UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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APPLE INC., HTC CORPORATION, HTC AMERICA, INC.,
SAMSUNG ELECTRONICS CO. LTD,
SAMSUNG ELECTRONICS AMERICA, INC., AMAZON.COM, INC.,
SONY CORP., SONY ELECTRONICS INC.,
SONY MOBILE COMMUNICATIONS AB,
SONY MOBILE COMMUNICATIONS (USA) INC.,
LG ELECTRONICS, INC., LG ELECTRONICS USA, INC., and
LG ELECTRONICS MOBILECOMM USA, INC.,[1]
Petitioner,

v.

MEMORY INTEGRITY, LLC,
Patent Owner.

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Case IPR2015-00163
Patent 7,296,121 B2

———————

Before JENNIFER S. BISK, NEIL T. POWELL, and
KERRY BEGLEY, *Administrative Patent Judges.*

BISK, *Administrative Patent Judge.*

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

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[1] Petitioners from IPR2015-01353 were joined with this proceeding. Paper 34.

INTRODUCTION

A. Background

Apple Inc., HTC Corporation, HTC America, Inc. Samsung Electronics Col, Ltd., Samsung Electronics America, Inc.,[2] and Amazon.com, Inc. ("Initial Petitioner"), filed a Petition requesting *inter partes* review of claims 1–6, 8–12, and 15–25 of U.S. Patent No. 7,296,121 B2 (Ex. 1001, "the '121 patent"). Paper 1 ("Pet."). On May 8, 2015, we instituted a review (Paper 18, "Institution Decision" or "Inst. Dec.") based upon Petitioner's assertion that claims 4–6, 11, and 19–24 are unpatentable under 35 U.S.C. §§ 102 and 103. Inst. Dec. 28. On July 1, 2015, in response to Petitioner's request for rehearing, we added claim 12 to the review. Paper 22, 6.

On June 8, 2015, Sony Corp., Sony Electronics Inc., Sony Mobile Communications AB, Sony Mobile Communications (USA) Inc., LG Electronics, Inc., LG Electronics USA, Inc., and LG Electronics Mobilecomm USA, Inc. (collectively, "Subsequent Petitioner"), filed a Petition requesting *inter partes* review of the same claims of the '121 patent and based on the same grounds as those instituted in IPR2015-00163. Case IPR2015-01353 (Paper 1, "Second Pet."). The Subsequent Petitioner simultaneously filed a Motion for Joinder of its newly filed case with the Initial Petitioner's previously instituted case. IPR2015-01353 (Paper 4,

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[2] The Petition also lists Samsung Telecommunications America, LLC ("STA") as a petitioner. Paper 6 ("Pet."), 1. After the filing of the Petition, however, STA merged with and into Samsung Electronics America, Inc. Paper 12. Thus, STA no longer exists as a separate corporate entity. *Id.*

"Mot. for Joinder"). On October 5, 2015, we granted the Motion for Joinder and joined Subsequent Petitioners as petitioners in the instant proceeding.[3] Paper 34; Case IPR2015-01353 (PTAB Oct. 5, 2015) (Paper 11).

This is a Final Written Decision under 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons set forth below, Petitioner has shown by a preponderance of the evidence that claims 4–6 and 19–24 are unpatentable. Petitioner has not shown by a preponderance of the evidence that claims 11 and 12 are unpatentable.

B. Related Matters

The parties indicate that the '121 patent is the subject of several proceedings in the United States District Court for the District of Delaware. Pet. 1–2; Paper 11, 1–2. Initial Petitioners also filed three other petitions seeking *inter partes* review of the '121 patent—IPR2015-00159, IPR2015-00161, and IPR2015-00172. In addition, another petition was filed seeking *inter partes* review of the '121 patent—IPR2015-00158. *See* Paper 11, 4. Of these proceedings at the Office, only IPR2015-00159[4] is ongoing and a final written decision in IPR2015-00159 is being issued concurrently with this Decision.

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[3] For purposes of this decision, we will cite only to Initial Petitioner's Petition.

[4] Subsequent Petitioners, who filed a petition and motion for joinder in IPR2015-01376, were also joined to IPR2015-00159. IPR2015-00159, Paper 29.

C. The Asserted Grounds of Unpatentability

Petitioner contends that claims 4–6, 11, 12, and 19–24 ("the challenged claims") of the '121 patent are unpatentable under 35 U.S.C. §102 or 103 based on the following grounds (Pet. 3):

Ground	References	Challenged Claims
§ 102	Koster[5]	4–6, 11, and 12
§ 103	Koster and Smith[6]	19–24

Petitioner supports its challenge with Declarations executed by Dr. Robert Horst on October 28, 2014 (Ex. 1014) and on December 1, 2015 (Ex. 1025). Patent Owner relies on a Declaration executed by Dr. Vojin Oklobdzija on August 11, 2015 (Ex. 2016).

D. The '121 Patent

The '121 patent relates to accessing data in computer systems that include more than one processor. Ex. 1001, 1:23–24. Specifically, the '121 patent discusses multiple processor systems with a point-to-point architecture—a cluster of individual processors (also referred to as processing nodes) that are directly connected to each other through point-to-point links, each with an associated cache memory. *Id.* at 4:38–40. To increase the number of available processors, multiple clusters may be connected. *Id.* at 4:50–53. Figure 1A is reproduced below.

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[5] U.S. Patent No. 7,698,509 B1 (Ex. 1009) ("Koster").
[6] MICHAEL JOHN SEBASTIAN SMITH, *APPLICATION-SPECIFIC INTEGRATED CIRCUITS*, Addison-Wesley (1997) (Ex. 1008, "Smith").
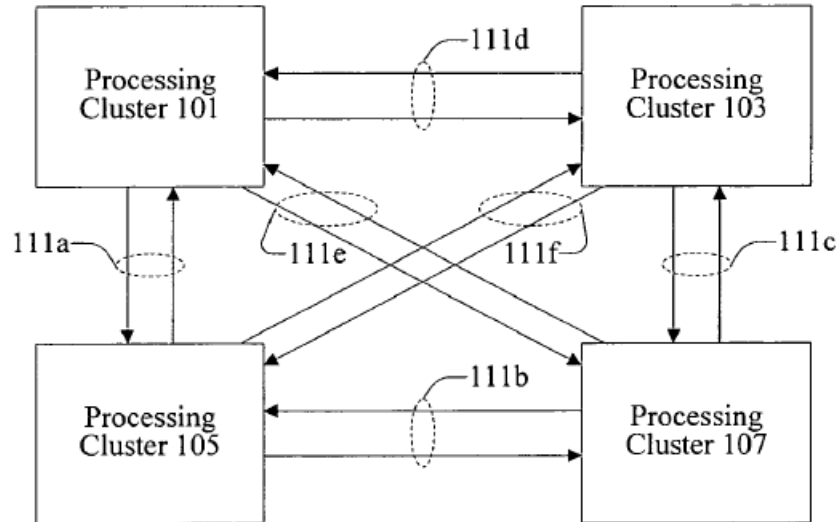
Figure 1A

Figure 1A shows an example of a multiple cluster, multiple processor system described by the '121 patent. *Id.* at 6:10–12. Figure 1A includes four processing clusters: 101, 103, 105, and 107, each of which can, in turn, include multiple processors. *Id.* at 6:12–14. The clusters are connected through point-to-point links 111a–f. *Id.* at 6:14–16.

The '121 patent explains that cache coherency problems can arise in such a system, because it may contain multiple copies of the same data. *Id.* at 1:26–38. For example, if the caches of two different processors have a copy of the same data block and both processors "attempt to write new values into the data block at the same time," then the two caches may have different data values and the system may be "unable to determine what value to write through to system memory." *Id.* at 1:37–45. Solutions to cache coherency problems often involve an increase in communication traffic and a resulting decrease in efficiency. *Id.* at 1:23–26, 2:46–48. The '121 patent

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