

Filed on behalf of: Google Inc.

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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Google Inc.  
Petitioner,  
v.  
Network-1 Technologies, Inc.  
Patent Owner.

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Case IPR2015-00348  
U.S. Patent 8,656,441

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**PETITIONER'S REPLY TO**  
**PATENT OWNER'S RESPONSE TO PETITION**

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**EXHIBIT LIST**

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- 1002** Prosecution History of U.S. Patent No. 8,656,441
- 1003** Visual Summary of Petition Grounds
- 1004** December 3, 2014 Declaration of Dr. Pierre Moulin
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- 1006** Sunil Arya, et al., "An Optimal Algorithm for Approximate Nearest Neighbor Searching in Fixed Dimensions" ("Arya")
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- 1008** U.S. Patent No. 7,444,353 ("Chen")
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- 1010** U.S. Patent No. 5,874,686 ("Ghias")
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- 1015** U.S. Patent No. 7,743,092 ("Wood")
- 1016** Prosecution History of U.S. Patent App. No. 09/438,469
- 1017** Timo Raita, "Tuning the Boyer–Moore–Horspool String Searching Algorithm"
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- 1019** Plaintiff Network-1 Technologies, Inc.'s Responses to Defendants Google, Inc. and YouTube, LLC's First Set of Interrogatories (Nos.

1–4) in *Network-1 Technologies, Inc. v. Google, Inc., et al.*  
(S.D.N.Y. Case No. 14-cv-2396-PGG)

- 1020** Transcript of the November 12, 2015 Deposition of Dr. George Karypis
- 1021** U.S. Patent No. 8,010,988 to Cox

## I. INTRODUCTION

The Board has instituted *Inter Partes* Review of U.S. Patent No. 8,656,441 ("the '441 Patent") (Ex. 1001) on the grounds that claims **1–3**, 6, 8–12, **13–14**, 18, 19, 21–24, **25–27**, 29 and 30 (independent claims bolded) are anticipated and/or obvious in view of U.S. Patent Nos. 5,874,686 ("Ghias"), 6,098,106 ("Philyaw"), and 6,970,886 ("Conwell"), as summarized in the following table:

Ground	'441 Patent Claims	Grounds for Trial
A	<b>1–3</b> , 6, 8–12, <b>13–14</b> , 19, 21–24, <b>25–26</b> , and 30	Anticipated by Conwell
B	<b>1–3</b> , 8, 10–12, <b>13–14</b> , 18, 19, 21–24, <b>25–27</b> , 29, and 30	Obvious Over Ghias and Philyaw

The parties dispute only whether Conwell and Ghias disclose two elements of independent claims 1, 13, and 25: (1) "non-exhaustive search"; and (2) "neighbor search."<sup>1</sup> Paper No. 17 at 7, 32.

Patent Owner's expert witness concedes that both of these limitations were well known in the prior art. Ex. 1020, 25:22–26:8 (agreeing that "non-exhaustive searching was a concept known in the art"); Ex. 1020, 78:24–79:6 (agreeing that "Dr. Cox doesn't purport to have invented neighbor searching"). Unable to contest

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<sup>1</sup> Patent Owner does not dispute that Philyaw discloses all claim elements for which it is asserted.

the *disclosure* of the prior art, Patent Owner attempts to narrow the claims through improper *interpretation* of the Board's claim constructions. However, there is no support for these narrowing interpretations. The specification does not purport to define—let alone narrow the plain meaning of—the disputed terms.<sup>2</sup> Patent Owner's citations to purported admissions of Dr. Moulin merely confirm uncontroversial facts and or assume at the questioner's instruction—and contrary to Dr. Moulin's opinion—that Patent Owner's incorrect interpretations are correct. *E.g.*, Paper No. 17 at 16 (citing Ex. 2006, 262:20–21 "Under your flawed definition . . ."); Paper No. 17 at 34 (citing Ex. 2006, 327:11–12 (same)).

In reality, Conwell and Ghias disclose all disputed claim limitations, and therefore anticipate and/or render obvious independent claims 1, 13, and 25. Additionally, because Patent Owner does not dispute any further limitations of the instituted dependent claims, Ghias and Iwamura anticipate and/or render obvious all instituted dependent claims for the reasons discussed in the Petition and recognized by the Board in its Institution Decision.

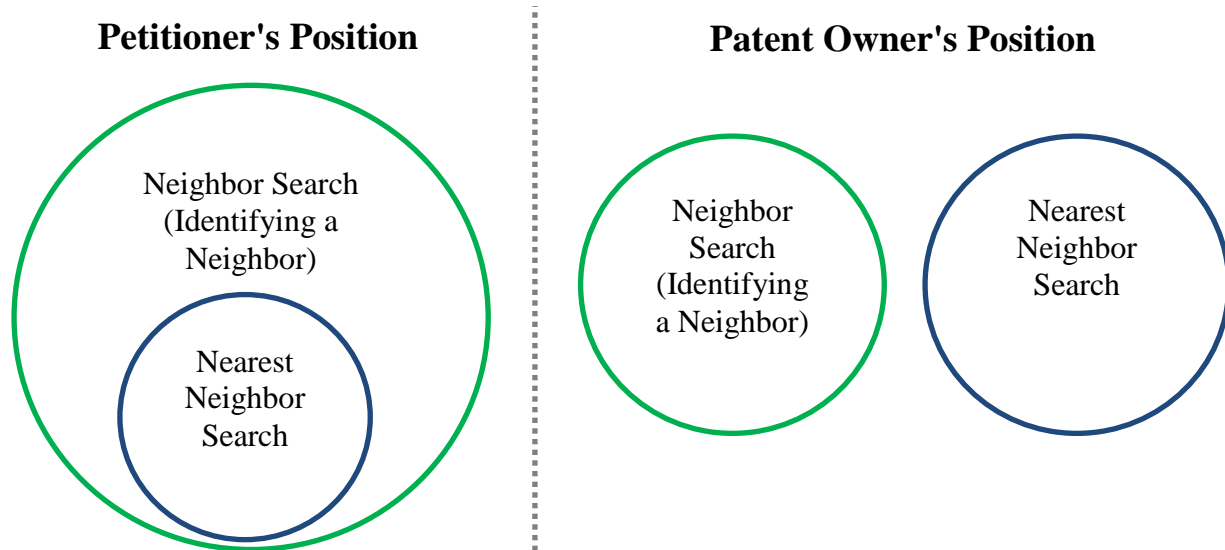
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<sup>2</sup> The specification employs the uncontroversial term "nearest neighbor search," but never employs, let alone defines, the claimed term "neighbor search." *See generally*, Ex. 1001.

## II. CLAIM INTERPRETATION: PATENT OWNER MISINTERPRETS "NEIGHBOR SEARCH"

The parties agree that, in its Institution Decision, the Board correctly construed "neighbor search" to mean "identifying a close, but not necessarily exact or closest, match." Paper No. 6 at 7–8 (emphasis added). Patent Owner contends that the word "necessarily" *narrows* the construction to exclude searches that "necessarily identif[y] an exact or the closest match." Paper No. 17 at 6. This is incorrect. The Board's construction, based on the ordinary usage of the words, must be understood as follows: identifying a close match, *which may be, but does not have to be*, an exact match or the closest match. Patent Owner's interpretation improperly limits the scope of this term in violation of the plain meaning of the Board's words.

Moreover, Patent Owner's interpretation of "neighbor search" would exclude "nearest neighbor searches," in contravention of the claim language. Patent Owner asserts that "neighbor search" excludes searches that "necessarily identif[y] an exact or the closest match." Paper No. 17 at 6; *see* Ex. 2005, 60. The patent defines such searches as "nearest neighbor searches." Ex. 1001, 9:15–16 ("A nearest neighbor search always finds the closest point to the query.") Thus, Patent Owner contends that a "nearest neighbor search" is *not* a "neighbor search," while Petitioner contends that a "nearest neighbor search" is *one form of* "neighbor search."



Patent Owner's position runs counter to the claim language. There is no dispute that the terms "neighbor search" and "identifying a neighbor" are synonymous. Ex. 2005, 60 (recognizing identical constructions of the terms); *Google Inc. v. Network-1 Techs., Inc.*, IPR2015-00347, Paper 17 at 6 (Sept. 18, 2015) ("The Board properly construed *identifying a neighbor* . . . . There are two relevant features of *neighbor search* under this construction[.]"); *compare* Paper No. 6 at 7–8, *with Google Inc. v. Network-1 Techs., Inc.*, IPR2015-00347, Paper 6 at 7–8 (June 23, 2015) (construing the terms identically); *compare* Paper No. 17 at 6–7, *with Google Inc. v. Network-1 Techs., Inc.*, IPR2015-00347, Paper 17 at 6–7 (Sept. 18, 2015) (proposing identical interpretations of the terms). Independent claim 15 of related U.S. Patent No. 8,010,988 ("the '988 Patent") recites "a non-exhaustive search identifying a neighbor." Ex. 1021, Cl. 15 (emphasis added). Claims 18 through 20 of the '988 Patent further recite "The method of claim 15,

wherein the non-exhaustive search [identifying a neighbor] is based on" "kd-trees," "vantage point trees," or "excluded middle vantage point forest[s]." Ex. 1021, Cl. 18–20. Hence, these algorithms constitute "neighbor searches." However, the specification of the '441 Patent identifies the same three algorithms as "nearest neighbor searches." Ex. 1001, 9:8–10, 11:3–4 ("the kd-tree method which finds the nearest neighbor with certainty"); Ex. 1001, 21:50–51 ("vantage point trees will always return a nearest neighbor"), Ex. 1001, 21:43–44 ("Yianilos proposed an excluded middle vantage point forest for nearest neighbor search"). Thus, "neighbor searches" and "nearest neighbor searches" are not mutually exclusive, as Patent Owner contends. Rather, "nearest neighbor searches" are a type of "neighbor search," and Patent Owner's contrary interpretation should be rejected.

### **III. GROUND A: CONWELL ANTICIPATES CLAIMS 1–3, 6, 8–12, 13–14, 19, 21–24, 25–26, 30, 31, AND 34–37**

The Board instituted review on the ground that Conwell anticipates claims 1–3, 6, 8–12, **13–14**, 19, 21–24, **25–26**, and 30 (independent claims bolded). Patent Owner contends that Conwell does not disclose only two elements of independent claims 1, 13, and 25 of the '441 patent: (1) a "neighbor search"; and (2) a "non-exhaustive search." Paper No. 17 at 7. In fact, Conwell discloses both elements and anticipates claims 1, 13, and 25. Patent Owner does not dispute that Conwell discloses all additional limitations of the instituted claims that depend from claims 1, 13, and 25 (claims 2–3, 6, 8–12, 14, 19, 21–24, 26 and 30). Thus, Conwell

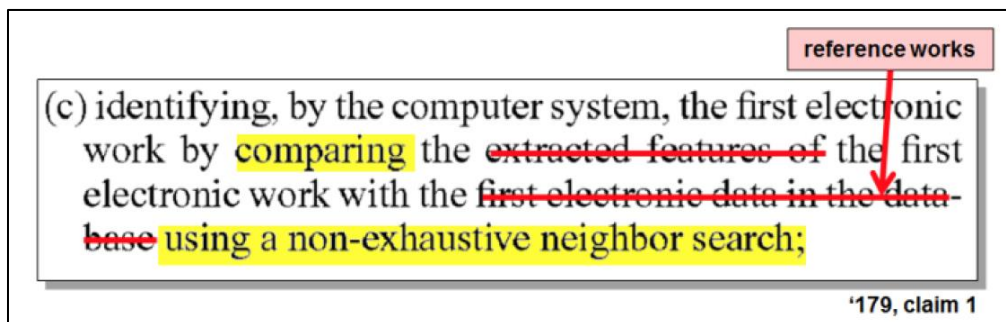
additionally anticipates these dependent claims for the reasons discussed in the Petition and recognized by the Board in its Institution Decision.

**A. Conwell Discloses a "Neighbor Search"**

Patent Owner's argument that Conwell does not disclose a "neighbor search" hinges on an improperly narrow interpretation of the term, which excludes searches that locate near matching works by performing exact match comparisons of extracted features. Paper No. 17 at 9–14. Under the correct interpretation of the Board's construction, because there is no dispute that Conwell locates near matching works, there can be no dispute that Conwell discloses a "neighbor search."

**1. Patent Owner's Interpretation Conflicts with the Claims**

Patent Owner contends that reading "neighbor search" to encompass exact match comparisons amounts to rewriting the claim language to recite comparing *works*, rather than comparing extracted *features*. Paper No. 17 at 8–10. In support, Patent Owner portrays the Board's position as a heavy markup of the claims, striking and substituting key limitations:



Paper No. 17 at 10. However, this markup blatantly ignores the claim language and the Board's actual position. In fact, the unaltered claim language recites *identifying* a work by *comparing* extracted features:

(c) *identifying*, by the computer system, the first electronic work by *comparing* the extracted features of the first electronic work with the first electronic data in the database using a non-exhaustive neighbor search;

Ex. 1001, Cl. 1 (emphasis added). That is, an algorithm that *identifies* a near matching work is a "neighbor search" even if it operates by *comparing* extracted features. In apparent recognition of this fact, Dr. Karypis repeatedly reproduces a cropped version of the claim language omitting the dispositive "identifying . . . a work" language.

work by comparing the extracted features of the first electronic work with the first electronic data in the data- base using a non-exhaustive neighbor search;
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Ex. 2005, ¶¶ 354, 355; *see* Ex. 2005, ¶ 412. Read in its entirety, the claim language that Patent Owner points to actually proves Petitioner's point.

## **2. Patent Owner's Proposed Limitation Contradicts the Purpose of the '441 Patent**

In the absence of claim language to the contrary, "neighbor search" should be interpreted broadly in accordance with the stated purpose of the patent: identifying a near matching *work*. Contrary to Patent Owner's interpretation, the patent never

discloses the goal of identifying similar "extracted features," only identifying similar "works," e.g.:

- "the present invention concerns identifying a work," Ex. 1001, 1:49–50;
- "[t]he present invention may involve novel methods, apparatus and data structures for identifying works," Ex. 1001, 5:26–27; and
- "[t]he present invention functions to identify a work," Ex. 1001, 5:43.

Most importantly, the language of the independent claims at issue explicitly recites "identifying . . . the first electronic work . . . using a . . . neighbor search." Ex. 1001, Cl. 1; *see also* Ex. 1001, Cl. 13 ("identifying . . . a matching reference electronic work"); Ex. 1001, Cl. 25 (same). While the claims further require performing this identification by "comparing . . . extracted features" (Ex. 1001, Cl. 1; *see* Ex. 1001, Cl. 13, 25), there is no basis to conclude that this comparison must exclude an exact match of extracted features, especially where an exact match would achieve the stated purpose of identifying a similar work.

Thus, the specification supports the Board's determination that "neighbor search" should include searches that locate similar works, even if they achieve this result by locating exact matches of "extracted features."

### **3. Under the Correct Interpretation, Conwell Discloses a "Neighbor Search"**

The parties do not dispute that "the search disclosed in Conwell [has] the result of identifying a neighbor of the work to be identified." Paper No. 17 at 17;

Ex. 2005, ¶ 346; Ex. 1020, 179:2–15; Paper No. 6 at 11–12. Conwell discloses a "hashing algorithm[] by which similar or related, but non-identical, inputs map to the same hash outputs." Ex. 1009, 4:64–5:3; Paper No. 6 at 11–12; Paper No. 17 at 21; Ex. 2005, ¶ 356. Thus, as the Board concluded, "similar, but non-identical, inputs . . . Song A and Song A<sub>1</sub> . . . would produce the same identifier, and . . . the hash table lookup . . . would provide the same URL for both . . . thereby matching both Song A and Song A<sub>1</sub>." Paper No. 6 at 11–12; Paper No. 17 at 21; Ex. 2005, ¶ 360. Thus, if "neighbor search" is interpreted, consistent with the Board's construction and all evidence, to encompass searches identifying a near matching work by performing exact match comparisons of extracted features, then there is no dispute that Conwell discloses this limitation.

**B. Conwell Discloses a "Non-Exhaustive Search"**

There is no dispute that Conwell's search is a "database query" (*e.g.*, Ex. 1009, Abstract; Ex. 1009, Cl. 21; *see* Ex. 2005, ¶ 365; Paper No. 17 at 24), and that, at the time the '441 patent was filed, it was at least "probable" that one skilled in the art would use a non-exhaustive lookup to conduct a database query. Ex. 2005, ¶ 371. Yet Patent Owner argues that because its expert witness *can conceive of* ways to perform a database query exhaustively, Conwell does not disclose a "non-exhaustive search." Paper No. 17 at 24–26. Anticipation does not require *ipsissimis verbis* recitation of claim limitations, however, but rather that the

anticipating reference be considered for what it discloses to persons skilled in the art.

**1. The '441 Specification Confirms a "Database Query" Is a "Non-Exhaustive Search"**

While Patent Owner may be able to imagine an exhaustive database query after the fact, persons skilled in the art at the time the patent was filed understood "database queries" to refer to a non-exhaustive search. Indeed, the '441 specification explains that "databases . . . rely o[n] efficient search to access entries, i.e., they do not perform a linear search." Ex. 1001 at 20:67–21:1 (emphasis added); *see* Ex. 1020, 189:11–19. Patent Owner's expert, Dr. Karypis, acknowledges that "linear search" is a synonym for "exhaustive search."<sup>3</sup> Ex. 1020, 66:6–12; *see* Ex. 1020, 69:22–70:20. Thus, the '441 Patent explicitly teaches that database lookups are not "exhaustive searches." Rather, the patent explains that database lookups commonly employed "binary search" (Ex. 1001, 20:66–21:4), which Dr. Karypis agrees is "non-exhaustive" (Ex. 1020, 186:6–8). Consequently, the patent confirms the Board's ruling that Conwell's disclosure of a database query amounts to a disclosure of a "non-exhaustive search."

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<sup>3</sup> As used in the specification, "linear search" is simply a synonym for a "sequential search" of all records, not a reference to whether or not a work has sublinear time complexity. Ex. 1020, 69:22–70:20.

## 2. Anticipation Does Not Require Ipsissimis Verbis Recital

Patent Owner essentially argues that Conwell cannot disclose a non-exhaustive database query because it does not recite the word "non-exhaustive." This is incorrect. An anticipatory "reference need not satisfy an *ipsissimis verbis* test"; rather, anticipation is established where a reference discloses the elements of a claim *in substance*. *In re Gleave*, 560 F.3d 1331, 1334 (Fed. Cir. 2009). Accordingly, when a "genus is so limited that a person of ordinary skill in the art can 'at once envisage each member of this limited class,' . . . a reference describing the genus anticipates every species within the genus." *Id.* at 1337–38 (citation omitted); *see also In re Schaumann*, 572 F.2d 312, 316–17 (C.C.P.A. 1978) (finding anticipation because the parameters of the specification effectively "embrace[d] a very limited number of compounds," allowing a skilled artisan to envisage the constituent members).

Here, not only would a skilled artisan have been able to envisage the constituent members of the database query "genus" (non-exhaustive and exhaustive), but one would have envisaged a "non-exhaustive" search as the *predominant* form of "database query." *See* Ex. 2005, ¶ 371. Dr. Karypis admits that it was not only possible, but "probable that one skilled in the art could use a non-exhaustive approach to conduct [the database query]." Ex. 2005, ¶ 371. He further acknowledges that the commercially available database software as of the

filing of the Patent was readily configurable to perform "non-exhaustive" database queries. Ex. 1020, 187:3–188:15. Nevertheless, Patent Owner insists that a skilled artisan—with a computer science degree and 3 years of experience in "database systems" and "content retrieval" (Ex. 2005 ¶ 11; Ex. 1020 at 107:9–18; Ex. 1009, 5:58–59)—would respond to instructions to perform a "database query" by robotically implementing a brute force search known to be several orders of magnitude slower than the standard, non-exhaustive "binary search." *See* Ex. 1001, 21:1–4 ("[a] binary search of a 90,000,000-item database requires less than 20 comparisons," but "a linear search will require an average of 45,000,000!" (emphasis added)) The Board should "[n]ot countenance a result which so obviously exalts form over substance." *Schaumann*, 572 F.2d at 317.

#### **IV. GROUND B: GHIAS AND PHILYAW RENDER OBVIOUS CLAIMS 1–3, 8, 10–12, 13–14, 18, 19, 21–24, 25–27, 29, AND 30**

The Board further instituted review on the ground that Ghias and Philyaw render obvious claims **1–3, 8, 10–12, 13–14, 18, 19, 21–24, 25–27, 29, and 30** (independent claims bolded). Patent Owner contends that Ghias does not disclose only two elements of independent claims 1, 13, and 25: (1) "non-exhaustive search"; and (2) "neighbor search."<sup>4</sup> Paper No. 17 at 32. In fact, Ghias discloses

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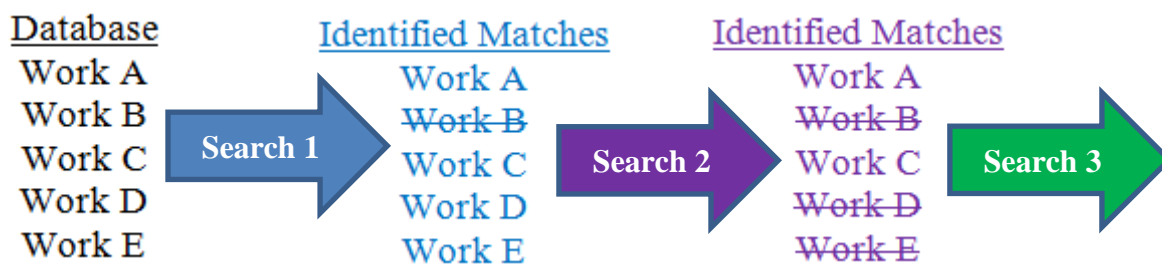
<sup>4</sup> Patent Owner does not dispute that Philyaw discloses all claim elements for which it is asserted.

these elements and therefore the combination of Ghias and Philyaw renders obvious independent claims 1, 13, and 25. Patent Owner does not dispute that Ghias and Philyaw disclose all additional limitations of the instituted claims that depend from claims 1, 13, and 25 (claims 2–3, 8, 10–12, 14, 18, 19, 21–24, 26–27, 29, and 30). Thus, Ghias and Philyaw additionally render obvious all instituted dependent claims for the reasons discussed in the Petition and recognized by the Board in its Institution Decision.

**A. Ghias Discloses "Non-Exhaustive Search"**

**1. Ghias's Subsequent Searches Are "Non-Exhaustive"**

Ghias discloses subsequent searches that consider only a subset of all references, and are therefore "non-exhaustive." Specifically, Ghias describes a first search, which considers all reference works, followed by subsequent searches to refine the results, as shown below. Ex. 1010, 7:5–8. "[T]he same search algorithm is applied to [each] 'new query.'" Ex. 2005, ¶ 287. Thus, like the first search, each subsequent search can be further refined with a new query, which in turn will display a more refined "list consisting of songs just retrieved." Ex. 1010, 7:5–8.



The subsequent searches (i.e., Searches 2 and 3 in the above diagram) do not

consider all references, and are "non-exhaustive." *See* Paper No. 6 at 12–13; Ex. 2006, 325:15–22.

Patent Owner argues that the subsequent searches do search all possible matches, because each round of searching "excludes . . . songs that are not possible matches." Paper No. 17 at 40–41. This is false. As Dr. Karypis explains, "the 'new query' . . . disclosed in Ghias must be different from the original query." Ex. 2005, ¶ 287 (emphasis added). Each new query can be any unknown work, even a different song than the previous query, or a different part or version of the same song. Ex. 1020, ¶ 172:5–15; *see also* Ex. 2005, ¶ 287. Moreover, queries based on two different songs—or even two different portions of the same song—can yield entirely different search results. *See* Ex. 1020, 172:19–173:3. The results of a first search for a first query may exclude results that are not matches to the first query, but are matches to a second query. A subsequent search for the second query would not consider these excluded references, and would therefore not compare the second query to all possible matches. As such, the subsequent searches are non-exhaustive.

## **2. Ghias Identifies Its Searches as Non-Exhaustive**

Even if Ghias did not disclose performing subsequent searches of less than all matches, it nevertheless identifies all of its searches—including the first search of the full database—as non-exhaustive. Ghias discloses string matching

algorithms that operate faster than a "brute force search." Paper No. 1, 48 (citing Ex. 1010, 6:23–28 ("Running times have ranged from  $O(mn)$  for the brute force algorithm to" substantially faster.) (emphasis modified)). While these algorithms often compare a query to a single reference, Ghias further discloses that "[p]erformance may . . . be improved by packing all the songs into one file." Ex. 1010, 7:41–45. In this case, the entire search—not just the search of one song—operates faster than "brute force." Because "brute force search" equates to "exhaustive search" (e.g., Ex. 2005, ¶ 82; Ex. 2001, 1; Paper No. 6 at 6–7), and any search other than a "brute force search" (i.e., an "exhaustive search") is a "non-exhaustive search" (e.g., Paper No. 6 at 6–7), Ghias discloses a "non-exhaustive search."

## **B. Ghias Discloses "Neighbor Search"**

### **1. Ghias Discloses "Neighbor Search" Under the Board's Construction**

There is no dispute that Ghias discloses "neighbor search" under the Board's construction, which encompasses searches for near matches, including searches that find the closest match. The parties agree that Ghias discloses returning a "ranked list of approximately matching melodies" (Ex. 1010, 2:50–52 & Fig. 1, 6:60–63), and only dispute whether Ghias always identifies the closest match (Paper No. 17 at 47; Ex. 2005, ¶ 293). Even if Ghias did always identify the closest match, it satisfies the Board's construction of "neighbor search." Ex. 1010, 6:60–7:3.

**2. Ghias Discloses "Neighbor Search" Under Patent Owner's Interpretation of the Board's Construction**

Patent Owner interprets the Board's construction of "neighbor search" to exclude searches that always identify the closest matching work. Even under this improper interpretation, Ghias discloses a "neighbor search" because it does not always identify the closest match.

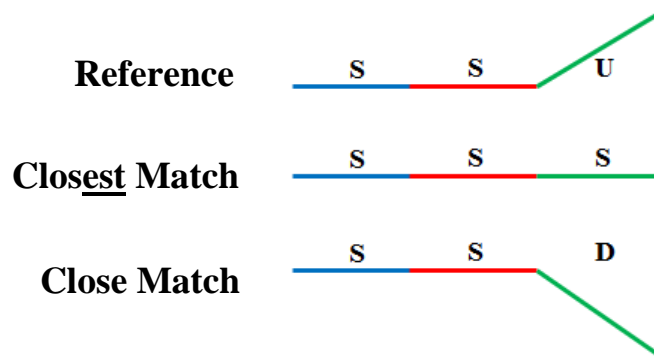
**(a) Ghias's Subsequent Searches Do Not Always Consider the Closest Match**

Ghias' subsequent searches do not always consider, let alone identify, the closest match. Ghias discloses performing a series of searches to refine search results. Ex. 1010, 7:5–8. Each search considers only the results of the previous search. Ex. 1010, 7:5–8. Each search also employs a different query, which may be an entirely different song than the query of the preceding search. Ex. 2005, ¶ 287; Ex. 1020, ¶ 172:5–15. Because searches on different queries can yield completely different sets of potential matches, a first search for a first query may exclude references that are the closest matches to a second query. Ex. 1020, 172:19–173:3. Thus, when Ghias performs a second search on the second query considering only the results of the first search, it may not consider the reference(s) that would be the closest match to the second work. For instance, if Ghias ran a first search to identify Frank Sinatra's *My Way*, it would likely exclude The Beatles' *Twist and Shout* from the list of matches. If Ghias subsequently ran a second

search to identify *Twist and Shout*, that search would consider only the results of the first search, which excluded *Twist and Shout*. The second search would not consider, let alone identify the closest matching reference. Thus, because Ghias locates a close match, but does not always locate the closest match, it discloses "neighbor search" even under Patent Owner's interpretation.

**(b) Ghias Cannot Always Identify the *Closest Match* in a Group of *Close Matches***

Even if Ghias always *located* the closest match, it cannot always "*identify*" the closest of a group of close matches, as Patent Owner's interpretation requires. Ghias compares a query to references using a string matching algorithm that evaluates match quality by the number of character mismatches. Ex. 1010, 6:37–41. However, references with the same number of character mismatches may not be equal quality matches. Melodies are represented as "sequence[s] of relative pitch transitions": (1) "D," meaning "lower than the previous note"; (2) "S," meaning "the same as the previous note"; or (3) "U," meaning "higher than the previous note." Ex. 1010, 3:8–14. As shown below, if "U" (i.e., higher) represents a query melody, "S" (i.e., same) represents smaller deviation from that melody than "D" (i.e., lower). Thus, if "SSU" is a query string, "SSS" is a better match than "SSD."



Dr. Karpis confirmed that Ghias cannot distinguish this quality difference, and will consider both strings "equal quality melodies." *See* Ex. 1020, 164:7–21, 164:25–165:14, 162:21–163:10. Thus, while Ghias may return a list *containing* the closest match (e.g., all references with only one character mismatch), it cannot *identify* which of those matches is the closest.

Patent Owner's interpretation of "neighbor search" does not exclude returning a list that always *contains* the closest match, only one that always "*identifies*" the closest match. Paper No. 17 at 6–7 ("If a search necessarily identifies . . . the closest match . . . it is not a neighbor or near neighbor search.").

As Dr. Karpis confirmed, if a list of matches does not specifically indicate which constituent match is the closest, it has not "identified" the closest match under Patent Owner's interpretation. Ex. 1020, 92:13–93:2. Because Ghias cannot always *identify* the closest match from a list of matches, it discloses a "neighbor search" even under Patent Owner's interpretation.

**V. DR. KARYPIS'S TESTIMONY INCLUDES ATTORNEY  
ARGUMENT WHICH SHOULD BE GIVEN LITTLE WEIGHT**

Dr. Karypis's Declaration is replete with attorney argument presented in the guise of expert testimony, which is entitled to little, if any, weight. *See Gateway Equip. Corp. v. United States*, 247 F. Supp. 2d 299, 317 (W.D.N.Y. 2003) (affording little weight under Rule 702 to legal conclusions submitted as expert opinion); *Ramirez v. Salvation Army*, No. C06-0631 TEH, 2008 WL 670153, at \*13 (N.D. Cal. Mar. 6, 2008) (excluding portions of an expert report that merely "restate[] other evidence, offering argument in the guise of expert opinion"). Dr. Karypis admits that he is not an expert on legal standards and requirements. Ex. 1020, 16:1–17:23. Nevertheless, Dr. Karypis's 292-page declaration includes numerous paragraphs opining on legal issues and drawing legal conclusions, and even asserting that "the Board's preliminary analysis has the relevant burden backwards." Ex. 2005, ¶¶ 128, 155. *See, e.g.*, Ex. 2005, ¶¶ 50–52, 84, 113, 208, 277 (opining on the legal sufficiency of the Petition); Ex. 2005, ¶¶ 279–80, 396, 428 (opining that the Board cannot consider certain evidence). Accordingly, the portions of Dr. Karypis's declaration that merely parrot attorney argument should be afforded no weight.

**VI. THE BOARD MAY CONSIDER ALL ASPECTS OF THE EVIDENCE BEFORE IT AND ALL ARGUMENTS PRESENTED IN PETITIONER'S REPLY**

Patent Owner asserts that, in its Institution Decision, the Board erred by considering uncited passages in the Ghias reference, and warns that the Board must confine its analysis here to "passages from . . . reference[s] that were . . . presented and analyzed in [the] initial Petition." *See* Paper No. 17 at 17–20, 50–54. The Board is not so constrained. Indeed, the Federal Circuit recently affirmed a final Board decision that relied on a related patent not raised in the petition. *Belden Inc. v. Berk-Tek LLC*, 610 Fed. Appx. 997, 1003 (Fed. Cir. 2015). "The very nature of a reply is to respond to the opposition [and] [t]he need for relying on evidence not previously discussed in the Petition may not exist until a certain argument has been raised in the Patent Owner Response." *Nintendo of America Inc. v. Motion Games, LLC*, IPR2014-00164, Paper 51 at 24 (May 15, 2015). Now is Petitioner's only opportunity to reply to Patent Owner's arguments in view of the Board's decision and claim constructions. If Petitioner were limited to the arguments in its Petition, there would be no call to file anything further. Instead, efficient adjudication demands that Petitioner reply fully to both Patent Owner's arguments and the Board's Institution Decision.

The cases cited by Patent Owner do not limit the Board or Petitioner to the specific page and line numbers cited in the Petition, but stand only for the

proposition that a petitioner should not begin anew with a different prima facie case in its reply. *See, e.g., Avaya Inc., v. Network-1*, IPR2013-00071, Paper 103 at 28 (May 22, 2014) (considering new expert analysis to the extent it rebutted the opposing expert); *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd*, IPR2013-00517, Paper 87 at 14, 15 (Feb. 11, 2015) (declining to consider a new argument opposite to that advocated in the petition); *Shaw Indus. Group, Inc. v. Automated Creel Sys., Inc.*, IPR2013-00132 and IPR2013-00584, Paper 44 at 23 (July 24, 2014) (criticizing, but still analyzing, an argument *replacing* a rejected portion of the prima facie case). Contrary to Patent Owner's preemptive admonishments, Petitioner offers no new expert declaration or evidence and is not replacing its prima facie case. Petitioner is simply replying to Patent Owner's arguments and the Board's Institution Decision.

Indeed, the Board may always consider *responsive* arguments, as the Petitioner offers here. *See Canon Inc. v. Intellectual Ventures II LLC*, IPR2014-00631, Paper 50 at 51 (August 19, 2015) (permitting new "arguments in the Reply [that] track the claim constructions and analyses set forth in [the Board's] Decisions to Institute and respond to the claim constructions and arguments in the Patent Owner Response"); *Nintendo*, IPR2014-00164, Paper 51 at 24 (permitting new, responsive arguments in a Reply, and finding it "unreasonable" to expect the petitioner to have included them in the petition anticipatorily); *but see TRW*

*Automotive US LLC v. Magna Elecs. Inc.*, IPR2014-00262, Paper 37 at 9 n.7, 12, 13 (June 25, 2015) (declining to consider a new argument characterizing prior art in view of the patent holder's proposed construction where the petitioner had offered no claim construction previously and should have foreseen the construction dispute given that a district court had adopted the patent holder's construction in a related litigation). Patent Owner's argument that the Board constrain itself to only the arguments and citations in the Petition must be rejected.

## **VII. CONCLUSION**

For the foregoing reasons, Petitioner respectfully requests that the Board declare claims **1**–3, 6, 8–12, **13**–14, 18, 19, 21–24, **25**–27, 29 and 30 of the '441 Patent unpatentable.

Respectfully Submitted,

Date: December 14, 2015

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**§ 42.6(E) – CERTIFICATION OF SERVICE**

Pursuant to 37 C.F.R. § 42.6(e), the undersigned certifies service on Patent Owner of this Petitioner's Reply to Patent Owner's Response to Petition and supporting materials via electronic mail at:

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Pursuant to 37 C.F.R. § 42.6(e), the undersigned further certifies service on Patent Owner's counsel in *Network-1 Technologies, Inc. v. Google Inc., et al.* (S.D.N.Y. Case No. 1:14-cv-2396-PGG; filed April 4, 2014) of this Petitioner's Reply to Patent Owner's Response to Petition and supporting materials counsel via electronic mail at:

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