

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

COMCAST CABLE COMMUNICATIONS, LLC,
Petitioner,

v.

VEVEO, INC.,
Patent Owner.

IPR2019-00292
Patent 7,937,394

Before KALYAN K. DESHPANDE, SHEILA F. McSHANE, and KARA L.
SZPONDOWSKI, *Administrative Patent Judges*.

SZPONDOWSKI, *Administrative Patent Judge*.

JUDGMENT

Final Written Decision

Determining All Challenged Claims Unpatentable
Granting In Part Petitioner's Motion to Seal Documents
Granting Petitioner's Motion to Enter Protective Order
35 U.S.C. § 318(a)

I. INTRODUCTION

Comcast Cable Communications, LLC (“Petitioner”) filed a Petition (Paper 2, “Pet.”) to institute *inter partes* review of claims 1–11 of US Patent No. 7,937,394 (Ex. 1221, “the ’394 patent”). Veveo, Inc. (“Patent Owner”) filed a Preliminary Response (Paper 9, “Prelim. Resp.”).

After consideration of the parties’ contentions and supporting evidence, we instituted *inter partes* review pursuant to 35 U.S.C. § 314, as to claims 1–11 of the ’394 patent. Paper 16 (“Inst. Dec.”).

After institution, Patent Owner filed a Patent Owner Response (Paper 22, “PO Resp.”); Petitioner filed a Reply (Paper 34, 40, “Pet. Reply”); and Patent Owner filed a Sur-Reply (Paper 44, “PO Sur-Reply”). Petitioner also filed a Motion to Seal and Motion to Enter Protective Order (Papers 32, 33). An oral hearing was conducted on April 2, 2020 and a transcript of the hearing has been entered into the record as Paper 51 (“Tr.”).

This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a). For the reasons that follow, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 1–11 of the ’394 patent are unpatentable.

II. BACKGROUND

A. *Real Parties-in-Interest*

Petitioner identifies the following as real parties-in-interest: Comcast Corporation; Comcast Business Communications, LLC; Comcast Cable Communications Management, LLC; Comcast Cable Communications, LLC; Comcast Financial Agency Corporation; Comcast Holdings Corporation; Comcast Shared Services, LLC; Comcast STB Software I, LLC; Comcast of Massachusetts I, Inc.; Comcast of Milton, Inc.; Comcast of

Southern New England, Inc.; Comcast of Massachusetts/New Hampshire, LLC; Comcast of Needham, Inc.; Comcast of Massachusetts/Virginia, Inc.; Comcast of Boston, Inc.; Comcast of Brockton, Inc.; Comcast of California/Massachusetts/Michigan/Utah, LLC; Comcast of Connecticut/Georgia/Massachusetts/New Hampshire/New York/North Carolina/Virginia/Vermont, LLC; Comcast of Massachusetts II, Inc.; and Comcast of Massachusetts III, Inc. Pet. 1.

Patent Owner names Veveo, Inc.; Rovi Guides, Inc.; and Rovi Corporation as real parties-in-interest. Paper 4, 1.

B. Related Matters

As required by 37 C.F.R. § 42.8(b)(2), each party identifies a judicial matter that would affect, or be affected by, a decision in this proceeding.

Both parties identify *Veveo Inc. v. Comcast Corporation, et al.*, Case No. 1:18-cv-10056-GAO (D. Mass) and *In the Matter of Certain Digital Receivers and Related Hardware and Software Components*, Investigation No. 337-TA-1103 (“ITC Investigation”). Pet. 2; Paper 4, 1.

Patent Owner additionally identifies *Veveo Inc. v. Comcast Corporation, et al.*, Case No. 1:13-cv-11885-GAO (D. Mass) and *Veveo, Inc. v. Verizon Services Corp. et al.*, Case No. 1-10-cv-06709 (D. Mass). Paper 4, 1.

Additionally, Petitioner filed IPR2019-00290, IPR2019-00291, and IPR2019-00293 also requesting *inter partes* review of claims 1–11 of the ’394 patent (“the ’394 proceedings”). Petitioner also filed IPR2019-00237, IPR2019-00238, and IPR2019-00239 requesting *inter partes* review of claims 1–24 of U.S. Patent No. 7,779,011 (“the ’011 patent”) (“the ’011 proceedings”). We exercised our discretion under 35 U.S.C. § 314(a) and denied institution of *inter partes* review as to three of these proceedings,

IPR2019-00291, IPR2019-00293, and IPR2019-00238. *See, e.g., Comcast Cable Communications, LLC v. Veveo, Inc.*, IPR2019-00291, Paper 16 (PTAB July 5, 2019) (Decision Denying Institution); *see, e.g., Comcast Cable Communications, LLC v. Veveo, Inc.*, IPR2019-00293, Paper 16 (PTAB July 5, 2019) (Decision Denying Institution); *see, e.g., Comcast Cable Communications, LLC v. Veveo, Inc.*, IPR2019-00238, Paper 15 (PTAB July 5, 2019) (Decision Denying Institution).

In addition, the parties refer to IPR2017-00715, which concerned U.S. Patent No. 8,433,696 (Ex. 1205, “the ’696 patent”), a patent related to the ’394 patent (hereafter “the ’696 patent proceeding”).

C. The ’394 Patent

The ’394 patent is a continuation of application No. 11/312,908, filed on December 20, 2005, now the ’011 patent, which claims the benefit of U.S. Provisional Patent Application No. 60/711,866, filed August 26, 2005 and U.S. Provisional Patent Application No. 60/716,101, filed September 12, 2005. Ex. 1221, 1:9–23.

The ’394 patent is titled “Method and System for Dynamically Processing Ambiguous, Reduced Text Search Queries and Highlighting Results Thereof” and generally describes “identifying an item from a set of items” from a search query entered by a user on a device having a text input interface with overloaded keys. *Id.*, codes (54), (57). An overloaded key has multiple alpha-numeric characters or functions so that the same key can be pressed to enter different characters. *Id.* at 1:44–47. For example, the “2” key can be pressed to enter the number “2” or the letters “A,” “B,” or “C.” *Id.* at 1:47–48. Such a keypad is illustrated below in Figure 1.

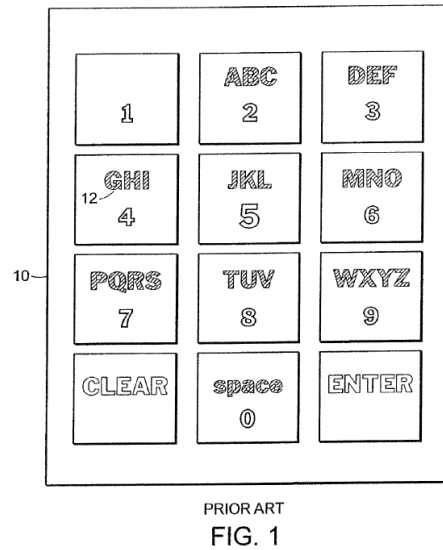


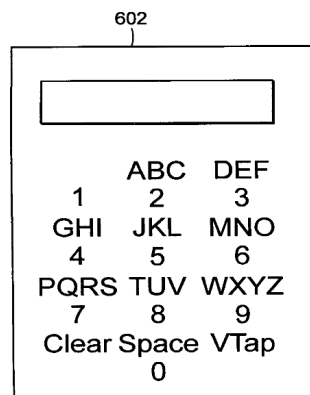
Figure 1 illustrates a keypad with overloaded keys. *Id.* at 2:54–55. The '394 patent explains that text entry using a keypad with overloaded keys, as shown in Figure 1 above, can result in an ambiguous text entry, which requires some type of disambiguation action, such as multiple key presses to select a desired character. *Id.* at 1:48–53. These known disambiguation actions may have deficiencies, such as requiring too many key strokes needed to make a text entry. *Id.* at 1:58–62.

The '394 patent processes a search query to identify an item from a set of items, where each of the items has a name comprising one or more words. *Id.* at 2:20–22. Using the text input interface, a user can enter an ambiguous search query that comprises a prefix substring of at least one word in the name of the desired item. *Id.* at 3:32–35; *see* 3:35–37 (“A prefix substring of a word is a variable length string of characters that contains fewer than all the characters making up the word”). A prefix query may be a single-word query that matches a single word term or an abbreviation representing multiple words, or a multi-word prefix query, that matches a

multi-word term or an abbreviation representing multiple words. *Id.* at 6:55–63.

The search space containing the searchable items is “initially indexed by performing a many-to-many mapping of the alphanumeric space of terms to numeric strings corresponding to the various prefixes of each alphanumeric term constituting the query string.” *Id.* at 3:50–55. In the numeric string, each alphanumeric character is replaced by its corresponding numeric equivalent. *Id.* at 3:55–59. This allows the system to incrementally retrieve results matching the ambiguous search query as the user types in each character of the query. *Id.* at 3:59–62. The items that match the search query are displayed on the device, preferably in the order of expected interest to the user, with the characters of the one or more words in the names corresponding to the prefix substring of the search query highlighted. *Id.* at 3:38–46, 5:38–44, 6:31–36.

For instance, as keystrokes are entered, the identified subsets of items are identified and displayed, as shown in Figures 6A and 6B reproduced below, with the respective figures illustrating a text input interface and a display interface. *See* Ex. 1221, 3:4–8; 7:9–11.



USER INPUT: 866

FIG. 6A

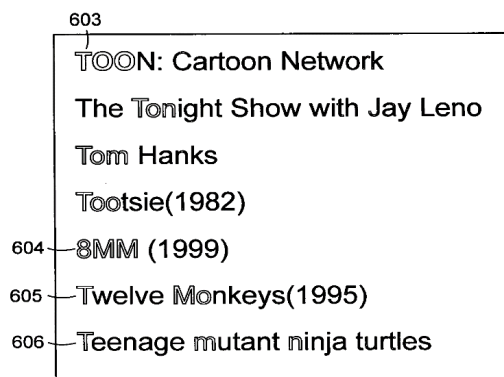


FIG. 6B

As illustrated in this example, in Figure 6A above, the user has entered a single-word text input query “866” using the overloaded keypad interface 602 and the results of the search input are shown in Figure 6B above. Ex. 1221, 7:11–15. Figure 6B shows single-word term matches 603 and 604 ordered before abbreviation matches 605 and 606. *Id.* at 7:14–17.

D. Illustrative Claim

Petitioner challenges claims 1–11 of the ’394 patent. Pet. 1. Claim 1, the only independent claim, is reproduced below, with annotations added to the step limitations for reference purposes:

1. A method of processing unresolved keystroke entries by a user from a keypad with overloaded keys in which a given key is in fixed association with a number and at least one alphabetic character, the unresolved keystroke entries being directed at identifying an item from a set of items, each of the items being associated with information describing the item comprising one or more words, the method comprising:

[a] providing access to an index of the items, the index having an association between subsets of the items and corresponding strings of one or more unresolved keystrokes for overloaded keys so that the subsets of items are directly mapped to the corresponding strings of unresolved keystrokes for various search query prefix substrings;

[b] for at least one subset of items, determining which letters and numbers present in the information associated with and describing the indexed items of the subset caused the items to be associated with the strings of one or more unresolved keystrokes that directly mapped to the subset;

[c] receiving from a user a search query for desired items composed of unresolved keystrokes, the search query comprising a prefix substring for at least one word in information associated with the desired item;

[d] in response to each unresolved keystroke, identifying and displaying the subsets of items, and information associated therewith, that are associated with the strings of one or more unresolved keystrokes received from the user based on the direct mapping of strings of unresolved keystrokes to subsets of items; and

[e] in response to each unresolved keystroke, as the identified items are displayed, highlighting the letters and numbers present in the one or more words in the information describing the identified items that were determined to have caused the displayed items to be associated with the strings of unresolved keystrokes that are directly mapped to the items so as to illustrate to the user how the unresolved keystrokes entered match the information associated with the displayed items.

Ex. 1221, 8:44–9:16.

E. Evidence Relied Upon

Petitioner relies on the following prior art references (*see* Pet. 8), as well as the Declarations of Dr. Edward A. Fox (Ex. 1214, Ex. 1233):

Reference	Exhibit	Patent/Printed Publication	Prior Art Basis
Gross	Ex. 1211	US 2004/0133564 A1 (filed Sep. 3, 2003, published July 8, 2004)	35 U.S.C. § 102(b)
Smith	Ex. 1213	US 6,529,903 (issued Mar. 4, 2003)	35 U.S.C. § 102(b)
Sanders	Ex. 1210	US 7,885,963 (filed Mar. 24, 2003, issued Feb. 8, 2011)	35 U.S.C. § 102(e)
Weeren	Ex. 1225	US 6,501,956 (issued Dec. 31, 2002)	35 U.S.C. § 102(b)

F. Prior Art and Asserted Grounds

Petitioner asserts that claims 1–11 would have been unpatentable on the following grounds. Pet. 8. Trial was instituted on these grounds. Inst. Dec. 8, 50.

Claim(s) Challenged	35 U.S.C. §¹	Reference(s)/Basis
1, 2, 4, 5, 6, 10, 11	103(a)	Gross, Smith
3, 8, 9	103(a)	Gross, Smith, Sanders
7	103(a)	Gross, Smith, Weeren

III. ANALYSIS

A. Legal Standards

A claim is unpatentable under 35 U.S.C. § 103(a) if, to one of ordinary skill in the pertinent art, “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007) (quoting 35 U.S.C. § 103(a)). The question of obviousness is resolved based on underlying factual determinations, including the “scope and content of the prior art,” “differences between the prior art and the claims at issue,” “the level of ordinary skill in the pertinent art,” and objective evidence of

¹ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. § 103, effective March 16, 2013. Because the application from which the ’394 patent issued was filed before this date, the pre-AIA version of § 103 applies.

nonobviousness, i.e., secondary considerations.² *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

To establish obviousness, a petitioner must “demonstrate both that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1381 (Fed. Cir. 2016) (internal quotation marks omitted); *see also KSR*, 550 U.S. at 418 (for an obviousness analysis, “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does”). A motivation to combine the teachings of two references can be “found explicitly or implicitly in market forces; design incentives; the ‘interrelated teachings of multiple patents’; ‘any need or problem known in the field of endeavor at the time of invention and addressed by the patent’; and the background knowledge, creativity, and common sense of the person of ordinary skill.” *Plantronics, Inc. v. Aliph, Inc.*, 724 F.3d 1343, 1354 (Fed. Cir. 2013) (citation omitted). Further, an assertion of obviousness “cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR*, 550 U.S. at 418 (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)); *In re NuVasive, Inc.*, 842 F.3d 1376, 1383 (Fed. Cir. 2016) (a finding of a motivation to combine “must be supported by a ‘reasoned explanation’” (citation omitted)).

² Patent Owner does not present objective indicia of nonobviousness. *See generally* PO Resp.

B. Level of Ordinary Skill in the Art

Petitioner asserts a person of ordinary skill in the art “would have had at least a bachelor’s degree in computer science and at least two years of experience in the field of search-query processing spent designing, constructing, and/or testing systems that utilize data and/or information search techniques.” Pet. 16 (citing Ex. 1214 ¶¶ 42–46).

Patent Owner asserts a person of ordinary skill in the art “would have a bachelor’s degree in electrical engineering, computer engineering, computer science, or applied mathematics as well as two or more years of relevant industry experience, including in electronic content delivery, electronic program guides, television video signal processing, graphical user interfaces, cable or satellite television systems, set-top boxes, multimedia systems, or data search techniques.” PO Resp. 16 (citing Ex. 2014 ¶¶ 17–19).

In determining the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (citation and internal quotation marks omitted).

The ’394 patent addresses methods and systems of processing ambiguous search queries. Ex. 1221, code (57), 1:28–31. Gross addresses data processing methods and systems “for quick and efficient searching.” Ex. 1211, code (57), ¶ 4. Smith addresses systems and methods for “providing search results in response to an ambiguous search query provided by a user.” Ex. 1213, code (57), 1:16–18.

Based on the full record before us, and considering the subject matter and technology at issue in the '394 patent and prior art, we generally agree with Petitioner's proposed qualifications, but in addition to having a bachelor's degree in computer science, having a bachelor's degree in electrical engineering, computer engineering, computer science, or applied mathematics, or some equivalent level of education, provides sufficient educational background. Further, we agree that having two years of experience in the field of search-query processing spent designing, constructing, and/or testing systems that utilize data and/or information search techniques is sufficient background, but more advanced formal education could be substituted for work experience. In view of the scope and complexity of the '394 patent and prior art, we disagree with Patent Owner that one of ordinary skill would need to have industry experience specifically in electronic content delivery, electronic program guides, television video signal processing, graphical user interfaces, cable or satellite television systems, set-top boxes, or multimedia systems.

Accordingly, we determine that a person of ordinary skill in the art would have a bachelor's degree in computer science, electrical engineering, computer engineering, computer science, or applied mathematics, or some equivalent level of education, and at least two years of experience in the field of search-query processing spent designing, constructing, and/or testing systems that utilize data and/or information search techniques, but more advanced formal education could be substituted for work experience.

Moreover, we determine that any differences between the parties' proposed level of skill in the art would not affect our analysis below, and the parties agree. Neither party identifies any impact to the obviousness analysis based upon the level of ordinary skill in the art adopted. *See e.g.*,

Tr. 24:19–21 (Petitioner’s counsel stating “even an engineer in satellite or television is familiar with how to use search engines and highlighting on search engines.”); *id.* at 60:22–24 (Patent Owner’s counsel stating “I don’t think our arguments really would change in terms of whether or not – depending on which level of ordinary skill you adopt here.”). The significance of the level of ordinary skill in the art is the role it plays in an obviousness analysis. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966); *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (“[T]he level of skill in the art is a prism or lens through which a judge, jury, or the Board views the prior art and the claimed invention”); *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991) (“The importance of resolving the level of ordinary skill in the art lies in the necessity of maintaining objectivity in the obviousness inquiry”).

Even though Petitioner does not identify any impact to the obviousness analysis based upon the level of ordinary skill in the art adopted, and its argument at the oral hearing seems to acknowledge Dr. Russ’s qualifications would be sufficient, Petitioner nonetheless argues that Patent Owner’s expert, Dr. Russ, is not an expert in search query processing, and, therefore, is not qualified to provide expert testimony about such matters. Pet. Reply 18–19; Tr. 24:19–21 (“even an engineer in . . . television is familiar with how to use search engines and highlighting on search engines”). Patent Owner enumerates Dr. Russ’s experience, and responds that Dr. Russ “has substantial academic and industry credentials to qualify him as an expert.” PO Sur-Reply 22 (citing Ex. 2014 ¶¶ 7–15; Ex. 2015).

Reviewing this evidence of record, we are persuaded that Dr. Russ’s qualifications align with the subject matter sufficiently so that his knowledge is helpful in understanding the evidence and determining the facts in issue.

In particular, we emphasize that Dr. Russ need not be a person of ordinary skill in the art to testify as an expert under Federal Rule of Evidence 702. *See SEB S.A. v. Montgomery Ward & Co., Inc.*, 594 F.3d 1360, 1373 (Fed. Cir. 2010). Instead, in order to testify in this proceeding, Dr. Russ must have sufficient specialized “knowledge, skill, experience, training, [and] education” to demonstrate that his testimony is likely to “assist the trier of fact” in understanding the evidence and in determining whether the challenged claims are unpatentable. *Id.* Nor must his qualifications perfectly match the patent at issue. However, we agree with Patent Owner that Dr. Russ’s academic and industry credentials are extensive. *See* Ex. 2014 ¶¶ 7–15; Ex. 2015. Accordingly, we decline to discount Dr. Russ’s testimony, as Petitioner requests. Rather, we will weigh the testimony regarding each particular issue on which Dr. Russ opines based on the factual corroboration, articulated reasoning, and disclosure of underlying facts or data provided. *See In re Acad. of Sci. Tech Ctr.*, 367 F.3d 1359, 1368 (Fed. Cir. 2004) (“[T]he Board is entitled to weigh the declarations and conclude that the lack of factual corroboration warrants discounting the opinions expressed in the declarations.”); *see also* 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”); *cf. In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016) (Petitioner’s burden of proving obviousness cannot be satisfied by mere conclusory statements).

C. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are interpreted according to their broadest reasonable construction in light of the

specification of the patent in which they appear. 37 C.F.R. § 42.100(b)³ (2018); *see In re Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016). Under that standard, and unless the record shows otherwise, we give claim terms their ordinary and customary meaning, as they would be understood by one of ordinary skill in the art in the context of the patent disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Any special definitions for claim terms must be set forth with reasonable clarity, deliberateness, and precision. *See In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

Petitioner contends the terms “directly mapped,” “letters and numbers,” and “caused said items to be associated with the strings of one or more unresolved keystrokes that are directly mapped to said subset” in claim 1 require construction. *See* Pet. 9–16.

In the Institution Decision, we determined that, at that preliminary stage of the proceeding, no terms required express construction. Inst. Dec. 22–23.

Patent Owner does not address Petitioner’s proposed constructions, propose constructions for any of the three terms, or argue that the construction of these terms affects any disputed issue in this proceeding. *See generally* PO Resp.

³ This Petition was filed on November 12, 2018. A different claim construction standard applies to petitions filed on or after November 13, 2018. *See* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (amending 37 C.F.R. § 42.100(b) effective November 13, 2018) (now codified at 37 C.F.R. 42.100(b)(2019)).

Because the terms are not in controversy, we find it is not necessary to expressly construe any of these terms to resolve the parties' dispute. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co. Ltd.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017), *cert. denied*, 138 S. Ct. 1695 (April 30, 2018) (noting that “we need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy’”) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)).

D. Preliminary Matters

1. ITC Investigation

Patent Owner argues that in a June 2019 Initial Determination in the ITC investigation concerning the related '011 patent, the Administrative Law Judge (“ALJ”) rejected Petitioner’s arguments and found Petitioner had not demonstrated a motivation to combine Gross and Smith. PO Resp. 39–40 (citing Ex. 2017). Patent Owner argues that “it is evident that the same theories made by Comcast at the ITC are being put forth here in an attempt to invalidate the '394 patent—the result of which is that Rovi is now prejudiced by being forced to re-litigate issues at a great expense that should not be re-litigated,” which “frustrates the purpose of the AIA and results in unnecessary legal process and unfairness.” *Id.* at 42. Patent Owner, therefore, argues that the doctrine of issue preclusion prevents this “exact unfairness.” *Id.* Patent Owner also argues that “the ALJ’s (correct) reasoning is fully applicable and should be given substantial weight here.” *Id.* at 43; *see* PO Sur-Reply 24 (clarifying that Patent Owner is *not* arguing “that the ITC’s determination is mandatory authority”).

Petitioner argues that the “ITC determinations of patent validity and infringement are specifically excluded from carrying any preclusive weight.” Pet. Reply 20. Petitioner further contends that the “legal standards applied

by the ITC and the Board are different,” “the records before the ITC and the Board are different,” and “the instant Petition sets forth and seeks consideration of additional and new obviousness rationales based in part on the testimony of Dr. Fox.” Pet. Reply 21–22.

The ITC investigation does not have preclusive effect on this proceeding, but can be considered for any persuasive value it offers. *Texas Instruments Inc. v. Cypress Semiconductor Corp.*, 90 F.3d 1558, 1569 (Fed. Cir. 1996) (ITC decision has no preclusive effect in other forums but a district court can attribute persuasive value to a prior ITC decision, as justified); see *Tandon Corp. v. United States Int’l Trade Comm’n*, 831 F.2d 1017, 1019 (Fed. Cir. 1987) (holding ITC’s determinations regarding patent issues should be given no *res judicata* or collateral estoppel effect); Patent Trial and Appeal Board Consolidated Trial Practice Guide at 49 (Nov. 2019), available at <https://ptabe2edocs.uspto.gov/prps-services/casedocs/IPR2019-00290/document/4f1ef0be-e24e-400a-ab7f-174a36542c25/content> (indicating that prior claim construction from the ITC is considered by the Board, but no guidance that it is binding).

The ITC investigation concerned, *inter alia*, the infringement and the invalidity of several patents, including the related ’011 patent, which is the subject of IPR2019-00239. Ex. 2017 at iii–iv. In particular, and pertinent to Patent Owner’s arguments, Petitioner asserted that claims 1 and 9 were obvious over Gross and Smith. *Id.* at 100–113. The ITC determined that “Gross in combination with Smith teaches all the limitations recited in claims 1 and 9. However, Comcast failed to demonstrate that a person of ordinary skill in the art would have had a motivation to combine the references.” *Id.* at 100.

The parties have not provided the full record from the ITC in this proceeding, and more particularly, we do not have the full briefing on the obviousness assertions. In the June 2019 Initial Determination provided, the discussion of the parties' arguments on the rationale to combine Gross and Smith is limited. *See* Ex. 2017, 111–113. The arguments and evidence presented to the ITC are not before us. Petitioner argues that the record in this proceeding is different, and additional and new obviousness rationales have been presented here. Pet. Reply 21–22; Tr. 8:18–23, 9:9–10:4. Patent Owner conceded at the hearing that the record in this proceeding is determinative, and that “I don’t think that anything that happened in the ITC is that relevant in this case because we have to look at the record here.” Tr. 39:20–24. We have reviewed the portions of the ITC investigation in the record, and determine that Petitioner’s assertion that the record before the ITC is more limited than the record here is accurate. Importantly, the only motivation to combine the references cited by the ITC is that Gross and Smith “are in the same field of art, they are related to searching, indexing, presenting information.” Ex. 2017 at 111.

We have reviewed and considered the ITC’s June 2019 Initial Determination. We, however, come to a different conclusion on the rationale to combine Gross and Smith based on the record before us, as discussed below. In light of the differences in the records in each respective proceeding, however, we do not consider any determination herein to be in tension with that made by the ITC.

Patent Owner also argues that Petitioner engaged in gamesmanship by delaying the Petition filing until after the ITC investigation had progressed. PO Resp. 43. Patent Owner contends that by waiting to file the Petition, Petitioner gained a tactical advantage. *Id.* at 43–44. Patent Owner argues

that Petitioner’s alleged gamesmanship results in unnecessary legal process and unfairness, and Petitioner’s tactics should not be rewarded. *Id.*

We addressed the alleged gamesmanship issues and potential overlapping issues with the ITC proceeding in the Decision on Institution. *See* Inst. Dec. 14–17. In our Decision, we did not find that there was substantial overlap in the proceedings because there was insufficient evidence in the record showing Petitioner’s theories and arguments on invalidity in the ITC investigation, and the claims at issue in both proceedings also differed. *Id.* As such, we were not persuaded that Petitioner gained a tactical advantage or engaged in gamesmanship. *Id.* In its Response, Patent Owner’s arguments are substantially similar to those previously raised, and we find them unpersuasive for similar reasons. *Compare* Inst. Dec. 14–17, with PO Resp. 43–44.

2. Collateral Estoppel

Petitioner argues that collateral estoppel prevents Patent Owner “from re-litigating issues of invalidity that have been fully and fairly tried in a previous action and adversely resolved against it.” Pet. Reply 6. Specifically, Petitioner argues that Patent Owner may not argue against the combination of Gross and Smith to provide an incremental searching system because this issue has already been decided by the Board and affirmed by the Federal Circuit in IPR2017-00715, which concerned the ’696 patent.⁴ *Id.* at 5, 8–9. Petitioner argues

[t]he Board considered a nearly identical combination of Gross and Smith with respect to the ’696 patent, specifically holding that a [person of ordinary skill in the art] ‘would have readily

⁴ Both the ’696 patent and the ’011 patent claim priority to provisional application No. 60/711,866 and provisional application No. 60/716,101. *See* Ex. 2005, code (60), 1:7–23; Ex. 1201, code (60), 1:8–18.

recognized the proposed combination and would have been able to incorporate the incremental searching system and method described by Gross with the overloaded keypad environment and numeric index taught by Smith.’

Id. at 6–7. Petitioner argues that the claim elements are nearly identical between the ’394 and ’696 patents, and to the extent that they are different, the differences are not material. *Id.* at 7–8.

Patent Owner responds that “[t]he issues litigated for the ’696 patent had nothing to do with the highlighting element at issue in this case” because “the ’696 patent does not recite highlighting at all.” PO Sur-Reply 2; *see also id.* at 3–6. Patent Owner argues that Petitioner admits that the “identical” issue was not previously decided, and “[t]he fact that the ’394 patent and the ’696 patent are related and have some similar claim elements does not reach the threshold for collateral estoppel.” *Id.* at 3.

We agree with Patent Owner that there is no collateral estoppel. “Collateral estoppel protects a party from having to litigate issues that have been fully and fairly tried in a previous action and adversely resolved against a party-opponent.” *Ohio Willow Wood Co. v. Alps S., LLC*, 735 F.3d 1333, 1342 (Fed. Cir. 2013). To prove collateral estoppel, a party must show:

[1] that in the prior action the party against whom estoppel is sought had a full and fair opportunity to litigate the issue; [2] the issue was actually litigated; [3] the controlling facts and applicable legal rules were the same in both actions; [4] resolution of the particular issue was essential to the final judgment in the first action; and [5] the *identical* issue was decided in the first action.

See Comair Rotron, Inc. v. Nippon Densan Corp., 49 F.3d 1535, 1537 (Fed. Cir. 1995) (emphasis added). In considering collateral estoppel of adjudicated patent claims, the patent claims do not have to be identical;

rather, “it is the identity of the *issues* that were litigated that determines whether collateral estoppel should apply.” *Ohio Willow Wood*, 735 F.3d at 1342.

Here, we agree with Patent Owner that the issues presented are not identical to the issues addressed in IPR2017-00715 as to the ’696 patent. Importantly, the ’696 patent does not claim, discuss, or describe the claimed “highlighting” limitation 1[e], which is the central subject of the arguments presented by Patent Owner in this proceeding. *See* PO Sur-Reply 4; *see* Ex. 2005. Indeed, Patent Owner clarified at the hearing that the primary dispute is “whether or not Gross and Smith teaches the claimed highlighting in response to unresolved element of the claims.” Tr. 37:7–12; 38:15–17 (“overall, I think our arguments related to combinability relate to the highlighting element”); 38:21–24 (“[indexing is] not precisely what we’re arguing, although, frankly, it’s all linked together. But the arguments related to combinability here are primar[ily] related to the highlighting argument—the highlighting aspect of the claims.”).

We agree with Patent Owner that the arguments could have some potential overlap, but given the differences between the ’696 patent and the ’394 patent with respect to claimed “highlighting,” as well as the differences in arguments presented in this proceeding, we are not persuaded that collateral estoppel applies to Patent Owner’s arguments. Moreover, Petitioner clarified at the hearing that they “don’t think that [Patent Owner is] precluded from arguing the combination with respect to highlighting.” Tr. 35:2–4.

E. Obviousness of Claims 1, 2, 4, 6, 10, and 11 Over the Combination of Gross and Smith

Petitioner contends claims 1, 2, 4, 6, 10, and 11 would have been obvious over the combination of Gross and Smith. Pet. 28–64. Patent Owner opposes. *See generally* PO Resp. In our discussion below, we first provide a brief overview of the prior art, and then address the parties’ contentions in turn.

1. Gross (Ex. 1211)

Gross is titled “Methods and Systems for Search Indexing” and generally describes methods and systems for quick and efficient searching. Ex. 1211, code (54), code (57). Gross provides for incremental or reactive searching, which allows search results to be provided and narrowed substantially immediately after each character in a search string is entered by a user, thus providing the user with immediate visual feedback. Ex. 1211 ¶¶ 10, 29.

Gross’s search application includes an index engine that creates indexes of the potential search targets. *Id.* ¶¶ 38, 175. “The index includes a data structure that associates character strings with files, documents, and the like.” *Id.* ¶ 40. “In one example embodiment, for each word or character string found with[in] a file or document, the index stores which field of which documents or files contain that word or character string.” *Id.* In addition to complete words, the index may also store “prefix” entries, such as “d” or “do,” which will enhance the speed of response for the first letter or two of a filtering or search operation. *Id.* ¶ 51. “The ‘d’ prefix entry contains information indicating which documents or files contain a word or character string starting with ‘d.’” *Id.* In response to a query, the search engine accesses the index and locates corresponding matches. *Id.* ¶ 58. The

search results are displayed to the user in the list pane or area, and the view area or pane displays the contents of the first item or a selected item from the list area. *Id.* ¶ 48. Gross also teaches that the first matching character or character string in the search results may be highlighted or otherwise emphasized. *Id.* ¶ 49.

2. *Smith (Ex. 1213)*

Smith is titled “Methods and Apparatus for Using a Modified Index to Provide Search Results in Response to an Ambiguous Search Query” and generally “allows a user to submit an ambiguous search query and to receive potentially disambiguated search results.” Ex. 1213, code (54), code (57).

Smith explains that the data input interface in certain devices, such as wireless telephones, may result in a particular action by a user (e.g., pressing a key) corresponding to more than one alphanumeric character. *Id.* at 1:27–30. For example, pressing the number 2 on a telephone keypad may correspond to the number “2” or the letters “A,” “B”, or “C.” *Id.* at Fig. 5B. Such a keypad is illustrated below in Figure 5B of Smith.

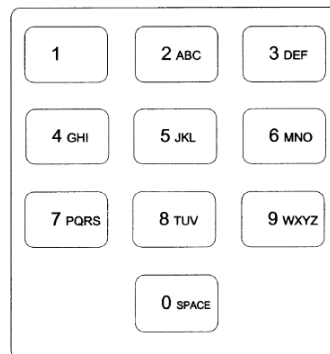


Figure 5B shows a keyboard where multiple letters on a key map to a particular number. *Id.* Therefore, with conventional search methods, the “user may be required to press multiple keys to select a particular letter” in a

keypad such as that illustrated in Figure 5B of Smith, above, which can be inefficient. *Id.* at 1:37–39, 1:62–63.

Smith seeks to resolve these problems by “generating a numeric index based on the mapping of a standard telephone handset.” *Id.* at 4:63–65. Smith describes generating an alphanumeric index of terms corresponding to documents to be searched. *Id.* at 5:1–3, Fig. 4A. The alphanumeric terms in the index are then translated into their numeric equivalents using mapping information corresponding to a standard telephone handset. *Id.* at 5:5–7. For example, “the alphanumeric term ‘car’ is translated into the numeric term ‘227’.” *Id.* at 5:10–11. Then, “a numeric index is generated based on the translated terms” that corresponds to each document. *Id.* at 5:20–24. The user’s search query (e.g., “227”) is compared to the numeric index and the corresponding documents are provided to the user as search results. *Id.* at 2:62–64. Figure 5A of Smith, depicted below, illustrates Smith’s technique for providing search results in response to an ambiguous search query:

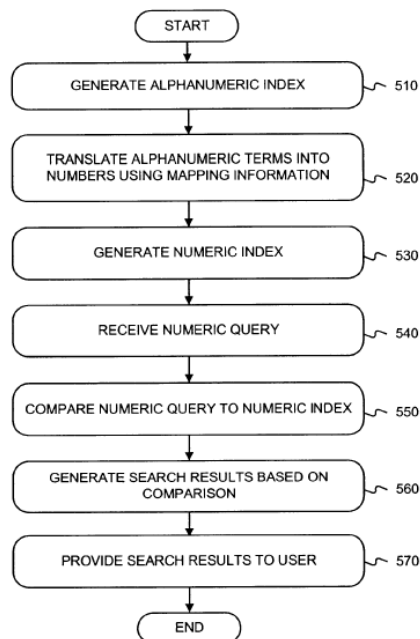


Figure 5A of Smith, above, illustrates Smith's technique for providing search results in response to an ambiguous search query.

3. Analysis of Claim 1

Petitioner contends claims 1, 2, 4, 6, 10, and 11 would have been obvious over the combination of Gross and Smith. Pet. 28–64. The dispute between the parties centers on element 1[e] and Petitioner's proffered motivation to combine Gross and Smith with respect to the claimed “highlighting” feature of limitation 1[e]. PO Resp. 18–34. Petitioner's contentions regarding other elements recited in claim 1 are unopposed. Unless otherwise noted, Patent Owner's arguments as to the motivation to combine Gross and Smith will be addressed below in Section III.E.3.f.2, in connection with limitation 1[e].

a) Preamble

The preamble of claim 1 recites

[a] method of processing unresolved keystroke entries by a user from a keypad with overloaded keys in which a given key is in fixed association with a number and at least one alphabetic character, the unresolved keystroke entries being directed at identifying an item from a set of items, each of the items being associated with information describing the item comprising one or more words, the method comprising:

Ex. 1221, 8:44–50. Petitioner contends the combination of Gross and Smith teaches the preamble. Pet. 28–29. Specifically, Petitioner asserts Gross discloses a system for searching, e.g., emails and files, that “includes an index engine with a data structure that associates information regarding files, documents, and the like with character strings.” *Id.* at 29 (citing Ex. 1211 ¶¶ 10, 38, 40; Ex. 1214 ¶ 123). Petitioner explains “[e]ach item is indexed and can be searched by information” and the “[l]etters and words in these

various searchable fields are mapped to the search query strings entered by the user.” *Id.* (citing Ex. 1211 ¶¶ 103, 111, 135; Ex. 1214 ¶ 123).

Petitioner contends “Gross explains that indexed strings can be input via a computer-networkable wireless phone, which suggests the use of ‘unresolved keystroke entries . . . from a keypad with overloaded keys.’” *Id.* (citing Ex. 1211 ¶ 60; Ex. 1214 ¶¶ 124–125). However, Petitioner asserts Smith explicitly discloses the “unresolved keystroke entries by a user from a keypad with overloaded keys in which a given key is in fixed association with a number and at least one alphabetic character.” *Id.* at 31 (citing Ex. 1213, 5:7–19, Fig. 5B; Ex. 1214 ¶¶ 126–127). Petitioner explains “[i]n Smith, overloaded key inputs are used to conduct searches using a numeric index that maps the numeric inputs from the overloaded keypad to search results.” *Id.* at 31 (citing Ex. 1213, 1:62–2:22, 5:20–42, Figs. 4A, 5A, 5C).

Petitioner contends, with supporting testimony from Dr. Fox, that “[i]t would have been obvious to combine Gross’s search system using a wireless phone with Smith’s search system to efficiently search using a keypad with overloaded keys.” Pet. 32 (citing Ex. 1213, 2:1–3; Ex. 1214 ¶¶ 128–132). Petitioner explains “Smith converts alphanumeric indexes (as described by Gross) to numeric indexes useful for when a user has an overloaded keypad.” *Id.* at 32.

Petitioner and Dr. Fox present several reasons why a person of ordinary skill in the art would have been motivated to combine Gross with Smith. Pet. 32–34; Ex. 2014 ¶¶ 128–131. First, Petitioner argues that “Gross was ready for the improvement Smith offers, and Smith explicitly teaches that it improves systems such as the one disclosed in Gross, which have an overloaded keypad.” *Id.* at 32 (citing Ex. 1214 ¶ 128); *see also id.* at 34 (“Smith explicitly teaches . . . how to translate Gross’s alphanumeric

index to a numeric index . . .”). Second, Petitioner argues that a person of ordinary skill in the art “would have been motivated to combine Gross with Smith’s more efficient input and indexing method to improve the speed and efficiency of Gross’s searching using an overloaded keypad.” *Id.* (citing Ex. 1214 ¶ 128); *id.* at 33 (citing Ex. 1214 ¶ 129) (“the combination would allow the user to enter fewer keystrokes on an overloaded keypad . . .” and the combination would “allow[] the user to more quickly find content the user desires to view, and enhanc[e] the user experience”); *id.* at 34 (citing Ex. 1214 ¶ 129) (the combination “would reduce the keystrokes necessary to find matching items . . . and thus improve a user’s search experience”). Finally, Petitioner asserts that “[a]ll claimed elements were known in the prior art, and a [person of ordinary skill in the art] would have combined them by known methods ‘with no change in their respective functions,’” and, therefore, “[t]he combination . . . does no more than yield predictable results.” *Id.* at 32 (citing Ex. 1214 ¶ 129); *see also id.* at 33–34 (citing Ex. 1214 ¶¶ 126–131) (clear expectation of success to modify Gross with Smith’s numeric indexing because these “known options [were] within [a person of ordinary skill in the art’s] technical grasp”).

Patent Owner does not dispute Petitioner’s showing. *See generally* PO Resp.; PO Sur-Reply. We agree with Petitioner’s contentions and credit and give weight to the testimony of Dr. Fox, both of which are consistent with the evidence of record. Accordingly, Petitioner has sufficiently demonstrated that a person of ordinary skill in the art would have combined

the teachings of Gross and Smith in the manner suggested and that the combination teaches or suggests the preamble of claim 1.⁵

b) Limitation 1[a]

Limitation [a] of claim 1 recites “providing access to an index of the items, the index having an association between subsets of the items and corresponding strings of one or more unresolved keystrokes for overloaded keys so that the subsets of items are directly mapped to the corresponding strings of unresolved keystrokes for various search query prefix substrings.” Ex. 1221, 8:51–57. Petitioner contends Gross in combination with Smith teaches this limitation. Pet. 34.

Specifically, Petitioner contends Gross provides for incremental searching through use of an index that “includes a data structure that associates character strings with files, documents, and the like.” *Id.* at 35–36 (citing Ex. 1211 ¶¶ 10–12, 29, 31, 38, 40, 45, 46, 48–51, 58, 103–107 111, 112, 149; Ex. 1214 ¶¶ 135–138). Petitioner argues Gross describes “for each word or character string found with a file or document, the index stores which fields of which documents or files contain that word or character string.” *Id.* at 36 (citing Ex. 1211 ¶ 40). In support, Petitioner points to paragraph 51 of Gross, which states “in addition to bare or complete words, such as ‘dog,’ common prefixes, such as ‘d’ or ‘do’, are stored as well. The ‘d’ prefix entry contains information indicating which documents or files contain a word or character string starting with ‘d.’” Pet. 36 (citing Ex. 1211 ¶ 51; Ex. 1214 ¶ 138) (emphasis omitted). Petitioner contends “each

⁵ Neither party argues whether the preamble limits claim 1. Although we find that the evidence supports that the prior art teaches the preamble, we make no determination in this Decision that the preamble of claim 1 is limiting.

alphanumeric character of a search query prefix substring associated with an item is matched, based on direct mapping in the index, to alphanumeric characters being entered by the user.” *Id.* at 37 (citing Ex. 1211 ¶¶ 45–47, 51, 68, 82, 83, 124, 131, 135, 137, 149, 150, 165–170, 177; Ex. 1214 ¶ 138).

Petitioner explains that although “Gross discloses an alphanumeric index, it does not explicitly disclose an index that maps the index items to numeric key equivalents of queries entered by a user.” *Id.* at 37. Therefore, Petitioner relies on Smith to disclose “an index that maps subsets of items to numeric key equivalents, and uses an alphanumeric index to generate an index for numeric key equivalents.” *Id.* at 37 (citing Ex. 1214 ¶¶ 139–140). Petitioner contends that in Smith “[o]nce the numeric index is generated, indexed items are directly mapped to the numbers corresponding to overloaded keystrokes.” *Id.* at 37–38 (citing Ex. 1213, 5:20–62, Fig. 5C; Ex. 1214 ¶ 140). Petitioner explains “[t]o create the numeric index, Smith translates alphanumeric terms in an index[.]” *Id.* at 39.

Petitioner, with supporting testimony from Dr. Fox, contends a person of ordinary skill in the art would modify “Gross’s index to directly map subsets of items to the numeric key equivalent (i.e., unresolved keystrokes for overloaded keys) that could be entered by a user who was using an overloaded keypad. . . .” *Id.* at 39 (citing Ex. 1214 ¶¶ 141–153); *see also id.* at 42–43. Petitioner explains “[i]n the Gross/Smith combined system’s numeric index, subsets of items associated with words beginning with ‘3’, ‘d’, ‘e’, and ‘f’ would be all directly mapped to ‘3,’ since ‘3’ is the numeric equivalent of ‘3,’ ‘d,’ ‘e,’ and ‘f’ on an overloaded keyboard.” *Id.* at 41 (citing Ex. 1214 ¶ 146). Petitioner further explains “the subsets of items associated with words beginning with ‘do’ would be directly mapped to ‘36,’ so that as the user entered more of the search query (i.e., ‘3’ then ‘36’),

the results would be more narrowly filtered.” *Id.* at 41 (citing Ex. 1214 ¶¶ 141–152). Therefore, Petitioner argues the Gross/Smith combination

meets the proposed construction of ‘directly mapped’ because ‘each alphanumeric character of a search query prefix substring associated with an item’ (e.g., the characters ‘d,’ ‘do,’ or ‘dog,’ which are associated with items in a subset) ‘is matched with its corresponding numeric key equivalent on an overloaded keypad’ (e.g., the index maps ‘36’ to the items associated with ‘DM,’ ‘DN,’ ‘DO,’ etc.).

Id. (citing Ex. 1214 ¶ 152). Petitioner, with supporting testimony from Dr. Fox, asserts similar motivations to combine the references as discussed *infra* at Section III.E.3.a, such as efficient searching, improvement to Gross’s system, and the use of a known technology to modify a known system to achieve predictable results, with benefits as explained in Smith. *Id.* at 42–43 (citing Ex. 1214 ¶¶ 128–132, 141–152; Ex. 1211 ¶ 60; Ex. 1213, 1:20–65, 5:33–42).

Patent Owner does not dispute Petitioner’s showing. *See generally* PO Resp.; PO Sur-Reply. We agree with Petitioner’s contentions and credit and give weight to the testimony of Dr. Fox, both of which are consistent with the evidence of record. Accordingly, Petitioner has sufficiently demonstrated that a person of ordinary skill in the art would have combined the teachings of Gross and Smith in the manner suggested and that the combination teaches or suggests limitation 1[a].

c) Limitation 1[b]

Limitation 1[b] of claim 1 recites “for at least one subset of items, determining which letters and numbers present in the information associated with and describing the indexed items of the subset caused the items to be associated with the strings of one or more unresolved keystrokes that

directly mapped to the subset.” Ex. 1221, 8:58–63. Petitioner contends the combination of Gross and Smith teaches this limitation. Pet. 43.

Petitioner asserts “Gross, combined with Smith, teaches this in conjunction with displaying highlighted search results.” *Id.* at 44. Petitioner argues “Gross discloses highlighting characters that matched keystroke entries during an incremental search,” so, therefore, “highlights each corresponding character of the search results that were determined to have caused the match to the search query.” *Id.* (citing Ex. 1211 ¶¶ 49, 107, 114, 120; Ex. 1214 ¶¶ 164–165). Petitioner explains “[t]he Gross/Smith system, therefore, determines which characters match a string of unresolved keystrokes directly mapped to the subset (e.g., if a user types ‘364,’ the system highlights matching characters ‘dog’).” *Id.* (citing Ex. 1214 ¶¶ 164–165). Petitioner contends “[u]sing Gross’s highlighting technique in the Gross/Smith system results in the ‘determining’ being performed.” *Id.* (citing Ex. 1214 ¶¶ 164–165); *see also id.* at 45. Petitioner further argues “[a] POSA with ordinary creativity would have recognized that incorporating Gross’s highlighting technique in the Gross/Smith system would require determining which alphanumeric characters to highlight.” *Id.* at 44 (citing Ex. 1214 ¶ 165).

Patent Owner does not dispute Petitioner’s showing. *See generally* PO Resp.; PO Sur-Reply. We agree with Petitioner’s contentions and credit and give weight to the supporting testimony of Dr. Fox, both of which are consistent with the evidence of record. Accordingly, Petitioner has sufficiently demonstrated that a person of ordinary skill in the art would have combined the teachings of Gross and Smith in the manner suggested and that the combination teaches or suggests limitation 1[b].

d) Limitation 1[c]

Limitation 1[c] of claim 1 recites “receiving from a user a search query for desired items composed of unresolved keystrokes, the search query comprising a prefix substring for at least one word in information associated with the desired item.” Ex. 1221, 8:64–67. Petitioner contends the combination of Gross and Smith teaches this limitation. Pet. 48.

Petitioner contends “Gross’s incremental search queries are prefix substrings (the ‘d’ in ‘dog’), used to pull subsets of items from an index mapping the substring to items with information associated with the items that match the prefix.” *Id.* at 49 (citing Ex. 1211 ¶¶ 40, 51, 118). Therefore, according to Petitioner, in Gross, “if a user searches for ‘dog,’ the first entered key corresponds to ‘d,’” whereas “[i]n the combined Gross/Smith system, the entered prefix for ‘d’ would be ‘3,’ the unresolved numeric keystroke corresponding to ‘d.’” *Id.* at 49–50 (citing Ex. 1211 ¶ 51; Ex. 1214 ¶¶ 170–171; Ex. 1213, Fig. 5A, 5:33–42).

Petitioner asserts the same motivations to combine the references as discussed *infra* at Section III.E.3.a, such as using Smith’s techniques to generate numeric indexes in Gross’s system “for the purpose of efficiently searching when receiving input from devices with overloaded keypads.” Pet. 50.

Patent Owner does not dispute Petitioner’s showing. *See generally* PO Resp.; PO Sur-Reply. We agree with Petitioner’s contentions and credit and give weight to the supporting testimony of Dr. Fox, both of which are consistent with the evidence of record. Accordingly, Petitioner has sufficiently demonstrated that a person of ordinary skill in the art would have combined the teachings of Gross and Smith in the manner suggested and that the combination teaches or suggests limitation 1[c].

e) Limitation 1[d]

Limitation 1[d] recites “in response to each unresolved keystroke, identifying and displaying the subsets of items, and information associated therewith, that are associated with the strings of one or more unresolved keystrokes received from the user based on the direct mapping of strings of unresolved keystrokes to subsets of items.” Ex. 1221, 9:1–9:6. Petitioner contends the combination of Gross and Smith teaches this limitation. Pet. 50–51.

Petitioner asserts “Gross discloses an incremental search system . . . and the Gross/Smith system allows input of search queries via unresolved keystrokes on an overloaded keypad . . . , so the results of the Gross/Smith system are identified and displayed ‘in response to each unresolved keystroke.’” *Id.* at 51 (citing Ex. 1211 ¶¶ 10–12, 29, 30, 35, 51, 103, 111–113, 117–119, 123, 131, 136, 137, 141, 142, 144, 145, 149, 150, 171, 173, 174, 181, 187; Ex. 1214 ¶¶ 173–175). Petitioner argues “the identified and displayed results in Gross are the subsets of items, and information associated therewith (e.g., titles, file paths, dates, genres), associated with strings of one or more keystrokes received from the user based on direct mapping of strings of keystrokes to subsets of items.” *Id.* at 52–53 (citing Ex. 1211 ¶¶ 40, 51, 58, Figs. 3A–3H; Ex. 1214 ¶¶ 174–177). Petitioner further argues “[i]n the Gross/Smith system, the keystrokes are unresolved keystrokes from an overloaded keypad. In Gross, the results of the search display links to the items themselves, portions of the contents of the items, or information about the items that caused the items to be returned in search results.” *Id.* at 53 (citing Ex. 1211 ¶¶ 31, 48–50, 58, 104–107).

Petitioner asserts the same motivations to combine the references as discussed *infra* at Section III.E.3.a. Pet. 53. Patent Owner does not dispute

Petitioner's showing. *See generally* PO Resp.; PO Sur-Reply. We agree with Petitioner's contentions and credit and give weight to the supporting testimony of Dr. Fox, both of which are consistent with the evidence of record. Accordingly, Petitioner has sufficiently demonstrated that a person of ordinary skill in the art would have combined the teachings of Gross and Smith in the manner suggested and that the combination teaches or suggests limitation 1[d].

f) Limitation 1[e]

Limitation 1[e] of claim 1 recites,

in response to each unresolved keystroke, as the identified items are displayed, *highlighting the letters and numbers present in the one or more words in the information describing the identified items that were determined to have caused the displayed items to be associated with the strings of unresolved keystrokes that are directly mapped to the items* so as to illustrate to the user how the unresolved keystrokes entered match the information associated with the displayed items,

Ex. 1221, 9:7–9:15 (emphasis added). Petitioner contends the combination of Gross and Smith teaches this limitation. Pet. 53–54.

Petitioner contends “Gross discloses that search results ‘may be highlighted or otherwise emphasized.’” *Id.* at 54 (Ex. 1211 ¶¶ 49, 107, 114, 120). Petitioner points to paragraph 114 of Gross, which states “search terms will be highlighted in the list pane or area search results and/or in the view pane or area content display. The highlight can be in the form of a different coloring, the use of different fonts, blinking text, and/or the like.” *Id.* (emphasis in Petition). Petitioner explains:

In the Gross/Smith system, if a [user] wanted to search for “dog” the user would enter “3” (corresponding to the “d” in “dog”), and then results with the word “dog” in the title, along with other “d” words, are returned with the letter “d” highlighted. Items with

words associated with “e,” “f,” and “3” would also be returned, with the “e,” “f,” or “3” highlighted, respectively. Ex. 1214, ¶ 164. The user would next enter “6” (corresponding to the “o” in “dog”), and results with the word “dog” in the title, along with other “do” words, would be returned, with the “do” highlighted. *Id.* The highlighting of the search terms “illustrate to the user how the unresolved keystrokes entered match the information associated with the displayed items.” *Id.*, ¶¶ 162–165, 181.

Pet. 54–55; *see also* Pet. 43–45. Petitioner asserts that “[i]n combination, Gross-Smith teaches highlighting the ambiguous search terms in the search results.” Pet. Reply 3.

Patent Owner argues that (1) neither Gross nor Smith teaches or suggests the claimed “highlighting”; and (2) a person of ordinary skill in the art would not have been motivated to modify Gross’s system based on Smith’s teachings. PO Resp. 18, 21. We address each argument in turn.

(1) Whether the Combination of Gross and Smith teaches limitation 1[e]

Patent Owner argues that Gross highlights the exact alphanumeric search string entered by a user, which consists only of *unambiguous* alphanumeric keystrokes. PO Resp. 19. For example, Patent Owner argues “if the user enters the search term ‘866,’ Gross highlights **the exact search term** ‘866.’” *Id.* Patent Owner further argues that Smith does not cure Gross’s deficiencies because Smith does not highlight numbers or letters, but, rather, simply returns document results with no manipulation of the letters and numbers within the returned documents. *Id.* at 19–22; *see* PO Sur-Reply 8 (“Smith does not describe highlighting at all”).

We do not find Patent Owner’s arguments persuasive. Instead, we agree with Petitioner that Patent Owner’s arguments address the teachings of Gross and Smith separately, rather than in the combination as asserted by

Petitioner. *See* Pet. Reply 4–5; *In re Mouttet*, 686 F.3d 1322, 1332 (Fed. Cir. 2012); *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). As Patent Owner points out, there is no dispute that Gross only highlights the exact search terms in the search results, e.g., *unambiguous or resolved keystrokes*. *See*, e.g., PO Resp. 20 (citing Ex. 2016, 275:19–276:1, 281:20–25, Ex. 1214, ¶ 164); Sur-Reply 8; Pet. 44–45. However, Smith is relied upon to teach providing search results in response to an *ambiguous or unresolved search query* by using a numeric index to translate alphanumeric terms into their numeric equivalents. E.g., Pet. 31–34. Therefore, “[i]n combination, Gross-Smith teaches highlighting the *ambiguous search terms* in the search results.” Pet. Reply 3 (emphasis added).

Moreover, the fact that Smith returns documents is irrelevant in Petitioner’s analysis, as Petitioner is not relying on Smith’s documents as part of the combination. E.g., Ex. 1233 ¶ 13 (“Gross/Smith would have highlighted the ‘matching character string’ or ‘search terms’ corresponding to the ambiguous keystroke(s) by the user that are *within the displayed search results, as taught in Gross*.”) (emphasis added). Patent Owner’s arguments, therefore, do not persuasively address the teachings of the combination of Gross and Smith as disclosing the claimed “highlighting” feature in the manner proposed by Petitioner.

Patent Owner also asserts that Petitioner “never explains how or why the combination of Gross/Smith discloses the claimed highlighting.” PO Sur-Reply 8; PO Resp. 22–23. Specifically, Patent Owner argues that neither Petitioner nor Dr. Fox “explained *how* Smith’s numeric index would integrate into Gross’s index such that Gross would know which character strings to highlight in the documents.” PO Sur-Reply 9; *see* PO Sur-Reply 10–11. According to Patent Owner, this is especially problematic because

Gross does not describe how its highlighting process works; rather, it only describes that the results are highlighted. PO Sur-Reply 11, 14.

We disagree that Petitioner’s explanation of how and why the combination of Gross and Smith discloses the claimed highlighting is inadequate. To the contrary, as cited *infra*, Petitioner, supported by testimony from Dr. Fox, has sufficiently described how and why the combination teaches the claimed highlighting. See Pet. 43–45, 54–55, Ex. 1214 ¶¶ 162–165, 181. Petitioner is not required to provide technical detail on exactly how the features of the secondary reference – Smith – would be incorporated into Gross. “It is well-established that a determination of obviousness based on teachings from multiple references does not require an actual, physical substitution of elements.” *In re Mouttet*, 686 F.3d at 1332. The skilled artisan is “[a] person of ordinary creativity, not an automaton” and “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR*, 550 U.S. at 416, 421; *see also id.* at 417 (“If a person of ordinary skill in the art can implement a predictable variation, § 103 likely bars its patentability.”). Dr. Fox provides unrebutted testimony that “highlighting characters that match a search query was a predictable technique long known in the art” (Ex. 1214 ¶ 165), and submitted evidence supporting such testimony. Ex. 1214 ¶ 57 (citing Ex. 1204, 197 (“Highlighting of query terms has been found time and again to be a useful feature for information access interfaces”)). That such highlighting was well known in the art is also supported by the lack of detailed disclosure in Gross. *In re Buchner*, 929 F.2d 660 (Fed. Cir. 1991) (“The specification need not disclose what is well known in the art.”).

Accordingly, Petitioner has sufficiently demonstrated that the combination of Gross and Smith teaches or suggests limitation 1[e]. We now turn to Petitioner's contentions, and Patent Owner's arguments, on the motivation to combine the references.

(2) Whether Petitioner has Shown Sufficient Motivation to Combine Gross and Smith with Respect to Limitation 1[e]

Upon review of the evidence in the current record and the parties' contentions, we determine that Petitioner has shown sufficiently that a person of ordinary skill in the art would have had reason, with rational underpinnings, to combine Gross and Smith in the manner Petitioner proposes.

Petitioner, with supporting testimony from Dr. Fox, contends a [person of ordinary skill in the art] would have found it obvious to determine and highlight the alphanumeric characters of the items that caused the displayed items to be associated with the strings of unresolved keystrokes, so that the system could efficiently display to the user how the search results correspond to the indexed search terms.

Pet. 55 (citing Ex. 1214 ¶¶ 162–165). Petitioner further contends that it would have been obvious “to determine which letters and numbers to highlight, since doing so would save processing power at the time of search, and thereby allow the system to more quickly provide highlighted results to the user, thus resulting in an improved user experience.” *Id.* (citing Ex. 1211 ¶ 51, Ex. 1214 ¶¶ 165, 181). Petitioner contends that Gross explicitly recognizes this benefit “with respect to pre-indexing, and this benefit would be undermined, if not erased, if the determined letters and numbers weren't used for the highlighting.” *Id.* at 55–56 (citing Ex. 1211 ¶¶ 38–47, 51).

Patent Owner presents several arguments regarding the combination of Gross and Smith. Specifically, Patent Owner argues that (1) Petitioner “can only be resorting to hindsight bias” to arrive at the combination of Gross-Smith, given the “technical problems” with the combination; (2) the proposed modification results in alleged deficiencies, such as performance degradation, irrelevant search results that would undesirably confuse the user, and frustration of Gross’s intended purpose of providing precise results; and (3) Smith teaches away from search queries based on exact matches. PO Resp. 21–34; *see also* PO Sur-Reply 15. We address each argument in turn.

(a) Whether the Combination of Gross and Smith is the Result of Hindsight Bias Given “Technical Problems” With the Combination

Patent Owner contends that Petitioner “can only be resorting to hindsight bias” to arrive at the combination of Gross-Smith, given the “technical problems” with the combination. PO Resp. 24; *see also* PO Sur-Reply 15. Patent Owner asserts that Petitioner’s modifications to Gross are not trivial, and would not have been obvious to a person of ordinary skill in the art during the relevant timeframe. PO Resp. 23 (citing Ex. 2014 ¶ 71). Specifically, and supported by testimony from Dr. Russ, Patent Owner argues that “an additional and undesirable layer of search result processing, beyond what is disclosed in Gross and Smith, would be required to identify the alleged terms highlighted.” *Id.* (citing Ex. 2014 ¶ 71).

We do not find these arguments persuasive. Specifically, there is no persuasive evidence in the record that it would have been “uniquely challenging or difficult for one of ordinary skill in the art” to combine the teachings of the Gross and Smith, with respect to the highlighting. *See Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir.

2007) (citing *KSR*, 550 U.S. at 418). As discussed above, Petitioner has submitted un rebutted evidence that highlighting search results was well known in the art. *E.g.*, Ex. 1204 at 197. Dr. Fox provides testimony that “a POSA would have found the modification to be a straightforward application of Smith’s teaching to Gross.” Ex. 1214 ¶ 128; *see also id.* ¶ 130 (“a POSA would have recognized, from Smith’s description of a numeric index and comparing a numeric query to the numeric index, how to modify Gross’s system (e.g., by modifying Gross’s software) to use numeric indexes and numeric queries.”); *id.* ¶ 165 (“logical and efficient to combine Gross and Smith so that in the combined Gross/Smith system, the highlighted characters correspond to the characters that caused the items to be associated with the strings of unresolved keystrokes” and “highlighting characters that match a search query was a predictable technique long known in the art”). Dr. Fox also testifies that the combination does not require a change to Gross’s or Smith’s functions. *Id.* ¶ 128; *see KSR*, 550 U.S. at 416 (“[i]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill”).

Dr. Russ testifies that

a [person of ordinary skill in the art] would have needed to modify Gross and Smith beyond their disclosures in a non-trivial, complex manner that would not have been obvious to a [person of ordinary skill in the art] during the relevant timeframe. For example, another additional and undesirable layer of search result processing, beyond what is disclosed in Gross and Smith, would have been required to actually identify the alleged terms to be highlighted.

Ex. 2014 ¶ 71. Dr. Russ’s testimony does not provide persuasive explanation or refer to supporting evidence as to why the proposed modification was “complex” or “non-trivial,” or why adding an additional layer of processing would have been challenging or difficult for a person of ordinary skill in the art. “Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.” 37 C.F.R. § 42.65 (2019).

We also find that Petitioner and Dr. Fox have provided a credible and persuasive rationale for making the proposed modification to Gross in light of Smith’s teachings, namely “so that the system could efficiently display to the user how the search results correspond to the indexed search terms.” *See* Pet. 55 (citing Ex. 1214 ¶¶ 162–165, 181). Petitioner and Dr. Fox’s reasoning is consistent with what was known in the art, that highlighting “is thought to help draw the user’s attention to the parts of the document most likely to be relevant to the query.” Ex. 1204 at 197.

(b) Whether a Person of Ordinary Skill in the Art Would Not Have Been Motivated to Combine Gross and Smith Due to Alleged Deficiencies in the Combination

Patent Owner, with supporting testimony from Dr. Russ, argues that because the Gross-Smith combination would highlight additional irrelevant search results (e.g., non-matching words), rather than only highlighting “matching words” as intended by Gross, the modification “directly conflicts with Gross’s goal of providing clear search results and preventing undesirable user confusion.” PO Resp. 28–31; *see also* PO Sur-Reply 17. For example, Patent Owner points out that entering “227” would result in returning documents with both “car” and “bar” because both map to “227.”

PO Resp. 23 (citing Ex. 2014 ¶¶ 72–73). Dr. Russ testifies that this type of operation would be “detrimental to the user experience.” Ex. 2014 ¶ 72. According to Patent Owner, because Gross is directed to unambiguous search queries, and Smith is directed to ambiguous search queries, “no [person of ordinary skill in the art] would have combined the teachings of Gross and Smith since such a combination would necessarily result in a change of principle of operation of one or both references.” PO Resp. 30.

Petitioner contends that, “rather than frustrate Gross’s purpose, a [person of ordinary skill in the art] would have appreciated that applying Smith to Gross would allow Gross to be used efficiently when inputting entries on an overloaded keypad.” Pet. Reply 12. Dr. Fox provides supporting testimony that the combination of Gross/Smith “would provide a user the ability to search using quick search entries through an overloaded keypad, thus expanding the scope of applicability of Gross.” Ex. 1233 ¶ 16.

We do not find Patent Owner’s arguments persuasive. It is correct that a person of ordinary skill in the art has little reason to make a modification that renders the prior art unsatisfactory or inoperable for its intended purpose. *In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984). However, merely showing that the result of the modification may be inconsistent with some of the reference’s goals is not sufficient for a modification to be unsatisfactory or inoperable for its intended purpose. *In re Gurley*, 27 F.3d 551, 554 (Fed. Cir. 1994).

Patent Owner identifies Gross’s intended purpose as “providing accurate results to avoid user confusion” by “only highlight[ing] ‘matching words.’” PO Resp. 28–29. But Gross’s intended purpose is much broader than that: “The present invention provides for quick and efficient searching.” Ex. 1211, code (57). To provide quick and efficient searching,

Gross discloses “incremental or reactive searching . . . [to provide the user] with substantially immediate feedback as the search string is being entered, and so can quickly decide on the desirability of entering additional search characters, entering a new search string, or deleting one or more search string characters.” *Id.* ¶ 10. Gross also discloses highlighting a matching character or character string “so that the user can immediately see the matching word . . . in context.” *Id.* ¶ 49. We note that in connection with other arguments presented, Patent Owner acknowledges this disclosure in Gross. *See* PO Resp. 31 (stating that “Gross’s system is directed to ‘quick and efficient searching’” and “advantageously provides for incremental or reactive searching of a variety of search targets . . .” in arguing that the modification would degrade Gross’s system performance); PO Resp. 33 (“[s]earching all of the permutations of possible strings . . . would result in undesirable processing time and *frustrate Gross’s goal of achieving a fast and efficient search process*”) (emphasis added); Ex. 2014 ¶ 84 (“[a]s an additional goal to providing precise results, Gross describes another goal of ‘quick and efficient searching’”).

Patent Owner points to testimony from Dr. Fox in support of its arguments, where Dr. Fox testified that “a [person of ordinary skill in the art] would recognize that highlighting any other characters (instead of the matching characters) would undesirably confuse the user, which would lead away from Gross’s goal of helping the user ‘see the matching word . . . in context.’” Ex. 1214 ¶ 165 (citing Ex. 1211 ¶ 49). But nothing in Dr. Fox’s testimony describes anything other than how Gross would perform when combined with Smith. The Gross-Smith combination, as proposed by Petitioner, does not highlight characters that *do not match*. Dr. Fox’s testimony supports this: “[a person of ordinary skill in the art] would

combine the references in this way so that *the highlighted characters correspond to the characters that were determined to have caused the matches to the search query.*” Ex. 1214 ¶ 165 (emphasis added); Ex. 1233 ¶ 16 (“[a person of ordinary skill in the art] would appreciate that when ***ambiguous*** keystrokes are entered in Gross/Smith, the results presented would, correctly, match at least one permutation of the ambiguous keystrokes, and are thus, not ‘irrelevant.’”). Rather, Gross continues to highlight matching characters; there are simply *more* matching characters because the user input is ambiguous due to the overloaded keypad. Accordingly, even under the combination, Gross continues to highlight matching characters so that the user can “see the matching word . . . in context.” Ex. 1211 ¶ 49.

That there are additional search results that may not match the user’s *intended* search query (e.g., where the user types in a “2” intending to select “c,” but words beginning with “b” are returned), or are irrelevant to the user’s intended search query (e.g., the user is searching for “car” and not “bar”), does not frustrate Gross’s intended purpose. The combination may be less accurate in returning words that do not directly match the user’s *intended* character entry, but that is simply a trade off in allowing the search query functionality to be able to provide ambiguous input on an overloaded keypad. Even if the modified system highlights more search results, the fact that another alternative may be more effective does not mean that a person of ordinary skill in the art would not have been motivated to make the proposed combination. *See In re Mouttet*, 686 F.3d at 1334 (“[J]ust because better alternatives exist in the prior art does not mean that an inferior combination is inapt for obviousness purposes.”); *In re Fulton*, 391 F.3d 1195, 1200 (Fed. Cir. 2004) (“[O]ur case law does not require that a

particular combination must be the preferred, or the most desirable, combination described in the prior art in order to provide motivation for the current invention.”). We agree with Petitioner that “[t]he return of additional results is the tradeoff for the added convenience of using an ambiguous search query.” Pet. Reply 13; *see* Ex. 1233 ¶ 19.

Patent Owner, supported by testimony from Dr. Russ, additionally argues that the modification to Gross’s system would degrade Gross’s system performance by introducing unnecessary search processing operations and frustrate Gross’s goal of achieving a fast and efficient search process. PO Resp. 31 (citing Ex. 2014 ¶¶ 84–87); *see also id.* at 33; PO Sur-Reply 17–18. According to Patent Owner, the proposed modifications to Gross would slow down Gross’s system because it “would introduce additional (and unnecessary) search processing to perform Smith’s search term disambiguation,” and result in the return of irrelevant and ambiguous search results. PO Resp. 32; *see also* PO Sur-Reply 18. Patent Owner further argues that adding Smith’s additional processing would provide no benefit to Gross’s system. PO Resp. 33–34 (citing Ex. 2014 ¶ 91).

Petitioner contends that “Gross-Smith system would improve the original functionality of the Gross search technique so that it could handle ambiguous search queries.” Pet. Reply 12 (citing Ex. 1233 ¶ 19; Ex. 1214 ¶¶ 141–142). Petitioner further contends that the return of additional results is a tradeoff for the added convenience of using an ambiguous search query. *Id.* at 13. According to Petitioner, “[a]ny extra processing is simply a result of having implemented Smith the way Smith says to do, but that is not a reason that a [person of ordinary skill in the art] would foreswear input on an overloaded keypad.” *Id.*

We are not persuaded by Patent Owner's arguments. It is not disputed that, due to the ambiguous search query, the combined system will search more permutations and return more matches than Gross's system alone. *See* PO Resp. 32–33 (citing Dr. Fox's deposition testimony, Ex. 2016, 296:17–297:19); Ex. 1233 ¶ 19. However, as discussed above, the fact that there may be some disadvantages to the combination, e.g., requiring additional processing, does not mean there is no motivation to combine the references. To the contrary, we credit Dr. Fox's testimony that a person of ordinary skill in the art would have realized the trade-off between quick search entry and the potential for extra processing required to handle ambiguous search queries, but would not be a reason to reject the combination. Ex. 2033 ¶ 19. Petitioner has shown sufficiently that modifying Gross with Smith provides an improvement to Gross, in that it can process ambiguous search queries. *E.g.*, Pet. 32–34, 43, 55–56; Ex. 1214 ¶ 128–129, Ex. 1233 ¶ 14, 17, 19. We are, therefore, not persuaded by Dr. Russ's testimony that the additional processing would provide no benefit to Gross's system. *See* Ex. 2014 ¶ 91.

(c) Whether Smith Teaches Away from Search Queries Using Exact Matches

Patent Owner, with supporting testimony from Dr. Russ, argues that Smith teaches away from search queries using exact matches, like the one in Gross. PO Resp. 25 (citing Ex. 2014 ¶¶ 75–79). According to Patent Owner, Gross is directed to a search system that receives alphanumeric *unambiguous* keystroke entries (e.g., exact terms for search queries), while Smith is directed to a search system that receives *ambiguous* keystrokes and, therefore, Smith differentiates its system from alphanumeric search systems like the one in Gross. *Id.* at 25–26. Patent Owner argues that Smith teaches

ambiguous search queries because unambiguous search queries, like the one in Gross, are inefficient. *Id.* at 26 (citing Ex. 1213, 1:62–65, 2:1–3).

However, Patent Owner argues Smith’s search results may be “less precise” relative to the results generated by exact match systems like the one in Gross. *Id.* at 27.

Petitioner contends that Smith expresses an alternative solution, rather than a teaching away. Pet. Reply 11. Petitioner further argues that “the fact that there are some tradeoffs—various advantages and disadvantages—does not mean the claim is not obvious. Patent Owner ignores (and thus does not dispute) the other benefits of Smith’s ambiguous search using an overloaded keypad.” *Id.*

We are not persuaded that Smith teaches away from search queries using exact matches. A reference teaches away from a claimed invention if it “criticize[s], discredit[s], or otherwise discourage[s]” modifying the reference to arrive at the claimed invention. *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004). Petitioner’s obviousness grounds are based on Gross modified by Smith. *E.g.*, Pet. 32. Patent Owner is correct that Smith and Gross describe different search functionalities in that Smith teaches ambiguous search queries, while Gross teaches unambiguous search queries. PO Resp. 26. However, Smith describes the inefficiencies resulting from unambiguous (or exact match) search queries, like the one in Gross, and describes a need to provide relevant search results in response to an ambiguous search query. Ex. 1213, 1:62–2:3; *see* PO Resp. 26. Smith, thus provides motivation to modify Gross and even suggests the desirability of such a modification. *See In re Urbanski*, 809 F.3d 1237, 1243–244 (Fed. Cir. 2016); *see* Pet. 32 (“Gross was ready for the improvement Smith offers, and Smith explicitly teaches that it improves systems such as the one

disclosed in Gross, which have an overloaded keypad”); Pet. Reply 14 (“[a person of ordinary skill in the art] would have understood that Smith’s searching techniques would extend the capabilities of Gross’s search system”). We, therefore, credit Dr. Fox’s testimony that “[t]his was the purpose of Smith’s teachings, i.e., to convert indexes like Gross’s for compatibility with ambiguous entries through an overloaded keypad.” Ex. 1233 ¶ 12; *see also id.* ¶ 14 (“a [person of ordinary skill in the art] would have appreciated that these techniques may be complementary and can be combined readily to yield an improved overall system . . . [and] the combined Gross/Smith system would have the advantage of being able to handle both scenarios appropriately”); *see also id.* ¶ 15 (“the Smith patent states explicitly that such is its purpose, and it is designed to be combined with a search system (like that of Google, the assignee of Smith – or Gross), that handles unambiguous search queries.”).

We do not find credible Dr. Russ’s testimony that “Smith explicitly teaches that query systems based on [alphanumeric indexes and numeric indexes] would not have been combined” simply because Smith describes a different type of search system. *See* Ex. 2014 ¶ 77. We do not see where Smith teaches that such systems would not have been combined; rather, Smith simply describes alternative search systems that provide improvements in efficiency over conventional, unambiguous search queries, like the one in Gross. *See* Ex. 1213, 1:20–2:3. The “mere disclosure of alternative designs does not teach away.” *In re Fulton*, 391 F.3d at 1201. Moreover, Patent Owner does not point to any disclosure in Gross that can be said to discourage a person of ordinary skill in the art from modifying Gross to use the ambiguous search query methods taught in Smith for its

search queries. Rather, even Dr. Russ conceded that there are drawbacks in using multi-tap entry in conventional keyboards. Ex. 2014 ¶¶ 32–34.

Patent Owner’s arguments also imply that there is a teaching away because there are some trade-offs that would result in adopting Smith’s ambiguous search query functionality, *e.g.*, less precise search results. These arguments were addressed above. Although modification to Gross may result in less precise, or additional search results, than would result from an exact match search, “a given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine.” *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) (citation omitted). Accordingly, the record does not include sufficient or credible evidence that the references teach away from modifying Gross with the teachings of Smith.

Therefore, we agree with Petitioner’s contentions as to limitation 1[e], and credit and give weight to the supporting testimony of Dr. Fox, both of which are consistent with the evidence of record. Accordingly, Petitioner has sufficiently demonstrated that a person of ordinary skill in the art would have combined the teachings of Gross and Smith in the manner suggested and that the combination of Gross and Smith teaches or suggests limitation 1[e].

g) Summary of Claim 1

We are persuaded by Petitioner’s showing for all recitations in claim 1. Also, we are persuaded that Petitioner has offered articulated reasoning with a rational underpinning as to why one of ordinary skill in the art would have modified and combined the teachings of Gross and Smith in the manner proposed by Petitioner. Therefore, Petitioner has shown by a

preponderance of evidence that claim 1 is unpatentable as obvious over Gross and Smith.

4. Analysis of Claim 2

Claim 2 depends from claim 1 and recites “wherein highlighting the letters and numbers comprises highlighting by coloring, bolding, italicizing, underlining, or changing to a different font, or some combination thereof.” Ex. 1221, 9:17–20. Petitioner relies on Gross, which states “highlighting can be in the form of a different coloring, the use of different fonts, blinking text, and/or the like.” Pet. 56 (citing Ex. 1211 ¶¶ 114, 49, 107; Ex. 1214 ¶ 184).

Patent Owner does not argue separately Petitioner’s contentions for claim 2, but argues that this claim is patentable for the same reasons as claim 1. *See* PO Resp. 34. We disagree for the reasons discussed in § III.E.3, *supra*. We determine that Petitioner’s arguments and evidence, for instance, the disclosure in paragraph 114 of Gross, show that the limitations in claim 2 are taught by Gross.

Accordingly, for the reasons discussed above, Petitioner has shown by a preponderance of evidence that claim 2 is unpatentable as obvious over Gross and Smith.

5. Analysis of Claim 4

Claim 4 depends from claim 1 and recites “wherein the search query is processed by a server system remote from said user.” Ex. 1221, 10:5–6. Petitioner relies on Gross for the teaching the limitation of this claim, particularly its disclosure that its system may be implemented by a server-based search application. Pet. 57–59 (citing Ex. 1211 ¶¶ 8, 35, 80, 173–185, Figs. 1, 5, 6; Ex. 1214 ¶¶ 185, 186).

Patent Owner does not argue separately Petitioner's contentions for claim 4, but instead argues that this claim is patentable for the same reasons as claim 1. *See* PO Resp. 34. We disagree for the reasons discussed in § III.E.3, *supra*. We determine that Petitioner's arguments and evidence, for instance, the disclosure in paragraphs 173–185 of Gross, show that the limitations in claim 4 are taught by Gross.

Accordingly, for the reasons discussed above, Petitioner has shown by a preponderance of evidence that claim 4 is unpatentable as obvious over Gross and Smith.

6. *Analysis of Claim 5*

Claim 5 depends from claim 1 and recites “wherein the search query is processed by a device operated by said user.” Ex. 1221, 10:7–8. Petitioner relies on Gross for the teaching of the limitation of this claim, and particularly Gross's disclosure that its system may be implemented by a “client-based search application . . . where indexing and searching are implemented on the user's terminal 104.” Pet. 60–61 (citing Ex. 1211 ¶¶ 38, 58, 60–62, 112, 113, 118, 123, 145, Fig. 1; Ex. 1214 ¶¶ 188–190).

Patent Owner does not argue separately Petitioner's contentions for claim 5, but instead argues that this claim is patentable for the same reasons as claim 1. *See* PO Resp. 34. We disagree for the reasons discussed in § III.E.3, *supra*. We determine that Petitioner's arguments and evidence, for instance, the disclosure in paragraphs 38, 60, and 61 of Gross, show that the limitations in claim 5 are taught by Gross.

Accordingly, for the reasons discussed above, Petitioner has shown by a preponderance of evidence that claim 5 is unpatentable as obvious over Gross and Smith.

7. *Analysis of Claim 6*

Claim 6 depends from claim 5 and recites “wherein the device is a cell phone.” Ex. 1221, 10:9–10. Petitioner relies on Gross for the teaching of the limitation of claim 8, and specifically that Gross discloses a user terminal that “can be a personal computer, an interactive television, a networkable programmable digital assistant, a computer networkable wireless phone, and the like . . .” Pet. 61 (citing Ex. 1211 ¶ 60; Ex. 1214 ¶ 189). Petitioner contends “[a] POSA would have known that some computer networkable wireless phones were used in cellular networks (i.e., a ‘cell phone’).” *Id.* at 61–62 (citing Ex. 1214 ¶¶ 191, 192).

Patent Owner does not argue separately Petitioner’s contentions for claim 6, but instead argues that this claim is patentable for the same reasons as claim 1. *See* PO Resp. 34. We disagree for the reasons discussed in § III.E.3, *supra*. We determine that Petitioner’s arguments and evidence, for instance, the disclosure in paragraph 60 of Gross, show that the limitations in claim 6 are taught by Gross.

Accordingly, for the reasons discussed above, Petitioner has shown by a preponderance of evidence that claim 6 is unpatentable as obvious over Gross and Smith.

8. *Analysis of Claim 10*

Claim 10 depends from claim 1 and recites “wherein at least some items of the set of items are product items.” Ex. 1221, 10:17–18. Petitioner relies on Gross and Smith to teach the limitations of claim 10. Pet. 62. Specifically, Petitioner points to Gross’s teaching of using “command words such as ‘shop,’ which allows a user to ‘find[] the lowest online price for the product named in the following term,’” as well as Gross’s teaching of searching for books or movie show times. *Id.* (citing Ex. 1211 ¶ 153).

Petitioner also points to Smith’s teaching that “an index may contain information about product items such as ‘wine,’ ‘champagne,’ ‘bar items,’ and other such information.” *Id.* at 63 (citing Ex. 1213, 4:18–25; Ex. 1214 ¶ 196).

Patent Owner does not argue separately Petitioner’s contentions for claim 10, but instead argues that this claim is patentable for the same reasons as claim 1. *See* PO Resp. 34. We disagree for the reasons discussed in § III.E.3, *supra*. We determine that Petitioner’s arguments and evidence, for instance, the disclosure in paragraph 153 of Gross and at column 4, lines 18–25 of Smith, show that the limitations in claim 10 are taught by Gross.

Accordingly, for the reasons discussed above, Petitioner has shown by a preponderance of evidence that claim 10 is unpatentable as obvious over Gross and Smith.

9. *Analysis of Claim 11*

Claim 11 depends from claim 1 and recites “wherein identifying and displaying the subsets of items comprises identifying the subsets of items by reference to the index of the items.” Ex. 1221, 10:19–21. Petitioner relies on Gross for its teachings, and specifically on Gross’s teaching that “the subsets of items are identified using the index and are subsequently displayed.” Pet. 64 (citing Ex. 1211 ¶¶ 38, 40, 51, 60, 103, 111, 135; Ex. 1214 ¶ 199).

Patent Owner does not argue separately Petitioner’s contentions for claim 11, but instead argues that this claim is patentable for the same reasons as claim 1. *See* PO Resp. 34. We disagree for the reasons discussed in § III.E.3, *supra*. We determine that Petitioner’s arguments and evidence, for instance, the disclosure in paragraph 40 of Gross, show that the limitations in claim 11 are taught by Gross.

Accordingly, for the reasons discussed above, Petitioner has shown by a preponderance of evidence that claim 11 is unpatentable as obvious over Gross and Smith.

F. Obviousness of Claims 3, 8, and 9 Over the Combination of Gross, Smith, and Sanders

Petitioner contends claims 3, 8, and 9 would have been obvious over the combination of Gross, Smith, and Sanders. Pet. 64–72. In our discussion below, we first provide a brief overview of Sanders, and then address the parties’ contentions in turn.

1. Sanders (Ex. 1210)

Sanders is titled “Free Text and Attribute Searching of Electronic Program Guide (EPG) Data,” and generally describes a search engine for electronic program guide (EPG) data. Ex. 1210, codes (54), (57). In particular, Sanders describes “stemming,” which is “a process of removing prefixes and/or suffixes from a search term to allow the root of the search term to proxy for the original search term.” *Id.* at 6:43–46. For example, the word “divine” can be stemmed so it matches “divinity,” “divination,” or “diviner.” *Id.* at 6:46–49. Search hits may be ranked so that results can be sorted for display so that the most likely results are presented first. *Id.* at 11:52–55. Exact matches of the search term may be ranked higher than hits that only match the text to be searched after stemming. *Id.* at 11:56–62.

2. Analysis of Claim 3

Claim 3 depends from claim 1 and recites “wherein the items of the subsets of items displayed are ordered when displayed such that items having single-word and multi-word term matches between the information associated with and describing those items and the unresolved keystrokes of

the search query received from the user are displayed before items having single-word or multi-word abbreviation matches.” Ex. 1221, 9:21–10:4.

Petitioner, with supporting testimony from Dr. Fox, relies on Sanders to teach the limitation recited in claim 3. Pet. 64–69. Petitioner explains that “Gross contemplates ordering displayed items according to relevancy to the user.” *Id.* at 66 (citing Ex. 1214 ¶ 204; Ex. 1211 ¶ 81). Petitioner contends that Sanders, like Gross, discloses “that search results can ‘be ranked so that hit results can be sorted for display in such a way as to present the most likely results first.’” *Id.* (quoting Ex. 1210, 11:52–57). Petitioner asserts that “Sanders discloses that one way of ranking the search results is by ranking exact matches before matches of stemmed (i.e., abbreviated) words.” *Id.* (quoting Ex. 1210, 11:59–62; Ex. 1214 ¶ 207). Petitioner argues that a person of ordinary skill in the art would have understood Sanders’s “stemming” to refer to word abbreviations because stemming generates an abbreviation of a query term. Pet. 67 (citing Ex. 1214 ¶ 206). Petitioner further contends “a [person of ordinary skill in the art] would have understood that Sanders’s description of ranking exact matches of search terms before stemming matches shows ordering items having single-word or multi-word term matches before items having single-word or multi-word abbreviation matches.” *Id.* at 67 (citing Ex. 1214 ¶¶ 207–209).

Petitioner contends it would have been obvious to modify the Gross/Smith combination with Sanders “to generate additional search results and rank those additional search results in a way most useful to the user.” *Id.* at 68 (citing Ex. 1214 ¶¶ 210–215). According to Petitioner, although “[i]ncluding additional search results based on abbreviations (stemming) would improve the chances of finding the user’s desired item, [it] may increase the number of irrelevant results as well,” and, therefore, “a [person

of ordinary skill in the art] would have been motivated to incorporate Sanders's stemming and ranking techniques in order to rank exact matches above additional matches based on stemming, as taught by Sanders." *Id.* (citing Ex. 1210, 11:59–62; Ex. 1214 ¶¶ 210–215). Petitioner also argues "a [person of ordinary skill in the art] would have understood that applying Sanders's ordering criteria to the Gross/Smith combination was simply the application of a known technique to prior art ready for the improvement." *Id.* at 69 (citing Ex. 1214 ¶ 215).

Patent Owner argues that "Sanders's stemming process orders longer words **after** shorter words (or abbreviations)—rather than ordering longer words **before** abbreviations, as required by the claims." PO Resp. 35 (citing Ex. 2014 ¶ 94). Patent Owner points to Figures 5A and 5B of the '394 patent as examples of item display order, and Figure 6B as an example of ranked items. *Id.* at 35–36. For example, Patent Owner argues Figure 6B "shows 'abbreviations' or words having shortened, partial matches ranked and displayed below search term matches." *Id.* at 36–37 (citing Ex. 2014 ¶ 96). Patent Owner contrasts this disclosure with that in Sanders, where Sanders's "stemming process broadens the search scope and generates results **longer** than the originally entered word." *Id.* at 37 (citing Ex. 2014 ¶ 97). Patent Owner explains:

For example, Sanders describes the stemming of the word "divine" with the results being "divinity," "divination," and "diviner." EX1210, 6:42-61. Sanders ranks (or orders) the longer words of "divinity" and "divination" below the word "divine," despite the word "divine" being a shorter (or abbreviated) word. *Id.*, 11:57-62. Sanders states that "[e]xact matches of each search term, for instance, may be afforded a relevancy ranking of 100% and given top priority" and that "[h]its that only match the text to be searched after some transformation such as **stemming or spell-correcting** are

usually given a lower relevancy.” *Id.*, 11:57- 62 (emphasis added). Sanders thus does not rank or order longer words before shorter or abbreviated words, as required by the claims. *Id.* (emphasis added); EX2014, ¶ 97.

Id. at 37–38. Patent Owner further argues that words like “divinity,” “divination,” and “diviner,” are not abbreviation matches of the term “divine.” PO Sur-Reply 21. According to Patent Owner, “the only arguable abbreviation in Sanders (‘divin’) is not displayed.” *Id.*

Petitioner responds that claim 3 does not require ordering based on length, but rather, ordering items with matching terms before items with matching abbreviations. Pet. Reply 14. Petitioner argues that this is supported by the ’394 patent, where, for example, in Figures 6A and 6B the term matches (e.g., “8MM”) are ordered before abbreviation matches (e.g., “Teenage mutant ninja turtles”). *Id.* at 15. Petitioner asserts that even Patent Owner’s expert, Dr. Russ, acknowledged that the results in Figure 6B are not sorted by the length of the result. *Id.* at 16. Petitioner argues that Sanders, likewise, “teaches the ordering of results that match a whole search term (single-word matches) ahead of results that match an abbreviated search term (single-word abbreviation matches).” *Id.* at 17.

We determine that Petitioner’s arguments and evidence show the limitations in claim 3 are taught by Sanders. The claim language simply requires that the items are ordered so that term matches are displayed before abbreviation matches. We agree with Petitioner that the claim language and portions of the specification cited have nothing to do with the length of the items, or ordering based on the length. *See* Pet. Reply 14 (citing Ex. 1214 ¶¶ 201; Ex. 1233 ¶¶ 20–21). Patent Owner’s expert, Dr. Russ, conceded as much. Ex. 1232, 155:2–5 (“Q. And just so we are clear the results in

Figures 6B are not sorted by how long the total result is. Correct? A. Right.”). Rather, the claim language recites ordering term matches before abbreviation matches.

Patent Owner’s arguments appeared to shift between the Response and the Sur-Reply, and the crux of Patent Owner’s later argument is apparently that Sanders’ “stemming” does not teach the claimed “abbreviation matches.” *See* Tr. 59:9–13 (“JUDGE SZPONDOWSKI: Is your argument that the stemming in Sanders doesn’t teach an abbreviation match? MR. BLOCK: Yes, that’s it. That’s fundamentally what our point is.”).

Patent Owner concedes that the ’394 patent does not provide an explicit definition of the term “abbreviation match.” Tr. 59:8–12. The ’394 patent describes that “[a] single word query 501 can either match a single-word term 503 or an abbreviation representing multiple words 505.” Ex. 1221, 6:57–59. Likewise, “[a] multi-word prefix query 502 can match a multi-word term 504 or an abbreviation presenting multiple words.” *Id.* at 6:61–63. Both parties focus on the embodiment shown in Figure 6B to show the claimed ordering. Pet. Reply 15–16; PO Resp. 36–37. Figure 6B is shown below:

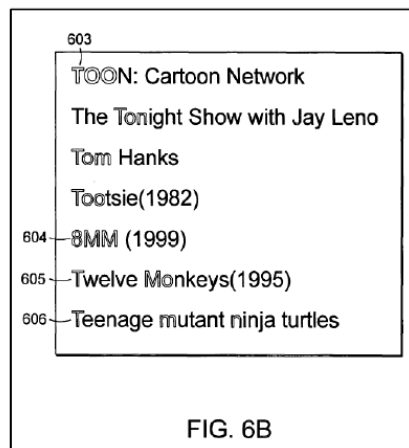


Figure 6B, above, depicts the search results shown when a user has input the single-word text input query “866.” Ex. 1221, 7:13–14. The results show single-word term matches (e.g., “**TOON**: Cartoon Network,” “The **T**onight Show with Jay Leno,” “**T**om Hanks,” “**T**ootsie(1982), “**8MM** (1999)”) ordered before abbreviation matches (“**T**welve **M**onkeys (1995),” “**T**eenage **m**utant **n**inja turtles”). *Id.* at 7:14–17.

Petitioner contends “a ‘single-word term match’ is an item associated with a word that matches a query term, and a ‘single-word abbreviation match’ is an item associated with a word that matches an abbreviation of a query term.” Pet. Reply 17 (citing Pet. 65; Ex. 1214 ¶ 201). Petitioner distinguishes between an abbreviation and an abbreviation match. *Id.* For example, according to Petitioner, “Twelve Monkeys” is an item which matches apparent abbreviation “TMO,” but is not the abbreviation itself. *Id.* (citing Ex. 1233 ¶ 24). Patent Owner does not appear to dispute this. *E.g.*, Sur-Reply 20 (describing the disclosure in Figure 6B).

Sanders describes the following:

“Stemming” is a process of removing prefixes and/or suffixes from a search term to allow the root of the search term to proxy for the original search term. This produces more hits capturing more variants of the original search term. For example, the word “divine” can be stemmed to “divin” so that it matches “divinity,” “divination”, “diviner”, “divinity,” etc.

Ex. 1210, 6:2–49. Sanders further describes ranking or ordering search results:

A results ranker 326 may organize hits for display by relevance or other criteria . . . The hits generated by the search engine 204 can often be ranked so that hit results can be sorted for display in such a way as to present the most likely results first, i.e., hits that are closest to the interpretation of the users intent in constructing the search string 202 (as hypothesized by the string interpreter

304). *Exact matches of each search term, for instance, may be afforded a relevancy ranking of 100% and given top priority. Hits that only match the text to be searched after some transformation such as stemming or spell-correcting are usually given a lower relevancy.*

Ex. 1210, 11:48–62 (emphasis added). In other words, Sanders teaches that exact matches of search terms (e.g., “divine”) may be given a higher relevancy ranking than matches of search terms after stemming (“divinity,” “divination,” “diviner,”). This is undisputed. *E.g.*, PO Resp. 36–37; Ex. 1232, 155:11–16; Pet. Reply 17–18.

We find Dr. Fox’s testimony credible that Sanders’ stemming process teaches the claimed abbreviation matches. *See* Ex. 1214 ¶¶ 201–209. Dr. Fox provides testimony that a single-word abbreviation could refer to an abbreviation created by shortening a single word, such as the abbreviations “ex.” or “exh.” for the word “exhibit.” *Id.* ¶ 203. Likewise, an abbreviation could be created by shortening the word “divine” to “divin,” and matching words related (e.g., “divinity,” “divination,” and “diviner”) to that abbreviation. *Id.* ¶ 206. Therefore, Petitioner contends, in Sanders, the stemmed term “divin” discloses an abbreviation, and, therefore, search term matches “divinity,” “divination,” and “diviner,” disclose the claimed “abbreviation matches.” Pet. Reply 18. Although Patent Owner argues that these search term matches are not “abbreviation matches,” Patent Owner does not persuasively rebut Petitioner’s showing or Dr. Fox’s testimony. PO Sur-Reply 21–22.

Patent Owner does not dispute Petitioner’s rationale for combining Sanders with Gross and Smith. We are persuaded that Petitioner has offered articulated reasoning with a rational underpinning as to why one of ordinary

skill in the art would have modified and combined the teachings of Gross, Smith, and Sanders in the manner proposed by Petitioner.

Accordingly, for the reasons discussed above, Petitioner has shown by a preponderance of evidence that claim 3 is unpatentable as obvious over Gross, Smith, and Sanders.

3. Analysis of Claim 8

Claim 8 depends from claim 5 and recites “wherein the device is a remote control device for a television.” Ex. 1221, 10:13–14. Petitioner relies on Gross, Smith, and Sanders for the teachings of the limitations of claim 5. Pet. 69. Specifically, Petitioner identifies that Gross “teaches that searching may be done via a network of interactive televisions . . . [b]ut . . . does not explicitly recite a ‘remote control device for a television.’” *Id.* at 70 (citing Ex. 1211 ¶¶ 32, 60; Ex. 1214 ¶ 217). Petitioner points to Sanders, which describes “that a user might use ‘a digital television system in which the user has limited inputting capability,’ and that the user might enter a search string ‘using a remote control with relatively few keys to actuate.’” *Id.* (citing Ex. 1210, 4:23–34; Ex. 1214 ¶ 218).

Petitioner contends “[a] POSA would have recognized that televisions commonly have remote control devices, particularly the interactive televisions described by Gross” and “that a remote control device, as described by Sanders, would have an overloaded keypad, as described by Smith.” *Id.* (citing Ex. 1214 ¶ 218). Petitioner asserts that “modifying Gross to allow a user to enter search queries to an interactive television by using a remote control would improve the user experience by giving the user more options for how to interact with an interactive television (e.g., compared to a television without a remote control).” *Id.* (citing Ex. 1214 ¶ 218).

Patent Owner does not argue separately Petitioner's contentions for claim 8, but instead argues that this claim is patentable for the same reasons as claim 1. *See* PO Resp. 38. We disagree for the reasons discussed in § III.E.3, *supra*. We determine that Petitioner's arguments and evidence, for instance, the disclosure in column 4, lines 23–34 of Sanders, show that the limitations in claim 8 are taught by Sanders. Also, we are persuaded that Petitioner has offered articulated reasoning with a rational underpinning as to why one of ordinary skill in the art would have modified and combined the teachings of Gross, Smith, and Sanders in the manner proposed by Petitioner.

Accordingly, for the reasons discussed above, Petitioner has shown by a preponderance of evidence that claim 8 is unpatentable as obvious over Gross, Smith, and Sanders.

4. Analysis of Claim 9

Claim 9 depends from claim 1 and recites “wherein at least some items of the set of items are television content items.” Ex. 1221, 10:15–16. Petitioner relies on Gross, Smith and Sanders for the teachings of the limitations of claim 9. Pet. 71. Petitioner asserts that Gross discloses that a user can search for content items, services, and movie times and that the searching may be done via a network of interactive televisions, but “does not explicitly disclose searching for ‘television content items.’” *Id.* (citing Ex. 1211 ¶¶ 32, 50, 164; Ex. 1214 ¶ 1221). Petitioner contends Sanders explicitly teaches an electronic program guide database that is capable of receiving and recording television broadcasts that allows users to search for and watch television content items. *Id.* at 72 (citing Ex. 1210, 2:65–3:19; Ex. 1214 ¶ 222). Petitioner contends it would have been obvious to a person of ordinary skill in the art to combine the Gross-Smith system with Sanders

to allow a user to search for television content items, and there would have been a reasonable expectation of success to do so. Pet. 72 (citing Ex. 1214 ¶¶ 218–219).

Patent Owner does not argue separately Petitioner’s contentions for claim 9, but instead argues that this claim is patentable for the same reasons as claim 1. See PO Resp. 38. We disagree for the reasons discussed in § III.E.3, *supra*. We determine that Petitioner’s arguments and evidence, for instance, the disclosure in paragraphs 32 and 64 of Gross and column 2, line 65 through column 3, line 19 of Sanders, show that the limitations in claim 9 are taught by Gross and Sanders. Also, we are persuaded that Petitioner has offered articulated reasoning with a rational underpinning as to why one of ordinary skill in the art would have modified and combined the teachings of Gross, Smith, and Sanders in the manner proposed by Petitioner.

Accordingly, for the reasons discussed above, Petitioner has shown by a preponderance of evidence that claim 9 is unpatentable as obvious over Gross, Smith, and Sanders.

G. Obviousness of Claim 7 Over the Combination of Gross, Smith, and Weeren

Petitioner contends claim 7 would have been obvious over the combination of Gross, Smith, and Weeren. Pet. 73. In our discussion below, we first provide a brief overview of Weeren, and then address the parties’ contentions in turn.

1. Weeren (Ex. 1225)

Weeren is titled “Providing Blended Interface for Wireless Information Services” and is generally directed to “a user interface between a wireless communication device and an information service provider.” Ex. 1225, code (54), code (57). The user interface may access and supply

information from databases, and is applicable to conventional wired telephones as well. *Id.* at 3:7–10, 5:3–7.

2. *Analysis of Claim 7*

Claim 7 depends from claim 5 and recites “wherein the device is a desk phone.” Ex. 1221, 10:11–12. Petitioner relies on Weeren for the teachings of the limitations of claim 7, and specifically, that Weeren teaches an information retrieval system that is usable by a wireless phone or a desk phone. Ex. 1225, 5:3–22. Petitioner asserts

[b]ecause Weeren teaches that desk phones may be used to access such information and services, including ‘phone directories, locator services, retail services, or other information services,’ . . . a POSA would have been motivated to access the search system of Gross and Smith, which also provides such information services, to be operable with a desk phone as a client.

Pet. 73 (citing Ex. 1225, 5:16–17; Ex. 1211 ¶¶ 103, 111, 126, 128, 129, 131, 153, 155, 156; Ex. 1214 ¶¶ 225, 226). According to Petitioner, such a modification would “beneficially expand the number of devices from which the information and services provided by the search system would be available.” *Id.* at 74 (citing Ex. 1214 ¶ 227). Further, Petitioner explains the combination is “nothing more than the ‘mere application of a known technique’ (accessing search services via a desk phone) to the Gross/Smith system, which was ‘ready for the improvement’” and “would have yielded predictable results because a desk phone was a known alternative to a wireless phone.” *Id.* at 74 (citing Ex. 1214 ¶ 227; Ex. 1211 ¶ 60, Ex. 1225, 5:3–22).

Patent Owner does not argue separately Petitioner’s contentions for claim 7, but instead argues that this claim is patentable for the same reasons as claim 1. *See* PO Resp. 39. We disagree for the reasons discussed in

§ III.E.3, *supra*. We determine that Petitioner’s arguments and evidence, for instance, the disclosure in column 5, lines 3 through 22 of Weeren, show that the limitations in claim 7 are taught by Weeren. Also, we are persuaded that Petitioner has offered articulated reasoning with a rational underpinning as to why one of ordinary skill in the art would have modified and combined the teachings of Gross, Smith, and Weeren in the manner proposed by Petitioner.

Accordingly, for the reasons discussed above, Petitioner has shown by a preponderance of evidence that claim 7 is unpatentable as obvious over Gross, Smith, and Weeren.

IV. MOTION TO SEAL

Petitioner filed a Motion to Seal “portions of its Petitioner’s Reply to Patent Owner Response, portions of supporting declarations, and the entirety of certain exhibits.” Paper 32 at 1 (“Motion”). Petitioner also filed a Motion to Enter Protective Order. Paper 33. Specifically, Petitioner seeks to file under seal (1) Petitioner’s Reply to Patent Owner’s Response (Paper 34) (“Reply”); (2) portions of the supporting Declaration of Dr. Edward A. Fox in Support of Petitioner’s Reply to Patent Owner’s Response (Ex. 1233) (“Declaration”); and (3) the entirety of the deposition transcript of Dr. Samuel H. Russ (Ex. 1232), Patent Owner’s expert. Motion 1. Petitioner filed public versions of each of the three documents. Paper 40, Ex. 1232, Ex. 1233.⁶ Petitioner “respectfully requests that this motion be granted in light of Patent Owner’s Motion to Seal in related IPR2019-00237 (Paper No. 22) and [IPR2019]-00290 (Paper No. 22), and Patent Owner’s designation of

⁶ Petitioner used the same Exhibit number for the confidential and public versions of Exhibits 1232 and 1233.

Dr. Russ's deposition transcript as confidential under the Standing Protective Order in those matters." Motion 1.

Petitioner asserts that it relies on Dr. Russ's deposition testimony in its Reply, and, for efficiency purposes, took a single deposition of Dr. Russ for all of IPR2019-00237, -00239, -00290, and -00292. Motion 1–2. Petitioner asserts that Dr. Russ's testimony relates to Patent Owner's confidential business information, including information relating to conception and reduction to practice. *Id.* at 2. Therefore, Petitioner requests that the entire deposition transcript, as well as the Reply and Dr. Fox's Declaration be kept under seal. *Id.* at 1–2.

Although Petitioner generally asserts that it relies on Dr. Russ's deposition testimony in its Reply, it does not identify any specific information that it cited, discussed, or referred to in the Reply that disclosed any purported confidential business information. The Reply contains citations to Dr. Russ's deposition testimony that pertain to Dr. Russ's qualifications, what a person of ordinary skill would have understood, the level of ordinary skill in the art, and the disclosure of the '394 patent, none of which appear to refer to any confidential business information, conception, or reduction to practice. *See* Pet. Reply 2, 11, 13, 16, 19. Moreover, many of these citations do not even disclose Dr. Russ's testimony; they merely provide the page and line numbers of Dr. Russ's testimony. *See id.* at 2, 11, 13. Other citations do disclose Dr. Russ's testimony, but that testimony is not related to Patent Owner's confidential business information, conception, or reduction to practice. *See id.* at 16, 19. Indeed, conception and reduction to practice are not even at issue in this *inter partes* review. Further, none of the cited testimony – nor anything else – is redacted in the public version of the Reply. *Compare* Paper 34

(confidential), *with* Paper 40 (public). In other words, the confidential and public versions of the Reply brief are identical and the public version does not contain any redactions. *See* Papers 34, 40. The same is true for Dr. Fox's Declaration. *See e.g.*, Ex. 1233 ¶¶ 7, 22. Accordingly, we are not persuaded of the confidential nature of the Reply (Paper 34) or of Dr. Fox's Declaration (Ex. 1233) and *deny without prejudice* Petitioner's motion as to both of these documents.

With respect to Dr. Russ's deposition transcript, the testimony pertaining to Patent Owner's confidential business information, including the conception and reduction to practice, was not relevant to or relied upon in this proceeding and therefore, the transcript should not have been filed in its entirety. In the future, we encourage Petitioner to only file the portions of testimony, along with any additional pages required for context, that are relied upon, as opposed to filing an entire deposition transcript that necessitates the need for filing under seal. Nonetheless, we will *grant* Petitioner's motion as to Dr. Russ's deposition transcript (Exhibit 1232). Likewise, we will *grant* Petitioner's Motion to Enter Protective Order (Paper 33.)

V. CONCLUSION

The outcome for the challenged claims in this proceeding is set forth below.⁷ In summary:

⁷ 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

Claims	35 U.S.C. §	Reference(s)/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1, 2, 4, 6, 10, 11	103(a)	Gross, Smith	1, 2, 4, 5, 6, 10, 11	
3, 8, 9	103(a)	Gross, Smith, Sanders	3, 8, 9	
7	103(a)	Gross, Smith, Weeren	7	
Overall Outcome			1–11	

VI. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1–11 of the '394 patent have been proven to be unpatentable by a preponderance of the evidence;

ORDERED that Petitioner's Motion to Enter Protective Order is *granted*;

ORDERED that Petitioner's Motion to Seal Documents is *denied without prejudice* as to Petitioner's Reply (Paper 34) and Dr. Fox's Declaration (Ex. 1233) and *granted* as to Dr. Russ' deposition transcript (Ex. 1232); and

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

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).

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