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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/704,922	04/26/2013	Etienne de Villers-Sidani	UCSF-420	7898

24353 7590 11/22/2019

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ART UNIT	PAPER NUMBER
3715	

NOTIFICATION DATE	DELIVERY MODE
11/22/2019	ELECTRONIC

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte ETIENNE DE VILLERS-SIDANI, XIAOMING ZHOU, JYOTI MISHRA-RAMANATHAN, MICHAEL MERZENICH, and ADAM GAZZALEY

Appeal 2018-006591
Application 13/704,922
Technology Center 3700

Before PHILIP J. HOFFMANN, KENNETH G. SCHOPFER, and TARA L. HUTCHINGS, *Administrative Patent Judges*.

SCHOPFER, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals from the Examiner's decision to reject claims 19–30, 32, and 37–51. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

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[1] We use the word "Appellant" to refer to "applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as the Regents of the University of California. Appeal Br. 3.

BACKGROUND

"The present disclosure relates to methods and tools for enhancing cognition in an individual." Spec. ¶ 7.

CLAIMS

Claims 19 and 21 are the independent claims on appeal. Claim 19 is illustrative of the appealed claims and recites:

> 19. A method of training for improving an individual's ability to suppress irrelevant stimuli, comprising:
>
> executing instructions using a computer system to present to said individual via an output device multiple sets of auditory stimuli at an inter-stimulus interval of 600 milliseconds or less, wherein:
>
> each of the multiple sets of stimuli comprises three or more auditory stimuli,
>
> at least one set of said multiple sets of stimuli comprises a target auditory stimulus and an irrelevant auditory stimulus,
>
> at least one set of said multiple sets of stimuli does not comprise the target auditory stimulus;
>
> the irrelevant auditory stimulus differs in at least one or more acoustic properties from the target auditory stimulus, and
>
> prior to presentation of a set of stimuli comprising the target auditory stimulus and an irrelevant auditory stimulus for the first time to said individual, said individual has not been informed of said target auditory stimulus or its properties;
>
> receiving an input electronically from said individual in response to the presentation of at least one set of said multiple sets of stimuli, wherein:
>
> the input requires a physical action by the individual, and

an input in response to a set of stimuli comprising the target auditory stimulus is a correct input; and

executing instructions to generate an output to inform said individual as to whether said input is correct.

REJECTION

The Examiner rejects claims 19–30, 32, and 37–51 under 35 U.S.C. § 101 as claiming ineligible subject matter.

DISCUSSION

Standard for Patent Eligibility

An invention is patent-eligible if it claims a "new and useful process, machine, manufacture, or composition of matter." 35 U.S.C. § 101. However, the Supreme Court has long interpreted 35 U.S.C. § 101 to include implicit exceptions: "[l]aws of nature, natural phenomena, and abstract ideas" are not patentable. *E.g.*, *Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014) (citation omitted).

In determining whether a claim falls within an excluded category, we are guided by the Supreme Court's two-step framework, described in *Mayo* and *Alice*. *Id.* at 217–18 (citing *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 75–77 (2012)). In accordance with that framework, we first determine what concept the claim is "directed to." *See Alice*, 573 U.S. at 219 ("On their face, the claims before us are drawn to the concept of intermediated settlement, *i.e.*, the use of a third party to mitigate settlement risk."); *see also Bilski v. Kappos*, 561 U.S. 593, 611 (2010) ("Claims 1 and 4 in petitioners' application explain the basic concept of hedging, or protecting against risk.").

Concepts determined to be abstract ideas, and thus patent ineligible, include certain methods of organizing human activity, such as fundamental

economic practices (*Alice*, 573 U.S. at 219–20; *Bilski*, 561 U.S. at 611); mathematical formulas (*Parker v. Flook*, 437 U.S. 584, 594–95 (1978)); and mental processes (*Gottschalk v. Benson*, 409 U.S. 63, 67 (1972)). Concepts determined to be patent eligible include physical and chemical processes, such as "molding rubber products" (*Diamond v. Diehr*, 450 U.S. 175, 191 (1981)); "tanning, dyeing, making water-proof cloth, vulcanizing India rubber, smelting ores" (*id.* at 183 n.7 (quoting *Corning v. Burden*, 56 U.S. 252, 267–68 (1853))); and manufacturing flour (*Benson*, 409 U.S. at 69 (citing *Cochrane v. Deener*, 94 U.S. 780, 785 (1876))).

In *Diehr*, the claim at issue recited a mathematical formula, but the Supreme Court held that "[a] claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula." *Diehr*, 450 U.S. at 187; *see also id.* at 191 ("We view respondents' claims as nothing more than a process for molding rubber products and not as an attempt to patent a mathematical formula."). Having said that, the Supreme Court also indicated that a claim "seeking patent protection for that formula in the abstract . . . is not accorded the protection of our patent laws, . . . and this principle cannot be circumvented by attempting to limit the use of the formula to a particular technological environment." *Id.* (citing *Benson* and *Flook*); *see, e.g.*, *id.* at 187 ("It is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.").

If the claim is "directed to" an abstract idea, we turn to the second step of the *Alice* and *Mayo* framework, where "we must examine the elements of the claim to determine whether it contains an inventive concept

sufficient to transform the claimed abstract idea into a patent-eligible application." *Alice*, 573 U.S. at 221 (citation omitted). "A claim that recites an abstract idea must include 'additional features' to ensure 'that the [claim] is more than a drafting effort designed to monopolize the [abstract idea].'" *Id.* (alterations in original) (quoting *Mayo*, 566 U.S. at 77). "[M]erely requir[ing] generic computer implementation[] fail[s] to transform that abstract idea into a patent-eligible invention." *Id.*

The United States Patent and Trademark Office ("USPTO") recently published revised guidance on the application of the *Alice* and *Mayo* framework. USPTO, *2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. 50 (Jan. 7, 2019) ("Revised Guidance"). Under that guidance, we first look to whether the claim recites:

> (1) (*see* Revised Guidance Step 2A – Prong One) any judicial exceptions, including certain groupings of abstract ideas (i.e., mathematical concepts, certain methods of organizing human activity such as a fundamental economic practice, or mental processes); and
> (2) (*see* Revised Guidance Step 2A – Prong Two) additional elements that integrate the judicial exception into a practical application (*see* MPEP §§ 2106.05(a)–(c), (e)–(h) (9th ed. 2019).[2]

[2.] We acknowledge that some of these considerations could instead be evaluated under Step 2 of *Alice* (Step 2B of Office guidance). In the interest of maintaining consistent treatment within the Office, we evaluate them under Step 1 of *Alice* (Step 2A of Office guidance). *See* USPTO's January 7, 2019 Revised Guidance, "2019 Revised Patent Subject Matter Eligibility Guidance."

Only if a claim (1) recites a judicial exception and (2) does not integrate that exception into a practical application, do we then look to whether the claim (*see* Revised Guidance Step 2B):

> (3) adds a specific limitation beyond the judicial exception that are not "well-understood, routine, conventional" in the field (*see* MPEP § 2106.05(d)); or
>
> (4) simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception.

See Revised Guidance.

Analysis

To the extent our analysis below addresses claim 19, the analysis is equally applicable to independent claim 21.

Step 2A, Prong One

The Examiner finds that the claims recite "[t]he idea of providing target and irrelevant sets of stimulus to a user that differ in at least one acoustic property and having the user indicate a correct input when the individual has not been informed of the stimulus or its properties and outputting whether the input is correct." Non-Final Act. 3. The Examiner determines that this "is similar to 'ideas standing alone.'" *Id.* Further, the Examiner indicates that steps in the claims are performed only in the human mind or at least in the absence of a computer. *See* Ans. 10.

We are not persuaded the Examiner erred to the extent the Examiner determined that the claims recite an abstract idea. Under the broadest reasonable interpretation of the claim, we determine that the claims steps of receiving an input from an individual and providing an output fall into the

category of mental processes as they may be performed, at least in part, in the human mind and also may entirely be performed without a computer. For example, the claim requires input from the "individual in response to the presentation . . . of stimuli," which requires observation and evaluation of the stimuli. Similarly, the generation of a response regarding whether the input is correct may be described as an evaluation, judgment, or opinion that is a mental process. *See* Revised Guidance, 84 Fed. Reg. at 52.

Based on the foregoing, we determine that claim 19 recites an abstract idea in the form of a mental process. And for the reasons discussed, we are not persuaded of error by Appellant's arguments with respect to this step. *See* Appeal Br. 8–9.

Step 2A, Prong Two

Having determined that claim 19 recites a judicial exception, we next consider whether there are additional elements in the claim that integrate the judicial exception into a practical application. *See* Revised Guidance, Step 2A–Prong Two. Here we look to see if, for example, (i) any additional elements of the claims (i) reflect an improvement in the functioning of a computer or to another technological field; (ii) apply the abstract idea to effect a particular treatment or prophylaxis for a disease or medical condition; (iii) apply the judicial exception with, or by use of, a particular machine; (iv) reflect a transformation or reduction of a particular article to a different state or thing (iv) or use the judicial exception in some other meaningful way beyond generally linking the use of the judicial exception to a particular technological environment. *See* Revised Guidance, 84 Fed. Reg. at 55; *See also* MPEP §§ 2106.05(a)–(c), (e)–(h).

Here, the Examiner determines that the additional elements of the claim include the use of a computer at a high level of generality. Non-Final Act. 3. We agree that the Specification and claims show that the claimed method includes the use of a general purpose computer. However, in addition to the claim limitations that require a computer, the claim also requires that the computer provides an output in the form of a set of auditory stimuli at a specific interval and with certain specific parameters.

Specifically, the output is provided "at an inter-stimulus interval of 600 milliseconds or less" and requires multiple sets of auditory stimuli, and at least one set has a target auditory stimulus and an irrelevant auditory stimulus with different acoustic properties. Here, the Specification describes that the claimed invention addresses issues related to cognitive decline in the elderly, and more specifically "the deterioration of the neurological processes that normally suppress ('adapt to')" background stimuli. Spec. ¶¶ 2, 3; *see also id.* ¶¶ 79–84. Cognition is defined in the Specification as the "speed, accuracy and reliability of processing of information, and attention and/or memory." *Id.* ¶ 19. Measurable deterioration of cognitive abilities in an individual is common with aging. *Id.* ¶ 80. The decline often progresses with age making tasks that require quickly and accurately extracting visual or auditory information from a noisy environment difficult. *Id.* For example, avoiding dangers while driving a car, scanning a crowd for a familiar face, and reading quickly become more difficult. *Id.* Sometimes this cognitive decline leads to more serious conditions such as Mild Cognitive Impairment and Alzheimer's Disease. *Id.* ¶ 82. Cognitive losses also arise due to injury, medical treatments, and neurological or psychiatric illness. *Id.* ¶ 83.

The Specification discloses that the invention is related to "enhancing cognition" through "iterations of stimuli presentation" to an individual. *Id.* ¶ 7. The Specification further discloses that the invention resulted in measurable improvement in neurological functionality. For example, neurological measures were attained using electro-encephalographic (EEG) recordings in neural assessment sessions pre- and post-training. *Id.* ¶ 119. During these assessments stimulus evoked responses, referred to as event-related potentials (ERPs), were provided to target and non-target stimuli. *Id.* The training was found to negatively modulate the auditory evoked potential in aging humans in response to background distractors by about 30 percent, thus showing improved neural capacity. *See id.* ¶¶ 107, 108, Fig. 3D.

This evidence shows that the additional elements of the claim are related to providing an individual with sets of auditory stimuli that apply the abstract idea to effect a particular treatment for a medical condition. Specifically, the claimed presentation of stimuli effect a treatment for addressing cognitive decline related to the ability to suppress background auditory stimuli. Thus, we determine that the additional elements of the claim are integrated into a practical application. *See* Revised Guidance, 84 Fed. Reg. at 55.

Based on the foregoing, although claim 19 recites an abstract idea, we determine that the claim is not directed to an abstract idea under *Alice* because the additional elements of the claim integrate the abstract idea into a practical application. Accordingly, we determine that claim 19 is directed to eligible subject matter. We reach the same determination with respect to independent claim 21 and each of the dependent claims for the same reasons.

Step 2B

Because we determine that the claims at issue are directed to eligible subject matter under Step 2A, prong two, we need not address this step of the analysis.

Determination Regarding Patent Eligibility

Based on the foregoing, we are persuaded of error in the Examiner's rejection of independent claims 19 and 21. We also reverse the rejection of the dependent claims for the same reasons. Accordingly, we do not sustain this rejection.

CONCLUSION

We REVERSE the rejection of claims 19–30, 32, and 37–51.

DECISION SUMMARY

In summary:

Claims Rejected	35 U.S.C. §	Basis	Affirmed	Reversed
19–30, 32, 37–51	101	Ineligible subject matter		19–30, 32, 37–51

REVERSED