Filed on behalf of: Amazon.com, Inc. and Amazon Web Services, Inc.
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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AMAZON.COM, INC. and
AMAZON WEB SERVICES, INC.,
Petitioner,

v.

SWARM TECHNOLOGY LLC,
Patent Owner.

Case IPR2023-00390
Patent 9,146,777 B2

REQUEST FOR REHEARING BY THE DIRECTOR

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The Amazon Petitioners respectfully request Director Review of the Board's institution denial based on an erroneous claim construction—here, a conclusion of law based solely on intrinsic evidence. Decision Denying Institution (Paper 7).

The '777 patent relates to "processing information in parallel us[ing] autonomous computer processing cells to perform tasks." '777 Patent Abstract.

Claim 14 recites "the first solidarity cell comprising a first agent configured to ***proactively retrieve***, from the task pool, a matching task for the solidarity cell to process."[1] The specification provides examples of what qualifies as proactive:

> 1) "Each solidarity cell is proactive, in that it obtains a task to perform by sending its agent to the task pool when the solidarity cell has no processing to perform."
> 2) "The cells 12A … n act proactively in that they seek a task 22 from the task pool 13 as soon as the cells 12A … n become available to do further processing."

'777 Patent 2:8-10, 5:22-25 (original omissions). Patent Owner admitted as much:

> The '777 Patent states that "it is an object of this invention to provide an apparatus and method for parallel processing in a multiprocessor system using co-processors that proactively seek threads to process." *Id.* at 1:46-49. Describing proactivity of the solidarity cells, the '777 Patent discloses that "[e]ach solidarity cell is proactive, in that it obtains a task to perform by sending

[1] All emphasis added and internal citations omitted unless noted otherwise.

> its agent to the task pool when the solidarity cell has no processing to perform." *Id.* at 2:8-10. Moreover, "the [solidarity cells] act proactively in that they seek a task 22 from the task pool 13 as soon as the [solidarity cells] become available to do further processing." *Id.* at 5:22-25.

POPR 28 (original alterations).

The Board excluded these embodiments, instead construing "proactively retrieve" to mean that the solidarity cells must never receive a notification or instruction before retrieving tasks—even if received only upon registration of the cells in the system and the cells retrieve tasks later without subsequent notification or instruction. Decision 18-19. For example, the Board stated:

> Because of the undisputed need for the initial notification [in the Lurie prior art reference], it does not matter that the TCW can obtain additional tasks without further notifications. A cell that sometimes needs a notification to obtain a task is not proactive; rather, it is at least partially reactive.

Id. 18. The Board then immediately contradicted this construction, stating confusingly that "Petitioner has not shown that proactive means acting without an instruction"—which Petitioner never proposed—and that "it does not matter whether the TCW [solidarity cell] receives an instruction to obtain a task." *Id.*

This construction is erroneous, was the basis for institution denial, and warrants Director Review.

I. Background: Statement of the Case

The Petition challenged all claims of the '777 patent because these claims would have been obvious under 35 U.S.C. § 103 based on a Lurie prior art reference in combination with one or more other prior art references. *See* Pet. 1-2.

All claims require "proactively retriev[ing]" tasks from a task pool. The Board, like the Petition, focused on independent claim 14. *See* Decision 15 & n.5. This claim recites: "the first solidarity cell comprising a first agent configured to ***proactively retrieve***, from the task pool, a matching task for the solidarity cell to process." '777 Patent 8:56-58; *see also id.* 8:59-61 (same for "a second solidarity cell"). The Board concluded that "claim 1 recites substantially the same limitation" and therefore rested on its analysis of claim 14. Decision 20. Specifically, claim 1 recites: "the first solidarity cell comprising a first agent configured to ***proactively retrieve***, from the task pool, without requiring an instruction from the CPU, a matching task for the solidarity cell to process." '777 Patent 7:46-49.

As explained above, the specification provides two examples of proactive retrieval: "[e]ach solidarity cell is proactive, in that it obtains a task to perform by sending its agent to the task pool when the solidarity cell has no processing to perform," *see* '777 Patent 2:8-10, and "[t]he cells 12A … n act proactively in that they seek a task 22 from the task pool 13 as soon as the cells 12A … n become available to do further processing," *see* '777 Patent 5:22-25 (original omissions).

Lurie discloses an "instrument-based distributed system on a network" comprising a central processing unit called the technical computing client (TCC), a task pool called the automatic task distribution mechanism (ATD), and solidarity cells called technical computing workers (TCWs). Ex. 1003 (Lowenthal Decl.) ¶¶ 64-69, 114-144 (discussing Ex. 1007 (Lurie)). The TCC populates the ATD with tasks, TCWs register with the ATD, the ATD sends an initial "notification" to the TCWs that tasks are available, and the TCWs thereafter retrieve tasks from the ATD. *Id*. ¶¶ 69-76, 148-158. Lurie never states that subsequent notifications are sent or that a TCW would require subsequent notifications before retrieving additional tasks. Rather, as Petitioner's expert (Dr. Lowenthal) explained, a POSITA would have understood that Lurie uses a textbook bag-of-tasks technique in which TCWs continue retrieving available tasks rather than re-registering and awaiting a notification before retrieving each subsequent task. *Id*. ¶¶ 193-198. At a minimum, Dr. Lowenthal explained, such an implementation would have been obvious. *Id*.

The Petition demonstrated that Lurie discloses or renders obvious ***the '777 patent's own example of proactive retrieval***, explaining that (i) a person of ordinary skill in the art would have understood that Lurie's TCWs (i.e., the claimed "cells") use the "textbook bag-of-tasks technique" to repeatedly complete tasks and then immediately obtain new tasks until Lurie's task pool/bag is empty, and (ii) in the

alternative, it would have been obvious to implement Lurie with that functionality. Pet. 24, 32-37.

Patent Owner's Preliminary Response (POPR) argued that Lurie fails to teach the proactive retrieval limitation because Lurie's TCWs receive a notification "before obtaining each task." *See* POPR 27-30. Patent Owner argued further that it would not have been obvious "to modify Lurie's TCWs to proactively retrieve tasks" as proposed in the Petition without "classic hindsight reconstruction" and that such modification would render other components of Lurie "inoperable or moot." *Id.* 31-33.

The Board denied institution because, in its view, the Amazon Petitioners had not "shown that the combination of Lurie and Ethernet Specification teaches or suggests the disputed [proactive retrieval] limitation." Decision 17. According to the Board, (1) the ATD Mechanism sends a notification to the TCWs that a task is available before the TCW obtains its first task and (2) even if Lurie uses the bag-of-tasks model, the TCW still requires the first notification before it starts obtaining tasks. *Id.* 17-18. The Board concluded as follows:

> Because of the undisputed need for the initial notification, it does not matter that the TCW can obtain additional tasks without further notifications. A cell that sometimes needs a notification to obtain a task is not proactive; rather, it is at least partially reactive.

Id. 18.

The Board next responded to the Amazon Petitioners' contention that Lurie disclosed or rendered obvious the proactive retrieval limitation at least under the specification's own example of what qualifies—e.g., "it obtains a task to perform by sending its agent to the task pool when the solidarity cell has no processing to perform." *Id.* 19. The Board criticized the Amazon Petitioners for not explaining why this example is the plain meaning of "proactive" and, in any event, declined to adopt this example as a definition or even acknowledge that the example falls within the scope of the claims.

The '777 patent is formally related to two other patents for which the Board instituted IPRs. In IPR2022-00283 (Paper 43), the Board issued a final written decision that all claims of U.S. Patent No. 9,852,004 (none of which recite proactive retrieval) are unpatentable based at least in part on Lurie. In IPR2022-00633, a final written decision regarding U.S. Patent 10,592,275 is expected by September 6, 2023. All claims of this patent recite proactive retrieval, and the Patent Owner itself proposed construing this term consistent with the Amazon Petitioners' contention here:

> Patent Owner submits that all claim terms of the '275 Patent should be given their ordinary and customary meaning as understood by one of ordinary skill in the art in light of specification and '275 Patent file history.

…

> The terms "proactive" and "proactively" are properly understood to describe a co-processor configured to seek/obtain a new task as soon as the co-processor becomes available to perform further processing.

IPR2022-00633, Paper 12 (POR) 6-8; *see also id.* 27. The '275 patent is a continuation of the '004 patent, which is a continuation of the '777 patent.

For the reasons explained below, the Board erroneously construed the proactive retrieval limitation. This construction was the basis for denying institution, was adopted as a conclusion of law based solely on intrinsic evidence, and warrants Director Review.

II. Legal Standard

"Requests for Director Review of the Board's decision whether to institute an AIA trial … shall be limited to decisions presenting (a) an abuse of discretion or (b) important issues of law or policy." *See* USPTO, Revised Interim Director Review Process at 2.B (July 24, 2023) (Availability of Director Review: AIA Trial Proceedings). A party seeking rehearing must identify the matters that the Board "misapprehended or overlooked," and the Board reviews its decision for an abuse of discretion. 37 C.F.R. § 42.71(c)-(d). The Board abuses its discretion when, as here, its decision "(1) is clearly unreasonable, arbitrary, or fanciful; (2) is based on an erroneous conclusion of law; (3) rests on clearly erroneous fact findings; or (4)

involves a record that contains no evidence on which the Board could rationally base its decision." *Ultratec, Inc. v. CaptionCall, LLC*, 872 F.3d 1267, 1272 (Fed. Cir. 2017).

III. Argument

The Board abused its discretion in denying institution based on an erroneous conclusion of law. As explained below, the Board's construction (1) excludes the specification's only examples of proactive retrieval, (2) violates black letter law by construing "comprising" claims as closed rather than open-ended, and (3) renders other language superfluous by conflating the specification's principles of "autonomous" and "proactive." Respectfully, in committing these errors, the Board misapprehended or overlooked material issues of law to arrive at an erroneous claim construction.

A. The Board's Construction Excludes the Specification's Only Examples of Proactive Retrieval

The specification provides only two examples of what qualifies as proactive—both of which are consistent with the Amazon Petitioners' position, supported by Patent Owner's own proposed construction in the related '275 patent IPR, and excluded by the Board's decision denying institution. The specification states:

1) "Each solidarity cell ***is proactive, in that*** it obtains a task to perform by sending its agent to the task pool when the solidarity cell has no processing to perform."

2) "The cells 12A … n act ***proactively in that*** they seek a task 22 from the task pool 13 as soon as the cells 12A … n become available to do further processing."

'777 Patent 2:8-10, 5:22-25 (original omissions). Indeed, the POPR quoted these and only these same sentences from the specification as support for the specification "[d]escribing proactivity of the solidarity cells." *See* POPR 28.

The Petition explained how Lurie discloses or at least renders obvious the proactive retrieval limitation just like these examples. *See* Pet. 24, 32-37.[2]

The Board legally erred by excluding these sole, let alone preferred embodiments. "'A claim construction that excludes a preferred embodiment is rarely, if ever correct and would require highly persuasive evidentiary support.' A fortiori as to excluding a sole embodiment." *Kaufman v. Microsoft Corp.*, 34 F.4th 1360, 1372 (Fed. Cir. 2022) (internal citations omitted). The Board's construction has no such "highly persuasive evidentiary support."

The Board criticized the Petition insofar as it "does not argue for a specific construction of the term 'proactive'" and instead "argues that prior art teaches the claim limitation 'under any reasonable construction, including their plain meaning."

[2] Because the "without instruction" issue arose in the previous IPRs, the Petition also demonstrated that "[i]t is not required by claim 14, but Lurie's agents retrieve the matching task without requiring an instruction from the task pool." Pet. 21.

Decision 19. This criticism is unfair and clearly unreasonable. There was no reason for the Petition to propose a definition—i.e., the outer bounds of what constitutes proactive retrieval—because Lurie discloses (or at least renders obvious) the very same and sole examples of proactive retrieval in the specification. The analysis can and should end there. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) ("The Board is required to construe only those terms … that are in controversy, and only to the extent necessary to resolve the controversy.").

The Board further demotes the patent's sole examples as "simply describ[ing] an aspect of being proactive." Decision 19. That conclusion is baseless. These examples are the ***only*** support for what constitutes proactive, yet are excluded from the Board's erroneous construction. Under the Board's construction and in contrast to the specification, a solidary cell that obtains tasks when the solidarity cell has no processing to perform and as soon as the solidary cell becomes available to perform further processing would ***not*** perform the proactive retrieval limitation unless the cell also retrieves ***all*** tasks without ever having received a notification or instruction at any point earlier. Under this construction, one notification or instruction means that the cell is not and can never be proactive.

B. The Board's Construction Violates Black Letter Law on "Comprising" Claims

The claims recite a solidarity cell "***comprising*** a first agent configured to proactively retrieve" a matching task. '777 Patent 7:46-49, 8:56-58; *see id.* 8:59-61

("comprising a second agent that proactively retrieves matching tasks"). "Because 'comprise' is inclusive or open-ended, the use of the term does not exclude unrecited elements." *E.g.*, *Regeneron Pharms., Inc. v. Merus NV*, 864 F.3d 1343, 1352 (Fed. Cir. 2017). Accordingly, even if the Board were correct that proactive retrieval is correlated with whether a notification or instruction is received, the Board erroneously construed proactive retrieval to ***exclude*** solidarity cells that retrieve a first task following a notification but retrieve subsequent tasks without further notifications. *See* Decision 18 (concluding that "it does not matter that the TCW can obtain additional tasks without further notifications" because, according to the Board, "[a] cell that sometimes needs a notification to obtain a task is not proactive; rather, it is at least partially reactive"). Rather, a proper construction of proactive retrieval would include a solidarity cell having an agent configured to retrieve a first task following an instruction and also an agent configured to retrieve one or more additional tasks without further instructions. That is the case, as the Petition explained, with Lurie's TCWs when understood as (or implemented) using the textbook bag-of-tasks paradigm—as Swarm acknowledged in its POPR. *See* Pet. 24, 32-37; POPR 31 (admitting that the Petition "proposes modifying Lurie to incorporate the functionality of the '777 patent, namely, modifying Lurie's TCWs to proactively retrieve tasks"). The Board's contrary claim construction is erroneous.

C. The Board's Attempt to Avoid Rendering Certain Claim Language Superfluous Is Misguided and Instead Renders Other Language Superfluous

In rejecting the specification's sole examples of proactive retrieval, the Board rationalized that "claim 14 already requires that 'each solidarity cell sends its agent to the task pool when the solidarity cell does not have a matching task to process.'" Decision 19. According to the Board, "[i]f proactive means that the cell 'obtains a task to perform by sending its agent to the task pool when the solidarity cell has no processing to perform,' … then there would be no need for claim 14 to explicitly require it elsewhere in the claim." *Id.* (quoting '777 Patent (Ex. 1001) 2:8-10).

The Board misapplied the rule that disfavors rendering claim language superfluous. Specifically, "when the solidarity cell has no processing to perform" or "become[s] available to do further processing" is broader than the exemplary reason elsewhere in claim 14 of "not having a matching task to process." This result is consistent with the very structure of the claim, which states first that the cells comprise an agent configured to proactively retrieve a matching task ***and later specifically wherein*** each cell sends its agent to the task pool when the cell does not have a matching task to process. '777 Patent 8:56-67. Thus the Board's conclusion on superfluity was erroneous.

Instead, when viewed in context of the '777 patent specification as a whole and the related '275 patent claims requiring cells that are both autonomous and

proactive, the Board's adopted construction renders other language superfluous. The specification contrasts the terms "autonomous" and "proactive" as follows:

> The cells … ***autonomously*** and ***proactively*** seek[] labor within the task pool 13. The cells 12A … n act ***autonomously*** in that they may act independently of the CPU 11 or any other co-processor. In particular, the cells 12A … n do not require an instruction from the CPU 11 to act. The cells 12A … n act ***proactively*** in that they seek a task 22 from the task pool 13 as soon as the cells 12A … n become available to do further processing.

'777 Patent 5:15-25 (first omission added; subsequent original omissions). In other words, the specification describes autonomous—not proactive, as the Board would have it—in terms of acting without requiring an instruction. If the Board were correct that proactive excludes any notification or instruction whatsoever and at any time, then there would be no need for the '777 patent specification to describe certain cells also as autonomous or for claims of the related '275 patent (such as claim 11) to require cells that are both autonomous and proactive. The Board's contrary claim construction is erroneous.

IV. Conclusion

Accordingly, the Board erroneously construed the proactive retrieval limitation. This construction was the basis for denying institution, was adopted as a conclusion of law based solely on intrinsic evidence, and warrants Director Review.

The Director should vacate the Board's decision denying institution; construe the term proactive retrieval limitation (e.g., "obtains a task to perform by sending its agent to the task pool when the solidarity cell has no processing to perform or becomes available to do further processing"); decide that Lurie discloses or at least renders obvious this limitation under the proper construction; and remand to the Board panel for further proceedings.

Respectfully submitted,

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e), I certify that on this 2nd day of August 2023, a true and correct copy of the foregoing **Request for Rehearing by the Director** was served by electronic mail on Patent Owner's lead and backup counsel at the following email addresses:

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