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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* ROBERT R. FRIEDLANDER and JAMES R. KRAEMER<sup>1</sup>

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Appeal 2016-008135  
Application 13/870,324  
Technology Center 1600

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Before RICHARD J. SMITH, RYAN H. FLAX, and  
RACHEL H. TOWNSEND *Administrative Patent Judges*.

FLAX, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134(a) involving claims directed to a method of providing secure access to data representing a genetic sequence of an organism to at least one user requesting access to the data. Claims 1–11 are on appeal as rejected under 35 U.S.C. § 101. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

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<sup>1</sup> Appellants identify the Real Party in Interest as “International Business Machines Corporation.” Appeal Br. 1.

## STATEMENT OF THE CASE

The Specification states, “[t]he present invention relates to encryption of data, and more specifically to the encryption and storage of genetic surprisal data.” Spec. ¶ 2. The Specification further states, “[a]ccording to one embodiment of the present invention, a method of providing secure access to data representing a genetic sequence of an organism to at least one user requesting access to the data, the user having a private key and a public key related to the private key” and “[p]ublic key cryptography is a cryptography system that uses two separate keys to encrypt data, a public key and a private key. The public key, which can be freely distributed, is related mathematically to the private key”; the public key can be “a username and password or identification number, etc., as is commonly known in the art.” *Id.* ¶¶ 4, 5, 31. The Specification further states, “[t]he illustrative embodiments also recognize that with the small amount of differences present between the genetic sequence from two humans, the ‘common’ or ‘normally expected’ sequences of nucleotides can be compressed out or removed to arrive at ‘surprisal data’ -differences of nucleotides which are ‘unlikely’ or ‘surprising’ relative to the common sequences, for example of a filter.” *Id.* ¶ 11.

Claims 1 and 8 are the independent claims. Claim 1 is representative and is reproduced below:

1. A method of providing secure access to data representing a genetic sequence of an organism to at least one user requesting access to the data, the user having a private key and a public key related to the private key, the method comprising the steps of:

- a source computer comparing nucleotides of the genetic sequence of the organism to nucleotides from a reference

genome, to find differences where nucleotides of the genetic sequence of the organism which are different from the nucleotides of the reference genome;

the source computer using the differences to create and store surprisal data and associated metadata in a repository, the surprisal data and associated metadata comprising a starting location of the differences within the reference genome, and the nucleotides from the genetic sequence of the organism which are different from the nucleotides of the reference genome, discarding sequences of nucleotides that are the same in the genetic sequence of the organism and the reference genome;

the source computer receiving a request from a user for specific surprisal data and associated metadata;

the source computer retrieving the specific surprisal data and associated metadata indicated by the user within the repository;

the source computer using the public key of the user to encrypt the specific surprisal data and associated metadata to produce encrypted specific surprisal data and associated metadata;

the source computer sending the encrypted specific surprisal data and associated metadata to a repository accessible to the user, the repository having a location indicator for accessing the repository over a network; and

the source computer sending the location indicator to the user.

Appeal Br. 10 (Claims App'x).

The following rejection is appealed:

Claims 1–11 stand rejected under 35 U.S.C. § 101 as directed to patent-ineligible subject matter. Final Action 3.

## DISCUSSION

We adopt the Examiner’s findings of fact, reasoning on scope and content of the claims and prior art, and conclusions set out in the Final Action and Answer. Final Action 3–4; Answer 2–3. Findings of fact indicated below are provided to highlight evidence of record.

Only those arguments made by Appellants in the Appeal Brief and properly presented in the Reply Brief have been considered in this Decision. Arguments not so presented in the Briefs are waived. *See* 37 C.F.R. § 41.37(c)(1)(iv) (2015); *see also Ex parte Borden*, 93 U.S.P.Q. 2d 1473 (BPAI 2010) (informative) (“Any bases for asserting error, whether factual or legal, that are not raised in the principal brief are waived.”).

“[T]he examiner bears the initial burden, on review of the prior art ***or on any other ground***, of presenting a *prima facie* case of unpatentability. If that burden is met, the burden of coming forward with evidence or argument shifts to the applicant.” *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992) (emphasis added).

“Phenomena of nature, though just discovered, mental processes, and abstract intellectual concepts are not patentable, as they are the basic tools of scientific and technological work.” *Mayo Collaborative Servs. v. Prometheus Labs, Inc.*, 566 U.S. 66, 71 (2012) (quoting *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972)). Claims directed to *nothing more than* abstract ideas (such as mathematical algorithms), natural phenomena, and laws of nature are not eligible for patent protection. *Diamond v. Diehr*, 450 U.S. 175, 185 (1981); accord MPEP § 2106 (II) (discussing *Diehr*).

In analyzing patent-eligibility questions under 35 U.S.C. § 101, the Supreme Court instructs us to “first determine whether the claims at issue are directed to a patent-ineligible concept.” *Alice Corp. Pty Ltd. v. CLS Bank Int’l*, 134 S. Ct. 2347, 2355 (2014). If the initial threshold is met, we then move to a second step and “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.” *Id.* (quoting *Mayo*, 566 U.S. at 97).

The Federal Circuit has “recognize[d] that defining the precise abstract idea of patent claims in many cases is far from a ‘straightforward’ exercise.” *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1150 (Fed. Cir. 2016) (quoting *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1257 (Fed. Cir. 2014)). However, “we continue to ‘treat[ ] analyzing information by steps people [could] go through in their minds, or by mathematical algorithms, without more, as essentially mental processes within the abstract-idea category.’” *Id.* at 1146–47 (quoting *Electric Power Group, LLC v. Alstom S.A.*, 830 F.3d 1350, 1354 (Fed. Cir. 2016) (citations omitted); *see also Electric Power Group*, 830 F.3d at 1353 (“collecting information, analyzing it, and displaying certain results of the collection and analysis” “fall[s] into a familiar class of claims ‘directed to’ a patent-ineligible concept,” that of the abstract idea). The Federal Circuit has recognized that “a claim for a *new* abstract idea is still an abstract idea.” *Synopsys*, 839 F.3d at 1151.

Further, in *In re BRCA1*, the Federal Circuit held that a claimed method for screening a germline of a human subject for an alteration of the

BRCA1 gene by comparing a sample BRCA1 gene sequence with a reference, wild-type germline sequence of BRCA1 gene was directed to an abstract idea — a “mental process of ‘comparing’ and ‘analyzing’ two gene sequences.” *In re BRCA1– and BRCA2–Based Hereditary Cancer Test Patent Litigation*, 774 F.3d 755, 763–64 (Fed. Cir. 2014) (“allowing a patent on the comparison step could impede a great swath of research relating to the BRCA genes, and it is antithetical to the patent laws to allow these basic building blocks of scientific research to be monopolized.”).

Moreover, the Federal Circuit, in *Intellectual Ventures I LLC v. Capital One Financial Corp.*, 850 F.3d 1332 (Fed. Cir. 2017), where the claims were held to be directed to a computer programmed to edit XML documents, “conclude[d] [the claims were] . . . at their core, directed to the abstract idea of collecting, displaying, and manipulating data.” *Id.* at 1339–40. Even though the patent at issue in *Intellectual Ventures I* indicated its invention provided a concrete solution to a particular problem in computer programming, it “at best, . . . limit[ed] the invention to a technological environment for which to apply the underlying abstract concept,” which does “not render an otherwise abstract concept any less abstract.” *Id.* at 1340 (citing *Affinity Labs of Tex., LLC v. DIRECTV, LLC*, 838 F.3d 1253, 1259 (Fed. Cir. 2016)). Under step two of the *Alice* analysis, the *Intellectual Ventures I* Court held that claims reciting generic computer components or elements and their functions, e.g., organizing, mapping, identifying, defining, detecting, and modifying, “merely describe the functions of the abstract idea itself” and are not sufficient to supply significantly more than the abstract idea so as to confer patent-eligibility. *Id.* at 1341.

The Federal Circuit has established in several other holdings that collecting, classifying, storing, and organizing data, regardless of whether such data manipulations are limited to a particular environment, is an abstract idea and, without more, is not patent eligible. *See, e.g., In re TLI Communications LLC Patent Litigation*, 823 F.3d 607 (Fed. Cir. 2016) (collecting and organizing data in the form of digital images is abstract and patent ineligible and using computer systems in their generic ways does not add an inventive concept); *Content Extraction and Transmission LLC v. Wells Fargo Bank, Nat'l Ass'n*, 776 F.3d 1343 (Fed. Cir. 2014) (extracting data from documents, recognizing information therefrom, and storing the information is abstract).

Under the above-cited precedent and in view of the facts presented, we conclude the Examiner's determination under *Alice* step one, that the claims are directed to an abstract idea (using a computer to find differences between genomes by comparing the sequences and providing that data regarding the differences upon request via secure access through public key encryption and private key decryption of the data), is reasonable and discern no error therein. Simply put, “[i]nformation as such is an intangible,” and collecting it and analyzing it by mathematical algorithm without more are abstract, and presenting that information with routine tools “is abstract as an ancillary part of such collection and analysis.” *Electric Power Group*, 830 F.3d at 1353–54. Further, we also conclude the Examiner's determination under *Alice* step two, that in analyzing the remaining claimed subject matter individually and as an ordered combination, the claimed data manipulation is performed by routine computer-aided processing of that data including data



encryption using mathematical algorithms, is reasonable and without error. *See* Answer 3 (referencing “other similar algorithms of genetic data encryption in the prior art”); *see also* Gatawood<sup>2</sup> Abstract (disclosing “[s]ystems and methods . . . for compressing and comparing data such as genomic data” via computer systems), *id.* ¶ 6 (disclosing SNP discovery projects); Markowitz<sup>3</sup> Abstract (disclosing “a common interface for multiple databases containing [genetic data]”), *id.* ¶¶ 129–30 (teaching security protection for the genetic information based on user profiles); Von Hoff<sup>4</sup> Fig. 6 (disclosing computer networks for storing, identifying, comparing, and accessing patient biomarker information), *id.* ¶ 36 (teaching the system contemplates known security measures including identity solutions). The claims do not require a new source or type of information, or new techniques or programming for analyzing it or transferring it. Rather, they merely require selection of information, manipulation of that data for analytical purposes, using a conventional computer system or network programmed to do so, including to ready the data for secure transfer, something that is evidenced to be routine and customary; such steps do not transform the abstract ideas of the claims into a patent-eligible invention. *See, e.g., Electric Power Group*, 830 F.3d at 1355.

We have considered Appellants’ arguments and find them unpersuasive. Appellants argue the claims are not directed to an abstract idea because the Examiner has not classified such under one of the abstract

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<sup>2</sup> US 2008/0077607 A1 (pub. Mar. 27, 2008) (“Gatawood”).

<sup>3</sup> US 2003/0100999 A1 (pub. May 29, 2003) (“Markowitz”).

<sup>4</sup> US 2010/0113299 A1 (pub. May 6, 2010) (“Von Hoff”).

ideas listed in the Examples provided by the USPTO as of the date of the Appeal Brief. Appeal Br. 6–7. This is not persuasive because, under the precedent cited above, the claims are directed to a computer based implementation of determining genetic code differences of organisms (something that could be done by hand and is merely the act of collecting information), and providing that data securely upon request, which is established as abstract.

Appellants argue the claims recite something “significantly more” so as to provide an inventive concept, e.g., per an analysis under *Alice* step two. *Id.* at 7–8. Appellants point to the “secure access” concept of the claims, as well as to the method steps recited, e.g., comparing nucleotides, using differences to create and store suprisal data, metadata, querying a system, using public and private security keys, etc., as the something more. *Id.* As discussed, the steps and concepts identified are merely the manipulation of data via mathematical algorithms, using well known, routine, conventional computer/data related means. As the case law makes clear, such steps cannot supply the *something more* to confer patent-eligibility to an otherwise ineligible claim.

For the reasons set forth above, we affirm the rejection.

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Application 13/870,324

SUMMARY

The rejection of the claims as directed to patent-ineligible subject matter is affirmed.

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