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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
14/484,861	09/12/2014	Alexeev Alexander Nikolayevich	00163/EMC-13-0534(RU1)US	7442

75165 7590 06/21/2018

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EXAMINER	
ROSSITER, SEAN D	

ART UNIT	PAPER NUMBER
2133	

NOTIFICATION DATE	DELIVERY MODE
06/21/2018	ELECTRONIC

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ALEXEEV ALEXANDER NIKOLAYEVICH,
ANTON GENADYEVICH PEGUSHIN, and
RAFIKOV RUSTEM VALERYEVICH

Appeal 2017-010115
Application 14/484,861
Technology Center 2100

Before JOSEPH L. DIXON, SCOTT B. HOWARD, and
STEVEN M. AMUNDSON, *Administrative Patent Judges*.

Opinion for the Board filed by *Administrative Patent Judge* AMUNDSON

Opinion Concurring filed by *Administrative Patent Judge* HOWARD

AMUNDSON, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants[1] seek our review under 35 U.S.C. § 134(a) from a final rejection of claims 1–24, i.e., all pending claims. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

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[1] Appellants identify the real party in interest as EMC IP Holding Company LLC. Br. 4.

STATEMENT OF THE CASE

The Invention

According to the Specification, the invention "relates to system design and, more particularly, to systems and methods that aid in system design" for transactional memory systems, e.g., "in IO intensive environments." Spec. ¶¶ 2–4.[2] The Specification explains that: (1) "[a]n abort probability (p) is associated with [an] optimal execution time (t) based, at least in part, upon a probability curve"; (2) "[t]he probability curve is empirically derived and based upon the performance of the transactional memory system"; and (3) "[a] probable execution time (T_{tm}) is determined for the concurrent memory operation based, at least in part, upon the abort probability (p)." Abstract.

Exemplary Claim

Independent claim 1 exemplifies the claims at issues and reads as follows:

> 1. A computer-implemented method comprising:
>
> defining, using one or more processors, an optimal execution time (t) for a concurrent memory operation to be performed on a transactional memory system;

[2] This decision uses the following abbreviations: "Spec." for the Specification, filed September 12, 2014; "Final Act." for the Final Office Action, mailed September 29, 2016; "Br." for the Appeal Brief, filed March 24, 2017; and "Ans." for the Examiner's Answer, mailed May 4, 2017.

> associating, using the one or more processors, an abort probability (p) with the optimal execution time (t) based, at least in part, upon a probability curve, wherein the probability curve is empirically derived and based upon the performance of the transactional memory system;
>
> determining, using the one or more processors, a probable execution time (T_{tm}) for the concurrent memory operation based, at least in part, upon the abort probability (p);
>
> determining a performance boost indicator (B) for the concurrent memory operation based, at least in part, upon the probable execution time (T_{tm}); and
>
> implementing the transactional memory system on a computing device based, at least in part, upon the performance boost indicator (B) for the concurrent memory operation.

Br. 23 (Claims App.).

The Rejection on Appeal

Claims 1–24 stand rejected under 35 U.S.C. § 101 as directed to patent-ineligible subject matter. Final Act. 2.

ANALYSIS

We have reviewed the rejection of claims 1–24 in light of Appellants' arguments that the Examiner erred. Based on the record before us and for the reasons explained below, we concur with Appellants' contention that the Examiner erred in rejecting the claims under § 101.

The § 101 Rejection of Claims 1–24

The Patent Act defines patent-eligible subject matter broadly: "Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title." 35 U.S.C. § 101. In *Mayo Collaborative*

Services v. Prometheus Laboratories, Inc., 566 U.S. 66, 70 (2012), and *Alice Corp. v. CLS Bank International*, 134 S. Ct. 2347, 2354 (2014), the Supreme Court explained that § 101 "contains an important implicit exception" for laws of nature, natural phenomena, and abstract ideas. *See Diamond v. Diehr*, 450 U.S. 175, 185 (1981). In *Mayo* and *Alice*, the Court set forth a two-step analytical framework for evaluating patent-eligible subject matter: First, "determine whether the claims at issue are directed to" a patent-ineligible concept, such as an abstract idea. *Alice*, 134 S. Ct. at 2355. If so, "consider the elements of each claim both individually and 'as an ordered combination' to determine whether the additional elements" add enough to transform the "nature of the claim" into "significantly more" than a patent-ineligible concept. *Id.* at 2355, 2357 (quoting *Mayo*, 566 U.S. at 79); *see Affinity Labs of Tex., LLC v. DIRECTV, LLC*, 838 F.3d 1253, 1257 (Fed. Cir. 2016).

Step one in the *Mayo/Alice* framework involves looking at the "focus" of the claims at issue and their "character as a whole." *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016); *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335 (Fed. Cir. 2016). Step two involves the search for an "inventive concept." *Alice*, 134 S. Ct. at 2355; *Elec. Power Grp.*, 830 F.3d at 1353. An "inventive concept" requires more than "well-understood, routine, conventional activity already engaged in" by the relevant community. *Rapid Litig. Mgmt. Ltd. v. CellzDirect, Inc.*, 827 F.3d 1042, 1047 (Fed. Cir. 2016) (quoting *Mayo*, 566 U.S. at 79–80).

For *Mayo/Alice* step two, Appellants argue that "claims 1–24 recite specific limitations that are other than what is well-understood, routine, or conventional in the field of computer system design." App. Br. 18. In

particular, Appellants contend that: (1) "[c]laims 1–24 include using a probability curve empirically derived from and based upon performance of the transactional memory system to associate an abort probability (p) with an optimal execution time (t)"; and (2) "[e]mpirically deriving a probability curve based upon the performance of the transactional memory system (e.g., in response to processing concurrent memory operations including concurrent memory operations on the transactional memory system) is not understood to be well-understood, routine, or conventional in the relevant field." *Id.* According to Appellants, the Examiner "has not asserted this feature to be well-known, routine, or conventional in this field." *Id.*

In the Final Office Action, the Examiner did not analyze the additional elements in the claims under *Mayo/Alice* step two. Final Act. 2. In the Answer, the Examiner analyzes the additional elements. Ans. 3–6. But the Examiner does not take the position—or cite any evidence—that associating an abort probability (p) obtained from an empirically derived probability curve with an optimal execution time (t) was a well-understood, routine, conventional activity already engaged by the relevant community. *Id.*

"Whether something is well-understood, routine, and conventional to a skilled artisan at the time of the patent is a factual determination." *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1369 (Fed. Cir. 2018). Based on the record before us, we agree with Appellants that the Examiner has not adequately demonstrated that associating an abort probability (p) obtained from an empirically derived probability curve with an optimal execution time (t) was a well-understood, routine, conventional activity already engaged by the relevant community. *See* Final Act. 2; Ans. 3–6. Because

the Examiner has not adequately demonstrated that fact, the Examiner has not established patent ineligibility. Hence, we do not sustain the § 101 rejection of claims 1–24.

Because this determination resolves the appeal with respect to claims 1–24, we need not address Appellants' other arguments regarding Examiner error. *See*, *e.g.*, *Beloit Corp. v. Valmet Oy*, 742 F.2d 1421, 1423 (Fed. Cir. 1984) (explaining that an administrative agency may render a decision based on "a single dispositive issue").

DECISION

We reverse the Examiner's decision to reject claims 1–24 under 35 U.S.C. § 101.

REVERSED

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STEVEN M. AMUNDSON, *Administrative Patent Judges*.

HOWARD, *Administrative Patent Judge*, concurring.

I agree with the Majority that the Examiner erred in rejecting the pending claims as directed to patent-ineligible subject matter. However, I would reverse the rejection on the first step of the *Alice/Mayo* framework.

Appellants argue that "the claims are directed to an improvement in computer-related technology because 1) the specification teaches how the claimed invention improves a computer and 2) the claims recite a particular solution to achieve a desired outcome of predicting the impact of and implementing a transactional memory system." App. Br. 13. Specifically, Appellants contend the pending claims recite "an improvement in computer-related technology" that is "directed to the testing and prediction of concurrent memory operations in a transactional memory system for

implementing a transactional memory system on a computing device." *Id.* at 13–15. According to Appellants, "by predicting the effect of a transactional memory system (e.g., determining a performance boost indicator), the transactional memory system may be implemented where beneficial (e.g., implementing the transactional memory system on a computing device)." *Id.* at 15–16.

In applying the first step of the *Alice/Mayo* framework, our reviewing court has held examined "whether the focus of the claims is on the specific asserted improvement in computer capabilities (i.e., the self-referential table for a computer database) or, instead, on a process that qualifies as an 'abstract idea' for which computers are invoked merely as a tool." *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335–36 (Fed. Cir. 2016). Like in *Enfish*, I agree with Appellants that the claimed invention is not directed to some pre-existing business method and applying it to a computer—which would be abstract—but, instead, is directed to a specific improvement in the operation of the computer itself. Such an improvement is not an abstract idea. *See Enfish*, 822 F.3d 1327.

Accordingly, because the claims are directed to a specific improvement in the operation of the computer itself, the claims are not directed to an abstract idea and are patent-eligible.