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**Please find below and/or attached an Office communication concerning this application or proceeding.**

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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ARTERIS, INC.,  
Requester,

v.

SONICS, INC.,  
Patent Owner.

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Appeal 2017-001062  
Reexamination Control 95/000,669  
Patent 6,961,834 B2  
Technology Center 3900

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Before STEPHEN C. SIU, BRADLEY W. BAUMEISTER, and IRVIN E.  
BRANCH, *Administrative Patent Judges*.

SIU, *Administrative Patent Judge*

DECISION

In an earlier Decision, Appeal No. 2015-006299, mailed February 2, 2016 (“Decision”), we reversed the Examiner's decision favorable to the patentability of claims 1–9 and 18–20 under 35 U.S.C. § 112, first paragraph, as failing the written description requirement and under 35 U.S.C. § 103(a) as unpatentable over Lentz<sup>1</sup> or Strongin<sup>2</sup> or the combination of either one of Lentz or Strongin with Lamport.<sup>3</sup> Decision 22–23. Our reversal of the Examiner’s decision not to reject claims 1–9 and 18–20 was designated as a new ground of rejection pursuant to 37 C.F.R. § 41.77(b). *Id.* Patent Owner elected to reopen prosecution under 37 C.F.R. § 41.77(b)(1) (“Patent Owner’s Amendment and Request to Reopen Prosecution Pursuant to 37 C.F.R. § 41.77(b)(1),” filed March 2, 2016, “PO Request”) in which Patent Owner proposed claim amendments to claims 1–4, 7, 8, 18, and 19. Requester filed comments pursuant to 37 C.F.R. § 41.77(c) in response to Patent Owner’s Request to Reopen Prosecution (“Requestor’s Comments to Patent Owner’s Amendment and Request to Reopen Prosecution,” filed April 1, 2016, “3PR Comments”) and argued that claims 1–9 and 18–20 are unpatentable over any one of Lentz, Strongin, or the combination of either one of Lentz or Strongin and Lamport. 3PR Comments 5–14. Requester also proposed a rejection of claims 1–9 under 35 U.S.C. § 112, second paragraph. 3PR Comments 2–4.

In the Order Remanding Inter Partes Reexamination Under 37 C.F.R.

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<sup>1</sup> U.S. Patent No. 5,754,800, issued May 19, 1998 (“Lentz”).

<sup>2</sup> U.S. Patent No. 6,219,769 B1, issued April 17, 2001 (“Strongin”).

<sup>3</sup> L. Lamport, *How to Make a Multiprocessor Computer that Correctly Executes Multiprocess Programs*, Sept. 1979 (“Lamport”).

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§ 41.77(d) to the Examiner, dated April 8, 2016 (“Remand”) 2, the matter was remanded to the Examiner for consideration of Patent Owner’s and Requester’s comments and evidence as they pertain to grounds of rejection.

In accordance with 37 C.F.R. § 41.77(e), the Examiner determined that “the rejection under 35 U.S.C. § [112], first paragraph for claim 1 and by dependency claims 2–9 has been overcome in view of the amendments” but that “the amendments made to claim 1 do not appear to overcome the rejections under 35 U.S.C. 103(a) over Lentz or Lentz in combination with Lamport or over Strongin or Strongin in combination with Lamport.” Examiner’s Determination, dated April 22, 2016, (“Examiner’s Determination”) 4. The Examiner also “**does not believe the claims should be rejected**” under 35 U.S.C. § 112, second paragraph. Examiner’s Determination 24. Hence, the Examiner rejects claims 1–9 and 18–20 under 35 U.S.C. § 103(a) as unpatentable over Lentz or Strongin or the combination of any one of Lentz or Strongin with Lamport and does not adopt the rejection of claims 1–9 and 18–20 under 35 U.S.C. § 112, first paragraph, as failing the written description requirement or the rejection of claims 1–9 under 35 U.S.C. § 112, second paragraph.

In response to the Examiner’s Determination, Requester filed “Requester’s Comments to Examiner’s Determination Under 37 C.F.R. § 41.77(d),” filed May 20, 2016 (“3PR Comments on Exr’s Determ.”) and Patent Owner filed “Patent Owner’s Comments to Examiner’s Determination Under 37 C.F.R. § 41.77(d),” filed May 23, 2016 (“PO Comments on Exr’s Determ.”). Requester also filed “Requestor’s

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Reply to Patent Owner's Comments to Determination," filed June 21, 2016 ("3PR Reply to PO Comments").

Pursuant to 37 C.F.R. § 41.77(f), the proceeding has been returned to the Board so that we may reconsider the matter and issue a new decision.

35 U.S.C. § 112, first paragraph

The Examiner finds that "the rejection under 35 U.S.C. § [112], first paragraph for claim 1 and by dependency claims 2–9 has been overcome in view of the amendments." Examiner's Determination 4. We agree with the Examiner for at least the reasons provided by the Examiner.

The Examiner did not err in not adopting the rejection of claims 1–9 under 35 U.S.C. § 112, first paragraph.

35 U.S.C. § 112, second paragraph

Requester argues that amended claim 1 and dependent claims 2–9 are unpatentable under 35 U.S.C. § 112, second paragraph, as indefinite because amended claim 1 recites "then processing **in the a** combined scheduled result" and "a 'that' clause that deletes the previously added where and wherein clauses." 3PR Comments 2–3. Hence, Requester argues that various typographical errors made in the amendment to claim 1 render claim 1 and dependent claims 2–9 indefinite. The Examiner finds that "incorrect grammar does not render this claim indefinite" and that "[t]he incorrect grammar does not deter one of ordinary skill in the art from understanding" the metes and bounds of claim 1. Examiner's Determination 23. We agree with the Examiner.

For example, when considering the claim as a whole, claim 1 (the alleged typographical errors notwithstanding) reasonably apprises one of

ordinary skill in the art of its scope and serves the notice function of providing clear warning to others as to what constitutes infringement of the patent. *See, e.g., Solomon v. Kimberly-Clark Corp.*, 216 F.3d 1372, 1379 (Fed. Cir. 2000). Requester does not demonstrate sufficiently otherwise.

The Examiner did not err in not adopting the rejection of claims under 35 U.S.C. § 112, second paragraph, as indefinite.

### Obviousness

#### *System on a Chip*

Claim 1, as amended, recites a “process for scheduling requests . . . on a system on a chip (SoC).” Patent Owner argues that Lentz, Strongin, and Lamport fail to disclose a “system on a chip (SoC).” PO Request 10, 12, 13. This issue was previously raised and addressed. *See, e.g., Decision 18–19.*

Patent Owner now argues that Lentz and Strongin both fail to disclose or suggest a “system on a chip” because each of Lentz and Strongin discloses a “system [that] is a highly complex system.” PO Request 10, 12. Thus, Patent Owner argues that the systems of Lentz and Strongin are “highly complex” with a “complexity” that presumably exceeds acceptable levels for being incorporated on a “system on a chip.”

We are not persuaded by Patent Owner’s argument at least because Patent Owner provides insufficient evidence to demonstrate persuasively that the system of Lentz or that of Strongin is, indeed, “highly complex.” Even assuming that the systems of Lentz and Strongin are both “highly complex,” as Patent Owner argues, Patent Owner does not demonstrate sufficiently that an allegedly “highly complex” system would be precluded from being a “system on a chip.” And even assuming further that a

hypothetically “highly complex” system would somehow be precluded from being a “system on a chip” as Patent Owner implies, Patent Owner does not provide sufficient evidence to demonstrate precisely how “high” the complexity would be required to be in order to be precluded from being a “system on a chip,” and how the Lentz and Strongin systems would be sufficiently “highly complex” to exceed the undetermined maximum level (assuming such a level exists) to be precluded from being a system on a chip.

Hence, we conclude as before that it would have been at least obvious to one of skill in the art to have recognized that the technique of providing a system on a chip, having been used to improve one device, would improve similar devices in the same way and that using this technique would not have been beyond his/her skill, the level of skill in the art being high and the skilled artisan not being an automaton. *See, e.g.*, Decision 18–19.

We also disagree with Patent Owner’s contention for the additional reasons provided by the Examiner and Requester. Examiner’s Determination 4, 5, 13–14; 3PR Comments 5–7, 3PR Reply to PO Comments 3–4.

*“Independent” QoS – claim 2*

Claim 2, as amended, recites that “the QoS scheduling is based on a first QoS guarantee for a first initiator of the two different initiators that is independent of a second QoS guarantee for a second initiator of the two different initiators.” Patent Owner now argues that Lentz only discloses “using ‘[i]ntrinsic priority of the device’ in scheduling requests . . . [which]

is only relevant when compared relative to another device’s priority;” that “[d]evice priorities . . . provide no guarantee that a performance requirement will be met [because] . . . there could always be another device with a higher priority;” and that Strongin only discloses a “‘designated priority’ of a source,” but both Lentz and Strongin fail to disclose or suggest that “a QoS guarantee for a first initiator . . . is *independent* of a second QoS guarantee for a second initiator.” PO Request 11, 13; PO Comments on Exr’s Determ. 10–13. Hence, Patent Owner now argues that Lentz and Strongin only discloses a QoS guarantee for one initiator that is dependent on (and not “independent” of) a second QoS guarantee for a second initiator. We disagree with Patent Owner’s argument for at least the reasons set forth by the Examiner and Requester. Examiner’s Determination 7–8, 12–13; 3PR Comments 7–9; 3PR Reply to PO Comments 4–9.

For example, as Patent Owner states, Lentz discloses that “a dynamic arbitration scheme is used which allocates different priorities to the various devices on the fly” and is based on the “[i]ntrinsic priority of the device.” Lentz 4:52–55. Patent Owner appears to argue that Lentz discloses that priority of one device must be dependent on the priority of another device, but fails to demonstrate persuasively how a characteristic of a device that is based on an “intrinsic priority of the device” is somehow dependent on a characteristic of some other device. One of skill in the art would have understood that a priority that is based on an “intrinsic” property of a first device would not depend on some other device. Otherwise, the priority would not be based on a characteristic that is “intrinsic” to the first device. Rather, the priority would be determined by “*extrinsic*” factors, including

factors originating from *another* device on which the first device allegedly depends. Patent Owner does not demonstrate persuasively that Lentz discloses this alleged requirement of dependence on such extrinsic factors.

Patent Owner appears to take the position that one of skill in the art would have understood, in light of the Specification, that if multiple requests are prioritized or re-ordered relative to one another, then a QoS guarantee of one requesting device must be dependent on (and not “independent of”) a QoS guarantee of a different requesting device. However, the Specification discloses that requests “from different initiators [or “devices”] . . . are presented in parallel to the DRAM and thread scheduler block” and that the DRAM and thread scheduler “establishes the order in which . . . requests are processed” and “may . . . re-order[] . . . in order to satisfy thread quality of service (QOS) guarantees.” Spec. 2:41–42, 49–50, 61–62, 63–65. In other words, the Specification discloses quality of service guarantees based on ordering (or “prioritizing”) received requests.

The Specification also discloses other examples in which a “preferred order for processing requests for DRAM efficiency is determined” (Spec. 3:10–11), “a request order is determined that satisfies QOS guarantees and is then modified to optimized DRAM efficiency” (Spec. 3:23–25), “requests . . . from different threads are presented and sequenced to the DRAM controller” such that a “service scheduler . . . determine[s] which thread should go next . . . and prioritizes threads accordingly” (Spec. 3:26–28, 32, 34, 38–39), a “DRAM scheduler . . . attempts to sequence requests from different threads” (Spec. 39–40), certain requests “are preferred over” other requests (Spec. 4:51), and a “thread

scheduler . . . schedules requests using the quality of service requirements for each thread” (Spec. 5:59–60). In each of these examples, requests are prioritized relative to one another as pertaining to quality of service guarantees.

Patent Owner does not indicate, and we do not independently identify, any portion of the Specification in which requests are *not* prioritized relative to each other with respect to quality of service guarantees. Hence, one of skill in the art would have understood, in light of the Specification, that a QoS guarantee of one requesting device is independent of a QoS guarantee of a different requesting device even if multiple requests are prioritized or re-ordered relative to one another. To the extent that Patent Owner argues that re-ordering or prioritizing multiple requests from different devices cannot be based on a “QoS guarantee” for a first device that is “*independent of*” a “QoS guarantee” for a second device, as recited in claim 2, we are not persuaded by Patent Owner’s argument because the Specification discloses explicitly that requests from different devices are re-ordered (or prioritized) relative to one another with respect to QoS guarantees.

For at least this additional reason, we are not persuaded by Patent Owner’s argument.

Patent Owner also argues that one of skill in the art would have broadly, but reasonably, construed the term “QoS guarantee” to mean “an agreement . . . for use of that resource to satisfy a specific performance requirement” or “the degree of service quality expected for the application.” PO Comments on Exr’s Determ. 10–11 (citing U.S. Patent No 6,212,562, “Huang” 4:57–65 and U.S. Patent No. 5,742,772, “Sreenan” 5:36–44).

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Patent Owner further argues that Lentz and Strongin both fail to disclose a “QoS guarantee” based on these proposed definitions of “QoS guarantee” and that “device priority [of Lentz and Strongin] is not a QoS guarantee.” PO Comments on Exr’s Determ. 10–12. Hence, Patent Owner argues that Lentz (and Strongin) discloses “device priority,” but fails to disclose or suggest a QoS guarantee. This issue was previously raised and addressed. See, e.g., Decision 9–10.

Regarding Patent Owner’s newly proposed claim construction of the term “QoS guarantee,” we note that claim 2 recites a first and a second “QoS guarantee,” but does not recite specific characteristics a “QoS guarantee.” Hence, based on the context in which the term “QoS guarantee” is used in the claim, one of skill in the art would not have understood the term “QoS guarantee” to include (or exclude) any specific characteristics. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1314 (Fed. Cir. 2005), *see Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996) (stating that “[t]o begin with, the context in which a term is used in the asserted claim can be highly instructive,” “the claims themselves provide substantial guidance as to the meaning of particular claim terms”).

One of ordinary skill in the art in attempting to construe the meaning of the claim term “QoS guarantee,” and having gleaned essentially no information from the context of the claim itself, would have turned to the Specification for guidance. The Specification “is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.” *Vitronics Corp.*, 90 F.3d at 1582. Patent Owner does not point out a specific definition of the term “QoS

guarantee” disclosed in the Specification. However, we note that the Specification discloses “reordering of memory requests to achieve . . . QOS guarantees” (Spec. 1:66–67), requests may be re-ordered by the scheduler block 35 in order to satisfy thread quality of service (QOS) guarantees (Spec. 2:63–65), an embodiment in which “a preferred request order for QOS guarantees is identified or determined” (Spec. 3:8–10), and an embodiment in which “a request order is determined that satisfies QOS guarantees” (Spec. 3:22–23). Therefore, the Specification discloses multiple examples in which QoS guarantees are achieved and/or satisfied by reordering (or prioritizing) of requests. In fact, we do not identify, and Patent Owner does not point out, examples in the Specification in which QoS guarantees are *not* associated with reordering or prioritizing requests. In view of this explicit disclosure in the Specification and contrary to Patent Owner’s arguments, one of skill in the art would have broadly, but reasonably, understood the term “QoS guarantee” in light of the Specification to be based on (potentially) the reordering or prioritization of requests from devices.

Patent Owner argues that one of skill in the art would have broadly, but reasonably, understood the term “QoS guarantee” in light of the Specification not to be device (request) priority (see e.g., PO Comments on Exr’s Determ. 10), but Patent Owner does not explain why one of skill in the art would have understood device (and request) priority to be distinct from a QoS guarantee in view of the explicit disclosure in the Specification that QoS guarantees are achieved and/or satisfied by prioritization of requests from devices.

Patent Owner cites extrinsic evidence as support for the contention that one of skill in the art would have understood that “QoS guarantees” must not be associated with device or request priorities. However, extrinsic evidence has been considered “less significant than the intrinsic record” in construing claim terms. *Phillips*, 415 F.3d at 1317–1318 (citing *Renishaw PLC v. Marposs Societa per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998) and *Rexnord Corp. v. Laitram Corp.*, 274 F.3d 1336, 1344 (Fed. Cir. 2001)).

In any event, even assuming that extrinsic evidence was *more* significant (instead of *less* significant) than the intrinsic record, neither of the cited extrinsic evidence (i.e., Sreenan or Huang) discloses that “QoS guarantees” must not be associated with device or request priorities. Rather, the cited portion of Huang merely discloses that “QoS specifies the degree of service quality expected” (Huang 4:57), which is consistent with a quality of service that is achieved and/or satisfied by reordering (or prioritizing) of requests (as disclosed in the Specification) and the cited portion of Sreenan discloses a “QOS contract” and does not disclose “QoS guarantees” at all. Sreenan 5:36–39.

At least because Patent Owner does not demonstrate sufficiently that one of skill in the art would have broadly but reasonably understood the term “QoS guarantee” in light of the Specification to exclude association with reordering or prioritizing requests from devices and does not dispute that any of Lentz or Strongin discloses such as “QoS guarantee,” we are not persuaded by Patent Owner.

Patent Owner does not provide additional arguments with respect to Lamport.

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*QoS bandwidth guarantee – claim 4*

Claim 4 recites “determining whether a QoS bandwidth guarantee is met for a thread based on the thread scheduling history.” Patent Owner argues that Lentz, Strongin, and Lamport fail to disclose such a “QoS bandwidth guarantee” because, according to Patent Owner, each of Lentz and Strongin discloses a “relative priority scheme” that “depend[s] on the number of devices, relative priorities of those devices, and whether those devices were making requests,” which “prevent . . . guaranteeing bandwidth because the bandwidth available to any one device varies depending on these factors over time.” PO Request 11, 13–14; PO Comments on Exr’s Determ. 14. We disagree with Patent Owner for at least the reasons set forth by the Examiner and Requester. Examiner’s Determination 16–18, 21; 3PR Comments 11–12, 3PR Reply to PO Comments 9–10.

For example, claim 4 recites determining *whether* a QoS bandwidth guarantee is met, but does not recite guaranteeing bandwidth. Therefore, even assuming Patent Owner to be correct that “various factors” “prevent . . . guaranteeing bandwidth” in the systems of Lentz and Strongin, Patent Owner does not assert or demonstrate persuasively that Lentz and Strongin also fail to disclose or suggest determining whether a QoS bandwidth guarantee is met, as recited in claim 4.

In any event, Patent Owner also does not explain sufficiently how the “number of devices,” the “priorities of those devices,” and “whether those devices were making requests” would somehow prevent determining whether a QoS bandwidth guarantee is met or not, as recited by claim 4. Rather it at least would have been obvious to one of ordinary skill in the art,

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the skilled artisan not being an automaton, to consider any relevant information, including but not limited to the “number of devices,” the “priorities of those devices,” and/or “whether those devices were making requests” to make such a determination.

Patent Owner does not provide additional arguments with respect to Lamport.

*Direction of a bus – claim 8*

Claim 8, as amended, recites that “cost-function scheduling is based on a direction of a bus for the target resource.” Patent Owner argues that Lentz, Strongin, and Lamport fail to disclose this feature. PO Request 12, 14.

Requester argues that Strongin discloses “giving priority to memory access request that result in not having to change direction of data flow.” 3PR Comments (citing Strongin 18:66–67). The Examiner concurs with Requester. Examiner’s Determination 22. We agree with the Examiner and Requester. Patent Owner does not assert or demonstrate persuasively a difference between Strongin and this disputed feature of claim 8. PO Comments on Exr’s Determ. 1–22.

Patent Owner does not provide additional arguments with respect to Lamport.

In view of the above, we need not further consider the propriety of the Examiner’s decision to reject claim 8 on a different basis (i.e., over Lentz or the combination of Lentz and Lamport). *Cf. In re Gleave*, 560 F.3d 1331, 1338 (Fed. Cir. 2009).

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## DECISION

We affirm the Examiner's non-adoption of the rejection of claims 1–9 and 18–20 under 35 U.S.C. § 112, first paragraph and claims 1–9 under 35 U.S.C. § 112, second paragraph. We also affirm the Examiner's rejection of claims 1–9 and 18–20 under 35 U.S.C. § 103(a) as unpatentable over Strongin or the combination of Strongin and Lamport, and the Examiner's rejection of claims 1–7, 9, and 18–20 under 35 U.S.C. § 103(a) as unpatentable over Lentz or the combination of Lentz and Lamport.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

In the event neither party files a request for rehearing within the time provided in 37 C.F.R. § 41.79, and this decision becomes final and appealable under 37 C.F.R. § 41.81, a party seeking judicial review must timely serve notice on the Director of the United States Patent and Trademark Office. *See* 37 C.F.R. §§ 90.1 and 1.983.

AFFIRMED

dm

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