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Table with 5 columns: APPLICATION NO., FILING DATE, FIRST NAMED INVENTOR, ATTORNEY DOCKET NO., CONFIRMATION NO.
12/900,329 10/07/2010 Jerome F. Duluk JR. NVDA/SC-09-0294-US0-US1 7568

102324 7590 12/13/2016
Artegis Law Group, LLP/NVIDIA
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EXAMINER

RICHER, JONI

ART UNIT PAPER NUMBER

2611

NOTIFICATION DATE DELIVERY MODE

12/13/2016

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JEROME F. DULUK JR., JOHN CHRISTOPHER COOK,
FRED GRUNER, and GREGORY SCOTT PALMER¹

Appeal 2015-004541
Application 12/900,329
Technology Center 2600

Before JOSEPH L. DIXON, KRISTEN L. DROESCH, and
MONICA S. ULLAGADDI, *Administrative Patent Judges*.

DROESCH, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants seek review under 35 U.S.C. § 134(a) from the Final Rejection of claims 1–3, 5–9, 11, 12, 14–16, 18, and 19², all of the pending claims in the application. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

¹ Appellants indicate the real party-in-interest is NVIDIA Corp. App. Br. 3.

² Claims 4, 10, 13, 17, and 20 were objected to as dependent upon rejected base claims, but indicated to be allowable if rewritten in independent form. Final Act. 10.

BACKGROUND

The disclosed invention relates to a system and method of executing a software method within a graphics processing unit (GPU) that does not require an exchange of information between a central processing unit (CPU) and the GPU so that the CPU is not interrupted and the CPU throughput is not reduced. *See* Spec. ¶ 5, Abstract.

Representative claim 1, reproduced from the Claims Appendix of the Appeal Brief, reads as follows (disputed limitations in *italics*):

1. A method for executing software methods, comprising:
receiving, by a front end unit of a graphics processing unit (GPU), a firmware method that is configured to perform a function of a software method;
issuing an interrupt by the front end unit to a processor within the GPU that is configured to execute the firmware method *without exchanging information with a central processing unit that is separate from the GPU*;
executing the firmware method; and clearing the interrupt by the processor.

REJECTIONS

Claims 1, 5, 7–9, 11, 12, 14, 18, and 19 stand rejected under 35 U.S.C. § 102(e) as anticipated by Grossman (US 2009/0160867 A1, published June 25, 2009).

Claims 2, 3, 15, and 16 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Grossman and Heirich (US 7,788,635 B2, issued Aug. 31, 2010).

Claim 6 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Grossman and Toelle et al. (US 7,659,901 B2, issued Feb. 9, 2010).

ANALYSIS

We have reviewed the Examiner's rejection in light of Appellants' arguments in the Brief, the Answer, and the arguments in the Reply Brief. We do not agree with Appellants' arguments. We agree with and adopt as our own the Examiner's findings and conclusions of law. We highlight and address specific findings and arguments below for emphasis.

Appellants argue that Grossman does not disclose "issuing an interrupt by the front end unit to a processor within the GPU that is configured to execute the firmware method without exchanging information with a central processing unit that is separate from the GPU," as recited in claim 1, and recited similarly in independent claims 11, and 14. *See App. Br.* 9, 11. Appellants assert the aforementioned limitations "require that a GPU is configured to execute a firmware method without communicating with a CPU." *Id.* at 10. Appellants contend that although Grossman discloses a scheduler component that is autonomous, Grossman's scheduler communicates with the CPU when scheduling contexts for execution. *See id.* at 9 (citing Grossman ¶¶ 16–17). Appellants assert that "Grossman teaches that the scheduler component is specifically required to report certain information back to the operating system, and, thus, to the CPU, during each context switch operation." *Id.* (citing Grossman ¶ 22). Similarly, Appellants argue that "Grossman explicitly teaches that the status information is provided to the CPU for each context switch operation, meaning that such a communication with the CPU occurs with each context switch operation." *Id.* at 11 (citing Grossman ¶ 22). Appellants contend "the status reports transmitted by the GPU 502 constitute an information

exchange” Reply Br. 6 (citing Grossman ¶¶ 22, 29); *see id.* at 7 (citing Grossman ¶¶ 22, 29).

We are not persuaded by Appellants’ arguments because they are not commensurate in scope with the claim limitations. Claim 1, and independent claims 11 and 14, do not require the GPU to be configured to execute the firmware method without communicating with the CPU or without sending or transmitting a report to the CPU. Instead, claim 1, and independent claims 11 and 14 recite, *inter alia*, “without exchanging information.”

Appellants do not direct us to, and we cannot find, an explicit definition in Appellants’ Specification for the term “exchanging,” such that the meaning of “exchanging” can be equated with communicating, sending, and transmitting information. As evidenced by a dictionary definition for “exchanging,” the ordinary and customary meaning of “exchanging” would have been understood by one with ordinary skill in the art as: “to part with, give, or transfer in consideration of something received as an equivalent,” “to have replaced by other merchandise,” and “to give and receive reciprocals.” MERRIAM WEBSTER ONLINE DICTIONARY, <http://www.merriam-webster.com/dictionary/exchanging> (last accessed November 25, 2016). In other words, “exchanging” information means transferring and receiving reciprocal information. Appellants’ arguments focus on Grossman’s disclosure of the GPU transmitting or reporting certain information to the CPU. However, an exchange of information also would require reciprocal information to be received at Grossman’s GPU from the CPU. Appellants do not direct us to evidence to demonstrate that Grossman discloses the GPU receives information from CPU, and thus Appellants do

not demonstrate that there is an exchange (i.e., reciprocal transfer and receipt) of information between Grossman's GPU and CPU.

For these reasons, Appellants do not persuade us of error in the rejection of independent claims 1, 11, and 14, and dependent claims 5, 7–9, 12, 18, and 19 as anticipated by Grossman. Accordingly, we affirm the Examiner's rejection of claims 1, 5, 7–9, 11, 12, 14, 18, and 19 as anticipated by Grossman. Appellants do not present separate arguments addressing dependent claims 2, 3, 6, 15, and 16. *See* App. Br. 9–12. For the same reasons as claims 1, 5, 7–9, 11, 12, 14, 18, and 19, we affirm the Examiner's rejections of claims 2, 3, 15, and 16 as unpatentable over Grossman and Heirich, and claim 6 as unpatentable over Grossman and Toelle.

DECISION

We AFFIRM the rejections of claims 1–3, 5–9, 11, 12, 14–16, 18, and 19.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED