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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MARIANNE HICKEY,
ANDREW BYDE,
MAHER RAHMOUNI, and
CLAUDIO BARTOLINI

Appeal 2015-000550
Application 12/916,043¹
Technology Center 3600

Before HUBERT C. LORIN, ANTON W. FETTING, and
MATTHEW S. MEYERS, Administrative Patent Judges.

LORIN, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Marianne Hickey, et al. (Appellants) seek our review under 35 U.S.C. § 134 of the final rejection of claims 1-8 and 20-31. We have jurisdiction under 35 U.S.C. § 6(b) (2002).

¹ Rather than identifying the real party in interest, the Appeal Brief states that “[t]he real party in interest in the above-captioned application is the assignee.” Appeal Br. 2. According to current USPTO records, the assignee is Hewlett-Packard Enterprise Development LP.

SUMMARY OF DECISION

We AFFIRM.

THE INVENTION

Claim 1, reproduced below, is illustrative of the subject matter on appeal.

1. A method for assessing health of a project, comprising:
 - determining, by a processor in response to computer-readable instructions, vectors for a set of project features;
 - determining, by a processor in response to computer-readable instructions, an indication of health of some aspect of the project using a machine learning classifier that has been trained for the set of project features using a set of training elements for one or more projects of a data set for a plurality of time intervals, each training element comprising a feature vector for a particular project of the data set at a particular time interval for that particular project and a health classification deemed to be correct for that particular project at that particular time interval.

THE REJECTIONS

The Examiner relies upon the following as evidence of unpatentability:

Cross	US 2009/0292580 A1	Nov. 26, 2009
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Abe, Seiya, et al., "Estimation of Project Success Using Bayesian Classifier," ICSE'06, pages 600-603, May 20-28, 2006, Shanghai, China. [Abe]

The following rejections are before us for review:

1. Claims 1-8 and 20-31 are rejected under 35 U.S.C. §101 as being directed to non-statutory subject matter.

2. Claims 1-8 and 20-31 are rejected under 35 U.S.C. §103(a) as being unpatentable over Cross and Abe.

ISSUES

Did the Examiner err in rejecting claims 1-8 and 20-31 under 35 U.S.C. §101 as being directed to non-statutory subject matter?

Did the Examiner err in rejecting claims 1-8 and 20-31 under 35 U.S.C. §103(a) as being unpatentable over Cross and Abe?

FINDINGS OF FACT

We rely on the Examiner's factual findings stated in the Answer. Additional findings of fact may appear in the Analysis below.

ANALYSIS

The rejection of claims 1-8 and 20-31 under 35 U.S.C. §101 as being directed to non-statutory subject matter.

The Appellants argued claims 1-8 and 20-31 as a group (Appeal Br. 9-11). We select claim 1 as the representative claim for this group, and the remaining claims 2-8 and 20-31 stand or fall with claim 1. 37 C.F.R. § 41.37(c)(1)(vii) (2007).

Alice Corp. Pty. Ltd. v. CLS Bank International, 134 S. Ct. 2347 (2014) identifies a two-step framework for determining whether claimed subject matter is judicially-excepted from patent eligibility under § 101.

According to *Alice* step one, “[w]e must first determine whether the claims at issue are directed to a patent-ineligible concept,” such as an abstract idea. *Id.* at 2355. The Examiner found that “[t]he claim(s) is/are

directed to the abstract idea of assessing project health, which is a fundamental economic practice and idea of itself.” Ans. 11. This does not appear to be in dispute.

Step two of *Alice* is “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.’” 134 S. Ct. at 2355 (quoting *Mayo Collaborative Servs. v. Prometheus Labs, Inc.*, 132 S. Ct. 1289, 1294 (2012)).

The Examiner found that

[t]he additional element(s) or combination of elements in the claim(s) other than the abstract idea per se amount(s) to no more than: (i) mere instructions to implement the idea on a computer, and/or (ii) recitation of generic computer structure that serves to perform generic computer functions that are well-understood, routine, and conventional activities previously known to the pertinent industry. 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.

Ans. 11.

The Appellants dispute this. According to the Appellants,

[r]epresentative [independent] claim 1 recites, in part, "determining, by a processor in response to computer-readable instructions, an indication of health of some aspect of the project using a machine learning classifier that has been trained for the set of project features using a set of training elements for one or more projects of a data set for a plurality of time intervals, each training element comprising a feature vector for a particular project of the data set at a particular time interval for that particular project and a health classification deemed to be correct for that particular project at that particular time interval." Appellant contends this limitation

meaningfully extends any abstract idea of assessing project health beyond its mere linking to a particular technological environment.

Reply Br. 10. The other independent claims, claims 20 and 25 have similar limitations.

A factor to consider is whether a claimed solution is necessarily rooted in computer technology. *Cf. Amdocs (Israel) Limited v. Openet Telecom, Inc*, No. 2015-1180, 2016 WL 6440387, *10 (Fed. Cir. Nov. 1, 2016):

this claim entails an unconventional technological solution (enhancing data in a distributed fashion) to a technological problem (massive record flows which previously required massive databases). The solution requires arguably generic components, including network devices and “gatherers” which “gather” information. However, the claim’s enhancing limitation necessarily requires that these generic components operate in an unconventional manner to achieve an improvement in computer functionality. The enhancing limitation depends not only on the invention’s distributed architecture, but also depends upon the network devices and gatherers—even though these may be generic—working together in a distributed manner.

See also *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1257 (Fed. Cir. 2014):

these claims stand apart because they do not merely recite the performance of some business practice known from the pre-Internet world along with the requirement to perform it on the Internet. Instead, the claimed solution is necessarily rooted in computer technology in order to overcome a problem specifically arising in the realm of computer networks.

The Appellants argue that, given said claim limitation, “Appellant’s claim 1 requires the use of a machine learning classifier trained in a

specific manner that is not found in the prior art of record. Appellant contends that it is well understood that the response of a machine learning classifier is highly dependent upon the training data utilized.” Reply Br. 10.

The evidence the Appellants provide (i.e., via the discussion of classifiers in Specification paras. 14 and 17) appears to support that view. Reply Br. 10. According to the Specification, “training data” are “a set of observed examples.” Specification para. 14. The Specification gives “historical data” as an example. Specification para. 15. In other words, classifiers will yield a result specific to and dependent on the type of information (e.g., historical data) provided to it.

But the Appellants further argue that “a machine learning classifier trained in a manner as recited in claim 1 *would be expected to respond differently* than a machine learning classifier trained in some other manner, such as that found in Abe et al” (Reply Br. 10, emphasis added). The Appellants imply that machine learning classifiers are necessarily different because they yield a result specific to and dependent on the type of information (e.g., historical data) provided to it. To the extent the Appellants mean to further argue that the claimed method is necessarily rooted in computer technology, we find insufficient evidence to support it.

The record does not sufficiently show that a training scheme as claimed - whereby a claimed machine learning classifier yields a result specific to and dependent on the type of provided information (i.e., “a set of training elements for one or more projects of a data set for a plurality of time intervals, each training element ...”) - transforms a known machine learning classifier into something structurally and/or functionally different.

The record is more supportive of the opposite conclusion; that is, the claimed machine learning classifier is not structurally and/or functionally different from what has been well understood in the art. According to the Specification, the invention involves a common computer system “suitable for use with various embodiments of the disclosure” (Specification para. 26). *See* Specification paras. 26-28 for the common components. And the invention is said to involve classifiers that are well understood in the art. *See* Specification para. 14 (emphasis added):

Various embodiments described herein include methods of assessing health of projects using classifiers. Machine learning research has led to classifiers, such as statistical linear classifiers, capable of making a classification decision on the basis of a set of observed examples, i.e., training data. Statistical linear classifiers do this by determining the value of a linear combination of features of interest in relation to the training data. Examples of statistical linear classifiers might include spam filters. Other examples of classifiers include quadratic classifiers, kernel estimation classifiers, Bayesian network classifiers, k-nearest neighbor (kNN) classifiers, etc. *Classifiers are well understood in the art and the embodiments are not limited to a specific classifier.*

There is insufficient discussion in the Specification to lead one of ordinary skill in the art to understand that by training a classifier as claimed it would be transformed from what is already well understood in the art into something structurally and/or functionally different. Rather, one of ordinary skill in the art would understand the change to reside in the type of information being introduced into the classifier, not the classifier itself. *See e.g.*, Specification para. 17 (emphasis added): “The *training data may be randomly selected* over a broad range of projects. Alternatively, the *training data may be tailored* to one or more specific types of projects.”

The Appellants’ remaining arguments make the point that the claim 1 machine learning classifier is “not found in the prior art.” *See* Reply Br. 10. However, the question here is not whether the prior art describes or discloses using the machine learning classifier recited in claim 1 but whether there is “an element or combination of elements [] ‘sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [ineligible concept] itself.’” *Alice*, 134 S. Ct. at 2355.

In summary, we find that in light of the Specification claim 1 reasonably broadly covers using conventional computer technology comprising a common computer system and a common machine-learning classifier operating as they are normally expected to. The Appellants have not come forward with, and the record before us does not provide, sufficient evidence to support, for example, finding that the claimed method for assessing health of a project is necessarily rooted in computer technology. Rather, the evidence weighs in favor of finding the claimed method for assessing health of a project is instead rooted in the *type* of information used. This does no more than express the assessing project health idea in more contextual terms. *Cf. CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1371 (Fed. Cir. 2011) (“The Court [*Parker v. Flook*, 437 U.S. 584 (1978)] rejected the notion that the recitation of a practical application for the calculation could alone make the invention patentable.”). As such, the argued-over machine learning classifier as claimed is insufficient to ensure that the claimed method in practice amounts to significantly more than the “abstract idea of assessing project health” (Ans. 11) itself.

For the foregoing reasons, the Appellants' arguments are unpersuasive as to error in the rejection.

The rejection of claims 1-8 and 20-31 under 35 U.S.C. §103(a) as being unpatentable over Cross and Abe.

The Examiner's position is the same for all three independent claims 1, 20, and 25. Final Act. 5-6.

Taking claim 1 as representative, the Examiner takes the position that Cross discloses all that is claimed but for the classifier, for which Abe is relied upon. Final Act. 5. According to the Examiner,

it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Cross to include the classifiers of Abe for the purpose of predicting the final status of the project (Abe, section 2.4). By doing so, one would reasonably expect the overall appeal of the invention to increase by utilizing a common approach to classification of categorical data to aid in predicting project status.

Final Act. 6.

The Appellants disagree. The Appellants argue, in part, the Examiner's foregoing assertion merely addresses what portions of the cited references are relied upon, i.e., that Cross et al. is relied upon to teach project health determination over various time intervals including feature vectors and health classification at particular time intervals, and that Abe et al. is relied upon to teach the inclusion of machine learning classifiers, as applied to the base reference of Cross et al. *See, e.g.*, Examiner's Answer, page 13, last paragraph. This assertion fails to provide any reasoned statement as to how one skilled in the art would modify the project decay function of Cross et al. to incorporate the Bayesian classifier of Abe et al. to arrive at the elements of Applicant's claims.

Reply Br. 3-4. We agree.

There is no dispute that Cross fails to disclose a machine learning classifier. And there is no dispute that Abe discloses a machine learning classifier. The dispute is over why one of ordinary skill in the art would be led to include Abe's machine learning classifier in Cross so as to reach the claimed subject matter.

The Examiner points out that "[b]oth Cross and Abe are drawn to project management and success determination of projects" (Final Act. 6) and that including Abe's machine learning classifier in Cross would provide for "predicting the final status of the project (Abe, section 2.4)" (Final Act. 6). "By doing so, one would reasonably expect the overall appeal of the invention to increase by utilizing a common approach to classification of categorical data to aid in predicting project status." Final Act. 6.

But the difficulty with this reasoning is that Cross and Abe are directed to different purposes, albeit both are generally about "project management and success determination of projects" (Final Act. 6).

Cross seeks to determine project health. This involves defining a "project decay function", "a mathematical model or algorithm for calculating the health of the project, referred to as the "project health." Para. 30. The process begins by defining the project. *See* para. 24 discussing step 105 in Fig. 1. The final status of the project is considered during the defining of the project. "[T]he user can outline a timeline for the project, organize a structure for development of the project, and determine a metric for the "health" and success of the project." Para. 26. The project then defines the project decay function to determine a project's health. *See* para. 30 discussing step 110 in Fig. 1.

Abe discloses applying a Bayesian classifier to metrics to estimate the final status (successful or unsuccessful) of a project. *See* Abstract. Abe describes a study of 29 metrics. *See* Table 1. To determine a set of metrics predictive of project success, three viewpoints from experts were considered: with respect to quality, cost, and duration. Section 4.1. Table 3 shows the results when a Bayesian classifier is applied in light of said viewpoints.

One of ordinary skill in the art with these references in hand would possibly be led to employ Abe's Bayesian classifier in Cross's process when the project is first defined, or maybe at the end of Cross's process. But that would not lead one to the method as claimed wherein a classifier is used to assess a project's health. Cross's "project decay function" and Abe's Bayesian classifier have different purposes. Changing the purpose of Abe's Bayesian classifier so as to direct it to assessing project health, as with Cross's "project decay function," would amount to a reconstruction of Abe's Bayesian classifier. "We must still be careful not to allow hindsight reconstruction of references to reach the claimed invention without any explanation as to how or why the references would be combined to produce the claimed invention." *Innogenetics, N.V. v. Abbott Labs.*, 512 F.3d 1363, 1374 n.3 (Fed. Cir. 2008). In that regard, we do not see and the Examiner does not fully explain why one of ordinary skill would be led to substitute Cross's "project decay function" (used for calculating a project's health) with Abe's Bayesian classifier (used to estimate the final status (successful or unsuccessful) of a project) and thereby reach the method as claimed (wherein a classifier is used to assess a project's health).

Accordingly, the rejection is not sustained.

CONCLUSIONS

The rejection of claims 1-8 and 20-31 under 35 U.S.C. §101 as being directed to non-statutory subject matter is affirmed.

The rejection of claims 1-8 and 20-31 under 35 U.S.C. §103(a) as being unpatentable over Cross and Abe is affirmed.

DECISION

The decision of the Examiner to reject claims 1-8 and 20-31 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