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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* CHEN LI, and CHUNG CHANG<sup>1</sup>

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Appeal 2019-003159  
Application 14/381,400  
Technology Center 2800

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Before ROBERT E. NAPPI, LINZY T. McCARTNEY, and JOHN P. PINKERTON, *Administrative Patent Judges*.

NAPPI, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's final rejection of claims 1 through 20. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

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<sup>1</sup> According to Appellants, Halliburton Energy Services Inc. is the real party in interest. App. Br. 3.

## INVENTION

The invention is directed to a simplified model of an acoustic logging tool, which is used as part of the evaluation of geological formations. The simplified model represents the acoustic logging tool structure using concentric cylindrical shells in a coaxial configuration. *See generally* Specification 18–21. Claim 1 is illustrative of the invention and is reproduced below.

1. A method of modeling an acoustic logging tool, comprising:
  - establishing a first cylindrical shell representing an interior tubular portion of an acoustic logging tool, the interior tubular portion including apertures;
  - establishing a second cylindrical shell located concentrically outside the first cylindrical shell, the second cylindrical shell representing a acoustically-isolating portion of the acoustic logging tool, including:
    - establishing a model density and a model compressional wave propagation velocity of the second cylindrical shell using information about the acoustically-isolating portion of the acoustic logging tool; and
    - establishing a model shear wave propagation velocity of the second cylindrical shell as zero or about zero; and
    - determining information indicative of a flexural wave propagation velocity with respect to acoustic frequency of the acoustic logging tool using the acoustic logging tool model including the first and second cylindrical shells.

## EXAMINER’S REJECTION<sup>2</sup>

The Examiner rejected claims 1 through 20 under 35 U.S.C. § 101 for being directed to patent-ineligible subject matter. Final Act. 2–7.

## ANALYSIS

We have reviewed Appellants’ arguments in the Briefs, the Examiner’s rejections, and the Examiner’s response to Appellants’ arguments. Appellants’ arguments have persuaded us of error in the Examiner’s rejection of claims 1 through 20 under 35 U.S.C. § 101.

## PRINCIPLES OF LAW

Patent-eligible subject matter is defined in 35 U.S.C. § 101 of the Patent Act, which recites:

Whoever 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.

There are, however, three judicially created exceptions to the broad categories of patent-eligible subject matter in 35 U.S.C. § 101: “[I]aws of nature, natural phenomena, and abstract ideas.” *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 216 (2014); *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 70 (2012).

In determining whether a claim falls within an excluded category, we are guided by the Supreme Court’s two-step framework, described in *Mayo*

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<sup>2</sup> Throughout this Decision we refer to the Appeal Brief filed August 8, 2018 (“App. Br.”); the Reply Brief filed March 11, 2019 (“Reply Br.”); Final Office Action mailed January 12, 2017 (“Final Act.”); and the Examiner’s Answer mailed January 11, 2019 (“Ans.”).

and *Alice*. *Alice*, 573 U.S. at 217–18 (citing *Mayo*, 566 U.S. at 75–77). 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, 69 (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 184 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.* (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 § 101. USPTO’s 2019 *Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. 50 (Jan. 7, 2019) (“2019 Guidance”). Under that guidance, we first determine whether the claim recites:

- (1) 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) additional elements that integrate the judicial exception into a practical application (*see* MANUAL OF PATENT EXAMINING PROCEDURE (“MPEP”) § 2106.05(a)–(c), (e)–(h) (9<sup>th</sup> Ed., Rev. 08.2017, Jan. 2018)).

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:

(3) adds a specific limitation beyond the judicial exception that is 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* 2019 Guidance.

#### ANALYSIS

The Examiner determines the claims are not patent eligible as they are directed to a judicial exception without reciting significantly more. Final Act. 3–7. Specifically, the Examiner determines the claims are directed to an abstract idea stating that the claims:

describe the concepts of collecting and comparing known information, as well as organizing information through mathematical correlations, which corresponds to concepts identified as abstract ideas by the courts. Please see *Synopsys, Inc. v. Mentor Graphics Corporation* for a court case containing similar types of claim language wherein a novel abstract idea is still an abstract idea. Additionally, the claims are analogous to the case: *Diamond v. Diehr*, 450 U.S. 175 (1981 ). (Federal Register page 74626, second column) in that the claims pertain to mathematical relationships, e.g., [.] abstract

ideas. In this case, creating mathematical models of real world systems as evidenced in the specification, is called an abstract idea. In Diehr, they did something with the info, however in this case, nothing is being done with the information.

Final Act. 3. Further, in response to Appellants' arguments in the Appeal Brief, the Examiner states the claims recite "a purely abstract step in the modeling process, not a real-world step" and finds that the claimed invention is "merely a better model which is run on a conventional computer (which acts as a tool) [and] not a better way of using a computer." Answer 10.

Appellants argue based upon the 2019 Guidance, the claims do not recite an abstract idea as the claims do not fall into one of the groupings in the 2019 Guidance. Reply Br. 3–5. Specifically, Appellants argue that the claims do not recite a mathematical concept as they "do not recite any specific mathematical relationships, formulas, equations or mathematical calculations." Reply Br. 4. Appellants assert that the claims recite a model and as such are similar to the claim in Example 38 in the 2019 Guidance. Reply Br 4. Further, Appellants argue the claims do not recite methods of organizing human activity or a mental process. Reply Br. 4–5.

We concur with Appellants that the claims do not recite an abstract idea within the groupings of the guidelines. As discussed *supra*, the Examiner finds the claims recite mathematical relationships. Final Act. 3, Answer 10. We disagree with the Examiner. The 2019 Guidance states that abstract ideas include mathematical concepts (mathematical relationships, mathematical formulas or equations and mathematical calculations). Independent claims 1, 14, and 15 do not recite a mathematical relationship, formula, or calculation; rather, they recite a model comprising two cylindrical shells and properties such as density and wave propagation

velocity of the shells. Although the limitation of determining a flexural wave propagation velocity using the model may be based on mathematical concepts, the mathematical concepts are not recited in the claims. Thus, we disagree with the Examiner that the claims recite a mathematical concept and as such recite an abstract idea.

Similarly, we do not find that the claims recite an abstract idea in the other two categories of abstract ideas discussed in the 2019 Guidance. We do not find the claims recite a mental process because the steps are not practically performed in the human mind. Further, the claims do not recite a certain method of organizing human activity such as a fundamental economic concept or commercial and legal interactions.

Thus, we do not agree with the Examiner that the claims recite an abstract idea. Accordingly, we do not sustain the Examiner's rejection of independent claims 1, 14, and 15, and dependent claims 2 through 13 and 16 through 20, under 35 U.S.C. § 101 for being directed to patent-ineligible subject matter.

#### DECISION

We reverse the Examiner's rejection of claims 1 through 20 under 35 U.S.C. § 101.

REVERSED