

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INTEL CORPORATION, CAVIUM, LLC, and DELL, INC.,
Petitioner,

v.

ALACRITECH, INC.,
Patent Owner.

Case IPR2017-01410
Patent 8,131,880 B2

Before CHARLES J. BOUDREAU, STEVEN M. AMUNDSON, and
JASON M. REPKO, *Administrative Patent Judges*.

BOUDREAU, *Administrative Patent Judge*.

DECISION
Denying Petitioner's Request on Rehearing of
Final Written Decision on Remand
37 U.S.C. § 42.71(d)

I. INTRODUCTION

Intel Corporation filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review of claims 32, 34, 35, 37–39, and 41–43 (“the challenged claims”) of U.S. Patent No. 8,131,880 B2 (Ex. 1001, “the ’880 patent”) on the following grounds:

Claim(s) Challenged	35 U.S.C. §¹	Reference(s)/Basis
32, 34, 35, 39, 41–43	103(a)	Thia, ² Tanenbaum ³
37, 38	103(a)	Thia, Tanenbaum, Nahum ⁴

Pet. 14. We⁵ instituted an *inter partes* review of the challenged claims on the asserted grounds. Paper 8, 19 (“Decision on Institution” or “Dec. on Inst.”). In response to petitions and requests for joinder filed in IPR2017-01737 and IPR2018-00339, we joined Cavium, Inc. and Dell, Inc., respectively, as petitioners in this proceeding. *See* IPR2017-01737, Paper 8; IPR2018-00339, Paper 9. According to an updated mandatory notice filed in this proceeding,

¹ The Leahy-Smith America Invents Act (“AIA”) included revisions to 35 U.S.C. § 103 that became effective on March 16, 2013. Because the ’880 patent issued from an application filed before March 16, 2013, we apply the pre-AIA version of the statutory basis for unpatentability.

² Y.H. Thia and C.M. Woodside, “A Reduced Operation Protocol Engine (ROPE) for a Multiple-Layer Bypass Architecture,” 1995 (“Thia,” Ex. 1015).

³ Andrew S. Tanenbaum, *Computer Networks*, Third Edition, 1996 (“Tanenbaum” or “Tanenbaum96,” Ex. 1006).

⁴ Erich M. Nahum et al., “Performance Issues in Parallelized Network Protocols,” *Proceedings of the First Symposium on Operating Systems Design and Implementation*, November 1994 (“Nahum,” Ex. 1079).

⁵ Due to unavailability, original panel members Stephen C. Siu and Daniel N. Fishman have been replaced by Administrative Patent Judges Steven M. Amundson and Jason M. Repko. *See* Paper 84.

Cavium, Inc. subsequently was converted to Cavium, LLC. Paper 72. Intel Corporation, Cavium, LLC, and Dell, Inc. are identified herein collectively as “Petitioner.”

In a Final Written Decision (Paper 77, “FWD”), we concluded that Petitioner had established by a preponderance of the evidence that all the challenged claims are unpatentable on the asserted grounds, and we also denied a Contingent Motion to Amend filed by Patent Owner, after determining that the proposed substitute claims also were unpatentable. *Id.*

Patent Owner appealed to the Federal Circuit, alleging error in our holding the challenged claims unpatentable. The Federal Circuit affirmed our conclusion that claims 32, 34, 35, and 37–39 are unpatentable, but held that the Final Written Decision did not adequately support the finding that the asserted prior-art combination teaches or suggests “re-assembler” limitations recited in claims 41–43 that “require that reassembly take place in the network interface as opposed to a central processor.” *Alacritech, Inc. v. Intel Corp.*, 966 F.3d 1367, 1369–74 (Fed. Cir. 2020) (“*Alacritech I*”). Accordingly, the Court vacated the determination of unpatentability as to claims 41–43 and remanded for further proceedings regarding those claims. *Id.* at 1373.

On remand, we authorized the parties to file supplemental briefs limited to addressing the sufficiency of Intel’s showing at trial as to whether the asserted prior art teaches or suggests the limitation identified by the Federal Circuit. Paper 85. Following the parties’ briefing, we issued a Final Written Decision on Remand (Paper 88, “Decision on Remand” or “RFWD”), in which we concluded that Petitioner had not proven by a

preponderance of the evidence that claims 41–43 at issue on remand are unpatentable.

Petitioner now requests rehearing of our Decision on Remand. Paper 89 (“Req. Reh’g”). For the reasons that follow, we deny Petitioner’s request.

II. STANDARD OF REVIEW

A party requesting rehearing bears the burden of showing that the decision should be modified. 37 C.F.R. § 42.71(d). The party must identify specifically all matters we misapprehended or overlooked, and the place where each matter was previously addressed in its petition. *Id.*

III. ANALYSIS

In the Request for Rehearing, Petitioner argues that the Decision on Remand misapprehends the dispute on remand from the Federal Circuit. Req. Reh’g 1–7. Petitioner contends, “[t]he Federal Circuit determined that there is *no dispute* that the asserted combination of Thia and Tanenbaum discloses flow reassembly, and the crux of the remanded dispute is *where* reassembly takes place—in the network interface, or in the host.” *Id.* at 3 (citing *Alacritech I*, 966 F.3d at 1371). Further, Petitioner contends, “[t]he Court did *not* hold that the original final written decision was wrongly decided,” but “[i]nstead . . . remanded for further explanation because the original FWD did not acknowledge this dispute, or sufficiently explain how the prior art teaches or suggests reassembly on the network interface.” *Id.* at 3–4. According to Petitioner, “the RFWD fails to address the issue the Federal Circuit remanded the case to address: *where* the claimed flow reassembly occurs in the combination of Thia and Tanenbaum” and “[i]nstead . . . addressed an issue that was not disputed in the initial appeal

(or on remand) and has been waived: *whether* it occurs in the combination or either reference alone.” *Id.* at 4.

Petitioner’s arguments are not persuasive. First, contrary to Petitioner’s assertion that the Decision on Remand misapprehends the dispute on remand, the Decision on Remand expressly explains that the Federal Circuit

pointed out in particular that “[t]he claim limitations at issue require that reassembly take place in the network interface, as opposed to a central processor,” and “the crux of the [parties’] dispute was *where* reassembly takes place in the prior art and whether that location satisfies the claims limitations,” not merely *whether* reassembly is disclosed by the asserted prior art.

RFWD 17 (quoting *Alacritech I*, 966 F.3d at 1371).

Second, although the Federal Circuit did not expressly hold that the determination with respect to claims 41–43 was “wrongly decided,” the Court did hold that “[t]he Board’s analysis of the disclosure of the reassembly limitations in claims 41–43 falls short of that which the [Administrative Procedure Act] and our precedent require.” *Alacritech I*, 966 F.3d at 1371. The Court therefore concluded that the Final Written Decision did not adequately support the finding that the asserted prior-art combination teaches or suggests the “re-assembler” limitations recited in those claims that “require that reassembly take place in the network interface as opposed to a central processor.” *Id.* at 1369–74.

The Final Written Decision found that Patent Owner “fail[ed] to demonstrate that Petitioner . . . ‘admitted’ that Tanenbaum fails to disclose the disputed claim limitation or how the re-assembly of data portions of packets of Tanenbaum . . . differs from the reassembly of data portions of packets, as recited in claim 41” and that “[i]n both cases, data portions of

packets are reassembled.” FWD 11. However, the Final Written Decision did not affirmatively find that Petitioner had demonstrated that Tanenbaum teaches reassembly in the network interface. Indeed, as the Federal Circuit noted, “[a]lthough the Board cited to the relevant portions of Intel’s petition as it recounted certain arguments made by Intel, the Board did not endorse, adopt, or otherwise suggest that it was persuaded by those arguments, much less explain why it found those arguments persuasive.” *Alacritech I*, 966 F.3d at 1371.

Put another way, the finding that Petitioner *did not admit that the disputed limitation is not taught* by Tanenbaum was not a finding that Petitioner proved that that limitation is taught or suggested by the asserted prior art. As the Federal Circuit explained, “the Board’s rejection of certain arguments made by [Patent Owner] does not necessarily support the Board’s finding that the asserted prior art teaches or suggests reassembly in the network interface,” and “[t]hat is especially the case here, where the parties’ briefing focuses on the disclosure of the reassembly limitations by one reference (*Thia*), but the Board appears to have relied on a different reference (*Tanenbaum*) to support its finding.” *Id.* at 1371–72 (emphasis added). The Court, accordingly, vacated the Board’s obviousness determination as to claims 41–43 and remanded “for the Board to reconsider whether the asserted prior art teaches or suggests the entirety of the reassembly limitations, *including the requirement that reassembly takes place in the network interface.*” *Id.* at 1373 (emphasis added). And as we explained in the Decision on Remand, after such reconsideration, we were not persuaded that the combination of *Thia* and *Tanenbaum* teaches or suggests “a flow re-assembler, disposed in the network interface,” as recited

in claim 41, or a “network interface comprising . . . a re-assembler,” as recited in claim 43. RFWD 22–25. While Petitioner argues that “the RFWD tacitly acknowledges that the Petition’s discussion of Tanenbaum is much more extensive than the discussion on p. 77 that the Federal Circuit described as ‘conclusory’” (Req. Reh’g 3 n.4 (citing RFWD 23–24)), we find nothing in that “more extensive” discussion that establishes by a preponderance of the evidence that the asserted combination teaches or suggests reassembly in the network interface.

Petitioner further contends that “the RFWD also notes that Thia discloses that ‘[t]he Segmentation and Reassembly sublayer of the ATM adaptation layer is a good place for such functions’ ([RFWD] 23), but overlooks Thia’s explicit disclosure that the ATM layer *is on* the network interface (NIA), directly contradicting the finding.” Req. Reh’g 4–5 (citing Ex. 1223 ¶ 28; Ex. 1015, 7, 13–14). Petitioner contends, “[t]he RFWD relies on the same statement from Thia again to improperly conclude that flow reassembly does not occur in Thia at all,” “conflict[ing] with the undisputed fact that the transport layer processing *requires* flow reassembly, independent of fragmentation/reassembly at lower layer, and with final and binding findings in the 205 Case^[6] that Thia teaches transport layer reassembly.” *Id.* at 5 (citing RFWD 23). Still further, Petitioner contends that “the RFWD also misapprehends the undisputed fact that Tanenbaum teaches that the TCP transport entity performs flow reassembly, incorrectly drawing a distinction between TCP’s ability to ‘reconstruct a byte stream’ (*i.e.*, flow reassembly) and the claimed ‘reassembler’” and “ignores final and

⁶ See Req. Reh’g 2 (referring to “IPR2017-[0]1405 and its Federal Circuit Appeal No. 2019-1443 (collectively, ‘the 205 Case’)”).

binding findings that Tanenbaum teaches TCP reassembly.” *Id.* at 5–6 (citing RFWD 23–24; IPR2017-01409, Paper 79 at 26; Paper 87, 1, 3). According to Petitioner, “[t]he parties did not dispute that a POSA would have understood that TCP must perform flow reassembly,” and “the only conclusion consistent with this record is that flow reassembly occurs on the network interface.” *Id.* at 6–7. Petitioner argues, “[t]he location of Tanenbaum’s transport entity, which performs all TCP processing—the network interface—has already been affirmed by the Federal Circuit,” and “[l]ikewise, . . . the location of Thia’s entire transport layer processing—the network interface—has also been determined.” *Id.* at 7 (citing *Alacritech, Inc. v. Intel Corp.*, 817 F. App’x 995, 999 n.4 (Fed. Cir. July 16, 2020) (“*Alacritech IP*”).

We have considered Petitioner’s arguments but find them unpersuasive. First, contrary to Petitioner’s contentions, we did not find that “flow assembly does not occur in Thia at all” (Req. Reh’g 5), but instead that a person of ordinary skill in the art would not have understood Thia to teach or suggest “a flow re-assembler, disposed in the network interface,” as recited in claim 41, or “a network interface . . . comprising . . . a re-assembler,” as recited in claim 43, in view of Thia’s express statement that “[t]here is no segmentation/reassembly within the bypass path” (Ex. 1015, 14). Although, as quoted by Petitioner, Thia also states that “[i]n an ATM system we assume that the segmentation and reassembly or SAR operation would also be in hardware, since it is done frequently” (Ex. 1015, 13–14 (quoted at Req. Reh’g 4–5)), that statement appears as a parenthetical in the context of describing that “[t]he speed of communication processing in the host system can now match the transmission bandwidth of high-speed

networks, e.g., ATM technology, thereby including the application-to-application throughput performance” (*id.* at 13). Read in that context, we are not persuaded that Thia suggests reassembly in a network interface, particularly in view of Thia’s further statements in the immediately following paragraph that “[t]he scope of functions included in a bypass may be narrowly defined, or more extended” and that “[t]here is no segmentation/reassembly in the bypass path.” *Id.* at 14.

Second, contrary to Petitioner’s contentions, we did not “draw[] a distinction [in the RFWD] between TCP’s ability to ‘reconstruct a byte stream’ (*i.e.*, flow reassembly) and the claimed ‘reassembler’” (Req. Reh’g 5), but instead found that Tanenbaum does not disclose where reconstruction occurs (RFWD 23–24). Notwithstanding Petitioner’s contention that “[t]he location of Tanenbaum’s transport entity, which performs all TCP processing—the network interface—has already been affirmed by the Federal Circuit” (Req. Reh’g 7), the cited support simply says that the Board, in a different case involving a different (albeit related) patent, made findings supporting Petitioner’s arguments concerning motivation to combine Tanenbaum with Erickson, a prior-art reference not at issue in this case. *Alacritech II*, 817 F. App’x at 999 n.4. In this case, in contrast, the Federal Circuit specifically held that the Final Written Decision did not adequately support the finding that the combination of Tanenbaum and Thia teaches or suggests the “re-assembler” limitations of claims 41–43, particularly where “the parties’ briefing focuses on the disclosure of the reassembly limitations by one reference (Thia), but the Board appears to have relied on a different reference (Tanenbaum) to support its finding.” *Alacritech I*, 966 F.3d at 1371–72.

We also have considered and find unpersuasive Petitioner’s arguments that the RFWD “conflicts with conclusive determinations in the 205 Case that Thia teaches transport layer reassembly in the bypass path” and “overlooks final and binding rejections of claims reciting reassembly in related IPR2017-01409.” Req. Reh’g. 7–13 (emphasis omitted). Petitioner contends that the 205 Case concluded that Thia teaches that its bypass protocol stack on the network interface performs transport layer reassembly, whereas the RFWD concludes that it does not and fails to acknowledge the conflict or explain why the conclusions differ. *Id.* at 7 (citing *Alacritech, Inc. v. Intel Corp.*, 817 F. App’x 1014, 1017 (Fed. Cir. July 17, 2020) (“*Alacritech III*”); RFWD 24–25). We are not persuaded that there is any conflict. As we explained in the RFWD, “[c]ontrary to Petitioner’s argument, we do not find that the Federal Circuit ‘affirm[ed] that “Thia expressly discloses bypassing . . .” . . . reassembly”’ in the 205 Case. RFWD 25 (quoting Paper 87, 3). We also do not find that the Federal Circuit made any “final and binding determination that Thia teaches transport layer reassembly in the bypass path.” Req. Reh’g 9–10 (emphasis omitted); *see also id.* at 2 (arguing that ““the 205 Case’ . . . directly determined that Thia teaches transport layer reassembly on the network interface”). Although the Court concluded that “substantial evidence supports the Board’s finding [in the 205 Case] that Thia discloses offloading the entire transport layer from the host computer,” *Alacritech III*, 817 F. App’x at 1017 (quoted at Req. Reh’g 10), the claims at issue in the 205 Case do not recite a “flow re-assembler, disposed in the network interface,” as recited in claim 41 of the ’880 patent, or “a network interface . . . comprising . . . a re-assembler,” as recited in claim 43. Moreover, as Petitioner itself quotes in its Request for

Rehearing, the Court explained, prior to reaching the conclusion quoted above, that “[a]side from Thia’s disclosure that ‘there is no segmentation/reassembly within the bypass path,’ Alacritech has not identified any transport layer functionality that would not be offloaded from the host computer in any of Thia’s embodiments.” *Id.* (emphasis added). Thus, we disagree that the Federal Circuit made any “final and binding determination” that Thia teaches “transport layer reassembly,” without qualification. Further, we were constrained in the RFWD both by the Federal Circuit’s determination that the conclusion in the FWD with respect to claims 41–43 was not adequately supported, as well as by the briefing in this case, which, for the reasons previously stated, does not persuade us that Petitioner demonstrated the unpatentability of claims 41–43 by a preponderance of the evidence.

Petitioner further contends that “[t]he RFWD also overlooks substitute claim 79 in IPR2017-01409 (880 Patent),” which, according to Petitioner, “recited flow reassembly: ‘re-assembling the data portion of said packet with a data portion of another packet in the communication flow’” and was “rejected” by the Board over Thia and Tanenbaum, and “[s]ubstitute claim 61 [which] likewise sought to add reassembly to claim 1 and was similarly rejected over Thia and Tanenbaum.” Req. Reh’g 13 (citing IPR2017-01409, Paper 20, Appendix A at ii; IPR2017-01409, Paper 79, 26; Paper 87, 3; FWD 25; RFWD 26). These further arguments also are unpersuasive. Patent Owner’s Contingent Motion to Amend in IPR2017-01409 included proposed substitute claims numbered only 61–78. IPR2017-01409, Paper 20, Appendix A at viii–xii (listing proposed substitute claims). Notwithstanding Petitioner’s arguments, we find no “substitute claim 79” in

that case. *See id.* Nor do we find in that case any other proposed substitute claim having the specific “re-assembling” language quoted above.

Moreover, although proposed claim 61 in that case included a *similar* recitation to that quoted by Petitioner (*see id.* at ix (reciting “re-assembling said data portion of said first packet with a data portion of a second packet in the communication flow”))), it did not recite a “flow re-assembler, disposed in the network interface,” as recited in claim 41 of the ’880 patent, or “a network interface . . . comprising . . . a re-assembler,” as recited in claim 43. Accordingly, we are not persuaded that we “overlook[ed] final and binding rejections of claims . . . in related IPR2017-01409” in reaching our conclusion that “the Board . . . made no finding that the Thia-Tanenbaum combination teaches or suggest a reassembler” in IPR2017-01409. Req. Reh’g 13; RFWD 26.

Lastly, Petitioner contends that the RFWD misapprehends Thia’s statement that “[t]here is no segmentation/reassembly within the bypass path.” Req. Reh’g 13–15. According to Petitioner, that statement “relates to a lower layer reassembly of individual lower-layer packets (called Protocol Data Units) broken up in transit (fragmentation), not transport layer reassembly of data portions of transport PDUs.” *Id.* at 13. Petitioner further contends that the Final Written Decision in the related 205 Case noted that that statement is only an example and would not discourage a person of ordinary skill in the art from performing segmentation/reassembly in the bypass path. *Id.* at 14 (citing IPR2017-01405, Paper 84 at 23). Still further, Petitioner contends, “claims 41–43 relate to layered protocols,” where “each layer is responsible only for its respective functions,” and “[t]he Board’s analysis of Thia misses the crucial distinction between lower-layer

reassembly of a packet from its fragments, and transport layer reassembly of data from multiple packets on the same flow or connection, which . . .

[Patent Owner] *admits must be performed by the transport layer.*” *Id.* at 14–15 (citing Ex. 1006, 425).

We are again unpersuaded by Petitioner’s arguments. The question is not whether reassembly must be performed by the transport layer, but where the re-assembler is located. Claims 41 and 42 require that the re-assembler be “disposed in the network interface,” and claim 43 similarly requires that the network interface comprises the re-assembler. Regardless of the Board’s findings and conclusions in the 205 case, which did not include those same limitations, the Federal Circuit determined that the Board’s FWD in this case did not provide adequate support for the conclusion of obviousness of claims 41–43. After reviewing the parties’ trial evidence and arguments anew and taking into account the Federal Circuit’s decision, we were not persuaded that Petitioner demonstrated the unpatentability of claims 41–43 by a preponderance of the evidence. *See* RFWD 22–26. We have considered each of Petitioner’s arguments in its Request for Rehearing but are not persuaded that we misapprehended or overlooked any matter in reaching that conclusion.

IV. CONCLUSION

Based on the reasons stated above, we deny Petitioner’s Request for Rehearing.

V. ORDER

It is ORDERED that Petitioner's Request for Rehearing is *denied*.

Outcome of Decision on Rehearing:

Claims	35 U.S.C. §	Reference(s)/ Basis	Denied	Granted
41–43	103(a)	Thia, Tanenbaum	41–43	

Final Outcome of Final Written Decision After Rehearing:

Claims	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
32, 34, 35, 39, 41–43	103(a)	Thia, Tanenbaum	32, 34, 35, 39	41–43
37, 38	103(a)	Thia, Tanenbaum, Nahum	37, 38	
Overall Outcome			32, 34, 35, 37–39	41–43

Motion to Amend Outcome	Claim(s)
Original Claims Cancelled by Amendment	
Substitute Claims Proposed in the Amendment	79–87
Substitute Claims: Motion to Amend Granted	
Substitute Claims: Motion to Amend Denied	79–84
Substitute Claims: Not Reached	85–87

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