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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte CHRISTOPHER R. DANCE, ONNO R. ZOETER,
and DANIEL H. GREENE¹

Appeal 2018-000074
Application 13/969,762
Technology Center 3600

Before MICHAEL J. STRAUSS, NABEEL U. KHAN, and
PHILLIP A. BENNETT, *Administrative Patent Judges*.

STRAUSS, *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, 3–14, 16–21, and 24–29. Claims 2, 15, 22, and 23 are canceled. *See* App. Br. 38–41, Claims App. We have jurisdiction under 35 U.S.C. § 6(b).

¹ According to Appellants, Conduent Business Services, LLC is the real party in interest. *See* App. Br. 1.

We AFFIRM.²

THE INVENTION

The claims are directed to simple pricing by price-difference regularization. Spec., Title. Claim 1, reproduced below, is representative of the claimed subject matter:

1. A method for selecting an optimized price schedule for communication from a server to a user device over a computer network, comprising:
 - providing, at the server, a simplicity metric for computing a simplicity term based on weighted differences between prices in a price schedule;
 - providing, at the server, a welfare function for computing a welfare term corresponding to the price schedule;
 - for a plurality of price schedules, the server:
 - evaluating the simplicity term of each price schedule in accordance with the simplicity metric,
 - computing a welfare term for each price schedule in accordance with the welfare function, and,
 - determining a difference between the welfare term and the simplicity term for each price schedule;
 - performing, at the server, a plurality of iterations, for each iteration:
 - determining a set of price differences between an initial price schedule and a target schedule which optimize a soft threshold function, the soft threshold function being based on the welfare function for the initial price schedule and simplicity metric for the initial price schedule, subject to a constraint on the set of price differences, and wherein the soft threshold function is of the form:

² We refer to the Specification, filed August 19, 2013 (“Spec.”); Final Office Action, mailed January 18, 2017 (“Final Act.”); Appeal Brief, filed June 19, 2017 (“App. Br.”); Examiner’s Answer, mailed August 2, 2017 (“Ans.”) and Reply Brief, filed October 2, 2017 (“Reply Br.”).

$$p^k := \operatorname{argmax}_p W(p) - \sum_{i \in A \setminus A^k} \alpha_i g(C(Y^i p))$$

subject to $Y^i p = 0$ for $i \in A^{k-1}$

determining a new price schedule by optimizing a hard threshold function that optimizes the welfare function subject to the determined set of price differences, wherein the hard threshold function is of the form:

$$p^{uk} := \operatorname{argmax}_p W(p) \text{ subject to } Y^i p = 0 \text{ for } i \in A^k$$

computing a value of the new price schedule as a function of the computed welfare term and simplicity term for the new price schedule;

selecting one of the new price schedules, the selected one of the new price schedules being selected based on the values computed over the plurality of the iterations;

outputting, by the server, the selected one of the new price schedules as an optimized price schedule selected from the plurality of price schedules, the selected one of the plurality of price schedules being selected in accordance with the determined respective differences;

modifying the selected one of the plurality of price schedules by the server for display on a display of the user device, wherein the selected one of the plurality of price schedules is adapted by the server to retain readability on a small display of the user device; and

transmitting the selected one of the plurality of price schedules from the server to the user device over the computer network, wherein at least one of the evaluating, computing, determining, selecting, and outputting is performed by a computer processor.

REJECTION

Claims 1, 3–14, 16–21, and 24–29 stand rejected under 35 U.S.C.

§ 101 as being directed to ineligible subject matter. Final Act. 2–17.

REJECTION UNDER 35 U.S.C. § 101

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*, 573 U.S. 208 (2014). The Supreme Court instructs us to “first determine whether the claims at issue are directed to a patent-ineligible concept,” *Id.* at 218–219. 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).

The USPTO recently published revised guidance on the application of § 101. USPTO’s January 7, 2019 Memorandum, *2019 Revised Patent Subject Matter Eligibility Guidance* (hereinafter “Memorandum”). 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 activity 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 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 Memorandum.

Examiner’s Determinations and Conclusion

In the first step of the *Alice* inquiry, the Examiner determines the claims are “directed to a series of computational functions that analyze data to generate a pricing schedule.” Final Act. 12. The Examiner reasons the claimed steps recite mathematical equations/relationships and the idea itself which are similar to claims directed to organizing information through mathematical correlations that were determined to be an abstract idea in *Digitech Image Techs., LLC v. Elecs. for Imaging, Inc.*, 758 F.3d 1344, 1350 (Fed. Cir. 2014). *Id.*

At *Alice* step 2, the Examiner determines the claims do not recite elements sufficient to amount to significantly more than the abstract idea because the resultant claims do not amount to an improvement to: (i) another technology or technical field; or (ii) the functioning of a computer and because the claim; (iii) does not move beyond a general link of the use

of an abstract idea to a particular technological environment; and (iv) merely amounts to the application or instructions to apply the abstract idea on a computer. Final Act. 14. Addressing claim 1, the Examiner finds

[T]he additional limitations of claim 1, “providing a simplicity metric, providing a welfare function, outputting an optimized price schedule, and transmitting the selected one of the plurality of price schedules from the server to the user device over the computer network[,]” simply append well-understood, routine, and conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception (e.g., a claim to an abstract idea requiring no more than a generic computer to perform generic computer functions that are well-understood, routine and conventional activities previously known to the industry), therefor insufficiently providing information qualifying as “significantly more” when analyzing part 2 of the Mayo test because the providing and providing steps amount to generically making a metric of function available and outputting the price schedule is directed to generic displaying functions, which are well-understood, routine, and conventional activities previously known to the industry.

Id. at 14–15. Addressing the recited structural elements, the Examiner finds the “server, user device, and computer network . . . merely facilitate the claimed functions at a high level of generality and they perform conventional functions.” *Id.* at 16. According to the Examiner, “[w]hen viewed as a whole, these additional claim element(s) do not provide meaningful limitation(s) to transform the abstract idea into a patent eligible application of the abstract idea such that the claim(s) amounts to significantly more than the abstract idea itself.” *Id.*

Appellants' Contentions

Appellant presents several arguments in favor of eligibility. First, Appellants contend the Examiner has failed to set forth a prima facie case of ineligibility by omission of a “discussion which reflects that an analysis looking to all limitations of the claims as an ordered combination.” App. Br. 13. Appellants further contend “the present claims do not claim an end result, but rather claim only a limited and specific apparatus or method for achieving the end result, hence are not directed to an abstract idea.” *Id.* at 14. In support of their contention, Appellants argue “[f]or example, claim 1 calls for a method for creating price schedules. Claim 1 does not create price schedules regardless by what method they are generated. Rather, it only protects the specific combination of steps set forth in claim 1.” *Id.*

Appellants also challenge the Examiner’s determination under *Alice* step 2. Specifically, Appellants argue “[i]n the present claims, general purpose computer components were not added post hoc to a fundamental economic practice or mathematical equation. Rather, the claims are directed to a specific implementation of a solution to a problem.” *Id.* at 15. Appellants further contend “[t]he present claims do not set forth merely a series of well-understood steps or computer operations. Rather, they set forth something significantly more.” *Id.* Appellants argue the claimed optimization calculations “cannot be performed without the help of computer technology, and would require specific processes and programs to analyze data of each of these multiple parameters to perform these complex calculations.” *Id.* Appellants assert that claim 1 is similar to the hypothetical claim determined to be patent eligible in example 36 of the USPTO’s “Subject Matter Eligibility Examples: Business Methods” (Dec.

15, 2016) (hereinafter “Example 36”). *Id.* at 15–16. Appellants’ contentions of error in connection with independent claim 24 (*id.* at 23–28) and independent claim 25 (*id.* at 28–34) are repetitive in substance to those presented in connection with independent claim 1 (*id.* at 12–18). Appellants’ contentions of error in connection with dependent claims 3–14 and 16–21 (*id.* at 18–23) and dependent claims 26–29 (*id.* at 34–35) are that the claims improve computer related technology and thereby recite significantly more than an abstract idea.

Examiner’s Response

The Examiner provides a comprehensive response to Appellants’ contentions of error and arguments which we adopt and incorporate herein. Ans. 9–20. Addressing Appellants’ contention the Examiner failed to set forth a prima facie case of ineligibility, the Examiner repeats the analysis of the claims, identifying each element considered to be a mathematical equation/relationship and idea of itself and, therefore, an abstract idea. Ans. 9–12. The Examiner references the “2014 Interim Guidance on Patent Subject Matter Eligibility” (dated December 16, 2014) and July 2015 Update to Subject Matter Eligibility for guidance and examples of limitations found insufficient in qualifying as “significantly more” under Part 2 of the *Mayo* test. Ans. 12. Addressing the computer or server element, the Examiner finds Appellants’ Specification describes the required functionality to be provided by a general-purpose computer. *Id.* The Examiner again explains the additional elements “are well-understood, routine, and conventional activities previously known to the industry.” *Id.* at 13. Thus, according to the Examiner, “[t]he additional limitations of the independent and dependent claim(s) when considered individually and as an ordered combination do not

amount to significantly more than the abstract idea.” *Id.* at 14. The Examiner further finds there is “no evidence that the claimed process/functions are any different than what would be done without a computer, where there are no adjustments to the mental process to accommodate implementation by computers.” *Id.* at 17. The Examiner addresses Appellants’ arguments analogizing the rejected claims to those found patent-eligible in *McRO*,³ *TLI*,⁴ *BASCOM*,⁵ *Enfish*,⁶ Example 36, and *Diamond*,⁷ finding those cases distinguishable and inapposite to the subject matter of Appellants’ claims. *Id.* at 16–20.

Our Review

Addressing Appellants’ procedural objection, Appellants’ contention the Examiner has failed to set forth a prima facie case of ineligibility is unpersuasive. The Federal Circuit has repeatedly noted “the prima facie case is merely a procedural device that enables an appropriate shift of the burden of production.” *Hyatt v. Dudas*, 492 F.3d 1365, 1369 (Fed. Cir. 2007) (citing *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992)). The court has, thus, held that the Office carries its procedural burden of establishing a prima facie case when its rejection satisfies the requirements of 35 U.S.C. § 132 by notifying the applicant of the reasons for rejection, “together with such information and references as may be useful in judging

³ *McRO, Inc. v. Bandai Namco Games America Inc.*, 837 F.3d 1299 (Fed. Cir. 2016).

⁴ *TLI Communications LLC Patent Litigation*, 823 F.3d 607, 612 (Fed. Cir. 2016).

⁵ *BASCOM Glob. Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341 (Fed. Cir. 2016).

⁶ *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1334 (Fed. Cir. 2016).

⁷ *Diamond v. Diehr*, 450 U.S. 175, 192 (1981).

of the propriety of continuing the prosecution of [the] application.” *In re Jung*, 637 F.3d 1356, 1362 (Fed. Cir. 2011). All that is required of the Office is that it set forth the statutory basis of the rejection in a sufficiently articulate and informative manner as to meet the notice requirement of 35 U.S.C. § 132. *Jung*, 637 F.3d at 1362; *see also Chester v. Miller*, 906 F.2d 1574, 1578 (Fed. Cir. 1990) (Noting that [35 U.S.C.] § 132 “is violated when a rejection is so uninformative that it prevents the applicant from recognizing and seeking to counter the grounds for rejection.”).

Here, in rejecting the pending claims under 35 U.S.C. § 101, the Examiner analyzed the claims using the *Mayo/Alice* two-step framework, consistent with the then available guidance set forth in the USPTO’s Interim Guidance. Specifically, the Examiner notified Appellants that claims 1, 3–14, 16–21, and 24–29 “directed to a series of computational functions that analyze data to generate a pricing schedule” and that such computational functions “are directed toward the abstract idea of mathematical equations/relationships” and “the abstract concept of organizing information through mathematical correlations.” Final Act. 12–13. The Examiner has provided a complete characterization of each claim element individually and as an ordered combination. We conclude the rejection is sufficient to satisfy the notice requirement of 35 U.S.C. § 132.

Substantively, applying the guidance set forth in the Memorandum, we are not persuaded of Examiner error. The Memorandum instructs us first to determine whether any judicial exception to patent eligibility is recited in the claim. The guidance identifies three judicially-expected groupings: (1) mathematical concepts; (2) certain methods of organizing human activity such as fundamental economic practices; and (3) mental processes. We

focus on the first group, mathematical concepts which includes mathematical relationships, mathematical formulas or equations, and mathematical calculations.

Appellants' Specification discloses "[a] method and system for determining an optimized price schedule that control the simplicity of a price schedule while maintaining efficiency in terms of welfare." *See* Abstract.

In accord with the Examiner's analysis of the claim elements, we agree that

"evaluating the simplicity term, computing a welfare term, determining a difference between the welfare term and the simplicity term, performing a plurality of iterations, determining a set of price differences, determining a new price schedule, computing a value of the new price schedule, selecting one of the new pricing schedules, modifying the selected one of the plurality of price schedules for display on the user device, and adapting the price schedule to retain readability on a small display of the user device" [are] []mathematical equations/relationships and idea of itself[], which are considered to be abstract ideas.

Final Act. 12. The emphasis on the mathematical relationships required by claim 1 are clearly apparent by the recitation of specific formulas for calculating soft and hard thresholds p^k and p^{uk} , respectively, used in determining a set of price differences and a new price schedule, as follows:

$$p^k := \operatorname{argmax}_p W(p) - \sum_{i \in A \setminus A^k} \alpha_i g(C(Y^i p))$$
$$\text{subject to } Y^i p = 0 \text{ for } i \in A^{k-1}$$
$$p^{uk} := \operatorname{argmax}_p W(p) \text{ subject to } Y^i p = 0 \text{ for } i \in A^k$$

Claim 1. Appellants' argument that the claims do not claim an end result are unpersuasive as such argument does not address whether the claims recite

and are directed to an abstract idea. Accordingly, we conclude the claims recite a judicial exception of a mathematical concept.

Having determined that the claims recite a judicial exception, our analysis under the Memorandum turns to determining whether there are “additional elements that integrate the judicial exception into a practical application.” *See* MPEP § 2106.05(a)–(c), (e)–(h)). Appellants’ claim 1 recites computer-related and/or hardware-related limitations, including a “server,” “user device,” and “computer network.” Appellants disclose “computer system 102 may include a computer server, workstation, personal computer, combination thereof, or any other computing device” and “one or more interface devices 112, 114 for communicating with external devices or to receive external input.” Spec. ¶¶ 32, 38. The recited user device is only generally disclosed as a display device 116 and input device 118. Thus, these computer and/or hardware-related limitations are described at a high level in the Specification without meaningful detail about their structure or configuration that differentiates them from standard computers performing the recited operations. As such, we do not find the computer and/or hardware-related limitations are sufficient to integrate the judicial exception into a practical application.

In addition to the identified computer hardware, claim 1 recites providing a simplicity metric, providing a welfare function, outputting an optimized price schedule, and transmitting the selected one of the plurality of price schedules from the server to the user device over a computer network. *See* Final Act. 5. We agree with the Examiner these steps of receiving, outputting and transmitting information are generic computer functions and that such functions described, as they are, at a high level

without meaningful detail about their operation, fail to differentiate them from operations performed by standard computers performing the recited operations. *See id.* As such, we do not find these data processing-related functional limitations are sufficient to integrate the judicial exception into a practical application.

Furthermore, we agree with the Examiner that claim 1 “do[es] not affect an improvement to another technology or technical field [or] an improvement to the functioning of the computer itself [*see* MPEP 2106.05(a)], [or meaningful limitations] beyond generally linking the use of an abstract idea to a particular technological environment [*see* MPEP 2106.05(h)].” Final Act. 7–8. Consistent with Appellants’ argument, rather than a technological innovation, the “claims provide systems and methods to perform multiple optimization calculations to optimize weighted sums of welfare and simplicity metrics in order to generate a price schedule, in addition a continuous analysis to improve traffic flow, decrease problems with parking spots, and the like.” App. Br. 17. Thus, in view of Appellants’ Specification, and consistent with the Examiner’s determinations and Appellants’ characterization of the claims, we conclude that claim 1 does not integrate the judicial exception into a practical application. We determine claim 1 does not recite:

- (i) an improvement to the functioning of a computer;
- (ii) an improvement to another technology or technical field;
- (iii) an application of the abstract idea with, or by use of, a particular machine;
- (iv) a transformation or reduction of a particular article to a different state or thing; or

- (v) other meaningful limitations beyond generally linking the use of the abstract idea to a particular technological environment.

See MPEP §§ 2106.05(a)–(c), (e)–(h). Instead, any improvement is to the underlying abstract idea of a series of computational functions that analyze data to generate a pricing schedule. *Accord OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359 (Fed. Cir. 2015) (claim to price optimization method directed to an abstract idea).

For the reasons discussed above, we agree with the Examiner that claim 1 is directed to a judicial exception that is not integrated into a practical application.

Having determined the claim is directed to a judicial exception, we proceed to evaluating whether the claim adds a specific limitation beyond the judicial exception that is not “well-understood, routine, conventional” in the field (see MPEP § 2106.05(d)) or simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception. *See Memorandum.*

We agree with the Examiner that the claim does not supply the inventive concept required under *Alice* step 2. *See Final Act.* 14–15; *Ans.* 6–7, 11–13. Appellant’s argument under *Alice* step 2 is that the claims require the performance of multiple calculations that “cannot be performed without the help of computer technology, and would require specific processes and programs to analyze data of each of these multiple parameters to perform these complex calculations.” App. Br. 15. We are unpersuaded by this argument. “[R]elying on a computer to perform routine tasks more quickly or more accurately is insufficient to render a claim patent eligible.”

Alice, 573 U.S. at 225. These processes remain unpatentable even when automated to reduce burden to the user of what once could have been done with pen and paper. *CyberSource*, 654 F.3d at 1375 (“That purely mental processes can be unpatentable, even when performed by a computer, was precisely the holding of the Supreme Court in *Gottschalk v. Benson*.”).

Accordingly, we do not discern in claim 1 any specific limitation beyond the judicial exception that is not “well-understood, routine, conventional,” and instead agree with the Examiner that the claims do not supply an inventive concept sufficient to transform the judicial exception into patent-eligible subject matter. Ans. 7.

Because the Examiner correctly concluded claim 1 is directed to a judicial exception, and because Appellants do not identify any error in the Examiner’s determination under *Alice* step 2, we sustain the rejection of claim 1 under 35 U.S.C. § 101. Appellants’ contentions of error in connection with independent claim 24 (*id.* at 23–28) and independent claim 25 (*id.* at 28–34) are repetitive in substance to those presented in connection with independent claim 1. *Id.* at 12–18. Appellants’ contentions of error in connection with dependent claims 3–14 and 16–21 (*id.* at 18–23) and dependent claims 26–29 (*id.* at 34–35) are, in substance, repetitions of the claims limitations followed by the conclusory assertion that the claims improve computer related technology and thereby recite significantly more than an abstract idea without further explanation. Such naked contentions standing alone are insufficient to identify and persuade us of reversible Examiner error and are not considered to be separate arguments for patentability. Accordingly, we treat claim 1 as representative, and sustain the patent-eligibility rejection of the remaining claims for the same reasons.

Appeal 2018-000074
Application 13/969,762

DECISION

We affirm the Examiner's rejection of claims 1, 3–14, 16–21, and 24–29 under 35 U.S.C. § 101.

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