

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Apple Inc.,
Petitioner,

v.

Varia Holdings LLC,
Patent Owner.

U.S. Patent No. 8,381,974

Inter Partes Review Case No. 2024-01362

**PATENT OWNER'S REQUEST FOR DIRECTOR REVIEW OF
FINAL WRITTEN DECISION**

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I. Introduction

Varia Holdings LLC (“Varia” or “Patent Owner”) respectfully requests Director Review of the Board’s Final Written Decision (“FWD”, Paper 36) ruling that claims 1-19 of U.S. Patent No. 8,381,974 (“’974 Patent”) are unpatentable.

The FWD rests unsupportably on a “functional emulation” theory that:

- (1) was never presented in the Petition (the term never appears);
- (2) was introduced through unsupported expert *ipse dixit* (no citations were offered for the theory or its purported definition, and none of Petitioner’s references use the term); and
- (3) was expanded and applied to references Petitioner itself never argued (the FWD concluded that “the Willgert/Mooney combination serves the functional emulation purpose” despite Petitioner and its expert never applying the theory to those references).

Each of these is an independent procedural violation. Any one alone requires reversal—the Board was clear that “functional emulation” was the basis for its decision on all claims (“it is sufficient for purposes here to conclude that the claims encompass Petitioner’s ‘functional emulation’ articulation”)—and taken together, they confirm that the Board departed from the Petition, relieved Petitioner of its burden, and decided the case on a theory Patent Owner had no fair opportunity to

address. This is not a close question of weighing evidence—it is a breakdown of the required adjudicatory framework that necessitates Director Review.

II. Background

A. The '974 Patent Covers “Emulated Radio Frequency Identification”

Conventional radio frequency identification (“RFID”) relies on a physical transponder—a circuit that returns a set code in response to a reader—embedded in a device, such as a key, card or tag. The '974 Patent, titled “Emulated Radio Frequency Identification,” recognized the drawbacks of this approach, including the need to carry an ever-growing number of such transponders. Ex. 1001 at 1:45-48. To solve this challenge, the '974 Patent teaches and claims modifying a mobile communication device to create a switchable “*transceiver* configured to output . . . RFID *transponder* signals.” *Id.*, Cl. 1 (emphases added). Using this different type of device—a transceiver—the inventors were able to enter, store and communicate multiple “transponder” codes without using an actual transponder. This was consistently described throughout the intrinsic record as “emulation”—using one type of component (*transceiver*) to mimic the response of a different component (*transponder*). In other words, by using emulation, the transceiver could mimic any number of RFID transponders using a single device—putting a virtual wallet on a smartphone.

As discussed below, this emphasis on emulation is confirmed throughout the intrinsic record of the '974 patent, and emulation is required—either explicitly or under a proper construction—for every challenged claim.

Claim 6 explicitly requires “emulating output of...RFID transponder data by an RFID transponder.” Ex. 1001 at 9:65-67. As explained by Patent Owner throughout the trial, the proper construction of the “RFID transponder signal [or data]” and related terms in other claims likewise requires emulation. Resp. at 20-25; Ex. 2004 ¶¶ 48-54; Sur-Reply at 4-14. While the FWD “conclude[d] that it is unnecessary to formalize a comprehensive construction” of those terms, it determined that all “claims encompass...‘functional emulation,’” and its analysis was predicated on that “emulation” scope being part of every claim. FWD at 22.¹

B. The Asserted Art Used Actual RFID Transponders (Not Emulation)

The Petition relied on only two references for the independent claims—Willgert and Mooney. Petition at 1-2. The Petition relied on two secondary references—Holloway and Pitroda—for limitations in dependent claims, but not for

¹ Petitioner disagreed that emulation was required for every claim. *See, e.g.*, Reply at 7-8. The Board, however, resolved this dispute by adopting the “functional emulation” theory.

any limitations in the independent claims. *Id.* All of these references and their proposed combination utilize actual RFID transponders—none used a separate component to mimic, *i.e.*, emulate, an RFID transponder. Resp. at 31-33, 41-43; Petition at 26-28.

C. Petitioner Added a New “Functional Emulation” Theory for the Holloway Reference in its Reply Based on Expert Gap-Filling

Patent Owner pointed out this requirement for all claims its Response (Resp. at 20-25) and detailed how none of Petitioner’s references disclosed the requisite RFID transponder emulation because they relied on actual RFID transponders. Resp. at 31-33, 41-43; Petition at 26-28. In its Reply, Petitioner tacitly conceded this “emulation” requirement and added a new “functional emulation” argument, *i.e.*, that a transponder could “emulate” itself if it was integrated into another device. Reply at 10-11; APPLE-1063 ¶¶ 35-40. This “functional emulation” was never disclosed in the Petition, which neither uses the term “functional emulation” itself nor cites to any evidence using that term, as Patent Owner made clear on Sur-Reply. Sur-Reply at 1 (noting “Petitioner...pivoting to a new ‘functional emulation’ argument...not raised in the Petition.”). It is based solely on the Reply Declaration of Petitioner’s expert, Dr. Ding, who introduced the term and defined it without any citation or other support. *See* APPLE-1063 ¶ 35 (introducing and offering a definition of this term with no citations).

It is undisputed that this new “functional emulation” theory and the supplemental declaration on which it was based were not included in the Petition. Moreover, even as added in the Reply, Petitioner and its expert raised the “functional emulation” theory only as to the secondary Holloway reference. Reply at 8, 10-11; APPLE-1063 ¶ 39. Nowhere in its Petition or Reply—or in either of its expert declarations—did Petitioner ever disclose a “functional emulation” theory using Willgert or Mooney, the only references on which Petitioner relied for the independent claims.

“Functional emulation” is suspect on its face. The theory is not used or even mentioned in any of Petitioner’s references. Furthermore, it makes little sense in the context of the ’974 Patent, where the conventional approach of integrating transponders in another device (key, card, tag, etc.) was criticized since users would still have to carry separate devices for each transponder. Ex. 1001 at 1:45-48.

“Functional emulation” also fails to hold up to close scrutiny. When asked the difference between “functional emulation” and “emulation,” Dr. Ding did not have an answer. Ex. 2009 at 27:2-12. When asked during his deposition, Dr. Ding contradicted Petitioner’s argument that a transponder can emulate itself. *See* Ex. 2009 at 26:4-9 (“And that’s just a phrase of a -- what we mean by RFID emulation. You’re emulating the functionalities of a passive RFID tag *by using a different*

device.”). In other words, a device cannot emulate itself, in contradiction to Petitioner’s new “functional emulation” theory.

Despite the foregoing, the Final Written Decision adopted the “functional emulation” theory. As shown below, the FWD expanded “functional emulation” well beyond the context of the secondary Holloway reference, using it to justify its reading of the primary Willgert prior art reference. Without having done this, the FWD lacked justification for finding the claims of the ’974 Patent unpatentable as obvious.

D. The FWD Depended on “Functional Emulation” Using the Willgert/Mooney References, Which Was Never Raised by Petitioner or Its Expert

In its Response and Sur-Reply, Patent Owner proposed to construe a “transceiver configured to output . . . RFID transponder signals” (and related terms) to require “RFID signal[s] emulated by a mobile communications device without the use of a physical RFID transponder.” Resp. at 20-25; Sur-Reply at 4-14. Petitioner disagreed. Reply at 5-14. To resolve this dispute, the FWD relied on the new “functional emulation” theory:

We conclude that it is unnecessary to formalize a comprehensive construction for the RFID transponder signal or data terms—it is sufficient for purposes here to conclude that the claims encompass Petitioner’s “functional emulation” articulation. *See* Reply 10-11.

FWD at 22. Based on the new “functional emulation” theory raised for the first time on Reply—that a transponder can emulate itself—the FWD then concluded that an RFID transponder could emulate an RFID transponder:

This functional emulation solution is served regardless of how the specific RFID transceiver is implemented... There is no reason why one version of the hardware used to emulate the RFID [transponder] function could not be RFID transponder circuitry.

Id. at 23-24; *see also id.* at 26 n.11 (“we adhere to our conclusion that emulation does not rule out the use of physical RFID transponder circuitry”). And the FWD then concluded that “the *Willgert/Mooney* combination serves the *functional emulation* purpose of the ‘974 patent” despite Petitioner never advancing such a Willgert/Mooney argument in *any* of its submissions, let alone in its Petition. FWD at 39 (emphasis added).

III. Argument

A. Director Review Is Necessary Because Petitioner Improperly Raised a New “Functional Emulation” Theory on Reply

In its Petition, Petitioner did not assert that either the Willgert reference itself or the Willgert/Mooney combination disclosed emulation for the “transceiver configured to output . . . RFID transponder signals” limitation or related terms. Resp. at 31-33, 41-43; Petition at 26-28. Nor did Petitioner raise any “functional

emulation” theory for any reference. Petitioner’s expert similarly failed to mention “functional emulation” in his original declaration.

In response, Patent Owner pointed out that “*transceiver* configured to output . . . RFID *transponder* signals” in Claim 1 (and related terms in the other independent claims) all required emulation of a transponder signal, and that Petitioner had failed to show that the prior art taught such emulation.

In its Reply, Petitioner then for the first time mentioned “functional emulation.” Reply at 10-11. And even then, this was only in the context of Holloway—not Willgert/Mooney—as discussed below. Despite the limited purpose for which Petitioner’s sought reliance on “functional emulation” in relation to the secondary Holloway reference, the FWD relied extensively on this new theory—reciting the phrase “functional emulation” ten times and expressly using the theory in the context of Willgert/Mooney, rather than Holloway, to address the “RFID transponder signal”-related claim limitations and resolve the Petition. FWD at 39 (“the Willgert/Mooney combination serves the functional emulation purpose of the ‘974 patent”).

“A petitioner’s reply ... cannot, after a patent owner ‘point[s] out the flaws of this position,’ articulate ‘an entirely new theory ... absent from the petition.’” *Luminex Int’l Co. v. Signify Holdings B.V.*, IPR2024-00101 (PTAB Feb. 5, 2026) (Paper 57) (quoting *Wasica Fin. GmbH v. Cont’l Auto Sys., Inc.*, 853 F.3d 1272,

1286-87 (Fed. Cir. 2017)); *see also Acceleration Bay, LLC v. Activision Blizzard Inc.*, 908 F.3d 765, 775 (Fed. Cir. 2018) (affirming rejection of an obvious argument raised for the first time in reply, as “petitioner...had an opportunity to present this argument in its petition, but chose not to”). This is exactly what happened here: Patent Owner pointed out the flaw in Petitioner’s position—that the prior art did not teach emulation—and Petitioner articulated a new “functional emulation” theory on Reply that was absent from its Petition. This was improper in itself, and the FWD finding of unpatentability must therefore be reversed for this reason.

B. Director Review Is Necessary Because Petitioner Improperly Relied on Unsupported Expert Opinion

As discussed, Petitioner and Dr. Ding introduced the new “functional emulation” concept in the Reply. Reply at 10-11; APPLE-1063 ¶¶ 35-40. Dr. Ding offered no support other than his say-so for the definition of this term.

35. By the Critical Date, a POSITA would have also known of RFID “emulation” techniques that involve use of an RFID transponder signal. One example is “functional emulation,” which refers to the capability of a transmitting device (e.g., mobile device) to make an external RFID reader perceive a transmission of an RFID signal as if it were transmitted from an originating device of a different device type (e.g., perceive a device that is not a passive RFID tag as if it were a passive RFID tag). This example is consistent with the specification, which describes a mobile device being used to transmit an RFID signal that is

perceived by an RFID reader as being transmitted by a dedicated RFID device such as a passive RFID tag.

APPLE-1063 ¶ 35 (introducing and offering a definition of “functional emulation” with no citations).

When asked the difference between “functional emulation” and “emulation,” Dr. Ding did not have an answer. Ex. 2009 at 27:2-12. Dr. Ding suggested that there might be 20 other types of emulation but could not provide a single one. *Id.* at 29:20-30:14. There is no “record evidence” confirming anything related to “functional emulation.” Reply at 10-11. Despite all the prior art that Dr. Ding had reviewed and was aware of, he could not ground this new theory in the discussion of even one single prior art reference. “Functional emulation” is thus a term wholly introduced herein by Dr. Ding, and Patent Owner submits that this failure to cite to any support for the term, in combination with Dr. Ding’s lack of answers and contradictory answers in his deposition, means that the Board should not have afforded this phrase (“functional emulation”) and related arguments any weight even if they were not brand new in the Petitioner’s Reply.

This is gap-filling by an expert without any support, and, even were it not new in reply, it cannot support the FWD. Moreover, Dr. Ding vacillated during cross-examination and testified contradictorily that an RFID tag *cannot* emulate itself. *See* Ex. 2009 at 26:4-9 (“And that’s just a phrase of a -- what we mean by RFID

emulation. You’re emulating the functionalities of a passive RFID tag by using a *different device*.”). *See Interactive Comm’s Int’l, Inc. v. Blackhawk Network Inc.*, IPR2024-00465 (Dir. Rev. Oct. 1, 2025) (Paper 39) (reversing FWD because “[t]he Board abused its discretion by improperly crediting [Petitioner’s] expert’s [contradictory] testimony”). Petitioner’s unsupported *ipse dixit* from its expert fails to carry its burden, and the FWD relying on the same must therefore be reversed. *See TQ Delta, LLC v. CISCO Sys., Inc.*, 942 F.3d 1352, 1362 (Fed. Cir. 2019) (“[u]ntethered to any supporting evidence . . . *ipse dixit*” of expert insufficient to carry burden on motivation to combine).

**C. Director Review Is Necessary Because the FWD Improperly
Depended on an Argument the Petitioner Never Made**

The FWD expressly relied on its “conclu[sion] that the claims encompass Petitioner’s ‘functional emulation’ articulation” and that “the Willgert/Mooney combination serves the functional emulation purpose of the ‘974 patent” to find the independent claims unpatentable. FWD at 22, 39. ***But Petitioner never argued that Willgert/Mooney teaches functional emulation.*** At most, Petitioner only ever argued that ***Holloway*** could be interpreted in light of “functional emulation” (*see* Reply at 8; Ex. 1063 ¶ 39; Sur-Reply at 20-21), and Holloway was not part of any grounds raised in the Petition or the Institution Decision for challenging the independent claims of the ‘974 Patent (Petition at 1-2).

Petitioner never argued, even in Reply, that Willgert disclosed “functional emulation.” Petitioner’s expert similarly offered a conclusory supplemental declaration that Holloway should be viewed in light of “functional emulation.” He also nowhere argued that Willgert disclosed “functional emulation.” The FWD advanced a new argument—that Willgert disclosed “functional emulation”—that was never raised by Petitioner. This was improper—it is not the role of the Board to correct Petitioner’s failure to carry its burden—and the FWD finding of unpatentability must therefore be reversed. *Cf. SAS Inst. Inc. v. Iancu*, 584 U.S. 357, 365, 369-70 (2018) (noting that neither the Board nor the Director “enjoys a license to depart from the petition and institute a *different* inter partes review of his own design”).

**D. Director Review Is Proper for All Claims—Not Just Claim 6—
Because All “RFID Transponder Signal” Terms Require Emulation**

Petitioner’s failure to raise its “functional emulation” theory in its petition, compounded by its failure to support the “functional emulation” theory with competent evidence, and failure to offer any “functional emulation” theory for Willgert/Mooney as opposed to Holloway, render the FWD’s reliance on a “functional emulation” theory in regard to Willgert/Mooney improper and requires vacating that decision at a minimum. Moreover, because the ’974 Patent requires

emulation and Petitioner offered no Willert/Mooney emulation theory in its Petition, the decision must be reversed as well.

This is true for both the those claims that explicit recite “emulating,” *i.e.*, claim 6, as well as all of the independent claims which also require emulation as properly construed. The ’974 patent addresses emulated radio-frequency identification (RFID)—mimicking an RFID transponder signal without using a physical RFID transponder. The Title, Abstract and Detailed Description of the Invention all identify “emulation” as the core of the invention. Ex. 1001 at 1, 2:22-26. The specification then recites emulation more than 20 times in the ensuing discussion. Sur-Reply at 8. This is not a case of an “exemplary embodiment”—it is every embodiment. *Trs. of Columbia Univ. v. Symantec Corp.*, 811 F.3d 1359, 1367-69 (Fed. Cir. 2016) (upholding construction based on the consistent usage in the specification). Moreover, the specification makes clear that the “***present invention*** is related to an emulated radio frequency data input method,” not just an optional embodiment. Ex. 1001 at 1:18-21.

The claim language of the ’974 Patent confirms Patent Owner’s construction. “[A] transceiver[,] configured to output . . . RFID transponder signals [or data]” as recited in claims 1 and 8 of the ’974 patent, and related terminology in claim 12 (Ex. 1001 at 9:34-36, 10:10-12, 10:40-42), only makes sense if the transceiver is not itself an RFID transponder. Otherwise, if the transceiver itself were an RFID transponder,

it would read out most of this claim language. If the transceiver were an RFID transponder, then all signals [or data] would be RFID signals [or data], and this language would be unnecessary and mere surplusage. *See Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 950-51 (Fed. Cir. 2006) (reading terms as meaningless disfavored).

The Patentee confirmed in the prosecution history of related U.S. Patent No. 8,127,984 that the prior art “*requires a separate transmission/reception component (a transponder)*” and that “claim 1 recites a method for providing RFID identification using a *transceiver...eliminating an element taught by [the art] while retaining the function of that element.*” Ex. 1008 at 197; Hearing Tr. at 45:17-47:4. The claims must be interpreted consistent with this intrinsic record—the claimed “*transceiver* configured to output . . . RFID *transponder* signals” (and related terms) require the emulation of an RFID transponder, *i.e.*, a transceiver that mimics a transponder by sending RFID transponder signals without a physical transponder. The Board tacitly acknowledged this by relying on “functional emulation” throughout the FWD to characterize the scope of the claims.

The FWD did not “formalize a comprehensive construction for the RFID transponder signal or data terms,” but it did tacitly agree that emulation is required by all claims, “conclude[ing] that the claims encompass Petitioner’s ‘functional emulation’ articulation[.]” FWD at 22. The problem is that the Petitioner never

raised any emulation theory for the independent claims in its Petition, and neither did the Institution Decision, thus failing to uphold Petitioner's burden of proof and requiring reversal. The belated introduction of the "functional emulation" theory in relation to the secondary Holloway reference is simply too little, too late. For the FWD to say otherwise was reversible error.

IV. CONCLUSION

The FWD is predicated on procedural errors which deprived Patent Owner of fair opportunity to respond and relieved Petitioner of its burden. Critically, the Board—in supplying a missing theory of unpatentability and reframing the Petition to sustain the result—exceeded its adjudicatory role and effectively became an advocate. This is true for all claims because the FWD relied on the improper "functional emulation" theory for all of them, but is particularly consequential for Claim 6 which expressly requires "emulating." For all of the reasons set forth above, Director Review is warranted to reverse—or at a minimum vacate and remand—the Board's FWD finding unpatentability.

Dated: March 30, 2026

Respectfully submitted,

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CERTIFICATE OF SERVICE

Pursuant to 37 CFR § 42.205(b), the undersigned hereby certifies that on March 30, 2026, a complete and entire copy of the foregoing Patent Owner's Request for Director Review of Final Written Decision was served on Petitioner via email to IPR50095-0181IP1@fr.com, as authorized in Petitioner's mandatory notices.

Dated: March 30, 2026

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