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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MARK LEONARD COOPER and
STEPHEN SOLOMON ALTUS

Appeal 2018-003623¹
Application 12/030,553
Technology Center 3600

Before: MURRIEL E. CRAWFORD, JOSEPH A. FISCHETTI, and
MICHAEL W. KIM, *Administrative Patent Judges*.

CRAWFORD, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

This is an appeal from the final rejection of claims 1–4, 17–19, 21–23,
and 25–30. We have jurisdiction to review the case under 35 U.S.C.
§§ 134(a) and 6(b).

¹ The Appellants identify The Boeing Company as the real party in interest.
Br. 2.

The invention relates generally to “minimizing aircraft emissions.”
Spec. ¶ 1.

Claim 1 is illustrative:

1. A method for reducing emissions by an aircraft, the method comprising:

calculating by a processor a set of emissions data for the aircraft for a plurality of route segments in a route as a function of parameters for a flight plan comprising:

the route, a weight, an altitude, and engine data;

generating the flight plan for the aircraft taking into account a total of each type of emission for the aircraft in the set of emissions data from the plurality of route segments;

determining by the processor whether an amount of each type of emissions identified for the aircraft using the flight plan is greater than a threshold level; and

modifying by the processor a portion of the parameters for the flight plan to reduce the effect of the emissions for the aircraft and meet a set of objects for the flight plan until the flight plan meets an objective.

The Examiner rejects claims 1–4, 17–19, 21–23, and 25–30 under 35 U.S.C. 101 as directed to ineligible subject matter in the form of abstract ideas.

We AFFIRM.

ANALYSIS

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

However, the Supreme Court has long interpreted 35 U.S.C. § 101 to include implicit exceptions: “[l]aws of nature, natural phenomena, and abstract ideas” are not patentable. *E.g.*, *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 216 (2014).

In determining whether a claim falls within an excluded category, we are guided by the Supreme Court’s two-step framework, described in *Mayo* and *Alice*. *Id.* at 217–18 (citing *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 75–77 (2012)). In accordance with that framework, we first determine what concept the claim is “directed to.” *See Alice*, 573 U.S. at 219 (“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.”); *see also 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.”).

Concepts determined to be abstract ideas, and thus patent ineligible, include certain methods of organizing human activity, such as fundamental economic practices (*Alice*, 573 U.S. at 219–20; *Bilski*, 561 U.S. at 611); mathematical formulas (*Parker v. Flook*, 437 U.S. 584, 594–95 (1978)); and mental processes (*Gottschalk v. Benson*, 409 U.S. 63, 69 (1972)). Concepts determined to be patent eligible include physical and chemical processes, such as “molding rubber products” (*Diamond v. Diehr*, 450 U.S. 175, 191 (1981)); “tanning, dyeing, making water-proof cloth, vulcanizing India rubber, smelting ores” (*id.* at 182 n.7 (quoting *Corning v. Burden*, 56 U.S. 252, 267–68 (1854))); and manufacturing flour (*Benson*, 409 U.S. at 69 (citing *Cochrane v. Deener*, 94 U.S. 780, 785 (1876))).

In *Diehr*, the claim at issue recited a mathematical formula, but the Supreme Court held that “[a] claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula.” *Diehr*, 450 U.S. at 187; *see also id.* at 191 (“We view respondents’ claims as nothing more than a process for molding rubber

products and not as an attempt to patent a mathematical formula.”). Having said that, the Supreme Court also indicated that a claim “seeking patent protection for that formula in the abstract . . . is not accorded the protection of our patent laws, . . . and this principle cannot be circumvented by attempting to limit the use of the formula to a particular technological environment.” *Id.* (citing *Benson* and *Flook*); *see, e.g., id.* at 187 (“It is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.”).

If the claim is “directed to” an abstract idea, we turn to the second step of the *Alice* and *Mayo* framework, where “we must examine the elements of the claim to determine whether it contains an ‘inventive concept’ sufficient to ‘transform’ the claimed abstract idea into a patent-eligible application.” *Alice*, 573 U.S. at 221 (quotation marks omitted). “A claim that recites an abstract idea must include ‘additional features’ to ensure ‘that the [claim] is more than a drafting effort designed to monopolize the [abstract idea].’” *Id.* (quoting *Mayo*, 566 U.S. at 77). “[M]erely requir[ing] generic computer implementation[] fail[s] to transform that abstract idea into a patent-eligible invention.” *Id.*

The PTO recently published revised guidance on the application of § 101. *2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. 50 (Jan. 7, 2019) (“Guidance”). Under the Guidance, we first look to whether the claim recites:

- (1) any judicial exceptions, including certain groupings of abstract ideas (i.e., mathematical concepts, certain methods of organizing human activity such as a fundamental economic practice, or mental processes); and

(2) additional elements that integrate the judicial exception into a practical application (*see* Manual of Patent Examining Procedure (“MPEP”) § 2106.05(a)–(c), (e)–(h)).

Only if a claim (prong 1) recites a judicial exception and (prong 2) does not integrate that exception into a practical application, do we then look to whether the claim:

(3) adds a specific limitation beyond the judicial exception that is not “well-understood, routine, conventional” in the field (*see* MPEP § 2106.05(d)); or

(4) simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception.

See Guidance.

Step 2A, prong 1

Independent method claim 1 recites the steps of “calculating . . . emissions data,” “generating [a] flight plan,” “determining . . . whether an amount of each type of emissions . . . is greater than a threshold,” and “modifying . . . the parameters for the flight plan to reduce the effect of emissions . . . until the flight plan meets an objective.” Claim 1 is therefore directed to generating and modifying a flight plan until an objective is met.

Each step in the method, calculating, generating, determining, and modifying, can be done mentally by a human using mental thought to analyze and modify a plan. Generating flight plans and ship routes is an evaluation that has been done mentally by a human using pen and paper for generations, and doing so always involves considering parameters and factors that affect the plans. Calculating, making determinations by comparing numbers with thresholds, and modifying plans are also purely mental steps in the form of opinions and judgments. “If a claim, under its broadest reasonable interpretation, covers performance in the mind but for

the recitation of generic computer components, then it is still in the mental processes category unless the claim cannot practically be performed in the mind. *See Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1318 (Fed. Cir. 2016).” Guidance, fn.14. Though claim 1 recites that three of the four steps, calculating, determining, and modifying, are performed by “a processor,” because what claim 1 is directed to can be performed mentally, under Prong One of Revised Step 2A of our Guidance, claim 1 is directed to an abstract idea. MPEP § 2106.04(a)(2)(III)(A).

Step 2A, prong 2

We turn to Prong Two of Revised Step 2A of our Guidance to determine if the abstract idea is integrated into a practical application.

The method does not improve the underlying “processor” by generating and modifying a flight plan, because the Specification indicates that any generic computer can be used to execute the claimed method. *See* Spec. ¶¶ 26–34. In addition, the method is directed to “optimizing flight plans,” which we find, as claimed, is more akin to saying to just “apply” the mental steps to a field of use, as opposed to an improvement to another technology. MPEP §§ 2106.05(a), (f), (h). Because a particular computer is not required, the claim also does not define or rely on a “particular machine.” MPEP § 2106.05(b). Further, the method does not transform matter. MPEP § 2106.05(c). We are unable to discern any other meaningful limitations. MPEP § 2106.05(e).

Therefore, the claim does not integrate the abstract idea into a practical application.

Step 2B

We thus turn to Step 2B of our Guidance to determine of the claim recites an “inventive concept.”

Claim 1 recites steps for calculating, generating a flight plan, determine if parameters exceed thresholds, and modifying the flight plan to meet an objective. There is no other language that recites meaningful limitations that alter the abstract idea analysis, because no language in the claim amounts to significantly more than the abstract idea. As such, while these inquiries were also addressed above, we consider them again and come to the same conclusion that the method has no other meaningful limitations (MPEP § 2106.05(e)), and thus merely recites instructions to execute the abstract idea on a computer (MPEP § 2106.05(f)). For example, the “processor” is a general purpose computer. Spec. ¶ 26–27. The operations of storing, analyzing, receiving, and writing data are primitive computer operations found in any computer system. *See In re Katz Interactive Call Processing Patent Litig.*, 639 F.3d 1303, 1316 (Fed. Cir. 2011). Thus, the only additional elements beyond the abstract idea are well-understood, routine, and conventional. MPEP § 2106.05(d).

Thus, under our Guidance, claim 1 is directed to an abstract idea, and does not recite limitations that transform the abstract ideas into eligible subject matter by integrating the abstract idea into a practical application or reciting an inventive concept. However, because our analysis, which determines that the claim is directed to generating and modifying a flight plan until the flight plan meets an objective, differs significantly from the analysis of the Examiner, we denominate our affirmance a new ground of rejection.

Dependent claims 2–4 and 22, 23, and 25–30 merely limit the nature of the data and calculations, and are encompassed within the abstract idea.

Independent computer program product claim 17 recites a media that embodies instructions that execute to perform a method substantially identical that that of claim 1. As the Federal Circuit has made clear “the basic character of a process claim drawn to an abstract idea is not changed by claiming only its performance by computers, or by claiming the process embodied in program instructions on a computer readable medium.”

CyberSourceCorp. v. Retail Decisions, Inc., 654 F.3d 1366, 1375–6 (Fed. Cir. 2011) (*citing In re Abele*, 684 F.2d 902 (CCPA 1982)). Claims 18, 19, and 21 that depend from claim 17 merely limit the nature of the analysis, and are thus encompassed within the abstract idea.

Under our Guidance, we have thus determined that claims 1–4, 17–19, 21–23, and 25–30 are directed to ineligible abstract ideas, and do not integrate the abstract ideas into a practical application, or recite an inventive concept that transforms the abstract ideas into eligible subject matter. We turn to the Appellants’ arguments.

We are not persuaded by the Appellants’ argument that the Examiner’s determination of what the claims are directed to is in error, because the claims do not concern “saving fuel.” Br. 7. As we have stated above, we have denominated our affirmance as a new ground of rejection and therefore have not determined that the claims are directed to “saving fuel.”

We are not persuaded by the Appellants’ argument that the claims are not abstract ideas, because reducing emissions is a “physical improvement” in the operation of an airplane. Br. 8; *see also* Br. 10 (“the improvement is

in the technology of reducing emissions from an aircraft during flight.”). First, the claims do not necessarily reduce emissions to reduce the “effect of the emissions,” as claim 1 recites. The Specification, for example, describes that “the effect of emissions may be reduced by . . . generating emissions in a location that reduces the effect of the emissions on the atmosphere.” Spec. ¶ 42. More importantly, the claims do not cause any physical improvement, because the claims merely generate and modify a flight plan, without any more effect. The resulting, emission-effect-optimized flight plan could thus be ignored, which means no physical improvement is within the scope of the claims.

The Appellants argue that the Examiner has not adequately associated the claims with claims in cases found to be directed to abstract ideas by our reviewing courts. Br. 11–14. Our analysis, however, does not rely on similarities to other abstract claims in specific cases, because we instead rely on the claims reciting steps that can be performed mentally. MPEP § 2104.06(a)(2)(III)(A). The argument thus is inapposite.

We also are unpersuaded that the processor and code are “not generic, but are specially programmed.” Br. 14. Claim 1 recites “calculating,” “determining,” and “modifying” a plan. However, the operations of storing, analyzing, receiving, and writing data are primitive computer operations found in any computer system. *See In re Katz Interactive Call Processing Patent Litig.*, 639 F.3d at 1316 (“Absent a possible narrower construction of the terms ‘processing,’ ‘receiving,’ and ‘storing,’ discussed below, those functions can be achieved by any general purpose computer without special programming.”). The actual, broadly-claimed functions in the claims thus

represent general-purpose computer operations that do not require special programming.

We finally are unpersuaded by the Appellants' argument that "the claims do not recite any equations, and thus do not preempt other uses of any particular calculations." Br. 15. "Where a patent's claims are deemed only to disclose patent ineligible subject matter under the Mayo framework, as they are in this case, preemption concerns are fully addressed and made moot." *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1379 (Fed. Cir. 2015).

For these reasons, we sustain the rejection of claims 1–4, 17–19, 21–23, and 25–30 as directed to ineligible abstract ideas.

DECISION

We affirm the rejection of claims 1–4, 17–19, 21–23, and 25–30 under 35 U.S.C. § 101.

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