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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte TAE-YONG KIM, NUTTAPONG CHENTANEZ, and
MATTHIAS MULLER-FISCHER

Appeal 2018-005712
Application 14/665,452¹
Technology Center 2600

Before ST. JOHN COURTENAY III, LARRY J. HUME, and
JOYCE CRAIG, *Administrative Patent Judges*.

CRAIG, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's Final Rejection of claims 1, 2, 5, 7–9, 12, 14, 21, 22, 25, and 27–29, which are all of the claims pending in this application.² We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

¹ According to Appellants, NVIDIA Corporation is the real party in interest. App. Br. 3.

² Claims 3, 4, 6, 10, 11, 13, 15–20, 23, 24, and 26 have been canceled. App. Br. 13–15 (Claims App'x).

INVENTION

Appellants' application relates to computer simulation of physical structures and, more specifically, to systems and methods for representing and simulating graphics objects with particles of velocity-dependent shape and size. Spec. ¶ 2. Claim 1 reads as follows with emphasis added:

1. A method of determining a collision of cloth in a game representing said cloth using oblate spheroids having only a dimension normal to a surface of said cloth that *depends upon velocities of said oblate spheroids*; and treating intersections involving said oblate spheroids as collisions.

REJECTIONS

Claims 1, 2, 5, 7–9, 12, 14, 21, 22, 25, and 27–29 stand rejected under 35 U.S.C. § 101 because the claimed subject matter is judicially-excepted from patent eligibility under § 101. Final Act. 4.

Claims 1, 2, 5, 7–9, 12, 14, 21, 22, 25, and 27–29 stand rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Stam (US 2006/0235659 A1; publ. Oct. 19, 2006) and Matthias Muller & Nuttapong Chentanez, *Solid Simulation with Oriented Particles*, ACM TRANS. on GRAPHICS, Vol. 30, No. 4, Art. 92 (July 2011) (“Muller”). Final Act. 8–9.

ANALYSIS

We have reviewed the rejections of claims 1, 2, 5, 7–9, 12, 14, 21, 22, 25, and 27–29 in light of Appellants' arguments that the Examiner erred. We have considered in this decision only those arguments Appellants actually raised in the Briefs. Any other arguments Appellants could have made, but chose not to make, in the Briefs are waived. *See* 37 C.F.R. § 41.37(c)(1)(iv).

Appellants' arguments regarding the § 101 rejection are persuasive. Appellants' arguments regarding the § 103(a) rejection are not persuasive of error. We agree with and adopt as our own the Examiner's findings of facts and conclusions regarding the obviousness rejection only, as set forth in the Answer (Ans. 4–5) and in the Action from which this appeal was taken (Final Act. 9–22). We provide the following explanation for emphasis.

*Rejection of Claims 1, 2, 5, 7–9, 12, 14, 21, 22, 25, and 27–29
under 35 U.S.C. §101*

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).

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, 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, 192 (1981)); “tanning, dyeing, making waterproof cloth, vulcanizing India rubber, smelting ores” (*id.* at 182 n.7 (quoting *Corning v. Burden*, 56 U.S. 252, 267–68 (1854))); 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 176; *see also id.* at 192 (“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 (quotation marks 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 PTO recently published revised guidance on the application of § 101. USPTO’s January 7, 2019 Memorandum, 84 Fed. Reg. 50, 2019 *Revised Patent Subject Matter Eligibility Guidance* (“Guidance”). Under that guidance, we first look to whether the claim recites:

- (1) any judicial exceptions, including certain groupings of abstract ideas (i.e., mathematical concepts, certain methods of organizing human interactions such as a fundamental economic practice, or mental processes); and
- (2) additional elements that integrate the judicial exception into a practical application (*see* MPEP § 2106.05(a)–(c), (e)–(h)).

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 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 Guidance.

Here, we conclude claim 1 is directed to a process under the Step 1 inquiry and turn to evaluate USPTO Revised Step 2A.

Appellants contend the Examiner erred because the Examiner concluded the cloth in game simulation is a mathematical representation. App. Br. 7. Appellants argue “the Office Action does not assert what the mathematical representation of the claimed cloth is. There is no discussion in the Office Action of what the mathematical representation of the claimed cloth actually is, just the conclusory statement that the claimed cloth is a ‘mathematical representation.’” *Id.*

Appellants further contend:

the Examiner's Answer (and the Office Action) allege that the claimed oblate spheroid is “just a 3D mathematical function describing the 3D ellipsoids” and is, therefore, abstract. The Examiner’s Answer fails to compare this allegedly claimed abstract idea to concepts previously identified as abstract ideas by the courts.

Reply Br. 4.

Pursuant to the Guidance, “mathematical concepts,” such as mathematical relationships, mathematical formulas or equations, and mathematical calculations, are abstract ideas when “recited as such in a claim limitation(s) (that is when recited on their own per se).” *See* Memorandum, Section 1. *Grouping of Abstract Ideas*.

Here, Appellants have persuaded us that the Examiner has not sufficiently explained why claim 1 is directed to the abstract idea of “mathematical relationships,” and we decline to speculate. *See* Ans. 3. The Examiner’s determination that “oblate spheroids may be just a 3D Mathematical function describing the 3D ellipsoids” is unsupported by citations to the Specification or claims. *See id.* Although claim 1 recites limitations that may be based upon mathematical relationships, formulas, or calculations, the mathematical relationships, formulas, or calculations are

not explicitly recited in the claim. Therefore, claim 1 does not recite an abstract idea under § 101. This ends our § 101 analysis.

Accordingly, we reverse the Examiner's rejection under 35 U.S.C. § 101 of independent claim 1, and grouped claims 2, 5, 7–9, 12, 14, 21, 22, 25, and 27–29. *See* App. Br. 7–8.

*Rejection of Claims 1, 2, 5, 7–9, 12, 14, 21, 22, 25, and 27–29
under 35 U.S.C. § 103(a)*

Appellants contend the Examiner erred in rejecting claim 1 for obviousness because “there is no disclosure in these cited portions of Muller that *any* dimension of Muller's oblate spheroids is dependent on a *velocity* of Muller's oblate spheroids.” App. Br. 9. Appellants specifically argue “Muller does not use velocity dependent particle sizes.” App. Br. 9, *see also* Reply Br. 5.

We are not persuaded by Appellants' argument because it is not commensurate with the recited claim language. Appellants argue Muller does not teach “velocity dependent particle sizes” (App. Br. 9), but claim 1 recites the limitation “velocities of said *oblate spheroids*.”

We are also not persuaded that the Examiner erred because Appellants' arguments are not commensurate in scope with the rejection actually made by the Examiner. The Examiner cited Stam as teaching the “depends upon velocities” limitation. Final Act. 9; Ans. 5 (citing Stam Fig. 7 and ¶ 53). Thus, the Examiner relied on Stam, not Muller, for teaching velocity dependency. Nonobviousness cannot be established by attacking the references individually when the rejection is predicated upon a combination of prior art disclosures. *See In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). The test for obviousness is not whether the claimed

invention is expressly suggested in any one or all of the references, but whether the claimed subject matter would have been obvious to those of ordinary skill in the art in light of the combined teachings of those references. *See In re Keller*, 642 F.2d 413, 425 (CCPA 1981).

For these reasons, we are not persuaded that the Examiner erred in finding that the combination of Muller and Stam teaches or suggests the disputed limitation.

Accordingly, we sustain the Examiner's § 103(a) rejection of independent claim 1. We also sustain the Examiner's rejection of dependent claims 2, 5, 7–9, 12, 14, 21, 22, 25, and 27–29, not argued separately with particularity. App. Br. 11–12. *See* 37 C.F.R. § 41.37(c)(1)(iv).

DECISION

We reverse the decision of the Examiner rejecting claims 1, 2, 5, 7–9, 12, 14, 21, 22, 25, and 27–29 under 35 U.S.C. § 101.

We affirm the decision of the Examiner rejecting claims 1, 2, 5, 7–9, 12, 14, 21, 22, 25, and 27–29 under 35 U.S.C. § 103(a).

Because we affirm at least one ground of rejection with respect to each claim on appeal, the Examiner's decision rejecting claims 1, 2, 5, 7–9, 12, 14, 21, 22, 25, and 27–29 is affirmed. *See* 37 C.F.R. § 41.50(a)(1).

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). *See* 37 C.F.R. § 41.50(f).

AFFIRMED