UNITED STATES PATENT AND TRADEMARK OFFICE

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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Ex parte GARY F. ANDERSON, MARK S. RAMSEY,
DAVID A. SELBY, and STEPHEN J. TODD

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Appeal 2016-002310
Application 12/043,564
Technology Center 3600

_____

Before HUNG H. BUI, JON M. JURGOVAN, and PHILLIP A. BENNETT,
Administrative Patent Judges.

JURGOVAN, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellants appeal under 35 U.S.C. § 134(a) from a Final Rejection of claims 1–5, 8–12, 14–17, and 20. Claims 6, 7, 13, 18, and 19 have been cancelled. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.[1]

CLAIMED INVENTION

The claims are directed to evaluating an entity by analyzing its attributes using ranges of values. Spec. ¶ 1. Claim 1, reproduced below, is illustrative of the claimed invention.

> 1. A method of evaluating an entity, the method comprising:
>
> [1st step] assigning, using at least one computing device, an attribute score to each of a plurality of attributes of the entity, the entity comprising a credit card, the attributes comprising transaction information of the credit card including a vendor associated with the transaction, an amount of the transaction, a location of the transaction, and a time of the transaction, the assigning including, for at least one of the plurality of attributes:
>
>> [substep (i)] managing, using the at least one computing device, a data structure that includes a plurality of boundary values, each boundary value defining a boundary between a pair of adjacent ranges of values, and a count of entries for each range of values for the at least one attribute, wherein the data structure includes a number of boundary values that is a power of 2;

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[1] Our Decision refers to the Specification ("Spec.") filed June 13, 2008, the Final Office Action ("Final Act.") mailed January 26, 2015, the Appeal Brief ("App. Br.") filed June 17, 2015, the Examiner's Answer ("Ans.") mailed October 28, 2015, and the Reply Brief ("Reply Br.") filed December 21, 2015.

[substep (ii)] determining, using the at least one computing device, one of a plurality of ranges of values that corresponds to an attribute value of the entity for the attribute, wherein each range of values includes an attribute score, the determining including using a binary search to determine the range of values that corresponds to the attribute;

[substep (iii)] incrementing the count of entries for the one of the plurality of ranges; and

[substep (iv)] assigning, using the at least one computing device, the attribute score that corresponds to the determined one of the plurality of ranges;

[2nd step] generating, using the at least one computing device, a composite score for the entity based on the attribute scores for the plurality of attributes;

[3rd step] writing, using the at least one computing device, the composite score for the entity to a computer-readable medium for further processing; and

[4th step] periodically recalculating, using the at least one computing device, the plurality of boundary values for the at least one attribute, such that each of the plurality of ranges includes substantially the same number of entries after the recalculation.

App. Br. 17–18 (Claims App'x).

REJECTIONS

Claims 1–5, 8–12, 14–17, and 20 stand rejected under 35 U.S.C. § 101 as directed to non-statutory subject matter. Final Act. 3.

Claims 1–5, 8–12, 14–17, and 20 stand rejected under 35 U.S.C. § 103(a) based on Prezioso (US 5,724,488, issued March 3, 1998), Vazquez et al. (US 2007/0288205 A1, published December 13, 2007), Fredrickson et al. (US 2007/0186199 A1, published August 9, 2007), and Kroll (US 2005/0027667 A1, published February 3, 2005). Final Act. 5.

ANALYSIS

§ 101 Rejection

Patent eligibility is a question of law that is reviewable *de novo.*
Dealertrack, Inc. v. Huber, 674 F.3d 1315, 1333 (Fed. Cir. 2012).
Patentable subject matter is defined by 35 U.S.C. § 101, as follows:

> [w]hoever invents or discovers any new and useful process,
> machine, manufacture, or composition of matter, or any new and
> useful improvement thereof, may obtain a patent therefor, subject
> to the conditions and requirements of this title.

In interpreting this statute, the Supreme Court emphasizes that patent
protection should not preempt "the basic tools of scientific and technological
work." *Gottschalk v. Benson*, 409 U.S. 63, 67 (1972); *Mayo Collaborative
Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 71 (2012); *Alice*, 134 S. Ct. at
2354. The rationale is that patents directed to basic "building blocks of
human ingenuity" would not "promote the progress of science" under the
U.S. Constitution, Article I, Section 8, Clause 8, but instead would impede
it. Accordingly, these basic "building blocks of human ingenuity" including
laws of nature, natural phenomena, and abstract ideas are not patent-eligible
subject matter. *Thales Visionix Inc. v. U.S.*, 850 F.3d 1343, 1346 (Fed. Cir.
2017) (citing *Alice,* 134 S. Ct. at 2354).

The Supreme Court set forth a two-part test for subject matter
eligibility in *Alice.* 134 S. Ct. at 2355. The first step is to determine
whether the claim is directed to a patent-ineligible concept. *Id.* (citing
Mayo, 566 U.S. at 76–77). If so, then the eligibility analysis proceeds to the
second step of the *Alice/Mayo* test in which we "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, 134 S. Ct. at 2357 (quoting *Mayo*, 566 U.S. at 72, 79). The "inventive
concept" may be embodied in one or more of the individual claim
limitations or in the ordered combination of the limitations. *Alice*, 134 S. Ct.
at 2355. The "inventive concept" must be significantly more than the
abstract idea itself, and cannot be simply an instruction to implement or
apply the abstract idea on a computer. *Alice*, 134 S. Ct. at 2358. "'[W]ell-
understood, routine, [and] conventional activit[ies]' previously known to the
industry" are insufficient to transform an abstract idea into patent-eligible
subject matter. *Alice*, 134 S. Ct. at 2359 (citing *Mayo*, 566 U.S. at 73).

In support of the § 101 rejection of claims 1–5, 8–12, 14–17, and 20,
the Examiner finds the claims are directed to the abstract idea of a
mathematical relationship for determining and assigning scores to attributes
of an entity. Final Act. 3. The Examiner also finds the additional elements
or combinations of elements in the claims besides the abstract idea amount
to no more than mere instructions to implement the idea on a computer to
perform well-understood, routine, and conventional activities, and do not
amount to significantly more than the abstract idea itself. *Id.* The Examiner
further finds the recited limitations fail to recite improvements to the
functioning of the computer itself, and, thus, are directed to non-statutory
subject matter under 35 U.S.C. § 101. *Id.* The Examiner elaborates on these
findings, stating that the claimed invention is directed toward the abstract
idea of evaluating entities through mathematical relationships, algorithms or

formulas for determining ranges of values, incrementing the ranges, and assigning scores. Ans. 2.

In responding to the Examiner's § 101 rejection, Appellants argue all claims together as one group, which is permissible under the rules for appeals. App. Br. 7–11, 37 C.F.R. § 41.37(c)(1)(iv) ("the claims may be argued . . . as a group").

Appellants rely on the Office's Memorandum on preliminary examination instructions in view of the Supreme Court Decision in *Alice Corp. v. CLS Bank Int'l*, 134 S.Ct. 2347 (2014) dated June 25, 2014. This Memorandum set out a list of judicial exceptions to subject-matter eligibility. App. Br. 7–8, Memorandum 2–3. Appellants argue the claimed invention does not fall within one of those exceptions, and therefore is patent eligible. *Id.* In particular, Appellants asserts the claimed invention is not a fundamental economic practice, certain methods of organizing human activities, an idea of itself, or a mathematical relationship or formula. *Id.* Appellants further contend that, even if the claims recite an abstract idea, the claims recite significantly more than the abstract idea itself and are a patent-eligible application of it. *Id.*

The Examiner finds that the list contained in the Office's Memorandum is not exclusive, but instead provides examples of what subject matter may be ineligible for patent protection. Ans. 2. We agree with the Examiner. We base this determination on the fact that the Memorandum clearly identifies the four listed types as examples. Memorandum 2–3. Also, the Examiner explains that the abstract idea is evaluating entities through mathematical relationships, algorithms or formulas for determining ranges of values, incrementing the ranges, and

assigning scores, which embodies a mathematical relationship or formula. Ans. 2–4. Such steps or functions fall within the mathematical relationship or formula exception to eligibility identified in the Memorandum.

Appellants next argue the claims are "directed toward methods of evaluating an entity including determining with a computing device one of a plurality of ranges of values that corresponds to an attribute value." App. Br. 9. Appellants argue this determining requires a particular computing device to perform processes recited in the claims, such as managing a data entity, generating a composite score, and periodically recalculating a plurality of boundary values for an attribute, which allegedly go beyond the abstract idea. *Id.* In the Reply Brief, Appellants make clear that this argument is intended to mean that the claim is not directed to a law of nature, a natural phenomenon, or an abstract idea under step one of the *Alice/Mayo* test. Reply Br. 3, 5.

We do not agree with Appellants' arguments. The claims are directed to "evaluating an entity" by assigning scores to attributes of an entity (see, e.g., claim 1, 1st step), which the Examiner found to be an abstract idea. Final Act. 3. Under similar circumstances as presented here, the Supreme Court found patent claims directed to mathematical formulae to be ineligible subject matter. For example, converting binary-coded decimal numerals into pure binary form has been held abstract. *See Benson, supra.*

The claims at issue here are not purely mathematical but are connected to a credit card transaction. Specifically, the claims recite that the "entity" comprises a "credit card" and the "attributes" comprise "transaction information of the credit card including a vendor associated with the transaction, an amount of the transaction, a location of the transaction, and a

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time of the transaction." However, our reviewing court has found claims directed determining the validity of a credit card transaction over the Internet to be ineligible as an abstract idea. *Cybersource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366 (Fed. Cir. 2011). In the present case, the claims do not recite any purpose or application of the method steps, such as determining whether a credit card transaction is valid, nor are the "attribute score," "boundary values," "ranges of values," and "data structure" defined in any way that could be considered non-abstract. In other words, the claims in this case are even more abstract than those involved in *Cybersource*. Accordingly, precedent from our reviewing courts in similar cases indicates the claims in this case are directed to an abstract idea.

Appellants appear to point to the recited steps or functions in addition to "assigning . . . an attribute score" as going beyond a mere abstract idea. App. Br. 9. The additional step or function of generating a composite score from these attribute scores (see, e.g., claim 1, 2nd step) is basically an operation of combining scores of multiple attributes, and is thus not something that goes beyond the abstract idea of assigning a score to an attribute. Appellants do not show that this step results in any improvement in functioning of a computer or improving a technological process, as opposed to merely using the computer as a tool to carry out the recited step. *See Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335–36 (Fed. Cir. 2016). Similarly, Appellants do not show how writing this composite score for the entity to a computer-readable medium (see, e.g., claim 1, 3rd step) for unspecified "further processing" amounts to any improvement in functioning of a computer or improving a technological process. The step of recalculating boundary values (see, e.g., claim 1, 4th step) merely involves

repetition of a substep or function used in assigning scores to attributes (see, e.g., claim 1, 1st step, substep (i)), which we already found abstract. Accordingly, the Examiner did not err in finding these claims to be directed to an abstract idea.

Furthermore, all of the steps or functions of the claims can be carried out as a mental process that can be performed entirely by hand with pencil and paper, without the use of a computer. Specifically, assigning scores to attributes using various calculations, determining composite scores, writing down the composite scores, and recalculating boundary values for attributes, can be carried out mentally using pencil and paper. Our reviewing court has found such mental processes to be abstract ideas. *See CyberSource* at 1371–72.

Moreover, our reviewing court has stated that "[i]nformation as such is an intangible." *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016). Merely collecting, processing, and storing information, without more, is abstract. *Id.*; *Gottschalk v. Benson*, 93 S.Ct. 253 (1972); *Content Extraction and Transmission LLC v. Wells Fargo Bank, Nat. Ass'n*, 776 F.3d 1343 (Fed. Cir. 2014). In the recited claims, as mentioned, the attributes comprise transaction information for a credit card, including a vendor associated with the transaction, the amount of the transaction, a location of the transaction, and a time of the transaction. *See, e.g.*, claim 1, 1st step. Other than to recite particular credit card information, however, the claims do not set forth any purpose or technological improvement that results from collecting and processing this information, and thus the claims are directed to an abstract idea.

Turning now to step two of the *Alice/Mayo* test, Appellants contend the 'inventive concept' recited in the claims is determining ranges of values corresponding to an attribute using a binary search. App. Br. 10–11. Appellants contend this feature improves upon conventional entity evaluation systems that do not have the ability to efficiently determine value ranges and periodically recalculate boundary values. *Id.* However, Appellants do not explain how efficient determination of value ranges or periodic recalculation of boundary values amounts to an improvement beyond normal functioning of a computer, nor do we find any explanation in the Specification other than that rebalancing of data ranges for buckets of entries is desirable for some unspecified reason. Spec. ¶ 28.

Furthermore, Appellants fail to establish that determining ranges of values corresponding to an attribute using a binary search is not a "well-understood, routine, conventional activity" previously known to the industry. *Mayo* at 82. The Specification mentions a binary search but does not elaborate on what it is or why it is beneficial to use in the claimed invention. Spec. ¶¶ 27, 31. One of the cited references, Kroll, mentions a "Binary Search Tree" but likewise does not elaborate. We assume that if a binary search was a new feature at the time of the invention, the Specification and Kroll reference would have described it in detail. Given the mentions of binary search are cursory in both the Specification and Kroll, and absent evidence cited by Appellants that indicates otherwise, we are led to the conclusion that a binary search is a "well-understood, routine, conventional activity" per *Mayo*.

For the foregoing reasons, we are not persuaded the claimed invention is significantly more than the abstract idea.

Appellants further contend "the claimed invention is not trying to preclude other from a mathematical relationship for determining and assigning attribute scores." App. Br. 10. According to Appellants, "the claimed invention only seeks to obtain protection for a unique approach of evaluating an entity, including managing a data structure, determining one of a plurality of ranges for an entity, and periodically recalculating the plurality of boundary values for the attribute as set forth in independent claims 1, 9, 14, and 20." *Id.* Apart from the fact that the claimed invention mentions that attributes pertain to a credit card transactions, there is no indication the claimed invention is used in a particular application involving a credit card, such as detecting fraud, determining creditworthiness, etc. The "attribute score," "boundary values," "ranges of values," and "data structure" as claimed are generally unrestricted in what they may be. A patent on such broad claims would result in significant preemption not only within the credit card industry, but also in fields that are merely ancillary to it. For example, the claims could be applied to determining economic performance in a region based on credit card transactions, estimating tax revenues, determining voting demographics, or other activities that have little to do with the credit card industry. Although Appellants may be correct the claimed invention does not completely preempt use of a credit card, "the absence of complete preemption does not demonstrate patent eligibility." *Ariosa Diagnostics, Inc. v. Sequenom, Inc.*, 788 F.3d 1371, 1379 (Fed. Cir. 2015).

For the foregoing reasons, we agree with the Examiner that claims 1– 5, 8–12, 14–17, and 20 are unpatentable under 35 U.S.C. § 101.

§ 103 Rejection

Claim 1

Appellants argue the combination of Prezioso, Vazquez, Fredickson, and Kroll fails to disclose "managing, using the at least one computing device, a data structure that includes a plurality of boundary values, each boundary value defining a boundary between a pair of adjacent ranges of values." App. Br. 12. Particularly, Appellants argue "Prezioso simply discloses two values, and thus a single boundary value as defined in Appellant's claim, and not a plurality of boundary values which each define a boundary between adjacent ranges of values. Rather, Prezioso teaches the use of a single pair of boundary values, not a plurality." *Id.*

As the Examiner notes, Prezioso teaches boundary values 2120, 2130, as shown in Figure 21. Ans. 6–7.
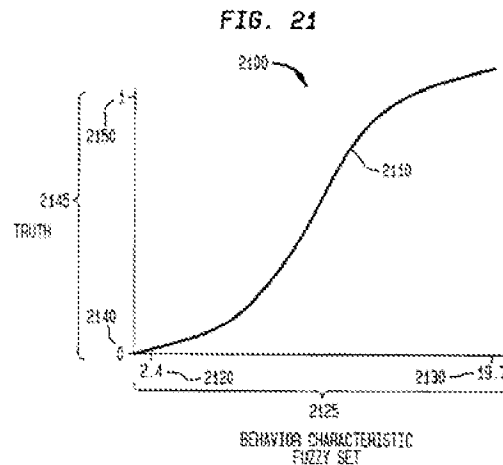

Figure 21 of Prezioso shows boundary values 2120, 2130 of a graph of truth
versus behavior characteristic fuzzy set.

Boundary value 2120 corresponds to a value "2.4" which defines two ranges, those values below and above it. Similarly, boundary value 2130 corresponds to a value "19.7" and defines two ranges, those below and those

above it. Thus, the Examiner has shown the claimed limitation is present in Prezioso.

Appellants further argue the combination of references fails to disclose "determining, using the at least one computing device, one of a plurality of ranges of values that corresponds to an attribute value of the entity for the attribute, wherein each range of values includes an attribute score, *the determining including using a binary search to determine the range of values that corresponds to the attribute*." App. Br. 12–13, Reply Br. 5–6. (Emphasis added). Particularly, Appellants contend Kroll, the reference on which the Examiner relies to teach this feature, uses a set of binary thresholds to determine if an 'event' has occurred, not to determine the range of values that corresponds to the attribute. *Id.* Appellants argue "[t]here would be no motivation to combine Kroll's set of binary thresholds with other disclosures, and further, even if combined, would not result in Appellant's claimed binary search that determines a range of values corresponding to an attribute." *Id.*

The Examiner finds that the claimed feature is disclosed by Kroll in paragraphs 17 and 18. Final Act. 13–14, Ans. 7–8. We agree. Kroll discloses an example of fraud detection involving binary thresholds, specifically, a daily spending maximum of $100 and a monthly maximum of $500, to determine whether a transaction is valid. Kroll ¶ 18. Kroll discloses if a customer withdraws $50 from an ATM on the 10th of the month, the validity of the transaction is determined by combining expenditures over daily and monthly ranges and comparing them with daily and monthly maxima. Thus, the attribute in Kroll can be the amount or time of the transaction, and the ranges can be the time from the 1st of the month to

the transaction date, or the range of money spent over the day or month. In addition, as the Examiner noted, Kroll mentions use of a binary search tree. Kroll ¶ 112. Thus, we agree with the Examiner that a person of ordinary skill would have understood Kroll to teach or at least suggest the argued feature.

Regarding Appellants' argument concerning the motivation to combine Kroll's binary thresholds with teachings of the other references, Appellants do not explain *why* a person of ordinary skill in the art would not have done so. *See* 37 C.F.R. § 41.37(c)(1)(iv) ("The arguments shall explain why the examiner erred as to each ground of rejection contested by appellant.") The Examiner finds "utilizing the binary thresholds to make determinations the combinations enable determinations to be made more quickly regarding the validity of credit card transactions." Final Act. 14. Moreover, the Examiner finds the "technical ability existed to combine the elements as claimed and the result of the combination is predictable because each of the elements performs the same function as it did independently." *Id.* We find no error in the Examiner's findings or conclusion of obviousness.

Remaining Claims

Appellants argue the remaining claims on the same basis as stated for claim 1. App. Br. 14–16. For the stated reasons, we find these arguments unpersuasive.

DECISION

We affirm the Examiner's rejection of claims 1–5, 8–12, 14–17, and 20 under 35 U.S.C. §§ 101 and 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)(1)(iv).

AFFIRMED