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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte CHAO LIU and YI-MIN WANG

Appeal 2017-004814
Application 12/764,983
Technology Center 3600

Before JEAN R. HOMERE, JOSEPH P. LENTIVECH, and
MICHAEL J. ENGLE, *Administrative Patent Judges*.

LENTIVECH, *Administrative Patent Judge*.

DECISION ON APPEAL

Pursuant to 35 U.S.C. § 134(a), Appellants¹ appeal from the Examiner's decision to reject claims 1, 3, 5–11, and 13–23. Claims 2, 4, and 12 have been canceled. *See* App. Br. 21–27 (Claims App'x). We have jurisdiction over the pending claims under 35 U.S.C. § 6(b).

We reverse.

¹ According to Appellants, the real party in interest is Microsoft Technology Licensing, LLC. App. Br. 2.

STATEMENT OF THE CASE

Appellants' Invention

Appellants' invention generally relates to "learning a domain-specific ranker that can be configured to rank entities that belong to a domain."

Spec. ¶ 5. "[A]n entity can be a person, object, place, etc. and an entity may belong to a certain domain that may be used to classify the entity. Spec.

¶ 18. For example, a domain may be "actors" and particular actors may be entities within the domain. *Id.* Claim 1, which is illustrative of the claimed invention, reads as follows:

1. A method executed by at least one processor of at least one computing device, the method comprising:

receiving, at a computer, a plurality of computer-readable entities that each belong to a domain, wherein each computer-readable entity in the plurality of computer-readable entities represents an entity referenced in a computer-readable document, each computer-readable entity comprises:

an identifier for the computer-readable entity; and

a feature vector that describes the entity represented by the computer-readable entity, the feature vector has a plurality of values therein, the plurality of values respectively corresponds to a plurality of attributes of the entity;

applying a preference rule over pairs of computer-readable entities from amongst the plurality of computer-readable entities to generate preference pairs, each preference pair identifies which computer-readable entity in a pair of computer-readable entities in the preference pair is preferable over the other computer-readable entity in the pair of computer-readable entities, the preference rule comprising a defined preference between a first value of a first attribute in the plurality of attributes and a second value of the first attribute in the plurality of attributes; and

learning a computer-implemented ranker that is specific to the domain based upon the preference pairs, wherein the computer-implemented ranker, subsequent to being learned, is configured to output a ranked list of entities in the domain in response to receipt of a query, wherein the acts of receiving, applying, and learning are performed by the at least one processor.

References

The Examiner relies on the following prior art in rejecting the claims:

Liao et al.	US 2009/0006360 A1	Jan. 1, 2009
Chapelle et al.	US 2011/0016065 A1	Jan. 20, 2011

Rejections

Claims 1, 3, 5–11, and 13–23 stand rejected under 35 U.S.C. § 101 as directed to judicially-excepted subject matter under 35 U.S.C. § 101. Final Act. 2–4.

Claims 1, 3, 5–7, 9–11, and 13–23 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Liao. Final Act. 5–12.

Claim 8 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the combination of Liao and Chapelle. Final Act. 13–15.

ANALYSIS

Rejection under 35 U.S.C. § 101

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. v.*

CLS Bank Int'l, 134 S. Ct. 2347, 2354 (2014) (quoting *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576, 589 (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. The inquiry often is whether the claims are directed to “a specific means or method” for improving technology or whether they are simply directed to an abstract end-result. *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1311, 1314 (Fed. Cir. 2016). If the claims are not directed to a patent-ineligible concept, 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 79–80). 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 itself 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).

The Examiner determines the claims are directed to “outputting a ranked list of entities according to a defined preference rule.” Final Act. 3. The Examiner determines the claims “compare[] new entity and feature vector information with preference rules to determine and output a ranked

list of entities” and, therefore, are directed to an abstract idea. *Id.* (citing *SmartGene, Inc. v. Advanced Biological Labs., SA*, 555 F. App’x 950 (Fed. Cir. 2014) (unpublished)); *see also* Ans. 8 (citing *Cybersource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366 (Fed. Cir. 2011)).

Appellants argue the claims are not directed to an abstract idea but, instead, are directed to “learning a domain-specific computer-implemented ranker.” App. Br. 7. Appellants argue learning a domain-specific, computer-implemented ranker is not abstract because:

1) ***learning a computer-implemented ranker that is specific to the domain*** necessarily occurs in the context of computers; 2) the claims are directed to solving a problem that exists in a computing environment; and 3) ***learning a computer-implemented ranker that is specific to the domain*** cannot be fairly characterized as corresponding to any of the judicial descriptors of abstract ideas.

App. Br. 8; *see also* App. Br. 9–10.

For *Mayo/Alice* step two, Appellants argue

[The] claims recite features in addition to “outputting a ranked list of entities according to a predefined preference rule.” Specifically, independent claim 1 (for example) recites ***applying a preference rule over pairs of computer-readable entities from amongst the plurality of computer-readable entities to generate preference pairs . . . ; and learning a computer-implemented ranker that is specific to the domain based upon the preference pairs***. Therefore, even if the claims were deemed to be directed towards outputting a ranked list of entities according to a predefined preference rule, as alleged by the [Examiner], it is clear that these claims recite additional features pertaining to acquiring domain-specific training data and learning a domain-specific ranker based upon such training data.

App. Br. 12. Appellants argue that these additional features “provide a solution to the problem of conventional rankers lacking robustness and

accuracy when ranking entities belonging to a specific domain” (App. Br. 13) and “are directed to a new and useful application embodied through the specific combination of novel, non-generic (i.e., not well known, routine, or conventional) computer functions” (App. Br. 14).

We find Appellants’ arguments persuasive. Turning to the Examiner’s rejection, we note that, apart from listing multiple concepts, the Examiner does not identify specific claim limitations that the Examiner believes may be an abstract idea. Final Act. 3–4; Ans. 2–8. In particular, the Examiner determines:

Such as in *Cybersource (Cybersource Corp. v. Retail Decisions, Inc., 654 F.3d 1366 (Fed. Cir. 2011))*, which obtains and compares intangible data, the current invention obtains vector-based entity data and compares multiple entities of that obtained data together by applying a preference rule to learn a ranker. Therefore an abstract idea is present in the claims.

Ans. 8. The Examiner does not persuasively explain why or how “learning a computer-implemented ranker that is specific to the domain based upon the preference pairs” (the “learning limitation”), as recited in independent claim 1, is a step of “obtaining and comparing intangible data.” Next, we consider whether the learning limitation amounts to significantly more under step two of the analysis.

According to Appellants, the learning limitation contributes to the invention’s alleged improvement over the prior art. App. Br. 13–14; Reply Br. 7. For example, Appellants’ Specification provides “today’s search engines . . . are not configured to rank entities belonging to a certain domain” and that entity ranking is difficult because “entities in different domains have quite different attributes and the weights [assigned to the attributes when performing ranking] are dependent on the attributes when

entity ranking is undertaken.” Spec. ¶ 3. Appellants explain that to address this difficulty, the claims “recite a specific approach for acquiring domain-specific training data (applying a preference rule over pairs of computer-readable entities that belong to a same domain), and further recite use of that training data to solve a technological problem (the inability of conventional rankers to act as robust domain-specific rankers).” Reply Br. 7 (citing *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709 (Fed. Cir. 2014)).

“Whether something is well-understood, routine, and conventional to a skilled artisan at the time of the patent is a factual determination.” *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1369 (Fed. Cir. 2018). Based on the record before us, we agree with Appellants that the Examiner has not adequately demonstrated that the learning limitation was a well-understood, routine, conventional activity already engaged by the relevant community. *See* Final Act. 2–3; Ans. 8–20. Because the Examiner has not adequately demonstrated that fact, the Examiner has not established patent ineligibility. Hence, we do not sustain the § 101 rejection of independent claims 1.

The remaining claims were rejected under the same rationale. Final Act. 2–3; Ans. 2–20. Because we do not sustain the Examiner’s rejection of claim 1 as being directed to ineligible subject matter, we also do not sustain the rejection of independent claims 13 and 20, which recite similar limitations, and dependent claims 3, 5–11, 14–19, and 21–23 for the same reasons.²

² Appellants raise additional arguments. *See* App. Br. 6–15. Because the identified issue is dispositive of the rejection of claims 1, 3, 5–11, and 13–23 under 35 U.S.C. § 101, we do not reach the additional arguments.

Rejection under 35 U.S.C. § 102(b)

Appellants contend Liao fails to disclose

applying a preference rule over pairs of computer-readable entities from amongst the plurality of computer-readable entities to generate preference pairs, each preference pair identifies which computer-readable entity in a pair of computer-readable entities in the preference pair is preferable over the other computer-readable entity in the pair of computer-readable entities,

as recited in claim 1. App. Br. 16–19, Reply Br. 12–15.

Liao relates to providing “query relaxative ranking for support vector machines in order to provide more accurate and useful search results for a user, client, or application.” Liao ¶ 16. To provide the search results, Liao discloses obtaining a set of ranked query item pairs. *Id.* ¶ 17. Each query item pair corresponds to a query and a hit document. *Id.* Liao discloses that each query item pair also corresponds to a set of feature vectors and that each feature vector includes a set of features and corresponding feature weights. *Id.*

The Examiner finds the features included in Liao’s feature vectors disclose the claimed “entities.” Ans. 23 (citing Liao ¶ 35). The Examiner finds Liao discloses “for the same query, thus for the same particular ‘domain’ as claimed, feature items of documents (i.e., ‘entities’ as claimed) are evaluated and ranked relative to one another.” Ans. 23 (citing Liao ¶ 35). The Examiner finds Liao discloses analyzing the pair of feature items to produce a relevancy score and applying weighted factors to learn a ranking function via a machine learning application and training vectors and, therefore, Liao discloses “‘applying a preference rule’ as claimed.” Ans. 24 (citing Liao ¶¶ 38–39). We disagree.

Claim 1 recites that each computer-readable entity comprises “a feature vector that describes the entity represented by the computer-readable entity” and “has a plurality of values therein, the plurality of values respectively correspond[ing] to a plurality of attributes of the entity.” We agree with Appellants (Reply Br. 13–14), that Liao teaches that the features, which the Examiner relies upon for disclosing the claimed “plurality of computer-readable entities” (Ans. 23), are included in a feature vector that represents each item (Liao ¶ 35) but not that the features comprise a feature vector, as required by claim 1. Further, the Examiner’s findings are insufficient to show that Liao’s features have a plurality of values respectively corresponding to a plurality of attributes of the entity, as also required by claim 1.

Accordingly, we do not sustain the Examiner’s rejection under 35 U.S.C. § 102(b) of claim 1, independent claims 13 and 20, which recite corresponding limitations, and claims 3, 5–7, 9–11, 13–19, and 21–23, which depend from claims 1 and 13.³

Rejection under 35 U.S.C. § 103(a)

Claim 8 depends from claim 1. The Examiner does not find Chapelle cures the deficiencies in the teachings of Liao discussed with respect to claim 1. *See* Final Act. 13–14. Accordingly, we do not sustain the Examiner’s rejection of claim 8 under 35 U.S.C. § 103(a) for the reasons discussed *supra*.

³ Appellants raise additional arguments. *See* App. Br. 15–19. Because the identified issue is dispositive of the rejection of claims 1, 3, 5–7, 9–11, and 13–23 under 35 U.S.C. § 102(b), we do not reach the additional arguments.

DECISION

We reverse the Examiner's rejection of claims 1, 3, 5–11, and 13–23 under 35 U.S.C. § 101.

We reverse the Examiner's rejection of claims 1, 3, 5–7, 9–11, and 13–23 under 35 U.S.C. § 102(b).

We reverse the Examiner's rejection of claim 8 under 35 U.S.C. § 103(a).

REVERSED