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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/409,971	03/01/2012	Aaron D. Civil	AUS920110186US2	8738
133311	7590	12/20/2017	EXAMINER	
Law Office of Marcia L. Doubet, P.L. P.O. Box 1087 Lake Placid, FL 33862			PURI, VENAY	
			ART UNIT	PAPER NUMBER
			3624	
			NOTIFICATION DATE	DELIVERY MODE
			12/20/2017	ELECTRONIC

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte AARON D. CIVIL, JEFFREY G. KOMATSU,
ANDREW SOON NG YONG LIANG, JOHN M. WARGO,
EMMANUEL YASHCHIN, and PAUL A. ZULPA

Appeal 2016-002749¹
Application 13/409,971²
Technology Center 3600

Before MICHAEL C. ASTORINO, MATTHEW S. MEYERS, and
ALYSSA A. FINAMORE, *Administrative Patent Judges*.

FINAMORE, *Administrative Patent Judge*.

DECISION ON APPEAL

¹ Our Decision references Appellants' Specification ("Spec.," filed Mar. 1, 2012), Appeal Brief ("Appeal Br.," filed June 26, 2015), and Reply Brief ("Reply Br.," filed Jan. 14, 2016), as well as the Examiner's Final Office Action ("Final Act.," mailed Jan. 22, 2015) and Answer ("Ans.," mailed Nov. 20, 2015).

² Appellants identify International Business Machines Corporation ("IBM") as the real party in interest. Appeal Br. 4.

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellants appeal from the Examiner's decision to reject claims 1, 4–8, and 10. We have jurisdiction under § 6(b).

We AFFIRM.

SUBJECT MATTER ON APPEAL

The invention “relates to process control, and deals more particularly with using hybrid analysis of emerging trends for process control.”

Spec. ¶ 2. Claim 1, reproduced below, is the sole independent claim on appeal and is representative of the claimed subject matter:

Claim 1: A computer-implemented method of analyzing trends in a process control environment, comprising:

- determining, by applying at least one defect-detecting analysis scheme to first observed process control data for a process entity, when the process entity exhibits a defect during a process;

- determining, by applying at least one recovery-detecting analysis scheme to second observed process control data for the process entity, whether the process entity is recovered from the defect, further comprising:

- determining a point in time (T - M) in the second observed process control data, wherein: T represents a current time; the point (T - M) starts a window having depth M in the second observed process control data, the window extending backwards from the current time; and the point (T - M) is determined as a position of a last point in time at which the second observed process control data is consistent with the process entity exhibiting the defect;
 - and

- iteratively performing a sequential time-reversed estimation that analyzes the second observed process control data for each of (m = 1 to M) successively-longer

intervals in the window until determining whether the process entity is recovered from the defect; and causing the process control environment to stop performing a previously-initiated remediation effort on the process entity, responsive to determining that the process entity is recovered from the defect, wherein the remediation effort was previously initiated responsive to determining that the process entity exhibited the defect.

REJECTION

The Examiner rejects claims 1, 4–8, and 10 under 35 U.S.C. § 101 as non-statutory subject matter.

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. The Supreme Court, however, has long interpreted § 101 to include implicit exceptions: “[l]aws of nature, natural phenomena, and abstract ideas” are not patentable. *See, e.g., Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 134 S. Ct. 2347, 2354 (2014). To “distinguish[] patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of those concepts,” the Supreme Court, in *Alice*, reiterated the two-step framework previously set forth in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 132 S. Ct. 1289 (2012), which considers, in the first step, whether a claim is directed to a patent-ineligible concept, e.g., an abstract idea, and, if so, considers, in the second step, whether the elements the claim, individually and as an ordered combination, recite an inventive concept—an element or combination of elements sufficient to ensure the claim amounts to significantly more than the abstract idea and

transform the nature of the claim into a patent-eligible concept. *Alice*, 134 S. Ct. at 2355 (citing *Mayo*, 132 S. Ct. at 1294, 1296–98).

In rejecting the claims under 35 U.S.C. § 101 as non-statutory subject matter, the Examiner applies this two-step analysis. Final Act. 5. Under the first step, the Examiner finds the claims are directed to a mathematical relationship or formula, which is an abstract idea. *Id.* Under the second step, the Examiner finds the claims do not recite additional elements amounting to significantly more than the abstract idea because the claims do not recite an improvement to another technology or technical field or an improvement to the functioning of the computer itself. *Id.* The Examiner also finds that the claims do not include meaningful limitations beyond generally linking the use of the abstract idea to a particular technology, and that the claims require no more than a generic computer performing generic computer functions. *Id.* The Examiner further finds the claims do not recite specific and non-abstract details performed outside of the computer. *Id.*

Turning to Appellants' arguments, initially, we find unpersuasive the argument that independent claim 1 should not be rejected under 35 U.S.C. § 101 for including software recitations. Appeal Br. 26; Reply Br. 10. As set forth in the Answer, the Examiner is not rejecting independent claim 1 under § 101 because the claim recites software. Ans. 18.

Also as an initial matter, we find unpersuasive Appellants' arguments regarding preemption. Namely, Appellants contend that independent claim 1 recites patent-eligible subject matter under the streamlined eligibility analysis set forth in the Office's guidance because the claim does not preempt others from all use of the mathematical relationship.

Appeal Br. 17–19 (citing 2014 Interim Guidance on Patent Subject Matter

Eligibility, 79 Fed. Reg. 74618, 74622, 74625 (Dec. 16, 2014)); Reply Br. 7. Appellants similarly assert that independent claim 1 does not preempt the field of defect recovery detection. Appeal Br. 26–28; Reply Br. 10.

The Office’s guidance explains that “a streamlined eligibility analysis *can be used* for a claim that may or may not recite a judicial exception but, when viewed as a whole, clearly does not seek to tie up any judicial exception such that others cannot practice it.” 2014 Interim Guidance, 79 Fed. Reg. at 74625 (emphasis added). As such, the Office’s guidance does not require a streamlined eligibility analysis, but rather states that the streamlined analysis can be used. And, as Appellants point out, the result of the streamlined analysis will always be the same as the result of the full two-step patent-eligibility analysis. Reply Br. 7.

Moreover, although preemption may be the concern driving the exclusion of abstract ideas from patent-eligible subject matter, preemption is not the test for eligibility. “The Supreme Court has made clear that the principle of preemption is the basis for the judicial exceptions to patentability. For this reason, questions on preemption are inherent in and resolved by the § 101 analysis.” *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1379 (Fed. Cir. 2015) (citation omitted). Accordingly, we consider Appellants’ arguments under the two-step analysis for determining patent-eligibility under § 101.

Pursuant to the first step of the patent-eligibility analysis, Appellants contend that independent claim 1, as a whole, is not directed to a mathematical relationship or formula, but rather to “*analyzing process control data in order to detect recovery from a defect and thus cause the process control environment to stop performing a previously-initiated*

remediation effort.” Appeal Br. 14 (footnotes omitted). Yet, the analysis of process control data is the mathematical relationship or formula. In other words, independent claim 1 requires detecting recovery from a defect and thereby stopping the remediation effort via the mathematical relationship or formula, i.e., determining a point in time ($T - M$) defining a backward extending window having a depth M and iteratively performing a sequential time-reversed estimation for each of ($m = 1$ to M) successively longer intervals until determining whether the process entity is recovered from the defect. As such, Appellants’ argument does not apprise us of error in the Examiner’s characterization of independent claim 1 as directed to a mathematical relationship or formula.

Appellants also argue that independent claim 1 is not directed to a mathematical relationship or formula because, similar to the claims in *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245 (Fed. Cir. 2014), independent claim 1 provides a specific solution to a specific problem that exists in real-time process control environments. Appeal Br. 15; Reply Br. 4. We, however, see no parallel between independent claim 1 and the claims in *DDR Holdings*.

In *DDR Holdings*, the Federal Circuit determined that the claims address the problem of retaining website visitors who, if adhering to the routine, conventional functioning of Internet hyperlink protocol, would be transported instantly away from a host’s website after clicking on an advertisement and activating a hyperlink. 773 F.3d at 1257. The Federal Circuit, thus, held that the claims are directed to statutory subject matter because they claim a solution “necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer

networks.” *Id.* Notably, the Court did not find the claims to be patent-eligible merely because they provide a specific solution to a specific problem; the Court specifically held that the claims address a problem unique to computer technology.

Even if we agree Appellants that the claimed invention provides a specific solution to a specific problem in real-time process control environments, we see no corollary between real-time process control environments and computer technology. For instance, independent claim 1 does not describe the process, and Appellants’ Specification explains that the invention addresses a problem associated with supply chains (Spec. ¶ 3). Consequently, Appellants’ reliance on *DDR Holdings* does not apprise us of error in the Examiner’s finding that independent claim 1 is directed to a mathematical relationship or formula.

Appellants further contend there is insufficient support for the Examiner’s finding that independent claim 1 is directed to an abstract idea. Appeal Br. 19–20; Reply Br. 7–8. We disagree.

Our reviewing court has explained that when determining whether a claim is directed to an abstract idea, “the decisional mechanism courts now apply is to examine earlier cases in which a similar or parallel descriptive nature can be seen—what prior cases were about, and which way they were decided.” *Amdocs (Israel) Ltd. v. Openet Telecom, Inc.*, 841 F.3d 1288, 1294 (Fed. Cir. 2016). Indeed, courts have held mathematical relationships or formulas to be abstract ideas. *See, e.g., DDR Holdings*, 773 F.3d at 1256 (“We know that mathematical algorithms, including those executed on a generic computer, are abstract ideas.”); *see also Parker v. Flook*, 98 S. Ct. 2522 (1978) (explaining that mathematical formulas are not

patent-eligible and holding that a conventional post-solution application does not transform a claim reciting a mathematical formula into eligible subject matter). As such, Appellants' argument does not apprise us of error in the Examiner's finding that independent claim 1 is directed to an abstract idea under the first step of the patent-eligibility analysis.

Appellants additionally argue that the Examiner's rejection is insufficient under the second step of the analysis because the Examiner does not identify which claim limitations are the additional elements, nor explain why these additional elements do not amount to significantly more than the abstract idea. Appeal Br. 22–23; Reply Br. 9. Appellants' argument is not persuasive.

As set forth the Answer, the Examiner finds that, apart from the abstract idea of a mathematical relationship or formula, independent claim 1 recites the additional element of “causing the process control environment to stop performing a previously-initiated remediation effort on the process entity, responsive to determining that the process entity is recovered from the defect, wherein the remediation effort was previously initiated responsive to determining that the process entity exhibited the defect,” which is a post-solution activity that does not add any meaningful limit on the use of the equation. Ans. 16. We agree with the Examiner. Causing the process control environment to stop performing a previously-initiated remediation effort is simply an instruction to apply the mathematical relationship to the process control environment. In other words, the claimed invention uses a mathematical relationship to determine whether a process entity has recovered from a defect, i.e., been remediated, and then based on this determination, stops remediation. Such a step is tantamount to adding

the words “apply it” to the mathematical relationship, which insufficient to confer patent-eligibility. *Alice*, 134 S. Ct. at 2358 (“Stating an abstract idea while adding the words ‘apply it’ is not enough for patent eligibility.” (quoting *Mayo*, 132 S. Ct. at 1294 (internal quotation marks omitted))).

Appellants further argue that independent claim 1 specifies how to carry out interactions that differ from a routine and conventional approach to detecting recovery from a defect. Appeal Br. 23–25; Reply Br. 9. According to Appellants, the claimed steps of determining a point in time (T - M) defining a backward extending window having a depth M and iteratively performing a sequential time-reversed estimation for each of (m = 1 to M) successively longer intervals represents an unconventional approach to detecting recovery from a defect. Appeal Br. 24–25; Reply Br. 9. Appellants’ argument is not persuasive of error.

Notwithstanding that “‘the § 101 patent-eligibility inquiry and, say, the § 102 novelty inquiry might sometimes overlap’ . . . a claim for a *new* abstract idea is still an abstract idea.” *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1151 (Fed. Cir. 2016) (quoting *Mayo*, 132 S. Ct. at 1304). The question in the second step of the patent-eligibility analysis is not whether a claimed element is novel, but rather whether the implementation of the abstract idea involves “more than performance of ‘well-understood, routine, [and] conventional activities previously known to the industry.’” *Content Extraction & Transmission LLC v. Wells Fargo Bank, N.A.*, 776 F.3d 1343, 1347–48 (Fed. Cir. 2014) (quoting *Alice*, 134 S. Ct. at 2359). Here, Appellants rely on the alleged novelty of the mathematical relationship or formula, but do not address the implementation of it. For example, Appellants do not explain, and we fail to see, how the

claimed step of causing the process control environment to stop a previously-initiated remediation effort is something other a well-understood, routine, and conventional activity.

Appellants further contend that independent claim 1 amounts to significantly more than the abstract idea because the claimed invention provides an improvement to process control environments by stopping remediation efforts in a quicker more cost-effective way. Appeal Br. 24, 25. As such, Appellants assert independent claim 1 is similar to the claims in Example 4 in the Office's guidance (Examples: Abstract Ideas (Jan. 27, 2015), https://www.uspto.gov/sites/default/files/documents/abstract_idea_examples.pdf). Appeal Br. 32–33. Appellants' arguments are not persuasive.

At the outset, we note that alleged benefit is effectuated by the post-solution activity of causing the process control environment to stop performing the remediation effort. As the Supreme Court has explained:

The notion that post-solution activity, no matter how conventional or obvious in itself, can transform an unpatentable principle into a patentable process exalts form over substance. A competent draftsman could attach some form of post-solution activity to almost any mathematical formula; the Pythagorean theorem would not have been patentable, or partially patentable, because a patent application contained a final step indicating that the formula, when solved, could be usefully applied to existing surveying techniques. The concept of patentable subject matter under § 101 is not “like a nose of wax which may be turned and twisted in any direction”

Flook, 98 S. Ct. at 2525–26.

Moreover, regardless of whether the improvement is merely the result of a post-solution activity, we fail to see how the improvement to process control environments represents a patent-eligible application of the

mathematical relationship or formula. In *Alice*, the Supreme Court held that an improvement to an existing technological process may constitute significantly more under the second step of the patent-eligibility analysis. 134 S. Ct. at 2358. There is no indication, however, that the recited process control environment is technical. As set forth above, independent claim 1 does not describe the process, and the Specification explains that the invention addresses a problem associated with supply chains (Spec. ¶ 3). Accordingly, Appellants do not apprise us of error in the Examiner's finding that independent claim 1 does not recite additional elements amounting to significantly more than the abstract idea of a mathematical relationship or formula.

Additionally, Appellants argue that independent claim 1 is patent-eligible because it is inextricably tied to computer technology, like the claims in Example 1 in the Office's guidance and the claims in *California Institute of Technology v. Hughes Communications, Inc.*, 59 F.Supp.3d 974 (C.D. Cal. 2014). Appeal Br. 29–31; Reply Br. 10–12. Appellants similarly argue that independent claim 1 recites a specific way of doing something with a computer where the computer plays a significant part, like the claims in *Data Distribution Technologies, LLC v. BRER Affiliates, Inc.*, 2014 WL 4162765 (D. N.J. 2014). Appeal Br. 31. Appellants' arguments are not persuasive.

Although independent claim 1 is directed to a computer-implemented method of analyzing trends in a process control environment, process control is not an issue unique to computers. Also, there is no indication that the implementation of the recited steps involves something other than generic computer components performing well-known, routine, and conventional

computer functions, such as receiving and processing data. To the contrary, Appellants' Specification describes that "[t]hese computer program instructions may be provided to a processor of a general purpose computer, special purpose computer, or other programmable data processing apparatus to produce a machine, such that the instructions . . . create means for implementing the functions/acts." Spec. ¶ 94.

Furthermore, the recitation of a complex time-sensitive operation does not transform independent claim 1 into a patent-eligible application of the abstract idea. According to our reviewing court, "the inability for the human mind to perform each claim step does not alone confer patentability. As we have explained, 'the fact that the required calculations could be performed more efficiently via a computer does not materially alter the patent eligibility of the claimed subject matter.'" *FairWarning IP, LLC v. Iatric Sys., Inc.*, 839 F.3d 1089, 1098 (Fed. Cir. 2016) (citing *Bancorp Servs., L.L.C. v. Sun Life Assurance Co. of Canada (U.S.)*, 687 F.3d 1266, 1278 (Fed. Cir. 2012)).

Consequently, the claimed invention is not inextricably tied to computer technology, nor does the claimed invention involve a computer in a significant way. Rather, the claimed invention represents the performance of an abstract idea on a generic computer, which is not patent-eligible. *See, e.g., DDR Holdings*, 773 F.3d at 1256 ("[T]hese claims [of prior cases] in substance were directed to nothing more than the performance of an abstract business practice on the Internet or using a conventional computer. Such claims are not patent-eligible.").

Appellants further assert that independent claim 1 is patent-eligible because, similar to the claims in *DDR Holdings*, the claimed invention addresses a business challenge that is particular to the process control

environment and is necessarily rooted in computer technology.

Appeal Br. 29–30. Appellants’ argument is not persuasive for the reasons we previously discussed. Namely, we see no corollary between the present process control environment and computer technology. Also, the claimed invention is not necessarily rooted in computer technology, but rather represents the performance of an abstract idea on a generic computer.

In view of the foregoing, Appellants do not apprise us of error in the Examiner’s determination that independent claim 1 is patent-ineligible subject matter. Appellants do not present separate arguments for dependent claims 4–8, and 10. Appeal Br. 34. Accordingly, we sustain the rejection of claims 1, 4–8, and 10 under 35 U.S.C. § 101.

DECISION

The Examiner’s decision to reject claims 1, 4–8, and 10 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). 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED