***viewed*** documents or images that were not ***marked***." PO Sur-reply 18 (citing Ex. 1004, 10:55–56, 11:61–63).

b) Our Analysis and Conclusion – Claim 7

With respect to claim 7, we determine that Petitioner has persuasively shown that the claim would have been obvious over Li as detailed above in Petitioner's contentions and for the following reasons.

With respect to limitation 7e, "a viewed document database storing viewed document indicia corresponding to selected documents viewed in response to said relevance search results" (Ex. 1001, 7:14–16), we agree with Petitioner that the user log 190 database teaches viewed document indicia, because the images in Li are part of webpages and, in the modified Li, would be visited by visiting the webpage containing the document. Pet. Reply 21 (citing Ex. 1004, 10:57–62; Ex. 2051, 79:3–11, 81:10–24). Thus, feedback regarding the image in a document would be feedback regarding

the webpage (viewed document indicia). While Patent Owner argues that the same webpage would contain two images, one marked relevant and one marked irrelevant (PO Resp. 30), Petitioner has shown that the database stores such data "for each image that was marked relevant or irrelevant" and thus each teaches or suggests considered viewed document indicia. *See* Pet. 37 (citing Ex. 1004, 10:57–62; Ex. 1002 ¶ 87). Additionally, we agree that the vectors in user space model 232, which represent the relevance of keywords of queries that resulted in retrieving images, also teach the claimed "viewed document indicia." *Id.* (citing Ex. 1004, 12:19–56; Ex. 1002 ¶ 88).

Patent Owner argues that Petitioner has not shown how Li's processor executing code to form high-level feature vectors, described by Petitioner as teaching or suggesting the vector constructor of limitation 7g of claim 7 (Pet. 25–27, 39), uses query words of multiple different queries, as recited in that limitation. PO Resp. 40–41. However, we agree that limitation 7g is taught or suggested in Li's high-level feature vectors and discussions of Li's teachings that keywords from past queries ("different queries") and relevance information provided are characterized in these feature vectors and incorporated into the document space model. Pet. 25–28, 38 (citing Ex. 1004, 11:61–63, 12:4–8, 12:19–56; Ex. 1002 ¶¶ 66–68, 91). Additionally, Petitioner has persuasively shown that a feature vector is constructed for each document, which characterizes attributes associated with different prior queries if feedback is available. Pet. 26 (citing Ex. 1004, 11:61–63); Pet. Reply 26–27. While Patent Owner argues that if no feedback has been received, it would not be included in the relevant vector, a feature vector is

still formed that characterizes attributes and query words associated with the document. Ex. 1004, 12:19–25; Ex. 1002 ¶ 43.

Having considered the record evidence and the arguments of the parties, we find that Petitioner has shown by a preponderance of the evidence that claim 7 would have been obvious to one of ordinary skill in the art in view of Li.

c) Claim 14

Claim 14 is argued by Petitioner on substantially the same basis as claim 7, with some references to arguments regarding claim 1. Pet. 41–42. Patent Owner does not present any arguments specific to claim 14 that have not been addressed with respect to claims 1 and 7. Thus, for the same reasons discussed above, Petitioner has shown by a preponderance of the evidence that claim 14 would have been obvious to one of ordinary skill in the art in view of Li.

5. Dependent Claims 2–6, 8–13, and 15–19

Claims 2–6, 8–13, and 15–19 depend directly or indirectly from independent claims 1, 7, and 14. *See* Ex. 1001, 6:58–8:41. Petitioner identifies disclosure in Li that teaches or renders obvious the limitations of dependent claims 2–6, 8–13, and 15–19. Pet. 31–35, 40–44. We summarize Petitioner's contentions for these claims below, with the claims grouped according to similar limitations.

a) Claims 2, 9, and 15 – "forming said feature vector with attributes defining key words found within said document" (claim 2)

Petitioner relies on the contentions presented for claim 1, limitation 1c and asserts that "the feature vector is formed **with attributes defining key**

words found within said document." Pet. 31 (citing Ex. 1002 ¶ 74; Ex. 1004, 7:10–59). Petitioner relies on the same contentions for claim 9 as for claim 2, and on the same contentions for claim 15 as for claim 2 and claim 7, limitation 7i. *See id.* at 40, 42.

Patent Owner does not present any arguments specific to these claims that have not been addressed with respect to the claims from which they, respectively, depend. We determine Petitioner's contentions, as summarized, to be persuasive and determine that Petitioner has shown by a preponderance of the evidence that claims 2, 9, and 15 would have been obvious to one of ordinary skill in the art in view of Li.

b) Claims 3, 10, and 16 – "forming said feature vector with query words that resulted in the previous identification of said document" (claim 3)

Petitioner relies on the contentions presented for claim 1, limitation 1c and asserts that "the feature vector is updated using the user-space-model vector, which results in the feature vector containing **query words that resulted in the previous identification of said document**." Pet. 31–32 (citing Ex. 1002 ¶ 75; Ex. 1004, 12:26–13:27). Petitioner relies on the same contentions for claim 10 as for claim 3, and on the same contentions for claim 16 as for claim 3 and claim 7, limitation 7i. *See id.* at 40, 43.

Patent Owner does not present any arguments specific to these claims that have not been addressed with respect to the claims from which they, respectively, depend. We determine Petitioner's contentions, as summarized, to be persuasive and determine that Petitioner has shown by a preponderance of the evidence that claims 3, 10, and 16 would have been obvious to one of ordinary skill in the art in view of Li.

c) Claims 4, 11, and 17 "wherein said assigning includes assigning a rank value for said document utilizing a function that adaptively weighs said relevance score and said similarity score" (claim 4)

Petitioner relies on the contentions presented for claim 1, limitations 1c and 1d and asserts that "Li teaches assigning a rank value for said document using a linear combination of the relevance score and the similarity score, where the relevance and similarity scores are weighted using a term **α** (alpha)." Pet. 32–33 (citing Ex. 1002 ¶¶ 76–77; Ex. 1004, 9:45–60). In addition, Petitioner contends that Li's assignment of rank can also be performed using adaptive weighting. *Id.* (quoting Ex. 1004, 14:4–18). Petitioner reasons that "[b]ecause the time-variant parameter α is the weighting factor used to weight the relevance score and similarity score," Li teaches "**assigning a rank value for said document utilizing a function that adaptively weighs said relevance score and said similarity score**." Pet. 33 (citing Ex. 1002 ¶ 77). Petitioner relies on the same contentions for claim 11 as for claim 4, and on the same contentions for claim 17 as for claim 4 and claim 7, limitation 7i. *See id.* at 40–41, 43.

Patent Owner does not present any arguments specific to these claims that have not been addressed with respect to the claims from which they, respectively, depend. We determine Petitioner's contentions, as summarized, to be persuasive and determine that Petitioner has shown by a preponderance of the evidence that claims 4, 11, and 17 would have been obvious to one of ordinary skill in the art in view of Li.

d) Claims 5, 12, and 18 – "wherein said assigning includes assigning a rank value for said document utilizing a function that adaptively weighs said relevance score and said similarity score based upon prior search result viewing behavior" (claim 5)

Petitioner relies on the contentions presented for claim 1, limitation 1d and claim 4 and asserts that "Li teaches and renders obvious **assigning a rank value for said document utilizing a function that adaptively weighs said relevance score and said similarity score based upon prior search result viewing behavior**." Pet. 33. In particular, Petitioner reasons that "the weighting parameter α is adapted based on the closeness of the query vectors to feature vectors, which in turn changes according to feedback from the user," where "Li's feedback involves a user **viewing** search results and taking some action that indicates relevance." *Id.* at 33–34 (citing Ex. 1002 ¶ 78; Ex. 1004, 10:47–64, 14:4–18).

Further, Petitioner contends "[i]t would have been an obvious modification to Li, implementable with no unpredictable results, to record as relevance feedback from Li the act of a user clicking on an image or related text form the Web page, as opposed to clicking on a '+' sign or checkbox next to the image," as Li teaches. Pet. 34–35 (citing Ex. 1002 ¶ 79; Ex. 1004, 3:18–21, 10:47–55).

Petitioner relies on the same contentions for claim 12 as for claim 5, and the same contentions for claim 18 as for claim 5 and claim 7, limitation 7i. *See id.* at 41, 43–44.

Patent Owner does not present any arguments specific to these claims that have not been addressed with respect to the claims from which they, respectively, depend. We determine Petitioner's contentions, as

summarized, to be persuasive and determine that Petitioner has shown by a preponderance of the evidence that claims 5, 12, and 18 would have been obvious to one of ordinary skill in the art in view of Li.

e) Claims 6, 13, and 19 – "wherein said assigning includes assigning a rank value for said document utilizing a linear combination function" (claim 6)

Petitioner relies on the contentions presented for claim 1, limitation 1d and asserts that "Li assigns a rank value using a linear combination." Pet. 35 (citing Ex. 1002 ¶ 80; Ex. 1004, 9:41–67). Petitioner relies on the same contentions for claim 13 as for claim 6, and the same contentions for claim 19 as for claim 6 and claim 7, limitation 7i. *See id.* at 41, 44.

Patent Owner does not present any arguments specific to these claims that have not been addressed with respect to the claims from which they, respectively, depend. We determine Petitioner's contentions, as summarized, to be persuasive and determine that Petitioner has shown by a preponderance of the evidence that claims 6, 13, and 19 would have been obvious to one of ordinary skill in the art in view of Li.

f) Claim 8 – "wherein said viewed document processor associates a selected viewed document with different query words that resulted in the previous identification of said selected viewed document"

Petitioner relies on the contentions presented for claim 7, limitations 7e and 7f and asserts that "Li teaches that the viewed document processor **associates a selected viewed document with different query words that resulted in the previous identification of said selected viewed document**." Pet. 40 (citing Ex. 1002 ¶ 94; Ex. 1004, 10:57–62, 12:19–56).

Patent Owner does not present any arguments specific to claim 8 that have not been addressed with respect to claim 7 from which it depends. We determine Petitioner's contentions, as summarized, to be persuasive and determine that Petitioner has shown by a preponderance of the evidence that claim 8 would have been obvious to one of ordinary skill in the art in view of Li.

E. Ground 2: Asserted Obviousness of Claims 1–19 Over Edlund and Li

Petitioner asserts that claims 1–19 are unpatentable under 35 U.S.C. § 103 as being obvious over Edlund (Ex. 1005) and Li (Ex. 1004). Pet. 44–67; Pet. Reply 27–31. As explained above, we conclude that these claims are unpatentable over Li. *See supra* Section II.D. As such, we need not address Petitioner's alternative grounds based on the combination of Li and Edlund. *See Boston Sci. Scimed, Inc. v. Cook Grp. Inc.*, 809 F. App'x 984, 990 (Fed. Cir. Apr. 30, 2020) (non-precedential) (recognizing that "the Board need not address issues that are not necessary to the resolution of the proceeding" and, thus, agreeing that the Board has "discretion to decline to decide additional instituted grounds once the petitioner has prevailed on all its challenged claims").

III. MOTION TO EXCLUDE

Petitioner filed a motion to exclude Exhibits 2050, 2057–2062, and 2064–2067. Paper 54, 1. Patent Owner filed Patent Owner's Opposition to Petitioner's Motion to Exclude. Paper 58. Petitioner filed a Reply. Paper 61.

A. Exhibit 2050

Petitioner argues that Exhibit 2050, the declaration of Dr. Barr, should be excluded because it is presented as expert testimony but Patent Owner

represented to third party Micro Focus, during discussions regarding the protective order, that Dr. Barr was not an expert. Paper 54, 1–5; Ex. 1054. Petitioner thus argues that Patent Owner should be "held to its representation that Dr. Barr is not an expert" and thus his opinion should be excluded because he offers opinion that is based on specialized knowledge. Paper 54, 4. Petitioner additionally argues that Dr. Barr does not qualify as a person of ordinary skill in the art. *Id.* at 5–6. Patent Owner argues that the declaration is of an expert, that he qualifies as a person of ordinary skill in the art, and that the declaration is relevant and non-prejudicial. Paper 58, 1–7.

B. Exhibits 2057–2062 and 2064–2067

Petitioner argues that Exhibits 2057–2062 and 2064–2067 are improper new evidentiary exhibits, in contravention of 37 C.F.R. § 42.23(b), and should be excluded for that reason. Paper 54, 6–7. Patent Owner argues that Petitioner's objections are not timely and Petitioner suffered no prejudice as a result of the exhibits' introduction. Paper 58, 7–10.

C. Disposition of Motion to Exclude

Both Dr. Barr's declaration and Exhibits 2057–2062 and 2064–2067 are used only in arguments relating to antedating Li. Pet. Reply 6–16; Sur-reply 1, 3–11. Having considered the evidence Petitioner seeks to exclude, we still conclude that the preponderance of the evidence does not show that Verity product(s) included a reduction to practice of any claims of the '764 patent, see supra Section II.D.2. Thus, we need not reach Petitioner's Motion to Exclude, and we dismiss it as moot.

IV. MOTIONS TO SEAL AND MOTION FOR ENTRY OF THE AGREED PROTECTIVE ORDER AND SUPPLEMENTAL PROTECTIVE ORDER

Both Petitioner and Patent Owner have filed motions to seal selected exhibits and documents.

Patent Owner filed a Motion to Seal Patent Owner's Response and Exhibit 2050 and also requested entry of an agreed Protective Order and Supplemental Protective Order. Paper 33. Patent Owner filed a complete version of its Patent Owner's Response as Paper 32 and a redacted version as Paper 34. Patent Owner also filed a redacted version of Exhibit 2050. Petitioner did not file an opposition.

Petitioner filed a Motion to Seal Petitioner's Reply and Exhibits 1036, 1038, 1040, 1041, and 1042 according to the agreed Protective Order and Supplemental Protective Order. Paper 45. Petitioner filed a complete version of its Reply as Paper 43 and a redacted version as Paper 46. Petitioner filed a redacted version of Exhibits 1036, 1038, and 1040. Patent Owner did not file an opposition.

Patent Owner filed a Motion to Seal Patent Owner's Sur-Reply and Exhibit 2063 according to the agreed Protective Order and Supplemental Protective Order. Paper 51. Patent Owner filed a complete version of its Sur-Reply as Paper 52 and a redacted version as Paper 53. Patent Owner also filed a redacted version of Exhibit 2063. Petitioner did not file an opposition.

Petitioner filed a Motion to Seal Petitioner's Motion to Exclude according to the agreed Protective Order and Supplemental Protective Order. Paper 55. Petitioner filed a complete version of its Motion to Exclude as

Paper 54 and a redacted version as Paper 59. Patent Owner did not file an opposition.

Patent Owner filed a Motion to Seal Patent Owner's Opposition to Petitioner's Motion to Exclude according to the agreed Protective Order and Supplemental Protective Order. Paper 58. Patent Owner filed a complete version of its Opposition as Paper 57 and a redacted version as Paper 60. Petitioner did not file an opposition.

Petitioner filed a Motion to Seal Petitioner's Demonstratives according to the agreed Protective Order and Supplemental Protective Order. Paper 64. Petitioner filed its Demonstratives in two parts, with a non-confidential portion as Paper 62 and a confidential portion as Paper 63. Petitioner seeks to seal Paper 63. Patent Owner did not file an opposition.

Patent Owner filed a Motion to Seal Patent Owner's Demonstratives according to the agreed Protective Order and Supplemental Protective Order. Paper 66. Petitioner filed a complete and redacted version of its Demonstratives as Exhibit 2068. Petitioner did not file an opposition.

The record for an *inter partes* review shall be made available to the public, except as otherwise ordered, and a document filed with a motion to seal shall be sealed provisionally until the motion is decided. *See* 35 U.S.C. § 316(a)(1); 37 C.F.R. § 42.14. Additionally, "[a] party may file a motion to seal where the motion to seal contains a proposed protective order, such as the default protective order set forth in the Office Patent Trial Practice Guide." 37 C.F.R. § 42.54(a).

There is a strong public policy that favors making information filed in *inter partes* review proceedings open to the public. *See Garmin Int'l v. Cuozzo Speed Techs., LLC*, IPR2012-00001, Paper 34 at 1–2 (PTAB Mar.

14, 2013). The standard for granting a motion to seal is good cause. *See* 37 C.F.R. § 42.54(a). The Board has stated that

> a movant to seal must demonstrate adequately that (1) the information sought to be sealed is truly confidential, (2) a concrete harm would result upon public disclosure, (3) there exists a genuine need to rely in the trial on the specific information sought to be sealed, and (4), on balance, an interest in maintaining confidentiality outweighs the strong public interest in having an open record.

Argentum Pharms. LLC v. Alcon Research, Ltd., IPR2017-01053, Paper 27 at 4 (PTAB Jan. 19, 2018) (informative) (citing 37 C.F.R. § 42.54(a)). The Consolidated Trial Practice Guide[7] explains that "[t]he rules aim to strike a balance between the public's interest in maintaining a complete and understandable file history and the parties' interest in protecting truly sensitive information." CTPG 19. Further, the moving party bears the burden of showing that the relief requested should be granted. *See* 37 C.F.R. § 42.20(c).

We have reviewed the redactions and we find that the parties have established good cause for the Motions to Seal. In particular, Patent Owner asserts that Exhibit 2050 contains non-public information regarding source code, produced on the condition that Patent Owner maintains the confidentiality of the source material. Paper 33, 1–2. Petitioner argues that Exhibits 1041 and 1042 contain sections of this source code under the terms of the Supplemental Protective Order. Paper 45, 2. The parties assert that Patent Owner's Response, Petitioner's Reply, Patent Owner's Sur-Reply,

[7] The Patent Trial and Appeal Board Consolidated Trial Practice Guide (Nov. 2019) ("CTPG") is available at https://www.uspto.gov/TrialPracticeGuideConsolidated.

Petitioner's Motion to Exclude, Patent Owner's Opposition to Petitioner's Motion to Exclude, Petitioner's Demonstratives, Patent Owner's Demonstratives, and Exhibits 1036, 1038, 1040, and 2063, refer to and include information from Exhibits 1041, 1042, or 2050. Papers 33, 45, 51, 55, 58, 64, and 66.

We are mindful that the non-public information in each case is that of a third party, produced according to our order granting third-party discovery in this case. *See* Paper 22. After balancing the public's interest in a complete and understandable file history with the third-party's interest in protecting this information, we are persuaded that there is good cause to seal the information in Exhibits 1041, 1042, and 2051 and the information redacted from the documents filed discussing this information

Accordingly, for these reasons, and as detailed in the Motions, the parties have established good cause to seal the Patent Owner's Response, Petitioner's Reply, Patent Owner's Sur-Reply, Petitioner's Motion to Exclude, Patent Owner's Opposition to Petitioner's Motion to Exclude, the confidential portion of Petitioner's Demonstratives (Paper 63), Patent Owner's Demonstratives, and Exhibits 1036, 1038, 1040–1042, 2050, and 2063.

Additionally, while no party has requested to seal the confidential version of Exhibit 1039, this exhibit does not appear to have been referenced in any filing by the parties, and a redacted version was filed. Thus, we seal the version of Exhibit 1039 that was filed as "Parties and Board" only.

As noted above, Petitioner and Patent Owner have agreed to the proposed Protective Order and Supplemental Protective Order. Paper 33. After review of these proposed protective orders, we find that entry of the

proposed protective orders, Paper 33, Attachments A and B, is appropriate. Accordingly, we hereby enter Paper 33, Attachments A and B, as the Protective Order governing the treatment and filing and confidential information in this proceeding.

Additionally, the second portion of the transcript (Paper 68) of the oral hearing in this case was filed as Parties and Board only, and this Final Written Decision is being filed Parties and Board Only. Petitioner and Patent Owner are ordered to confer and to jointly file, within ten business days of this Decision, a motion to seal the second portion of the transcript and this Decision along with proposed redacted versions, in compliance with the Protective Order's agreement for the parties to use reasonable efforts to maintain the confidentiality of confidential information. A public version of this Final Written Decision and of Paper 68 will be issued after consideration of a motion to seal or expiration of the time period to file a motion to seal.

V. CONCLUSION[8]

For the foregoing reasons, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 1–19 of U.S. Patent 6,738,764 B2 are unpatentable on the bases set forth in the following table.

In summary:

Claim(s)	35 U.S.C. §	Reference(s)/Basis	Claim(s) Shown Unpatentable	Claim(s) Not shown Unpatentable
1–19	103	Li	1–19	
1–19	103	Edlund, Li[9]		
Overall Outcome			1–19	

[8] Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. *See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

[9] As explained above, given our disposition of the ground based on Li, we do not reach Petitioner's alternative ground based on Edlund and Li. *See supra* Section II.E.

VI. ORDER

For the reasons given, it is

ORDERED that claims 1–19 of U.S. Patent No. 6,738,764 B2 have been proven to be unpatentable;

FURTHER ORDERED that Petitioner's Motion to Exclude is denied as moot;

FURTHER ORDERED that the parties' Motions to Seal are granted and that, additionally, the non-public version of Exhibit 1039 is sealed;

FURTHER ORDERED that Paper 33, Attachments A and B, are entered as protective orders governing the confidential information in this proceeding; and

FURTHER ORDERED that the parties are ordered to file, within ten business days of this Decision, a motion to seal this Decision in compliance with their duties having received confidential information from a third party under the agreed-upon Protective Order;

FURTHER ORDERED that the parties are ordered to file, within ten business days of this Decision, a motion to seal the second portion of the oral hearing transcript (Paper 68) in compliance with their duties having received confidential information from a third party under the agreed-upon Protective Order;

FURTHER ORDERED that a public version of this Decision will be issued in due course; and

FURTHER ORDERED that because this is a Final Written Decision, parties to this proceeding seeking judicial review of the Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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