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Brown & Michaels (END)
c/o Brown & Michaels, PC
118 North Tioga Street
Suite 400
Ithaca, NY 14850

EXAMINER
NEGIN, RUSSELL SCOTT

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte THOMAS W. DEUTSCH, ROBERT R. FRIEDLANDER, JAMES R. KRAEMER, and JOSKO SILOBRCIC[1]

Appeal 2017-006170
Application 13/770,025
Technology Center 1600

Before ERIC B. GRIMES, JOHN E. SCHNEIDER, and DEVON ZASTROW NEWMAN, *Administrative Patent Judges*.

SCHNEIDER, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 involving claims to methods for reducing the amount of data representing a genetic sequence, which have been rejected as being directed to non-statutory subject matter. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

STATEMENT OF THE CASE

The Specification teaches that

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[1] Appellants identify the Real Party in Interest as International Business Machines Corporation. Appeal Br. 1.

> DNA gene sequencing of a human, for example, generates about 3 billion ($3x10^{9)}$ nucleotide bases. Currently, if one wishes to transmit, store or analyze this data, all 3 billion nucleotide base pairs are transmitted, stored and analyzed. The storage of the data associated with the sequencing is significantly large, requiring at least 3 gigabytes of computer data storage space to store the entire genome which includes only nucleotide sequenced data and no other data or information such as annotations. The movement of the data between institutions, laboratories and research facilities is hindered by the significantly large amount of data and the significant amount of storage necessary to contain the data.

Spec. ¶ 2.

The present invention is directed to a method for reducing an amount of "data representing a genetic sequence of an organism using a file distributed system." Spec. ¶ 8.

Claims 1–4, 8–11, and 15–18 are on appeal.[2] Claim 1 is representative of the rejected claims and reads as follows:

> 1. A method for reducing an amount of data representing a genetic sequence of an organism using a file distributed system comprising a series of clusters coupled together, each cluster having at least one master node and a plurality of worker nodes, comprising:
>
> a computer comprising one of the master nodes of one of the clusters of the file distributed system breaking a surprisal[3]

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[2] Claims 5–7, 12–14, and 19–21 are pending in the application but have been withdrawn from consideration as being directed to nonelected species. Final Act. 2.

[3] The Specification defines surprisal data as

> at least one nucleotide difference that provides an "unexpected value" relative to the normally expected value of the surprisal data filter. In other words, the surprisal data contains at least

data filter comprising a filter associated with identified characteristics of a generated hierarchy from reference genomes created by combining pieces of the reference genomes that correspond with the identified characteristics and an uncompressed genetic sequence into blocks of data of a fixed size;

the computer distributing the blocks of data to the plurality of worker nodes within the clusters and replicating the blocks of data within each of the worker nodes;

the computer tasking the plurality of worker nodes to perform a map job comprising mapping the surprisal data filter relative to the uncompressed genetic sequence by:

comparing nucleotides of the genetic sequence of the organism to nucleotides of the assigned part of the surprisal data filter, to find differences where nucleotides of the genetic sequence of the organism are different from the nucleotides of the surprisal data filter;

storing intermediate surprisal data in a key and value format in a repository of the cluster, the intermediate surprisal data comprising at least a starting location of the differences within the surprisal data filter, and the nucleotides from the genetic sequence of the organism which are different from the nucleotides the surprisal data filter, discarding sequences of nucleotides that are the same in the genetic sequence of the organism; and

reporting the status of the task to map the surprisal data filter to the uncompressed genetic sequence to the at least one master node of the cluster;

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one nucleotide difference present when comparing the sequence to the surprisal data filter. The surprisal data that is actually stored in the repository preferably includes a location of the difference within the surprisal data filter, the number of nucleotides that are different, and the actual changed nucleotides.

Spec. ¶ 32.

> when a worker node has reported a completion of the map job, the computer tasking the worker node with a reduce job based on a specific key, comprising:
>
> the worker node shuffling the intermediate surprisal data between the worker node and a plurality of worker nodes of other clusters, based on the specific key;
>
> the worker node reducing the intermediate surprisal data to an output of surprisal data and associated metadata.

Claims 1–4, 8–11, and 15–18 stand rejected under 35 U.S.C. § 101 as directed to non-statutory subject matter.

DISCUSSION

Issue

The issue is whether a preponderance of the evidence supports the Examiner's conclusion that claims 1–4, 8–11, and 15–18 are directed to non-statutory subject matter.

The Examiner finds that the rejected claims are directed to an abstract idea and are therefore directed to non-statutory subject matter. Final Act. 3–4. The Examiner finds that using a computer to distribute work between nodes is conventional and routine and does not represent something significantly more than the abstract idea. *Id.*

Appellants contend that the claimed method is patentable as the method does not fall within one of the four listed categories of abstract ideas identified by the USPTO and the courts. Appeal Br. 9. Appellants argue that the use of a computer does not automatically trigger an eligibility analysis. *Id.* Appellants contend that the specific steps recited in the claims represent something significantly more than the abstract idea of analyzing the genetic sequence data. *Id.* at 10.

Analysis

As stated in *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992):

> [T]he examiner bears the initial burden . . . of presenting a *prima facie* case of unpatentability. . . .
>
> After evidence or argument is submitted by the applicant in response, patentability is determined on the totality of the record, by a preponderance of evidence with due consideration to persuasiveness of argument.

Appellants do not persuade us that a preponderance of the evidence fails to support the Examiner's conclusion that the rejected claims recite subject matter ineligible for patenting under 35 U.S.C. § 101, which states 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, subject to the conditions and requirements of this title."

The Supreme Court has "long held that this provision contains an important implicit exception: Laws of nature, natural phenomena, and abstract ideas are not patentable." *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2354 (2014).

Our reviewing court has summarized the Supreme Court's two-part test for distinguishing between claims to patent-ineligible exceptions, and claims to patent-eligible applications of those exceptions, as follows:

> Step one asks whether the claim is "directed to one of [the] patent-ineligible concepts." [*Alice*, 134 S. Ct. at 2354]. If the answer is no, the inquiry is over: the claim falls within the ambit of § 101. If the answer is yes, the inquiry moves to step two, which asks whether, considered both individually and as an ordered combination, "the additional elements 'transform the nature of the claim' into a patent-eligible application." *Id.*

> (quoting *Mayo* [*Collaborative Services v. Prometheus Labs., Inc.*, 132 S. Ct. 1289, 1297 (2012)]). Step two is described "as a search for an 'inventive concept.'" *Id.* (quoting *Mayo*, 132 S.Ct. at 1294). At step two, more is required than "well-understood, routine, conventional activity already engaged in by the scientific community," which fails to transform the claim into "significantly more than a patent upon the" ineligible concept itself. *Mayo*, 132 S.Ct. at 1298, 1294.

Rapid Litigation Mgmt. Ltd. v. CellzDirect, Inc., 827 F.3d 1042, 1047 (Fed. Cir. 2016).

In the present case, claim 1 recites the steps of "breaking a surprisal data filter comprising a filter associated with identified characteristics of a generated hierarchy from reference genomes created by combining pieces of the reference genomes that correspond with the identified characteristics and an uncompressed genetic sequence into blocks of data of a fixed size," "distributing the blocks of data to the plurality of worker nodes within the clusters and replicating the blocks of data within each of the worker nodes," "tasking the plurality of worker nodes to perform a map job comprising mapping the surprisal data filter relative to the uncompressed genetic sequence," and comparing subsets of genetic sequences. Appeal Br. 13 (Claims Appendix).

Appellants contend that the method recited in the claims does not fall within one of the specific categories of abstract ideas found to be ineligible subject matter. Appeal Br. 9–10. We find this argument unpersuasive.

Each of the recited steps is a manipulation of data performed by a computer, which have been deemed patent-ineligible processes. *See Digitech Image Techs. v. Electronics 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."). Appellants provide no reason why any of the claimed steps is not a data manipulation. Thus, we agree with the Examiner (Ans. 2) that the recited steps involve mathematical manipulations of computational data which falls within the category of mathematical relationships.

As to part two of the Supreme Court's test, Appellants contend that the recited steps represent something significantly more than an abstract idea rendering the method eligible for patent protection. Appeal Br. 10–11.

Appellants argue "[t]he independent claims are all tied to a method of using a file distributed system comprising a series of clusters coupled together, each cluster having at least one master node and a plurality of worker nodes, which in and of itself recites more physical structure than just an abstract idea or using a generic computer." Appeal Br. 10. Appellants go on to argue that "Clearly, all of these steps and/or program instructions, performed by a file distributed system with clusters and nodes, is 'significantly more' than just an abstract idea. The actions of the computers of the file distributed system are not generic, nor are they simply routine." Appeal Br. 11. This argument not persuasive because as the Examiner points out, all of the limitations recited by Appellants as representing something significantly more are themselves abstract ideas. *Id.* Appellants have offered nothing persuasive to support their contention that the recited steps represent something significantly more than abstract ideas. *Id.* Appellants' argument merely paraphrases the claim limitations and

requirements for patentability supplied by the case law. Appellants offer no persuasive rationale or evidence to support their contention that the additional claim elements are not routine or conventional.

Moreover, the instant Specification supports a finding that such elements are conventional. The Specification at page 6 teaches that a Hadoop® distributed file system can be used to reduce the genetic sequence data into small blocks which are then distributed to different nodes. Spec. 6. The Specification also teaches that Hadoop® was known in the art at the time the invention was made. *See,* Spec. 1.

We, therefore, agree with the Examiner that, under the Supreme Court's two-part test, claim 1 recites subject matter ineligible for patenting under § 101.

As discussed above, the recited steps themselves are abstract ideas and do not render the claimed method patentable.

In sum, for the reasons discussed, Appellants do not persuade us that a preponderance of the evidence fails to support the Examiner's conclusion that Appellants' claims 1–4, 8–11, and 15–18 are patent-ineligible under § 101. Accordingly, we affirm the Examiner's rejection of claims 1–4, 8–11, and 15–18.

SUMMARY

We affirm the rejection under 35 U.S.C. § 101.

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