

NOTE: This disposition is nonprecedential.

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

CASES2TECH, LLC,
Appellant

v.

**JOHN A. SQUIRES, UNDER SECRETARY OF
COMMERCE FOR INTELLECTUAL PROPERTY
AND DIRECTOR OF THE UNITED STATES
PATENT AND TRADEMARK OFFICE,**
Intervenor

2023-2290

Appeal from the United States Patent and Trademark
Office, Patent Trial and Appeal Board in No. IPR2022-
00282.

Decided: November 4, 2025

TIMOTHY DEVLIN, Devlin Law Firm LLC, Wilmington,
DE, for appellant. Also represented by ANDREW PETER
DEMARCO, ROBERT J. GAJARSA, JASON MITCHELL SHAPIRO.

MAI-TRANG DUC DANG, Office of the Solicitor, United
States Patent and Trademark Office, Alexandria, VA, for
intervenor. Also represented by OMAR FAROOQ AMIN,
PETER J. AYERS, AMY J. NELSON.

Before TARANTO, SCHALL, and STARK, *Circuit Judges*.

TARANTO, *Circuit Judge*.

In late 2021, Samsung Electronics Co. and an affiliate (collectively, Samsung) petitioned the Patent and Trademark Office (PTO) for institution of an inter partes review (IPR) of all twenty claims of U.S. Patent No. 8,315,400, then owned by Staton Techiya, LLC, and now assigned to the current appellant, Cases2Tech, LLC (collectively, Techiya). The '400 patent describes and claims noise-suppressing earpieces and methods for using them. The IPR was instituted, and the PTO's Patent Trial and Appeal Board (Board) eventually held seven claims unpatentable for anticipation and another eight for obviousness. *Samsung Electronics Co. v. Staton Techiya, LLC*, IPR2022-00282 (P.T.A.B. June 14, 2023).

On appeal, Techiya offers two claim-construction challenges to the Board's decision, each pertinent to all claims held unpatentable. First, Techiya argues that the Board's express claim construction of the claim term "background noise level" was incorrect. Second, Techiya argues that the Board implicitly, and incorrectly, broadened the phrase "based on" beyond its ordinary meaning in the claim phrase "adjust a [] . . . sound signal based on the background noise level." We reject both challenges and affirm.

I

A

The '400 patent is titled "Method and Device for Acoustic Management Control of Multiple Microphones," J.A. 97, and has twenty claims, of which claims 1, 14, and 18 are independent. The patent describes and claims an earpiece (along with methods for using it) that is capable of suppressing background noise by mixing, through a "processor," the signals from two microphones mounted on the

earpiece. '400 patent, col. 2, lines 16–40; *see also id.*, col. 1, lines 17–25; col. 6, lines 41–57. One microphone, the “ear canal microphone,” is mounted close to the speaker of the earpiece and faces inward toward the eardrum, such that, when the earpiece is worn, the seal created between the user’s ear canal and the earpiece partially muffles the sound received by that microphone. *See id.*, col. 4, lines 27–50. A second, “ambient sound” microphone, mounted on the outside of the device, captures environmental noise (such as traffic sounds, nearby conversations, and the like). *See id.*, col. 5, lines 41–48; col. 7, lines 19–26.

The '400 patent describes how the signals received by the two microphones can be mixed to reduce “background noise,” thereby “enhanc[ing] intelligibility” of the resulting noise-reduced signal, which is played for the user through the earpiece’s speaker. *Id.*, col. 6, line 41 through col. 7, line 7; *see also* fig. 3 (illustrating the same). In certain embodiments, this mixing is based on a background noise *level* (*i.e.*, a sound pressure, measured in decibels). *E.g.*, *id.*, col. 3, line 53 through col. 4, line 6. In others, the two microphone signals are mixed using a background noise *signal*, which is a more expansive concept—a background noise level is one part of a background noise signal. *Id.*, col. 1, lines 64–67; col. 6, lines 64–66; *see* J.A. 61 (Board noting that parties agreed on this relationship between the level and signal terms).

“Background noise level” and “background noise signal” are not expressly defined. The patent discloses, however, that a background noise level can be an average “weighted using a frequency-weighting system . . . [for example, by attenuating] the high and low frequencies . . .” *Id.*, col. 3, lines 59–64. A background noise level can be continuously evaluated and used to determine an appropriate mix between the microphone signals: “At low background noise levels,” the earpiece’s processor can amplify the signal from the ambient sound microphone, whereas at “medium” and “high background noise levels,” the

processor progressively increases the contribution of the ear canal microphone signal to the mix, especially the relatively low frequencies of that signal. *See id.*, col. 7, lines 27–41; fig. 10. And “based on the characteristics of the background noise” the processor can apply “frequency specific filters” to the microphone signals. *Id.*, col. 7, lines 38–41.

Techiya has consistently maintained that background noise “level” and “signal,” although the former is an attribute of the latter, are not meaningfully different for the purposes of its present claim-construction arguments about those terms, so independent claim 1, which uses “level,” is representative even though the other two independent claims (14 and 18) use “signal.” *See* J.A. 22–23; Techiya’s Opening Br. at 6–7, 26. Independent claim 1 states:

1. An earpiece comprising:

at least one Ambient Sound Microphone (ASM) configured to convert ambient sound to an ambient sound signal;

at least one Ear Canal Microphone (ECM) configured to convert an internal sound from an ear canal of a user to an internal sound signal and where the internal sound signal includes an internal voice of the user; and

a processor operatively coupled to the at least one ASM and the at least one ECM and which receives the ambient sound signal and the internal sound signal, and where the processor is configured to: **determine a background noise level** from at least one of the ambient sound signal or the internal sound signal, and to **adjust an amplitude of one or more frequencies of the internal sound signal and the ambient sound signal based on the background noise level**, to filter the internal sound signal relative to the ambient sound signal.

Id., col. 12, lines 21–38 (emphases added to show disputed terms); see J.A. 114 (certificate of correction). Claim 5, which depends on claim 1 through claims 4, 3, and 2, is important to Techiya’s arguments. It states:

5. The earpiece of claim 4 where at low background noise levels the ambient sound signal from the ASM is amplified relative to the internal sound signal from the ECM, where at medium background noise levels low frequencies of the ambient sound signal are attenuated and high frequencies of the internal sound signal are attenuated, and where at high background noise levels the internal sound signal from the ECM is amplified relative to the ambient sound signal from the ASM.

’400 patent, col. 12, lines 51–59.

B

In November 2021, Techiya sued Samsung in district court for infringement of the ’400 patent, among others. Amended Complaint at 1–2, ¶¶ 1, 9, *Staton Techiya, LLC v. Samsung Electronics Co.*, No. 2:21-cv-00413 (E.D. Tex. Nov. 12, 2021), ECF No. 11. The following month, Samsung petitioned the PTO for institution of an IPR of the ’400 patent, challenging all twenty claims. See J.A. 8, 119; 35 U.S.C. §§ 311–19. Samsung alleged, as relevant here, that claims 1, 6–8, 12–15, and 17 were anticipated by U.S. Patent Application Publication No. 2008/0037801 (Alves) and that claims 2–5, 9–11, 16, and 18–20 were unpatentable for obviousness over Alves in view of certain other prior art references. J.A. 8.

Alves is titled “Dual Microphone Noise Reduction for Headset Application.” J.A. 586. Like the ’400 patent, Alves describes an earpiece with a signal processing system, a speaker, and two microphones, one in the ear canal and one outside. J.A. 587, fig. 1; 601 ¶ 15. The Alves system reduces noise in the signal from the external microphone by,

first, dividing the signal into “subbands,” each subband containing only certain frequencies; second, within each subband, computing the average power of background noise; and, finally, filtering that background noise out of each subband to then recombine the modified subbands for further processing. J.A. 603–04 ¶¶ 42–43, 47. Afterward, the noise-reduced external microphone signal is mixed with the internal microphone signal to generate the speaker output heard by the wearer. J.A. 588, fig. 3.

The Board, acting for the PTO’s Director, instituted an IPR in June 2022, J.A. 948, and rendered its final written decision in June 2023, J.A. 1. In an analysis of Alves not challenged here, *see* Techiya’s Opening Br. at 30–37, the Board found that Alves’s noise reduction system has several components that perform different parts of its signal processing method, *see* J.A. 27–29, 35–44. One is a “noise reducer,” which receives a signal from the external microphone and “eliminates some noise” from that signal. J.A. 602 ¶ 31. Another is an “adaptive equalizer,” which “adjusts the output of [the] second[, *i.e.*, internal] microphone to the spectral characteristics of” the external microphone signal. *Id.* ¶ 32. The noise-reduced external signal (not the unmodified, noisy external signal) is used by Alves’s system to “set filter coefficients,” which are applied by the adaptive equalizer to the internal signal to filter it with respect to the noise-reduced external signal. *Id.* ¶¶ 31–32.

Two other Board determinations are relevant on appeal. First, in its claim-construction analysis, the Board, relying on both intrinsic evidence and Samsung’s expert testimony, construed the claim term “background noise level” to include “any one frequency subband’s particular background noise level.” J.A. 11–18. Applying that claim construction, the Board found that Alves discloses determining a background noise level as claimed by the ’400 patent, J.A. 32–34, 61, 88–89, which was necessary to all of its determinations of unpatentability because such a limitation appears in all independent claims. *See* ’400 patent,

col. 12, lines 21–38 (claim 1); col. 13, lines 20–36 (claim 14); col. 14, lines 9–32 (claim 18).

Second, the Board found that Alves discloses the ’400 patent’s claimed adjustment of amplitudes of an internal sound signal “based on” a background noise level. Techiya had argued that, because Alves’s adaptive equalizer receives a noise-reduced ambient signal from Alves’s noise reducer, the adaptive equalizer’s use of the noise-reduced ambient signal to adjust the internal signal is not “based on” the background noise level, which has already been stripped out. J.A. 35–36. The Board disagreed, determining that the Alves system’s adjustments of an internal signal (in particular, through “the combination of [the] noise reducer [] and [the] adaptive equalizer”) are based on a background noise level because the noise-reduced ambient signal is used as a “control input” to the adaptive equalizer, against which the internal signal is adjusted and filtered. J.A. 38–39.

The Board held claims 1, 6–7, 12–14, and 17 unpatentable for anticipation by Alves and claims 2–3, 9–11, and 18–20 unpatentable for obviousness over a combination of Alves and another reference. J.A. 2, 94. It further held that Samsung had failed to show the unpatentability of the remaining claims (4–5, 8, and 15–16). *Id.*

Techiya timely appealed on August 11, 2023, ECF No. 1, and Samsung cross-appealed the same day, *see* ECF No. 3; J.A. 119. The parties later jointly stipulated to dismissal of the cross-appeal, Samsung filed a notice of non-participation, and we dismissed the cross-appeal. ECF Nos. 40–41, 43. Shortly afterward, the Director timely intervened as of right to defend the Board’s decision under 35 U.S.C. § 143. ECF No. 44. We have jurisdiction under 35 U.S.C. §§ 141(c), 319 and 28 U.S.C. § 1295(a)(4)(A).

II

On appeal, Techiya asserts two grounds of error, each related to claim construction and each relevant to all claims held unpatentable. We review the Board's claim constructions and its analysis of the intrinsic record without deference. *Intel Corp. v. Qualcomm Inc.*, 21 F.4th 801, 808 (Fed. Cir. 2021). Subsidiary factfinding based on extrinsic evidence is reviewed for substantial evidentiary support. *Id.* Substantial evidence is "such relevant evidence as a reasonable mind might accept as adequate to support a conclusion." *Consolidated Edison Co. v. National Labor Relations Board*, 305 U.S. 197, 229 (1938). We reject Techiya's challenges.

A

Techiya's first contention is that the Board erred when it expressly construed the claimed "background noise level" to encompass a background noise level in a subset of sound frequencies, like the noise within one of Alves's subbands, rather than, as Techiya urges, to be limited to a "single overall background noise level." Techiya's Opening Br. at 19–30. Techiya makes no different arguments for the related term "background noise signal," which appears in a similar context in independent claims 14 and 18, *see id.* at 26, so we treat the two terms together.

Techiya relies heavily on dependent claim 5, which recites "low," "medium," and "high background noise levels." Techiya argues that those characterizations often could not be sensibly applied to background noise in multiple subbands, because the noise could be low in one subband but high in another, so claim 5 must refer only to one *overall* background noise and, says Techiya, the same must be true of claim 1 because it is presumptively broader. Techiya's Opening Br. at 25. Techiya makes a similar point about a disclosure in the specification that teaches adjusting the ambient and internal sound signals based on whether the

“background noise levels increase” or “decrease.” ’400 patent, col. 1, lines 56–62; *see* Techiya Opening Br. at 22.

When construing claims, the “[c]laim language and the specification . . . are the dominant sources of interpretation.” *Intel*, 21 F.4th at 809. The language of dependent claims can inform the scope of terms used in the corresponding independent claims because “[d]ependent claims are presumed to be of narrower scope than the [corresponding] independent claims,” such that a claim construction that would result in a dependent claim being broader than its independent claim is disfavored. *AK Steel Corp. v. Sol-lac and Ugine*, 344 F.3d 1234, 1242 (Fed. Cir. 2003); *see also* 35 U.S.C. § 112 ¶ 4 (2006). Here, we conclude, the claims and the specification do not support Techiya’s claim construction.

The language of “background noise level” is broad enough on its face to cover both an overall level and a level of part of the signal. No words provide for Techiya’s proposed narrowing to the first meaning. And the specification points against Techiya’s proposal. It states, twice, that the internal and ambient sound signals can be adjusted “by the spectral profile of the background noise measurement. For instance, if there is a large Low Frequency noise in the ambient sound field of the user, then the [ambient sound microphone] filter can [adjust] the low-frequencies” of each of the ambient and internal sound signal. ’400 patent, col. 4, lines 6–13; *id.*, col. 11, lines 27–33. That is, a “high” (or “large”) background noise level can properly refer to a portion of the entire noise spectrum (in the example just given, the low frequencies), and in such a case the patent provides guidance for adjusting the amplitude of the corresponding frequencies of the ambient and internal signals. Similarly, the patent’s disclosure of “a frequency-weighting system” whereby “the high and low frequencies [of the background noise level] are attenuated before the level of the microphone signals are calculated,” directs readers to focus on

only a portion of the entire audio frequency spectrum (there, the middle frequencies). *Id.*, col. 3, lines 59–64.

Claim 5 does not support Techiya’s proposal either. Even under Techiya’s characterization of claim 5 as limited to an overall background noise level, claim 5 would be narrower, not broader, than claim 1, which under the Board’s view encompasses *both* overall and subband levels. Techiya’s premise that the independent claim must be broader than the dependent claim thus does not support its position that claim 1 cannot *include* coverage of subband levels. That is enough to support the Board’s claim construction, even apart from the Board’s conclusion—itsself not shown to be incorrect—that claim 5 itself “can refer to background noise levels within multiple frequency subbands.” J.A. 15.

Techiya repeatedly cites expert testimony that “at any given place and time, a single ‘background noise’ exists.” J.A. 1111 ¶ 64; *see, e.g.*, Techiya’s Opening Br. at 20. Even if that is so, it does not establish that *only* a single background noise exists, and if that is what Techiya is suggesting, the Board was not obligated to credit the cited testimony to so find. *See Apple Inc. v. Corephotonics, Ltd.*, 81 F.4th 1353, 1360–61 (Fed. Cir. 2023). That is especially so because the ’400 patent refers to “background noises [that] can degrade the quality of the listening experience,” ’400 patent, col. 1, lines 32–34 (emphasis added), and discusses “background noise levels,” *e.g.*, *id.*, col. 10, lines 1, 65 (emphasis added). To be sure, there are some embodiments that suggest the calculation of a single, overall background noise level. *See, e.g.*, col. 6, lines 41–57 (pertaining to figure 3) (“[M]ixing . . . depend[s] on the background noise level of the ambient sound field.”). But no such embodiment is expressly limiting, and we see no clear intent to limit the claims to such embodiments. *See* col. 3, lines 17–20 (expressly stating that embodiments are non-limiting); *Innova/Pure Water, Inc. v. Safari Water Filtration Systems, Inc.*, 381 F.3d 1111, 1117 (Fed. Cir. 2004). Therefore, Techiya has failed to demonstrate that the Board

erred in construing “background noise level” to include the background noise level within a portion, or subband, of the sound spectrum.

B

Techiya’s second argument is that the Board, in analyzing whether Alves discloses the claimed “adjust[ing] an amplitude of one or more frequencies of the internal sound signal . . . *based on* the background noise” level, erroneously expanded the scope of the term “based on” beyond its ordinary meaning to include adjustments “made *independent of* the background noise.” Techiya’s Opening Br. at 30 (quoting ’400 patent, col. 12, lines 34–37) (emphases Techiya’s). We see no persuasive basis in this argument for disturbing the Board’s decision.

The Board’s pertinent findings and logic can be summarized as follows: The ’400 patent’s claimed “processor” reads on Alves’s system, which includes Alves’s noise reducer and adaptive equalizer as components. *See* J.A. 32. The noise reducer receives an ambient sound signal with a background noise level and, “based on” that level, reduces or eliminates noise in the ambient sound signal. J.A. 38, 40. The adaptive equalizer receives the noise-reduced ambient signal and uses it to adjust a second signal from Alves’s internal microphone. *Id.* The noise-reduced ambient signal is a “control input” for determining how the internal signal should be filtered; if the background noise were *not* first removed from the ambient signal, the internal signal would be adjusted differently. *See* J.A. 38–39. Thus, Alves’s system (the claimed processor), by the combination of the operation of the noise reducer and the adaptive equalizer, performs the claimed “adjust[ment]” of the “internal sound signal . . . based on the background noise level,” because the initial removal of background noise affects how the internal sound signal is adjusted. *See* J.A. 35–40.

Techiya argues that the foregoing facts cannot support a determination that Alves discloses adjusting an internal signal “based on” a background noise level because “the background noise level is not known by [Alves’s] *adaptive equalizer*.” J.A. 1040 (Techiya patent owner response) (emphasis added); Techiya’s Opening Br. 31, 34 (making similar assertions). But the Board found, and Techiya does not dispute, that the ’400 patent’s claimed processor (which is the element that determines a background noise level and adjusts an internal signal based on that level) encompasses both Alves’s noise-reducer and adaptive equalizer. J.A. 32; see Techiya’s Opening Br. at 30–37 (not challenging Board’s findings of fact). Thus, Techiya’s position appears to be that, for the claimed processor to adjust an internal sound signal “based on” the background noise level, the same *component* of the processor (such as the adaptive equalizer) must both receive the background noise and perform the adjustment. See, e.g., Techiya’s Opening Br. at 31; Techiya’s Reply Br. at 24 (asserting that “a component . . . must . . . have the background noise level as a[n] . . . input”).

We agree with the Board that Techiya advances a belated, and incorrect, narrowing construction. See J.A. 39. Techiya did not squarely ask the Board to construe the “based on” claim language according to Techiya’s narrow, same-component understanding, see J.A. 11–26; 1035–42 (Techiya’s patent owner response), so that argument was forfeited, see *In re Google Technology Holdings LLC*, 980 F.3d 858, 863 (Fed. Cir. 2020). Furthermore, the intrinsic record is contrary to Techiya’s construction. The ’400 patent discloses a singular “processor,” comprising multiple components, that performs various functions. See, e.g., ’400 patent, figs. 4–6 (depicting processor components). In view of that disclosure, the claimed processor configured to (1) determine a background noise level from a received ambient sound signal and (2) adjust an internal sound “based on” that level must perform both of those steps, but there

is no requirement that a single component *within* the processor do so. *Cf. Salazar v. AT&T Mobility LLC*, 64 F.4th 1311, 1316–17 (Fed. Cir. 2023) (discussing claims to a processor “defined by certain recited characteristics” which therefore “require[d] *a single processor* having all [those] characteristics”) (cleaned up) (emphasis added).

Techiya cites no intrinsic evidence and no case law in support of its contrary reading of the “based on” limitation. *See* Techiya’s Opening Br. at 30–37; Techiya’s Reply Br. at 21–25. Instead, Techiya refers extensively to Alves and expert testimony about Alves. *See* Techiya’s Opening Br. at 30–37; Techiya’s Reply Br. at 21–25. Alves, not cited by the ’400 patent, is of minimal relevance to the interpretation of the ’400 patent. *See Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1328 (Fed. Cir. 2008) (“[E]xtrinsic sources . . . cannot overcome more persuasive intrinsic evidence.”). Techiya identifies nothing in Alves pertinent to the question whether a relevant artisan would understand that the ’400 patent’s processor adjusts a signal “based on” background noise only when a single component both receives background noise and adjusts a signal.

We have considered Techiya’s remaining arguments and are not persuaded that they support its challenge to the Board’s ruling.

III

For the foregoing reasons, we affirm the decision of the Board.

AFFIRMED