

NOTE: This disposition is nonprecedential.

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

SPRINT SPECTRUM L.P.,
Appellant

v.

GENERAL ACCESS SOLUTIONS, LTD.,
Appellee

2019-1855

Appeal from the United States Patent and Trademark
Office, Patent Trial and Appeal Board in No. IPR2017-
01889.

Decided: May 13, 2020

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EVAN FINKELSON.

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Scott LLP, Denver, CO, for appellee. Also represented by
JOHN HUGHES, NOSSON KNOBLOCH, DANIEL TAYLOR.

Before CHEN, LINN, and STOLL, *Circuit Judges*.

STOLL, *Circuit Judge*.

Sprint Spectrum L.P. appeals the final written decision of the Patent Trial and Appeal Board declining to hold certain claims of U.S. Patent No. 7,230,931 unpatentable on anticipation and obviousness grounds. Sprint specifically challenges the Board's construction of a claim term that appears in most of the challenged claims. Sprint also challenges the Board's determinations relating to the scope of Sprint's reply and the scope and content of the asserted prior art. Because we agree that the Board erred in construing the claim term at issue, we vacate the Board's decision as to the applicable claims and remand for consideration of certain grounds under the proper claim construction. We affirm the Board's decision in all other respects.

BACKGROUND

I

The '931 patent is directed to a wireless data communication system that selectively and dynamically directs bandwidth to specific subscribers within a service area. The disclosed system applies a known technique called time division duplexing (TDD), which uses a single frequency for bidirectional communication by designating separate and distinct periods of time for the transmittal and receipt of data. TDD systems may employ "frames" to structure the transmittal of downlink data and receipt of uplink data over a short period of time (e.g., 2 milliseconds).

The improvement disclosed in the '931 patent relates to these TDD frames. Specifically, the '931 patent discloses sending a broadcast signal to all subscribers within a service area at the start of each frame, followed by a series of directed signals or "beams" sent to and received from selected subscribers over the remainder of each frame. The broadcast signal at the start of each frame includes

instructions that assign the forthcoming beams to the selected subscribers. Through this approach, the downlink and uplink bandwidth of each frame can be dynamically allocated to various subscribers in a nonuniform fashion, thereby improving performance as compared to other ways of allocating bandwidth, such as “equal duration round robin polling” or “dynamic weighted polling . . . based on the throughput per cell.” ’931 patent col. 28 ll. 44–50.

Claims 2, 11, and 20 and the claims that depend from them are at issue on appeal. Claim 2, which depends from claim 1, is illustrative:

1. For use in a wireless access network comprising a plurality of base stations, each of said plurality of base stations capable of bidirectional time division duplex (TDD) communication with wireless access devices disposed at a plurality of subscriber premises in an associated cell site of said wireless access network, a transceiver associated with a first of said plurality of base stations comprising:

transmit path circuitry associated with a beam forming network capable of transmitting directed scanning beam signals each directed to substantially only wireless access devices within a different one of a plurality of sectors of a cell site associated with said first base station, wherein said transmit path circuitry

transmits, at a start of a TDD frame, a broadcast beam signal to wireless access devices within more than one of said sectors, the broadcast beam signal comprising a start of frame field, and

subsequently transmits, in a downlink portion of said TDD frame, first downlink data traffic to substantially only wireless access devices

within one of said sectors using one of said directed scanning beam signals.

2. The transceiver as set forth in claim 1 wherein said broadcast beam signal further comprises a first beam map containing *scanning beam information usable by said wireless access devices to detect said directed scanning beam signals*.

Id. at col. 30 ll. 31–57 (emphasis added to disputed claim limitation). Dependent claims 28 and 29 are also at issue on appeal, but do not depend from claims 2, 11, or 20. Claim 28 is illustrative:

28. The transceiver as set forth in claim 1 wherein said transmit path circuitry transmits, in said downlink portion of said TDD frame, second downlink data traffic to substantially only wireless access devices within an other of said sectors using an other of said directed scanning beam signals.

Id. at col. 33 ll. 4–9.

II

In July 2017, Sprint petitioned for inter partes review of claims 1–29 of the '931 patent. The Board instituted trial of the challenged claims on five grounds of unpatentability.¹ The instituted grounds included anticipation of certain claims by Vornefeld² and various obviousness

¹ The Board initially declined to institute trial for claims 2, 11, and 20, but added those claims to the proceedings following *SAS Institute, Inc. v. Iancu*, 138 S. Ct. 1348 (2018).

² Ulrich Vornefeld, et al., *SDMA Techniques for Wireless ATM*, IEEE COMM'NS MAGAZINE, Nov. 1999, at 52.

combinations of Vornefeld, Ahy,³ Andersson,⁴ and Newman.⁵ During the proceedings, patent owner General Access Solutions (GAS) conceded the unpatentability of independent claims 1, 10, and 19, thereby shifting the focus of the Board’s unpatentability analysis to claims 2, 11, and 20. Following oral argument, the Board authorized supplemental briefing on the construction of the term “beam map” as recited in claims 2, 11, and 20.

Beyond accepting GAS’s surrender of claims 1, 10, and 19, the Board declined to hold any of the other challenged claims unpatentable in its final written decision. *See Sprint Spectrum L.P. v. Gen. Access Sols., Ltd.*, No. IPR2017-01889, 2019 WL 1096544, at *13 (P.T.A.B. Mar. 7, 2019) (*Decision*). Applying the broadest reasonable interpretation standard, the Board first construed the term “a first beam map” as “scheduling information for one or more beams.” *Id.* at *5. The Board then construed the phrase “a first beam map containing scanning beam information usable by said wireless access devices to detect said directed scanning beam signals,” recited in claims 2, 11, and 20,⁶ as “scheduling information for one or more beams

³ U.S. Patent No. 7,366,133. We recognize, as the Board did, that the first named inventor’s surname is Majidi-Ahy. We use the shorthand “Ahy” for consistency with the Board’s decision.

⁴ U.S. Patent No. 6,470,177.

⁵ U.S. Patent No. 5,684,491.

⁶ The language of claim 20 varies slightly from claims 2 and 11, reciting “a first beam map containing scanning beam information usable by said wireless access devices to *receive* said *first* directed scanning beam signal.” ’931 patent col. 32 ll. 35–39 (emphases added). Neither the Board nor the parties identified any effect of this slight variation, so we do not analyze claim 20 separately for the purpose of our review.

that provides data indicating which scanning beam is used at which time.” *Id.* at *4–6. The Board held that the asserted prior art did not disclose the “scanning beam information” limitation of claims 2, 11, and 20 under its construction. *See id.* at *8–9, *11–13. In analyzing these claims, the Board declined to consider certain argument and evidence presented in Sprint’s reply. *Id.* at *12 n.6. The Board separately found that the asserted prior art did not disclose the limitations of claims 28 and 29. *Id.* at *10, *13.

Sprint challenges these determinations on appeal. We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

DISCUSSION

I

Sprint first challenges the Board’s construction of the “scanning beam information” limitation in claims 2, 11, and 20. We review de novo the Board’s ultimate claim construction and any supporting determinations based on intrinsic evidence. *Personalized Media Commc’ns, LLC v. Apple Inc.*, 952 F.3d 1336, 1339 (Fed. Cir. 2020) (citing *Knowles Elecs. LLC v. Cirrus Logic, Inc.*, 883 F.3d 1358, 1361–62 (Fed. Cir. 2018)). We review any subsidiary factual findings involving extrinsic evidence for substantial evidence. *Id.*

The broadest reasonable interpretation standard applies to this IPR proceeding.⁷ “Under a broadest

⁷ Per recent regulation, the Board applies the *Phillips* claim construction standard to IPR petitions filed on or after November 13, 2018. *See Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board*, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (codified at 37 C.F.R. § 42.100(b)). Because Sprint filed its IPR petition before

reasonable interpretation, words of the claim must be given their plain meaning, unless such meaning is inconsistent with the specification and prosecution history.” *Tri-vascular, Inc. v. Samuels*, 812 F.3d 1056, 1062 (Fed. Cir. 2016) (citing *Straight Path IP Grp., Inc. v. Sipnet EU S.R.O.*, 806 F.3d 1356, 1362 (Fed. Cir. 2015)). “While the broadest reasonable interpretation standard is broad, it does not give the Board an unfettered license to interpret the words in a claim without regard for the full claim language and the written description.” *Id.* (first citing *In re Suitco Surface, Inc.*, 603 F.3d 1255, 1260 (Fed. Cir. 2010); then citing *In re Abbott Diabetes Care, Inc.*, 696 F.3d 1142, 1148–50 (Fed. Cir. 2012)). Indeed, the broadest reasonable interpretation must take into account “the context of the entire patent.” *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1374 (Fed. Cir. 2019) (emphasis added) (quoting *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (en banc)).

The Board interpreted the claim term “scanning beam information usable by said wireless access devices to detect said directed scanning beam signals” as “data indicating which scanning beam is used at which time.”⁸ *Decision*, 2019 WL 1096544, at *5–6. For the following reasons, we agree with Sprint that the Board’s construction is not the broadest reasonable interpretation in view of the context of the entire ’931 patent.

To start, the Board’s construction is narrower than the plain claim language, which merely requires that the

November 13, 2018, we apply the broadest reasonable interpretation standard.

⁸ We focus on the “scanning beam information” portion of the claim because the construction of the “first beam map” portion of the claim is not in dispute. In construing “first beam map,” the Board adopted Sprint’s proffered construction. *Decision*, 2019 WL 1096544, at *5.

scanning beam information can be used “to detect” directed scanning beam signals. Moreover, claims 4 and 5, which depend from claim 3, which in turn depends from claim 2, recite examples of the “scanning beam information” of claim 2 that would fall outside of the Board’s narrow construction. “Under the doctrine of claim differentiation, dependent claims are presumed to be of narrower scope than the independent claims from which they depend.” *AK Steel Corp. v. Sollac & Ugine*, 344 F.3d 1234, 1242 (Fed. Cir. 2003) (first citing *RF Del., Inc. v. Pac. Keystone Techs., Inc.*, 326 F.3d 1255, 1264 (Fed. Cir. 2003); then citing 35 U.S.C. § 112, ¶ 4 (2000)). The Board’s construction would require the dependent claims to broaden “said scanning beam information” rather than narrow it. Claim 4, in particular, recites “wherein said scanning beam information identifies at least one modulation format,” while claim 5 recites “wherein said scanning beam information identifies at least one forward error correction code level.” ’931 patent col. 30 l. 62 – col. 31 l. 2. The reference to “said” scanning beam information means that the particular “scanning beam information” identified in claim 2—i.e., “usable by said wireless access devices to detect said directed scanning beam signals”—must further “identif[y] at least one modulation format” (claim 4) or “identif[y] at least one forward error correction code level” (claim 5). The “modulation format” and “forward error correction code level” for a directed scanning beam do not identify “which scanning beam is used at which time”—yet they are types of information that can be used to *detect* a directed signal, which is all that the plain language of claim 2 requires. While we acknowledge that dependent claims are “only an aid to interpretation and are not conclusive,” *Regents of Univ. of Cal. v. Dakocytomation Cal., Inc.*, 517 F.3d 1364, 1375 (Fed. Cir. 2008) (quoting *N. Am. Vaccine, Inc. v. Am. Cyanamid Co.*, 7 F.3d 1571, 1577 (Fed. Cir. 1993)), the incompatibility of these dependent claims counsels against adopting the Board’s narrowing construction—especially

here, where the broadest reasonable interpretation standard applies.

The specification of the '931 patent similarly counsels against the Board's narrowing construction. The Board reasoned that the specification "consistently describes" the beam map as indicating "which scanning beam is used at which time." *Decision*, 2019 WL 1096544, at *6 (citing '931 patent col. 29 ll. 34–36, col. 29 ll. 51–55, col. 29 l. 66 – col. 30 l. 2). The three passages cited by the Board describe only a single embodiment, however, illustrated by Figure 14. As we have explained, the scope of an invention may only be properly limited to the preferred embodiment "if the patentee uses words that manifest a clear intention to restrict the scope of the claims to that embodiment." *Info-Hold, Inc. v. Applied Media Techs. Corp.*, 783 F.3d 1262, 1267 (Fed. Cir. 2015) (citing *Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004)).

The Board identified no manifestation of a clear intention to restrict the scope of the claims to the embodiment illustrated by Figure 14. In support of its construction, the Board relied heavily on a sentence in the specification that states:

The Broadcast Beam Maps provide data indicating which scanning beam (or beams) are used at which time (measured in symbols or other baud-oriented time unit) for the frame.

'931 patent col. 29 ll. 34–36. This sentence is not definitional and should not be read into the broader claim language that the patent applicant chose to use in claims 2, 11, and 20, particularly under the broadest reasonable interpretation standard. This sentence is also within the description of Figure 14, which the specification describes as just "one embodiment of the present invention." *Id.* at col. 29 ll. 3–5. And the same section of the specification also states that beam maps more broadly "comprise . . . information that defines scanning beams that cover the

sector.” *Id.* at col. 29 ll. 51–53. Elsewhere, the specification expressly states that its figures and embodiments “are by way of illustration only and should not be construed in any way to limit the scope of the invention.” *Id.* at col. 11 ll. 47–51. At bottom, there is no clear manifestation (nor did the Board identify one) that would allow the Board to limit the broad words “scanning beam information usable by said wireless access devices to detect said scanning beam signals” to an embodiment that provides “data indicating which scanning beam is used at which time.”

The Summary of the Invention section repeats the limitations of the various dependent claims. *See id.* at col. 9 ll. 35–52. It states that in “one embodiment,” the “scanning beam information [is] usable by the at least one wireless access device to detect the [at] least one directed scanning beam,” and in “another embodiment” the “scanning beam information identifies a downlink time slot.” *Id.* at col. 9 ll. 35–44. In “still another embodiment,” the “scanning beam information identifies at least one modulation format associated with the at least one directed scanning beam,” and in “yet another embodiment,” the “scanning beam information identifies at least one forward error correction code level associated with the at least one directed scanning beam.” *Id.* at col. 9 ll. 45–52. All of these different options for the “scanning beam information” support an interpretation broader than the Board’s construction, given the interrelationship of claims 2–5.

In addressing this section of the specification, the Board relied on the specification’s use of the phrase “another embodiment” to reason that the “downlink time slot” of claim 3 “is different than the information usable to detect directed scanning beam signals” recited in claim 2. *Decision*, 2019 WL 1096544, at *6 (citing ’931 patent col. 9 ll. 35–44). That reasoning does not withstand scrutiny. While the Summary of the Invention does characterize each additional piece of information as “another embodiment” or similar, the specification does not describe these

embodiments as separate and distinct, or mutually exclusive. Nor does it preclude a broad interpretation of claim 2’s “scanning beam information.” As explained above, the structure of the corresponding dependent claims indicates that the types of information recited in claims 3, 4, and 5 are examples of “*said* scanning beam information”—i.e., the *same* scanning beam information recited in claim 2 that is “usable . . . to detect said directed scanning beam signals.”

Finally, the specification expressly contemplates an embodiment where “only one beam is active” for a given frame. ’931 patent col. 28 ll. 61–63. The Board’s construction for “first beam map” likewise requires providing “scheduling information for *one* or more beams.” *Decision*, 2019 WL 1096544, at *5 (emphasis added). The broadest reasonable construction of the “scanning beam information” limitation, then, should accommodate an embodiment where only one beam is active for the duration of a frame. *See GE Lighting Sols., LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1311 (Fed. Cir. 2014) (“[W]here claims can reasonably [be] interpreted to include a specific embodiment, it is incorrect to construe the claims to exclude that embodiment, absent probative evidence on the contrary.” (second alteration in original) (quoting *Oatey Co. v. IPS Corp.*, 514 F.3d 1271, 1277 (Fed. Cir. 2008))). The Board’s construction is thus too narrow because it requires identifying “which scanning beam is used *at which time*” for each frame—a superfluous requirement for an embodiment where only one beam is active for each frame.

We conclude that the Board erred in its overly narrow construction of the “scanning beam information” limitations in claims 2, 11, and 20. Absent any lexicography or manifestation of clear intent to limit the scope of “scanning beam information” to any particular embodiment, the plain language must control. Accordingly, the recited “scanning beam information” must be broad enough to include *any* information that is “usable by said wireless access devices

to detect said directed scanning beam signals.” *E.g.*, ’931 patent col. 30 ll. 55–57. Certainly, that can include “data indicating which scanning beam is used at which time,” as recited in the Board’s construction. But the broadest reasonable interpretation of “scanning beam information” is not limited to that kind of data, nor must it include that kind of data. Consistent with the claims and specification, it could instead include the identification of “a downlink time slot,” a “modulation format,” a “forward error correction code level,” or any other kind of “information usable by said wireless access devices to detect said directed scanning beam signals” as recited in the claim. *See id.* at col. 9 ll. 35–52, col. 30 l. 53 – col. 31 l. 2.

Because the Board did not apply the broadest reasonable interpretation of “scanning beam information,” we vacate its unpatentability determinations as to claims 2, 11, and 20 and the claims that depend therefrom. We remand to the Board for an analysis of the unpatentability grounds under the proper construction.

II

Next, Sprint challenges the Board’s refusal to consider its reply arguments regarding the disclosure of the asserted Ahy prior art. In the final written decision, the Board objected to Sprint’s identification of Ahy’s “antenna selection parameter” as disclosing the limitations of claims 2, 11, and 20. The Board explained that Sprint’s arguments were “new assertions because they raise[d] a new issue and exceed[ed] the scope of a proper reply.” *Decision*, 2019 WL 1096544, at *12 n.6 (first citing 37 C.F.R. § 42.23(b); then citing Office Practice Trial Guide, 77 Fed. Reg. 48,765, 48,767 (Aug. 14, 2012)). Sprint insists that its reply arguments “simply expanded upon [the arguments in its petition] in response to a claim construction argument raised by GAS in its Response.” Appellant’s Br. 43.

We conclude that Sprint's scope of reply challenge is rendered moot by the Board's separate determination that Sprint failed to sufficiently establish a reason to combine the prior art references at issue: Newman and Ahy. *See Decision*, 2019 WL 1096544, at *13. Whether there is a reason to combine is a factual determination that we review for substantial evidence. *Rambus Inc. v. Rea*, 731 F.3d 1248, 1251–52 (Fed. Cir. 2013). The Board's finding is supported by substantial evidence because a reasonable factfinder could find no reason to combine based on the limited argument and evidence presented by Sprint. The portion of Sprint's petition addressing claim 2 merely refers back to an earlier analysis for claim element 1[a], as does the supporting expert declaration. We agree with the Board that Sprint's reason to combine analysis for claim element 1[a]—a different claim limitation covering different subject matter—is “insufficient to explain why one of ordinary skill would have incorporated Ahy's disclosure of [certain parameters relevant to claim 2] into Newman.” *Decision*, 2019 WL 1096544, at *13. Sprint complains that the Board overlooked certain pages of its petition, but the pages that Sprint identifies on appeal—which address claim element 1[c]—are not the pages that Sprint identified to the Board. We can hardly fault the Board for focusing on the pages that Sprint actually referenced in its petition.

Even if the Board had considered Sprint's reply arguments and evidence, nothing in the excluded portion of Sprint's reply addresses the reason to combine Newman and Ahy. Thus, the Board's finding of no reason to combine precludes a finding of obviousness regardless of whether Sprint's reply arguments were proper. Accordingly, we affirm the Board's finding of no reason to combine and hold Sprint's scope of reply challenge moot.

III

Finally, Sprint challenges the Board’s separate determination as to claims 28 and 29 of the ’931 patent. Sprint does not dispute the Board’s interpretation of claims 28 and 29, focusing instead on the Board’s reading of the Vornefeld prior art reference. Specifically, Sprint insists that the only reasonable understanding of Vornefeld’s Figure 3 is that it discloses a single frame covering a fixed unit of time. The Board rejected Sprint’s view, finding instead that Figure 3 of Vornefeld discloses *multiple* spatially separated frames that are simultaneously transmitted in parallel—not a *single* frame with “second downlink data traffic,” as required by claims 28 and 29.

We review the Board’s findings regarding the scope and content of the prior art for substantial evidence. *Rambus*, 731 F.3d at 1251–52. “If two ‘inconsistent conclusions may reasonably be drawn from the evidence in record, [the PTAB]’s decision to favor one conclusion over the other is the epitome of a decision that must be sustained upon review for substantial evidence.” *Elbit Sys. of Am., LLC v. Thales Visionix, Inc.*, 881 F.3d 1354, 1356 (Fed. Cir. 2018) (alteration in original) (quoting *In re Cree, Inc.*, 818 F.3d 694, 701 (Fed. Cir. 2016)). When presented with the figure and accompanying discussion in Vornefeld, a reasonable factfinder could conclude, as the Board did, that the depicted transmissions comprise separate frames transmitted in parallel. Figure 3 identifies two axes: a time domain and a spatial domain. The depiction of components in parallel in the spatial domain could illustrate to an ordinarily skilled artisan that multiple frames are sent simultaneously to different locations in three-dimensional space. Indeed, the Board observed that the text accompanying Figure 3 describes “*concurrent* transmission of [medium access control protocol data units] in the spatial domain.” *Decision*, 2019 WL 1096544, at *10 (emphasis added) (citing J.A. 1003). In the context of Figure 3, Vornefeld also discusses a “[s]imultaneous downlink

transmission” that “enables the base station to *send different information to several locations* in the same time and frequency slot.” J.A. 1004 (emphases added). Vornefeld additionally discusses “[c]oncurrent transmission of [mobile terminals] in one slot” if “spatial filtering” is performed. *Id.* (emphasis added). These disclosures support the Board’s interpretation of Figure 3 as one in which the parallel lines represent spatially separated frames sent simultaneously—not components of one large frame, as Sprint proposes.

Because the Board’s understanding of Figure 3 of Vornefeld is reasonable in view of these disclosures, it is supported by substantial evidence. We therefore affirm the Board’s determination as to claims 28 and 29.

CONCLUSION

We have considered the parties’ remaining arguments, and we do not find them persuasive. For the foregoing reasons, we vacate the Board’s final written decision with regard to claims 2–9, 11–18, and 20–27 of the ’931 patent and remand for further proceedings consistent with this opinion.⁹ We affirm the Board’s decision in all other respects.

AFFIRMED-IN-PART, VACATED-IN-PART, AND REMANDED

COSTS

No costs.

⁹ Because we affirm the Board’s finding of no reason to combine Newman and Ahy, on remand the Board need not address the asserted combination of Newman, Ahy, and Andersson (Ground V) notwithstanding our vacatur and remand on the claim construction issue.