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SINORICA, LLC
20251 Century Blvd.
Suite 140
Germantown, MD 20874

EXAMINER
BRUSCA, JOHN S

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pair@sinorica.com

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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Ex parte VITALY L. GALINSKY

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Appeal 2017-003297
Application 13/545,077[1]
Technology Center 1600

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Before ERIC B. GRIMES, JOHN E. SCHNEIDER, and
RACHEL H. TOWNSEND, *Administrative Patent Judges.*

TOWNSEND, *Administrative Patent Judge.*

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 involving claims to a method
of rapidly assessing similarity between genomic sequences, which have been
rejected as being directed to patent ineligible subject matter. We have
jurisdiction under 35 U.S.C. § 6(b).

We affirm.

STATEMENT OF THE CASE

"Searching databases for sequences similar to a given sequence is
probably one of the most fundamental and important tools for predicting
structural variations and functional properties in the modern biology."
(Spec. 1.) "The rapidly increasing amounts of genetic sequence information

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[1] Appellant identifies himself as the real party in interest. (Br. 2.)

available represent a constant challenge to developers of hardware and software database searching and handling." (*Id.*) "[T]he invention relates to a method . . . for rapid screening of local sequence similarity." (*Id.*)

Claims 1–19 are on appeal. Claim 1 is representative and reads as follows:

> 1. A method of fast and accurate alignment of genomic sequences comprising:
>
> building indices for reference sequence;
>
> recording all local hits between a reference index and a query sequence in a local hit table;
>
> identifying candidate entries in said local hits table for final alignment of said query sequence to said reference sequence;
>
> decoding unmasked location of said hits in said reference sequence;
>
> glueing said hits together by filling holes (no local hits) in said local hit table; and
>
> reporting alignment result;
>
> wherein said genomic sequences are human genomic sequences; said method is implemented in a computational system; and said method is implemented with graphics processing unit (GPU) or Field Programmable Gate Array (FPGA).

(Br. 8.)

The following ground of rejection by the Examiner is before us on review:

Claims 1–19 under 35 U.S.C. § 101 as being directed to non-statutory subject matter.

DISCUSSION

The Examiner finds that claim 1 is directed to an abstract idea of determining similarity between genomic sequences by indexing a reference sequence and aligning a query sequence to the reference sequence using a local hit table. (Final Action 3.) The Examiner notes that the additional limitations of the claims "constitute conventional steps appended to the abstract idea" as a computer-mediated process using a graphics processing unit or a field programmable gate array that "do not comprise an inventive concept that transforms the claimed abstract idea into a patent eligible application of the abstract idea." (Final Action 5; Ans. 3–5.)

We agree with the Examiner's factual findings and conclusion that claim 1 is directed to patent ineligible subject matter.

Section 101 provides that "[w]hoever 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." 35 U.S.C. § 101. In *Alice*, the Supreme Court articulated a two-step test for examining patent eligibility under § 101. *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347 (2014). Step one involves determining whether the claims at issue are directed to a patent ineligible concept, and step two, reached only if the determination in step one is yes, considers the elements of each claim both individually and "'as an ordered combination'" to determine whether additional elements "'transform the nature of the claim'" into a patent eligible application. *Id.* at 2355.

"The Supreme Court has not 'delimit[ed] the precise contours of the 'abstract ideas' category.'" *Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat'l Ass'n*, 776 F.3d 1343, 1346 (Fed. Cir.

2014) (quoting *Alice*, 134 S. Ct. at 2357). However, our reviewing Court has held "[i]nformation as such is an intangible" and thus, has "treated collecting information, including when limited to particular content (which does not change its character as information), as within the realm of abstract ideas." *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016) (collecting cases); *see also SAP America, Inc. v. InvestPic LLC*, 898 F.3d 1161, 1162 (Fed. Cir. 2018). Likewise it has "treated analyzing information by steps people go through in their minds, or by mathematical algorithms, without more, as essentially mental processes within the abstract-idea category." *Elec. Power Grp.* 830 F.3d at 1354 (collecting cases). Claim 1 is directed at abstract ideas under those principles.

The focus of the claim is on organizing information in a particular way and using that information to perform a computerized search of a database for sequence alignment, i.e., collection, storage, and comparison of data. As explained in the Specification the indices are organized as a sorted array of base pairs (Spec. 5) and then local similarities are found between a query and reference sequence using a computer that has been appropriately programmed by comparing the data and the similarity hits are recorded (Spec. 6–7). Once the entire query sequence has been processed, and hits have been identified, the computer performs further processing to decode and piece together the hits (Spec. 8–9.) As the Specification explains, any conventional computer system can be used to perform the method. (Spec. 10.)

The claimed method does not improve computer technologies as such, *see, e.g., McRO, Inc. v. Bandai Namco Games America Inc.*, 837 F.3d 1299, 1313 (Fed. Cir. 2016) (claims reciting rules that improve how a physical

display operated through computer automation to produce "accurate and realistic lip synchronization and facial expressions in animated characters"), *Finjan, Inc. v. Blue Coat Systems, Inc.*, 879 F.3d 1299, 1305 (Fed. Cir. 2018) (claims were directed to employing a new kind of file that enables a computer security system to do things it could not do before), or recite steps or rules that solve a technological problem *in the use of computers* in a particular way, *see, e.g., Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335–36 (Fed. Cir. 2016) (claims recite employing a particular database technique to improve how computers carry out storage and retrieval of data, i.e., a software method that improves the way the computers themselves operate); *Bascom Glob. Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1348–49 (Fed. Cir. 2016) (inventive concept in the non-conventional and non-generic arrangement of known, conventional pieces, including installation of a filtering tool at a specific location, remote from the end-users, with customizable filtering features specific to each end user, giving "the filtering tool both the benefits of a filter on a local computer and the benefits of a filter on the ISP server"). The Specification explains that the use of the "alignment tool" allows rapid assessment of a similarity between genomic sequences. (Spec. 3.) While the rules implicit in building the indices recited in the claims and the manner of comparing the data speed up the sequencing analysis, they do not improve computer technology per se. The claim instead invokes computers in the collection and arrangement of data. Claims with such character do not escape the abstract idea exception under *Alice* step one. *See, e.g., Smart Sys. Innovations, LLC v. Chicago Transit Authority*, 873 F.3d 1364, 1372–73 (Fed. Cir. 2018); *RecogniCorp LLP v. Nintendo Co. Ltd.*, 855 F.3d 1322, 1327 (Fed. Cir. 2017). That the

claimed method results in faster identifications does not take the claim out of the realm of the abstract. Our reviewing court has held that speed and accuracy increases stemming from the ordinary capabilities of a general purpose computer "do[] not materially alter the patent eligibility of the claimed subject matter." *Bancorp Servs., L.L.C. v. Sun Life Assurance Co. of Canada*, 687 F.3d 1266, 1278 (Fed. Cir. 2012).

Turning to *Alice* step-two, while the Examiner indicated in the Final Rejection that the claim recites additional elements beyond the abstract idea that are conventional (Final Action 5), in the Answer, the Examiner explained that the only additional element to the judicial exception is that "the process is computer mediated" (Ans. 3). We agree that claim 1 does not recite steps that are additional elements beyond the abstract idea. The steps of the method are simply collecting information, organizing it, and comparing it, which are abstract ideas. Indeed, Appellant does not argue that claim 1 includes unconventional steps beyond the abstract idea of collection, storage, and comparison of data that is the indexing and aligning using a hit table. Instead, Appellant simply argues that neither DNA nor RNA (recited in claims 18 and 19) is an abstract idea and that because the method is directed to rapidly assessing similarity between genomic sequences, the method of these claims is more than a pure abstract idea. (Br. 4) For the reasons discussed above, however, we disagree that the claim is not directed to an abstract idea even though it concerns sequence analysis of DNA and/or RNA. The fact that claims 1, 18, and 19 are limited to a particular field in which the data is organized and analyzed "does not render the claims any less abstract." *Affinity Labs of Tex., LLC v. DIRECTV, LLC*, 838 F.3d 1253, 1259 (Fed. Cir. 2016) (that "merely limiting the field of use

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of the abstract idea to a particular . . . environment does not render the claims any less abstract."); *see also Smart Sys.*, 873 F.3d at 1373; *Digitech Image Techs., LLC v. Elecs. for Imaging, Inc.*, 758 F.3d 1344, 1351 (Fed. Cir. 2014) (

> Without additional limitations, a process that employs mathematical algorithms to manipulate existing information to generate additional information is not patent eligible. "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) (internal quotations omitted)).

Indeed, "the absence of complete preemption does not demonstrate patent eligibility." *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1379 (Fed. Cir. 2015). "Where a patent's claims are deemed only to disclose patent ineligible subject matter under the [two-step] framework, as they are in this case, preemption concerns are fully addressed and made moot." *Id.*; *see also Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1321 (Fed. Cir. 2016) ("A narrow claim directed to an abstract idea, however, is not necessarily patent-eligible . . . ."); *OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359, 1362–63 (Fed. Cir. 2015) ("[T]hat the claims do not preempt all [inventions in the field] or may be limited to [certain processes in the field] do[es] not make them any less abstract.").

Appellant also asserts that the claimed invention is "a process for solving technical problems in the technical field of biotechnology." (Br. 5.) We disagree that the claimed invention solves a technical problem of the type that is patent-eligible. While the claims may be directed to an improvement in the processing of information, e.g., providing for "rapid assessment of a similarity between genomic sequences in a linear time

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O(M)" (*id.*at 5–6), collecting and processing information without more is within the realm of abstract ideas, as explained above. Moreover, even if the way in which the data is compiled were new, the compilation of data and its additional manipulation and storage in a particular way, which is the "writing alignment tool" (Br. 5) that provides for the rapid assessment (*see, e.g.*, Spec. 5–7), is still just a manipulation of information as such. "[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). Similarly, a claim for a beneficial abstract idea is still an abstract idea. *See Ariosa*, 788 F.3d at 1379–80.

Consequently, for the reasons discussed above, we sustain the Examiner's rejection of claim 1 under 35 U.S.C. § 101 as being directed to non-statutory subject matter.

Claims 2–19 have not been argued separately and therefore fall with claim 1. 37 C.F.R. § 41.37(c)(1)(iv).

SUMMARY

We affirm the rejection of claims 1–19 under 35 U.S.C. § 101 as being directed to non-statutory subject matter.

TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED