NOTE: This disposition is nonprecedential.

United States Court of Appeals for the Federal Circuit

APPLE INC.,
Appellant

v.

SMART MOBILE TECHNOLOGIES LLC,
Cross-Appellant

2024-1607, 2024-1609, 2024-1675, 2024-1676

Appeals from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Nos. IPR2022-01248, IPR2022-01249.

Decided: August 27, 2026

ANGELA M. OLIVER, Haynes and Boone, LLP, Washington, DC, argued for appellant. Also represented by ANDREW S. EHMKE, DEBRA JANECE MCCOMAS, Dallas, TX; LAURA VU, San Francisco, CA; CLINT S. WILKINS, Plano, TX.

PHILIP GRAVES, Graves & Shaw LLP, Los Angeles, CA, argued for cross-appellant. Also represented by GREER N. SHAW.

Before REYNA, HUGHES, and STARK, *Circuit Judges*.

STARK, *Circuit Judge*.

Apple Inc. ("Apple") appeals from two judgments of the Patent Trial and Appeal Board ("Board") in related *inter partes* reviews ("IPRs") of Smart Mobile Technologies LLC's ("Smart Mobile's") U.S. Patent Nos. 9,019,946 (the "'946 patent") and 8,842,653 (the "'653 patent") (together the "challenged patents"). Apple appeals from the portion of the judgments determining that it failed to prove certain claims unpatentable, a conclusion that rested on the Board's implicit construction of the claim term "multiplexed signals."

Smart Mobile cross-appeals from the portion of the same judgments holding that other claims are unpatentable. Smart Mobile contends that the Board's motivation to combine analysis was inadequate under the Administrative Procedure Act ("APA"), 5 U.S.C. § 701, *et seq.*

In general, we disagree with Apple and agree with Smart Mobile. Thus, with respect to Apple's appeal we affirm the Board. As to Smart Mobile's cross-appeal, we vacate the Board's judgment of unpatentability and remand for further proceedings.

I

A

Smart Mobile owns the challenged patents, both of which are directed to mobile wireless devices with multiple transmitter and receiver ("T/R") components. While they share a specification, and claim priority to the same 1999 application,[1] the challenged patents have different titles:

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[1] Application No. 09/281,739, filed on June 4, 1999, now U.S. Patent No. 6,169,789. J.A. 138, 153.

the '653 patent is entitled "Wireless Devices with Transmission Control and Multiple Paths of Communication," J.A. 138, and the '946 patent is entitled "Wireless and Cellular Voice and Data Transmission with Multiple Paths of Communication," J.A. 153. The specification explains that although "[t]he typical" cellular telephone or other mobile wireless device "has one transmitter and one receiver, with one antenna," the patented devices allow for incorporation of multiple transmitters and receivers into a single device, by "integrat[ing]" and "shrink[ing]" the necessary components, which boosts performance without increasing device size or cost. J.A. 145 ('653 pat. 1:57-65).

Independent claims 1 and 17 of the '653 patent, reproduced below, are representative of all challenged claims across both challenged patents for purposes of this appeal.

> [1pre] An Internet-enabled mobile communication device comprising:
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> [1a] a memory;
>
> [1b] display electronics;
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> [1c] at least two or more antennas;
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> [1d] at least one or more processors; and
>
> [1e] a plurality of wireless transmit and receive components including a first wireless transmit and receive component and a second wireless transmit and receive component, wherein each wireless transmit receive component is configured to communicate using one or more protocols;
>
> > [1f] wherein the device is configured for multi-band wireless communication;
> >
> > [1g] wherein the device is enabled for communication using Internet Protocol (IP);
> >
> > [1h] wherein the device is enabled for wireless communication on a wireless local area network;

> [1i] wherein the first wireless transmit and receive component is configured to communicate using a plurality of antennas; and
>
> [1j] wherein a transmission interface is created and wherein said transmission interface uses a plurality of IP enabled interfaces on the mobile device which utilize the plurality of wireless transmit and receive components on the mobile device to enable a single interface comprised of *multiplexed signals* from the plurality of wireless transmit and receive components.

17. A mobile communication device comprising:

a memory;

a display electronics;

at least two or more antennas;

at least one or more processors; and

a plurality of wireless transmit and receive units including a first wireless transmit and receive unit and a second wireless transmit and receive unit, wherein each wireless transmit receive unit is configured to communicate using one or more protocols;

> . . .
>
> wherein the first wireless transmit and receive component is configured to communicate over Internet Protocol with a remote system over a first network path and the second wireless transmit and receive component is configured to communicate with the same or a different remote system using a second network path *and wherein the processor on the mobile device is configured*

> *to combine the data paths into a single transmission interface to one or more applications on the mobile device.*

J.A. 150-51 ('653 pat. at 11:56-12:16, 13:45-14:5) (emphasis and bracketed numerals added); *see also* J.A. 165-66 (materially identical claims of '946 patent).

Claim 1's limitation [1j], requiring "a single interface comprised of multiplexed signals," is the only one at issue in Apple's appeal. Claim 17, which does not require "multiplexed signals," is the only independent claim at issue in Smart Mobile's cross-appeal.

B

Smart Mobile sued Apple in the Western District of Texas for infringement of 13 patents, including the two challenged patents. In response, Apple petitioned for IPR of multiple claims of the challenged patents on several grounds, each involving a unique combination of prior art references.[2] Apple also petitioned for IPR of another related patent asserted in the district court, U.S. Patent No. 9,319,075, which is the subject of Appeal No. 25-1090, which we decide today in a separate opinion. The Western District of Texas eventually transferred the litigation to the Central District of California, where it is stayed pending resolution of Apple's IPRs. *See Smart Mobile Techs. LLC v. Apple Inc.*, No. 3:23-cv-4186.

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[2] Samsung Electronics Co., Ltd. ("Samsung") was a defendant in the Western District of Texas case and also a joint petitioner in the IPRs. After having initially appealed the Board's decisions, Samsung reached a settlement with Smart Mobile, and voluntarily dismissed its appeals.

In the IPRs, Apple alleged the combination of two prior art references, Yegoshin[3] and Bernard,[4] discloses the claimed multiplexed signals of limitation [1j] in one of two alternative ways.[5] First Apple contended Yegoshin alone discloses multiplexed signals because it enables simultaneous use of both cellular and wireless local area network ("WLAN") signals through a single interface, achieved by multiplexing. J.A. 226-27. Alternatively, Apple argued that Bernard's cradle includes "communication server 750," which "operates as a multiplexer for combing the data packets coming from . . . different networks." J.A. 231-32.

Apple stated in its Petitions that no formal claim construction was needed to resolve the IPRs. However, in its Institution Decisions the Board expressed skepticism about Apple's arguments that both Yegoshin and Bernard disclosed "multiplexed signals" under the Board's view of the claim scope. Thereafter, Apple filed motions to submit

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[3] U.S. Patent No. 6,711,146. *See* J.A. 1358-67. Yegoshin discloses "a cellular phone 9 enhanced with additional communication ports and software," to allow for communication over both cellular networks and local area networks [i.e., WLAN networks]." J.A. 1363 (Yegoshin at 4:63-65).

[4] U.S. Patent No. 5,497,339. *See* J.A. 1431-66. Bernard describes a cradle (i.e., an external workstation) for a Personal Digital Assistant ("PDA"). The cradle allows the PDA to communicate on multiple different networks. Figure 10 of Bernard – depicting the "second embodiment," relevant to these appeals – shows the PDA and cradle being connected by a single interface, serial interface 701, allowing the PDA to communicate with several networks.

[5] Each ground of unpatentability asserted in Apple's Petitions included Yegoshin and/or Bernard in combination with one or more additional prior art references.

supplemental information, to "correct[] misunderstandings reflected in the Institution Decision[s] (as it relates to the term 'multiplex')," which the Board granted. J.A. 482, 469-83. In those filings, Apple emphasized that "multiplexing does not require multiple signals to be presented to a multiplexer simultaneously." J.A. 491.

In its Patent Owner Responses, Smart Mobile agreed with Apple that no claim construction, including of the term "multiplexed signals," was necessary. But it nonetheless contended that neither Yegoshin nor Bernard discloses use of a common pathway to transmit a composite signal comprised of several signals from distinct inputs and, therefore, neither discloses multiplexing. This debate – between Apple's broader interpretation of multiplexed signals and Smart Mobile's more narrow understanding of the claims – continued in Apple's replies and Smart Mobile's sur-replies.

In its Final Written Decisions, the Board agreed with both parties that no formal construction of any claim term was necessary, but it also adopted Smart Mobile's more narrow understanding of the "multiplexed signals" term. Applying this view of the scope of the claims, the Board found that neither Yegoshin nor Bernard discloses multiplexing. Thus, it held that Apple failed to prove claims 1-13 and 27-30 of the '653 patent and claims 1-13 and 16 of the '946 patent unpatentable. Apple's appeal turns on whether "multiplexed signals" merely requires simultaneous access to cellular and WLAN signals through a shared interface, as Apple contends, or instead requires that those signals be combined into a single composite signal carried over one common pathway, as Smart Mobile contends and the Board ultimately held.

C

In the Final Written Decisions, the Board determined that independent claim 17 of both challenged patents and

the claims depending from them, had been proven to be obvious. This holding is the subject of Smart Mobile's cross-appeal.

Independent claim 17 of the '653 patent recites a mobile communication device wherein "the processor on the mobile device is configured to combine the data paths into a single transmission interface to one or more applications on the mobile device." J.A. 151 ('653 pat. at 14:2-5). Claim 17 of the '946 patent contains a materially identical limitation. J.A. 166 ('946 pat. at 14:18-21).

Apple argued to the Board that the single-transmission-interface limitation was obvious because the Yegoshin-Bernard combination discloses combining "the signals received over cellular and WLAN [networks] into a single interface (e.g. the serial interface) (single transmission interface) connected/integral to the phone, which routes the received signals to 'appropriate applications' running on the phone as taught in Bernard." J.A. 251 (internal emphasis omitted). Apple did not identify any particular motivation to combine Yegoshin and Bernard in connection with claim 17. Instead, it incorporated by reference its motivation to combine analysis for independent claims 1 and 14.

In finding claim 17 obvious, the Board relied on Apple's motivation to combine analysis for claim 1. The Board explained that a skilled artisan would have found it obvious to modify Yegoshin's phone to internally integrate the multiple network connectivity allowed by Bernard's external cradle in order to provide increased connectivity without additional external hardware. J.A. 38-39, 105-06. The Board added: "Neither [Smart Mobile] nor Dr. Cooklev," Smart Mobile's expert, "addresses that explanation." J.A. 38-39, 105-06.

We have jurisdiction over both the appeal and the cross appeal under 28 U.S.C. § 1295(a)(4)(A).

II

We review the Board's claim construction de novo and subsidiary factual findings for substantial evidence. *See Personalized Media Commc'ns, LLC v. Apple Inc.*, 952 F.3d 1336, 1339 (Fed. Cir. 2020). Claims are generally construed according to their plain and customary meaning as understood by a person of ordinary skill in the art who has reviewed the patent and specification. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005) (en banc).

"Obviousness is a question of law based on underlying facts." *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1047 (Fed. Cir. 2016) (en banc). What a prior art reference teaches and whether a skilled artisan would have been motivated to combine references are questions of fact reviewed for substantial evidence. *See id.* Substantial evidence is "such relevant evidence as a reasonable mind might accept as adequate to support a conclusion." *Consol. Edison Co. v. NLRB*, 305 U.S. 197, 229 (1938).

We review the Board's compliance with the requirements of the APA *de novo*. *See Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F.3d 1359, 1365 (Fed. Cir. 2015). Although "the Board is not required to address every argument raised by a party or explain every possible reason supporting its conclusion," it must "address important aspects of the problem" before it. *Yeda Rsch. v. Mylan Pharms. Inc.*, 906 F.3d 1031, 1046 (Fed. Cir. 2018) (internal quotation marks and alterations omitted). The Board must also "explain[] why [it] accepts the prevailing argument." *In re Nuvasive, Inc.*, 842 F.3d 1376, 1383 (Fed. Cir. 2018). "The central inquiry is whether we can reasonably discern that the Board followed a proper path, even if that path is less than perfectly clear." *Medtronic, Inc. v. Teleflex Innovations S.a.r.l.*, 70 F.4th 1331, 1344 (Fed. Cir. 2023) (internal quotation marks and brackets omitted).

III

Apple's appeal rests on its challenge to the Board's understanding of the claim term "multiplexed signals." Apple asserts that the Board implicitly construed the term and did so too narrowly, limiting the scope of the claims as requiring separate signals to be combined into one composite (or mixed) signal *before* they are transmitted. In Apple's view, the Board also wrongly required all components of the multiplexed signal to be transmitted at the same time.

According to Apple, the proper construction of multiplexed signals is broader and would include any sharing of a single physical resource by multiple inputs, even if the different signals are not combined prior to transmission. Apple's position would allow the transmission of two different signals one after the other, known as "switching," to be considered multiplexing. Alternatively, Apple contends that even under the Board's unduly narrow construction, both Yegoshin and Bernard disclose "multiplexed signals," and the Board's contrary reading of these references lacks substantial evidence. We address, and reject, each of these arguments below.

A

We start with the construction of "multiplexed signals." While the Board did not expressly construe this claim term, we agree with Apple that the Board did so implicitly. *See Google LLC v. EcoFactor, Inc.*, 92 F.4th 1049, 1055 (Fed. Cir. 2024) ("If the outcome of the analysis of the claim term establishes the scope (e.g., boundaries) and meaning of the patented subject matter, the court (or the Board) has most likely construed the claim.") (emphasis omitted). On the merits, we agree with the Board's implicit construction, which is consistent with Smart Mobile's view of the claims, requiring "multiplexed signals" to involve creation of a pre-transmission composite signal for simultaneous sending along a single, shared physical pathway; this construction excludes "switching," i.e., the sequential transmission of the different signals. J.A. 27 (interpreting "multiplexed

signals" as requiring creation of composite signal to be sent simultaneously along single, shared pathway); J.A. 96 (same).[6]

Beginning with the intrinsic evidence, the claim language, "multiplexed signals," indicates it is *signals* that are being multiplexed, not paths. This contradicts Apple's insistence that multiplexing occurs whenever multiple data paths are combined into a single path. *See, e.g.*, Open. Br. at 4 ("'[M]ultiplexing' refers to combining multiple data paths (and, by extension, the data on those paths) into a single path.") (internal emphasis omitted); Oral Arg. at 1:42-3:08. The claim language's use of "multiplexed" to describe the "signals" also suggests that multiple different signals must be combined and then travel on the same path, such that those combined signals are the "multiplexed signals" as claimed. Apple's broader construction, which would include among "multiplexed signals" two signals that happen to travel on the same path seconds, minutes, or even years apart, finds no support in the claim language.

Apple's reliance on claim differentiation is unavailing because it misunderstands the claims. Apple characterizes

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[6] We disagree with Smart Mobile's forfeiture argument. Although a "party may not, as a general rule, change the scope of its claim construction on appeal," it may pursue a position that is not "substantially different" from the one it took at the Board. *Digit.-Vending Servs. Int'l, LLC v. Univ. of Phx., Inc.*, 672 F.3d 1270, 1273-74 (Fed. Cir. 2012); *see also EcoFactor*, 92 at 1054-59 (reviewing implicit claim construction where neither party advocated formal construction below). Apple has consistently taken the view that "multiplexed signal" has a meaning broad enough to encompass switching and is not limited to simultaneous communication.

dependent claim 2 of the '946 patent[7] as requiring simultaneous transmission of multiple signals, and dependent claim 3 of the '946 patent[8] as requiring sequential transmission of such signals, from which – if true – it might follow that claim 1, from which both claims 2 and 3 depend, must be broad enough to include simultaneous and sequential transmission. But claim 2 and 3's references to "simultaneous" and "sequential" do *not* relate to the *processor* multiplexing multiple receiving signals. Instead, the "simultaneous" and "sequential" transmitting of claims 2 and 3, respectively, is of "*two or more wireless transmit and receive connections*," which is neither the same signal nor location to which the "multiplexing signals" of claim 1 relate.

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[7] Claim 2 recites:

> The device of claim 1, wherein a single transmission connection is further comprised of at least *two or more wireless transmit and receive connections simultaneously transmitting and receiving* using the plurality of antennas, and wherein the *processor multiplexes* the receiving signals into the single transmission connection.

J.A. 165 ('946 pat. at 12:25-31) (emphasis added).

[8] Claim 3 recites:

> The device of claim 1, wherein a single transmission connection is further comprised of at least *two or more wireless transmit and receive connections sequentially transmitting and receiving* using the plurality of antennas, and wherein the *processor multiplexes* the receiving signals into the single transmission connection.

J.A. 165 ('946 pat. 12:32-37).

The specification also supports the Board's construction. Like the claim language, the specification suggests that multiplexing is a function performed *on signals*, at either end of a shared path, rather than a function performed on the path itself, which is, again, consistent with the Board's construction. *See* J.A. 146 ('653 pat. at 3:47-48) ("The signal is sampled and may be multiplexed at each end, at a rate that assures accuracy."). Dr. Jensen, Apple's expert, testified that this portion of the specification refers to messages, i.e., signals – not paths – being multiplexed. J.A. 3796 (Dr. Jensen interpreting specification as suggesting that multiplexing signals involves "combin[ing] them at their . . . transmitter [and] decoupl[ing] the signals at the receiver" and "interleaving multiple signals onto a single communication medium of some form."); *see also* J.A. 5873 (same). The specification thus suggests that a shared pathway is the medium over which multiplexed signals travel. Sending a message along a shared pathway may facilitate multiplexing signals, but it is not multiplexing itself. J.A. 146.

In opposition to this reasoning, Apple makes much of the specification's statements describing the cradle embodiment of the claims, as depicted in Figure 6, including that "[o]ne, all, or some of the connections may be used simultaneously or sequentially for combining multiple data paths into a single path." J.A. 147 ('653 pat. at 5:52-54); *see also* J.A. 149 ('653 pat. at 9:67-10:27) (explaining that features allow mobile device to "fully interface and interact with different environments sequentially or simultaneously"); *id.* at 9:53-55 ("The network switch box thus can fully interface and interact with different environments sequentially or simultaneously."). Apple also directs us to Figure 5B, which depicts a mobile device "capable of operating in a number of network environments sequentially or simultaneously." J.A. 145 ('653 pat. at 2:18-19). As Apple points out, the specification explains that the network switch box shown in Figure 5B can have "universal applications since

it can sequentially or simultaneously communicate optimally with other systems and networks to deliver quality/performance and speed tailored for each application." J.A. 147 ('653 pat. at 5:35-39).

But nothing in Figures 6 or 5B, nor in the specification's discussion of them, suggests they are actually referring to multiplexed signals. They appear to refer, instead, more generally to the mobile device "interfac[ing] and interact[ing] with different environments sequentially or simultaneously." J.A. 149 ('653 pat. 9:34-35; 9:61-63).

Apple next refers us to a section of the specification describing certain system components, which "may be specifically designed for a specific frequency or application or may be multiplexed for different uses." J.A. 149 ('653 pat. 9:14-16, 9:31-38). This language, too, does not pertain to signals but rather to antennas, processors, and other transmit and receive units. *See id.*

Turning to the extrinsic evidence,[9] we find further support for the Board's construction. The Board considered the parties' dictionaries, competing expert declarations, and other publications, including the Internetworking Technologies Handbook (Ford), on which Apple heavily relies on appeal. Apple's arguments that the Board should have interpreted this evidence differently, and its suggestion it should have credited its expert over Smart Mobile's, do not undermine the substantial evidence supporting the Board's actual findings. *See In re Jolley*, 308 F.3d 1317, 1320 (Fed. Cir. 2002) ("If the evidence in [the] record will support several reasonable but contradictory conclusions,

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[9] Neither party points to any prosecution history of significance to the claim construction dispute.

we will not find the Board's decision unsupported by substantial evidence simply because the Board chose one conclusion over another plausible alternative.").

Thus, we agree with the Board's implicit construction of "multiplexed signals" as meaning "combining multiple signal streams into one" and not including multiple signals sequentially using the same path.

B

Apple argues, in the alternative, that even under the Board's construction it proved by preponderant evidence that the Yegoshin-Bernard combination discloses "multiplexed signals." We disagree and determine the Board's contrary findings are supported by substantial evidence.

According to Apple, a person of ordinary skill would understand that Yegoshin's cell phone can simultaneously receive both cellular and WLAN signals through a single interface, and that this requires the use of multiplexed signals. The Board found, instead, that "an ordinarily skilled artisan would not have understood or found obvious that calls are received on both cellular and WLAN simultaneously." J.A. 20. It based this finding on portions of Yegoshin's specification stating that a user must "select a type of network for communication," which it determined meant a user may only use cellular *or* WLAN connectivity at any one time. *Id.* (citing J.A. 1364 (Yegoshin at 5:33-44)). It is true, as Apple observes, that the Board noted in Yegoshin that "both the cellular and WLAN networks are in use simultaneously, even if the phone does not establish cellular and WLAN calls simultaneously." J.A. 77. However, this does not mean that the Board found Yegoshin to disclose simultaneous *calls* requiring multiplexed signals.

With respect to Bernard, Apple argues that the cradle in Bernard's second embodiment includes "packet interface 752," which "operates as a multiplexer for combing the data packets coming from . . . different networks." J.A. 231-32.

The Board rejected this contention, finding that "the portions of Bernard cited by [Apple], like Yegoshin, do not teach [multiplexed signals] expressly." J.A. 24. The Board emphasized that Bernard has two alternative embodiments and only the first (depicted in Figure 13) describes the use of a multiplexer. J.A. 25 ("Bernard does not describe or show in its second embodiment a decoder/multiplexer."); J.A. 27 ("Rather than describing a multiplexer in the second embodiment, Bernard describes only how one of the four connections can be established at a time.").

Apple also points to Bernard's statement that "an alternative interconnection could be used that would allow multiple connections to be established simultaneously." J.A. 25 (discussing J.A. 1463 (Bernard at 26:56-65)). The Board found, however, that Apple "fail[ed] to identify the 'alternative interconnection' or explain how it could be incorporated into the combination." *Id.*

Apple has provided no persuasive basis, under our deferential review, to reverse any of these findings. Thus, we affirm the Board's determination that neither Yegoshin nor Bernard discloses multiplexed signals.

IV

Finally, we consider Smart Mobile's cross-appeal from the Board's judgment that Apple proved claim 17 of both challenged patents, and the claims depending from them,[10] invalid due to obviousness. Claim 17 does not contain a "multiplexed signals" limitation; however, the disputed limitation at the Board was "the processor on the mobile device is configured to combine the data paths into a single transmission interface to one or more applications on the mobile device." J.A. 151 ('653 pat. at 14:3-5).

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[10] The cross-appeal relates to claims 17-21 and 23-26 of the '653 and '946 patents.

Because the Board appears to have overlooked Smart Mobile's motivation to combine arguments with respect to claim 1 – which Apple also relied on for claim 17 – instead erroneously finding Smart Mobile made no such arguments, we cannot reasonably discern the Board's basis for siding with Apple. Thus, we vacate and remand the portion of the judgment at issue in the cross-appeal.

1

In its Petitions, Apple set out its motivation to combine analysis in its discussion of claims 1 and 14 of the challenged patents. When addressing claim 17, the Petitions permissibly incorporated by reference this same analysis. *See Voice Tech Corp. v. Unified Patents, LLC*, 100 F.4th 1331, 1337-38 (Fed. Cir. 2024) (allowing incorporation of argument by reference). As to claim 1, Apple argued that a skilled artisan would be motivated to combine Yegoshin and Bernard either by (1) physically connecting Yegoshin's phone to Bernard's external cradle (the "phone-plus-cradle" combination) or (2) modifying Yegoshin's internal circuitry in order to replicate Bernard's multi-network connectivity without the cradle (the "phone-only" combination).

As Apple rested its claim 17 motivation to combine arguments entirely on the same grounds as it asserted in relation to claim 1, Smart Mobile's responses with respect to claim 1 were also pertinent to claim 17. Since the Board found motivation to combine based only on Apple's arguments regarding claim 1, it was incumbent upon the Board, in order to hold Apple to its burden of proof, to assess any counterarguments and evidence presented by Smart Mobile as to claim 1. In particular, Smart Mobile made, as to claim 1, an extended argument, over several pages of its Patent Owner Responses, to the effect that Apple's proposed combination of Yegoshin and Bernard would lead to undesirable "bottlenecking," in both the phone-plus-cradle and phone-only manifestations. J.A. 581-91. This "bottle-

necking" problem, Smart Mobile continued, would have deterred – not motivated – a skilled artisan from making that combination.[11] Essentially, Smart Mobile contended that introducing Bernard's serial interface into Yegoshin's phone would significantly reduce data transmission speed, creating an undesirable bottleneck. Smart Mobile's contention was not merely conclusory, and it was supported by evidence from its expert, Dr. Cooklev.[12]

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[11] The Board concluded that neither Yegoshin nor Bernard, nor any proposed combination of the two, disclosed the "multiplexed signals" required for claim 1. Therefore, the Board had no occasion, with respect to claim 1, to address whether "bottlenecking" might be another reason a skilled artisan would not have been motivated to make this combination.

[12] Dr. Cooklev testified that a skilled artisan considering either of Apple's proposed combinations would be troubled by the problem of bottlenecking. As to the phone-plus-cradle combination, Dr. Cooklev explained that "even if a POSITA were to add Bernard's cradle [to Yegoshin's phone], the combined system would use the cellular and WLAN networks through the cradle interface. There does not appear to be any obvious reason to use a cellular and WLAN network through a cradle with a serial data bottleneck." J.A. 582 (quoting J.A. 3731-32) (internal quotation marks omitted). As to the phone-only scenario, Dr. Cooklev explained that the connection between Bernard's application server and communication server is a serial interface, which is disadvantageous because it "send[s] data serially, one bit at a time," a rate much slower than other interfaces known in the art – and a rate slower than Yegoshin, on its own, enjoys. J.A. 589 (quoting J.A. 3706-10) (internal quotation marks omitted).

In connection with claim 17, the Board, crediting Apple's evidence and argument as to claim 1, found that a person of ordinary skill in the art would have been motivated to combine Bernard's serial interface with Yegoshin's cell phone. Adopting Apple's "phone-only" combination, the Board reasoned that the skilled artisan would be motivated by the "benefits [of] implementing Bernard's cradle functionality internal to the mobile device to avoid the need for a separate cradle device and/or to achieve the benefits of Bernard's multi-network connectivity without requiring the mobile device to be connected to the cradle." J.A. 105-06; *see also* J.A. 38-39. In reaching this conclusion, the Board stated, erroneously, that "[n]either [Smart Mobile] nor Dr. Cooklev address that explanation, and we agree that it would have been obvious and predictable to include, in [Yegoshin's cell phone], a single serial interface, as in Bernard, to carry data traversing multiple paths." J.A. 106; *see also* J.A. 38-39. In fact, however, Smart Mobile's "bottlenecking" evidence and argument, including Dr. Cooklev's discussion of the issue in his expert report, *was* Smart Mobile's response to Apple's "explanation."

While the Board's failure to discuss the bottlenecking issue "does not alone establish that the Board did not consider it," *Yeda Rsch.*, 906 F.3d at 1046, here the non-existent discussion coupled with the Board's incorrect statement that Smart Mobile did not respond to Apple's explanation, leads us to question whether the Board did consider bottlenecking. It also leaves us unable to reasonably discern on what basis the Board determined (if it did) that a skilled artisan would be motivated to combine the functionality of Bernard's cradle with the internal architecture of Yegoshin's phone, thereby eliminating the need for a bulky external cradle, despite the resulting bottlenecking. Accordingly, vacatur and remand is appropriate. *See Provisur Technologies, Inc. v. Weber, Inc.*, 50 F.4th 117, 124 (Fed. Cir. 2022) (finding vacatur warranted where Board misread party's arguments as limited to one claim limitation, when two were argued).

Apple asks us to nonetheless affirm on the alternative ground that Smart Mobile itself failed to respond to Apple's evidence of certain benefits of the proposed combination. This contention is unavailing because, as we have explained, we cannot say with confidence that the Board considered Smart Mobile's evidence of "bottlenecking," which might be found to outweigh any purported benefits of the proposed combination. In an obviousness analysis, the "benefits, both lost and gained," arising from the proposed combination, "should be weighed against one another." *Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324, 1332 (Fed. Cir. 2019). Remand is necessary so that the Board can undertake this analysis, considering all the evidence from both parties as to benefits and detriments arising from Apple's combination.

Therefore, we vacate the judgment that claim 17 (and its dependent claims) are unpatentable as obvious and remand for further proceedings with respect to these claims.

V

We have considered the parties' remaining arguments and find them unpersuasive. Accordingly, we (1) affirm the Board's judgment that Apple did not prove claims 1-13 and 27-30 of the '653 patent and claims 1-13, 16, and 26 of the '946 patent are unpatentable and (2) vacate its judgment that claims 17-21 and 23-26 of both challenged patents are obvious and remand for further proceedings with respect to these claims.

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

COSTS

Each party to bear its own costs.