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MCGINN INTELLECTUAL PROPERTY LAW GROUP, PLLC	MALZAHN, DAVID H
8321 OLD COURTHOUSE ROAD	

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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Ex parte IRVIN JAY LUSTIG, HELMUT MAUSSER, and
OLEKSANDR ROMANKO

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Appeal 2017-007789
Application 14/189,976
Technology Center 2100

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Before CAROLYN D. THOMAS, JEREMY J. CURCURI, and
AARON W. MOORE, *Administrative Patent Judges*.

CURCURI, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's
rejection of claims 1–20. Final Act. 1. We have jurisdiction under 35 U.S.C.
§ 6(b).

Claims 1–20 are rejected under 35 U.S.C. § 101 as directed to a
judicial exception without significantly more. Final Act. 2–4.

We affirm.

STATEMENT OF THE CASE

Appellants' invention relates to "the solution of mathematical programs on a computer." Spec. ¶ 1. Claim 1 is illustrative and reproduced below:

1.   A method for a quadratic program or quadratically constrained program stored in a non-transitory computer readable medium, the method comprising:

receiving input for coefficients of a quadratic problem or a quadratically constrained problem by a computer for storage in the non-transitory computer readable medium for computations performed by a processor;

determining scaling factors by the processor by using the received input in the quadratic program or quadratically constrained program configured for optimality conditions by considering symmetric NxN matrices Q^0 and/or Q^k in a transformation, where N is an integer and $k=1,...,M_q$ is an integer for the computations performed by the processor; and

outputting, by the computer, transformed coefficients of column scaling factor β, row scaling factor α, and right hand side scaling factor γ from the transformation, where β >0, α >0, and γ>0, to perform the computations by the processor of the computer.

ANALYSIS

The Examiner finds claims 1–20 are directed to a judicial exception without significantly more. Final Act. 2–4.

An invention is patent-eligible if it claims a "new and useful process, machine, manufacture, or composition of matter." 35 U.S.C. § 101. The

Supreme Court, however, has long interpreted § 101 to include implicit exceptions: "[l]aws of nature, natural phenomena, and abstract ideas" are not patentable. *E.g.*, *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2354 (2014).

In determining whether a claim falls within the excluded category of abstract ideas, we are guided in our analysis by the Supreme Court's two-step framework, described in *Mayo and Alice*. *Id*. at 2355 (citing *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1296–97 (2012)). In accordance with that framework, we first determine whether the claim is "directed to" a patent-ineligible abstract idea. *See Alice*, 134 S. Ct. at 2356 ("On their face, the claims before us are drawn to the concept of intermediated settlement, *i.e.*, the use of a third party to mitigate settlement risk."); *Bilski v. Kappos*, 561 U.S. 593, 611 (2010) ("Claims 1 and 4 in petitioners' application explain the basic concept of hedging, or protecting against risk."); *Diamond v. Diehr*, 450 U.S. 175, 184 (1981) ("Analyzing respondents' claims according to the above statements from our cases, we think that a physical and chemical process for molding precision synthetic rubber products falls within the § 101 categories of possibly patentable subject matter."); *Parker v. Flook*, 437 U.S. 584, 594–95 (1978) ("Respondent's application simply provides a new and presumably better method for calculating alarm limit values."); *Gottschalk v. Benson*, 409 U.S. 63, 64 (1972) ("They claimed a method for converting binary-coded decimal (BCD) numerals into pure binary numerals.").

The patent-ineligible end of the spectrum includes fundamental economic practices, *Alice*, 134 S. Ct. at 2357; *Bilski*, 561 U.S. at 611, mathematical formulas, *Flook*, 437 U.S. at 594–95, and basic tools of

scientific and technological work, *Benson*, 409 U.S. at 67. On the patent-eligible side of the spectrum are physical and chemical processes, such as curing rubber, *Diehr*, 450 U.S. at 184 n.7, "tanning, dyeing, making waterproof cloth, vulcanizing India rubber, smelting ores," and a process for manufacturing flour, *Benson*, 409 U.S. at 69 (citing cases).

If the claim is "directed to" a patent-ineligible abstract idea, we then consider the elements of the claim—both individually and as an ordered combination—to assess whether the additional elements transform the nature of the claim into a patent-eligible application of the abstract idea. *Alice*, 134 S. Ct. at 2355. This is a search for an "'inventive concept'"—an element or combination of elements sufficient to ensure that the claim amounts to "significantly more" than the abstract idea itself. *Id.*

Appellants contend claims 1–20 are not directed to an abstract idea, and in the alternative, the claims amount to significantly more than any recited abstract idea. *See* App. Br. 5–12.

Regarding "abstract idea," for example, Appellants argue:

i.   "[N]o abstract idea has been articulated on the record that is both reasonably at risk of preemption and reasonably a fundamental tool of science or technology." App. Br. 9. "The Examiner improperly assumes that the limitations are merely a mathematical algorithm and concludes it is an abstract idea. Respectfully, the Examiner does not take into account the processor, computer and computer readable medium that is intertwined with the method steps in the body of the claim." App. Br. 10; *see also* Reply Br. 5–7.

Regarding "significantly more," for example, Appellants argue:

ii. "[T]he claim limitations add[] <u>improvement to computer functionality</u>, which is evidence of 'significantly more.'" App. Br. 6.

iii. "[T]he limitations are <u>not</u> performed merely on a set of generic [computers]. Instead, the limitations are intertwined in the computations performed by the processor." App. Br. 7. "There is a specific discrete implementation as shown in the scaling factors being implemented in processors computations." App. Br. 7. The claims improve existing technology. *See* App. Br. 8–9; *see also* Reply Br. 1–5.

Regarding Appellants' arguments (i)–(iii), we do not see any error in the Examiner's rejection of claims 1–20 as directed to non-statutory subject matter.

We hold that claims 1–20 are directed to an abstract idea without significantly more, and adopt as our own the Examiner's finding in the Final Action:

> The claims are directed to the abstract idea of scaling coefficients for a quadratic program or quadratic constrained program, which is defined by mathematical relationships. The claims do not include additional elements that are sufficient to amount to significantly more than the judicial exception because the additional computer elements, which are recited at a high level of generality, provide conventional computer functions that do not add meaningful limitations to practicing the abstract idea.

Final Act. 2; *see also* Final Act 3 ("The use of generic computer components to scale coefficients for a quadratic program or quadratic constrained program does not impose any meaningful limit on the computer implementation of the abstract idea.").

We agree with the Examiner that the claims relate to the basic concept of scaling of coefficients for a quadratic program or quadratic constrained program, i.e., information collection and analysis. Unfortunately, information collection and analysis, including when limited to particular content, is within the realm of abstract ideas. *See, e.g.*, *Elec. Power Grp. LLC v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016) (holding that "collecting information, analyzing it, and displaying certain results of the collection and analysis" are "a familiar class of claims 'directed to' a patent-ineligible concept"). Further, we note the claims primarily involve receiving data (coefficients) performing calculations (determining scaling factors) and outputting data based on those calculations (transformed coefficients). Such claims have been found to be directed to ineligible subject matter. *See Flook,* 437 U.S. at 595 ("If a claim is directed essentially to a method of calculating, using a mathematical formula, even if the solution is for a specific purpose, the claimed method is nonstatutory.") (internal quotations omitted); *Benson*, 409 U.S. at 65 (finding ineligible claims to a "method of programming a general-purpose digital computer to convert signals from binary-coded decimal form into pure binary form"); *see also Digitech Image Tech. LLC v. Electronics for Imaging, Inc.*, 758 F.3d 1344, 1350 (Fed. Cir. 2014) (finding "a process of organizing information through mathematical correlations and is not tied to a specific structure or machine" to be an abstract idea).

Turning to the second step of the *Alice* analysis, because we determine that independent claim 1 is directed to an abstract idea, the claim must include an "inventive concept" in order to be patent-eligible, *i.e.*, there must

be an element or combination of elements that is sufficient to ensure that the claim in practice amounts to significantly more than the abstract idea itself.

The question is whether the implementation of the abstract idea involves more than the performance of well-understood, routine, and conventional activities previously known to the industry. Claim 1 recites generic computer functions (i.e., receiving input, performing computations, providing output) that are well-understood, routine, and conventional activities previously known to the industry. However, nothing in claim 1 purports to improve computer functioning or "effect an improvement in any other technology or technical field." *Alice*, 134 S. Ct. at 2359.

Appellants' Specification at ¶ 84 discloses

> The CPUs 611 are interconnected via a system bus 612 to a random access memory (RAM) 614, read-only memory (ROM) 616, input/output (I/O) adapter 618 (for connecting peripheral devices such as disk units 621 and tape drives 640 to the bus 612), user interface adapter 622 (for connecting a keyboard 624, mouse 626, speaker 628, microphone 632, and/or other user interface device to the bus 612), a communication adapter 634 for connecting an information handling system to a data processing network, the Internet, an Intranet, a personal area network (PAN), etc., and a display adapter 636 for connecting the bus 612 to a display device 638 and/or printer 639 (e.g., a digital printer or the like).

Spec. ¶84.

There is no indication that the computers used in the invention are anything other than general purpose computers running conventional operating systems and being programmed using conventional techniques.

The claims also are not adequately tied to "a particular machine or apparatus." *Bilski v. Kappos*, 561 U.S. at 602. Independent claim 1 requires

no more than a generic computer to perform generic computer functions that are well known.

We are not persuaded of error on the part of the Examiner by Appellants' argument (i) that the claims are not directed to an abstract idea because we have determined that the claims are directed to the abstract idea of scaling of coefficients for a quadratic program or quadratic constrained program. *See* Ans. 5 ("the abstract idea is the scaling of coefficients for a quadratic program or quadratic constrained program").

We are also not persuaded of error on the part of the Examiner by Appellants' arguments (ii) and (iii) that the claim limitations improve computer functionality because there is no indication that the computers used in the invention are anything other than general purpose computers. *See* Spec. ¶ 84; *see also* Ans. 4 ("There is nothing in the combination of these elements that result[s] in a non-conventional and non-generic arrangement... simply claiming that the abstract idea is performed by a processor does not necessarily mean that the abstract idea in not preempted... [the] improvement is the result of the program and not due to the functioning of the processor.").

We, therefore, sustain the Examiner's non-statutory subject matter rejection of claim 1. We also sustain the Examiner's non-statutory subject matter rejections of claims 2–20, which are not separately argued with particularity.

ORDER

The Examiner's decision rejecting claims 1–20 is affirmed.

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).

<u>AFFIRMED</u>