NOTE: This disposition is nonprecedential.

# United States Court of Appeals for the Federal Circuit

---

**KONINKLIJKE PHILIPS N.V.,**
*Appellant*

**v.**

**QUECTEL WIRELESS SOLUTIONS CO. LTD.,**
*Appellee*

---

2023-1896

---

Appeal from the United States Patent and Trademark Office, Patent Trial and Appeal Board in No. IPR2021-00563.

---

Decided: August 29, 2024

---

GEORGE CHRISTOPHER BECK, Foley & Lardner LLP, Washington, DC, argued for appellant. Also represented by BRADLEY ROUSH; JOHN CUSTER, KEVIN M. LITTMAN, LUCAS I. SILVA, Boston, MA; ELEY THOMPSON, Chicago, IL.

ROBERT COURTNEY, Fish & Richardson P.C., Minneapolis, MN, argued for appellee. Also represented by MICHAEL TIMOTHY HAWKINS; THOMAS H. REGER, II, Dallas, TX.

---

Before LOURIE, REYNA, and CHEN, *Circuit Judges*.

CHEN, *Circuit Judge*.

Quectel Wireless Solutions Co. Ltd. (Quectel) petitioned the Patent Trial and Appeal Board (Board) for *inter partes* review (IPR) of claim 9 of U.S. Patent No. 8,195,216 ('216 patent), owned by Koninklijke Philips N.V. (Philips). The Board determined the challenged claim to be unpatentable under 35 U.S.C. § 103. *Quectel Wireless Sols. Co. v. Koninklijke Philips N.V.*, No. IPR2021-00563, 2022 WL 4280566, at *1 (P.T.A.B. Sept. 13, 2022) (*Decision*). Philips appeals. We *affirm* in part, *vacate* in part, and *remand* for further proceedings.

## BACKGROUND

The '216 patent relates to techniques for radio communication systems to regulate the power of communications transmitted between base stations and mobile stations. Uplink communications are those transmitted from a mobile station to a base station, and downlink communications are those transmitted from a base station to a mobile station. '216 patent col. 3 ll. 22–25. The mobile and base stations exchange two types of information: (1) user traffic, such as speech or packet data, and (2) control information, which sets and monitors various parameters of the transmission channel to enable the base and mobile stations to exchange user traffic. *Id.* col. 1 ll. 17–23.

The control information enables power control between the base and mobile stations. As the '216 patent explains, power control of signals transmitted from a mobile station to the base station is needed "so that the [base station] receives signals from different [mobile stations] at approximately the same power level, while minimi[z]ing the transmission power required by each [mobile station]." *Id.* col. 1 ll. 25–29. Furthermore, power control of signals transmitted from the base station to a mobile station is

needed "so that the [mobile station] receives signals from the [base station] with a low error rate while minim[z]ing transmission power, to reduce interference with other cells and radio systems." *Id.* col. 1 ll. 29–33. Radio communication systems typically use closed-loop power control, in which the mobile station determines the required changes in the power of transmissions from the base station and signals those changes to the base station, and vice versa. *Id.* col. 1 ll. 33–37.

Problems with closed-loop power control arise if there is an interruption in data transmission. "[A]fter the transmission is interrupted, the power control loops may take some time to converge satisfactorily. Until such convergence is achieved data transmissions are likely to be received in a corrupted state if their power level is too low, or to generate extra interference if their power level is too high." *Id.* col. 1 ll. 47–52. The '216 patent purports to address these problems by providing means "for setting the initial transmission power after a pause in transmission to that before the pause adjusted by an offset." *Id.* col. 1 ll. 65–67.

Claim 9 of the '216 patent recites:

> A secondary station for use in a radio communication system having a communication channel between the secondary station and a primary station, the channel including an uplink and a downlink control channel for transmission of control information, including power control commands, and a data channel for the transmission of data, the secondary station comprising:
>
> power control means for adjusting the power of the uplink control and data channels in response to the downlink power control commands;

> means for setting an initial transmission power after an interruption in transmission to that before the interruption adjusted by an offset; and
>
> means for determining the offset from a difference between a last transmission power and a weighted average of the transmission power over a predetermined period before the interruption in transmission.

*Id.* at claim 9.

Quectel's IPR Petition challenged claim 9 of the '216 patent as obvious over U.S. Patent No. 6,337,988 (Agin) in view of U.S. Patent No. 6,512,925 (Chen). The Board instituted review and issued a Final Written Decision finding claim 9 unpatentable over Agin and Chen. Philips appeals. We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A).

## DISCUSSION

"In an appeal from an IPR decision, we review the Board's legal conclusions *de novo* and its factual findings for substantial evidence." *Wasica Fin. GmbH v. Cont'l Auto. Sys., Inc.*, 853 F.3d 1272, 1278 (Fed. Cir. 2017). "Obviousness is a question of law based on underlying factual findings, including the scope and content of prior art references and the existence of a reason to combine those references." *Polaris Indus., Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1064 (Fed. Cir. 2018). "A finding is supported by substantial evidence if a reasonable mind might accept the evidence to support the finding." *Id.*

### I

Philips first argues that the Board erred by failing to explicitly construe the term "offset" in claim 9's recitation of "means for setting an initial transmission power after an interruption in transmission to that before the interruption adjusted by an offset." According to Philips, the Board should have explicitly construed "offset" to mean "a one-

time adjustment applied to initial transmission power following an interruption." Appellant's Br. 48.

Philips did not proffer this definition in either its Patent Owner's Preliminary Response or its Patent Owner's Response. Nor did Quectel proffer or request any formal definition of "offset" in its Petition or Petitioner's Reply. Philips waited until its Surreply to first articulate its preferred understanding of "offset," but merely asserted it without any explanation. Moreover, this Surreply argument was presented in the context of distinguishing the claimed "offset" from prior-art reference Agin's "step size," rather than in any request for the Board to construe the term. J.A. 381–86. The Board accordingly concluded: "Patent Owner [Philips] does not appear to be seeking an explicit construction of the claim term 'offset,' although we acknowledge ample arguments from Patent Owner, with counter-arguments from Petitioner [Quectel]. As such, we consider both parties['] arguments . . . outside of the context of claim construction." *Decision*, 2022 WL 4280566, at *4. We see no reason to disagree with the Board's understanding of the parties' arguments, and the Board thus did not err by not providing a construction of "offset."

II

Next, Philips contends that the Board erred in finding that Agin discloses the claimed "means for setting an *initial transmission power* after an interruption in transmission to that before the interruption adjusted by an *offset*." '216 patent at claim 9 (emphases added). Philips challenges the Board's obviousness analysis for this limitation on two grounds, which we address in turn.

First, Philips argues that the Board erred in concluding that Agin teaches the claimed "offset." Agin discloses a "power control step size" $\delta$ that may be set to a value of $\delta_1$ or $\delta_2$. *See* Agin col. 7 ll. 17–24. The Board found that Agin's step size teaches the claimed "offset." Philips contends that this was error because Agin does not "*identically* disclose

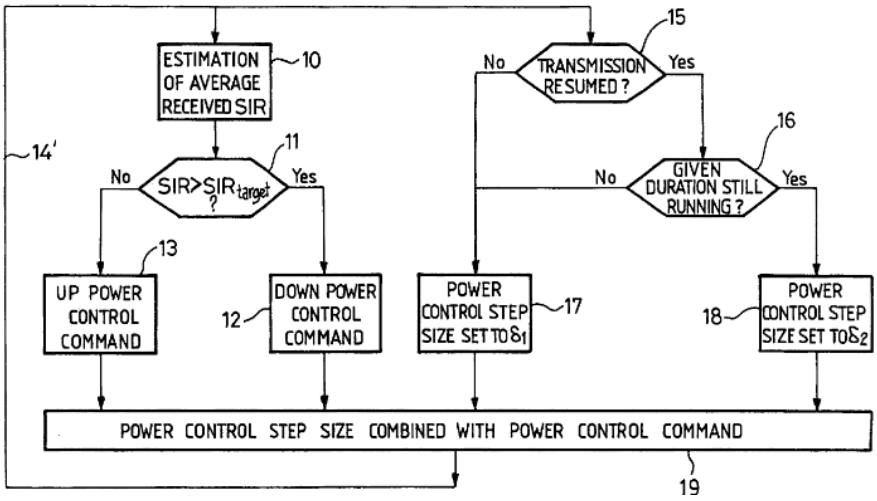
the function recited in the claim" given that the Board, at one point, indicated that an offset is distinct from a step size adjustment. Appellant's Br. 49. But the Board concluded that "an offset applying a single step size alteration is *not distinguishable* from the application of a step size." *Decision*, 2022 WL 4280566, at *8 (emphasis added); *see also Quectel Wireless Sols. Co. Ltd. v. Koninklijke Philips N.V.*, No. IPR2021-00563, 2023 WL 2602868, at *2 (P.T.A.B. Mar. 7, 2023). As the Board noted, the '216 patent itself teaches that the offset may be "quanti[z]ed to an available power control step size before it is applied." '216 patent col. 2 ll. 45–46. The Board also relied on Quectel's expert testimony to arrive at its conclusion. *Decision*, 2022 WL 4280566, at *8. Substantial evidence supports the Board's finding that Agin teaches the claimed "offset."

Second, Philips contends that the Board erred in concluding that Agin teaches applying an offset to an "initial transmission power," as claimed. Philips argues that "Agin is silent as to the *initial* transmission power after an interruption" and, moreover, "the specific teachings of Agin . . . demonstrate that Agin's step size adjustment could not be applied to the initial transmission." Appellant's Br. 51.

Quectel's Petition relied on Agin's description of its Figure 2, reproduced below, to teach the claimed "means for setting an initial transmission power after an interruption

in transmission to that before the interruption adjusted by an offset."

FIG_2 PRIOR ART




Agin FIG. 2.

As recounted by Quectel and depicted in Agin's Figure 2, "Agin describes setting the power control step size to $\delta = \delta_1$" (step 17) or "$\delta = \delta_2$" (step 18). J.A. 128 (citing Agin col. 5 ll. 44–53). In parallel, Agin's base station determines whether to employ an "'up' power control command" (step 13) or a "'down' power control command" (step 12) by determining whether the measured signal-to-inference ratio (SIR) of the received signal from the mobile station is greater or less than a target SIR (step 11). Agin col. 1 ll. 40–47; *id.* col. 5 ll. 31–38. Then, "$\delta_1$ or $\delta_2$ is combined with the 'up' or 'down' power control command to obtain a resulting power control command" (step 19). J.A. 128 (citing Agin col. 5 ll. 54–57). Agin's base station then sends the resultant, combined power control command to the mobile station, instructing the mobile station to either increase or

decrease its transmittal power level by the power control step size. Agin col. 1 ll. 43–47.

Notably, Agin recognizes that "downlink transmissions from a [base station] to a [mobile station] may momentarily be interrupted." *Id.* col. 1 ll. 62–63. "During these transmission interruptions . . . the [base station] does not send any more power control commands to the [mobile station], and the uplink signals from this [mobile station] are no longer power controlled." *Id.* col. 2 ll. 4–8. Philips argues that, based on this disclosure, "Agin's system cannot possibly adjust its initial transmission following an interruption by a step size . . . since it does not receive [a] power control command during the interruption." Appellant's Br. 55–56. Put another way, "Agin could not possibly apply a step size adjustment to the initial transmission [after an interruption], because Agin's closed loop power control algorithm requires receipt of a power command for the mobile station to know whether to increase or decrease its power." *Id.* at 51–52. Philips raised this argument in both its Patent Owner Response and its Surreply. J.A. 325–26; J.A. 378–79.

The Board did not account for this argument in its Final Written Decision. Instead, it found that "[b]oth parties agree that Agin's power control command instructs the [mobile station] regarding the step size for increasing or decreasing power after the interruption." *Decision*, 2022 WL 4280566, at *8. The Board concluded it was "persuaded that one of ordinary skill in the art would have interpreted Agin as setting an initial transmission power after an interruption in transmission to that before the interruption adjusted by a step size." *Id.* But the Board failed to address Philips's argument as to *how* Agin's system would adjust the initial transmission following an interruption without having received any power control commands during the interruption.

Because the Board's analysis on this point was too conclusory and did not address an argument timely raised below, we vacate the Board's finding. *See, e.g.*, *Provisur Techs., Inc. v. Weber, Inc.*, 50 F.4th 117, 123–24 (Fed. Cir. 2022). We remand for the Board to re-evaluate whether Agin teaches this limitation, taking into account Philips's argument discussed above.

## III

Philips argues next that the Board erred in finding that a skilled artisan would have been motivated to modify Agin in view of Chen. Quectel's Petition and the Board's decision relied on the combination of Agin and Chen to teach the claimed "means for determining the offset from a difference between a last transmission power and a weighted average of the transmission power over a predetermined period before the interruption in transmission." Philips raises three arguments challenging the Board's motivation-to-combine findings, though we find each unpersuasive.

Philips contends that "nothing in Agin suggests applying an average (much less a weighted average) to determine the magnitude of the modified step size adjustment $\delta_2$." Appellant's Br. 62. The Board disagreed, relying on Agin's discussion of "statistics" to make a contrary finding. Agin teaches that "[p]arameters T' and $\delta_2$ may . . . be determined based on *statistics* on power control results for a transmission period before said transmission interruption; for example the largest the [sic] variations of a received signal power before the interruption, the largest $\delta_2$ and T', and vice-versa." Agin col. 6 ll. 10–14 (emphasis added). The Board reasonably found that this disclosure in Agin "is sufficient to suggest the use of different types of statistics, including those disclosed by Chen," i.e., a weighted average. *Decision*, 2022 WL 4280566, at *10. Philips additionally argues that Agin's use of statistics to determine certain "parameters" is limited to determining T' and $\delta_2$, which

"have nothing to do with an *offset* that is applied to the initial transmission." Appellant's Br. 62. This appears to be a reiteration of Philips's argument that $\delta_2$ is a step size but not an offset, which we rejected above.

Philips also contends that the Board erred because Chen teaches a weighted average of power levels across *multiple* base stations, rather than claim 9's required "weighted average of the transmission power over a predetermined period before the interruption in transmission" at a *single* base station. *Id.* at 63. The Board considered and rejected this argument, reasonably concluding that although "Chen is utilizing a weighted average for one purpose, [the Board was] not persuaded that one of ordinary skill in the art could not review the disclosure of Chen and see its application to other aspects of computing an adjustment to power levels [such as in Agin]." *Decision*, 2022 WL 4280566, at *10; *see also id.* at *11 (referring to Quectel's argument that Philips's "arguments are akin to bodily incorporation and the disclosure elements of Agin and Chen need not be physically combinable to render claim 9 obvious"). We also find reasonable the Board's determination that "Chen discusses other options, i.e., 'a number of possible methods,' that can utilize a single base station in making a power control decision, such that ordinarily skilled artisans would have applied the weighted average in Agin as Petitioner has asserted." *Id.* at *11.

Additionally, Philips argues the Board erred as a matter of law by concluding that the "teachings of Chen *could* be incorporated into Agin" and "fail[ing] to explain why an ordinary artisan *would* modify Agin in view of Chen." Appellant's Br. 64. We disagree. The Board considered "multiple rationales for the combination of Agin and Chen, including the benefits of Chen's techniques, the predictability of such a combination, improvements in performance and transmission quality, reducing uncertainty, [and] smoothing power levels," *Decision*, 2022 WL 4280566, at *11, to conclude that "one of ordinary skill in the art would

have been motivated to make the combination," *id.* at *12. The Board also "[w]eigh[ed] the testimonies of Drs. Ding and Jackson," Quectel's and Philips's expert witnesses, respectively, and "determine[d] Dr. Ding's testimony to be more persuasive." *Id.* Substantial evidence supports the Board's determination that a skilled artisan would have been motivated to combine Agin and Chen.

IV

Finally, Philips argues that the Board erred in concluding that the combination of Agin and Chen discloses the claimed "means for determining the offset from a difference between a last transmission power and a weighted average of the transmission power over a predetermined period before the interruption in transmission." Philips presents two arguments on this point.

First, Philips contends that the Agin-Chen combination would create an "absurd result." Appellant's Br. 66. Specifically, "if a weighted average of prior transmission power were somehow used to determine Agin's modified step size $\delta_2$," Philips contends that Agin would need "to continually calculate the magnitude of the adjustment for every transmission, frustrating the very purpose of Agin's closed loop algorithm." Appellant's Br. 65–66. Philips did not present this argument to the Board and therefore forfeited it. *See In re Google Tech. Holdings LLC*, 980 F.3d 858, 863 (Fed. Cir. 2020) ("We have regularly stated and applied the important principle that a position not presented in the tribunal under review will not be considered on appeal in the absence of exceptional circumstances.").

Second, Philips contends that the prior art does not teach the claimed "weighted average of the transmission power *over a predetermined period* before the interruption in transmission," because Agin does not disclose a weighted average, and "Chen's weighted average is computed based on values *of current powers at multiple base stations*." Appellant's Br. 66–67. According to Philips, the Board's

"Final Written Decision did not address the fact that Chen's techniques do not involve a weighted average of a mobile station's prior power levels during a *predetermined time period* before an interruption." *Id.* at 67. But the Board considered and rejected this argument. *See Decision*, 2022 WL 4280566, at *10. The Board found that "Chen discusses other options, i.e., 'a number of possible methods,' that can utilize a single base station in making a power control decision, such that ordinarily skilled artisans would have applied [Chen's] weighted average in Agin as Petitioner has asserted." *Decision*, 2022 WL 4280566, at *10 (quoting Chen col. 10 ll. 47–56). Substantial evidence supports the Board's finding.

## CONCLUSION

We have considered Philips's remaining arguments and find them unpersuasive. For the foregoing reasons, we *vacate* the Board's finding that the prior art teaches the claimed "means for setting an initial transmission power after an interruption in transmission to that before the interruption adjusted by an offset" and *remand* for further proceedings consistent with this opinion. We *affirm* the Board's other determinations.

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

## COSTS

No costs.