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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MARIANNE IANNACE and LUCKNER B. POLYCARPE

Appeal 2017-004603
Application 14/169,866¹
Technology Center 3600

Before HUBERT C. LORIN, BRUCE T. WIEDER, and
ROBERT J. SILVERMAN, *Administrative Patent Judges*.

SILVERMAN, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

The Appellants appeal under 35 U.S.C. § 134(a) from the Examiner's decision rejecting claims 1–20. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

¹ The Appellants identify MasterCard International Incorporated as the real party in interest. Appeal Br. 2.

ILLUSTRATIVE CLAIM

1. A method comprising:
 - receiving a first data set, the first data set including anonymized transaction data representing purchase transactions made by customers of a merchant;
 - receiving a second data set, the second data set including anonymized transaction data representing purchase transactions made by cardholders in a payment network;
 - filtering the second data set to remove therefrom data relating to cardholders who are not customers of the merchant;
 - processing said first data set and said filtered second data set using a probabilistic engine to establish linkages between data in the first data set and data in the filtered second data set;
 - selecting a first data attribute with respect to data in the first data set or other data supplied by the merchant;
 - selecting at least one second data attribute with respect to data in the filtered second data set for which linkages exist with data in the first data set;
 - defining a predictive model having at least one independent variable and a dependent variable, said at least one independent variable corresponding to said selected at least one second data attribute and said dependent variable corresponding to said selected first data attribute;
 - performing calculations using the predictive model to generate output data; and
 - appending the output data to the first data set.

CITED REFERENCES

The Examiner relies upon the following references:

Kilger et al. US 7,490,052 B2 Feb. 10, 2009
(hereinafter “Kilger”)

Bernd Fischer & Joachim M. Buhmann, *Bagging for Path-Based Clustering*, 25 IEEE TRANSACTIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE (11), 1411 (2003) (hereinafter “Fischer”)

Chris Ding & Xiaofeng He, *K-means Clustering via Principal Component Analysis*, Proceedings of the 21st International Conference on Machine Learning, Banff, Canada, 2004 (hereinafter “Ding”)

REJECTIONS²

I. Claims 1–20 are rejected under 35 U.S.C. § 101 as ineligible subject matter.

II. Claims 1–20 are rejected under 35 U.S.C. § 112(a) as failing to comply with the written description requirement.³

III. Claims 1–20 are rejected under 35 U.S.C. § 112(b) as being indefinite for failing to particularly point out and distinctly claim the subject matter that the Appellants regard as the invention.

IV. Claims 1–3, 5–10, 12–17, 19, and 20 are rejected under 35 U.S.C. § 103(a) as unpatentable over Kilger and Fischer.

V. Claims 4, 11, and 18 are rejected under 35 U.S.C. § 103(a) as unpatentable over Kilger, Fischer, and Ding.

FINDINGS OF FACT

The findings of fact relied upon, which are supported by a preponderance of the evidence, appear in the following Analysis.

² In addition to the enumerated rejections, the Final Office Action (pages 18–22) rejects claims 1, 8 and 15 on the ground of nonstatutory obviousness-type double patenting. This rejection is withdrawn. *See* Answer 3, 23.

³ Although set forth under either 35 U.S.C. § 112(a) or 35 U.S.C. § 112 (pre-AIA), first paragraph (*see* Final Action 23), the AIA version of the statute applies herein, because the Application under review was filed after the effective date of § 4(c) of the Leahy-Smith America Invents Act (AIA) (September 16, 2012). *See, e.g.*, MPEP § 2161(I).

ANALYSIS

Subject-Matter Eligibility

Under 35 U.S.C. § 101, an invention is patent-eligible if it claims a “new and useful process, machine, manufacture, or composition of matter.” 35 U.S.C. § 101. Yet, subject matter belonging to any of the statutory categories may, nevertheless, be ineligible for patenting. The Supreme Court has interpreted § 101 to exclude laws of nature, natural phenomena, and abstract ideas, because they are regarded as the basic tools of scientific and technological work, such that including them within the domain of patent protection would risk inhibiting future innovation premised upon them. *Ass’n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576, 589 (2013).

Of course, “[a]t some level, ‘all inventions . . . embody, use, reflect, rest upon, or apply’” these basic tools of scientific and technological work. *Alice Corp. v. CLS Bank Int’l*, 134 S. Ct. 2347, 2354 (2014) (internal citation omitted). Accordingly, evaluating ineligible subject matter, under this judicial exclusion, involves a two-step framework for “distinguish[ing] between patents that claim the buildin[g] block[s] of human ingenuity and those that integrate the building blocks into something more, thereby transform[ing] them into a patent-eligible invention.” *Id.* (internal quotation marks and citation omitted). The first step determines whether the claim is directed to judicially excluded subject matter (such as a so-called “abstract idea”); the second step determines whether there are any “additional elements” recited in the claim that (either individually or as an “ordered combination”) amount to “significantly more” than the identified judicially excepted subject matter itself. *Id.* at 2355.

The USPTO recently published revised guidance on the application of § 101, in accordance with judicial precedent. 2019 Revised Patent Subject Matter Eligibility Guidance, 84 Fed. Reg. 50, 52 (Jan. 7, 2019) (“*2019 Revised Guidance*”). Under the *2019 Revised Guidance*, a claim is “directed to” an abstract idea, only if the claim recites any of (1) mathematical concepts, (2) certain methods of organizing human activity, and (3) mental processes — without integrating such abstract idea into a “practical application,” i.e., without “apply[ing], rely[ing] on, or us[ing] the judicial exception in a manner that imposes a meaningful limit on the judicial exception, such that the claim is more than a drafting effort designed to monopolize the judicial exception.” *Id.* at 53–55. A claim so “directed to” an abstract idea constitutes ineligible subject matter, unless it recites an additional element (or combination of elements) amounting to significantly more than the abstract idea. *Id.* at 56.

As to the first step of the *Alice* framework the Examiner states that, “[t]aken as a whole, the claim recites the abstract idea of using two different data sets which are then processed and used to develop a model for predicting customer behavior” that is considered to be “mathematical relationships/formulas (i.e. which provide a prediction of customer shopping or buying behavior based on past patterns).” Final Action 15. The Examiner alternatively identifies the abstract idea as “processing customer data from different databases for the purpose of generating a predictive model of customer behavior,” which the Examiner regards as a type of “mathematical and/or statistical formulation.” *Id.* at 14. The Examiner also compares the present claims to those involved in *Versata Development Group, Inc. v. SAP America, Inc.*, 793 F.3d 1306 (Fed. Cir. 2015),

explaining that the present claims amount to an “application of linking data to form a predictive model” that is “merely a method of calculating.”

Answer 10. Viewed through the lens of the *2019 Revised Guidance*, 84 Fed. Reg. at 52, the Examiner’s analysis depicts the claimed subject matter as one of the ineligible “[c]ertain methods of organizing human activity” that include “advertising, marketing or sales activities or behaviors” and “business relations.”

Turning to the second step of the *Alice* framework, the Examiner determines that the additional elements of the claims do not recite significantly more than an abstract idea, but instead merely implement an abstract idea by using routine computer functionality. Final Action 14, 15; *see also* Answer 10.

The Appellants argue claims 1–20 as a group, treating claim 1 as exemplary. Appeal Br. 8. Claim 1 is selected for analysis herein. *See* 37 C.F.R. § 41.37(c)(1)(iv).

With regard to the first step of the *Alice* framework, the Appellants contend that the Examiner’s characterization of the claim language “is crucially incomplete and fails to give ‘full faith and credit’ to the actual details and complexity of the claimed invention.” Appeal Br. 9. However, this criticism refers to the Examiner’s paraphrasing of only part of the language of claim 1 — which the Examiner described as “[d]efining a model based on the linked variables and generating output” (Final Action 15) (emphasis omitted) — rather than the Examiner’s more detailed and complete descriptions of the abstract idea, which are quoted above (*see id.* at 14, 15). Elsewhere, the Appellants (Reply Br. 2–3) cite to an instance in the Examiner’s Answer referring to “the assertion . . . that the claims are

directed to an abstract idea of modelling data” (Answer 5). Yet, here again, the Appellants, do not address the propriety of the Examiner’s more complete descriptions provide in the Final Office Action (pages 14 and 15).

A portion of the Appeal Brief (on page 10) identifies one of the Examiner’s more complete descriptions of the abstract idea — “processing customer data from different databases for the purpose of generating a predictive model of customer behavior” (*see* Final Action 14). Here, the Appellants proceed to argue:

The Examiner likens this alleged abstract idea to one concerned with “mathematical and/or statistical formulation.” However, a more accurate reading of the Examiner’s statement of the “abstract idea” would lead to a conclusion that the claims are concerned with the field of computerized data processing, including analysis of data stored in computer databases. This is not a disembodied mathematical concept, but rather is concerned with the widespread and practical field of data analytics performed by computer.

Appeal Br. 10. Yet, the Appellants do not provide any basis for the suggestion that the Examiner’s position requires the claims to be directed to “a disembodied mathematical concept.” *See id.* Nor do the Appellants explain why a solution from “the widespread and practical field of data analytics performed by computer” cannot be an abstract idea. *See id.* *See also* Reply Br. 3 (“[I]f one considers, ‘what did the inventors invent?’ — then the answer is a specific improvement in the field computerized [sic] data analytics, not an abstract idea.”)

Similarly, the Appellants do not present any reason why the abstract idea identified by the Examiner might be integrated into a practical application, regarded in view of the second prong of “Revised Step 2A” of the *2019 Revised Guidance*, 84 Fed. Reg. at 54–55. Although the

Appellants argue that claim 1 constitutes “a specific improvement in the field computerized [sic] data analytics, not an abstract idea” (Reply Br. 3), the alleged improvement is nothing more than implementing the identified abstract idea in a computer environment. *See Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335–36 (Fed. Cir. 2016) (“[T]he first step in the *Alice* inquiry in this case asks whether the focus of the claims is on the specific asserted improvement in computer capabilities . . . or, instead, on a process that qualifies as an ‘abstract idea’ for which computers are invoked merely as a tool.”)

The Appellants also contend that the claims are not directed to an abstract idea, because “the claims are completely different from the claims in the *Alice* case, in which the claims merely recite computerization of a conventional business practice.” Appeal Br. 10. This argument is unpersuasive, because it says nothing about the propriety of the Examiner’s determination of what the claims in this Appeal are directed to. Moreover, the realm of abstract ideas is not restricted to any template based upon the claims at issue in *Alice*.

Nor are we persuaded by the Appellants’ criticism of the Examiner’s reliance upon *Versata*, wherein the Appellants assert that the *Versata* claims involved “a computerized manner of determining prices, which is a completely different type of subject matter from the data analytics field to which the claims on appeal are related.” Reply Br. 2. The Examiner’s reliance on *Versata* does not depend upon there being a precise match with the claims in the present Appeal. Rather, the Examiner focuses on the *Versata* claims and those in this Appeal as both being “method[s] of calculating.” *See Answer 10*.

Therefore, the Appellants do not persuasively argue that the Examiner erred in performing the first step of the *Alice* framework.

With regard to the second step of the *Alice* framework (“Step 2B” of the *2019 Revised Guidance*, 84 Fed. Reg. at 56–57), the Appellants liken claim 1 to those in *DDR Holdings, LLC v. Hotels.com, LP*, 773 F.3d 1245 (Fed. Cir. 2014), alleging that claim 1 “goes beyond what is routine and conventional.” Appeal Br. 10–11. More particularly, the Appellants contend:

The claims in this application . . . involve computerized analysis of databases to uncover insights that can be gleaned from a linking of two databases. This further extension of computer-based data analytics is inherently tied to the field of data processing by computer. As such it overcomes a problem specifically arising in the field of computerized data processing. Moreover, the definition of variables for the predictive model in claim 1 goes beyond what is routine or conventional in the field of data analytics.

Id. at 11. According to the Appellants, “[w]hile predictive modeling by computer is of course in general a common activity, it is not conventional or routine to select an independent variable for the model and a dependent variable for the model in the manner recited in the claims” (Reply Br. 3) — “[i].e., with at least one independent variable that corresponds to an attribute of the network data, and a dependent variable that corresponds to an attribute of the merchant data” (Appeal Br. 10 n.6) (comparing the claimed subject matter to claim 2 of the USPTO’s Example 21, provided in July 2015).

This argument is unpersuasive, because the claimed features that the Appellants rely upon, as constituting “significantly more” than the abstract idea, are part of what the Examiner identifies as the abstract idea. *See* Final Action 14 (describing the abstract idea as “processing customer data from

different databases for the purpose of generating a predictive model of customer behavior”). The Federal Circuit has explained that “a claimed invention’s use of the ineligible concept to which it is directed cannot supply the inventive concept that renders the invention ‘significantly more’ than that ineligible concept. *BSG Tech LLC v. BuySeasons, Inc.*, 899 F.3d 1281, 1290 (2018).

Therefore, in view of the foregoing analysis, we are not persuaded of Examiner error in the rejection of claim 1, for being ineligible subject matter. Pursuant to 37 C.F.R. § 41.37(c)(1)(iv), we sustain the rejection of claims 1–20 under 35 U.S.C. § 101.

Written Description

The rejection for lack of adequate written description, in the present Appeal, concerns the “probabilistic engine” and “predictive model” limitations that appear in each of independent claims 1, 8, and 15. *See* Final Action 23. In claim 1, these limitations are set forth as follows:

processing said first data set and said filtered second data set using a *probabilistic engine* to establish linkages between data in the first data set and data in the filtered second data set;
[and]

defining a *predictive model* having at least one independent variable and a dependent variable, said at least one independent variable corresponding to said selected at least one second data attribute and said dependent variable corresponding to said selected first data attribute.

(Emphasis added).

In regard to a statement in the Specification that “the probabilistic engine 102 operates to perform an inferred match analysis to assess the inferred linkage for uniqueness and direct linkage,” so as to “allow[] further

assurance of anonymity and avoid[] use of any [personally identifiable information],” the Examiner states that “[h]ow the probabilistic [engine] actually functions to achieve this ‘inferred match’ is not disclosed.” Final Action 24 (quoting Spec. p. 8, ll. 1–3). *See also* Answer 12–15.

Similarly, the Examiner regards the Specification as lacking adequate written description for the recited “predictive model” of claim 1. *See* Final Action 25. Among its disclosures, the Specification states:

As is familiar to those who are skilled in the art, predictive analysis typically involves applying a predictive model to a data set. The prediction is performed by the predictive model on the basis of one or more independent variables, and with respect to a dependent variable. In accordance with aspects of the present invention, the data set with respect to which the predictive analysis is to be made is formed from the linkage of filtered payment network transaction data to merchant transaction data. The independent variable or variables for the predictive model may be selected (block 1012, FIG. 10) to correspond to one or more attributes of the payment network transaction data.

. . . Examples of suitable types of predictive model include logistic regression, linear regression, k-means clustering, a decision tree and a genetic algorithm. The nature and use of these and other types of predictive model are known to those who are skilled in the art.

It is contemplated that other types of predictive models may be used in addition to or instead of those types listed above. Predictive Model Markup Language (PMML) may be used to describe and define the desired predictive model(s).

Spec. p. 21, ll. 21–p. 22, l. 3; p. 22, l. 24–p. 23, l. 1. According to the Examiner, “[w]hile PMML is understood in the art, the reference to this fails to provide adequate written description for what model has actually been developed.” Final Action 25 (footnote omitted). Further, the Examiner

states that “[h]ow these [identified techniques] are applied to solve the problem at hand is not discussed nor explained by the specification” and “each of these models could give different results as each of these rely on different numerical techniques and are very different.” Answer 16.

Pursuant to the written-description requirement of 35 U.S.C. § 112(a), “the test for sufficiency is whether the disclosure of the application relied upon reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date.” *Ariad Pharm., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc) (citations omitted). Yet, “the level of detail required to satisfy the written description requirement varies depending on the nature and scope of the claims and on the complexity and predictability of the relevant technology.” *Id.* (citation omitted).

Although the Examiner states that particular details of the recited “probabilistic engine” and “predictive model” are not disclosed in the Specification, the Examiner’s analysis does not squarely address whether the Specification would adequately convey, to a person of ordinary skill in the art, possession of the claimed subject matter in question.

Furthermore, and contrary to the Examiner’s position, the Specification reflects that the disclosed uses of a “predictive model” would be familiar to a person of ordinary skill in the art. *See* Spec. p. 21, ll. 21–22 (“As is familiar to those who are skilled in the art, predictive analysis typically involves applying a predictive model to a data set”), p. 22, ll. 25–27 (“The nature and use of these and other types of predictive model are known to those who are skilled in the art”).

Additionally, the Appellants refer to the previously submitted Iannace Declaration,⁴ indicating that both the “probabilistic engine” and the “predictive model” are familiar to persons of ordinary skill in the art (specifically, the field of data analytics), such that the disclosure of the Specification reflects possession thereof. *See* Iannace Decl. ¶¶ 6–12.

In view of the foregoing, we are persuaded that the Examiner has not adequately shown that independent claims 1, 8, and 15 fail to satisfy the written-description requirement. Accordingly, we do not sustain the rejection of claims 1–20 under 35 U.S.C. § 112(a).

Indefiniteness

According to the Examiner, because independent claims 1, 8, and 15 recite limitations that “fail to have inadequate [sic, adequate] written description, the metes and bounds of these limitations are not clear.” Final Action 26. “For example,” the Examiner explains, “the claims recite using a probabilistic engine and defining a predictive model,” but “[i]t is not clear what is being recited here, since the specification does not say [what] constitutes the ‘probabilistic engine’ or defined ‘[predictive] model.’” *Id.* at 27.

Contrary to the Examiner’s position (*see* Final Action 26), a Specification’s insufficient written description, in violation of 35 U.S.C. § 112(a), does not necessarily establish indefinite claim language, in violation of 35 U.S.C. § 112(b).

During the Office’s evaluation, under 35 U.S.C. § 112(b), a proposed patent “claim is indefinite when it contains words or phrases whose meaning

⁴ We refer to the Rule 132 Declaration of Marianne Iannace received December 31, 2015. *See* Appeal Br. 12.

is unclear,” i.e., “ambiguous, vague, incoherent, opaque, or otherwise unclear in describing and defining the claimed invention.” *In re Packard*, 751 F.3d 1307, 1310–11 (Fed. Cir. 2014) (per curiam); *see also In re McAward*, No. 2015-006416, 2017 WL 3669566, at *3, *5–*6 (PTAB Aug. 25, 2017) (precedential).

The Examiner has not adequately addressed the question of whether a person of ordinary skill in the art would have sufficiently understood the meaning of the recited “probabilistic engine” and “predictive model,” in independent claims 1, 8, and 15, in accordance with the requirement of claim definiteness. By contrast, the Appellants have submitted a declaration stating that a person of ordinary skill in the art of data analytics would understand the meanings of the terms “probabilistic engine” (*see Iannace Decl.* ¶¶ 6, 10) and “predictive model” (*see id.* ¶¶ 11–12).

Therefore, we do not sustain the rejection of claims 1–20 under 35 U.S.C. § 112(b).

Obviousness

The Appellants contend that, among other arguments for the non-obviousness of independent claim 1, the cited Kilger reference fails to teach the claimed features of the recited “independent variable” and “dependent variable”:

Although Kilger briefly discusses a predictive model [at col. 9, ll. 39–42], the reference does not mention independent or dependent variables of a predictive model. To the extent that Kilger discusses prediction of consumer behavior, it is without the definition of variables for a predictive model as specifically recited in claim 1.

Appeal Br. 15.

The Examiner responds by focusing on a portion of Kilger (col. 9, ll. 29–32) that refers to “utiliz[ing] a previous consumer behavior to predict the behavior of the respondent (e.g., the consumer) in the future.” The Examiner states:

Here the “previous customer behavior” is the independent variable (i.e. predictions are based upon this variable) and the respondent (e.g. consumer) is the dependent customer variable (i.e. the variable being predicted). Thus Kilger teaches independent and dependent customer variables as much as claimed.

Answer 23.

Yet, the Appellants contend that “[t]he Examiner’s reading of Kilger strays far from the actual language of the claims,” arguing that “[i]n the claims, to be precise, the independent variable is specified to be an attribute of payment network transaction data (not previous customer behavior) and the dependent variable is specified to be an attribute of merchant transaction data (not a respondent).” Reply Br. 4.

Indeed, claim 1 requires an “independent variable” that “correspond[s] to” a “second data attribute” (i.e., an attribute of “the second data set including anonymized transaction data representing purchase transactions made by cardholders in a payment network”), whereas the recited “dependent variable” must “correspond[] to” a “first data attribute” (i.e., an attribute of “the first data set including anonymized transaction data representing purchase transactions made by customers of a merchant” or “other data supplied by the merchant”). The claimed technique analyzes one “data set” (including payment network data), in order to make predictions regarding a second “data set” (including the merchant information). According to the Specification, the significance of the claimed requirements

for the “independent variable” and the “dependent variable” is that merchants may use the results of a predictive analysis of payment network transaction data, in order to improve customer marketing and promotional efforts directed toward the merchant’s own customers. Spec. p. 3, ll. 3–8. *See also id.* at p. 11, ll. 22–24, and p. 21, l. 24–p. 22, l. 27. By contrast, Kilger analyzes consumer data in an integrated database (formed by “combining two or more market research databases”), in order to make predictions about the future behavior (e.g., shopping patterns) of the entire combined set of consumers being analyzed. Kilger, col. 9, ll. 20–21, 39–42.

In view of the foregoing, we do not sustain the rejection of independent claim 1 and, for similar reasons, independent claims 8 and 15, along with their respective dependent claims 2–7, 9–14, and 16–20, under 35 U.S.C. § 103(a).

DECISION

We AFFIRM the Examiner’s decision rejecting claims 1–20 under 35 U.S.C. § 101.

We REVERSE the Examiner’s decision rejecting claims 1–20 under 35 U.S.C. § 112(a).

We REVERSE the Examiner’s decision rejecting claims 1–20 under 35 U.S.C. § 112(b).

We REVERSE the Examiner’s decision rejecting claims 1–20 under 35 U.S.C. § 103(a).

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED