NOTE: This disposition is nonprecedential.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 Trademark Office, Patent Trial and Appeal Board in Nos. IPR2015-00343, IPR2015-00345, IPR2015-00347, IPR2015-00348.

Decided: March 26, 2018

DAN L. BAGATELL, Perkins Coie LLP, Hanover, NH, argued for appellant. Also represented by ROBERT SWANSON, Washington, DC; ANDREW GISH, DOUGLAS R. NEMEC, Skadden, Arps, Slate, Meagher & Flom LLP, New York, NY.

GREGORY S. DOVEL, Dovel & Luner, LLP, Santa Monica, CA, argued for appellee. Also represented by 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.

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[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;
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> (b) obtaining, by the computer system, extracted features of a first electronic work;
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> (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;
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> (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
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> (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-

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[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]

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[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

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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

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[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]

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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

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

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.