UNITED STATES PATENT AND TRADEMARK OFFICE

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Boston Scientific Neuromodulation Corp.
c/o Lowe Graham Jones
701 Fifth Avenue
Suite 4800
Seattle, WA 98104

EXAMINER
SECK, ABABACAR

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte J. LUIS LUJAN, ASHUTOSH CHATURVEDI,
and CAMERON MCINTYRE

Appeal 2018-000757
Application 13/839,906
Technology Center 2100

Before JOHN A. JEFFERY, JOHN D. HAMANN, and JOYCE CRAIG,
Administrative Patent Judges.

JEFFERY, *Administrative Patent Judge.*

DECISION ON APPEAL

Appellants[1] appeal under 35 U.S.C. § 134(a) from the Examiner's
decision to reject claims 1–3, 5, 7, 8, 10–16, 18, and 21–25. We have
jurisdiction under 35 U.S.C. § 6(b). We affirm.

STATEMENT OF THE CASE

Appellants' invention estimates a region for activating tissue, such as
for stimulating a patient's brain or spinal cord. To this end, a volume of
activation of tissue is determined using a parametric equation that is a
function of an input vector that includes stimulation parameters. After

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[1] Appellants identify the real party in interest as Boston Scientific
Neuromodulation Corporation. App. Br. 2.

receiving input data, the input vector is applied to the function to obtain parameters for the parametric equation. The equation is then solved to obtain a calculated volume of activation. *See generally* Abstract; Spec. ¶ 2. Claim 1 is illustrative:

> 1. A computer-implemented method, comprising:
> having one or more parametric equations that define a volume of activation, wherein the one or more parametric equations represent a geometric shape, wherein the parameters for the one or more parametric equations are given as a function of an input vector that includes stimulation parameters;
> receiving input data that includes values for the stimulation parameters and defining the input vector using the input data:
> applying the input vector to the function and obtaining the parameters for the one or more parametric equations;
> solving the parametric equation to calculate the volume of activation;
> displaying the calculated volume of activation on a display screen;
> comparing the calculated volume of activation to a target volume; and
> based on the comparison, initiating delivery of the stimulation parameters for the calculated volume of activation to an electrical stimulation device for delivery of electrical stimulation to a patient according to the stimulation parameters.

THE REJECTION

The Examiner rejected claims 1–3, 5, 7, 8, 10–16, 18, and 21–25 under 35 U.S.C. § 101 as directed to ineligible subject matter. Ans. 3–9.[2]

FINDINGS AND CONTENTIONS

The Examiner finds that the claimed invention is directed to an abstract idea, namely (1) mathematical relationships or formulas for

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[2] Throughout this opinion, we refer to (1) the Appeal Brief filed February 13, 2017 ("App. Br."); (2) the Examiner's Answer mailed September 6, 2017 ("Ans."); and (3) the Reply Brief filed October 10, 2017 ("Reply Br.").

calculating a volume of activation, and (2) an idea of itself by collecting, analyzing, and displaying associated results. Ans. 3–5, 21–23. According to the Examiner, the claimed elements do not add significantly more to the abstract idea to render the claimed invention patent-eligible. Ans. 5–6, 21–23.

Appellants argue that the claims are not directed to an abstract idea, but rather describe a specific way to solve the problem of producing an accurate and realistic calculated volume of activation, namely by using parametric equations. App. Br. 5–12; Reply Br. 2–11. According to Appellants, this technique requires less time and computational resources to obtain a volume of activation as compared to previous methods. Reply Br. 5.

ISSUE

Has the Examiner erred in rejecting claims 1–3, 5, 7, 8, 10–16, 18, and 21–25 by concluding that they are directed to ineligible subject matter under § 101? This issue turns on whether the claimed invention is directed to a patent-ineligible abstract idea and, if so, whether the claims' elements—considered individually and as an ordered combination—transform the nature of the claims into a patent-eligible application of that abstract idea.

ANALYSIS

To determine whether claims are patent-eligible under § 101, we apply the Supreme Court's two-step test articulated in *Alice Corp. Proprietary Ltd. v. CLS Bank International*, 134 S. Ct. 2347 (2014). First, we determine whether the claims are directed to a patent-ineligible concept:

laws of nature, natural phenomena, and abstract ideas. *Id.* at 2354–55. If so, we then proceed to the second step and examine the claim's elements—both individually and as an ordered combination—to determine whether the claim contains an "inventive concept" sufficient to transform the claimed abstract idea into a patent-eligible application. *Id.* at 2357.

Alice Step One

Applying *Alice* step one, we agree with the Examiner that the claimed invention is directed to an abstract idea, namely (1) mathematical relationships or formulas for calculating a volume of activation, and (2) an idea of itself by collecting, analyzing, and displaying associated results. Ans. 3–5, 21–23.

Independent claim 1 recites, among other things, at least one parametric equation that defines a volume of activation, where the equation's parameters are given as a function of an input vector that includes stimulation parameters. Input data is received that includes values for the stimulation parameters, and the input data is used to define the input vector that is applied to the function. The equation's parameters are obtained, and the equation is solved to calculate the volume of activation that is then displayed on a screen. Based on comparing the calculated volume of activation to a target volume, delivery of stimulation parameters for the calculated volume of activation to an electrical stimulation device is initiated *for* delivering electrical stimulation to a patient according to the stimulation parameters.

Our emphasis underscores that claim 1 does not recite electrically stimulating the patient according to the stimulation parameters, but rather

initiating delivery of those parameters *for* delivery of electrical stimulation to a patient—an intended use of those parameters that may or may not occur at some future time. *Accord* Ans. 22 (noting that the claimed invention does not use the stimulation parameters to stimulate the patient). Nor does the claim require actually delivering the stimulation parameters to stimulate the patient, but rather *initiating* their delivery.

As the Specification explains, the invention uses a parametric equation to determine the volume of activation of neural tissue, where the equations can represent various geometric shapes, such as ellipsoids. Spec. ¶ 75. Stimulation parameters, that can include voltage or current amplitude, frequency, pulse width, and pulse shape, are received as input data. *Id.* This received input data is then used to define the input vector for the function whose output can then be calculated and used to define parametric equation parameters. Spec. ¶ 76. The equation is then solved for the volume of activation. *Id.*

As shown in Appellants' Figure 1, a correlator 42 mathematically correlates a selected target volume and an output volume of tissue activation (VTA) 12 to calculate a volume or area of overlap between the output VTA and the model volume represented by the target VTA. Spec. ¶ 55. The corresponding results are then reproduced for visual presentation on display 40. *Id.*

When read in light of this disclosure, claim 1 is, in essence, directed to (1) a mathematical algorithm, and (2) collecting, analyzing, and displaying associated results—both of which are abstract ideas as the Examiner indicates. Ans. 3–5, 21–23. That the claimed invention is directed to a combination of abstract ideas is of no consequence here, for it is well settled

that adding one abstract idea to another does not render the claim non-abstract. *See RecogniCorp, LLC v. Nintendo Co., Ltd.*, 855 F.3d 1322, 1327 (Fed. Cir. 2017). As in *RecogniCorp*, the recited process (1) starts with data, (2) adds an algorithm, and (3) ends with a new form of data, namely a volume of activation—an abstract idea. *See id.* (citing *Digitech Image Technologies, LLC v. Electronics for Imaging, Inc.*, 758 F.3d 1344 (Fed. Cir. 2014)).

Notably, the claimed invention is analogous to the mathematical algorithm at issue in *Gottschalk v. Benson*, 409 U.S. 63 (1972). In *Benson*, the U.S. Supreme Court held that claims involving a mathematical algorithm and directed to a method for converting binary-coded-decimal (BCD) numerals into pure binary numerals for use with a computer were ineligible under § 101. *Benson*, 409 U.S. at 68–72. That technique is analogous to the case here, given the recited mathematical algorithm where a parametric equation is solved to calculate a volume of activation. *Accord Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1354 (Fed. Cir. 2016) (noting that analyzing information by steps people go through in their minds, or by mathematical algorithms, without more, are essentially mental processes within the abstract idea category); *Ex parte Gutta*, 93 USPQ2d 1025, 1027–35 (BPAI 2009) (precedential) (holding that claims directed to a mathematical algorithm, namely identifying mean items by (1) computing a symbolic value variance, and (2) selecting a mean item with a symbolic value minimizing the variance, were ineligible under § 101).

That this calculated volume of activation is displayed and compared to a target volume does not render the claim less abstract, for these steps merely collect, analyze, and display associated results as the Examiner

indicates. Ans. 5. *See Elec. Power*, 830 F.3d at 1354 (noting that merely presenting the results of abstract processes of collecting and analyzing information, without more (such as identifying a particular tool for presentation), is abstract as an ancillary part of such collection and analysis). Similar to the claims at issue in *Electric Power*, the claimed invention here gathers, manipulates, analyzes, and presents information of a specified content, but does not use any particular inventive technology for performing those functions.

Appellants' reliance on *McRO, Inc. v. Bandai Namco Games America, Inc.*, 837 F.3d 1299 (Fed. Cir. 2016) (App. Br. 6–7; Reply Br. 3–6, 11) is unavailing. There, the claimed process used a combined order of specific rules that rendered information in a specific format that was applied to create a sequence of synchronized, animated characters. *McRO*, 837 F.3d at 1315. Notably, the recited process *automatically animated characters* using particular information and techniques—an improvement over manual three-dimensional animation techniques that was not directed to an abstract idea. *Id.* at 1316.

But unlike *McRO*, the claimed invention here (1) uses a mathematical algorithm to solve an equation, (2) displays the associated results, and (3) compares those results with other data to provide a basis for initiating delivery of stimulation parameters. Although these steps may be beneficial, a claim for a useful or beneficial abstract idea is still an abstract idea. *See Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1379–80 (Fed. Cir. 2015).

Alice Step Two

Nor do the recited elements—considered individually and as an ordered combination—transform the nature of the claims into a patent-eligible application of the abstract idea to ensure that the claimed invention amounts to significantly more than that idea. *See Alice*, 134 S. Ct. at 2357.

That the claims recite computer implementation does not change our conclusion, for the claimed invention merely uses generic computing components to implement the recited abstract idea. *Accord* Spec. ¶ 83 (noting that computer-executable instructions associated with the disclosed invention can be provided to a processor of general-purpose computer); *Id.* ¶ 85 (noting that computer system 500 in Figure 7 can be a general-purpose networked computer system). Merely reciting these generic computing components cannot transform a patent-ineligible abstract idea into a patent-eligible invention. *Alice*, 134 S. Ct. at 2358. In other words, merely reciting an abstract idea while adding the words "'apply it with a computer'" does not render an abstract idea non-abstract: there must be more. *See id.* at 2359.

Indeed, these generic computing components merely do that which can be performed mentally or with a pen and paper—exclusive functions ineligible for patent protection under § 101. *See CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1372, 1375 (Fed. Cir. 2011) ("That purely mental processes can be unpatentable, even when performed by a computer, was precisely the holding of the Supreme Court in [*Benson*]"). Nor does the claimed invention improve the computer's functionality or efficiency, or otherwise change the way that device functions. *Cf. Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335 (Fed. Cir. 2016).

To be sure, Appellants' disclosed invention requires less time and computational resources to obtain a volume of activation as compared to previous methods as Appellants indicate. Reply Br. 5 (citing Spec. ¶¶ 62–68). But "[u]sing a computer to accelerate an ineligible mental process does not make that process patent-eligible." *Bancorp Services, L.L.C. v. Sun Life Assurance Co.*, 687 F.3d 1266, 1279 (Fed. Cir. 2012). *Accord FairWarning IP, LLC v. Iatric Systems, Inc.*, 839 F.3d 1089, 1095 (Fed. Cir. 2016) (citing *Bancorp*, 687 F.3d at 1278 ("[T]he fact that the required calculations could be performed more efficiently via a computer does not materially alter the patent eligibility of the claimed subject matter.")). Although the claimed invention may be beneficial, a claim for a useful or beneficial abstract idea is still an abstract idea. *See Ariosa*, 788 F.3d at 1379–80.

That the calculated volume of activation is displayed on a screen is of no consequence here, for this presentation is merely insignificant extra-solution activity that does not add significantly more to the abstract idea to render the claimed invention patent-eligible. *See Bilski*, 545 F.3d at 957; *see also Parker v. Flook*, 437 U.S. 584, 590 (1978) (insignificant post-solution activity found to be insufficient to impart patentability). *Accord Apple, Inc. v. Ameranth, Inc.*, 842 F.3d 1229, 1242 (Fed. Cir. 2016) (same). And, as noted previously, merely presenting the results of abstract processes of collecting and analyzing information, without more (such as identifying a particular tool for presentation), is abstract as an ancillary part of such collection and analysis. *Elec. Power*, 830 F.3d at 1354.

That delivery of stimulation parameters is *initiated* based on the recited comparison does not change our conclusion, for the claim does not specify the particulars of this initiation apart from the fact that it is

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computer-implemented. In any event, this initiation merely commences transferring data to an electrical stimulation device—a data transfer that does not add significantly more to the abstract idea. *Cf. EasyWeb Innovations, LLC v. Twitter, Inc.*, 689 F. App'x 969, 969–71 (Fed. Cir. 2017) (unpublished) (holding claims reciting receiving, authenticating, and publishing data in a different format as directed to an abstract idea).

Notably, this stimulation parameter delivery could involve manual steps. That is, nothing in the claim precludes a computer sending stimulation parameters based on results of the recited comparison to a human (e.g., a physician) who then configures the electrical stimulation device based on the received parameters. In this scenario, the computer would at least *initiate* delivering the stimulation parameters for the calculated volume of activation to an electrical stimulation device despite human involvement in that delivery. To the extent that Appellants contend that the recited parameter delivery initiation adds significantly more to the recited abstract idea (*see* App. Br. 9–12; Reply Br. 8–10), we disagree.

For the foregoing reasons, the recited elements—considered both individually and as an ordered combination—do not contain an "inventive concept" sufficient to transform the claimed abstract idea into a patent-eligible application. Therefore, we are not persuaded that the Examiner erred in rejecting claim 1, and claims 2, 3, 5, 7, 8, 10–16, 18, and 21–25 not argued separately with particularity.

CONCLUSION

The Examiner did not err in rejecting claims 1–3, 5, 7, 8, 10–16, 18, and 21–25 under § 101.

DECISION

We affirm the Examiner's decision to reject claims 1–3, 5, 7, 8, 10–16, 18, and 21–25.

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