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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ALEXANDER A. KALINKIN

Appeal 2017-010426
Application 13/995,520
Technology Center 2100

Before ALLEN R. MacDONALD, JEREMY J. CURCURI, and KARA L. SZPONDOWSKI, *Administrative Patent Judges*.

SZPONDOWSKI, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant appeals under 35 U.S.C. § 134(a) from the Examiner's Final Rejection of claims 1–11, 14–19, and 25–29, constituting all claims pending in the current application. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

STATEMENT OF THE CASE

Appellant's invention is directed to asynchronous data calculation and data exchange in a distributed computing based system. Spec. ¶ 15. Claim 1 is representative of the claimed subject matter:

> 1. At least one non-transitory storage medium having instructions stored thereon for causing a system to perform a method comprising:
>
> performing a first mathematical transform on a first subarray of an array of data via a first computer process executing on a first computer node of a distributed computer cluster concurrently with a second mathematical transform being performed on a second subarray of the array via a second computer process executing on a second computer node of the computer cluster;
>
> after the first and second subarrays are transformed into transformed first and second subarrays, performing a third mathematical transform on a third subarray of the array via the first computer node concurrently with:
>
> (a) a fourth mathematical transform being performed on a fourth subarray of the array via the second computer node; and
>
> (b) both the transformed first and second subarrays being transposed to transposed first and second subarrays located on one node of the first and second computer nodes and a third computer node included in the computer cluster via a communication path coupling at least two of the first, second, and third computer nodes;
>
> wherein the first subarray is stored in a first memory of the first computer node, and the second subarray is stored in a second memory of the second computer node.

REJECTION

Claims 1–11, 14–19, and 25–29 stand rejected under 35 U.S.C. § 101 as directed to non-statutory subject matter.

ANALYSIS

Alice Corp. Pty. Ltd. v. CLS Bank International, 134 S. Ct. 2347 (2014) identifies a two-step framework for determining whether claimed subject matter is judicially-excepted from patent eligibility under 35 U.S.C. § 101. In the first step, "[w]e must first determine whether the claims at issue are directed to a patent-ineligible concept." *Alice*, 134 S. Ct. at 2355. In the second step of the *Alice* analysis, we "consider the elements of each claim both individually and 'as an ordered combination' to determine whether the additional elements 'transform the nature of the claim' into a patent-eligible application." *Alice*, 134 S. Ct. at 2355 (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 78–79 (2012)). In other words, the second step is to "search for an 'inventive concept' – i.e., an element or combination of elements that is 'sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [ineligible concept] itself.'" *Id.* (alteration in original) (quoting *Mayo*, 566 U.S. at 72–73).

The Examiner determines the claims are "directed to media, apparatuses, and methods for performing abstract mathematical steps drawn to performing mathematical transforms, transposing data, decomposing data, storing data, and modeling," which is a mathematical algorithm and, therefore, abstract. Final Act. 2. The Examiner further determines the recitation of generic computer limitations, such as, for example, computer

nodes, storage medium, and processor, does not amount to significantly more than the judicial exception. Final Act. 2.

Appellant argues the claims do not recite a judicial exception because the focus of the claims is on an improvement in computer-related technology. App. Br. 8. Specifically, comparing the claims to those in *McRo, Inc. v. Bandai Namco Games America Inc.*, 837 F.3d 1299 (Fed. Cir. 2016), Appellant argues the claims are directed to improving distributed memory computer systems. App. Br. 8, citing Spec. ¶¶ 15, 23, 34.

In the Answer, the Examiner elaborates "Appellant admits that the alleged improvement of the claimed invention is drawn to concurrently performing data calculations and data exchange to improve the performance of Poisson solvers in distributed computer systems" and reasons any improvement "is to mathematical functions performed by the systems, e.g. to the Poisson solver method" so "any alleged improvement here is to the abstract idea (i.e. the mathematical algorithm) and not to some computer-related technology." Ans. 3.

In the Reply Brief, Appellant challenges the Examiner's statement that "the alleged improvement of the claimed invention is drawn to concurrently performing data calculation and data exchange to improve the performance of Poisson solvers in distributed computer systems," and argues "this statement appears to be a mischaracterization or conflation of multiple portions of the specification that were quoted in the Appeal Brief." Reply Br. 2. Appellant further argues the Examiner ignores the language "in distributed computer systems." Reply Br. 3.

In the Specification, Appellant describes that a distributed computing system may be used to solve real-world modeling problems. Spec. ¶¶ 1, 2.

According to Appellant, "[w]hen certain methods (e.g., a Poisson solver) are used in distributed computing, data exchange between nodes (e.g., message passing) can cause delay." Spec. ¶ 3. Appellant describes:

> An embodiment of the invention includes asynchronous data calculation and data exchange in a distributed system. Such an embodiment is appropriate for advanced modeling projects and the like. One embodiment includes a distribution of a matrix of data across a distributed computing system. The embodiment combines transform calculations (e.g., Fourier transforms) and data transpositions of the data across the distributed computing system. The embodiment further combines decompositions and transpositions of the data across the distributed computing system. The embodiment thereby concurrently performs data calculations (e.g., transform calculations, decompositions) and data exchange (e.g., message passage interface messaging) to promote distributed computing efficiency. Other embodiments are described herein.

Spec. ¶ 15. Appellant further describes "[the performance of step 2] is combined with data transposition, which improves the performance of, for example, Poisson solvers for distributed memory computer systems." Spec. ¶ 23. In addition, Appellant describes:

> Thus, applying the asynchronous approach to a direct Poisson solver for clusters enables the reduction of idle processes when the number of processes is relatively large. Data transfer can be done concurrently with the calculation of a previous step. Consequently, the process downtime will be considerably reduced and the performance of, for example, a Poisson solver package on computers with distributed memory can be increased. This may aid those who use, for example, Poisson solvers for clusters with weather forecasting, oil pollution simulation, and the like.

Spec. ¶ 34.

Appellant has not persuaded us that any improvement is to distributed memory computer systems, as opposed to the abstract idea (mathematical algorithm). Rather, the Examiner persuades us that any improvement is directed to the mathematical algorithm (e.g. the Poisson solver) rather than to the distributed memory computer system itself. Appellant's Specification indicates that Appellant's invention can be practiced with conventional distributed computing systems. Specifically, we rely on paragraphs 23 and 34 of Appellant's Specification, which, as noted above, state the embodiment "*improves the performance of, for example, Poisson solvers* for distributed memory computer systems" and "*applying the asynchronous approach to a direct Poisson solver . . .*" and "*the performance of, for example, a Poisson solver package* on computers with distributed memory can be increased," and *"[t]his may aid those who use, for example, Poisson solvers for clusters . . .*" Spec. ¶¶ 23, 34 (emphasis added). That the claims are for a specific purpose does not change that the claims are directed to an abstract idea. As the Supreme Court has said, "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." *Parker v. Flook*, 437 U.S. 584, 595 (1978) (quoting *In re Richman*, 563 F.2d 1026, 1030 (CCPA 1977)). "The Supreme Court and this court have repeatedly made clear that merely limiting the field of use of the abstract idea to a particular existing technological environment does not render the claims any less abstract." *Affinity Labs of Texas, LLC v. DirecTV, LLC*, 838 F.3d 1253, 1259 (Fed. Cir. 2016) (citing *Alice, Mayo, et al.*). Although Appellant asserts the Examiner has mischaracterized or conflated multiple portions of the Specification (Reply Br. 2), we disagree.

Appellant's arguments with respect to *McRO* are also not persuasive. In *McRO*, the claimed improvement was "allowing computers to produce 'accurate and realistic lip synchronization and facial expressions in animated characters' that previously could only be produced by human animators . . . through 'the use of rules, rather than artists, to set the morph weights and transitions between phonemes.'" 837 F.3d at 1313. Further, in *McRO*, the claims[1] were defined a specific way to solve the problem, automating tasks that previously were not automated because they were driven by subjective determinations, rather than specific mathematical rules. *Id.* at 1314. The

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[1] In *McRO*, the pertinent claim recited:

> A method for automatically animating lip synchronization and facial expression of three-dimensional characters comprising:
>
> obtaining a first set of rules that define output morph weight set stream as a function of phoneme sequence and time of said phoneme sequence;
>
> obtaining a timed data file of phonemes having a plurality of sub-sequences; generating an intermediate stream of output morph weight sets and a plurality of transition parameters between two adjacent morph weight sets by evaluating said plurality of sub-sequences against said first set of rules;
>
> generating a final stream of output morph weight sets at a desired frame rate from said intermediate stream of output morph weight sets and said plurality of transition parameters; and
>
> applying said final stream of output morph weight sets to a sequence of animated characters to produce lip synchronization and facial expression control of said animated characters.
>
> *McRO*, 837 F.3d at 1307–1308.

existing technological process was improved by the incorporation of the claimed rules to allow automation of further tasks. *Id*. Here, by contrast, Appellant's claims are not defined in a specific way to solve the problem; rather, the claims essentially combine (or concurrently perform) steps (transform calculations and data transpositions) that were previously performed in conventional methods. *See* Spec. ¶¶ 15, 23, 25.

Turning to the second step of the *Alice* analysis, Appellant argues "a claim including generic components can be eligible under 35 U.S.C. § 101 if those elements are arranged in a 'non-conventional and non-generic arrangement,' which can include 'the use of distributed architecture.'" App. Br. 9 (emphasis omitted). According to Appellant, "claim 1 includes a particular sequence of different actions that are performed by specific computer nodes." App. Br. 9. Appellant further argues the claims are similar to those in *BASCOM Global Internet Services, Inc. v. AT&T Mobility LLC*, 827 F.3d 1341 (Fed. Cir. 2016) and *Amdocs (Israel), Ltd. V. Openet Telecom, Inc.*, 841 F.3d 1288 (Fed. Cir. 2016). App. Br. 8–9. Additionally, Appellant argues "as admitted in the 'Allowable Subject Matter' section of the Office Action, the claimed arrangement is not found in the prior art" so "it is abundantly clear that the claimed arrangement is not conventional or generic." App. Br. 9.

We are not persuaded by Appellant's arguments. Rather, as the Examiner points out, and Appellant admits in the Specification, using a distributed computing system to solve mathematical problems is known in the art. Ans. 3, citing Spec. ¶ 2. Although Appellant claims a first, second, and third computer node of a distributed computer cluster, Appellant has not sufficiently explained how this arrangement of nodes constitutes a technical

improvement over prior art distributed computer systems, nor has Appellant identified any support from the Specification for such arguments. Nor do we discern anything in the Specification that describes anything other than a conventional distributed computing system. Although Appellant refers to "a particular sequence of different actions that are performed by specific computer nodes," Appellant does not elaborate on this argument. We note the "actions that are performed by specific computer nodes" may refer to the claimed first, second, third, and fourth mathematical transforms, but such mathematical transforms appear to be conventional. (E.g., Spec. ¶¶ 1–3, 16–19). The claim language "both the transformed first and second subarrays being transposed to transposed first and second subarrays located on one node of the first and second computer nodes and a third computer node included in the computer cluster via a communication path coupling at least two of the first, second, and third computer nodes" and "wherein the first subarray is stored in a first memory of the first computer node, and the second subarray is stored in a second memory of the second computer node" does not explicitly recite any "actions performed by specific computer nodes."

We also disagree the claims are similar to those in *BASCOM* and *Amdocs*. In *BASCOM*, the claims were generally directed to filtering content. 827 F.3d at 1348. Although the Court determined the claims recited generic computer, network, and Internet components which were not inventive by themselves, the Court found the ordered combination of the limitations provided the requisite inventive concept. *Id.* at 1349–1350 ("[A]n inventive concept can be found in the non-conventional and non-generic arrangement of known, conventional pieces"). The patent

extensively claimed and explained how a particular arrangement of elements was "a technical improvement over prior art ways of filtering such content." *Id.* at 1350 (E.g., "According to BASCOM, the inventive concept harnesses this technical feature of network technology in a filtering system by associating individual accounts with their own filtering scheme and elements while locating the filtering system on an ISP server.").

In *Amdocs*, the pertinent claim included language describing "computer code for using the accounting information with which the first network accounting record is correlated to *enhance* the first network accounting record." 841 F.3d at 1299 (emphasis added). The Court construed the term "enhance" as being dependent on the invention's distributed architecture, which was described in the Specification as a critical advancement over the prior art. *Id.* at 1300–1301. The Court, accordingly, found "this claim entails an unconventional technological solution (enhancing data in a distributed fashion) to a technological problem (massive record flows which previously required massive databases.)" *Id.* at 1301. Therefore, although generic computers were involved, "the claim's enhancing limitation necessarily requires that these generic components operate in an unconventional manner to achieve an improvement in computer functionality." *Id.* at 1300–1301.

In both *Amdocs* and *BASCOM*, there existed substantial argument and support from the Specification concerning the "inventive concept." Here, Appellant offers little more than attorney argument and conclusory statements. And, to the extent Appellant relies for support on the Examiner's statements in the Allowable Subject Matter section of the Final Action, Appellant misapprehends controlling precedent. Although the

second step in the *Alice* framework is termed a search for an "inventive concept," the analysis is not an evaluation of novelty or non-obviousness. *Alice*, 134 S. Ct. at 2355. A novel and nonobvious claim directed to a purely abstract idea is, nonetheless, patent-ineligible. *See Mayo*, 566 U.S. 66 at 78–79; *see Flook*, 437 U.S. at 588–595. Further, "under the *Mayo/Alice* framework, a claim directed to a newly discovered law of nature (or natural phenomenon or abstract idea) cannot rely on the novelty of that discovery for the inventive concept necessary for patent eligibility." *Genetic Techs. Ltd. v. Merial L.L.C.*, 818 F.3d 1369, 1376 (Fed. Cir. 2016).

Accordingly, Appellant has not adequately explained how the claims are performed such that they are not routine, conventional functions of a generic computer, nor has Appellant provided persuasive evidence why the claims are not routine and conventional functions of a generic computer. Put another way, "[t]he 'novelty' of any element or steps in a process, or even of the process itself, is of no relevance in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter." *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1315 (Fed. Cir. 2016) (quoting *Diamond v. Diehr*, 450 U.S. 175, 188–89 (1981)).

DECISION

For the above reasons, the Examiner's 35 U.S.C. § 101 rejection of claims 1–11, 14–19, and 25–29 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)(iv).

AFFIRMED