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Paper 62
Entered: April 14, 2016

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

LG ELECTRONICS, INC.,
Petitioner,

v.

ATI TECHNOLOGIES ULC,
Patent Owner.

Case IPR2015-00325
Patent 7,742,053 B2

Before JONI Y. CHANG, BRIAN J. McNAMARA, and RAMA G. ELLURU, *Administrative Patent Judges.*

CHANG, *Administrative Patent Judge.*

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

I. INTRODUCTION

LG Electronics, Inc. ("LG") filed a Petition requesting an *inter partes* review of claims 1, 2, and 5–7 ("the challenged claims") of U.S. Patent No. 7,742,053 B2 (Ex. 1001, "the '053 patent"). Paper 2 ("Pet."). Patent Owner, ATI Technologies ULC ("ATI"), filed a Preliminary Response. Paper 12 ("Prelim. Resp."). Upon consideration of the Petition and Preliminary Response, we instituted this trial as to claims 1, 2, and 5–7 of the '053 patent on June 15, 2015. Paper 13 ("Dec.").

Subsequent to institution, ATI filed a Patent Owner Response (Papers 21, 22, "PO Resp."); LG filed a Reply to the Patent Owner Response (Papers 33, 34, "Reply"); and ATI filed a sur-reply to LG's Reply with respect to the antedating issue (Papers 39, 40).[1] An oral hearing was held on February 10, 2016.[2]

We have jurisdiction under 35 U.S.C. § 6(c). This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a). For the reasons discussed herein, and in view of the record in this trial, we determine that LG has shown by a preponderance of the evidence that claims 1, 2, and 5–7 of the '053 patent are unpatentable.

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[1] The parties filed a confidential version and a redacted version of their papers. The Decisions denying the parties' Motions to Seal these documents and supporting evidence are entered concurrently with this Final Written Decision. Papers 63, 64. The citations to these papers are to the unredacted versions.

[2] A transcript of the oral hearing is entered in the record as Paper 61 ("Tr.").

A. Related Matter

The '053 patent is asserted in *Advanced Micro Devices, Inc. v. LG Electronics, Inc.*, No. 3:14-cv-01012-SI (N.D. Cal.). Pet. 1.

B. The '053 Patent

The '053 patent discloses a computer system for multithreaded graphics processing. Ex. 1001, 2:36–41. The system includes a memory device for storing command threads and an arbiter for providing a command thread to a command processing engine, based on a priority scheme. *Id.* at 2:48–52, 3:29–35; *see* Paper 13, 2–3.

C. Illustrative Claim

Of the challenged claims, claims 1 and 5 are independent. Claim 2 depends from claim 1, and claims 6 and 7 depend directly from claim 5. Claim 5, reproduced below, is illustrative of the challenged claims.

> 5. A graphics processing system comprising:
>
> at least one *memory device* comprising a first portion operative to store a plurality of pixel command threads and a second portion operative to store a plurality of vertex command threads;
>
> an *arbiter*, coupled to the at least one memory device, operable to select a command thread from either of the plurality of pixel command threads and the plurality of vertex command threads; and
>
> a plurality of *command processing engines*, coupled to the arbiter, each operable to receive and process the command thread.

Ex. 1001, 8:4–15 (emphases added).

D. Prior Art Relied Upon

LG relies upon the following prior art references:

Lindholm	US 7,015,913 B1	Mar. 21, 2006	(Ex. 1004)
Stuttard	US 7,363,472 B2	Apr. 22, 2008	(Ex. 1005)
Moreton	US 7,233,335 B2	June 19, 2007	(Ex. 1006)
Whittaker	US 5,968,167	Oct. 19, 1999	(Ex. 1007)
Kimura	US 6,105,127	Aug. 15, 2000	(Ex. 1008)

Admitted Prior Art – Figure 1, and the Background of the Invention Section of the '053 patent. Ex. 1001, 1:22–2:6, Fig. 1.

E. Instituted Grounds of Unpatentability

We instituted this trial based on the following grounds (Dec. 36–37):

Claims	Basis	References
5–7	§ 102(e)	Moreton
1 and 2	§ 103(a)	Moreton and Whittaker
1, 2, and 5–7	§ 103(a)	Lindholm in view of the Admitted Prior Art
1, 2, and 5–7	§ 103(a)	Stuttard in view of the Admitted Prior Art

II. ANALYSIS

A. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are given their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b). Under the broadest reasonable interpretation standard, claim terms are given their ordinary and customary meaning as would be understood by one of ordinary skill in the

art in the context of the entire disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

"command thread"

Each of independent claims 1 and 5 recites "at least one memory device comprising a first portion operative to store a plurality of pixel *command threads* and a second portion operative to store a plurality of vertex *command threads*." Ex. 1001, 7:11–15, 8:5–8 (emphases added). Before institution, ATI urged us to construe "command thread" as "a sequence of commands." Prelim. Resp. 12–13. ATI also argued that a command thread does *not* encompass an *instruction*. *Id.* at 12.

In the Decision on Institution (Dec. 6–7), we noted that the word "command" is used in the Specification of the '053 patent consistent with its plain and ordinary meaning, as including an *instruction*. *See, e.g.*, Ex. 1001, 4:21–27; MICROSOFT COMPUTER DICTIONARY 111 (5th ed. 2002) (Ex. 3001) (defining "command" as an "instruction to a computer program that, when issued by the user, causes an action to be carried out"). Notably, the Specification discloses that "[u]pon the execution of the associated *command of the command thread*, the thread is thereupon returned to the station 302 or 304 at the same storage location with its status updated, once all possible sequential *instructions* have been executed." Ex. 1001, 4:21–27 (emphasis added). Dr. Nader Bagherzadeh testifies that, in the context of computer multithreading, a stream of instructions is called a thread. Ex. 1003 ¶¶ 23–24. This is consistent with the usage of the word "thread" in

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