

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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COMCAST CABLE COMMUNICATIONS, LLC  
Petitioner,

v.

VEVEO, INC.,  
Patent Owner.

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Case IPR2017-00715  
Patent 8,433,696 B2

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Before JONI Y. CHANG, MINN CHUNG, and  
KEVIN C. TROCK, *Administrative Patent Judges*.

TROCK, *Administrative Patent Judge*.

FINAL WRITTEN DECISION  
*35 U.S.C. § 318(a) and*  
*37 C.F.R. § 42.73*

## I. INTRODUCTION

Comcast Cable Communications, LLC (“Petitioner”) filed a Petition requesting *inter partes* review of claims 1–31 (the “challenged claims”) of U.S. Patent No. 8,433,696 B2 (Ex. 1001, “the ’696 patent”). Paper 2 (“Pet.”). Veveo, Inc. (“Patent Owner”) filed a Preliminary Response. Paper 7 (“Prelim. Resp.”). We instituted an *inter partes* review of all of the challenged claims. Paper 8 (“Dec. Inst.”).

Patent Owner filed a Response (Paper 22, “PO Resp.”) and Petitioner filed a Reply (Paper 25, “Pet. Reply”). A hearing was held on April 23, 2018, a transcript of which has been entered into the record (Paper 30, “Tr.”).

We have jurisdiction under 35 U.S.C. § 6(b). This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a). We base our decision on the preponderance of the evidence. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). Having reviewed the arguments of the parties and the supporting evidence, we find that Petitioner has demonstrated by a preponderance of the evidence that each of the challenged claims is unpatentable.

### A. *The ’696 Patent*

The ’696 patent discloses methods and systems for “processing a search query entered by a user of a device having a text input interface with overloaded keys” in order to “identif[y] an item from a set of items.” Ex. 1001, Abstract. The claims are directed towards methods and systems designed to search for “content items” using such overloaded keys. *Id.* at claims 1 and 15. Figure 1 of the ’696 patent shows an example of an overloaded keypad with each key being associated with more than one alpha-numeric character. The ’696 patent explains that a “user enters a

character using an ambiguous text input interface, e.g., using a keypad with overloaded keys where a single key press is performed for each character entered” and “an incremental search system determines and displays results that match the input character.” *Id.* at 5:4–13. For example, “[t]he exemplary terms ‘TOON’, ‘TOM’, ‘TOMMY’, which can be search terms entered by a television viewer to identify television content, are mapped to the numeric equivalents of their prefix strings: ‘T’(8), ‘TO’(86), ‘TOO’(866), ‘TOON’(8666), ‘TOMMY’(86669).” *Id.* at 5:60–66. The results for “TOON” are mapped to overloaded inputs “8,” “86,” “866,” and “8666,” and, based on that mapping, the system “enables incremental search processing by enabling even a single character entered by the user to retrieve relevant results.” *Id.* at 5:66–6:2.

The ’696 patent also discloses that “an ordering scheme is preferably used to order the results to improve accessibility to results expected to be more of interest to the user.” *Id.* at 5:13–20. If the user does not find the desired results, he or she can continue to enter more characters to the search query. *Id.* at 5:55–57. Then “the system will perform the search based on the cumulative substring of characters of the search query entered by the user up to that point.” *Id.* at 5:57–59.

#### *B. Challenged Claims*

Petitioner challenges claims 1–31 of the ’696 patent. Claims 1 and 15 are independent and are substantially similar, the difference being that claim 1 recites a method and claim 15 recites a system. Claim 1 is illustrative and is reproduced below.

1. A method, comprising:

associating subsets of content items with corresponding strings of one or more overloaded keys of a keypad so that the subsets of content items are directly mapped to the corresponding strings of one or more overloaded keys by a direct mapping, wherein at least one overloaded key of the one or more overloaded keys is associated with a plurality of alphabetical and/ or numerical symbols;

ranking content items within at least one of the subsets of content items according to one or more ordering criteria;

subsequent to the associating and ranking, receiving entry of a first overloaded key;

selecting and presenting a first of the subsets of content items that is associated with the first overloaded key based on the direct mapping;

subsequent to receiving entry of the first overloaded key, receiving entry of a second overloaded key the same as or different than the first overloaded key, the second overloaded key forming a string with the first overloaded key; and

selecting and presenting a second of the subsets of content items that is associated with the string of overloaded keys formed by the first overloaded key and the second overloaded key based on the direct mapping.

Ex. 1001, 7:62–8:20.

## II. DISCUSSION

### A. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are given their broadest reasonable construction in light of the specification of the patent. 37 C.F.R. § 42.100(b). Consistent with that standard, we assign claim terms their ordinary and customary meaning, as would be understood by one of ordinary skill in the art at the time of the invention, in the context of the entire patent disclosure. *See In re Translogic Tech., Inc.*, 504 F.3d

1249, 1257 (Fed. Cir. 2007). Only those terms that are in controversy need be construed, and only to the extent necessary to resolve the controversy. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

The initial “associating” step of claim 1 reads as follows:

associating subsets of content items with corresponding strings of one or more overloaded keys of a keypad so that the subsets of content items are directly mapped to the corresponding strings of one or more overloaded keys by a direct mapping, wherein at least one over loaded key of the one or more overloaded keys is associated with a plurality of alphabetical and/ or numerical symbols;

Ex. 1001, 7:63–8:3.

The “associating” step of claim 1 recites the terms “content item” and “direct mapping,” among others. In our Decision Instituting *Inter Partes* Review, we construed preliminarily the terms “content item” and “direct mapping.” *See* Dec. Inst. 5–10.

1. “Content Item”

We construed preliminarily the term “content item” to mean “an item which contains information and is identifiable and selectable from a set of items through use of a search query.” Dec. Inst. 6–8.

In its Response, Patent Owner argues that our construction “fails to distinguish between a ‘content item’ and its associated descriptors.” PO Resp. 14. Patent Owner argues that our construction “allows Petitioner to improperly blur the lines between content items and their associated descriptors,” and points to testimony from Petitioner’s declarant, Dr. Fox, where he states that a “[c]ontent item can be the same as a descriptor if the descriptor is a long thing,” such as a list of titles. *Id.* at 15 (quoting

Ex. 2008, 67:1–21). Patent Owner proposes instead construing “content item” as “an identifiable and searchable item having one or more associated descriptors.” *Id.*

Petitioner argues that Patent Owner’s proposed construction of “content item” is inconsistent with Patent Owner’s proposed construction of “direct mapping,” is contradicted by Patent Owner’s litigation position, and improperly imports a limitation (“associated descriptors”) from the specification into the claim. Pet. Reply 10–12.

We agree with Petitioner that Patent Owner’s proposed construction improperly imports a limitation from the specification into the claim. Merely because a particular embodiment describes the association of “descriptors” with “content items” for purposes of searching and retrieving those content items, does not justify importing that limitation into the claim language. Claim 1, as written, does not recite “descriptors,” and it would be error to import this limitation into the broader claim. *See Superguide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004) (“it is important not to import into a claim limitations that are not part of the claim. For example, a particular embodiment appearing in the written description may not be read into a claim when the claim language is broader than the embodiment”). The specification provides examples showing how “descriptors” are associated and used with “content items.” *See, e.g.*, Ex. 1001, 2:11–19, 3:19–22. A person of ordinary skill in the art reading the claims in light of the specification would therefore understand that “content items” are not “descriptors.”

Although Patent Owner points to the same or similar disclosures in the specification, Patent Owner does not explain why such disclosures limit

the term “content item” to require “having one or more associated descriptors.” *See* PO Resp. 15 (citing Ex. 1001, 2:7–12, 3:5–8). For example, Patent Owner does not argue that it was acting as its own lexicographer or it disavowed the full scope of the term in the specification or during prosecution. *See GE Lighting Sols., LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014) (“[T]he specification and prosecution history only compel departure from the plain meaning in two instances: lexicography and disavowal.”). Therefore, we do not agree with Patent Owner that the term “content item” requires “having one or more associated descriptors.”

Moreover, we do not rely on the particular testimony of Dr. Fox criticized by Patent Owner. *See* PO Resp. 15–16 (quoting Ex. 2008, 67:1–21, 71:21–72:15). At oral argument, Patent Owner’s counsel indicated that our construction would be appropriate if we did not agree with Dr. Fox’s interpretation. Tr. 25:7–13.

Accordingly, based on the complete record, in this final decision, we adopt our preliminary construction of “content item” to mean “an item which contains information and is identifiable and selectable from a set of items through use of a search query.”

## 2. “*Direct Mapping*”

We construed preliminarily the term “direct mapping” to mean “matching each alphanumeric character of a descriptor identifying a content item with its corresponding numeric key equivalent on an overloaded keypad.” Dec. Inst. 8–10.

In its Response, Patent Owner argues that our preliminary construction describes “indirect mapping” instead of the claimed “direct

mapping.” PO Resp. 8. Patent Owner argues, “the claim explicitly requires that the content items themselves—and not their associated descriptors—are directly mapped to strings of overloaded keys.” *Id.* at 9. Patent Owner also argues that our preliminary construction fails to account for the mapping of prefix strings of overloaded keys to content items. *Id.* Patent Owner asserts that “the Board should construe ‘direct mapping’ to require mapping content items directly to corresponding prefix strings made up of overloaded keys.” *Id.* at 13 (citing Ex. 2009 ¶ 41).

Petitioner argues that the evidence cited by Patent Owner, specifically Figures 5 and 7 of the ’696 patent and the accompanying descriptions, does not support Patent Owner’s proposed construction. Pet. Reply 2–5.

Petitioner argues that neither Figure 5 nor Figure 7 depicts the direct mapping of content items. *Id.* at 3–5. Rather, Petitioner argues, Figures 5 and 7 show the mapping of descriptors, not content items. Tr. 7:5–26.

Petitioner argues that Patent Owner’s expert, Dr. Kerschberg, admitted that Figure 5 does not show content items. Pet. Reply 3. Petitioner also argues that Dr. Kerschberg testified that Figure 7 “is not intended to show [selecting and presenting a first of the subsets of content items].” *Id.* (quoting Ex. 1007, 33:10–23). Petitioner also points out that the ’696 patent specification does not mention or define specifically “direct mapping,” as this term was added to the claims by amendment. Tr. 9:6–7.

Moreover, at oral argument, Patent Owner’s counsel admitted that the search results in Figure 8-B of the ’696 patent showed “representations of content items,” not the content items themselves. Tr. 29:15–26. Patent owner’s counsel agreed that the search results provided to the user were in the form of language and were not the actual content items. *Id.* at 33:6–19.



Patent Owner’s counsel also conceded he was “not really sure” how one could map strings of overloaded keys to content items without using descriptors. *Id.* at 36:9–15.

As we explained in our Decision on Institution, we believe the key to understanding claim 1 lies in understanding what it means by “*associating . . . content items with . . . overloaded keys . . . so that the . . . content items are directly mapped to the corresponding strings of one or more overloaded keys.*” Dec. Inst. 9 (quoting Ex. 1001, 7:63–67). The ’696 patent provides an explanation of what it means by “associating.” The ’696 patent explains, “[t]he search query is directed at identifying an item from a set of [content] items. Each of the [content] items has one or more associated *descriptors*. *The descriptors can include words in the name of the [content] item or other information relating to the [content] item.*” Ex. 1001, 3:5–8 (emphasis added). The ’696 patent goes on to explain that, “[t]he system dynamically identifies a group of one or more [content] items from the set of [content] items having one or more *descriptors matching the search query* as the user enters each character of the search query.” *Id.* at 3:19–22 (emphasis added). The ’696 patent thus makes clear that it is the *descriptors* of the content items that directly match the search query, and not the content items themselves that directly match the search query as Patent Owner argues.

Accordingly, based on the complete record, in this final decision, we adopt our preliminary construction of “direct mapping” to mean “matching each alphanumeric character of a descriptor identifying a content item with its corresponding numeric key equivalent on an overloaded keypad.”

*B. Level of Ordinary Skill in the Art*

Petitioner argues a person having ordinary skill in the art at the time of the alleged invention 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, designing, constructing, and/or testing systems that utilize data and/or information search techniques. Pet. 19 (citing Ex. 1006 ¶¶ 40–45).

Patent Owner argues a person of ordinary skill in the art would have had a bachelor's degree in computer science and two years of experience in the field of search-query processing with particular experience analyzing, constructing and testing systems that utilize data and/or information search techniques. PO Resp. 8 (citing Ex. 2009 ¶¶ 16–17).

The parties essentially agree on the level of ordinary skill in the art. We, therefore, find that a person of ordinary skill in the art in the field of the '685 patent is a person who has a bachelor's degree in computer science and at least two years of experience in the field of search-query processing, with experience analyzing, designing, constructing, and/or testing systems that utilize data and/or information search techniques.

*C. Prior Art References and Alleged Grounds of Unpatentability*

Petitioner relies upon the following references:

(1) U.S. Patent Application Publication No. US 2004/0133564 A1, published July 8, 2004 (“Gross”) (Ex. 1003);

(2) U.S. Patent No. 6,529,903 B2, issued March 4, 2003 (“Smith”) (Ex. 1004); and

(3) U.S. Patent No. 8,051,450 B2, filed October 16, 2003; issued November 1, 2011 (“Robarts”) (Ex. 1005).

Petitioner asserts the following grounds of unpatentability:

Ground 1: Claims 1–10, 12–24, and 26–31 are unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Gross and Smith. Pet. 35–58.

Ground 2: Claims 11 and 25 are unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Gross, Smith and Robarts. Pet. 58–60.<sup>1</sup>

*D. Overview of Prior Art References*

*1. Gross (Ex. 1003)*

Gross pertains to incremental searching a variety of search targets, such as digital files, emails, email attachments, Web pages, databases, and the like. Ex. 1003 ¶ 10. Gross teaches generating indexes that contain content information and attribute information corresponding to the search targets. *Id.* ¶ 11. The index includes a data structure that associates character strings found with a file or document with the search targets. *Id.* ¶¶ 40, 46. The search is performed incrementally so that the results (i.e., the identification of the corresponding search targets) are provided or narrowed substantially, immediately after each character in a search string is entered by a user. *Id.* ¶ 10.

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<sup>1</sup> The Petition also asserted a third ground of unpatentability on which we declined to institute—that claims 1–31 were unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Gross and Robarts. Pet. 60–87. Subsequent to the Supreme Court’s decision in *SAS Institute Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018), we issued an Order (Paper 32) that the parties may file a request for rehearing after the final written decision in this case to request supplemental briefing, discovery, and/or oral argument on ground 3.

Figure 2B of Gross is set out below.

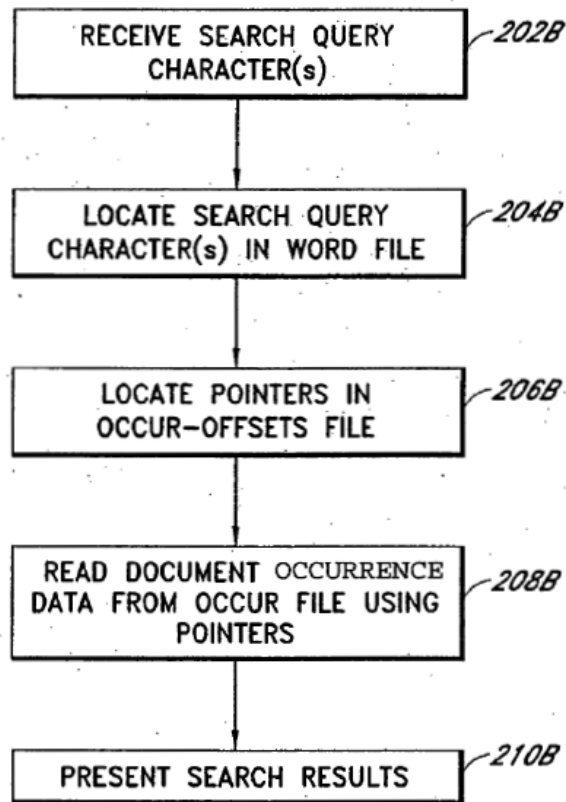


Figure 2B, shown above, illustrates an exemplary search lookup operation in Gross. At state 202B one or more search characters or strings are received. Ex. 1003 ¶ 48. At state 204B the character or character strings are located in the word file, which is part of the fixed index. *Id.* ¶¶ 46, 48. At state 206B the pointer or pointers for the character or character strings in the occur-offsets file are located. *Id.* At state 208B document occurrence information is read from the occur file using the located pointers. *Id.* The occur-offsets file and occur file are also part of the fixed index. *Id.* ¶ 46. At state 210B the search results are presented to the user. *Id.* ¶ 48. The search results are displayed 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.*

Figure 2B thus illustrates the search lookup operation in Gross. Gross also describes that

[i]n one optional embodiment, the index stores “prefix” entries, which further enhances the speed of incremental filtering or searching. For example, 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”. By preparing this information during indexing, the response for the first letter or two of a filtering or search operation is greatly enhanced as compared to a standard inverted index, which would have to locate thousands of matches at the time of receiving the user query, thereby resulting in slow filtering operations.

*Id.* ¶ 51.

Gross also describes a “sort” file provided for each attribute column. The sort files are cached sort orders for the documents or files in the fixed index, when sorted by that column. *Id.* ¶ 52. The user can optionally specify that a particular attribute is to be used as a default sort key when presenting a document list. *Id.* Thus, for example, the user can specify that, as a default sort for email, emails should be automatically sorted and ordered according to date/time received. *Id.* In this example, the precomputed default sort list, also referred to as a master sort list, would then be sorted according to date/time, and the master sort list would be almost instantly presented with the pre-computed sort list when the user clicks on the email tab. *Id.*

Gross explains that its user terminal 104 can be a computer-networkable wireless phone. *Id.* ¶ 60. Petitioner concedes, however, that Gross does not disclose explicitly an overloaded keypad environment for indexing and searching. Pet. 23.

2. *Smith (Ex. 1004)*

Smith relates to providing search results in response to an ambiguous search query provided by a user. Ex. 1004, 1:17–18. Smith explains that devices such as wireless telephones typically have a data input interface (e.g., a keypad) wherein a particular action by the user (e.g., pressing a key) may correspond to more than one alphanumeric character. Such a keypad is illustrated below in Figure 5B of Smith.

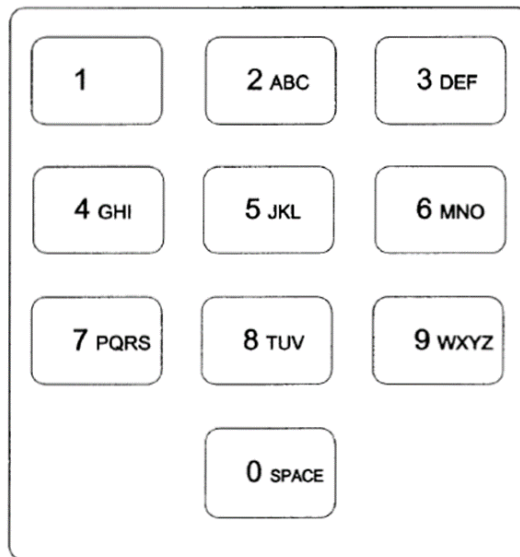


Figure 5B of Smith shows an alphanumeric keypad. Figure 5A of Smith, set out below, illustrates a technique for providing search results in response to an ambiguous search query from such a keypad.

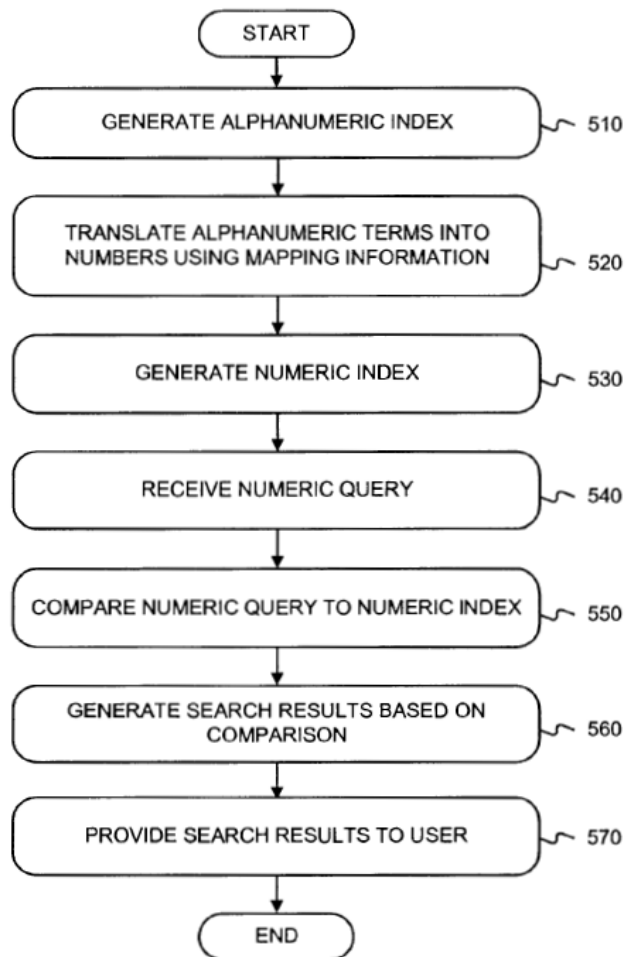


Figure 5A of Smith begins with generating an alphanumeric index (stage 510) from terms associated with search targets, such as documents. Ex. 1004, 5:1–2. Smith explains that such documents could contain other types of information for indexing in addition to alphanumeric strings, such as phonetic or audiovisual information. *Id.* at 4:29–31, 5:63–6:3. The alphanumeric terms are translated into numbers using mapping information (stage 520) corresponding to the keys on a telephone handset. *Id.* at 4:59–5:7. A numeric index is then generated (stage 530) that maps the numbers of the keypad to the information contained in the alphanumeric index. *Id.* at 5:20–22. When a numeric query is received 540 from the user’s keypad, a

comparison is made between the numeric query and the numeric index (stage 550). *Id.* at 5:33–35. Search results are then generated based on this comparison (stage 560), which are then provided to the user 570. *Id.* at 5:36–43.

3. *Robarts (Ex. 1005)*

Robarts provides an interactive television network with an electronic program guide (EPG) that facilitates both simple and complex searches. Ex. 1005, Abstract; 1:13–16. Robarts discloses a system for presenting a list of choices of television programming based upon entry of characters from a remote control handset. *Id.* at 4:37–55. For example, Robarts describes receiving entry of characters via a keypad, where the keys represent both numbers and letters, and incrementally displaying results based on the entered characters. *Id.* at 4:46–55, 19:11–20.

Robarts also describes associating program and network names with identification numbers via mapping prior to a search. *Id.* at 18:66–19:9. Robarts also shows examples of query results provided in an ordered list. *Id.* at 18:1–56.

E. *Obviousness Over Gross and Smith*

Petitioner contends that claims 1–10, 12–24, and 26–31 of the '696 patent would have been obvious over the combined teachings of Gross and Smith. Pet. 35–58. Claims 1 and 15 are independent and substantially similar. Claim 1 is illustrative.



*1. Independent Claims 1 and 15*

- a. “associating subsets of content items with corresponding strings . . . ;”*

With respect to the recited limitation “associating subsets of content items with corresponding strings of one or more overloaded keys of a keypad so that the subsets of content items are directly mapped to the corresponding strings of one or more overloaded keys by a direct mapping of . . . alphabetical and/or numerical symbols,” Petitioner relies on Gross’ teaching of an index engine that indexes emails and files and stores the indexes in a data repository. Pet. 36 (citing Ex. 1003 ¶ 38). Petitioner asserts that Gross’ index engine creates an index that includes a data structure that associates files, documents, and the like with character strings. *Id.* As Gross explains, “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.” Ex. 1003 ¶ 40. In addition, Gross teaches that, in one embodiment,

the index stores “prefix” entries, which further enhances the speed of incremental filtering or searching. For example, 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”. By preparing this information during indexing, the response for the first letter or two of a filtering or search operation is greatly enhanced . . . .

Ex. 1003 ¶ 51.

Although Petitioner concedes that Gross does not disclose explicitly “overloaded keys of a keypad,” Petitioner relies on Smith’s teaching of a

numeric index in an overloaded keypad environment to provide search results in response to an ambiguous search query. Pet. 38–39. Petitioner points to Smith’s translating alphanumeric terms in an index into their numeric equivalents using mapping information corresponding to a standard (overloaded) telephone handset. *Id.* (citing Ex. 1004, 5:5–19). In this way, Petitioner argues, once such words (i.e., alphanumeric terms) have been indexed in the combined Gross/Smith system, content items are directly mapped to corresponding strings of overloaded keys. *Id.* at 39 (citing Ex. 1006 ¶¶ 90–91). Petitioner argues it would have been obvious to combine Gross’ alphanumeric prefix indexing system on a wireless phone with Smith’s overloaded keypad environment with numeric index for the purpose of providing relevant search results in response to an ambiguous search query. *Id.* (citing Ex. 1004, 2:1–3; Ex. 1006 ¶¶ 90–94).

Patent Owner argues that the proposed combination of Gross and Smith does not directly map content items to strings of overloaded keys. PO Resp. 37–43. Patent Owner argues that in Gross, search strings are only indirectly mapped to the underlying content items. *Id.* at 38. Patent Owner argues that Petitioner’s proposed combination of Gross with Smith does not solve the problem because Petitioner does not explain how to replace the index of Gross with the Smith index and still have a working, operable system. *Id.* at 39.

Patent Owner’s argument, however, is inconsistent with our construction of “direct mapping,” which is “matching each alphanumeric character of a descriptor identifying a content item with its corresponding numeric key equivalent on an overloaded keypad.” Moreover, Gross explains that a fixed index as a single file can be used to match attributes as

search criteria to target files. *See* Ex. 1003 ¶ 45; Ex. 1009 ¶¶ 24–25. Smith also describes using a single index to match search characters from a user’s input device with target documents without the need for translations. *See* Ex. 1004, 6:6–14; Ex. 1006 ¶ 91; Ex. 1009 ¶ 28. Smith also shows a numeric index that maps content items such as documents directly to corresponding strings of one or more overloaded keys. *See* Ex. 1004, Fig. 5C; Ex. 1006 ¶ 91.

Patent Owner also argues that the claims “require mapping content items directly to corresponding prefix strings made up of overloaded keys. This is evidenced by the requirement that the claimed system select and present results that are ‘associated with the first overloaded key based on the direct mapping.’” PO Resp. 43. Patent Owner argues that Smith’s index “does not include prefixes,” and thus “there is no disclosure in Smith of ‘enabling even a single character entered by the user to retrieve relevant results.’” *Id.* at 44; *see also id.* at 48. Patent Owner argues there is no evidence of record demonstrating how the proposed Gross/Smith combination would have performed an incremental search. PO Resp. 44. Thus, Patent Owner argues, Gross’ system using Smith’s index would have been incapable of meeting the claim limitations “because Gross would be searching for single-character and two-character prefixes in an index that does not contain such prefixes.” *Id.* at 47; *see also id.* at 48.

We disagree with Patent Owner. First, Patent Owner is arguing the Gross and Smith references separately, as opposed to arguing against the combined teachings of Gross and Smith. *See In re Keller*, 642 F.2d 413, 426 (CCPA 1981) (“[O]ne cannot show non-obviousness by attacking references

individually where, as here, the rejections are based on combinations of references.”).

Here, Petitioner is combining Gross’ teaching of an index that includes a data structure associating files, documents, and the like with character strings to provide for incremental searching and presentation of results substantially immediately after each character in a search string is entered by a user, with Smith’s teaching of a numeric index to provide search results in response to an ambiguous search query by translating alphanumeric terms in an index into their numeric equivalents using mapping information corresponding to a standard telephone handset. *See* Pet. 36–39.

Second, the ’696 patent claims do not recite the term “prefix” nor are “prefixes” discussed in the specification. Rather, claim 1 recites “associating subsets of content items with corresponding strings of one or more overloaded keys of a keypad so that the subsets of content items are directly mapped to the corresponding strings” and “selecting and presenting . . . the subsets of content items that is associated with the . . . overloaded key based on the direct mapping.” Ex. 1001, 7:63–66, 8:8–10. Thus, Patent Owner’s arguments that the claims “require mapping content items directly to corresponding *prefix* strings made up of overloaded keys,” and Smith’s index “does not include *prefixes*,” are flawed substantively. *See* PO Resp. 43–44 (emphasis added). Moreover, Petitioner relies on Gross, not Smith, to teach incremental searching (i.e., the use of individual characters or prefixes of search terms to return results). *See, e.g.*, Pet. 36–37 (citing Ex. 1003 ¶ 51). Thus, Patent Owner’s criticism that Smith does not include prefixes is misplaced.

Furthermore, Smith recognizes that a single alphanumeric character term can correspond to a particular location document. Figure 4A of Smith, shown below, illustrates such an alphanumeric index.

TERM	LOCATION (DOCUMENT)
3	DOCUMENT 1
BAR	DOCUMENT 3
CAR	DOCUMENT 1
CHAMPAGNE	DOCUMENT 3
ITEMS	DOCUMENT 3
RENTAL	DOCUMENTS 1 AND 2
REPAIR	DOCUMENT 1
VIDEO	DOCUMENT 2
WINE	DOCUMENT 3

Smith's Figure 4A, shown above, provides an example of an index where an individual alphanumeric term "3" corresponds to a particular location, Document 1. Ex. 1004, 4:32–40. Smith also explains that the alphanumeric terms in an index are translated into their numeric equivalents using mapping information corresponding to a standard telephone (overloaded) handset. *Id.* at 5:4–7. For example, Smith explains, the alphanumeric term "car" is translated by mapping separately the letter "c" to

the number “2,” the letter “a” to the number “2,” and mapping the letter “r” to the number “7.” *Id.* at 5:10–13. Figure 5A of Smith shows that after receiving a numeric query (540), and comparing the numeric query to the numeric index (550), a search result is generated based on the comparison (560). Ex. 1004, Fig. 5A, 4:63–65. These teachings of Smith, at the very least, suggest to a person of ordinary skill in the art that Smith’s indexing system is capable of operating using incremental (i.e., single character) searching.

“[T]he [obviousness] analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). “[A]n analysis of obviousness . . . may include recourse to logic, judgment, and common sense available to the person of ordinary skill in the art that do not necessarily require explication in any reference or expert opinion.” *Perfect Web Techs., Inc. v. InfoUSA, Inc.*, 587 F.3d 1324, 1329 (Fed. Cir. 2009).

Given a person of ordinary skill in the art at the time of the claimed invention is a person who has a bachelor’s degree in computer science and at least two years of experience in the field of search-query processing, with experience analyzing, designing, constructing, and/or testing systems that utilize data and/or information search techniques, we are persuaded by Petitioner’s argument and evidence that such a person would have readily 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. *See* Pet. 28–29.

We find, on the basis of the evidence and explanation provided by Petitioner, that the combination of Gross and Smith teaches or suggests the limitation “associating subsets of content items with corresponding strings of one or more overloaded keys of a keypad so that the subsets of content items are directly mapped to the corresponding strings of one or more overloaded keys by a direct mapping, wherein at least one over-loaded key of the one or more overloaded keys is associated with a plurality of alphabetical and/or numerical symbols,” as recited by claim 1 and similarly recited by claim 15.

*b. “ranking content items . . . ;”*

With respect to the recited limitation “ranking content items within at least one of the subsets of content items according to one or more ordering criteria,” Petitioner asserts that Gross teaches that content items mapped to a particular search string can be ranked before a search query is received from a user. Pet. 39. Petitioner relies on Gross’ explanation that a user can specify that a particular attribute (e.g., date/time received for emails) may be used as a default sort key when presenting a list and that, “a pre-computed sort list for a plurality of documents or files, or for every document or file in a selected search tab or interface is stored in high speed local memory RAM, sorted by the current sort order.” Pet. 39–40 (citing Ex.1003 ¶¶ 45, 52–53).

Patent Owner does not contest specifically Petitioner’s evidence with respect to this limitation. *See* PO Resp. 37– 49.

We find, on the basis of the evidence and explanation provided by Petitioner, that Gross teaches or suggests the limitation “ranking content items within at least one of the subsets of content items according to one or

more ordering criteria,” as recited by claim 1 and similarly recited by claim 15.

*c. “subsequent to the associating and ranking . . . ;”*

With respect to the recited limitation “subsequent to the associating and ranking, receiving entry of a first overloaded key,” Petitioner asserts that Gross teaches indexing and pre-sorting before a user search in order to speed up the process for displaying results. Pet. 40–41 (citing Ex. 1003 ¶ 52). Petitioner asserts that Gross’ Figure 4B illustrates Gross’ process for searching files (i.e., “content items”) where the YES line from step 401B indicates receiving entry of a first key at 402B, implying that the recited associating and ranking occurs prior to receiving a first key entry. Pet. 41 (citing Ex. 1003, Fig. 4B, ¶ 118). This is supported by Dr. Fox’s testimony explaining how Gross’ system receives incremental text input from the user for searching and displaying results. *See* Ex. 1006 ¶¶ 98–100.

Patent Owner does not contest Petitioner’s evidence with respect to this limitation. *See* PO Resp. 37–49.

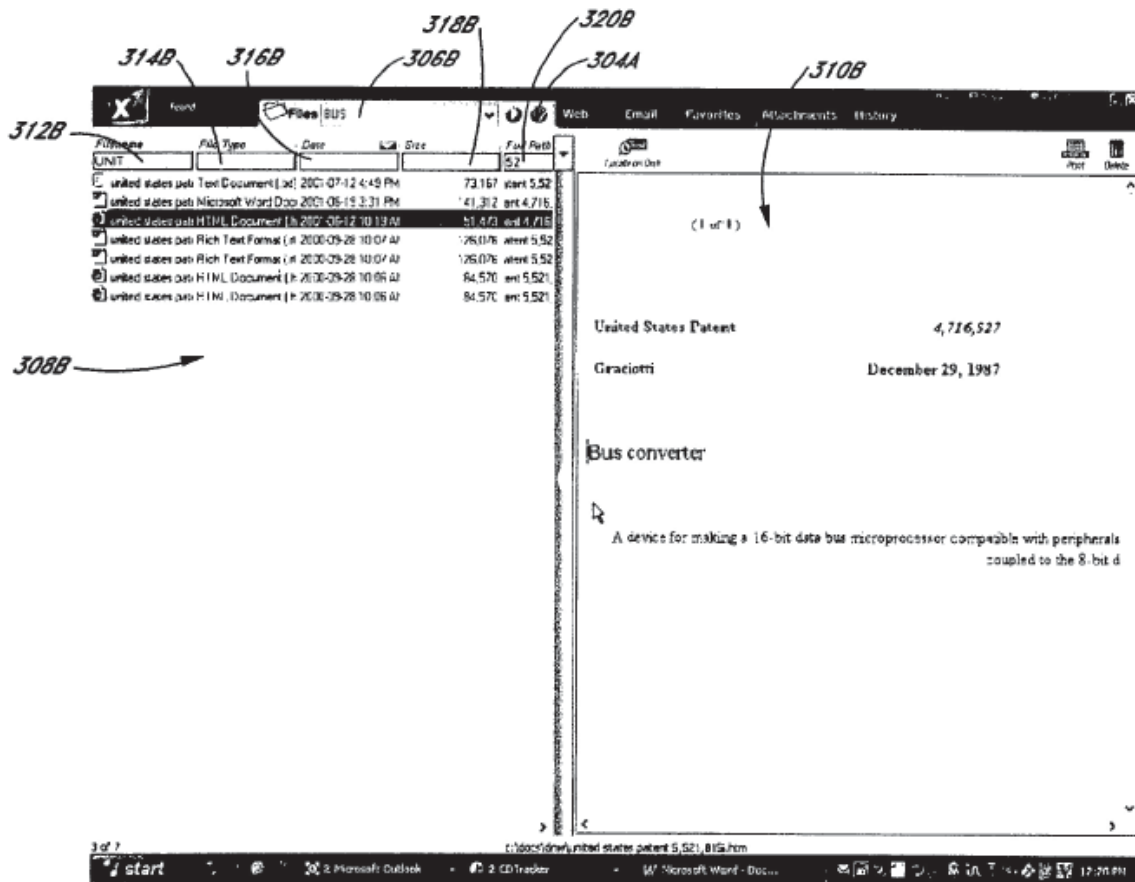
We find, on the basis of the evidence and explanation provided by Petitioner, that Gross teaches or suggests the limitation “subsequent to the associating and ranking, receiving entry of a first overloaded key” recited by claim 1 and similarly recited by claim 15.

*d. “selecting and presenting a first of the subsets . . . ;”*

With respect to the recited limitation “selecting and presenting a first of the subsets of content items that is associated with the first overloaded key based on the direct mapping,” Petitioner asserts that in Gross at step 404B, after the user has entered a single character into the main search field, a search is incrementally performed displaying the search results. Pet. 42



(citing Ex. 1003 ¶ 118; Fig. 4B). Petitioner explains, for example, that in Gross when a user has entered “d” as a first key, the results are displayed in a list pane or area 308B, as shown below in Gross’ Figure 3B. *Id.* (citing Ex. 1003, Fig. 3B).



Gross’ Figure 3B, shown above, depicts panes of a user interface. Petitioner argues that Gross’ displayed results are the recited “content items” associated with the first key based on direct mapping. *Id.* (citing Ex. 1003 ¶ 51). This interpretation is supported by testimony from Dr. Fox. Ex. 1006 ¶¶ 99, 101–102. Dr. Fox explains,

if a user has entered a keystroke corresponding to “d”, the documents, files, emails, etc. (i.e., content items) in Gross that were indexed to the character ‘d’ are provided to a user, since Gross teaches that

individual characters, prefixes, words, or phrases each may be indexed by direct mapping prior to receipt of user entered text.

*Id.* ¶ 102.

Patent Owner does not contest directly Petitioner's evidence with respect to this limitation. *See* PO Resp. 37– 49.

We find, on the basis of the evidence and explanation provided by Petitioner, that Gross teaches or suggests the limitation “selecting and presenting a first of the subsets of content items that is associated with the first overloaded key based on the direct mapping” recited by claim 1 and similarly recited by claim 15.

*e. “subsequent to receiving entry of the first overloaded key . . . ;”*

With respect to recited limitation “subsequent to receiving entry of the first overloaded key, receiving entry of a second overloaded key . . . forming a string with the first overloaded key,” Petitioner relies on Gross' illustration in step 404B that as each additional character is entered, the system incrementally performs a search, i.e., the system receives a second entered key. Pet. 44 (citing Ex. 1003, Fig. 4B). Petitioner explains that for the character string prefix index described in Gross, after receiving “d” (a first key), the system receives “o” (a second key), which forms a string “do” in a search for the word “dog.” *Id.* at 44–45 (citing Ex. 1003 ¶ 51). This explanation is supported by testimony from Dr. Fox. *See* Ex. 1006 ¶ 104.

Patent Owner does not contest Petitioner's evidence with respect to this limitation. *See* PO Resp. 37– 49.

We find, on the basis of the evidence and explanation provided by Petitioner, that Gross teaches or suggests the limitation “subsequent to

receiving entry of the first overloaded key, receiving entry of a second overloaded key the same as or different than the first overloaded key, the second overloaded key forming a string with the first overloaded key” recited by claim 1 and similarly recited by claim 15.

*f. “selecting and presenting a second of the subsets . . . .”*

With respect to the recited limitation “selecting and presenting a second of the subsets of content items . . . based on the direct mapping,” Petitioner relies on Gross’ Figure 4B, explaining that at step 404B after the user has entered the second key to form a two character string (e.g., “do”) into the main search field, a search is incrementally performed, and the list pane or area 308B (Fig. 3B) displays search results for the two-character string index. Pet. 45 (citing Ex. 1003 ¶ 118). Petitioner asserts that key(s) “d” and “do” are separately indexed to documents and files containing the word “dog,” and that these results in Gross represent the recited “content items” associated with the string of the first key and second key based on the mapping. *Id.* (citing Ex. 1003 ¶ 51). This explanation is supported by the testimony of Dr. Fox. Ex. 1006 ¶¶ 106–107.

Patent Owner does not contest directly Petitioner’s evidence with respect to this limitation. *See* PO Resp. 37–49.

We find, on the basis of the evidence and explanation provided by Petitioner, that Gross teaches or suggests the limitation “selecting and presenting a second of the subsets of content items that is associated with the string of overloaded keys formed by the first overloaded key and the second overloaded key based on the direct mapping” recited by claim 1 and similarly recited by claim 15.

- g. *“one or more computer memories collectively storing content items and instructions configured to cause one or more processors to control performance of a method comprising:...”*

As noted above, independent claim 15 is substantially similar to independent claim 1. Claim 15 is directed to a system including computer memories storing program code for implementing the steps in one or more processors. Petitioner argues Gross discloses that functions “are preferably performed by executable code and instructions running on one or more general-purpose computers. But the present invention can also be implemented using special purpose computers, state machines, and/or hardwired electronic circuits.” Pet. 55 (citing Ex. 1003 ¶ 33). Petitioner argues the same steps implemented in claim 1 are, therefore, implemented in program code in claim 15. *Id.* at 56.

Patent Owner does not address specifically Petitioner’s arguments or evidence regarding the particular limitations of independent claim 15.

We find, on the basis of the evidence and explanation provided by Petitioner, that Gross teaches or suggests the limitation “one or more computer memories collectively storing content items and instructions configured to cause one or more processors to control performance of a method comprising” recited by independent claim 15.

*h. Conclusion on limitations of claims 1 and 15*

For all the reasons stated above, we are persuaded that Petitioner has shown by a preponderance of the evidence that the combination of Gross and Smith teaches all the limitations of independent claims 1 and 15.

## *2. Motivation to Combine Gross and Smith*

Petitioner asserts that a person of ordinary skill in the art would have been motivated to modify Gross' method and its implementation on a wireless phone to be used with an overloaded keypad and the numeric indexing system of Smith in order to improve the relevant search results in response to an ambiguous search query, thus allowing the user to more quickly find the content the user desires to view, and enhancing the user experience. Pet. 28–29 (citing Ex. 1006 ¶¶ 88–94).

Petitioner argues a person of ordinary skill in the art would have found it obvious to incorporate the prefix indexing system and method described by Gross with the overloaded keypad environment with a numeric index taught by Smith by substituting the single-character and prefix alphanumeric indexes of Gross with the numeric indexes (that correspond to alphanumeric indexes) of Smith. *Id.* at 29. Such a combination, Petitioner argues, would not require any changes in Gross' and Smith's respective functions, and the combination would yield nothing more than predictable results. *Id.* (citing Ex. 1006 ¶¶ 92–94).

Petitioner argues skilled artisans would have known it was routine to provide searches in an overloaded keypad environment. *Id.* at 29–30 (citing Ex. 1006 ¶ 93). Therefore, Petitioner argues, a person of ordinary skill would have been motivated to modify Gross, which teaches implementing its alphanumeric indexing and searching on a wireless phone, so that its numeric indexing and searching could be applied to the overloaded keypads commonly found on wireless phones. *Id.*

Petitioner argues a person of ordinary skill would have been capable of combining the system of Gross to include the overloaded keypad search

capabilities of Smith. *Id.* at 30 (citing Ex. 1006 ¶ 92). Petitioner also argues that when modifying the Gross system to operate on the overloaded keyboards that were commonly used at the time of the invention, a person of ordinary skill would have chosen among a number of well-known and obvious approaches, such as the numeric indexing system for an overloaded keypad environment taught in Smith. *Id.* Such a combination, Petitioner argues, would have the anticipated result of implementing the indexing and search system on a computer-networkable wireless phone, as taught by Gross, with an overloaded keypad, as taught by Smith. *Id.*

Patent Owner contends a person of ordinary skill in the art would not have been motivated to combine Gross and Smith because the resulting system would have produced slower, less precise search results. PO Resp. 24–30. Patent Owner argues a person of ordinary skill looking to improve relevance and speed of search results would have instead combined Gross’ prefix-based index with a “multi-tap” key entry system. PO Resp. 30–32. Patent Owner argues a person of ordinary skill would not have combined a system that performs incremental searching (Gross) with a system that purportedly does not support incremental searching (Smith). PO Resp. 32–34.

We disagree with Patent Owner. Patent Owner’s arguments are not focused so much on whether a person of ordinary skill would have been motivated to combine Gross and Smith in the manner suggested by Petitioner, as they are on whether the proposed combination would have worked as well as expected (e.g., “the resulting system would have produced less precise search results”). PO Resp. 24–28. Patent Owner does not appear to be arguing that there is some technological incompatibility that

would prohibit combining Gross and Smith as Petitioner has proposed. Rather, Patent Owner appears to be arguing that the efficiency of the resulting system would not be as high as expected and that there might be more effective ways of improving Gross. However, merely because some other 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 at the time of the invention. *See In re Mouttet*, 686 F.3d 1322, 1334 (Fed. Cir. 2012) (“[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.”).

Moreover, Patent Owner’s arguments that Petitioner’s proposed combination would have frustrated Gross’ ability to provide incremental search results is based on an apparent misinterpretation of Petitioner’s proposed combination. *See* PO Resp. 32–34. Patent Owner narrowly and repeatedly focuses on a single phrase in the Petition, rather than considering Petitioner’s evidence and arguments in their entirety. Patent Owner ignores Petitioner’s assertion that “a POSA would have found it obvious *to incorporate the prefix indexing system and method described by Gross with the overloaded keypad environment with a numeric index taught by Smith*” (Pet. 29, emphasis added), and instead “speculate[s] that Petitioner proposes to have the indexing system of Gross replaced by the numeric indexing scheme of Smith” ( PO Resp. 22), allegedly resulting in a system that

“would have frustrated Gross’s ability to provide incremental search results” ( PO Resp. 32).

Full consideration of Petitioner’s evidence and arguments shows consistently that Petitioner is instead proposing to “modify the method and its implementation on a wireless phone described by Gross *to be used* on an overloaded keypad *with* the numeric indexing system of Smith” by “*incorporat[ing] the prefix indexing system and method described by Gross* with the overloaded keypad environment with a numeric index taught by Smith.” Pet. 29 (emphasis added). “A [person of ordinary skill in the art] would have been motivated to modify Gross so that its numeric indexing and searching *could be applied* to the overloaded keypads commonly found on wireless phones.” *Id.* at 30 (emphasis added). “Such a combination would have the anticipated result of *implementing the indexing and search system on a computer-networkable wireless phone, as taught by Gross, with an* overloaded keypad, as taught by Smith.” *Id.* (emphasis added).

As discussed *supra*, Gross teaches or suggests all the limitations of the independent claims except for the recited “overloaded keys of a keypad.” Gross explains, however, that its indexed strings can be strings that are input to a “computer-networkable wireless phone.” Ex. 1003 ¶ 60. As Dr. Fox testifies, a person of ordinary skill would have known that many computer-networkable wireless phone keypads at the time of the invention were non-full keyboard input devices where a single key would actually be an input for multiple characters, i.e., overloaded keys. Ex. 1006 ¶ 88. Indeed, the ’696 patent recognizes that such overloaded keypads were prior art. *See* Ex. 1001, Fig. 1, 1:32–40. Smith teaches using just such an overloaded keypad “[for the purpose of] providing relevant search results in response to



an ambiguous search query.” Ex. 1004, 1:65–2:3; *see also id.*, Fig. 5b, 5:3–13.

There is no dispute in this case that Gross, Smith, and overloaded keypads are all prior art. Petitioner has articulated clearly a motivation to combine Gross and Smith in the manner proffered by Petitioner—modify Gross to include, as suggested by Gross and as taught by Smith, a set of overloaded keys as the input device. Pet. 37–39. A person of ordinary skill would have had a reason, the knowledge, and the skills to modify Gross’ “computer-networkable wireless phone,” (Ex. 1003 ¶ 60), so that strings could be input using an overloaded keypad (Ex. 1006 ¶¶ 90–94). Thus, Petitioner’s proposed combination appears to be the predictable use of prior art elements according to their established functions. *See KSR*, 550 U.S. at 417. Gross’ incremental prefix searching is retained, and the mappings of content items to key sequences correlated with the alphanumeric search strings are extended (via Smith) to apply to numeric overloaded keys (0-9). *See* Ex. 1006 ¶¶ 88–93; Ex. 1009 ¶¶ 12–17.

For all the reasons stated above, we are persuaded that Petitioner has shown by a preponderance of the evidence that a person of ordinary skill in the art at the time of the invention would have been motivated to combine Gross and Smith in the manner proffered by Petitioner.

### *3. Dependent Claims 2–10, 12–14, 16–24, and 26–31*

Petitioner contends that dependent claims 2–10, 12–14, 16–24, and 26–31 are obvious over the combined teachings of Gross and Smith. Pet. 47–58. Patent Owner does not address specifically Petitioner’s evidence or arguments concerning these dependent claims.

*a. Dependent Claim 2*

Claim 2 recites “[t]he method of claim 1 wherein said one or more ordering criteria include one or more of: temporal relevance, location relevance, popularity, personal preferences and/or character count.” Petitioner argues Gross teaches personal preferences, where Gross explains “[w]ith respect to Internet, email, file, or other searches, the user can optionally specify that only search results that are likely to be relevant are to be displayed.” Pet. 47 (citing Ex. 1003 ¶ 81). Petitioner argues Gross’ pre-computed sort list of search results is stored before character entry, and thus the personal preferences of a user are taken into account, such as by an attribute for ordering index results by a title field. *Id.* (citing Ex. 1003 ¶ 74; Ex. 1006 ¶¶ 109–110). Petitioner argues Gross also teaches pre-sorting results based on date/time sent for emails (Ex. 1003 ¶¶ 52, 110–115), which, Petitioner argues, corresponds to the recited “temporal relevance.” *Id.* (citing Ex. 1006 ¶ 111).

As noted *supra*, Patent Owner does not address specifically Petitioner’s evidence or arguments concerning dependent claim 2.

We find, on the basis of the evidence and explanation provided by Petitioner, that the combination of Gross and Smith teaches or suggests all the limitations of dependent claim 2.

*b. Dependent Claim 3*

Claim 3 recites “[t]he method of claim 1 wherein associating the subsets of content items with the corresponding strings of one or more overloaded keys comprises indexing said content items by performing a many-to-many mapping wherein a descriptor associated with a content item is mapped to a candidate string of one or more overloaded keys if the

candidate string corresponds to an alpha-numeric string that matches the descriptor.”

Petitioner argues Gross discloses character prefixes and complete-word indexes containing information indicating what documents or files contain a word or character string. Pet. 48 (citing Ex. 1003 ¶ 51). Petitioner also argues Gross teaches that indexing and subsequent searching can be based on a specified attribute, such as file name and/or size, i.e., the recited “descriptor.” *Id.* (citing Ex. 1003 ¶ 82; Ex. 1006 ¶ 112).

To the extent Gross fails to explicitly teach the recited “performing a many-to-many mapping . . . mapped to a candidate string of one or more overloaded keys,” Petitioner argues Smith teaches this feature. *Id.* Petitioner argues Smith discloses example search queries (e.g., “227,” “736825”) that result in multiple content items (e.g., “DOCUMENTS 1 AND 3” and “DOCUMENTS 1 AND 2”) in the list. *Id.* (citing Ex. 1004, Figs. 5A and 5C). Smith states, “a search engine’s conventional alphanumeric index is translated into a second index that is ambiguated in the same manner as which the user’s input is ambiguated. The user’s ambiguous search query is compared to this ambiguated index.” Ex. 1004, Abstract. Therefore, Petitioner argues, Smith shows a many-to-many mapping between documents containing a term and different strings of overloaded keys corresponding to those terms. *Id.* at 49 (citing Ex. 1006 ¶¶ 113–114).

Petitioner argues a person of ordinary skill would have understood that when the combined indexing method of Gross and Smith was performed, multiple content items would have been mapped to a particular candidate string, and multiple candidate strings would have been mapped to

a particular content item— thus, resulting in the recited “many-to-many mapping.” *Id.* (citing Ex. 1006 ¶ 114).

As noted *supra*, Patent Owner does not address specifically Petitioner’s evidence or arguments concerning dependent claim 3.

We find, on the basis of the evidence and explanation provided by Petitioner, that the combination of Gross and Smith teaches or suggests all the limitations of dependent claim 3.

*c. Dependent Claim 4*

Claim 4 recites “[t]he method of claim 1 wherein a user presses the first overloaded key to cause the entry of the first overloaded key.” Petitioner argues that in Figure 4B, Gross shows that the system waits for a user input at step 401B. Pet. 49. This input, Petitioner argues, could be received as a user presses keys to enter a search character string into the main search field. *Id.* (Ex. 1003, Fig. 4B; Ex. 1006 ¶ 115).

Petitioner argues a person of ordinary skill would have been motivated to combine Gross’s alphanumeric prefix indexing system on a wireless phone with Smith’s overloaded keypad environment with numeric index translation to provide relevant search results in response to an ambiguous search query. *Id.* at 49–50 (citing Ex. 1004, 2:1–3; Ex. 1006 ¶ 116).

As noted *supra*, Patent Owner does not address specifically Petitioner’s evidence or arguments concerning dependent claim 4.

We find, on the basis of the evidence and explanation provided by Petitioner, that the combination of Gross and Smith teaches or suggests all the limitations of dependent claim 4.

*d. Dependent Claim 5*

Claim 5 recites “[t]he method of claim 1 wherein said method comprises receiving entry of a plurality of overloaded keys corresponding to one or more words in an ordered format, the plurality of overloaded keys comprising the string.” Petitioner argues Gross teaches that multiple words can be entered, and results are based on the exact word sequence in the search entry field, which is the recited “ordered format.” Pet. 50. Gross states “the user can specify that an exact word match is to be performed.” Ex. 1003 ¶ 172. Petitioner argues Gross teaches an option where a punctuation symbol follows a character string directly, and is followed by a space, e.g., “mark-” so the string is searched as an exact match. Pet. 50. In this case, Petitioner argues, a character string including two words and a space will only match results with the first word preceding the second word. *Id.* (citing Ex. 1006 ¶¶ 117–120). Petitioner argues a person of ordinary skill would have been motivated to implement the ambiguous text query resolution system of Smith in the search system of Gross. *Id.* (citing Ex. 1006 ¶ 121).

As noted *supra*, Patent Owner does not address specifically Petitioner’s evidence or arguments concerning dependent claim 5.

We find, on the basis of the evidence and explanation provided by Petitioner, that the combination of Gross and Smith teaches or suggests all the limitations of dependent claim 5.

*e. Dependent Claim 6*

Claim 6 recites “[t]he method of claim 1 wherein said method comprises receiving entry of a plurality of overloaded keys corresponding to one or more words in an unordered format, the plurality of overloaded keys

comprising the string.” Petitioner argues Gross teaches that a user can use Boolean operations for entry of multiple prefixes in a search, corresponding to the claimed “unordered format.” Pet. 51. Petitioner argues a search entry with Boolean operation(s), e.g., “A AND B,” incrementally searches and provides results of files that include “A” and “B” in the file name whether B or A comes first in the file name, i.e., an unordered format. *Id.* (citing Ex. 1003 ¶¶ 56, 68; Ex. 1006 ¶¶ 122–124). Petitioner argues a person of ordinary skill would have been motivated to implement the ambiguous text query resolution system of Smith in the search system of Gross. *Id.* (citing Ex. 1006 ¶ 125).

As noted *supra*, Patent Owner does not address specifically Petitioner’s evidence or arguments concerning dependent claim 6.

We find, on the basis of the evidence and explanation provided by Petitioner, that the combination of Gross and Smith teaches or suggests all the limitations of dependent claim 6.

*f. Dependent Claim 7*

Claim 7 recites “[t]he method of claim 1 wherein said string represents at least part of a first word and a second word separated by a word separator.” Petitioner argues Gross discloses entry of “Joh Do,” which is at least part of two words, “Joh” and “Do,” separated by a space, i.e., a word separator. Pet. 51 (citing Ex. 1003 ¶ 150; Ex. 1006 ¶¶ 126–127).

As noted *supra*, Patent Owner does not address specifically Petitioner’s evidence or arguments concerning dependent claim 7.

We find, on the basis of the evidence and explanation provided by Petitioner, that the combination of Gross and Smith teaches or suggests all the limitations of dependent claim 7.

*g. Dependent Claim 8*

Claim 8 recites “[t]he method of claim 1 wherein said string of overloaded keys is processed by a server system remote from a user.” Petitioner argues Gross discloses that its search system may be implemented by a server-based search application. Pet. 52 (citing Ex. 1003 ¶ 35, Figs. 5–6). Petitioner argues a user can access the search functionality using a thin client without the need to download to or otherwise store the search application on the user’s terminal. *Id.* (citing Ex. 1003 ¶ 173). When the overloaded keys of Smith are incorporated into Gross’s server-based search method, Petitioner argues, they would be processed at the server, i.e., “said string of overloaded keys is processed by a server system remote from a user.” *Id.* (citing Ex. 1006 ¶ 128).

As noted *supra*, Patent Owner does not address specifically Petitioner’s evidence or arguments concerning dependent claim 8.

We find, on the basis of the evidence and explanation provided by Petitioner, that the combination of Gross and Smith teaches or suggests all the limitations of dependent claim 8.

*h. Dependent Claim 9*

Claim 9 recites “[t]he method of claim 1 wherein said string of overloaded keys is processed by a device operated by a user.” Petitioner argues Gross teaches that its search system may be implemented by a client-based search application (Ex. 1003 ¶ 35, Figs. 5–6), where indexing and searching are implemented on the user’s terminal 104. Pet. 52 (citing Ex. 1003 ¶ 38). Furthermore, Petitioner argues, when the overloaded keys of Smith are incorporated into Gross’ client-based search method, they would be processed at the user terminal, i.e., the recited “said string of

overloaded keys is processed by a device operated by a user.” *Id.* (citing Ex. 1006 ¶ 129).

As noted *supra*, Patent Owner does not address specifically Petitioner’s evidence or arguments concerning dependent claim 9.

We find, on the basis of the evidence and explanation provided by Petitioner, that the combination of Gross and Smith teaches or suggests all the limitations of dependent claim 9.

*i. Dependent Claim 10*

Claim 10 recites “[t]he method of claim 1 further comprising determining descriptors relating to the content items, wherein the second subset of content items comprises one or more content items each having a descriptor matching the string.” Petitioner argues Gross teaches that indexing and subsequent searching can be based on a specified attribute, such as file name and/or size, i.e., “determining descriptors relating to the content items.” Pet. 53 (citing Ex. 1003 ¶ 82). Thus, Petitioner argues, the results for a string of two keys, such as “do,” would be files each having a file name matching the string “do”, i.e., the recited “second subset of content items comprises one or more content items each having a descriptor matching the string.” *Id.* (citing Ex. 1003 ¶ 40; Ex. 1006 ¶¶ 130–131).

As noted *supra*, Patent Owner does not address specifically Petitioner’s evidence or arguments concerning dependent claim 10.

We find, on the basis of the evidence and explanation provided by Petitioner, that the combination of Gross and Smith teaches or suggests all the limitations of dependent claim 10.



*j. Dependent Claim 12*

Claim 12 recites “[t]he method of claim 1 wherein said content items include a product or service.” Petitioner argues Gross explains that commands can be implemented with terms that follow. Pet. 53. Gross states “if the first word or string corresponds to a command word, then the subsequent words or strings are optionally treated as command arguments or terms.” Ex. 1003 ¶ 152. Thus, Petitioner argues, the command “shop” followed by a string corresponds to a command for finding the lowest online price for the product named in the string. Pet. 53 (citing Ex. 1003 ¶ 153). Petitioner argues a person of ordinary skill would have understood that Gross’s description of the command “shop” would result in a search for “a product or service.” *Id.* (citing Ex. 1006 ¶ 132).

As noted *supra*, Patent Owner does not address specifically Petitioner’s evidence or arguments concerning dependent claim 12.

We find, on the basis of the evidence and explanation provided by Petitioner, that the combination of Gross and Smith teaches or suggests all the limitations of dependent claim 12.

*k. Dependent Claim 13*

Claim 13 recites “[t]he method of claim 1 wherein the first overloaded key is entered by a user on the keypad of a cell phone, a PDA or a remote control device for a television.” Petitioner argues Gross teaches a user terminal, which can be “a computer networkable wireless phone.” Pet. 54 (citing Ex. 1003 ¶ 60). Petitioner argues a person of ordinary skill would have known that most computer networkable wireless phones as of the priority date were used in cellular networks and were non-full keyboard input devices where a single key would actually be an input for multiple

characters. *Id.* (citing Ex. 1006 ¶ 133). Petitioner argues it would have been obvious to apply Smith’s entry of search queries involving ambiguous overloaded key entry on a reduced keypad device to the alphanumeric prefix indexing system of Gross. *Id.*

As noted *supra*, Patent Owner does not address specifically Petitioner’s evidence or arguments concerning dependent claim 13.

We find, on the basis of the evidence and explanation provided by Petitioner, that the combination of Gross and Smith teaches or suggests all the limitations of dependent claim 13.

*l. Dependent Claim 14*

Claim 14 recites “[t]he method of claim 1, further comprising using the one or more ordering criteria to update the subsets of content items associated with the corresponding strings of one or more overloaded keys.” Petitioner argues Gross teaches that, “[i]ncremental indexing can be performed in direct response to a user command, continuously, periodically, and/or upon the occurrence of one or more specified conditions, generates and/or updates a corresponding index.” Pet. 54–55 (citing Ex. 1003 ¶ 77). Petitioner argues Gross teaches indexing of prefixes and words to files before user text entry, and because Gross teaches sorting by a default sort key option as part of the pre-configured index, as new content items are added to the system and need to be indexed, the ordering criteria for ranking of content items in the index would be utilized for updating the subsets of content items when adding new content items. *Id.* (citing Ex. 1006 ¶¶ 134–136).

As noted *supra*, Patent Owner does not address specifically Petitioner’s evidence or arguments concerning dependent claim 14.

We find, on the basis of the evidence and explanation provided by Petitioner, that the combination of Gross and Smith teaches or suggests all the limitations of dependent claim 14.

*m. Dependent Claim 29*

Claim 29 recites “[t]he system of claim 15, wherein the one or more computer memories comprise a first computer memory remote from a user causing entry of the first overloaded key, and wherein the first subset of content items is stored on the first computer memory.” Petitioner argues claim 29 limits claim 15 in that the first group of content items is stored in a memory remote from a user, e.g., on a server side. Pet. 56. Petitioner argues Gross teaches that its search system may be implemented by a server-based search application. *Id.* (citing Ex. 1003 ¶ 35, Figs. 5–6). Illustrating a server-based search application, Petitioner argues Figure 5 of Gross includes one or more index and content databases 512, which store subsets of content items, remote from a user terminal 502, and thus shows the recited “first computer memory remote from a user causing entry of the first overloaded key, and wherein the first subset of content items is stored on the first computer memory.” *Id.* at 56–57 (citing Ex. 1006 ¶ 151).

As noted *supra*, Patent Owner does not address specifically Petitioner’s evidence or arguments concerning dependent claim 29.

We find, on the basis of the evidence and explanation provided by Petitioner, that the combination of Gross and Smith teaches or suggests all the limitations of dependent claim 29.

*n. Dependent Claim 30*

Claim 30 recites “[t]he system of claim 15, wherein the one or more computer memories comprise a first computer memory of a device operated

by a user causing entry of the first overloaded key, and wherein the first subset of content items is stored on the first computer memory.” Petitioner argues claim 30 limits claim 15 in that the first group of content items is stored in a memory of a device operated by a user, i.e., on a client side. Pet. 57. Petitioner argues Gross teaches that its search system may be implemented by a client-based search application. *Id.* (citing Ex. 1003 ¶ 35, Fig. 1). Petitioner argues Figure 1 of Gross shows an index 105 at a user terminal 104, which includes the recited “first computer memory of a device operated by a user causing entry of the first overloaded key, and wherein the first subset of content items is stored on the first computer memory.” *Id.* (citing Ex. 1006 ¶ 152).

As noted *supra*, Patent Owner does not address specifically Petitioner’s evidence or arguments concerning dependent claim 30.

We find, on the basis of the evidence and explanation provided by Petitioner, that the combination of Gross and Smith teaches or suggests all the limitations of dependent claim 30.

*o. Dependent Claim 31*

Claim 31 recites “[t]he system of claim 15, wherein said content items comprise information about audio and/or video content.” Petitioner argues Gross teaches that a user can search for content items for services for movie times, i.e., “information about audio and/or video content.” Pet. 58. For example, Petitioner argues, “movies lord” would be a search for the term “lord” as it applies to movie listings, retrieving show times for “Lord of the Rings.” *Id.* (citing Ex. 1003 ¶ 164; Ex. 1006 ¶ 153).

As noted *supra*, Patent Owner does not address specifically Petitioner’s evidence or arguments concerning dependent claim 31.

We find, on the basis of the evidence and explanation provided by Petitioner, that the combination of Gross and Smith teaches or suggests all the limitations of dependent claim 31.

*p. Dependent Claims 16–24 and 26–28*

Claims 16–24 and 26–28 recite limitations substantially similar to dependent claims 2–10 and 12–14, respectively, discussed above. Dependent claims 16–24 and 26–28 do not contain meaningful distinctions compared to their method claim counterparts, claims 2–10 and 12–14, respectively. Petitioner asserts the same arguments for claims 16–24 and 26–28 as they did for claims 2–10 and 12–14 discussed above. *See* Pet. 56 (citing Ex. 1006 ¶¶ 139–150).

Patent Owner does not address specifically Petitioner’s evidence or arguments concerning dependent claims 16–24 and 26–28.

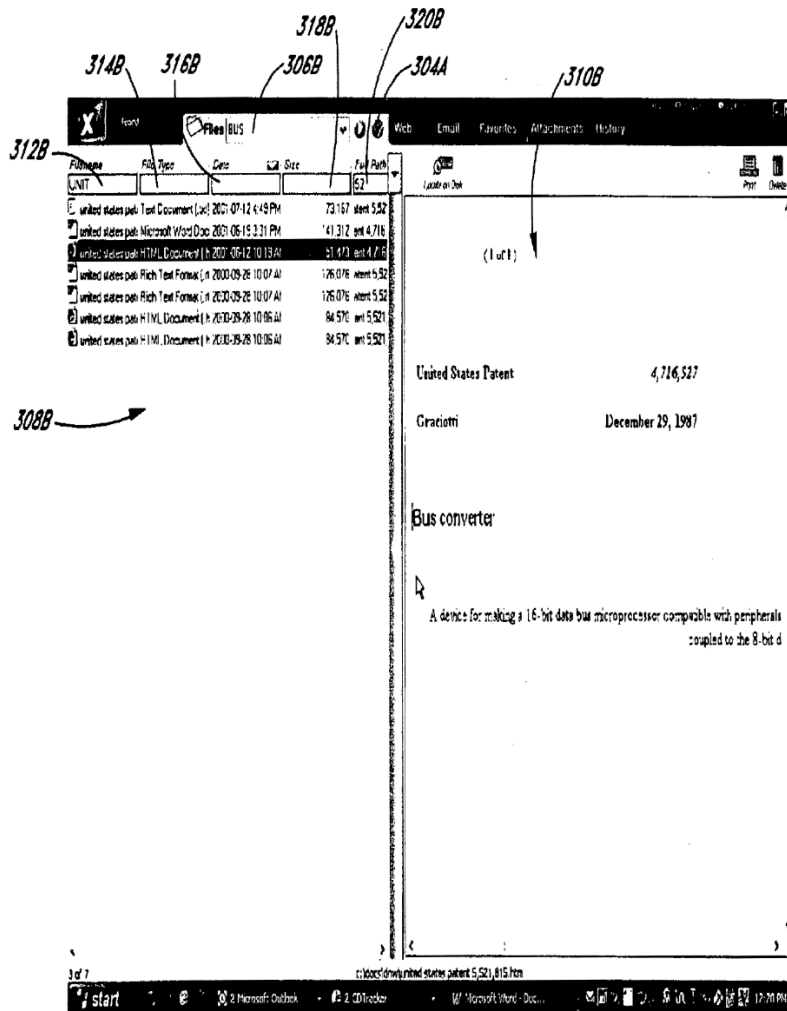
We find, on the basis of the evidence and explanation provided by Petitioner, that the combination of Gross and Smith teaches or suggests all the limitations of dependent claims 16–24 and 26–28.

*F. Obviousness Over Gross, Smith, and Robarts*

Petitioner contends that dependent claims 11 and 25 of the ’696 patent would have been obvious over the combined teachings of Gross, Smith, and Robarts. Pet. 58–60. Claims 11 and 25 recite similar limitations. Claim 11 is representative and is reproduced below.

11. The method of claim 10 wherein said content items comprise a television content item, and wherein a descriptor of the television content item includes title, cast, director, description, and/or keyword information relating to the television content item.

Petitioner asserts that Figure 3B of Gross, reproduced below, shows that “the file search fields can include one or more of a content field, a file name field, a file type field, a date field, a file size field, a path field, an author field, a subject field, and so on.” Pet. 58–59 (citing Ex. 1003 ¶ 74).



Gross’ Figure 3B, shown above, depicts a files search interface page. Petitioner points to Gross’ disclosure that

[i]f the user entered search characters or strings into the main file search field 306B, the entry is received at state 402B. For example, the entry can include one or more of alpha characters, numeric characters,

words and/or phrases that appear in . . . the file name. . . .”

*Id.* at 59 (citing Ex. 1003 ¶ 118 (emphasis added); Ex. 1006 ¶¶ 155–157).

Petitioner argues it would have been obvious to apply the alphanumeric indexing system of specific databases of Gross to Smith’s search queries involving ambiguous overloaded key entry on a reduced keypad device to have the specific database be an EPG database of television content items as taught by Robarts. *Id.*

In view of Robarts, Petitioner argues, it would have been obvious to modify the Gross/Smith combination to similarly search for television programs within an EPG database. *Id.* (citing Ex. 1006 ¶¶ 160–163).

A person of ordinary skill in the art, Petitioner argues, aware that Gross/Smith’s indexing and search system could be applied to specific databases that include video-type files, would have found it advantageous to use known EPG databases (e.g., Robarts’ EPG databases) for indexing and searching for television content items as the specific databases. *Id.* at 60 (citing Ex. 1006 ¶¶ 162–163). Petitioner argues a person of ordinary skill would have found it obvious to try incorporating Robarts’ television content items within an EPG database into Gross/Smith’s prefix indexing and search system of specific databases, and would have pursued this particular solution in light of Gross’ express disclosure of indexing and searching video-file types in a specific database, such as television content items in Robarts’ EPG database. *Id.*

Patent Owner does not argue that Petitioner’s proposed combination of Gross, Smith, and Robarts fails to teach or suggest all of the limitations recited in dependent claims 11 and 25. Rather, Patent Owner argues that a

person of ordinary skill in the art would not have been motivated to combine Gross, Robarts and Smith in the manner proposed. *See* PO Resp. 34–37.

Patent Owner argues that Petitioner has “fail[ed] to consider —let alone explain—why a POSITA would have been motivated to combine Gross (which discloses an incremental search technique) with Smith (which discloses pre-mapping content to whole strings of overloaded keys) in view of Robarts, which describes incremental search and pre-mapping overloaded keys as ‘**alternative**’ techniques.” PO Resp. 34–35 (citing Ex. 2009 ¶¶ 65, 90).

Patent Owner argues that Robarts expressly states that its search technique is an “alternative” to pre-mapping into associated identification numbers (i.e., mapping the letters “MTV” to their corresponding overloaded keys “688”). *Id.* at 36 (citing Ex. 1005, 18:66–19:2). Thus, Patent Owner concludes, “Robarts itself is contemporaneous evidence that a POSITA in the prior art time period and in the field of television interfaces **would not** have combined, and in fact, **did not** combine, an incremental search approach with pre-mapping.” *Id.* (citing Ex. 2009 ¶ 92).

We disagree with Patent Owner. Robarts provides “an electronic program guide (EPG) which enables creation of queries to facilitate simple and complex searches across predefined and arbitrary fields.” Ex. 1005, 3:53–55. Robarts provides users with multiple search capabilities, including both incremental single-character searching and searching using pre-mapped content to overloaded keys. *See e.g.*, Ex. 1005, 17:39–52 (describing incremental searching using a 10-key keypad); 18:66–19:10 (describing searching using pre-mapped identification numbers). Robarts’ search capabilities are not mutually exclusive or technically incompatible as Patent



Owner's argument suggests, but rather optional ways of assisting a user to find the particular program it desires. As Robarts explains,

[s]uppose a viewer wants to watch a particular program or network, but cannot remember what channel it is on . . . the EPG enables the viewer to enter data from the 10-key keypad for both channel numbers or letters in the program or network name. The EPG performs the mapping to identify any program, channel, or network that matches the entered data. . . . An alternative technique to searching on each number or letter is to pre-map the program and network names into associated identification numbers which can be stored as part of the data record in the EPG database.

*Id.* at 17:26–19:2.

Moreover, a reference does not teach away if it merely expresses a general preference for an alternative invention from amongst options available to the ordinarily skilled artisan, where the reference does not discredit or discourage investigation into the invention claimed. *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004).

We find, on the basis of the evidence and explanation provided by Petitioner, that the combination of Gross, Smith, and Robarts teaches or suggests all the limitations of dependent claims 11 and 25.

### III. CONCLUSION

Based on all the evidence of record, we determine that Petitioner has established by a preponderance of the evidence that claims 1–10, 12–24, and 26–31 are unpatentable under 35 U.S.C. § 103(a) as obvious over the combination Gross and Smith. We also determine that Petitioner has established by a preponderance of the evidence that claims 11 and 25 are

unpatentable under 35 U.S.C. § 103(a) as obvious over the combination of Gross, Smith, and Robarts.

#### IV. ORDER

For the reasons given, it is

ORDERED that claims 1–31 of the '696 patent are unpatentable; and

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

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