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Paper 14
Date: February 7, 2024

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LENOVO (UNITED STATES) INC. and
MOTOROLA MOBILITY LLC,
Petitioner,

v.

THETA IP, LLC,
Patent Owner.

IPR2023-00694
Patent 7,010,330 B1

Before JEFFREY S. SMITH, THOMAS L. GIANNETTI, and BARBARA A. BENOIT, *Administrative Patent Judges.*

GIANNETTI, *Administrative Patent Judge*.

DECISION
Denying Request for Rehearing
37 C.F.R. 42.71

I. INTRODUCTION

Lenovo (United States) Inc. and Motorola Mobility LLC (collectively, "Petitioner") filed a Petition requesting institution of *inter partes* review of claims 1, 23, 29, and 30 ("the challenged claims") of U.S. Patent No. 7,010,330 B1 (Ex. 1001, "the '330 patent"). Paper 1 ("Pet."), 1. Theta IP, LLC ("Patent Owner") filed a Preliminary Response (Paper 9, "Prelim. Resp.").

On October 23, 2023, we denied the Petition as to all challenged claims. Paper 10 ("Decision"). In denying the Petition, we concluded that Petitioner had failed to demonstrate that the cited prior art (specifically, Rauhala[1]) taught or suggested a claim limitation calling for "reducing a switching current in the signal path by dynamically *changing an impedance of a component in the signal path* based on the first signal strength." Decision 19–20 (emphasis added).

Petitioner has requested reconsideration of our Decision. Paper 11 ("Req. Reh'g"). Petitioner's grounds for seeking rehearing are: (1) the Board allegedly "misapprehended Rauhala's disclosure that the entirety of Figure 7 is a mixer within the signal path," and (2) the Board "misapprehended the meaning of 'signal path' and overlooked Petitioner's evidence of what constitutes a 'signal path.'" Req. Reh'g 3, 9 (title capitalization and boldface omitted).

Patent Owner filed an opposition to this request (Paper 12, "Opp.") and Petitioner filed a reply (Paper 13, "Reply").

For the reasons that follow, Petitioner's request for rehearing is denied.

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[1] EP Patent App. Pub. No. 0999649 A2 (Ex. 1004).

II. ANALYSIS

A. Legal Standard

The applicable standard for a request for rehearing is set forth in 37 C.F.R. § 42.71(d), which provides in relevant part:

> A party dissatisfied with a decision may file a single request for rehearing without prior authorization from the Board. The burden of showing a decision should be modified lies with the party challenging the decision. The request must specifically identify all matters the party believes the Board misapprehended or overlooked, and the place where each matter was previously addressed in a motion, an opposition, a reply, or a sur-reply.

When rehearing a decision on a petition to institute, a panel will review the decision for an abuse of discretion. 37 C.F.R. § 42.71(c).

A rehearing request is not an opportunity for the requesting party to present new arguments or merely to express disagreement with the Decision and reargue its case, which is all Petitioner has done in this instance.

B. The '330 Patent

The '330 patent is described in our Decision. *Id.* at 3–6. The patent relates to wireless transceivers, e.g., mobile phones, and describes "us[ing] bias current reduction, impedance scaling, and gain changes either separately or in combination to reduce power dissipation." Ex. 1001, (57). The '330 patent discloses the technique of varying the bias current supplied to various components in the signal path (e.g., amplifiers and mixers). *Id.* at 1:59–64; 4:15–21; 5:4–16.

In our Decision (at p. 6), we present independent claim 1, which is representative of the challenged claims and recites a method of receiving a signal using an integrated circuit, comprising the following step requiring "changing an impedance of a component in the signal path":

> reducing a switching current in the signal path by dynamically *changing an impedance of a component in the signal path* based on the first signal strength.

Ex. 1001, 12:65–67 (emphasis added). [2]

Neither party requested a special construction of the term "in the signal path." More specifically, Petitioner stated that except for two terms (not including "signal path"), "no express constructions are necessary to assess whether the prior art reads on the challenged claims." Pet. 20.

C. Overview of Rauhala

Rauhala is cited in each of Petitioner's challenges. Pet. 3–4. As is discussed in our Decision (at pp. 12–14), Rauhala discloses "a method and an arrangement for linearizing a radio receiver" that can be "applied in the reception circuits of mobile stations." Ex. 1004 ¶ 1. Our Decision refers to Figure 1 of Rauhala, shown below. Decision 12–13. Figure 1 is described as "a simplified example of a radio receiver without the low-frequency components." Ex. 1004 ¶ 12.

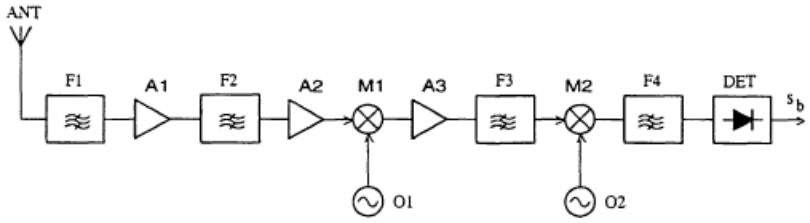

Fig. 1

[2] Independent claim 23 similarly calls for "an impedance *in the signal path* is configured to be dynamically adjusted." Ex. 1001 at 14:26–28 (emphasis added). Independent claim 29 also places the dynamically adjusted impedance in the signal path. *Id.* at 16:10–12.

Figure 1 depicts a radio receiver that includes an antenna (ANT) coupled to a series of filters (F1–F4), amplifiers (A1–A3), and mixers (M1, M2), with each mixer connected to an oscillator (O1, O2). *Id.* Rauhala describes these amplifiers and mixers as "linear units." *Id.* In this Figure, the signal path from the antenna (ANT) to the detector (DET) passes through the filters, amplifiers, and mixers to the detector to provide signal S_b.

Figure 2 of Rauhala, shown below, appears in the Rehearing Request Req. Reh'g 4. According to Rauhala, Figure 2 "shows a similar signal path structure as Figure 1." Ex. 1004 ¶ 13.

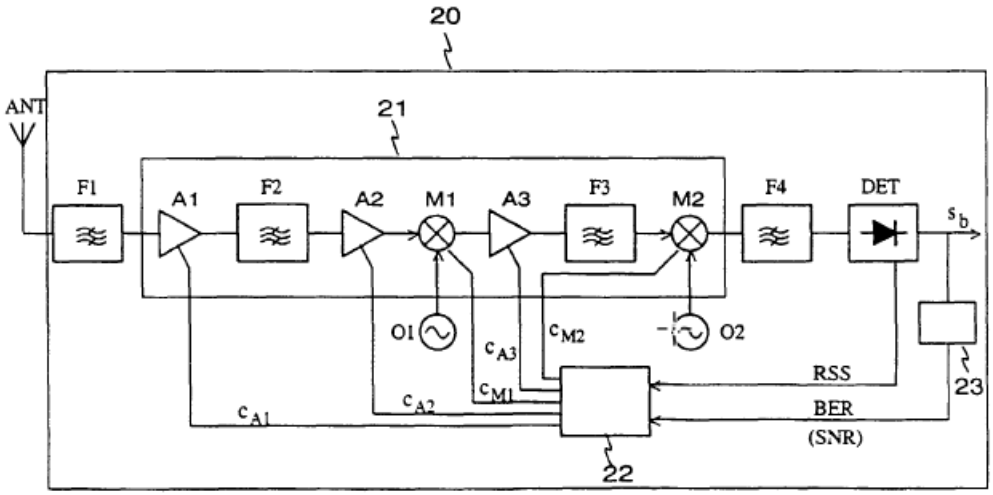

Fig. 2

Rauhala Figure 2 shows unit 21 including the same antenna (ANT), linear units (amplifiers A1, A2, A3, and mixers M1, M2), and detector (DET), resulting in signal S_b as shown in Figure 1. *Id.* Just as in Figure 1, the signal path passes from antenna ANT thorough linear units 21 to detector DET.

Rauhala describes control unit 22 shown in Figure 2 as "additional to Fig. 1." *Id.* Rauhala describes unit 22 as a control unit for "controlling the

supply currents to the linear units," and shows unit 22 as separate from the linear units 21 making up the signal path. *Id.*

The Petition cites Figure 7 of Rauhala, depicted below, in support of its argument that the limitation "dynamically changing an impedance of a component in the signal path" is met. Pet. 39–42.

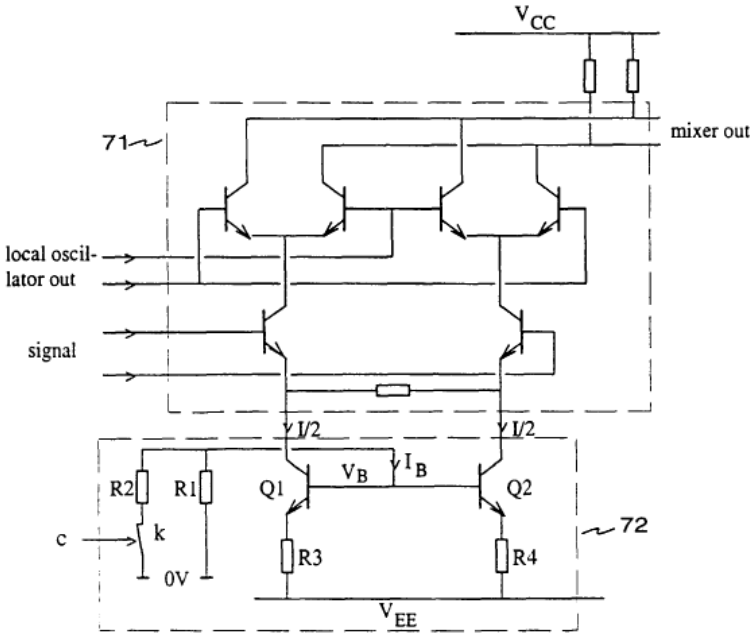

Fig. 7

Rauhula describes this figure as "an example of mixer supply current control." Ex. 1004 ¶ 11. Figure 7, like Figure 2, shows two separate units, identified as 71 and 72. Rauhala identifies separate unit 71 as "an analog multiplier used as a mixer." *Id.* ¶ 23. Rauhala identifies separate unit 72 as a "control circuit . . . for the supply current I of the analog mixer 71." *Id.* The separation of the mixer 71 from the control circuit 72 containing resistors R1 and R2 is emphasized by the separate broken-line rectangles around each.

The mixer (linear unit 72) shown in Figure 7 has as its inputs a signal originating from the antenna, just as is shown in Figures 1 and 2. *See* Fig. 7.

The mixer's output is also shown, presumably to the next linear unit in line, as shown in Figures 1 and 2. *Id.*

Our Decision refers to Figure 7 and describes the operation of control unit 72. Decision 13–14. We describe how control circuit 72 varies the supply current I to mixer 71 using resistors R1 and R2. *Id.* Control circuit 72 contains transistors Q1 and Q2, resistors R1 through R4, and switch k. Ex. 1004 ¶ 23. Resistors R1 and R2 are connected in parallel with one end of the connection, "coupled to signal ground and the other end to the bases of transistors Q1 and Q2." *Id.*

Activating switch k causes the effective resistance of the R1/R2 resistance combination to change, which in turn causes a change in control current I_B. When switch k is open, "the control current I_B of transistors Q1 and Q2 is V_B/R1," and when switch k is closed, "the control current I_B is V_B/R1 + V_B/R2." *Id.* Rauhala indicates that by closing switch k "the current I_B increases, causing the supply current I to increase as well." *Id.*

As noted, in its analysis of the disputed claim limitation "dynamically changing an impedance of a component in the signal path based on the first signal strength," the Petition also relies on Figure 7 of Rauhala, and specifically, on the switching of the configuration of resistors R1 and R2 to vary the effective resistance of the combination, thus varying the bias current to mixer 71. *See* Pet. 39–42.

As will be discussed further below, the central dispute lies in Petitioner's contention that control circuit 72 in Figure 7, including resistors R1 and R2, shown as a separate entity in Rauhala, is part of mixer 71. *See*, e.g., Reh'g Req. 1 ("Control circuit 72 must therefore be part of the mixers M1 and/or M2 that are within the 'signal path.'"). For the reasons that

follow, we do not agree that Petitioner's argument supports granting its rehearing request.

D. Alleged Misapprehension of Rauhala's Disclosure that Entire Figure 7 is a Mixer in the Signal Path

As discussed, the Petition relies on Rauhala as teaching "reducing a switching current in the signal path by dynamically changing an impedance of a component in the signal path based on the first signal strength." Pet. 39–42. More specifically, Petitioner relies on resistors R1 and R2 in control circuit 72 in Figure 7 as the varied impedance in "dynamically changing an impedance," as described *supra* and in our Decision at 13–14.

In our Decision, we concluded that Petitioner failed to demonstrate that Rauhala disclosed changing "an impedance of a component *in the signal path*." Decision 19–20 (emphasis added). In reaching this conclusion, we relied on a version of Figure 7 annotated by Patent Owner's expert, Dr. Larson, and reproduced below, to illustrate the distinction between Rauhala's disclosure and the requirements of the challenged claims.

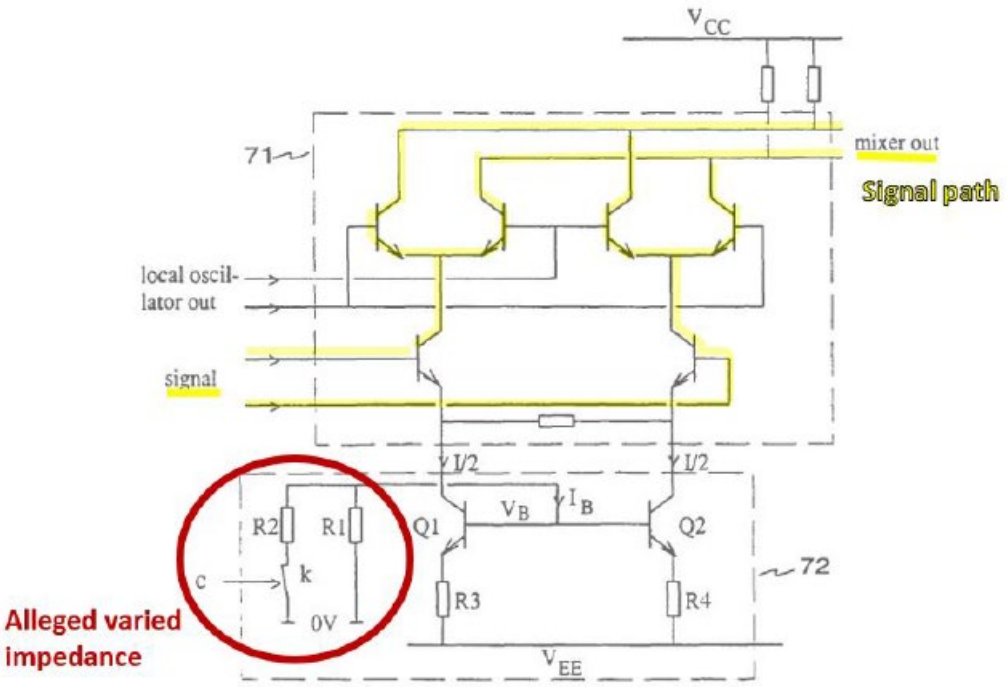

Fig. 7

Id. at 20 (citing Prelim. Resp. 38); Ex. 2005, Larson Decl. ¶ 63. We found that Figure 7 of Rauhala teaches that current supply circuit 72 (including resistors R1 and R2 and switch k) is outside the signal path (highlighted in yellow) through linear unit 71. Decision 20 (citing Prelim. Resp. 39–41). This is consistent with Figures 1 and 2 of Rauhala, reproduced *supra*, which show that control circuit 22 is separate from the linear signal path 21 containing mixers M1 and M2.

As noted, Petitioner identified R1, R2, and switch k in control circuit 72 as the claimed variable impedance. *See*, e.g., Pet. 39–40. We determined that the Petition (and the supporting Baker Declaration) did not explain adequately how, under this interpretation by Petitioner and its expert, Rauhala meets the "component in the signal path" limitation. *See* Decision 20 (citing Prelim. Resp. 39–41).

Petitioner challenges this finding. In its Rehearing Request, Petitioner asserts that Patent Owner's annotations of Figure 7 are "misleading." Req. Reh'g 1. Petitioner asserts that the Board "overlook[ed] *Rauhala's* teachings that control circuit 72 is indeed *part of* a mixer in the signal path." *Id.* at 3. Petitioner acknowledges that Figure 2, reproduced *supra,* shows a signal path that includes the antenna ANT, detector DET, and the linear units (amplifiers and mixers) between them. *Id.* at 3. Petitioner concludes that "in order for the mixer in FIG. 7 to receive the output of the control unit, as described with reference to FIG. 2, control circuit 72 <u>must be part of the mixer itself</u>." *Id.* at 4.

This is a new argument that was not presented in the Petition, and therefore, could not have been misapprehended or overlooked. In any case, we disagree with Petitioner's argument for several reasons. First, it is contrary to Rauhala's depiction of mixer 72, a linear unit that is part of the signal path, as separate from control unit 71 that supplies bias current I. The boxes drawn around those units and their descriptions by Rauhala confirm that they are separate. *See* Section II.C, *supra*. For example, Rauhala's description of linear unit 71 as a mixer and unit 72 as a control circuit and the separate boxes drawn around them in Figure 7 confirm that these are separate components. Ex. 1004 ¶ 23, Fig. 7.

We did not overlook or misapprehend Dr. Baker's testimony or his dictionary citation, as Petitioner asserts. Req. Reh'g 5–6 (citing Ex, 1002, Baker Decl. ¶¶ 103–105; Ex. 1011, 7). The cited Baker testimony relates to the presence of a signal path in Cummins, not Rauhala, and the diagram ("Block diagram, 1") reproduced from the dictionary is a generic signal path and does not at all resemble Rauhala's Figure 7. *See* Baker Decl. ¶ 104.

Neither Dr. Baker's testimony nor his dictionary reference supports Petitioner's argument.

Petitioner states that "Dr. Larson cites no extrinsic evidence to support his conclusion that linear unit 71 and control circuit 72 are somehow separate." Req. Reh'g 7. Petitioner characterizes his testimony as "conclusory and unsupported." *Id.* We do not agree and find Dr. Larson's testimony credible supported by the record. Dr. Larson's testimony is supported by Rauhala's Figures 1 and 2, *supra*, as well as Figures 6 and 7. Larson Decl. ¶¶ 62–63. The fact that Petitioner does not agree with Dr. Larson's opinions is not a ground for granting rehearing.

Petitioner contends that its argument is supported by the '330 patent. Req. Reh'g 8–9. We disagree. The passage Petitioner quotes from the '330 patent refers to amplifiers, mixers, and filters forming the signal path. *Id.* at 8 (quoting Ex. 1001, 4:15–17). The dispute is not whether the mixers in Rauhala are included in the signal path, but whether resistors R1, R2, and the control circuits are part of the mixer and therefore included in the signal path. The quoted passage from the '330 patent does not support this argument. In fact, it suggests the opposite. *See also* Ex. 1001, 2:7–11 (describing the signal path as having an amplifier, mixer, and low-pass filter).

In summary, Petitioner does not identify any arguments concerning Rauhala that were overlooked or misapprehended. Petitioner's new argument that the bias control resistors are part of the mixer in Rauhala is not persuasive that rehearing should be granted.

E. Alleged Misapprehension of the Meaning of "Signal Path"

Petitioner did not propose a special construction for the term "signal path." *See supra*. Nevertheless, Petitioner asserts that "as a threshold matter, neither Patent Owner nor Dr. Larson explains what a [person of ordinary skill] would understand the term 'signal path' to mean." Req. Reh'g 10. We disagree. Patent Owner addresses this question in its discussion of Rauhala's Figure 7. Prelim. Resp. 37–41. Dr. Larson addresses it in his declaration. Larson Decl. ¶¶ 63, 66. We cite and rely on this analysis in our Decision, at pp. 17–18, 19–20. After discussing the parties' submissions and the evidence of record, we concluded that "Petitioner fails to demonstrate sufficiently that Rauhala meets the limitation in claim 1 requiring 'dynamically changing an impedance of a component in the signal path' and the corresponding limitation in claim 23." *Id.* at 20.

In reaching this conclusion, we did not misapprehend or overlook any evidence, including that from Dr. Baker. We discuss Dr. Baker's testimony and his dictionary definition *infra*. We did not misapprehend that evidence, which at best shows that Rauhala discloses a signal path, a fact that is not in dispute. *See* discussion in Section II.E, *supra*.

Nor do we agree with Petitioner's argument that "Rauhala's own use of the them signal path . . . directly contradicts Patent Owner's and Dr. Larson's characterization of Rauhala Fig. 7." Req. Reh'g 10. As discussed *supra*, we thoroughly considered Rauhala in our Decision and found that Rauhala supports Patent Owner's argument, not Petitioner's. *See* Decision 12–14, 17–18, 19–20. Petitioner does not challenge our understanding of Rauhala, only our finding that Rauhala does not support its arguments. Petitioner's arguments based on Figures 1 and 2 of Rauhala, at

best, show that both those figures disclose that signal paths contain amplifiers, filters, and mixers, which is not disputed. *See* Reh'g Req, 10–11.

Finally, Petitioner's argument based on "control signal C" could not have been misapprehended or overlooked because it was not previously presented. *See* Req. Reh'g 13. In any case, this new argument is unavailing. Figure 2 of Rauhala shows control signals C_{M1} and C_{M2} coming from control unit 22, which lies outside the box identified by Rauhala as signal path structure 21. *Id.* at 11; Ex. 1004 ¶ 13. The fact that these control signals may be applied to the mixers in the signal path in Figure 2 of Rauhala does not place the control unit generating those signals within that path. This is consistent with Patent Owner's analysis of Figure 7 and with our finding that the control circuits and its resistors are not part of the signal path.

F. Petitioner's Reply

Petitioner's Reply presents two arguments. First, Petitioner contends Patent Owner "misled the Board, causing the Board to misapprehend the prior art and overlook Petitioners' [sic] evidence and positions." Reply 1–3. Petitioner contends that "[t]he Petition identifies the *Rauhala* signal path and explains that it includes a mixer." *Id.* at 2. Petitioner then quotes the following sentence from the Petition: "*Rauhala* teaches a receiver signal path comprising at least an amplifier, a mixer, and a filter." Pet. 50 (quoted at Reply 2, emphasis omitted). Petitioner follows this with a quote from Dr. Baker's declaration referring to the "signal paths between functional units." Reply 2 (quoting Baker Decl. ¶ 112).

This argument misses the point. As noted previously, the issue is not whether the signal path in Rauhala includes the mixers and amplifiers; that is not disputed. The issue is whether Petitioner is correct that the control unit

containing resistors R1 and R2 is part of the mixer or is separate. *See* discussion in Section II.E, *supra*. Conspicuously absent from Petitioner's quotation from the Petition is any mention of the control unit or the resistors as part of the mixer or the signal path. Likewise, Dr. Baker refers to Figure 2 of Rauhala as showing "a signal path comprising functional units (as blocks) and control signal paths (as lines and arrows between the blocks)." Baker Decl. ¶ 112. He makes no mention of the control unit or resistors as part of the signal path. For the reasons given, we are not persuaded that we were "misled" in deciding that that they are separate from the signal path. *See* Decision 19–20.

Second is the new argument that denying institution here would conflict with our decisions instituting *inter partes* review in IPR2023-00697 and IPR2023-00698. *Id.* at 4–5. We disagree. In each of those other proceedings, unlike here, some challenged claims did not require "changing an impedance of a component in the signal path" or the equivalent. For example, in IPR2023-00697, challenged claim 1 recites "causing *the bias current* of the one or more of the plurality of circuits in the receiver signal path of the wireless transceiver to be decreased." *See* IPR2023–00697, Paper 10, 6–7 (quoting claim 1; *see also* claim 3). Similarly, in IPR2023-00698, challenged claim 11 recites "causing *a bias current* of one or more of the plurality of circuits in the receiver signal path of the wireless transceiver to be dynamically decreased." *See* IPR2023-00698, Paper 10, 7–8 (quoting claim 11; *see also* claim 13). In both institution decisions, we determined that for those claims reciting causing a bias current to be decreased, Petitioner had established a reasonable likelihood of prevailing based on Rauhala. IPR2023-00697, Paper 10, 32–33 (claims 1, 3); IPR2023-00698, Paper 10, 20–21, 27 (claims 11, 13). On the other hand, for those claims

that, like the claims before us here, require changing an *impedance* of circuits in the signal path (*see* claim 8 in IPR2023-00697 and claims 7 and 19 in IPR2023-00698), we concluded, as here and in our Decision, that Petitioner's challenge based on Rauhala fails to meet the test for institution. IPR2023-00697, Paper 10, 35–36; IPR2023-00698, Paper 10, 25–26. Because we determined in each of those cases that some claims met the standard for institution, instituting review of all challenges was mandated by 37 C.F.R. § 42.108(a); *see SAS Inst. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018).

There is, therefore, no "inconsistency" between our decision not to institute *inter partes* review here and those cases. Here, all challenged claims include the limitation requiring "dynamically changing an impedance of a component in the signal path," or the equivalent, that we found is not taught by Rauhala in those other cases. Petitioner's suggestion that "[o]n full records, the Board may well reach conclusions that contradict the conclusion reached in the institution decision here" is speculation. Reply 5. In any event, we are bound by 35 U.S.C. § 314, which requires for instituting *inter partes* review a demonstration of a reasonable likelihood that Petitioner would prevail with respect to at least one challenged claim in this proceeding. This statutory obligation is not affected by whether or not we have instituted review in related cases. For the reasons given in our Decision, Petitioner's challenge does not meet this standard for institution.

In summary, neither of these reply arguments persuades us that we have overlooked or misapprehended Petitioner's arguments or evidence.

III. CONCLUSION

Petitioner has not carried its burden of demonstrating that our decision denying *inter partes* review of claims 1, 23, 29, and 30 of the ’330 patent misapprehended or overlooked any matters, or that the Board abused its discretion. 37 C.F.R. § 42.71(c), (d).

IV. ORDER

For the foregoing reasons, Petitioner’s Request for Rehearing is *denied*.

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