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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* ROBERT A. STUBBS and STEFAN HANS SCHMIETA

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Appeal 2017-001284  
Application 13/654,797<sup>1</sup>  
Technology Center 3600

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Before BRADLEY W. BAUMEISTER, AMBER L. HAGY, and  
PHILLIP A. BENNETT, *Administrative Patent Judges*.

BENNETT, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134(a) from the Examiner’s final rejection of claims 1–16. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

CLAIMED SUBJECT MATTER

The claims are directed to estimating active risk in an investment portfolio and modifying the portfolio based on the estimated risk. Spec. 1,

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<sup>1</sup> Appellants’ Brief (“App. Br.”) identifies Axioma, Inc. as the real party in interest. App. Br. 1.

ll. 10–17. Claim 1, reproduced below, is illustrative of the claimed subject matter:

1. A computer-based method comprising:

electronically inputting a set of  $N$  possible investment opportunities;

defining a vector space of  $N$ -dimensional vectors of all possible portfolios in the  $N$  investment opportunities, with vector elements corresponding to investment holdings in any investment portfolio;

electronically receiving by a programmed computer a factor risk model defined and calibrated for all possible portfolios in the  $N$  investment opportunities, said factor risk model comprising a matrix of factor exposures, a matrix of factor covariances, and a matrix of specific covariances;

electronically receiving by the programmed computer an estimate of expected investment returns defined by an  $N$ -dimensional vector;

employing a first portfolio optimization strategy for computing a first optimized portfolio of investment holdings utilizing an objective function that includes a utility measurement of the portfolio defined by the sum of a first constant times a vector inner product of the investment holdings of the first optimized portfolio and the expected investment returns added to a second constant times a variance predicted by the factor risk model for the first optimized portfolio;

electronically receiving by the programmed computer an  $N$ -dimensional target vector;

determining utilizing the programmed computer an  $N$ -dimensional new factor vector substantially representing a projection of the target vector into the null space of the transpose of said matrix of factor exposures so that a vector inner product of said new factor and any column of said matrix of factor exposure substantially vanishes;

calculating a second optimized portfolio of investment holdings using a modified portfolio optimization strategy in

which the objective function is altered by adding a constant times the square of a vector inner product of the new factor vector and the investment holdings of the second optimized portfolio; and  
electronically outputting the second optimized portfolio employing an output device.

App. Br. 31–32 (Claims Appendix).

## REJECTION

Claims 1–16 stand rejected under 35 U.S.C. § 101 as being directed to patent-ineligible subject matter. Final Act. 2–8.<sup>2</sup>

## OPINION

### *Examiner’s Findings and Conclusion of Ineligibility*

In rejecting the claims under 35 U.S.C. § 101, the Examiner determines the claims are directed to an abstract idea because they recite “a mathematical calculation and algorithm for portfolio optimization.” Ans. 4; *see also* Final Act. 6. In setting forth this determination, the Examiner finds the claims “employ[] a portfolio optimization strategy and run[] all possible portfolios for a set of financial instruments to determine an optimal way of putting the instruments together.” Final Act. 6. The Examiner finds the claims are directed to a fundamental economic practice (portfolio optimization) and a mathematical formula (applying a factor risk model), both of which have been previously held by courts to be examples of abstract ideas. *Id.*; Ans. 3. The Examiner further explains Appellants’ claims are dissimilar from those found eligible in *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245 (Fed Cir. 2014) because they do not solve

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<sup>2</sup> The Examiner has withdrawn the rejections under 35 U.S.C. § 103(a) and 35 U.S.C. § 112, second paragraph. Ans. 2.

an internet-centric problem, and instead provide only an improved technique for estimating risk using mathematical formulas and algorithms. Ans. 5–6.

The Examiner also determines the claims do not amount to significantly more than the abstract idea because the combination of steps amounts to only the use of a generic computer to implement the abstract idea. Ans. 6. The Examiner further explains that the use of the computer in Appellants’ claims is “described with a high level of generality” and that “[p]roviding a programmed computer with no further details is insufficient to impart eligibility.” *Id.* at 7.

#### *Appellants’ Contentions*

Appellants assert several errors in the Examiner’s analysis. Contesting the Examiner’s abstract-idea determination, Appellants argue the claims are directed to more than an algorithm for portfolio optimization because they are very specific in how they optimize portfolios. App. Br. 13. Appellants further argue that because of the specificity of the claimed method, the preemption concerns expressed in *Alice* and *Benson* are not implicated. *Id.* Appellants further contend the claims are analogous to those found eligible in *DDR Holdings* because their invention is “necessarily rooted in computer technology and clearly is identified as addressing problems in existing portfolio optimization strategies.” *Id.* at 14–16 (describing in detail the steps recited in the claimed method). According to Appellants, the “claimed process solves specific problems with risk models in a manner similar to the way in which Internet-centric problems were solved in DDR Holdings.” *Id.* at 16.

In their Reply Brief, Appellants argue the decision of the Federal Circuit in *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299

(Fed. Cir. 2016) weighs against any finding of ineligibility. Reply Br. 1–4. Appellants contend the Examiner erred by failing to utilize the approaches set forth in *McRO* and *Diehr*, which Appellants argue require that the claims be considered in terms of how they use the recited equation to solve an industry problem. *Id.* at 2. Appellants argue the claims are similar to those found eligible in *McRO* because “specific features of the rules included as claim limitations [do] not prevent other approaches that use rules of a different structure or different techniques as found by McRO.” *Id.* at 3.

*Legal Standard for Patent-Eligibility*

In issues involving subject-matter eligibility, our inquiry focuses on whether the claims satisfy the two-step test set forth by the Supreme Court in *Alice Corp. v. CLS Bank Int’l*, 134 S. Ct. 2347 (2014). The Supreme Court instructs us to “first determine whether the claims at issue are directed to a patent-ineligible concept,” *Alice*, 134 S. Ct. at 2355, and, in this case, the inquiry centers on whether the claims are directed to an abstract idea.

If the initial threshold is met, we then move to the second step, in which 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 claim’ into a patent-eligible application.” *Id.* (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 79, 78 (2012)). The Supreme Court describes the second step as a search for “an ‘inventive concept’—*i.e.*, an element or combination of elements that is ‘sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [ineligible concept] itself.’” *Id.* (quoting *Mayo*, 566 U.S. at 72–73).

*Analysis*

Here, the Examiner characterizes the invention as being directed to the abstract idea of “a mathematical calculation and algorithm for portfolio optimization.” Ans. 4. This characterization is supported by the evidence. For example, Appellants’ Specification describes the invention as “relat[ing] generally to the estimation of risk, or active risk, of an investment portfolio using factor risk models.” Spec. 1, ll. 11–12.

The Examiner’s characterization of the invention also is supported by Appellants’ flowchart drawing depicted in Figure 3, which they describe as a process that “addresses a computer implemented method for determining measures of risk for investment portfolios.” *Id.* at 14, ll. 15–16. These descriptions in the Specification are consistent with the Examiner’s characterization of the invention to which the claims are directed, and we discern no error in this determination.

We also agree with the *Alice* step 2 determination made by the Examiner. Ans. 6–7. As explained by the Examiner, the use of the computer in Appellants’ claims is “described with a high level of generality” and “[p]roviding a programmed computer with no further details is insufficient to impart eligibility.” *Id.* at 7.

In particular, there is no specific guidance in the Specification for how to program the computer to carry out the recited functions in the claims. Although the Specification provides detailed information regarding mathematical models and equations, it does not provide any specific description of how to configure a computer to apply and solve those models and equations. As such, the generalized use of the computer indicates that it “is employed only for its most basic function, the performance of repetitive

calculations, and as such does not impose meaningful limits on the scope of those claims.” *Bancorp Servs., LLC. v. Sun Life Assurance Co. of Canada*, 687 F.3d 1266, 1278 (Fed. Cir. 2012); *see also Intellectual Ventures I LLC v. Capital One Bank (USA)*, 792 F.3d 1363, 1367 (Fed. Cir. 2015) (“Nor, in addressing the second step of Alice, does claiming the improved speed or efficiency inherent with applying the abstract idea on a computer provide a sufficient inventive concept.”).

As we noted above, Appellants argue the claims are not directed to an abstract idea because of the specificity of the algorithm implemented by the claimed method, the preemption concerns expressed in *Alice* and *Benson* are not implicated. App. Br. 13. We do not find this argument persuasive.

The decision in *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709 (Fed. Cir. 2014) is instructive on this point. In *Ultramercial*, the Federal Circuit considered claims directed to a process for displaying advertisements in exchange for granting access to copyrighted media. *Ultramercial*, 772 F.3d at 714. The claims were very specific, and recited eleven specific steps required to carry out the claimed method. *Id.* at 715. The patentee argued the claims were not abstract because they were “directed to a specific method of advertising and content distribution that was previously unknown.” *Id.* at 714. Nevertheless, the Federal Circuit held the claims were abstract and ineligible because “[a]lthough certain additional limitations, . . . , add a degree of particularity, the concept embodied by the majority of the limitations describes only the abstract idea . . . .” *Id.* at 715.

Similarly here, although the limitations in Appellants’ claims add particularity to the process, at least the majority of the limitations in Appellants claims embody the concept of optimizing an investment portfolio

using a process by which data is inputted and received by a computer, analyzed by applying an equation and algorithm, and displayed on an output device. App. Br. 31–32 (Claim 1). As such, and consistent with the holding in *Ultramercial*, we are not persuaded the “addition of merely novel or non-routine components to the claimed idea necessarily turns an abstraction into something concrete.” *Ultramercial*, 772 F.3d at 715.

Nor are we persuaded by Appellants’ contentions regarding lack of preemption. Our reviewing court has held that lack of preemption is not dispositive of the abstract idea inquiry. *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1379 (Fed. Cir. 2015) (“While preemption may signal patent ineligible subject matter, the absence of complete preemption does not demonstrate patent eligibility.”). Still further, Appellants’ purported invention bears substantial similarity to the invention found ineligible by the Supreme Court in *Parker v. Flook*, 437 U.S. 584 (1978). In *Flook*, the claims were directed to the use of a mathematical algorithm or formula to calculate alarm limits in a catalytic conversion process. 437 U.S. at 585. The Court held the claims ineligible because they “simply provide[] a new and presumably better method for calculating alarm limit values.” *Id.* at 594–95. Similarly here, the claims are abstract as they simply provide a new and presumably better method for optimizing an investment portfolio.

Thus, even though Appellants’ claims recite a very specific implementation of the algorithm, when a “claim is directed essentially to a method of calculating, using a mathematical formula, even if the solution is for a specific purpose, the claimed method is nonstatutory.” *Id.* at 595 (quoting *In re Richman*, 563 F.2d 1026, 1030 (CCPA 1977)).

Appellants also argue the outcome in *DDR Holdings* is determinative here. App. Br. 14–16. We disagree.

The outcome in *DDR Holdings* turned on the fact that the invention addressed a problem unique to computer networks with no offline analog. *DDR Holdings*, 773 F.3d at 1257:

[The claims of *DDR*] stand apart because they do not merely recite the performance of some business practice known from the pre-Internet world along with the requirement to perform it on the Internet. Instead, the claimed solution is necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks.

The present claims do not share this characteristic. The optimization of investment portfolios has been a known business practice long before the advent of the Internet. The use of complex mathematical modelling is not unique to computer technology or computer networks, and in the case of Appellants' claims, the computer is merely a tool for carrying out the mathematical algorithm. As such, Appellants' claims do not closely align with the key factors in *DDR Holdings*, and we are not persuaded by this argument.

Finally, Appellants contend the decisions of patent-eligibility in *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299 (Fed. Cir. 2016), and *Diamond v. Diehr*, 450 U.S. 175 (1981), are dispositive of the outcome here. Reply Br. 1–4. We are not persuaded. The present claims are distinguishable from those in *McRO* and *Diehr* in important respects.

First, unlike the claims in *McRO*, Appellants' claimed method produces an abstract result—an optimized investment portfolio model. See App. Br. 11 (“[T]he claims of the present invention are related generally to improved computer based models and systems for the optimization of an

investment portfolio.”). The claims in *McRO* and *Diehr*, on the other hand, had more concrete applications—providing more realistic speech in animation products (*McRO*, 837 F.3d at 1307, 1314) and manufacturing cured synthetic rubber (*Diehr*, 175 U.S. at 177).

Second, unlike the claims in *McRO* and *Diehr*, the processes recited in Appellants’ claims could entirely be performed by a human being, either mentally or using a pen and paper. See *Intellectual Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1318 (Fed. Cir. 2016) (finding an abstract idea where “with the exception of generic computer-implemented steps, there is nothing in the claims themselves that foreclose them from being performed by a human, mentally or with pen and paper”). In contrast, the claimed rubber-curing process in *Diehr* required the use of a rubber-molding press (*Diehr*, 175 U.S. at 181 n.5), and the digital animation process in *McRO* did not lend itself to a manual implementation, as the claimed placement of key frames in digital animated content using evaluation of subsequences and generated transition parameters could only be performed on a computer. See *McRO*, 837 F.3d at 1314.

In sum, because the claims are distinguishable from those found eligible in *McRO* and *Diehr*, and they are more similar to the claimed method found ineligible in *Flook*, we are not persuaded the Examiner erred in determining the claims are drawn to an abstract idea under the first step of the *Alice* inquiry. Further, because the computer components are used in Appellants’ claims only for their most basic function—the performance of repetitive calculations using well-known operations—we are not persuaded the Examiner erred in finding the claims lack eligibility under *Alice* step 2. Accordingly, we sustain the rejection of claims 1–16 under 35 U.S.C. § 101.

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DECISION

We affirm the Examiner's rejection of claims 1–16.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED