UNITED STATES PATENT AND TRADEMARK OFFICE

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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 WILLIAM J. BOSL

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Appeal 2018-006301
Application 13/816,645
Technology Center 3700

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Before JENNIFER D. BAHR, MICHAEL J. FITZPATRICK, and
MICHELLE R. OSINSKI, *Administrative Patent Judges*.

FITZPATRICK, *Administrative Patent Judge*.

DECISION ON APPEAL

William J. Bosl ("Appellant")[1] appeals under 35 U.S.C. § 134(a) from
the Examiner's final decision rejecting claims 1, 8–20, 22, 23, 26–29, 31–33,
and 36–38. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

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[1] The real party in interest is identified as Children's Medical Center
Corporation. Appeal Br. 2.

STATEMENT OF THE CASE

The Specification

The Specification states:

> This invention relates generally to the analysis of electromagnetic signals to identify biomarkers for cognitive, language and behavioral disorders, of known or unknown etiology (collectively referred to herein as 'developmental disorders'), and more specifically to analyzing EEG data using complexity and/or synchronization measures in infants to identify characteristics associated with developmental disorders including autism spectrum disorder (ASD).

Spec. ¶1.

The Rejected Claims

Claims 1, 8–20, 22, 23, 26–29, 31–33, and 36–38 stand rejected.

Final Act. 1.[2] Claims 1, 26, 28, and 31 are independent. Appeal Br. 17, 20–21. Claim 1 is representative and reproduced below.

> 1. A method of analyzing electroencephalographic (EEG) data including measurements recorded from multiple scalp locations of a patient to assess the risk that the patient has autism spectrum disorder, the method comprising:
>
> collecting the EEG data from the patient at different developmental time points;
>
> applying to the EEG data collected at each of the developmental time points, with at least one computer processor, a multi-scale entropy analysis to the EEG data to generate a plurality of feature sets corresponding to the measurements at multiple scalp locations;
>
> combining the plurality of feature sets into a combined feature set;

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[2] Claims 2–7, 21, 24, 25, 30, 34, 35, and 39 are cancelled, and claim 40 is withdrawn from consideration. Appeal Br. 17, 19–22; Final Act. 1.

> classifying, using at least one machine learning algorithm, the combined feature set; and

> determining a risk factor for the patient having autism spectrum disorder based, at least in part, on the classified combined feature set.

Appeal Br. 17.

The Appealed Rejection

The following rejection is before us for review: claims 1, 8–20, 22, 23, 26–29, 31–33, and 36–38 under the judicial exception to 35 U.S.C. § 101.

DISCUSSION

Section 101 of Title 35 of the U.S. Code 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, subject to the conditions and requirements of this title." 35 U.S.C. § 101. However, the Supreme Court has "long held that this provision contains an important implicit exception: [l]aws of nature, natural phenomena, and abstract ideas are not patentable." *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014).

In analyzing patent-eligibility questions under the judicial exception to 35 U.S.C. § 101, we "first determine whether the claims at issue are directed to a patent-ineligible concept." *Alice*, 573 U.S. at 218. If the claims are determined to be directed to an ineligible concept, then 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

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claim' into a patent-eligible application." *Id.* at 217 (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 77 (2012)).

On January 7, 2019, the Director issued "2019 Revised Patent Subject Matter Eligibility Guidance," which explains how the Director requires that patent-eligibility questions under the judicial exception to 35 U.S.C. § 101 be analyzed. 84 Fed. Reg. 50–57 ("Revised Guidance").

Per the Revised Guidance, the first step of *Alice* (i.e., Office Step 2A) consists of two prongs. In Prong One, we must determine whether the claim recites a judicial exception, i.e., an abstract idea, a law of nature, or a natural phenomenon. 84 Fed. Reg. at 54 (Section III.A.1.). If it does not, the claim is patent eligible. *Id.* With respect to the abstract idea category of judicial exceptions, an abstract idea must fall within one of the enumerated grouping of abstract ideas in the Revised Guidance or be a "tentative abstract idea," with the latter situation predicted to be rare. *Id.* at 51–52 (Section I, enumerating three groupings of abstract ideas), 54 (Section III.A.1., describing Step 2A Prong One), 56–57 (Section III.D., explaining the identification of claims directed to a tentative abstract idea).

If a claim does recite a judicial exception, we proceed to Step 2A Prong Two, in which we must determine if the "claim as a whole integrates the recited judicial exception into a practical application of the exception." *Id.* at 54 (Section II.A.2.) If it does, the claim is patent eligible. *Id.*

If a claim recites a judicial exception but fails to integrate it into a practical application, we then proceed to the second step of *Alice* (i.e., Office Step 2B). In that step, we then evaluate the additional limitations of the claim, both individually and as an ordered combination, to determine

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whether they provide an inventive concept. *Id.* at 56 (Section III.B.). In particular, we look to whether the claim:

- Adds a specific limitation or combination of limitations that are not well-understood, routine, conventional in the field, which is indicative that an inventive concept may be present; or

- simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception, which is indicative that an inventive concept may not be present.

Id.

The Independent Claims

Appellant argues the independent claims, namely claims 1, 26, 28, and 31, together. Appeal Br. 9–14. Accordingly, we select independent claim 1 as representative. *See* 37 C.F.R. § 41.37(c)(1)(iv).

Revised Guidance Step 2a Prong One

In this part of Step 2a, we determine whether claim 1 is directed to an abstract idea. As set forth below, we determine that claim 1 is directed to multiple abstract ideas.

Claim 1 recites a method consisting of five steps.

The second step of the claim recites "applying to the EEG data collected at each of the developmental time points, with at least one computer processor, a multi-scale entropy analysis to the EEG data to generate a plurality of feature sets corresponding to the measurements at multiple scalp locations." This step is directed to an abstract idea in the category of mental processes, namely an evaluation of information. It merely requires the analyzing of data, which is a form of evaluation.

Moreover, the analysis is recited to be a multi-scale entropy analysis, which the Specification states is an algorithm employing a mathematical function. Spec. ¶26. Hence, the second step of the claim is also directed to an abstract idea in the mathematical concepts category, namely a mathematical calculation.

The third step of the claim recites "combining the plurality of feature sets into a combined feature set." This step is directed to an abstract idea in the category of mental processes, namely the arrangement and storing of information.

The fourth step of the claim recites "classifying, using at least one machine learning algorithm, the combined feature set." This step is directed to an abstract idea in the category of mental processes, namely making an evaluation or judgment regarding information or knowledge.

The fifth and final step of the claim recites "determining a risk factor for the patient having autism spectrum disorder based, at least in part, on the classified combined feature set." This step is directed to an abstract idea in the category of mental processes, namely making an evaluation, judgment, or opinion regarding information or knowledge.

<u>Revised Guidance Step 2a Prong Two</u>

In this prong of Step 2a, we determine whether claim 1 as a whole integrates any of the recited judicial exceptions into a practical application of the exception. We determine that claim 1 as a whole does not integrate any of the recited judicial exceptions into a practical application of the exception. This is so because claim 1 merely requires the receipt and processing of information.

More specifically, the only step of claim 1 that *might* not recite an abstract idea is the first step, which recites "collecting the EEG data from the patient at different developmental time points."[3] This step merely adds insignificant extra-solution activity to the judicial exception, which is insufficient to integrate the judicial exceptions into a practical application. *See* 84 Fed. Reg. at 55, n.31; MPEP 2106.05(g).

Revised Guidance Step 2b

In Step 2b, we evaluate the additional limitations of the claim, both individually and as an ordered combination, to determine whether they provide an inventive concept. *Id.* at 56 (Section III.B.). However, claim 1 does not include any additional limitations beyond the recitations of abstract ideas and insignificant extra-solution activity, as discussed above. The only specific element called out in claim 1 is "at least one computer processor" which applies an entropy analysis to collected EEG data. The Specification broadly describes computers as including memories, processors, user input devices, and any suitable software that may be executed by the computer to

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[3] In *Electric Power Group*, the Federal Circuit referred to "collecting and analyzing information" as "abstract processes." *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1354 (Fed. Cir. 2016). Further, the Court held that claims to "a process of gathering and analyzing information of a specified content, then displaying the results, and not any particular assertedly inventive technology for performing those functions [are] directed to an abstract idea." *Id.* Here, claim 1 recites the gathering and analyzing of information but does not even require displaying the result of the process (i.e., the risk factor that was determined). Thus, Appellant's claim 1, in one way, is even more abstract than the claims at issue in *Electric Power Group*. Like *Electric Power Group*, claim 1 does not recite any particular technology for performing the steps of data gathering and analysis.

perform the described functions. Spec. ¶54. The claimed computer processor performs in a conventional manner to execute program instructions and operations, such as data-gathering and mathematical calculation functions. *See* MPEP § 2106.05(g) (supporting that performing repetitive calculations and storing and retrieving information in memory are well-understood, routine and conventional computer functions). Thus, claim 1 simply appends well-understood, routine, and conventional elements, specified at a high level of generality, to the judicial exception.

For the foregoing reasons, we affirm the rejection of claim 1 as patent ineligible, as well as claims 26, 28, and 31, which fall therewith. *See* 37 C.F.R. § 41.37(c)(1)(iv).

The Dependent Claims

Appellant argues that "[s]everal of the dependent claims include additional technical limitations that further demonstrate that the claims are directed to patent-eligible subject matter under 35 U.S.C. § 101." Appeal Br. 14. Appellant specifically addresses only claims 8 and 13. *Id.* Accordingly, we select claims 8 and 13 as representative of the dependent claims. *See* 37 C.F.R. § 41.37(c)(1)(iv).

Claim 8 recites the following:

> The method of claim 1, wherein applying a multi-scale entropy analysis to the EEG data comprises:

> determining a plurality of scale time series, wherein values in each of the plurality of scale time series are determined by a coarse-graining procedure that involves averaging N successive values from the EEG data, where $N > 1$;

> determining an entropy value for each of the plurality of scale time series; and

> > determining at least one modified multiscale entropy curve based, at least in part, on the entropy values determined for each of the plurality of scale time series.

Appeal Br. 17.

> Claim 13 recites the following:

> > The method of claim 1, further comprising:

> > applying a synchronization analysis to the EEG data, wherein synchronization comprises correlation and coherence,

> > wherein each of the feature sets in the plurality of feature sets represents the results from applying both the multi-scale entropy analysis and the synchronization analysis to the EEG data.

Id. at 18.

> Appellant quotes these claims and argues that "[t]he Final Office Action does not describe how the Office is allegedly considering [these additional limitations] to be well-understood, routine, or conventional functions of a general purpose computer." *Id.* at 14. But Appellant's argument erroneously presupposes that these limitations do not themselves recite abstract ideas. Indeed, they do. More specifically, they recite abstract ideas in the mental processes category, namely an evaluation of information, and in the mathematical concepts category, namely a mathematical calculation. Thus, claims 8 and 13 do not have any additional limitations beyond those reciting abstract ideas to consider in Step 2B.

> For the foregoing reasons, we affirm the rejection of claims 8 and 13 as patent ineligible, as well as claims 9–12, 14–20, 22, 23, 27, 29, 32, 33, and 36–38, which fall therewith. *See* 37 C.F.R. § 41.37(c)(1)(iv).

DECISION

The Examiner's rejection of claims 1, 8–20, 22, 23, 26–29, 31–33, and 36–38 under the judicial exception to 35 U.S.C. § 101 is affirmed.

TIME PERIOD

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