UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/710,833	12/11/2012	Ruxian Wang	36MK-255223	2222

145169 7590 05/02/2018

SHEPPARD, MULLIN, RICHTER & HAMPTON LLP (DXC)
379 Lytton Avenue
Palo Alto, CA 94301

EXAMINER
GUILIANO, CHARLES A

ART UNIT	PAPER NUMBER
3623	

NOTIFICATION DATE	DELIVERY MODE
05/02/2018	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

svpatents@sheppardmullin.com
SheppardMullin_Pair@firsttofile.com

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte RUXIAN WANG and JULIE A. WARD

Appeal 2017-001168
Application 13/710,833
Technology Center 3600

Before CARLA M. KRIVAK, HUNG H. BUI, and
JON M. JURGOVAN, *Administrative Patent Judges*.

KRIVAK, *Administrative Patent Judge*.

DECISION ON APPEAL

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

We affirm.

STATEMENT OF THE CASE

Appellants' invention is directed to a method, system, and computer-readable storage medium for "determining efficient assortments of products" and identifying "[o]ne of the efficient assortments . . . based on a strictly decreasing convex function," where the "identified efficient assortment may be considered the optimal assortment of products for [a] capacity constraint C" that is "the maximum number of products that may be included in an efficient assortment" (Spec. ¶¶ 9–10; Title (capitalization altered); Abstract).

Claims 1, 9, and 15 are independent. Independent claim 1, reproduced below, is exemplary of the subject matter on appeal.

> 1. A method comprising:
>
> determining, by a computing device, a plurality of efficient assortments of a plurality of products using a generalized attraction model (GAM) to avoid an independence of irrelevant alternatives (IIA), each efficient assortment determined using the GAM as an ordered set of elements corresponding to the products, the elements ordered according to a predefined ordering of positive values of the elements;
>
> generating, by the computing device, a strictly decreasing convex function based on the efficient assortments;
>
> identifying, by the computing device, a unique fixed point of the function, via the GAM, by performing a number of iterations having an order based on a maximum number of the products within each efficient assortment multiplied by a difference between a total number of the products and the maximum number of the products within each efficient assortment, wherein the unique fixed point corresponds with one of the efficient assortments; and
>
> offering, by the computing device, the one of the efficient assortments for sale to users,
>
> wherein usage of the GAM improves a performance functioning of the computer in offering the one of the efficient assortments for sale to the users.

REJECTION

The Examiner rejected claims 1–20 under 35 U.S.C. § 101 as directed to non-statutory subject matter.

ANALYSIS

Under 35 U.S.C. § 101, a patent may be obtained for "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof." The Supreme Court has "long held that this provision contains an important implicit exception: Laws of nature, natural phenomena, and abstract ideas are not patentable" (*Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2354 (2014) (quoting *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 133 S. Ct. 2107, 2116 (2013)). The Supreme Court in *Alice* reiterated the two-step framework previously set forth in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 566 U.S. 66, 82–84 (2012), "for distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of these concepts" (*Alice*, 134 S. Ct. at 2355). The first step in that analysis is to "determine whether the claims at issue are directed to one of those patent-ineligible concepts," such as an abstract idea (*id.*). The Court acknowledged in *Mayo* that "all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas" (*Mayo*, 566 U.S. at 71). We, therefore, look to whether the claims focus on a specific means or method that improves the relevant technology or are instead directed to a result or effect that is the abstract idea and merely invoke generic processes and machinery (*see Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1336 (Fed. Cir. 2016)). If

the claims are not directed to an abstract idea, the inquiry ends. Otherwise, the inquiry proceeds to the second step where the elements of the claims are considered "individually and 'as an ordered combination' to determine whether the additional elements 'transform the nature of the claim' into a patent-eligible application" (*Alice*, 134 S. Ct. at 2355 (quoting *Mayo*, 566 U.S. at 79, 78)).

Alice/Mayo—Step 1

Turning to the first part of the *Alice/Mayo* analysis, the Examiner concludes claim 1 is directed to "using mathematical models to determine an assortment of products to offer for sale," which is an abstract idea describing (i) "a mathematical algorithm using . . . mathematical models, relationships, and formulas," and (ii) "a fundamental economic practice" that "relates to economy, commerce, agreements, and business relations . . . [which] facilitate offers for sale of an efficient assortment of products" (Ans. 4, 9).

Appellants argue independent claims 1, 9, and 15 together (Reply Br. 7–8; App. Br. 4–5, 8–9). We select claim 1 as representative. Claims 9 and 15 stand or fall with claim 1 (*see* 37 C.F.R. § 41.37(c)(1)(iv)).

Appellants contend the Examiner erred in rejecting the claims under 35 U.S.C. § 101 as directed to non-statutory subject matter because the claims are not directed to an abstract idea (Reply Br. 4) and the Examiner overgeneralized the claims (Reply Br. 5–6). However, the Examiner concludes, and we agree, the claims are abstract because they are directed to "a mathematical algorithm that determines efficient assortments using a mathematical model, generates a mathematical function, and identifies a mathematical point on the mathematical function corresponding to an efficient assortment"—an abstract idea of a mathematical algorithm similar

to mathematical algorithms and calculations identified in *Benson*, *Flook*, and *Grams* (Ans. 9) (*see Gottschalk v. Benson*, 409 U.S. 63–64, 67 (1972) (a "method for converting numerical information from binary-coded decimal numbers into pure binary numbers . . . [is merely a series of mathematical calculations or mental steps, and does not constitute a patentable] 'process'"); *Parker v. Flook*, 437 U.S. 584, 585, 594–96 (1978) (rejecting as ineligible claims directed to the use of an algorithm to calculate an updated "alarm-limit value" for a catalytic conversion process variable, and updating the limit with the new value); and *In re Grams*, 888 F.2d 835, 837 (Fed. Cir. 1989) ("[M]athematical algorithms join the list of non-patentable subject matter not within the scope of section 101.")).

Appellants contend claim 1's "particular limitations amount to 'unconventional steps that confine the claim to a particular useful application'" of "identifying . . . a unique fixed point" that "'corresponds with one of the efficient assortments,' such that 'the one of the efficient assortments' is offered 'for sale to users'" (App. Br. 6). Claim 1, however, merely claims "using mathematical models to determine an assortment of products to offer for sale," which designates a fundamental economic practice of marketing and selling (Ans. 9) (*see In re Maucorps*, 609 F.2d 481–83, 485–86 (CCPA 1979) (holding unpatentable an algorithm of "equations and data" for "determin[ing] an optimum . . . number of regular visits . . . by a business [sales] representative to a client")).

Additionally, we note claim 1 recites a set of calculations that can be performed manually, by a person using a pen and paper (*see*, e.g., Spec. ¶ 32 and Fig. 3 (describing a method for identifying a unique fixed point corresponding to one of three efficient assortments of at most 2 out of 3

possible products)). The law is clear that "a method that can be performed by human thought alone is merely an abstract idea and is not patent-eligible under § 101" (*CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1373 (Fed. Cir. 2011)). Additionally, mental processes remain unpatentable even when automated to reduce the burden on the user of what once could have been done with pen and paper (*see 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*.")).

Appellants argue claim 1 is not directed to an abstract idea; rather, claim 1 is similar to the claims of *Enfish* because it recites "an improvement in computer-related technology" that "helps avoid irrelevant alternatives when products are selected as an assortment to offer for sale to users" (Reply Br. 7). We disagree.

Claims 1, 9, and 15 do not recite a specific improvement to the way computers operate, and Appellants do not present evidence to establish these claims recite a specific improvement to the computers (Ans. 10–11). *See Enfish*, 822 F.3d at 1336, 1339. Appellants also have not demonstrated their claims "improve the way a computer stores and retrieves data in memory," as the claims in *Enfish* did via a "self-referential table for a computer database" (*see Enfish*, 822 F.3d at 1336, 1339). For example, claim 1 merely requires a generically-claimed computer and computing device using a GAM model and "a strictly decreasing convex function" for determining an efficient assortment of products offered for sale. This does not demonstrate an actual improvement in computer memory operations or in the technical functioning of the computer or other relevant technology.

Claim 1 further recites "usage of the GAM improves a performance functioning of the computer in offering the one of the efficient assortments for sale to the users," which does not specify or demonstrate any performance improvement to the functioning of the computer, as Appellants advocate (emphasis omitted) (Reply Br. 7).

In fact, none of the steps and elements recited in Appellants' claims provide, and nowhere in Appellants' Specification can we find, any description or explanation as to how the claimed mathematical manipulation steps are intended to provide: (1) a "solution . . . necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks," as explained by the Federal Circuit in *DDR Holdings, LLC, v. Hotels.com, L.P.*, 773 F.3d 1245, 1257 (Fed. Cir. 2014); (2) "a specific improvement to the way computers operate," as explained in *Enfish*, 822 F.3d at 1336; or (3) an "unconventional technological solution . . . to a technological problem" that "improve[s] the performance of the system itself," as explained in *Amdocs (Israel) Ltd. v. Openet Telecom, Inc.*, 841 F.3d 1288, 1300, 1302 (Fed. Cir. 2016).

We also are unpersuaded by Appellants' argument that claim language "appl[ying] a *novel concept to a new and useful end* . . . remains eligible for patent protection" because "the claim language *does not pre-empt others* from using the recited mathematical relationships . . . except in the new and useful end of offering for sale the identified efficient assortment" (App. Br. 7 (emphasis added); *see also* App. Br. 5, 9). Although Appellants contend the abstract idea identified by the Examiner is novel, even if true, this does not necessarily make the claim patent-eligible. That is, even assuming that claims 1, 9, and 15 may recite "novel subject

matter" (*see* App. Br. 6), as the Supreme Court has stated, "[t]he 'novelty' of any element or steps in a process, or even of the process itself, is of no relevance in determining whether the subject matter of a claim falls within the § 101 categories of possibly patentable subject matter" (*see Diamond v. Diehr*, 450 U.S. 175, 188–89 (1981)).

With respect to preemption, we note, "[w]hile preemption may signal patent ineligible subject matter, the absence of complete preemption does not demonstrate patent eligibility." (*FairWarning IP, LLC v. Iatric Sys., Inc.*, 839 F.3d 1089, 1098 (Fed. Cir. 2016) (quoting *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1379 (Fed. Cir. 2015)); *see also OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359, 1362–63 (Fed. Cir. 2015) ("[T]hat the claims do not preempt all price optimization or may be limited to price optimization in the e-commerce setting do not make them any less abstract."), *cert. denied*, 136 S. Ct. 701 (2015)). Thus, even assuming claim 1 recites a particular application of "offering for sale the identified efficient assortment" (*see* Appeal Br. 6–7), this does not demonstrate that claim 1 is directed to patent-eligible subject matter (Ans. 6–7). Rather, the claimed application of "offering, by the computing device, the one of the efficient assortments for sale to users" is very broad as it covers assortments of any kinds of *products* offered for sale (*see* Spec. ¶¶ 9, 12).[1]

Accordingly, we agree with the Examiner claims 1, 9, and 15 are directed to an abstract idea.

---

[1] Appellants' Specification provides "[t]he plurality of products *may correspond to a group of products that a firm (e.g., a business, an enterprise, an individual, a partnership)* is considering offering for sale," and "[t]he plurality of *products may include all of the products potentially available for offering by a firm*" (*see* Spec. ¶¶ 9, 12 (emphasis added)).

Alice/Mayo—Step 2

Appellants also allege the claims "recite[] 'significantly more' than any abstract idea" because they recite "unconventional steps" and "meaningful limitations" that "tie the mathematical operation (the GAM) to the processor's ability to identify efficient assortments" and "improve the functioning of the computer itself" (App. Br. 5, 8–9).

Appellants' arguments are not persuasive. Regardless of whether the recited limitations identified by Appellants may be "unconventional" or unknown to artisans of ordinary skill in the "efficient assortment" field (*see* App. Br. 9), the practical effect of Appellants' claims 1, 9, and 15 is that they would impermissibly preempt any use of the recited abstract mathematical algorithm for identifying efficient assortments (*see supra; see also Benson*, 409 U.S. at 71–72; *Flook*, 437 U.S. at 591–92).

As the Examiner also shows, the claims merely recite generic computer components performing "well-understood, routine, and conventional computer functions that are used to 'apply' the recited abstract idea" (Ans. 5–6, 10–11). The Specification, too, discloses using generic computer components (*see* Spec. ¶¶ 37–38, 40, 42–43). The evidence on record therefore supports the view that the broadest reasonable interpretation of such claim terms as "computing device," "computer," and "optimizer" (*see e.g.*, claims 1 and 9) is correctly construed as covering generic devices.

Appellants further argue claims 1, 9, and 15 "amount to significantly more than an abstract idea" as the claims "provide an improvement to the technology that presents assortments of products for sale to users because, in situations where there are unlimited numbers of products to select to offer for sale, the claimed invention helps avoid irrelevant alternatives of

products" and "facilitates [a] solution of identifying an efficient assortment using a GAM" which, "for large numbers[,] is intractable" (Reply Br. 8; App. Br. 9 (citing Spec. ¶ 20)). Appellants' arguments are unpersuasive because Appellants are reading limitations from the Specification into the claims. Although claims are interpreted in light of the Specification, limitations from the Specification are not read into the claims. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993). Here, claims 1, 9, and 15 do not recite or require determining efficient assortments from an "unlimited numbers of products" or identifying an efficient assortment by applying GAM to "large numbers" of products, as Appellants assert (*see* Reply Br. 8; App. Br. 9). Rather, claims 1, 9, and 15 merely require "a plurality" (i.e., *two or more*) products from which efficient assortments are determined by the GAM model.

Additionally, as discussed *supra*, we are not persuaded Appellants' stated advantages are caused by a technical improvement to computer operation. "[T]he use of generic computer elements like a microprocessor" to perform conventional computer functions "do not alone transform an otherwise abstract idea into patent-eligible subject matter." (*FairWarning*, 839 F.3d at 1096 (citing *DDR Holdings*, 773 F.3d at 1256)).

Accordingly, claims 1, 9, and 15, when considered "both individually and 'as an ordered combination,'" amount to nothing more than an attempt to patent the abstract idea embodied in the steps of the claims (*see Alice*, 134 S. Ct. at 2355 (quoting *Mayo*, 566 U.S. at 78)).

Because we agree with the Examiner's analysis and find Appellants' arguments insufficient to show error, we sustain the rejection of claims 1–20 under 35 U.S.C. § 101.

DECISION

The Examiner's decision rejecting claims 1–20 is affirmed.

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).

AFFIRMED