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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* RYUJI IWAMOTO

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Appeal 2017-007327  
Application 12/602,325  
Technology Center 2800

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Before JAMES C. HOUSEL, BRIAN D. RANGE, and  
MICHAEL G. McMANUS, *Administrative Patent Judges*.

HOUSEL, *Administrative Patent Judge*.

DECISION ON APPEAL<sup>1</sup>

Pursuant to 35 U.S.C. § 134(a), Appellant<sup>2</sup> appeals from the Examiner's decision rejecting claims 1, 2, 4–10, and 12–16 under 35 U.S.C. § 101 as not directed to patent eligible subject matter. We have jurisdiction over the appeal under 35 U.S.C. § 6(b).

We AFFIRM.

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<sup>1</sup> Our decision refers to the Specification (Spec.) filed June 23, 2010, the Examiner's Final Office Action (Final) dated June 15, 2016, Appellant's Appeal Brief (Appeal Br.) filed November 10, 2016, the Examiner's Answer (Ans.) dated February 9, 2017, and Appellant's Reply Brief (Reply Br.) filed April 7, 2017.

<sup>2</sup> According to Appellant, the real party in interest is Panasonic Intellectual Property Management Co., Ltd. Appeal Br. 2.

## STATEMENT OF THE CASE

The invention relates to a method of recording a flow rate change history, and a non-transient computer readable medium and apparatus for performing the method (claims 1, 8, 9).

Claim 1, reproduced below from the Claims Appendix to the Appeal Brief, is illustrative of the subject matter on appeal.

1. A method of recording a flow rate change history, comprising a computer and a memory that stores computer executable programs executed by the computer to implement:
  - measuring a flow rate of fluid at a first time interval;
  - generating a series of difference values from measurements of the flow rate measured during a predetermined time period, the series of difference values each calculated between respective pairs of measurements of flow rate, and the measurements in a respective pair being separated in time at a second time interval equal to or longer than the first time interval;
  - converting the series of difference values into a series of codes with reference to a flow rate class table which is arranged to define a range of difference values divided into classes each associated with a code, wherein the series of difference values are each replaced with a code associated with a class to which the difference value belongs; and
  - using the series of codes to generate a flow rate change history representing a flow rate change which occurred during the predetermined time period,
  - wherein the classes in the flow rate class table comprise four event categories comprising (a) a category indicative of an event that the flow rate is substantially zero, (b) a category indicative of an event that the flow rate is stable and not zero, (c) a category that the flow rate is increasing, and (d) a category indicative of an event that the flow rate is decreasing.

Independent claim 8 recites a non-transient computer readable medium containing a program for recording a flow rate change history,

wherein the program is executed by a computer to implement a method substantially the same as recited in claim 1. Independent claim 9 recites a flow rate measurement apparatus comprising sections for performing substantially the same functions as recited in claim 1.

Appellant argues the rejected claims together as a group. Accordingly, we select claim 1 as the representative claim on which we focus in deciding this appeal as to the maintained rejection. We review the appealed rejection for error based upon the issues identified by Appellant and in light of the arguments and evidence produced thereon. *Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential) *cited with approval in In re Jung*, 637 F.3d 1356, 1365 (Fed. Cir. 2011) (“[I]t has long been the Board’s practice to require an applicant to identify the alleged error in the examiner’s rejections.”)). After considering claim 1 relative to caselaw presented in this Appeal and each of Appellant’s arguments, we are not persuaded that Appellant identifies reversible error. Thus, we affirm the Examiner’s rejection for the reasons expressed in the Final Office Action and the Answer. We add the following primarily for emphasis.

#### ANALYSIS

To determine whether subject matter is patentable under 35 U.S.C. § 101, the Supreme Court has set forth a two part test “for distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of those concepts.” *Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 134 S. Ct. 2347, 2355 (2014). The first step in the analysis is to “determine whether the claims at issue are directed

to one of those patent-ineligible concepts,” such as an abstract idea. *Id.* (citation omitted). For computer-related technologies, “the first step in the *Alice* inquiry . . . asks whether the focus of the claims is on the *specific asserted improvement* in computer capabilities” (which would be eligible subject matter) or instead “on a process that qualifies as an ‘abstract idea’ for which *computers are invoked merely as a tool*” (which would be ineligible subject matter). *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335-36, 1338 (Fed. Cir. 2016) (emphasis added). “If the claims are not directed to an abstract idea [or other patent-ineligible concept], the inquiry ends. If the claims are ‘directed to’ an abstract idea, then the inquiry proceeds to the second step of the *Alice* framework.” *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1312 (Fed. Cir. 2016). Moreover, the Federal Circuit has recognized “that defining the precise abstract idea of patent claims in many cases is far from a ‘straightforward’ exercise.” *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1150 (Fed. Cir. 2016) (quoting *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1257 (Fed. Cir. 2014)). In view of this, the Federal Circuit has defined the “‘basic thrust’” of a claim, something that is wholly consistent with the description of an invention, to determine what abstract idea the claim may be directed to. *Synopsys*, 839 F.3d at 1150–51.

The Examiner determines that claim 1 is directed to an abstract idea, particularly calculation of difference values related to flow rates and conversion of a series of these difference values into a series of codes based on a class to which the difference values belong. Final 2–3. The Examiner further finds that the courts have identified conversion algorithms as a type of abstract idea. *Id.* at 3, citing *SmartGene, Inc. v. Advanced Biological*

*Laboratories, SA*, 555 Fed.Appx. 950, 954 (Fed. Cir. 2014) (“section 101 did not embrace a process defined simply as using a computer to perform a series of mental steps that people, aware of each step, can and regularly do perform in their heads”), *Cyberfone Systems, LLC v. CNN Interactive Group, Inc.*, 558 Fed.Appx 988, 992 (Fed. Cir. 2014) (“the well-known concept of categorical data storage, i.e., the idea of collecting information in classified form, then separating and transmitting that information according to its classification, is an abstract idea that is not patent-eligible”), *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 715 (Fed. Cir. 2014) (“an abstract idea, which is, as the district court found, a method of using advertising as an exchange or currency”), *In re Grams*, 888 F.2d 835, 838 (Fed. Cir. 1989) (“an algorithm, or mathematical formula . . . like a law of nature . . . cannot be the subject of a patent”), and *In re Abele*, 684 F.2d 902, 905 (CCPA 1982) (an algorithm or procedure for solving a given type of mathematical problem is an abstract idea).

The Examiner next determines that the additional elements of claim 1, viewed as a whole, do not provide meaningful limitations to transform the abstract idea into a patent eligible application of the abstract idea such that the claim amounts to significantly more than the abstract idea itself. Final 3. The Examiner determines that the only additional element, aside from the abstract idea, is the measurement of the flow rate of a fluid at a first time interval, which the Examiner finds is mere data gathering recited at a high level of generality and, as such, “is insignificant extra-solution activity using conventional equipment.” *Id.* at 4. In addition, the Examiner determines that the mere use of a generic computing device to perform generic computing functions or mere instruction to implement the abstract idea also

does not amount to significantly more than the abstract idea. *Id.* Moreover, considering the claim as a whole, the Examiner determines that claim 1 does not include non-limiting or non-exclusive improvements to another technology or technical field, improvements to the functioning of the computer itself, or meaningful limitations beyond generally linking the use of the abstract idea to a particular technological environment. *Id.*

Appellant argues that the claims are not directed to an abstract idea, asserting that the Examiner failed to consider the limitations as a whole. Appeal Br. 7, citing *Enfish*. Appellant contends that the Examiner committed the same error as did the district court in *Enfish*. *Id.* at 8. Therein, Appellant asserts that the district court concluded that the claims were directed to the abstract idea of storing, organizing, and retrieving memory in a logic table, but that the Federal Circuit faulted this conclusion for describing the claims at such a high level of abstraction and untethered from the language of the claims. *Id.* Appellant further asserts that *Enfish* held that “the claims are not simply directed to any form of storing tabular data, but instead specifically directed to a self-referential table for a computer dataset.” *Id.*

Appellant urges that the same holds true for the invention recited in claim 1, which is not directed to any form of comparing data, any form of organizing information, any form of algorithm, or any form of calculating differences. Appeal Br. 8. According to Appellant, the invention of “claim 1 is directed specifically to use of a flow rate class table to convert differences of temporally adjacent measured flow rates into codes that can be handled with less memory space and less computational overhead for identification of gas appliances.” *Id.* Appellant asserts that *Enfish* and claim

1 share a common feature in that *Enfish* used a self-referential table to improve computer performance, while claim 1 uses a flow rate class table to improve computer performance. *Id.* at 8–9, citing Spec. ¶ 14.

Appellant further compares claim 1 to the claimed invention in *McRO*, describing *McRO*'s claims as “the steps of: (1) obtaining a timed data file comprising sequences of data; (2) generating an intermediate stream of output data sets between two adjacent sets by evaluating the sequences of data; (3) generating a final stream of output data sets from the intermediate stream of output data sets; and (4) using the final stream of output data sets to produce a desired result.” Appeal Br. 10. Appellant contends that “claim 1 may be similarly described as consisting in effect of: (1) obtaining a timed data file comprising a series of measured flow rates (i.e., sequences of data); (2) generating a series of difference values (i.e., an intermediate stream of output data sets) between two temporally adjacent measurements of flow rates by evaluating the series of measured flow rates; (3) generating a series of codes (i.e., a final stream of output data sets) by converting the series of difference values with reference to a flow rate class table; and (4) using the series of codes to generate a flow rate change history (i.e., a desired result).” *Id.*

Under step one of the *Alice* framework, we note, claim 1 recites a flow rate measurement step, a step of calculating a series of difference values from the flow rate measurements during a predetermined time period, a step of converting this series of difference values into a series of codes using a flow rate class table with four event categories, and using the series of codes to generate a flow rate change history. The four event categories in claim 1 are: (a) flow rate is substantially zero; (b) flow rate is stable and not

zero; (c) flow rate is increasing; and (d) flow rate is decreasing. Figure 2 depicts the flow rate class table or table of flow rate difference values and their associated codes assigned by Appellant. Spec. ¶ 28. The number of codes or classes is not limited, though Appellant depicts both 16 and 4, and claim 1 recites four. *Id.* Once the difference calculation is performed, this difference is assigned a code according to the table. *Id.* When this process is performed for a series of difference values, a series of codes representing the flow rate change history is generated which completes the method of claim 1. Appellant discloses that, because of the use of coding in appliance identification, “computations are simplified and it is made possible to improve the computing speed and the appliance identification accuracy while decreasing the memory amount required for the computations.” Spec. ¶ 12.

However, claim 1 does not limit the method to appliance (or phenomenon) identification. The first step of the method of claim 1 is merely a data gathering step for providing data on which the mathematical and coding operations are performed to provide flow rates over time as seen in Figures 3B and 4B. Moreover, as the Examiner determines (Final 3, 6; Ans. 3, 5, 6, 13), the method recited in claim 1 merely defines mental activity, other than the collection of flow rate measurements.

“Information as such is an intangible” and, regarding the first step of *Alice*, our reviewing court has “treated collecting information, including when limited to particular content (which does not change its character as information), as within the realm of abstract ideas.” *Electric Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016). Similarly, the Federal Circuit “treat[s] analyzing information by steps people go through in

their minds, or by mathematical algorithms, without more, as essentially mental processes within the abstract-idea category.” *Id.* at 1354; *see also Digitech Image Technologies, LLC v. Electronics for Imaging, Inc.*, 758 F.3d 1344, 1351 (Fed. Cir. 2014) (“Without additional limitations, a process that employs mathematical algorithms to manipulate existing information to generate additional information is not patent eligible.”).

For example, the difference calculations are merely simple subtraction operations that can be and are performed mentally. The code conversion is merely an assignment of a code to describe each difference value according to a predetermined designation for that difference value, which describes a mental process often used to assimilate large amounts of data into a more manageable size, e.g., as is often done with population data converting population data to income ranges, rather than storing each individual by their income, or grading student test scores by assigning a code of A for scores from 90–100, B for scores of 80–89, etc. The use of the series of codes to generate a flow rate change history merely creates a table of coded data rather than a table of an equal number of difference values. *See* Fig. 3A (converting difference values to 16 class codes and then to 4 class codes). Thus, we agree with the Examiner that claim 1 defines an abstract idea directed primarily to mental activity. *See SmartGene*, 555 Fed.Appx. at 954.

Likewise, we further agree that claim 1 resembles the abstract idea presented in *Cyberfone*, in that this claim collects flow rate information, performs a series of mathematical operations (subtraction) on this information, and categorizes the information for storage. *See Cyberfone*, 558 Fed.Appx at 992 (Fed. Cir. 2014). We note that Appellant fails to

address these decisions, or any of the remaining decisions cited by the Examiner, relative to the scope of claim 1.

Regarding *Enfish*, Appellant mischaracterizes the court's holding therein, which held that the claims were not directed to the abstract idea of organizing information using tabular formats, but to a specific improvement to the way computers operate, embodied in a self-referential table for a computer database which functioned differently than conventional database structures and achieved benefits in computer performance over conventional databases. *Enfish*, 822 F.3d at 1332 and 1336. *Enfish* describes a self-referential table as a table that includes not only data as was conventional, but also how the data are arranged in physical memory devices, which was not conventional. *Enfish*, 822 F.3d at 1330.

Unlike *Enfish*, we discern in claim 1 no change in the way a computer or computer memory operates. Indeed, although Appellant discloses that the coding conversion performed by claim 1 enables simplified computations, Appellant fails to direct our attention to any disclosure in support of simplification of computations. In fact, in order to determine whether a flow rate is stable (unchanging over time), increasing or decreasing, the same difference calculations would be performed. Further, although Appellant discloses that less memory space is required, we note that claim 1 assigns a code to a difference value, which code may or may not require less memory bits than the difference value. Further, even where the code would require less bits than the difference value, such data compression occurs as a loss of data specificity similar again to the assignment of population codes or student test scores. We note that Appellant fails to direct our attention to any evidence in support of the reduction in memory use, improved

computing speed, or improved accuracy through the use of the method of claim 1 as compared to the same method performed without coding.

Accordingly, we are not persuaded that claim 1 is directed to an invention that improves the way a computer operates.

Regarding *McRO*, Appellant mischaracterizes the court's holding therein, which held that the claims directed to automatically animating lip synchronization and facial expressions of three-dimensional animated characters were limited to rules with specific, common characteristics, defining a morph weight set stream as a function of phoneme sequence and times associated therewith. *McRO*, 837 F.3d at 1313. As such, *McRO* held that the method of these claims, which allow computers to produce accurate and realistic lip synchronization and facial expressions that previously could only be produced by human animators, were patent eligible. *Id.*

Unlike *McRO*, claim 1 is not directed to a method that allows computers to produce accurate and realistic computer simulations that previously only could be produced by human operators in a way that was not previously used by these human operators. Nor is claim 1 directed to a method of automatically performing a complex function limited to rules with specific, common characteristics. Accordingly, we are not persuaded by Appellant's attempt to recharacterize the *McRO* claims in a manner so as to create similarity where such does not exist.

The claim language, in light of the Specification, thus supports the Examiner's determination that the claims are directed to the abstract idea of "calculation of difference values related to flow rates and conversion of a series of these difference values into a series of codes based on a class to which the difference values belong." Indeed, courts have regarded

algorithms performing mathematical operations and data conversions in various forms as abstract ideas. *See Diamond v. Diehr supra* (the Arrhenius equation); *Gottschalk v. Benson*, 409 U.S. 63 (1972) (an algorithm for converting binary coded decimal to pure binary); *Mackay Radio*, 306 U.S. 86 (1939) (a formula describing certain EM standing wave phenomena); *Parker v. Flook*, 98 U.S. 2522 (1978) (a formula for computing an alarm limit); *Grams*, 888 F.2d 835 (an algorithm for calculating parameters indicating an abnormal condition); *Abele*, 684 F.2d 902 (calculating the difference between local and average data values). Therefore, we are not persuaded that the Examiner erred in determining claim 1 is directed to an abstract idea under step one of the *Alice* framework.

If a claim is directed to a patent-ineligible concept, the second step in the analysis is to determine whether additional elements of the claim, “both individually and ‘as an ordered combination,’” “‘transform the nature of the claim’ into a patent-eligible application.” *Alice*, 134 S. Ct. at 2355 (quoting *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 566 U.S. 66, 78–79 (2012)). Thus, 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 78). In other words, the second step is to “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.’” *Id.* (citing *Mayo*, 566 U.S. at 72–73).

Here, the Examiner finds claim 1 does not recite additional elements sufficient to transform the abstract idea into patent eligible subject matter. Final 2–4. In particular, the Examiner determines that claim 1 recites only

the additional element of measuring a flow rate that amounts to no more than “mere data gathering recited at a high level of generality, which is insignificant extra-solution activity using conventional equipment.” *Id.* at 4. In addition, the Examiner determines that the mere use of a generic computing device to perform generic computing functions or mere instructions to implement the abstract idea does not amount to significantly more than the abstract idea itself. *Id.*

Appellant argues that the Examiner applies the wrong test for deciding whether claim 1 is patent eligible and applies the wrong meaning to the terms, “mere use of a generic computer.” Appeal Br. 11. Appellant again compares claim 1 to *McRO*, asserting that claim 1 defines specific rules for organizing the flow rate class table which comprises four event categories. *Id.* at 11–12. Appellant contends that these rules are applied to define classes in the table according to which difference values are converted into codes. *Id.* at 12. According to Appellant, it is the incorporation of these rules, not the use of the computer, that “materializes the improvement to the prior art technologies and sufficiently ensures that the patent in practice amounts to significantly more than a patent upon the ineligible concept itself.” *Id.*

Moreover, Appellant argues that the claimed subject matter is non-conventional because the Examiner has not maintained a prior art rejection under 35 U.S.C. § 103. Appeal Br. 12. Appellant further argues claim 1 recites a specific application of the idea and is not pre-emptive. *Id.* In particular, Appellant urges that “[t]he claimed invention has a specific application of algorithm to identifying gas appliances in a more efficient way than prior art.” *Id.*

We note Appellant does not dispute the Examiner's determination that the flow measurement step is the only additional element aside from the abstract idea, nor does Appellant dispute that this step is merely a data gathering step providing data to the steps of the abstract idea. Therefore, this measurement step is insufficient to transform the abstract idea into a patent-eligible invention. See *Electric Power Group*, 830 F.3d at 1355; *Ultramercial*, 772 F.3d at 716; *CyberSource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1370 (Fed. Cir. 2011); *Grams*, 888 F.2d at 838. In addition, Appellant does not argue that this step is not conventional, routine, and well-known. Appellant discloses that flow rate measurement units were known in the art prior to the invention. Spec. ¶ 2. Indeed, Appellant discloses that a computation unit for finding difference values between the flow rate values output from the flow rate measurement unit was also known in the art prior to the invention. *Id.*

Further, even taken as an ordered combination of elements, claim 1 merely recites a necessary data gathering step and the abstract idea for manipulating that data via a series of identical mathematical operations (subtractions) and a series of code conversions for the resulting difference values according to a look-up table. Additionally, although Appellant contends that the claimed invention is limited to a specific application of the abstract idea, that being identifying gas appliances in a more efficient manner, we disagree. Claim 1 does not recite any specific application of the abstract idea other than recording a flow rate change history; it does not recite either an intent to identify gas appliances or a step of identifying gas appliances.

Moreover, unlike *McRO*, which the Examiner accurately describes as defining a patent-eligible method because the claims define a technological improvement that allows a computer to produce accurate and realistic lip synchronization and facial expressions in animated characters through the use of a set of rules, rather than artists, which rules include meaningful requirements (morph weight set stream as a function of phoneme sequence and times associated therewith), that allow for the realization of the improvement. Ans. 11. Unlike *McRO*, claim 1 fails to recite specific rules having meaningful requirements which allow for the realization of an improvement that could not be done by computers before the invention. As discussed above, claim 1 merely sets forth the performance of a simple mathematical operation (calculation of difference values from the measured flow rates) which was known in the art and a code conversion operation for assigning a code to each difference value as appropriate from a flow rate class or look-up table.

With regard to Appellant's arguments that the claimed subject matter is non-conventional because the Examiner has not maintained a prior art rejection under 35 U.S.C. § 103, we note, as did the Examiner (Ans. 12), a determination that a claim is directed to patent ineligible subject matter under 35 U.S.C. § 101 is independent of a determination that the claim is free of the prior art under § 103. Here, claim 1 recites a method whose only additional element, apart from the abstract idea, is a data gathering step which our reviewing court has consistently determined is insufficient to transform an otherwise ineligible abstract idea to a patent eligible invention. Further, as an ordered combination, we likewise determine that this additional element does not meaningfully limit the abstract idea in a

transformative manner. As the Examiner determines (Ans. 13–14), claim 1, as a whole, does not confine the abstract idea to a particular technological application, improve the functioning of a computer itself, or improve another technological field.

As such, we are unable to identify an ‘inventive concept,’ i.e., an element or combination of elements that is ‘sufficient to ensure that the claimed method in practice amounts to significantly more than a claim upon the abstract idea itself. Therefore, we are not persuaded that the Examiner erred in determining claim 1 fails to recite additional elements or an ordered combination of elements which identify an inventive concept or are sufficient to transform the otherwise ineligible abstract idea into a patent eligible invention under step two of the *Alice* framework.

Appellant does not separately argue any of the remaining claims. Accordingly, we sustain the Examiner’s rejection of claims 1, 2, 4–10, and 12–16 as directed to non-statutory subject matter under 35 U.S.C. § 101.

## DECISION

Upon consideration of the record, and for the reasons given above and in the Answer, the decision of the Examiner rejecting claims 1, 2, 4–10, and 12–16 under 35 U.S.C. § 101 as not directed to patent eligible subject matter is *affirmed*.

Appeal 2017-007327  
Application 12/602,325

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).

AFFIRMED