UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
11/531,652	09/13/2006	Bernardo A. Huberman	82224047	1541

56436   7590   11/01/2018
Hewlett Packard Enterprise
3404 E. Harmony Road
Mail Stop 79
Fort Collins, CO 80528

EXAMINER
GILKEY, CARRIE STRODER

ART UNIT	PAPER NUMBER
3689	

NOTIFICATION DATE	DELIVERY MODE
11/01/2018	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):

hpe.ip.mail@hpe.com
chris.mania@hpe.com

UNITED STATES PATENT AND TRADEMARK OFFICE

_____

BEFORE THE PATENT TRIAL AND APPEAL BOARD

_____

Ex parte BERNARDO A. HUBERMAN and FANG WU

_____

Appeal 2017-003675[1]
Application 11/531,652[2]
Technology Center 3600

_____

Before NINA L. MEDLOCK, JAMES A. WORTH, and
SCOTT C. MOORE, *Administrative Patent Judges.*

WORTH, *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 under 35 U.S.C. § 101 of claims 1–25, which constitute all claims
pending in this application.[3]

_____

[1] Our Decision refers to the Appellants' Appeal Brief (filed Apr. 15, 2016,
"Br."), and the Examiner's Final Office Action (mailed Dec. 14, 2015,
"Final Act.") and Answer (mailed Sept. 8, 2016, "Ans.").

[2] According to Appellants, the real party in interest is Hewlett Packard
Enterprise Development LP (HPED), which is a wholly owned affiliate of
Hewlett Packard Enterprise. Br. 3. The general or managing partner of
HPED is Enterprise DC Holdings LLC. *Id.*

[3] This is the second time this application has come before the Board.
Previously, we reversed rejections based on 35 U.S.C. § 112, first paragraph
(written description) and § 103. Appeal No. 2012-008310 (PTAB Mar. 30,
2015).

We have jurisdiction under 35 U.S.C. §§ 134 and 6(b).

We AFFIRM.

Introduction

Appellants' application relates to a method, computer-readable medium, and system for "ordering a set of items, and more specifically to determining a most valuable ordering for presentation where a restriction exists limiting output to a subset of the items," e.g., in an internet search. Spec. ¶ 1; *see also id.* ¶ 2.

Claims 1, 8, and 15 are the independent claims on appeal. Claim 1, reproduced below, is illustrative of the subject matter on appeal:

> 1. A method, comprising:
>
> measuring item state for each item of a plurality of items corresponding to a result of a search query directed to a search engine;
>
> tracking rates at which items of the plurality transition between item states;
>
> maintaining a discount rate which indicates how much future time to account for in ordering the plurality of items; and
>
> at each of a plurality of discrete times, determining a respective subset of the items, wherein the determining comprises ordering the plurality of items based on the item states, the transition rates, and the discount rate, wherein the ordering comprises ordering the items based on an optimization that distinguishes between item state transitions of the items that are in the subset of the items determined for a preceding one of the discrete times and item state transitions of the items that are outside the subset of the items determined for the preceding discrete time;
>
> wherein the measuring, the tracking, the maintaining, and the determining are performed by a computer.

Br. 15, Claims App.

Rejection on Appeal

The Examiner maintains, and Appellants appeal, the following rejection:

Claims 1–25 under 35 U.S.C. § 101 as being directed to an abstract idea.

FINDINGS OF FACT

We make the following findings of fact, which we determine are supported by at least a preponderance of the evidence[4]:

FF1. The Specification discloses that by tracking properties for each item 111, such as its reputation, history, age, etc., order determination manager 112 can determine that item 111 is in a "state" 203 defined by those properties. Spec. ¶ 25.

FF2. According to the Specification, it can be assumed within the context of one embodiment that state 203 of each item 111 changes according to a Markov process independent of the state 111 of other items 111, with transition probabilities $\{ P^l ij : i, j \, E \in E \}$ if the item 111 is on top list 211, and $\{ P^0 ij: i, j \, E \in E \}$ if it is not. Spec. ¶ 27. According to the Specification, it can also be assumed that item 111 being on top list 211 encourages more users 101 to select it, and consequently accelerates its transition from one state 203 to another. *Id.* Conversely, when an item transitions away from top list 211, its rate of change slows down by an amount ε_i which is less than one. This dual speed assumption can be stated as

---

[4] *See Ethicon, Inc. v. Quigg*, 849 F.2d 1422, 1427 (Fed. Cir. 1988) (explaining evidentiary standard for proceedings before the Patent Office).

$$p_{ij}^{0} = \begin{cases} \varepsilon_i\, p_{ij}^1, & i \neq j, \\ (1-\varepsilon_i) + \varepsilon_i\, p_{ii}^1, & i = j, \end{cases} \tag{1}$$

where $\varepsilon_i \in [0,1]$.

Id.

FF3. The model described above is essentially a dual-speed restless bandit problem. Spec. ¶ 30. The Specification states that dual-speed restless bandit problems are discussed, for example, in P. Whittle, *Restless bandits: activity allocation in a changing world*, J. APPL. PROB., 25A, pp 287–298 (1988) and K. D. Glazebrook, J. Niño-Mora and P. S. Ansell, *Index policies for a class of discounted restless bandits*, ADV. APPL. PROB., 34, 754–774 (2002). *Id.*

FF4. The model described above is restless because changes of state can also occur when the items are not displayed in top list 211, and dual speed because those changes do happen at a different speed than those on top list 211. Spec. ¶ 31. The Specification states that Bertsimas and Niño-Mora have demonstrated that an optimal solution is available for the dual-speed restless bandit problem, and that this solution is discussed in, e.g., J. Niño-Mora, *Restless bandits, partial conservation laws and indexability*, ADV. APPL. PROB., 33, 76–98 (2001), and Glazebrook et al. Spec. ¶ 31.

FF5. According to the Specification, it is possible to attach index 213 to each item state 203, so that top list 211 is the ordering including those items 111 with the largest indices 213. Spec. ¶ 32.

FF6. According to the Specification, Bertsimas and Niño-Mora have shown that a relaxed version of the dual-speed problem is always indexable (i.e. such indices 213 always exist) and also proposed an

efficient adaptive greedy heuristic to compute these indices 213. Spec.
¶ 33.

FF7. The Specification provides a set of linear equations that can be
used to solve for variables. Spec. ¶ 34 & eq. (4)–(6).

FF8. The Specification provides a matrix of constants to be used in the
Bertsimas-Niño-Mora heuristic. Spec. ¶ 34 & eq. (7), Table 1.

FF9. The Specification discloses calculating G-index rankings based on
the Bertsimas-Niño-Mora heuristic. Spec. ¶ 41.

ANALYSIS

Claims 1–25

The Examiner determines that claim 1 is directed to ordering items,
i.e., measuring item state, tracking rates, maintaining a discount rate, and
determining a subset of items and ordering the items based on the item
states, transition rates, and the discount rate, which amounts to merely: (i) a
fundamental economic/business practice, (ii) a method of organizing human
activities, and (iii) an idea of itself. Final Act. 2; Ans. 10.

The Examiner further determines that the claimed invention fails to
further improve upon the technology since the claimed invention does not
improve on the general purpose computer of paragraphs 19 and 20 of the
Specification. Final Act. 3. The Examiner determines that when the claim
is viewed as a whole, the additional claim elements of the measuring,
tracking, maintaining, and determining steps do not provide meaningful
limitations to transform the abstract idea into a patent eligible application of
the abstract idea such that the claims amount to significantly more than the
abstract idea itself. *See id.* The Examiner reasons, *inter alia*, that the

invention collects information and uses rules to identify options. Ans. 6
(citing, e.g., *SmartGene, Inc. v. Advanced Biological Laboratories, SA*,
555 F. App'x 950 (Fed. Cir. 2014)). The Examiner further reasons that the
claimed invention resembles other cases in which there were processes of
organizing information, including using mathematical correlations. *Id.*
(citing *Cyberfone Sys., LLC v. CNN Interactive Group, Inc.*, 558 F. App'x
988 (Fed. Cir. 2014); *Content Extraction and Transmission LLC v. Wells
Fargo Bank*, 776 F.3d 1343 (Fed. Cir. 2014); *Digitech Image Technologies,
LLC v. Electronics for Imaging, Inc.*, 758 F.3d 1344 (Fed. Cir. 2014)). The
Examiner also reasons that performing mathematical calculations to
manipulate results is abstract. *Id.* at 7 (citing, e.g., *Bancorp Services, L.L.C.
v. Sun Life Assur. Co. of Canada (U.S.)*, 687 F.3d 1266 (Fed. Cir. 2012)).

Appellants argue that the claimed invention is significantly more than
the abstract idea of ordering, at least in view of the following limitations of
independent claim 1: "measuring item state . . . corresponding to a result of
a search query directed to a search engine"; "tracking rates at which items of
the plurality transition between item states"; "maintaining a discount rate
which indicates how much future time to account for in ordering the
plurality of items"; "[determining a respective subset of the items, wherein
the determining comprises ordering the plurality of items] based on the item
states, the transition rates, and the discount rate, [wherein the ordering
comprises ordering the items based on an optimization that] distinguishes
between item state transitions of the items that are in the subset of the items
determined for a preceding one of the discrete times and item state
transitions of the items that are outside the subset of the items determined for
the preceding discrete time." *See* Br. 7–8, 12 (citing 2014 Interim Guidance

on Patent Subject Matter Eligibility). However, we agree with the Examiner that the claimed limitations are abstract because they are based on mathematical calculations used to order items, which constitute an abstract idea. Ans. 7. Indeed, the claimed invention is based on a concatenation of mathematical techniques. *See* FF1–9.

Appellants' argue, *inter alia*, that receiving, tracking, maintaining, and determining data based on other data and programming rules is necessarily rooted in computer technology to overcome a problem specifically arising the realm of computer networks (e.g., the web). Br. 10–11 (citing *DDR Holdings, LLC v. Hotels.com*, 773 F.3d 1245 (Fed. Cir. 2014)). Appellants characterize the problem in the computing art and the proposed solution as follows:

> In the use of computer network(s) distorting reinforcement processes can lock a data item for display to a user into a top ranking and make it hard for other bottom-listed items to surface, even though the latter can often be more valuable data. However, the distorting reinforcement process can be overcome by determining a respective subset of the items at discrete times, wherein the determining comprises ordering the plurality of items based on the item states, the transition rates, and the discount rate. The ordering can comprise ordering the items based on an optimization that distinguishes between item state transitions of the items that are in the subset of the items determined for a preceding one of the discrete times and item state transitions of the items that are outside the subset of the items determined for the preceding discrete time. Utilizing these elements, the problem of distorting reinforcement processes that lock orderings in computer networks can be overcome to maximize user value in information rich environments.

Br. 12. We are not persuaded by Appellants' argument. In particular, the mathematical problem of ordering is not limited to a network

environment. For example, the Specification explains that the claimed invention can be used by a journal in deciding which content to display.

The claimed invention here may be contrasted with that in *BASCOM*, where the court held that a claimed invention for filtering internet content was not subject to dismissal under Fed.R.Civ.P. 12(b)(6) based on an ordered combination of conventional components. *BASCOM Global Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1350 (Fed Cir. 2016). The claimed invention in *BASCOM* provided a "specific, discrete implementation of the abstract idea of filtering content" by associating individual accounts with their own filtering scheme and elements while locating the filtering system on an ISP server. *Id.* at 1344–45, 1350. The claimed invention in *BASCOM* provided a concrete, structural solution to a networking problem by placing a filter on a specified position on network, which when considered as an ordered combination, which adequately alleged claims that pass step two of the *Alice* framework. In contrast, the claimed invention here uses mathematical formulae that are necessarily abstract to accomplish the task of ordering. *See id.* at 1351; Spec. ¶ 34 & eq. (4)–(6).

Appellants argue that the notion of patent eligibility is supported by the lack of a rejection under §§ 102 and 103. Br. 13. However, that is not sufficient to demonstrate eligible subject matter. *See SAP America, Inc. v. InvestPic, LLC*, 898 F.3d 1161, 1163 (Fed. Cir. 2018) ("We may assume that the techniques claimed are '[g]roundbreaking, innovative, or even brilliant,' but that is not enough for eligibility. Nor is it enough for subject-matter eligibility that claimed techniques be novel and nonobvious in light of prior art, passing muster under 35 U.S.C. §§ 102 and 103.") (citations omitted).

Appellants argue that the claims include specific limitations other than what is well-understood, routine, and conventional in the field. Br. 13. We agree with the Examiner's findings that paragraphs 19 and 20 of the Specification make use of a general purpose computer and that the claimed invention is intended to be implemented on any computer system. *See* Final Act. 3. For example, paragraph 20 of the Specification indicates that the structure of the computer system can be either distributed or centralized, and can take other forms. Spec. ¶ 20. The Specification further explains that ". . . as the term is used herein an order determination manager 112 refers to a collection of functionalities which can be implemented as software, hardware, firmware or any combination of these." *Id.* ¶ 21. Further, the claimed method makes use of mathematical techniques for indexing known to persons of ordinary skill in the art (and which are themselves abstract). *See* FF6; Ans. 7; Spec. ¶ 31 ("*As is known by those of ordinary skill in the relevant art*, Bertsimas and Niño-Mora have demonstrated that an optimal solution is available for the dual-speed restless bandit problem.") (emphasis added).

In sum, we agree with the Examiner that performing mathematical calculations to manipulate results is itself abstract. *See* Ans. 7 (citing, e.g., *Bancorp Services, L.L.C. v. Sun Life Assur. Co. of Canada (U.S.),* 687 F.3d 1266 (Fed. Cir. 2012)). In *Bancorp,* the claims were variously directed to a method for managing a life insurance policy comprising seven steps and a "computer readable media [sic]" for performing same. *Bancorp,* 687 F.3d at 1277. The court in *Bancorp* determined that the performance of computations on a computer was abstract. *Id.* at 1277–78.

9

Accordingly, we sustain the Examiner's rejection of independent claim 1 under § 101. Appellants' arguments for the patentability of independent claims 8 and 15 are similar to those for independent claim 1, and are unpersuasive for similar reasons. Accordingly, we sustain the Examiner's rejection of independent claims 8 and 15, for similar reasons as for independent claim 1. Appellants do not argue the patentability of the dependent claims separately from the independent claims, and we sustain the rejection of the dependent claims for similar reasons.

DECISION

The Examiner's decision to reject claims 1–25 under 35 U.S.C. § 101 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). *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED