

2016-2509, -2510, -2511, -2512

**UNITED STATES COURT OF APPEALS
FOR THE FEDERAL CIRCUIT**

GOOGLE LLC,
Appellant,

v.

NETWORK-1 TECHNOLOGIES, INC.,
Appellee

Appeals from the United States Patent and Trademark Office's Patent Trial and Appeal Board, in Case Nos. IPR2015-00343, IPR2015-00345, IPR2015-00347, IPR2015-00348.

**NETWORK-1'S COMBINED PETITION FOR PANEL REHEARING
OR REHEARING EN BANC**

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CERTIFICATE OF INTEREST

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Network-1 Technologies, Inc.

2. The name of the real party in interest (if the party named in the caption is not the real party in interest) represented by us is:

None

3. All parent corporations and any publicly held companies that own 10 percent or more of the stock of any party represented by us are:

None

4. The names of all law firms and the partners or associates that appeared for the party now represented by us in the trial court or are expected to appear in this court are:

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STATEMENT OF COUNSEL

Based on my professional judgment, I believe the panel decision is contrary to the following decisions of the Supreme Court of the United States and the precedents of this Court:

1. Precedent limiting the broadest reasonable interpretation standard:

Microsoft Corp. v. Proxyconn, Inc., 789 F.3d 1292, 1300 (Fed. Cir. 2015); *In re Smith Int'l, Inc.*, 871 F.3d 1375 (Fed. Cir. 2017); *In re Power Integrations, Inc.*, 884 F.3d 1370, 1376 (Fed. Cir. 2018).

2. Precedent requiring deference to the Board's subsidiary factual finding

for claim construction that a term of art has a particular ordinary meaning: *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831 (2015); *Perfect Surgical Techniques, Inc. v. Olympus Am., Inc.*, 841 F.3d 1004, 1012 (Fed. Cir. 2016); *Dickinson v. Zurko*, 527 U.S. 150, 153 (1999).

3. Precedent forbidding an appellate court from findings its own new facts

on appeal: *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 837 (2015); *Apple Inc. v. Samsung Elecs. Co., Ltd.*, 839 F.3d 1034, 1039 (Fed. Cir. 2016); *Fla. Power & Light Co. v. Lorion*, 470 U.S. 729, 744 (1985); *Neomagic Corp. v. Trident Microsystems, Inc.*, 287 F.3d 1062, 1074 (Fed. Cir. 2002).

4. Precedent guaranteeing the due process right to submit evidence to

contest a new factual allegation: *Dell Inc. v. Acceleron, LLC*, 818 F.3d 1293, 1301 (Fed. Cir. 2016); *Yakus v. United States*, 321 U.S. 414, 433 (1944).

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INTRODUCTION AND STATEMENT OF ISSUES

A. Points of law and fact overlooked or misapprehended by the panel.

This was an IPR appeal that turned on construing a term of art, “non-exhaustive search,” in the field of database search algorithms. Appx1554-1558.

For a construction to be the “broadest *reasonable* interpretation,” it must have some support in the intrinsic or extrinsic record. The panel concluded that Google’s broad construction of “non-exhaustive search” was *not* supported by the intrinsic or extrinsic record. Opinion *14 (“In sum, we view both the intrinsic and extrinsic evidence regarding the meaning of the foundational claim term ‘exhaustive’ as inconclusive as to the broader or narrower construction”). Under controlling Federal Circuit law, that lack of support should have ended the issue. *In re Smith Intl.*, 871 F.3d 1375, 1382-83 (Fed. Cir. 2017); *In re Power Integrations, Inc.*, 884 F.3d 1370, 1377 (Fed. Cir. 2018); *Microsoft Corp. v. Proxyconn, Inc.*, 789 F.3d 1292, 1298 (Fed. Cir. 2015). Network-1 quoted this precedent in its brief, at oral argument, and in supplemental authority letters. But the panel’s opinion did not cite or apply it.

Having found nothing in the intrinsic or extrinsic record to support Google’s broad construction, the panel improperly turned to a third source of support: its own de novo fact finding on appeal. The panel grounded its decision on an entirely new and erroneous technical fact, not raised below, about how search

algorithms operate. Opinion *14 (“without considering all data within all possible matches, a search of features is not guaranteed to find an existing match or a near-match”). But “appellate courts must constantly have in mind that their function is not to decide factual issues *de novo*.” *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 837 (2015). If this Court “cannot evaluate the challenged agency action on the basis of the record before it,” the case must be remanded to the Board to hear more evidence and find additional facts. *Fla. Power & Light Co. v. Lorion*, 470 U.S. 729, 744 (1985). The panel’s decision deprived Network-1 of its due process right to contest this newly-raised factual issue by presenting evidence below. *Dell Inc. v. Acceleron, LLC*, 818 F.3d 1293, 1301 (Fed. Cir. 2016).

Moreover, the Board had itself made a factual finding that Google’s construction was “not part of the ordinary meaning,” in the field, of “non-exhaustive search.” Appx1423-1424. When the Board finds that “a certain term of art had a particular meaning to a person of ordinary skill in the art,” this is a “factual finding” that must be accepted on appeal (if supported by substantial evidence). *Teva*, 135 S. Ct. at 841. In conflict with controlling law, the panel did not acknowledge or defer to the Board’s factual finding.

B. The claim construction issue on appeal.

The Board construed “non-exhaustive search” as “a search that locates a match without a comparison of all possible matches.” Appx1422-1424; Appx5-6. When a database is searched, each database entry (i.e., each record) is a possible

match. Appx1508 (¶14); Appx98 at 6:18-54. Applying the Board's construction, a search that compared a song title query to all 1,000,000 entries in a song database would be exhaustive, and a search that used an intelligent algorithm to skip 90% of the songs (comparing only 100,000) would be non-exhaustive.

The Board rejected Google's proposed construction: "a search that locates a match without conducting a brute force comparison of all possible matches, *and all data within all possible matches.*" Appx1422-1424(emphasis added); Appx5-6. This would have made a non-exhaustive search include "any search that does not compare 'all data' in each record, even if the search was a brute force comparison of each record in the database." Appx1423. For example, applying Google's construction, a search that compared a song title to all 1,000,000 entries (all possible matches), but only compared the "title" data within each entry and not the "artist" data, would be a non-exhaustive search.

The Board rejected Google's construction because it had no support in the specification and because the Board made a factual finding that searching "all data within all possible matches" was inconsistent with the ordinary meaning of "exhaustive" in the field. Appx1423-1424. The Board found that "exhaustive" refers to whether a search algorithm compares all possible matches, *not* whether it examines all data within all possible matches. *Id.*

On appeal, the panel reversed and adopted Google’s construction. Opinion *15. This decision is contrary to controlling precedent and misapprehended critical facts.

ARGUMENT

- I. **The panel’s decision conflicts with this Court’s precedent holding that a construction does not satisfy the “broadest reasonable interpretation” standard merely by being broader; to be “reasonable,” a construction must be affirmatively supported in the intrinsic or extrinsic record.**
 - A. **Under controlling precedent, a construction is not “reasonable” merely because it is broader and is not proscribed by the specification; it must also be affirmatively supported in the intrinsic or extrinsic record.**

“Even under the broadest reasonable interpretation” a construction “cannot be divorced from the specification and the record evidence.” *Microsoft Corp. v. Proxyconn, Inc.*, 789 F.3d 1292, 1298 (Fed. Cir. 2015) (internal quotation marks omitted). A construction does not become “reasonable” merely because it is broad and nothing in the record precludes it; to be reasonable, a construction must have affirmative support. “The correct inquiry in giving a claim term its broadest reasonable interpretation in light of the specification is not whether the specification proscribes or precludes some broad reading of the claim term And it is not simply an interpretation that is not inconsistent with the specification. It is an interpretation that corresponds with what and how the inventor describes his invention in the specification....” *In re Smith Intl.*, 871 F.3d 1375, 1382-1383

(Fed. Cir. 2017) (internal quotation marks omitted); *In re Power Integrations, Inc.*, 884 F.3d 1370, 1377 (Fed. Cir. 2018).

Under *Proxyconn*, *Smith*, and *Power Integrations*, this Court cannot reject the Board's construction in favor of a construction that, while broader, lacks any affirmative support in the specification or extrinsic evidence. The panel's decision did not address this controlling law and is in conflict with it.

B. The panel improperly broadened the Board's construction with an "all data within all possible matches" clause unsupported by the specification or extrinsic evidence.

The specification distinguishes exhaustive and non-exhaustive searches *solely* based on whether the search compares all database entries (i.e., all possible matches) and *not* based on the amount of data examined within each entry. The Board found that, while the specification does not use the terms "exhaustive" or "non-exhaustive," it presents contrasting examples of exhaustive and non-exhaustive searches. Appx1423.¹ The specification describes an exhaustive "linear search of all N entries" in a database. Appx100 at 9:3-12; Appx1423. The specification contrasts non-exhaustive "tree" searches that avoid comparing all "N" entries (i.e., avoid comparing all possible matches). Appx100 at 9:13-24; Appx1554. No example even mentions the amount of data searched within each entry. Appx1423-1424; Appx100 at 9:3-24.

¹ These Board findings were supported by substantial evidence and not disputed by Google. Appx1554-1555 (¶¶80-81); Appx1557 (¶85); Blue Brief at 34-35.

Google’s “all data within all possible matches” clause was also unsupported by what the “patent strives” to accomplish with a non-exhaustive search. *In re Power Integrations, Inc.*, 884 F.3d 1370, 1377 (Fed. Cir. 2018). According to the specification, a non-exhaustive search addresses the explosion of the number of database entries (i.e., the number of possible matches). Appx100 at 9:3-36; Appx1554-1555. An exhaustive search of “all N entries” (e.g., “90,000,000” entries) is “computationally very expensive.” Appx100 at 9:6-12; Appx1554-1558; Appx1544-1547; Appx106 at 21:35-39. The patents solved this problem by using intelligent algorithms that non-exhaustively compare only some (not all) entries (i.e., possible matches) to the query. Appx100 at 9:13-36; Appx1554; Appx1132 (¶12). This supported the Board’s construction, which interpreted a non-exhaustive search as one that avoids comparing all database entries and therefore accomplishes what the patents strive to do. But the specification does not support an interpretation that an exhaustive search requires searching all data *within each entry*. Searching more or less data within each entry does nothing to address the problem identified in the specification: the number of entries that must be compared.

After reviewing the specification, the panel correctly concluded that it does not “draw a clear line between ‘exhaustive’ and ‘non-exhaustive’ searching in terms of how much data within a record a search must consider.” Opinion *12. In fact, the specification does not mention “how much data within a record a search

must consider”); it distinguishes exhaustive searches from non-exhaustive searches based solely on whether all possible matches are compared.

The panel then turned to the extrinsic evidence. Opinion *12-*13. Google’s construction had no support there. In fact, it was contrary to the Board’s factual finding on the ordinary meaning of “non-exhaustive” in the field. Appx1423-1424; Appx5-6. As addressed below, failing to acknowledge and defer to this factual finding is a separate ground for rehearing or rehearing en banc. But even when the panel improperly analyzed de novo the extrinsic evidence (a Wikipedia article), it found only that it “does not speak to” Google’s construction (i.e., that it does not affirmatively support it). Opinion *12-*13.²

After reviewing the record, the panel concluded: “in sum, we view both the intrinsic and extrinsic evidence regarding the meaning of the foundational claim term ‘exhaustive’ as inconclusive as to the broader or narrower construction” (i.e., whether to include the “all data within all possible matches” clause). Opinion *12-*14. The panel identified *nothing* that supported Google’s broad construction. The panel merely identified that Google’s construction was not precluded. Under *Smith*, *Power Integrations*, and *Proxycorn*, this was dispositive—Google’s construction was not a “reasonable” construction.

² The panel correctly disregarded the testimony of Google’s expert because the Board discredited it. Appx1423-1424. Google did not appeal this finding and acknowledged that it could not rely on this testimony. Grey Brief at 7 n.7. This was the only evidence in the record that could have affirmatively supported Google’s construction.

This Court's precedent prevents the BRI standard from swallowing patent validity. A patent challenger can always assert *some* broad interpretation that, although not affirmatively supported by the record, is at least not precluded. Because the panel's decision is contrary to this controlling precedent, this case must be reheard or reheard en banc.

II. The panel's decision is contrary to Supreme Court precedent because the panel found an entirely new and critical technical fact on appeal.

A. If this Court concludes that resolving a claim construction dispute requires deciding a new, subsidiary issue of fact that was unaddressed below, this Court cannot perform this fact finding itself and must instead remand to the Board.

“[A]ppellate courts must constantly have in mind that their function is not to decide factual issues *de novo*.” *Teva*, 135 S. Ct. at 837. “The Supreme Court made clear that the factual components [of claim construction] include the background science or the meaning of a term in the relevant art during the relevant time period. After *Teva*, such fact findings are indisputably the province of the district court.” *Apple Inc. v. Samsung Elecs. Co., Ltd.*, 839 F.3d 1034, 1039 (Fed. Cir. 2016) (en banc) (internal punctuation and citations omitted).

If a court “cannot evaluate the challenged agency action on the basis of the record before it, the proper course, except in rare circumstances, is to remand to the agency for additional investigation or explanation. The reviewing court is not generally empowered to conduct a *de novo* inquiry into the matter being reviewed and to reach its own conclusions based on such an inquiry.” *Fla. Power & Light*

Co. v. Lorion, 470 U.S. 729, 744 (1985); *Neomagic Corp. v. Trident Microsystems, Inc.*, 287 F.3d 1062, 1074 (Fed. Cir. 2002) (“this matter can only be resolved by further evidentiary hearings, including expert testimony, before the district court”); *Va. Innovation Scis., Inc. v. Samsung Elecs. Co.*, 614 F. App'x 503, 511 (Fed. Cir. 2015) (non-precedential) (because “the record before us is not sufficiently developed to discern the skilled artisan's understanding of the [claim term]” we “remand to the district court with instructions to further develop the record” by “evaluation of direct and cross-examination testimony from experts showing and explaining usage in the field”); *see also In re Hodges*, 882 F.3d 1107, 1117 (Fed. Cir. 2018) (remanding for additional factual findings on obviousness); *Paice LLC v. Ford Motor Co.*, 881 F.3d 894, 910 (Fed. Cir. 2018) (remanding for additional factual findings on written description). The panel’s decision is contrary to this controlling law.

B. The panel adopted Google’s construction by finding a new and erroneous technical fact on appeal, without remand and without any support in the record.

The panel concluded: “we view both the intrinsic and extrinsic evidence regarding the meaning of the foundational claim term ‘exhaustive’ as inconclusive.” Opinion *14. But instead of remanding to the Board for additional fact finding, the panel looked beyond the record to find a new technical fact on appeal. To conclude that the “all data within all possible matches” clause was “consistent with how the inventor described his invention in the specification in

terms of finding a best match or a best near-match,” the panel found the following new technical fact: “without considering all data within all possible matches, a search of features is not guaranteed to find an existing match or a near-match, or it may stop prematurely before finding one.” Opinion *14.

This is a pure factual issue about how search algorithms work. To support this fact, the panel cited nothing in the intrinsic or extrinsic record and no fact finding by the Board. *Id.* Google did not even assert this “guarantee a match” fact below. In fact, Google’s expert testified to the opposite—that even a “non-exhaustive search” that does *not* consider “all data within each database item” can be “guaranteed to find the best match.” Appx1144-1145 (¶¶42-43).

This “guarantee a match” fact was found solely by the panel on appeal and was based only on a hypothetical search example asserted by Google’s counsel for the first time in appeal briefing. Opinion *14 (“Google’s search examples illustrate this point.”). This was doubly-improper because even an agency or district court empowered to make factual findings cannot rest factual findings solely on attorney argument. “Attorney argument is no substitute for evidence.” *Enzo Biochem v. Gen-Probe, Inc.*, 424 F.3d 1276, 1284 (Fed. Cir. 2005); *Verinata Health, Inc. v. Ariosa Diagnostics, Inc.*, 830 F.3d 1335, 1341 (Fed. Cir. 2016).

Moreover, the panel misinterpreted Google’s search hypothetical and got this technical fact wrong. A search need not examine all data within all records to guarantee a best match or near-match. A properly-designed search algorithm will

stop searching data within a record after it has enough information to definitively rule that record out.

In Google's hypothetical, "a database of court names" is searched for "Federal Circuit." Opinion *14. If this search examines a record and identifies an instance of the string "District" (e.g., "United States District Court for the District of Delaware") it can definitively and accurately eliminate this record as a match without examining any more data after "District." If the algorithm identifies the word "Appeals" (e.g., "United States Court of Appeals for the Federal Circuit"), it would continue checking additional data. But even then, it does not need to examine all data. For example, it can check only the first two letters of each word until it finds the "Fe" in "Federal," and then do the same for the "Ci" in "Circuit." This guarantees a match and will produce no false positives or false negatives. And beyond this example, there are numerous other search techniques that guarantee a match without searching all data (e.g., examining only word strings long enough to potentially match "Federal" and "Circuit").³

³ The panel's example looks for an exactly matching two-word phrase (matching the query "Federal Circuit" to "Federal Circuit" within a record). The same is true for a search algorithm that seeks a near match, e.g., a two-word phrase with one or fewer letters different from the query (like the typo "Federel Circuit"). This algorithm can still eliminate any district court when it first identifies the word "District." For "Appeals" courts, if the algorithm identifies two errors (i.e., incorrect letters) in any two-word phrase (e.g., the "if" in "Fith Circuit"), the algorithm skips the rest of the letters in that phrase (skips "th Circuit"). Despite not examining all data, this search is guaranteed to find the near-match ("Federel Circuit") if it compares all records (i.e., conducts an exhaustive search).

The panel pointed out that, if a search examined the first letter of “Court of Appeals for the Federal Circuit” and stopped, it would “stop prematurely” and fail to identify a match. Opinion *14. But this does not show that a search must consider *all data* to guarantee a match. It shows only that a search must consider *sufficient* data (e.g., it may be insufficient to look at the first letter and quit).

A simple example brings the point home. Someone exhaustively searching a parking lot for their car will stop looking at a particular car (a possible match) if it is the wrong model. This rules that car out. No person (and no computer algorithm) would continue to examine all of this car’s data (e.g., license plate, the interior) after identifying that it’s the wrong model. But this search is guaranteed to find the right car, despite not examining all data within each car.

When this Court introduces a new issue of fact on appeal, and then resolves that issue with its own independent fact finding, the patent owner is deprived of due process, including the opportunity to submit evidence. *Dell Inc. v. Accelaron, LLC*, 818 F.3d 1293, 1301 (Fed. Cir. 2016) (holding that due process, under the APA, requires patent owners have the “opportunity to present evidence” to contest newly alleged facts); *Yakus v. United States*, 321 U.S. 414, 433 (1944). And when the Court finds its own technical facts, based solely on attorney argument and without any evidence, it is likely to get the facts wrong and distort the claimed invention into something it is not. Because this happened here, in conflict with Supreme Court law, this case must be reheard or reheard en banc.

III. The panel’s decision conflicts with Supreme Court precedent by failing to acknowledge and defer to the Board’s factual finding on the ordinary meaning of “non-exhaustive search.”

When the Board finds that “a certain term of art had a particular meaning to a person of ordinary skill in the art,” this is a “factual finding” that must be reviewed under the deferential substantial evidence standard. *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 841 (2015); *Perfect Surgical Techniques, Inc. v. Olympus Am., Inc.*, 841 F.3d 1004, 1012 (Fed. Cir. 2016); 5 U.S.C. §706(2)(E). This deference is required for facts found based “on physical or documentary evidence or inferences from other facts.” *Anderson v. Bessemer City*, 470 U.S. 564, 574 (1985).

The Board made a factual finding that the “all data” clause was “not part of the ordinary meaning” of “non-exhaustive search.” Appx1423. In support, the Board cited a Wikipedia definition as “an example of the ordinary meaning” of “non-exhaustive search.” Appx1423. This article defined an “exhaustive search” as one that checks all “candidates for the solution” (i.e., all possible matches). Appx1423; Appx1393. The Board found that this article showed that Google’s “all data within all possible matches” clause was not part of the “ordinary meaning” of “non-exhaustive search” because the article did not “mention[] the evaluation of all data within each possible match.” Appx1423. By analogy, a definition of “electrocardiogram” will describe graphing the electrical signature of the entire heart and will not mention measuring the electrical potential of every individual

heart cell. This is because measuring every cell is not part of the ordinary meaning of “electrocardiogram.”

In light of this objective evidence, the Board discredited the testimony of Google’s expert that, to one of ordinary skill in the art, “exhaustive” conveys searching all data within all records. Appx1423-1424; Appx1143-1144.

In its Final Written Decision, the Board stated that, after reviewing “the entire record” (which now included testimony from Network-1’s expert, Appx1554-1558), it affirmed its previous findings and construction. Appx6.

On appeal, Network-1 repeatedly identified that the Board made a factual finding on what “non-exhaustive search” means to one of ordinary skill in the art. Red Brief at 2, 14, 17, 20. But the panel’s opinion never acknowledged it. Instead, the panel addressed the Wikipedia article de novo and reached its own opposite factual finding—that the article “does not speak to whether or not a ‘brute force search’ [i.e., exhaustive search] examines all data within a possible match.” Opinion *13. This is contrary to Supreme Court precedent. *Teva*, 135 S. Ct. at 836.

The panel further held that it could disregard the testimony of Network-1’s expert because the Board stated that its decision rested on its “‘review of ... the entire record,’” and did not specifically cite the expert testimony. Opinion *13. This is contrary to controlling law. “Support by substantial evidence is determined on the entirety of the record.” *Siemens Energy, Inc. v. United States*, 806 F.3d

1367, 1369 (Fed. Cir. 2015). The Court must review the “whole record.” 5 U.S.C. §706; *Dickinson v. Zurko*, 527 U.S. 150, 153 (1999). Therefore, when the Board makes a fact finding about the ordinary meaning of a term in the field, review is not limited to the evidence specifically mentioned by the Board; instead, the Board’s finding must stand if substantial evidence is found anywhere within the “entirety of the record.”⁴

In addition, in a footnote, the panel also overlooked an important portion of Network-1’s expert’s testimony. The panel stated that Network-1’s expert “did not ... discuss the amount of data considered within each record.” Opinion *13-14 n.6. But Network-1’s expert had three-pages of testimony specifically explaining why “exhaustive” does not mean comparing “all data within each record.” Appx1556-1558 (¶¶83-88). Network-1’s brief expressly cited this testimony. Red Brief at 10, 22, 27. The panel’s decision simply cited to other pages of Network-1’s expert’s testimony and then erroneously concluded that he had no testimony addressing the “amount of data considered within each record.” Opinion *13-14 n.6 (not acknowledging Appx1556-1558).

⁴ The panel quoted *Cardsoft LLC v. Verifone, Inc.*, 807 F.3d 1346, 1350 (Fed. Cir. 2015), which holds only that a district court construction based solely on “evidence intrinsic to the patent,” and not on any “factual findings,” is reviewed de novo. In contrast, when, as here, the Board makes a factual finding about the ordinary meaning of a term, this finding must stand if supported by substantial evidence in the “whole record,” whether cited or not cited by the Board.

The Board is a forum specifically designed to determine technical facts. “Federal Circuit judges lack the tools that [the Board has] available to resolve factual disputes fairly and accurately.” *Teva*, 135 S. Ct. at 838 (internal quotation marks omitted). When an appellate panel fails to acknowledge the Board’s factual findings and instead attempts to find facts itself, de novo, an error is more likely to result. That is what happened here, resulting in a construction of “non-exhaustive search” inconsistent with its meaning in the field. Because this is contrary to Supreme Court precedent, this case must be reheard or reheard en banc.

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ADDENDUM

NOTE: This disposition is nonprecedential.

**United States Court of Appeals
for the Federal Circuit**

GOOGLE LLC,
Appellant

v.

NETWORK-1 TECHNOLOGIES, INC.,
Appellee

2016-2509, 2016-2510, 2016-2511, 2016-2512

Appeals from the United States Patent and Trade-
mark Office, Patent Trial and Appeal Board in Nos.
IPR2015-00343, IPR2015-00345, IPR2015-00347,
IPR2015-00348.

Decided: March 26, 2018

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argued for appellant. Also represented by ROBERT
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SEAN LUNER, MATTHAEUS MARTINO-WEINHARDT; JUNG

SUK HAHM, CHARLES R. MACEDO, Amster Rothstein & Ebenstein LLP, New York, NY.

Before DYK, SCHALL, and REYNA, *Circuit Judges*.

SCHALL, *Circuit Judge*.

DECISION

Network-1 Technologies, Inc. (“Network-1”), owns U.S. Patent Nos. 8,640,179 (“the ’179 patent”); 8,205,237 (“the ’237 patent”); 8,010,988 (“the ’988 patent”); and 8,656,441 (“the ’441 patent”) (collectively, “the Network-1 Patents”). Network-1 sued Google, Inc. (“Google”) in the United States District Court for the Southern District of New York for infringement of the patents. Subsequently, Google filed petitions with the Patent and Trademark Office (“PTO”) seeking inter partes review (“IPR”) of various claims of the patents under 35 U.S.C. §§ 311–319. The Patent Trial and Appeal Board (“Board”), acting as the delegate of the PTO’s Director under 37 C.F.R. § 42.4(a), instituted reviews and, after conducting the reviews, concluded, in four separate final decisions, that Google had failed to demonstrate either anticipation under 35 U.S.C. § 102 or obviousness under 35 U.S.C. § 103 with respect to most of the reviewed claims. It therefore held that Google had failed to carry its burden of demonstrating that those claims were not patentable.

Google timely appealed each of the Board’s decisions under 35 U.S.C. §§ 141(c) and 319. We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A) and have consolidated the four appeals. Because we conclude that the Board erred in its construction of the claim term “non-exhaustive search,” we (1) *vacate* the Board’s final decisions with respect to the ’179 and ’441 patents; (2) *vacate-in-part* the

Board's final decisions with respect to the '237 and '988 patents; and (3) *remand* all four cases to the Board for further proceedings consistent with this opinion.¹

DISCUSSION

I.

The following claims of the Network-1 Patents are at issue:

Patent	Appealed Claims
'179	1-3, 6, 8-14, 18, 19, 21-27, 29-31, 34-37
'237	25-27, 29, 30
'988	15-16, 21-28, 31-33, 38, 51, 52
'441	1-3, 6, 8-14, 18, 19, 21-27, 29, 30

In its final decision relating to the '179 patent, the Board described the invention that is the subject of the Network-1 Patents:

The '179 Patent relates to identifying a work, such as a digital audio or video file, without the need to modify the work. '179 patent, col. 1, lines 35-40 and col. 4, lines 38-44. This identification can be accomplished through the extraction of features from the work, and comparison of those extracted features with records of a database or library. *Id.* at Abstract. Thereafter, an action may be determined based on the identification determined. *Id.* at col. 4, lines 36-40.

¹ Google does not appeal the Board's determinations regarding independent claims 1, 5, and 33 of the '237 patent and their related dependent claims. It also does not appeal the Board's determination regarding dependent claim 17 of the '988 patent.

Google Inc. v. Network-1 Techs., Inc., IPR2015-00343, 2016 WL 3438931, at *2 (P.T.A.B. June 20, 2016) (“*Final Decision*”).

For purposes of this appeal, the parties agree that claim 1 of the '179 patent is representative of all the claims at issue. That claim reads as follows, with italics added to highlight “non-exhaustive,” the critical claim term:

1. A computer-implemented method comprising:
 - (a) maintaining, by a computer system including at least one computer, a database comprising:
 - (1) first electronic data related to identification of one or more reference electronic works; and
 - (2) second electronic data related to action information comprising an action to perform corresponding to each of the one or more reference electronic works;
 - (b) obtaining, by the computer system, extracted features of a first electronic work;
 - (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;
 - (d) determining, by the computer system, the action information corresponding to the identified first electronic work based on the second electronic data in the database; and
 - (e) associating, by the computer system, the determined action information with the identified first electronic work.

For purposes of this appeal, the parties also agree that the written description of the '179 patent is representative, and that our determination of the correct construction of “non-exhaustive search,” as it appears in claim 1 of the '179 patent, disposes of the claim construction issue in all four of the Network-1 Patents. Google’s Corrected Opening Br. 7 n.1; Network-1’s Br. 5 n.1, 6 n.2. We therefore focus our discussion on the '179 patent.

In its decision instituting review of the '179 patent, the Board construed a “non-exhaustive search” as “a search that locates a match *without* a comparison of all possible matches.” *Google Inc. v. Network-1 Techs., Inc.*, IPR2015-00343, 2015 WL 3902007, at *3–4 (P.T.A.B. June 23, 2015) (“*Institution Decision*”) (emphasis added). In so doing, the Board declined to adopt Google’s construction of the term: “a search that locates a match without conducting a brute force comparison of all possible matches, and all data within all possible matches.” *Institution Decision* at *3. Thereafter, in its final decision with respect to the '179 patent, the Board maintained its construction of “non-exhaustive search.” *Final Decision* at *2. Based upon that construction, the Board determined that Google had failed to demonstrate that the cited prior art rendered the challenged claims of the '179 patent unpatentable as either anticipated or obvious.²

² Since we conclude that the Board erred in its construction of “non-exhaustive search,” and since, for that reason, all four of the Board’s decisions must be remanded for further proceedings under the correct construction of that term, it is not necessary for us discuss the prior art asserted by Google against the Network-1 Patents.

II.

We review an IPR decision under the standards set forth in the Administrative Procedure Act, 5 U.S.C. § 706. *Pride Mobility Prods. Corp. v. Permobil, Inc.*, 818 F.3d 1307, 1313 (Fed. Cir. 2016). We must set aside the Board's decision if it is "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law" or "unsupported by substantial evidence." 5 U.S.C. § 706(2). We review the Board's legal conclusions *de novo* and its factual findings for substantial evidence. *In re Gartside*, 203 F.3d 1305, 1316 (Fed. Cir. 2000). A finding of fact is supported by substantial evidence if a reasonable mind might accept the evidence as adequate support for the finding. *Consol. Edison Co. v. NLRB*, 305 U.S. 197, 229 (1938).

The issue before us is one of claim construction. We review the Board's ultimate construction of claim language *de novo*. *Teva Pharm. USA, Inc. v. Sandoz, Inc.*, 135 S. Ct. 831, 835 (2015). However, when, in construing a claim, the Board reviews extrinsic evidence and makes subsidiary fact findings with respect to that evidence, we review such findings for substantial evidence. *Perfect Surgical Techniques, Inc. v. Olympus Am., Inc.*, 841 F.3d 1004, 1012 (Fed. Cir. 2016); *Prolitec, Inc. v. Scentair Techs., Inc.*, 807 F.3d 1353, 1358–59 (Fed. Cir. 2015).

III.

The claim construction issue in this case is, in terms of its scope, a narrow one. The parties agree that, in conducting its inter partes review of the Network-1 Patents, the Board was required by its rules to apply the broadest reasonable construction of the term "non-exhaustive search" in light of the patents' specifications. 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2142–46 (2016). They also agree, as they did before the Board, that the linchpin of the claim construction analysis in this case is determining what an

“exhaustive search” is. Google’s Corrected Opening Br. 36–37; Network-1’s Br. 5. That is so because a “non-exhaustive” search necessarily is a search that is not “exhaustive.” Put another way, the claim limitation at issue does not require a search that *employs* a stated method (an “exhaustive” search). Rather, it requires a search that *does not employ* a stated method (a “non-exhaustive” search). As a result, in terms of claim construction, what must be determined is the meaning of the word “exhaustive.”³ In that regard, before the Board, the parties agreed, and the Board concurred, that, generally, an “exhaustive” search means a “brute-force” search that sequentially considers all possible matches revealed in a search. *Institution Decision* at *3. Further, in the *Institution Decision*, the Board stated that a “non-exhaustive” search “encompasses anything other than a ‘brute-force’ search.” *Id.* at *4. Where the parties part company is with respect to *the degree of exhaustion* required in order for a search to be “exhaustive.”

Google argues that the Board erred in accepting Network-1’s contention that a search qualifies as “exhaustive” as long as it considers “any portion of each potential match—even a single bit of a long string.” Google’s Cor-

³ In the district court, Google has advanced the argument that the claim term “non-exhaustive search” is indefinite. *See Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014) (“a patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention”). In an IPR, the Board cannot declare claims indefinite. *See* 35 U.S.C. § 311(b). The issue of indefiniteness is therefore not before us, and we express no view on it.

rected Opening Br. 32. As it did before the Board, Google urges that, instead, an “exhaustive” search must consider all data within each potential match, because only such a search will ensure “find[ing] the correct answer.” *Id.* at 32–33. For example, consider a musical identification system in which each known piece in a database contains two parts, an introduction and a chorus. If the system compares an unknown melody to every known work in the database, but does so only on the basis of the database songs’ introductions, the search is not “exhaustive” because it ignores the choruses. Thus, Google would argue, both the introduction (first part) and the chorus (second part) of each song in the database must be checked in order for a search to be “exhaustive.”

Google’s argument is based upon the proposition that the broadest construction of “non-exhaustive” searching corresponds to the *narrowest* construction of “exhaustive” searching. According to Google, the narrowest construction of “exhaustive” searching requires considering the entirety of each potential match, not just a single part of it. *Id.* at 34.⁴

⁴ Logic dictates that, in terms of exhaustiveness, all searches must be either “exhaustive” or “non-exhaustive.” No third option exists. Consider, then, a finite number of searches. As the construction for “exhaustive” narrows (*i.e.*, the number of searches that qualify as “exhaustive” decreases), the definition for “non-exhaustive” must broaden (*i.e.*, the number of searches that qualify as “non-exhaustive” must increase to continue adding up to the total, finite number of searches). Thus, a narrower interpretation of “exhaustive” corresponds to a broader interpretation of “non-exhaustive.” Google’s urged construction, requiring an exhaustive search to consider all data within each potential match (both introductions

Google states that the '179 patent's written description nowhere refers to "exhaustive" or "non-exhaustive" searches and nowhere identifies the types of searches that fall into the former rather than the latter category. *Id.* at 33. For this reason, Google argues, there is no basis to infer a definition of "non-exhaustive search" from any of the various exemplary searches discussed in the specification. *Id.* See '179 patent, col. 8, line 44–col. 9, line 55. According to Google, then, in its inter partes review, the Board should have chosen the broader construction (Google's) rather than the narrower construction (Network-1's) of the ambiguous term "non-exhaustive" as the broadest reasonable construction of the term. *Id.* at 28, 33–35.

Responding, Network-1 argues that the Board's claim construction was correct. Network-1 relies upon the Wikipedia entry that it introduced in response to Google's petition for review. In relevant part, the entry states that, "[i]n computer science, brute-force search or exhaustive search . . . is a very general problem solving technique that consists of systematically enumerating all possible candidates for the solution and checking whether each candidate satisfies the problem's statement." J.A. 1393. In the *Institution Decision*, the Board referenced Network-1's reliance on the Wikipedia entry ("Patent Owner supplies an example of the ordinary meaning of 'exhaustive search' or 'brute force search'"), and it noted that the entry did not mention "the evaluation of all data

and choruses in the example above), is a narrower construction of "exhaustive" and a broader construction of "non-exhaustive" than a search that considers only some data within each match (*either* introductions *or* choruses); fewer searches qualify as "exhaustive" under Google's construction.

within each possible match.” *Institution Decision* at *4. Network-1 argues that this entry confirms that a “brute force” search or “exhaustive” search consists of systematically enumerating all possible candidates for the solution and checking whether each candidate satisfies the search criteria. Network-1’s Br. 21. Network-1 continues that the Wikipedia entry does not state that, for a search to be “exhaustive,” all data within each candidate must be examined, as argued by Google.

Network-1 also points to the declaration testimony of its expert witness, Dr. George Karypis, which was introduced by Network-1 after review was instituted. Network-1’s Br. 20–23. In his declaration, Dr. Karypis stated that, in the context of the Network-1 Patents, techniques are described as “linear” with respect to “N”—the number of records in the database being searched—not with respect to the length of an individual database in the record. J.A. 1547 ¶ 72. Dr. Karypis also stated that “[a] ‘non-exhaustive search’ uses an intelligent algorithm to narrow the database to only a subset of potential matches,” J.A. 1554 ¶¶ 7, 9, and he pointed to what he described as examples of non-exhaustive search algorithms in the specification of the ’179 patent. Specifically, Dr. Karypis directed the Board’s attention to column 9, lines 14–17 of the specification, *see* J.A. 1554 ¶ 80, where the specification states that “other forms of matching include those based on clustering, kd-trees, vantage point trees and excluded middle vantage point forests”

IV.

The parties agree that Google’s construction of “non-exhaustive search” is broader than the Board’s construction of the term, which Network-1 supports. *See* Oral Argument at 25:50–26:01; 28:10–16. We concur. Of the two competing constructions, Google’s is, in fact, broader. That is because Google’s construction (through its narrower construction of “exhaustive”) necessarily encom-

passes all of the searches covered by the Board's construction. The Board's construction (through its broader construction of "exhaustive"), on the other hand, does not necessarily encompass all of the searches covered by Google's construction. In the example above, a search that examines only the introduction of a song and not its chorus would be "non-exhaustive" under Google's construction, but not under the Board's. That is because, by just examining the song's introduction, the search is not examining everything in the match—both the introduction and the chorus—that must be examined under Google's construction of "exhaustive." On the other hand, such a search would not be "non-exhaustive" under the Board's construction because, by examining the introduction, the search still would be examining the match. It thus would be "exhaustive."

The claim limitation at issue requires "using a non-exhaustive neighbor search." Bearing in mind what we have stated above about the unique nature of the claim limitation at issue (claiming a method that is not "exhaustive"), the question becomes whether Google's narrower construction of "exhaustive"—and hence its broader construction of "non-exhaustive"—is reasonable. In order to be found reasonable, it is not necessary that a claim be given its *correct* construction under the framework laid out in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). See *PPC Broadband, Inc. v. Corning Optical Commc'ns RF, LLC*, 815 F.3d 734, 742–43 (Fed. Cir. 2016) (citing *In re Cuozzo Speed Techs., LLC*, 793 F.3d 1268, 1279 (Fed. Cir. 2015), *aff'd sub nom. Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131 (2016)). In other words, under the broadest reasonable construction standard, where two claim constructions are reasonable, the broader construction governs.

"[T]he claim-construction inquiry . . . begins and ends in all cases with the actual words of the claim." *Homeland Housewares, LLC v. Whirlpool Corp.*, 865 F.3d 1372,

1375 (Fed. Cir. 2017) (quoting *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1248 (Fed. Cir. 1998)). The words of a claim “are generally given their ordinary and customary meaning” as understood by a person of ordinary skill at the time of invention. *Phillips*, 415 F.3d at 1312–13. Because that meaning is often not immediately apparent, the court looks to the intrinsic record, including “the words of the claims themselves, the remainder of the specification, [and] the prosecution history,” as well as to extrinsic evidence when appropriate, to construe a disputed claim term. *Id.* at 1314.

The specification of the '179 patent does not suggest the narrower construction of “non-exhaustive search” urged by Network-1. Network-1 contends that the specification specifically identifies “a linear search of all *N* entries” as an “exhaustive search.” See '179 patent, col. 9, lines 8–10. Further, according to Network-1, its converse, a “non-exhaustive search” is identified in the next paragraph at column 9, lines 13 through 37 of the '179 patent. See Oral Argument at 20:35–21:37. We do not agree, however, that these parts of the specification draw a clear line between “exhaustive” and “non-exhaustive” searching in terms of how much data within a record a search must consider in order to qualify as one or the other. Finally, the prosecution history of the '179 patent, the third piece of intrinsic evidence, also does not provide guidance.

That brings us to the extrinsic evidence. At the institution stage of the IPR, when the claims were construed, Network-1 presented to the Board the Wikipedia entry noted above describing a “brute force search.”⁵ The

⁵ At the institution stage of the IPR, the Board also had before it the declaration testimony of Google’s expert, Dr. Patrick Moulin. The Board did not credit Dr. Moulin’s

Wikipedia entry, though, does not answer the question before us. While the entry describes a “brute force search,” it does not speak to whether or not a “brute force search” examines all data within a possible match.

As noted, Network-1 also relies on the testimony of its expert, Dr. Karypis. However, this extrinsic evidence was not before the Board when it rendered its claim construction ruling in the *Institution Decision*. Moreover, in the *Final Decision*, the Board maintained without alteration, and did not elaborate upon, its construction of “non-exhaustive search.” The Board simply stated that “[u]pon review of the parties’ contentions and the Specification, as well as the entire record, we . . . discern no reason to modify our claim construction at this juncture.” *Final Decision* at * 6. In this passing reference, the Board did not mention the testimony of Dr. Karypis. *Cf. Cardsoft LLC v. Verifone, Inc.*, 807 F.3d 1346, 1350 (Fed. Cir. 2015) (“[I]t is not enough that the district court may have heard extrinsic evidence . . . rather, the district court must have actually made a factual finding in order to trigger *Teva’s* deferential standard of review.”) Under these circumstances, with the exception of the Wikipedia entry, we view the Board as having rested its claim construction ruling on intrinsic evidence.⁶

testimony, however, *Institution Decision* at *4, and, on appeal, Google does not rely on it. Google Reply Br. 7.

⁶ In any event, we are not convinced that, even if the Karypis testimony were considered together with the Wikipedia entry, it would establish what degree of exhaustion qualifies a search as “exhaustive.” Dr. Karypis explained that non-exhaustive searches use intelligent algorithms to narrow the database to a subset of potential matches and thus do not compare the work to all records in the database. J.A. 1541–42 at ¶¶ 63–64; J.A. 1554 at

In sum, we view both the intrinsic and extrinsic evidence regarding the meaning of the foundational claim term “exhaustive” as inconclusive as to the broader or narrower construction of the limitation “non-exhaustive search.” Bearing in mind, however, the way in which the inventor claimed his invention (by saying “do *not* do what is exhaustive”) and the way in which the parties have argued the case to us (focusing on the term “exhaustive”), we conclude that Google’s claim construction is reasonable. Quite simply, without considering all data within all possible matches, a search of features is not guaranteed to find an existing match or a near-match, or it may stop prematurely before finding one. Google’s search examples illustrate this point. For example, a database of court names contains a potential match “Court of Appeals for the Federal Circuit,” and the query is “Federal Circuit.” The Board’s construction would find a search “exhaustive” if it looked at the first letter of the query, “F,” determined that it did not match “C,” and moved on—even if the search was a neighbor search rather than a search for exact matches only. Similarly, if the query were “Federal Circuit” and the database entry were “First Circuit,” considering only the first letter would produce a false positive under the Board’s construction. Viewing the matter in this light, we conclude that Google’s broader construction of “non-exhaustive search” (via its narrower construction of “exhaustive”) is consistent with how the inventor described his invention in the specification in terms of finding a best match or a best near-match for the search query. *See* ’179 patent, col. 5, lines 40–58 and col. 9, lines 13–55. Google’s construction avoids false positives and false negatives by considering all the data

¶ 79; J.A.1547 at ¶ 74. He did not, however, discuss the amount of data considered within each record.

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within a match. In short, Google's claim construction is both broader than the Board's and is reasonable.

CONCLUSION

For the foregoing reasons, we hold that, under the broadest reasonable construction standard, Google's proposed construction of the term "non-exhaustive search" is broader than the construction that the Board adopted and is reasonable. Therefore, the Board erred in its claim construction. Also for the foregoing reasons, we hold that the claim construction most consistent with the broadest reasonable construction of the term "non-exhaustive search" is "a search that locates a match without conducting a brute-force comparison of all possible matches, and all data within all possible matches." That construction is relevant to all of the claims at issue in this appeal: claims 1-3, 6, 8-14, 18, 19, 21-27, 29-31, and 34-37 of the '179 patent; claims 25-27, 29, and 30 of the '237 patent; claims 15-16, 21-28, 31-33, 38, 51, and 52 of the '988 patent; and claims 1-3, 6, 8-14, 18, 19, 21-27, 29, and 30 of the '441 patent. As far as those claims are concerned, the decisions of the Board are vacated and the case is remanded to the Board for consideration of patentability based upon the claim construction stated above. The unappealed decisions of the Board, relating to (i) independent claims 1, 5, and 33 of the '237 patent and their related dependent claims; and (ii) dependent claim 17 of the '988 patent, are not before us and therefore are left undisturbed.

VACATED-IN-PART AND REMANDED

COSTS

No Costs.

CERTIFICATE OF COMPLIANCE

The undersigned hereby certifies that Network-1's foregoing Combined Petition for Panel Rehearing or Rehearing En Banc complies with the word limitation set forth in Fed. R. App. P. 35(b)(2). This brief contains 3,889 words (excluding the parts of the brief exempted by Fed. Cir. R. 35(c)(2)) as determined by the word count feature of the word processing program used to create this brief (Microsoft Word 2016). I further certify that the foregoing brief complies with the typeface requirements set forth in Fed. R. App. P. 32(a)(5) and the type style requirements of Fed. R. App. P. 32 (a)(6). This brief has been prepared using a proportionally spaced typeface using Microsoft Word 2016, in 14-point Times New Roman font.

Date: May 9, 2018

Respectfully submitted,

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CERTIFICATE OF SERVICE

I hereby certify that on May 9, 2018, I filed the foregoing Appellee Network-1 Technologies, Inc.'s Combined Petition for Panel Rehearing or Rehearing En Banc with the Clerk of the United States Court of Appeals for the Federal Circuit via the CM/ECF system, which will send notice of such filing to all registered CM/ECF users.

Date: May 9, 2018

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