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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte AARON K. BAUGHMAN, GARY F. DIAMANTI, MAURO MARZORATI, and ELIZABETH M. VALLETTI

Appeal 2019-000665
Application 14/623,292
Technology Center 2100

Before ALLEN R. MacDONALD, MICHAEL M. BARRY, and RUSSELL E. CASS, *Administrative Patent Judges*.

BARRY, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellant[1] appeals from the Examiner's decision to reject claims 1–20, which are all the pending claims. *See* Final Act. 1; Appeal. Br. 5–12. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

Introduction

[1] We use "Appellant" to refer to the "applicant" as defined in 37 C.F.R. § 1.42. Appellant identifies the real party in interest as International Business Machines Corporation. Appeal Br. 2.

As Appellant explains the invention, it relates to data processing and "more specifically to mechanisms for iterative deepening knowledge discovery using time-weighted closures based on dimensions of evidence." Spec. ¶ 1. Appellant's background discussion focuses on technology and functionality issues related to "Question and Answer (QA) systems." *Id.* ¶¶ 2–3. "[A] Question Answering system (QA system) is an artificial intelligence application executing on data processing hardware that answers questions pertaining to a given subject-matter domain presented in natural language." Spec. ¶ 33.[2]

Claim 1 is representative of the claims on appeal:

> 1. A method, in a data processing system comprising at least one processor and at least one memory, the at least one memory comprising instructions which are executed by the at least one processor and configure the processor to implement a question answering system which operates for question answering using context features in closure form, the method comprising:
>
> receiving, by the question answering system, a function call comprising an input question and a set of non-local context evidence in closure form;
>
> decomposing, by a question decomposition stage of the question answering system, the input question into one or more queries;

[2] QA is a developing area of computer science. Question answering (QA) is a computer science discipline within the fields of information retrieval and natural language processing (NLP), which is concerned with building systems that automatically answer questions posed by humans in a natural language. Philipp Cimiano; Christina Unger; John McCrae (1 March 2014). *Ontology-Based Interpretation of Natural Language*. Morgan & Claypool Publishers. ISBN 978-1-60845-990-2.

> applying, by a hypothesis generation stage of the question answering system, the one or more queries to a corpus of information to obtain a set of local hypothesis evidence;
>
> generating, by the hypothesis generation stage of the question answering system, hypotheses for answering the input question based on the local hypothesis evidence and the set of non-local context evidence;
>
> generating, by a synthesis stage of the question answering system, a set of candidate answers to the input question based on the hypotheses;
>
> ranking, by a final confidence merging and ranking stage of the question answering system, the set of candidate answers by confidence to form a ranked set of candidate answers to the input question; and
>
> outputting, by the question answering system, the ranked set of candidate answers.

Claims App'x 3.[3]

Background

The Examiner rejected claims 1–20 under 35 U.S.C. § 101 as directed to a judicial exception (i.e., an abstract idea) without reciting significantly more. Final Act. 2–4; *see also id.* at 4–7 (discussing the Examiner's response to arguments made by Appellant prior to the Final Rejection). In particular, the Examiner determined claim 1 is "directed to an abstract idea of 'generating candidate answers to a question.'" Final Act. 2. Appellant contends, *inter alia*,[4] claims are *not* directed to an abstract idea because they

[3] All references to the Appeal Brief Claims Appendix ("Claims App'x") are to the corrected Claims Appendix filed May 20, 2018.
[4] We reverse the rejection based on a dispositive issue as discussed *infra* and do not address all of Appellant's arguments.

"present a specific means or method that improves the technology of a question answering system." Reply Br. 5; *see also id.* at 2–10 *and* Ans. 8–9.

General § 101 Law and the USPTO 2019 Guidance

An invention is patent-eligible if it claims a "new and useful process, machine, manufacture, or composition of matter." 35 U.S.C. § 101. The Supreme Court, however, 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, 71–73 (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 concepts (*Parker v. Flook*, 437 U.S. 584, 594–95 (1978)); and mental processes (*Gottschalk v. Benson*, 409 U.S. 63, 67 (1972)). In *Diamond v. Diehr*, the claim at issue recited a judicial exception in the

category of mathematical concepts, 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." 450 U.S. 175, 176 (1981).

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 (internal citation 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 requiring generic computer implementation fails to transform that abstract idea into a patent-eligible invention." *Id.* at 212.

In early 2019, the USPTO published revised guidance on the application of § 101. *2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. 50–57 (Jan. 7, 2019) ("Revised Guidance"). Under the Revised 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* Manual of Patent Examining Procedure (MPEP) § 2106.05(a)–(c), (e)–(h)).[5]

[5] All references to the MPEP are to Rev. 08.2017 (Jan. 2018).

See 84 Fed. Reg. at 52, 54–55. 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 Revised Guidance, 84 Fed. Reg. at 56.

Our Analysis

Alice/Mayo *Step One*, *Revised Guidance Step 2A Prong One*

As we begin our analysis under prong one of step 2A of the Revised Guidance, we keep in mind the caveat that it is improper to express ideas recited by claims in a way "untethered from the language of the claims." *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1337 (Fed. Cir. 2016). We also note that artisans of ordinary skill would recognize that a "question answering system," in the context of Appellant's Specification and Claims, is technological. *See, e.g.*, Spec. ¶¶ 2–3, 33. At prong one, however, we put aside the implicit technological aspect of a "question answering system," and consider the abstractedness of the claims' recited functionality related to questioning and answering, as those limitations would have been understood by artisans of ordinary skill (in the context of the claim and in view of the Specification).

Claim 1 recites a seven-step method, the purpose of which is, *inter alia*, as the preamble explains, "to implement a question answering

system."[6] The first two steps recite "receiving . . . an input question" and "decomposing . . . the input question into one or more queries." Any artisan of ordinary skill would understand these are requirements that may be performed mentally.[7] Thus, the first two steps recite an abstract idea. *See* Revised Guidance, 84 Fed. Reg. at 52 (identifying "mental processes" as a category of patent-ineligible abstract ideas). The middle three steps of claim 1 recite applying the one or more queries, then generating "hypotheses," and then generating "a set of candidate answers to the input question based on the hypotheses."[8] These three steps focus on (recite) a process of using hypotheses to come up with answers, which encompasses the mental process of running queries and then reviewing the results to come up with at least two hypothetical answers to the input question. Claim 1's final two steps focus on "a set of candidate answers by confidence," which is ranked and output. We note claim 1 imposes no limitation on how ranking "by confidence" is performed, other than to say that a particular "stage of the question answering system" performs it. As recited, the final two steps encompass the mental process of reviewing search results and, based on prior experience and knowledge, mentally ranking the reliability those results.

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[6] All quotes in this paragraph are from claim 1.
[7] To the extent "receiving . . . an input question" relates to organizing human activity in addition to (or rather than) mental processes, this limitation is equally abstract as an aspect of certain methods of organizing human activity. *See* 84 Fed. Reg. at 52. "Adding one abstract idea . . . to another abstract idea . . . does not render the claim non-abstract." *RecogniCorp, LLC v. Nintendo Co. LTD.*, 855 F.3d 1322, 1327 (Fed. Cir. 2017).
[8] We note, based on antecedent basis, the recited limitations of the middle three steps of claim 1 require completion of the steps in the recited order.

In view of the foregoing functionality recited in claim 1, Appellant does not persuade us under prong one of step 2A of the Guidance that the Examiner erred in determining that claim 1 recites an abstract idea. Final Act. 2. Because claim 1 *recites* an abstract idea, our analysis now proceeds to prong two, in order to determine whether claim 1 *is directed to* that abstract idea.

Alice/Mayo *Step One, 2019 Guidance Step 2A Prong Two*

We next consider whether, beyond the recited judicial exception, claim 1 recites any additional elements that, individually or in combination, integrate the judicial exception into a practical application. *See* Revised Guidance, 84 Fed. Reg. at 54–55. It does: claim 1 recites, as its first step, "receiving, by the question answering system, a function call comprising an input question and a set of non-local context evidence in closure form." The recited use of a "function call" and the use of "closure form" are particular (non-generic) software technology limitations. Appellant's Specification explains "function closure" technology and discusses practical issues related to its use within QA systems. *See* Spec. 20–26.

The "function closure"-related software limitations recited in claim 1's first step are integrated with the limitations that describe the abstract idea for generating answers to a question. Claim 1 uses the queries decomposed from the received function call to obtain "local hypothesis evidence," and then uses that local hypothesis evidence along with "the set of non-local context evidence" for generating hypotheses. Taken as a whole, claim 1 recites a set of steps for a particular query- and hypothesis-based processing sequence and set of rules, executed by a QA system, that amounts to

"us[ing] the limited rules in a process specifically designed to achieve an improved technological result in conventional industry practice," i.e., to improve the technology of QA systems. *See McRO, Inc. v. Bandai Namco Games America Inc.*, 837 F.3d 1299, 1316 (Fed. Cir. 1016); *see also id.* at 1307–08, 1313–16 (explaining "that processes that automate tasks humans are capable of performing are patent eligible if properly claimed" (*id.* at 1313)).

In view of the foregoing, we conclude claim 1 imposes meaningful limits on the application of the recited judicial exception for generating candidate answers to a question. These limitations, in combination, integrate the abstract idea into a practical application for the technology of QA systems. Thus, we agree with Appellant the Examiner erred in rejecting claims 1–20 under 35 U.S.C. § 101.

CONCLUSION

In summary:

Claims Rejected	Basis	Affirmed	Reversed
1–20	§ 101		1–20
Overall Outcome			1–20

REVERSED