

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ARM LTD.,

Petitioner,

v.

DAEDALUS PRIME LLC,

Patent Owner.

Case No.: IPR2025-00207

U.S. Patent No. 8,984,228

PATENT OWNER'S REQUEST FOR DIRECTOR REVIEW

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Patent Owner Daedalus Prime LLC respectfully requests Director Review of the Final Written Decision, Paper 39 (“FWD”), pursuant to 37 C.F.R. § 42.75.

I. INTRODUCTION

Director Review is warranted because the FWD repeatedly finds express claim limitations satisfied without identifying evidence that discloses those limitations. This Request does not ask the Director to reweigh competing evidence. It identifies failures to apply the claims as written and failures to connect the cited record evidence to material factual findings.

The errors recur in three dispositive areas. For Claims 6 and 11, the Board identifies an I/O-device DMA write directed to cache but not the intervening receipt and forwarding path required by the claims. For Claims 2, 3, and 16, the Board identifies generic buffers, write machines, and posted writes but not the claimed table of requests (“TOR”), its entries for pending core or IIO requests, or an entry dedicated to a posted transaction. For Claim 1, the Board relies on disclosure that “at least some” directory controllers are associated with “a processor core” without explaining how that satisfies the requirement that the distributed portions be “each associated with a corresponding one” of the plurality of cores. FWD 29, 34, 40, 43–44, 49–56.

These are erroneous findings of material fact and erroneous conclusions of law within 37 C.F.R. § 42.75(c). The FWD also applies issue preclusion to the

Sinharoy grounds and mischaracterizes Patent Owner as “seemingly accept[ing]” preclusion of Claim 1, although Patent Owner’s supplemental briefs argued the opposite. FWD 19–22; Paper 35, 4–6; Paper 37, 2–4. That ruling presents an important recurring question concerning the level at which issue identity must be assessed in continuation-family IPRs.

The requested review is accordingly narrow. Patent Owner does not ask the Director to choose between competing expert opinions about system design. The question is whether the FWD identified evidence for each recited step and structure. Where the Decision cites evidence of an I/O-to-cache result, a generic buffer, or an association involving only “at least some” controllers, it still had to explain how that evidence establishes the additional words Congress required Petitioner to prove by a preponderance of the evidence. 35 U.S.C. § 316(e).

II. CLAIMS 6 AND 11: THE FWD DOES NOT IDENTIFY THE CLAIMED TRANSACTION PATH

A. The claims require receipt and forwarding through the IIO module

Claim 6 requires “the caching agent . . . [to] receive an allocation transaction from the IIO module,” with that transaction “received in the IIO module from an IO device.” Ex. 1001, 7:57–61. Claim 11 expressly requires “receiving” the transaction in the IIO module from an IO device and then “forwarding the allocation transaction to a caching agent.” *Id.* at 7:64–8:7. The claims thus require the path IO device → IIO module → caching agent, followed by direct storage in

shared cache. Mere evidence of an I/O-device write that ultimately reaches cache does not establish the intermediate receipt and forwarding operations.

B. Sinharoy shows source and destination, not the intervening path

Patent Owner argued that Sinharoy's cache injection directs DMA traffic to a physical L3 slice based on address homing and that integrated I/O controllers write into a local L3 region when that region already owns the targeted line. PO Resp. 40–41; Ex. 2006 ¶¶ 123–129. The claimed two-hop path is absent. The FWD recounts that argument but relies principally on one Sinharoy sentence: “An I/O device performing a direct memory access (DMA) write operation may target the operation to the cache, instead of to memory.” FWD 51–52 (quoting Ex. 1006, 17). It then concludes that “the caching agent receives an allocation transaction from the IIO module.” *Id.* at 52.

The cited sentence identifies an origin and destination. It does **not** state that the transaction is received in the IIO module, forwarded from that module, or received by the claimed caching agent. Nor does the FWD make an inherency finding that those steps necessarily occur. Instead, it adopts Petitioner's characterization that the coherence fabric receives a transaction “via an integrated I/O controller or the SMP interconnect” without explaining **how** receipt “via” either of two alternatives establishes the particular IIO-to-caching-agent transfer required by the claims. *Id.*

The disjunctive phrase on which the FWD relies reinforces the omission. A transaction received “via an integrated I/O controller or the SMP interconnect” need not be received in the claimed IIO module at all, much less forwarded from that module to the caching agent. FWD 52. The Decision never identifies which route satisfies the claim or traces the same allocation transaction through the two recited recipients. A finding that either route may deliver traffic to the coherence fabric cannot establish the particular route Claim 6 requires.

This is not a choice between two supported interpretations. The Board treated evidence of a result as evidence of the intervening claim-recited sequence. If an I/O-device DMA merely targeting cache is sufficient, the phrases “received in the IIO module,” “receive . . . from the IIO module,” and “forwarding . . . to a caching agent” perform no work. The same error controls Claim 11 because the FWD incorporates the Claim 6 analysis without separately identifying Claim 11’s express forwarding step. FWD 53. A conclusion incorporated from an analysis that omitted the step cannot supply the missing finding. See *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1375–81 (Fed. Cir. 2016).

C. The Agarwal analysis answers an unasserted “proxy” limitation, not the claim text

Patent Owner explained that Agarwal routes a transaction to the home tile selected by a hash of the address, after which that tile’s directory controller handles coherence. PO Resp. 31; Ex. 2006 ¶¶ 100–102. Patent Owner contrasted that path

with Claim 11's requirement that the IIO module forward the allocation transaction to the recited caching agent shared by the cores and IIO module. The FWD responds that the specification does not impose additional "proxy" restrictions. FWD 43–44.

Patent Owner did not rely on an optional proxy embodiment. It relied on Claim 11's words: "forwarding the allocation transaction to a caching agent." Ex. 1001, 8:5–7. The FWD does not identify evidence that Agarwal forwards the transaction to that recipient or explain why an address-selected home-tile controller is the caching agent shared by the cores and IIO module. The omission is material because the FWD itself recognizes that Agarwal selects "the home tile of address A" through a hash function or address mapping table. FWD 27–28.

The identity of the recipient is not surplusage. Claim 11 does not merely require forwarding toward cache or toward any coherence controller. It requires forwarding to "a caching agent" that the next clause defines as shared by the plurality of cores and the IIO module. Ex. 1001, 8:5–10. Agarwal's routing to whichever independent home-tile controller owns the address does not establish that the transaction is forwarded to that shared agent. The FWD's response therefore resolves a construction Patent Owner did not propose while leaving the express recipient limitation unanswered.

Director Review should therefore be granted as to Claims 6 and 11 and claims whose disposition depends on the same transaction-path finding.

III. CLAIMS 2, 3, AND 16: THE FWD DOES NOT IDENTIFY THE CLAIMED TOR OR DEDICATED ENTRY

A. The claims require a particular multi-source request structure

Claim 2 requires “a table of requests to store pending requests for the plurality of cores and the IIO module.” Ex. 1001, 7:47–49. Claim 3 adds “at least one dedicated entry” storing a pending request corresponding to a posted transaction. *Id.* at 7:50–52. Claim 16 similarly requires a first caching agent having a TOR with multiple entries for pending requests from the first cores or first IIO module, including a dedicated posted-transaction entry. *Id.* at 8:49–55. These claims require more than requests, buffers, or write resources; they require a specified structure serving identified sources.

B. Agarwal’s generic buffer does not establish Claim 2

Patent Owner argued that Agarwal’s per-tile buffers were not shown to be a TOR storing pending requests from both the cores and the I/O module. PO Resp. 21–24; Ex. 2006 ¶¶ 74–90. The FWD recounts that dispute, states that “Agarwal teaches a buffer,” and concludes that the buffer “corresponds to the TOR.” FWD 40.

That conclusion omits the substance of the limitation. The Decision identifies no evidence that the cited buffer is within the claimed caching agent, constitutes a table of requests, stores pending requests, or stores requests for both claimed sources. Because the '228 patent describes a TOR as a type of buffer, the FWD effectively treats any buffer as the complete TOR. But membership in the generic category “buffer” does not establish the additional structural and functional attributes recited by Claim 2. This remains true whether the TOR is centralized or distributed; the claim still requires a TOR in the caching agent storing pending requests for the cores and IIO module.

The cited Agarwal passages also do not bridge the gap. The Petition cited buffers associated with particular operations or controllers, not a structure shown to accept the population of pending requests recited by Claim 2. Pet. 24; PO Resp. 21–24. Thus, even if a POSITA could call an Agarwal storage element a buffer, the Decision still needed to find that the buffer performs the claimed multi-source storage function. It did not.

C. Sinharoy and Blumrich do not disclose a dedicated entry

The FWD states that Sinharoy’s write machines perform cache injection and that a cache-injection write is a posted transaction. FWD 55. Even if so, Claim 3 requires an entry in the TOR dedicated to storing a pending posted-transaction

request. The FWD identifies no such entry, no reservation of an entry, and no segregation of queue capacity for posted transactions.

Blumrich states that request queue 302 buffers incoming read and write requests, has sixteen entries in one embodiment, compares addresses with pending requests, and presents requests to a directory pipeline. Ex. 1007 ¶ 128; FWD 14. That is a general-purpose queue. It does not disclose that an entry is dedicated to posted transactions. Patent Owner made this exact distinction and explained that Blumrich's queue was not shown to store IIO requests. PO Resp. 43–47; Ex. 2006 ¶¶ 130–151. Petitioner's expert agreed that Blumrich paragraph 128's requests were understood to be processor-core requests. Ex. 2007, 26:15–21.

The FWD does not address that evidence, find that queue 302 receives IIO requests, identify a dedicated entry, or explain why a skilled artisan would dedicate an entry to posted transactions. It identifies a transaction type, not the claimed structure that stores it.

The word “dedicated” is decisive. A queue with sixteen interchangeable entries may have enough capacity to hold a posted write, but capacity to hold a request is not dedication of an entry to that request class. Petitioner therefore had to identify either an expressly reserved entry or a reasoned modification producing one. The FWD identifies neither. Its reasoning would read “dedicated” out of

Claims 3 and 16 by treating any entry that happens to contain a posted request as a dedicated entry.

D. Claim 16 receives no analysis of its complete TOR limitation

Claim 16 independently recites the full TOR architecture. Yet its claim-specific discussion identifies Sinharoy's multiprocessor system, cache, IIO modules, and caching agents without identifying the first caching agent's TOR, multiple entries, entries for pending core or IIO requests, or the dedicated entry. FWD 56. The statement that Patent Owner's arguments were "previously addressed" cannot cure the omission because the earlier discussion likewise did not identify the dedicated entry.

This omission cannot be treated as harmless incorporation. Claim 16 is independent and expressly locates the multi-entry TOR in the first caching agent of a two-processor system. Ex. 1001, 8:42–64. The cited Claim 2 and Claim 3 discussion does not establish the first IIO module as a source of requests to Blumrich's queue, and it never identifies a dedicated entry. Repeating the conclusion for Claim 16 therefore compounds rather than cures the missing findings.

The FWD also states generally that Petitioner showed reasons to combine Sinharoy and Blumrich. FWD 55. A general reason to combine does not establish that the resulting combination contains the missing dedicated entry. Nor does the

Decision identify a reason to replace or modify Blumrich’s general-purpose queue with dedicated posted-transaction capacity. See *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015); *Magnum Oil Tools*, 829 F.3d at 1375–78.

Petitioner bore the burden to prove that specific structure, and the FWD neither finds it disclosed nor explains the modification.

Director Review should therefore be granted as to Claims 2, 3, and 16–18.

IV. CLAIM 1: THE FWD DOES NOT GIVE EFFECT TO “EACH” AND “CORRESPONDING”

Claim 1 requires “a plurality of distributed portions each associated with a corresponding one of the plurality of cores.” Ex. 1001, 7:43–46. Patent Owner argued that Agarwal assigns controller responsibility by address homing, not corresponding-core association. PO Resp. 12–15; Ex. 2006 ¶¶ 41–51. A home tile is selected for a memory line by address mapping, including a hash of the address, and handles requests for that address regardless of the initiating core. Ex. 1005, 17:42–51, 23:51–53. The FWD recognizes this operation. FWD 27–28.

The Board nevertheless relies on Agarwal’s statement that “[a]t least some of the directory controllers are associated with a processor core.” *Id.* at 29, 33–34 (quoting Ex. 1005, 3:42–44). “Some” does not establish “each,” and association with “a processor core” does not establish a correspondence between each distributed portion and a corresponding one of the plurality of cores. The additional

disclosure that a directory may be located on a node and associated with that node's higher-level cache likewise does not establish the claimed core correspondence. The FWD instead states that "the tiles can be 'associated with' the directory," without identifying the required association between each caching-agent portion and a corresponding core, and without addressing "each." FWD 34.

The grammatical contrast is direct. Agarwal's sentence is expressly partial: "at least some" controllers have an association with "a" core. Claim 1 is distributive and correlative: every claimed portion must be associated with its corresponding core. Nothing in the cited sentence establishes that the number of associated controllers matches the number of cores or that each association is the correspondence the claim requires.

The extensive finding that Agarwal's controllers collectively maintain coherence addresses whether they may be characterized as one caching agent. It does not establish the separately recited association. A controller set may collectively maintain coherence while each controller remains responsible for an address-assigned region and serves requests from any core. The Board itself recognized the "associated" limitation as separate. FWD 21. Each claim word must be given effect. *Merck & Co. v. Teva Pharms. USA, Inc.*, 395 F.3d 1364, 1372 (Fed. Cir. 2005) ("A claim construction that gives meaning to all the terms of the claim is preferred over one that does not do so.").

Director Review should be granted because the FWD’s treatment of “at least some” as satisfying “each,” without reconciling address-based selection with corresponding-core association, is a material factual and legal error.

V. THE ISSUE-PRECLUSION RULING MISSTATES THE RECORD AND PRESENTS AN IMPORTANT POLICY QUESTION

The FWD states that Patent Owner “seemingly accepts” that Claim 1 is subject to issue preclusion. FWD 22. The record is the opposite. Patent Owner argued that the prior IPR decided whether Sinharoy’s cache structures could constitute a logical single caching agent, while this proceeding presented the separately recited association issue. Paper 35, 4–6; Paper 37, 2–4. Patent Owner’s additional argument that estoppel could not extend to Claims 11 and 16 was not a concession as to Claim 1. Paper 37, 4–5.

Issue preclusion requires an identical issue that was actually litigated and necessary to the prior judgment. *Google LLC v. Hammond Dev. Int’l, Inc.*, 54 F.4th 1377, 1381 (Fed. Cir. 2022). The prior FWD reasoned that Sinharoy’s separate controllers could form a logical single caching agent because the regions shared capacity and control and acted together. IPR2023-01344, Paper 31 at 27–28. Patent Owner did not ask the present Board to revisit that conclusion. Paper 37, 2. It argued instead that Sinharoy’s regions are address-homed and available to all

cores, and thus are not functionally associated with corresponding cores. Paper 26, 15–16.

The current FWD acknowledges that the prior decision treated the association requirement as separate but finds preclusion because substantially identical claims were previously held unpatentable. FWD 21–22. That approach does not identify whether the address-homing and core-association issue was actually determined. It raises an important recurring question: when related patents contain similar composite limitations, at what level must the Board identify the factual issue actually litigated and necessarily decided before precluding litigation of a separately recited requirement?

The distinction is not merely a new evidentiary theory about the same undifferentiated question. The prior decision’s shared-logic rationale could be true while the present address-homing contention is also true: controllers may cooperate as one logical agent yet remain assigned to address regions rather than corresponding cores. Because both propositions can coexist, deciding the former does not necessarily decide the latter. The FWD’s reliance on the ultimate unpatentability judgment does not supply the missing determination that the latter issue was essential to that judgment.

The Board states that it also decided the Sinharoy grounds on the merits. FWD 22. Correction of estoppel alone may therefore not alter the judgment, but

review remains warranted because the FWD misstates Patent Owner's position and the overbroad preclusion analysis appears intertwined with abbreviated Sinharoy findings, including the lack of a separate association analysis and the incorporation of Claim 6's incomplete transaction-path analysis into Claim 11. Further, the procedural posture of this case reinforces the importance of getting the issue-preclusion analysis exactly right because the original discretionary-denial decision was vacated in substantial part based on the existence of the continuation FWD. Once the proceeding was revived on that basis, the Board had an obligation to determine with precision which issues were actually litigated and necessarily decided in the earlier proceeding rather than treating the earlier result as blanket authority for materially different limitations. Accordingly, the Director should vacate the issue-preclusion determination or clarify that it cannot substitute for claim-specific findings in this proceeding.

VI. THE IDENTIFIED ERRORS REQUIRE CLAIM-SPECIFIC VACATUR OR REMAND

The errors addressed above are not harmless. For Claims 6 and 11, the allegedly missing transaction route is the substance of the additional limitation. The Board's evidence that an I/O-device DMA may target cache does not itself establish the intermediate IIO receipt and forwarding operations. For Claims 2, 3, and 16, the missing structures are the principal claimed distinctions. A generic

buffer does not establish the multi-source TOR, and the existence of a posted transaction does not establish an entry dedicated to that transaction. For Claim 1, the Board’s cited evidence of an association involving “at least some” controllers does not establish the claimed relationship for “each” distributed portion.

The Director need not reweigh expert credibility to address these errors. Review can be resolved by comparing the text of the claims with the evidence and findings identified in the FWD. Where the Decision did not make a required finding, remand is appropriate. Where the cited evidence cannot establish the missing limitation as a matter of law, reversal is appropriate.

VII. CONCLUSION

Patent Owner respectfully requests Director Review and vacatur or remand of the findings for Claims 1-3, 6, 11, and 16–18 for the reasons specified herein. Patent Owner further requests vacatur or clarification of the issue-preclusion ruling and such other relief as the Director may deem appropriate.

If there are any additional fees due in connection with this communication, please charge Deposit Account No. 50-5798.

Respectfully submitted,

Dated: October 6, 2026

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CERTIFICATION OF PAGE COUNT

Pursuant to 37 C.F.R. § 42.75 and the applicable Director Review procedures,
Patent Owner certifies that this Request for Director Review complies with the 15-
page page limit.

Dated: October 6, 2026

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing:

PATENT OWNER'S REQUEST FOR DIRECTOR REVIEW

was served on 10/6/2026, by filing this document though the PTAB P-TACTS System as well as by delivering a copy via email directed to the attorneys of record for the Petitioner at the following addresses:

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The parties have agreed to electronic service in this proceeding.

Respectfully submitted,

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