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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
13/316,624	12/12/2011	NICOLAS DANGEVILLE	FR920080218US2 8152-0159	2880
73109	7590	07/01/2020	EXAMINER	
Cuenot, Forsythe & Kim, LLC 20283 State Road 7 Ste. 300 Boca Raton, FL 33498			SHAH, KAMINI S	
			ART UNIT	PAPER NUMBER
			2127	
			NOTIFICATION DATE	DELIVERY MODE
			07/01/2020	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte NICOLAS DANGEVILLE and JOHAN PONIN

Appeal 2019-002705
Application 13/316,624
Technology Center 2100

Before JOHN A. EVANS, SCOTT B. HOWARD, and JASON M. REPKO,
Administrative Patent Judges.

REPKO, *Administrative Patent Judge.*

DECISION ON APPEAL

STATEMENT OF THE CASE

Under 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 7, 8, 10–13, 15, and 16. Appeal Br. 1. Claims 1–6 are canceled. Claims 9 and 14 are not rejected. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

¹ We use the word *Appellant* to refer to *applicant* as defined in 37 C.F.R. § 1.42(a). According to Appellant, the real party in interest is “IBM Corporation.” Appeal Br. 1.

CLAIMED SUBJECT MATTER

Appellant's invention modifies a diagram that shows resources and data manipulated by a program. Abstract. Specifically, software can be described by a visual language, such as Unified Modeling Language (UML). Spec. ¶ 4. A UML class diagram often represents a program to be written in an object-oriented programming language. *Id.* The actual program code is then derived from the UML class diagrams. *Id.* Appellant's invention adds new elements to a UML class diagram and allows for code generation in a procedural language, such as COBOL. Abstract.

Claims 7 and 12 are independent. Claim 7 is reproduced below.

1. A computer-implemented method of representing a software application to be coded in a procedural language, comprising

receiving an initial UML class diagram modelizing the software application;

identifying data definition classes within the initial UML class diagram;

identifying class operations within the initial UML class diagram; and

modifying, by a processor, the initial UML class diagram to generate an extended UML class diagram by

applying a data object stereotype to the identified data definition classes, and

applying a program stereotype to the identified class operations, wherein

the data definition classes represent logical data, and

the class operations represents programs.

Appeal Br. 17 (Claims Appendix).²

REJECTIONS

The Examiner rejects claims 7, 8, 10–13, 15, and 16 under 35 U.S.C. § 101 as directed to ineligible subject matter. Final 4–7.

OPINION

I. Principles of Law

Under § 101, patent-eligible subject matter is defined as “any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof.” 35 U.S.C. § 101. But courts have long held that laws of nature, natural phenomena, and abstract ideas are not patentable. *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 70–71 (2012) (citing *Diamond v. Diehr*, 450 U.S. 175, 185 (1981)). These ineligible concepts are implicit exceptions to the statutory categories. *Id.* at 71.

The Supreme Court articulated a two-step subject-matter eligibility test in *Mayo* and *Alice Corp. v. CLS Bank International*, 573 U.S. 208 (2014). *Alice/Mayo* step one asks whether a claim is “directed to” a judicial exception. *Alice*, 573 U.S. at 217. In *Alice/Mayo* step two, we consider “the elements of each claim both individually and ‘as an ordered combination’ to determine whether the additional elements ‘transform the nature of the

² Throughout this opinion, we refer to the Final Office Action (“Final”), mailed March 16, 2018; the Appeal Brief (“Appeal Br.”), filed August 20, 2018; the Examiner’s Answer (“Ans.”), mailed January 8, 2019; and Reply Brief (“Reply Br.”), filed February 19, 2019.

claim’ into a patent-eligible application.” *Id.* (quoting *Mayo*, 566 U.S. at 79, 78). Step two is described as a search for an “inventive concept.” *Id.*

The USPTO has published revised guidance on patent subject matter eligibility. 2019 Revised Patent Subject Matter Eligibility Guidance, 84 Fed. Reg. 50 (Jan. 7, 2019) (“Guidance”).³ Step 1 of the USPTO’s eligibility analysis asks whether the claimed subject matter falls within the four statutory categories of invention. *Id.* at 53–54. Under Step 2A, Prong One of the Guidance, we determine if the claim recites a judicial exception, including particular groupings of abstract ideas (i.e., mathematical concepts, certain methods of organizing human activity, or mental processes). *Id.* at 52–53. If so, we then analyze the claim to determine whether the recited judicial exception is integrated into a practical application under Step 2A, Prong Two of the Guidance. *Id.* at 53–55; MPEP §§ 2106.05(a)–(c), (e)–(h) (9th ed. Rev. 08.2017, Jan. 2018).

Only if the claim fails to integrate the exception and, thus, is “directed to” the judicial exception, do we then look to whether the claim adds a specific limitation beyond the judicial exception that is not “well-understood, routine, conventional activity in the field” or whether the claim simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception. Guidance, 84 Fed. Reg. at 56.

³ In response to public comments, the Office issued additional guidance on October 17, 2019. October 2019 Update: Subject Matter Eligibility (USPTO Oct. 17, 2019), https://www.uspto.gov/sites/default/files/documents/peg_oct_2019_update.pdf (“October 2019 Update”).

II. Overview of the Rejection and Appellant's Arguments

In the Examiner's view, representative⁴ claim 7 is directed to an abstract idea. Final 4. The Examiner determines that the claims are similar to those in *Gottschalk v. Benson*, 409 U.S. 63 (1972). *Id.* at 6. Apart from the abstract idea, the Examiner finds that the recited processor is conventional. *Id.* at 4–5 (citing Spec. ¶¶ 24, 35, 48). According to the Examiner, claim 7 does not recite an improvement to technology. Ans. 6.

Appellant argues that the claimed invention does improve computer technology. Appeal Br. 6–7. According to Appellant, software developers use a UML class diagram for designing programs, and the claimed invention is directed to “a series of rules that improve upon prior art UML class diagrams by extending them.” *Id.* at 12. Appellant makes other arguments discussed in detail below.

III. Step 1: Does the claim fall within a statutory category of invention?

Under Step 1 of the USPTO's eligibility analysis, the claimed subject matter falls within one of the four statutory categories of invention because claim 7 recites a process. Guidance, 84 Fed. Reg. at 53–54. In particular, claim 7 recites a series of steps for representing a software application.

IV. Step 2A, Prong One of the Guidance

We next consider whether claim 7 recites a judicial exception. *Id.* at 51. “[A] claim recites a judicial exception when the judicial exception is ‘set forth’ or ‘described’ in the claim.” October 2019 Update 1.

⁴ Appellant argues claims 7, 8, 10–13, 15, and 16 as a group. *See* Appeal Br. 6. Claim 7 is representative of that group. *Id.* (stating “claims 8–16 stand or fall together with independent claim 7”); 37 C.F.R. § 41.37(c)(1)(iv).

The Guidance synthesizes the key concepts identified by the courts as abstract ideas into three primary subject-matter groupings: mathematical concepts, certain methods of organizing human activities, and mental processes. 84 Fed. Reg. at 52.

The Examiner’s rejection predates the Guidance.⁵ Nevertheless, the Examiner determines that the claims are similar to those in *Gottschalk v. Benson*, 409 U.S. 63 (1972). Final 6. In *Benson*, the court concluded that a person could mentally perform the recited conversion. 409 U.S. at 67 (“The conversion of BCD numerals to pure binary numerals can be done mentally through use of the foregoing table.”). Similarly, the Examiner here explains how claim 7 merely modifies and manipulates data from one form to another. Final 5. Viewing the rejection through the lens of the Guidance, the Examiner has shown that the subject matter of claim 7 falls in the Guidance’s mental-processes grouping. *See id.* at 4–6. In the sections that follow, we explain why we agree with the Examiner’s determination.

1. Identifying Classes

Claim 7 recites, in part, “identifying data definition classes within the initial UML class diagram,” and “identifying class operations within the initial UML class diagram.” Appeal Br. 17 (Claims Appendix).

Identifying these classes and operations are observations or evaluations that can practically be performed in the mind. In particular, UML visually describes a program. *See Spec.* ¶ 4. So a person with an understanding of UML can review the diagram’s visual elements and

⁵ The USPTO issued The 2019 Revised Patent Subject Matter Eligibility Guidance on January 7, 2019. The Examiner’s rejection was mailed on March 16, 2018.

determine which elements are the data-definition classes, class operations, among other things.

The Specification supports interpreting the identifying steps as a person's evaluations and observations. For example, the Specification states, "*an architect identifies amongst the classes of the UML class diagram, the ones that contain operations that represent a program.*" *Id.* at ¶ 46 (emphasis added). Likewise, the Specification further explains how an architect examines the operation's parameters,

In step 340, *the architect examines* a parameter of the program. *He will consider* whether the parameter represents a resource of the program (such as a file) or not (step 341).

Id. ¶ 54 (emphasis added).

Thus, the step of "identifying data definition classes within the initial UML class diagram" and "identifying class operations within the initial UML class diagram" are part of the recited mental process.

2. Applying Stereotypes / Modifying the Diagram

Claim 7 further recites, in part,

modifying, by a processor, the initial UML class diagram to generate an extended UML class diagram by

applying a data object stereotype to the identified data definition classes, and

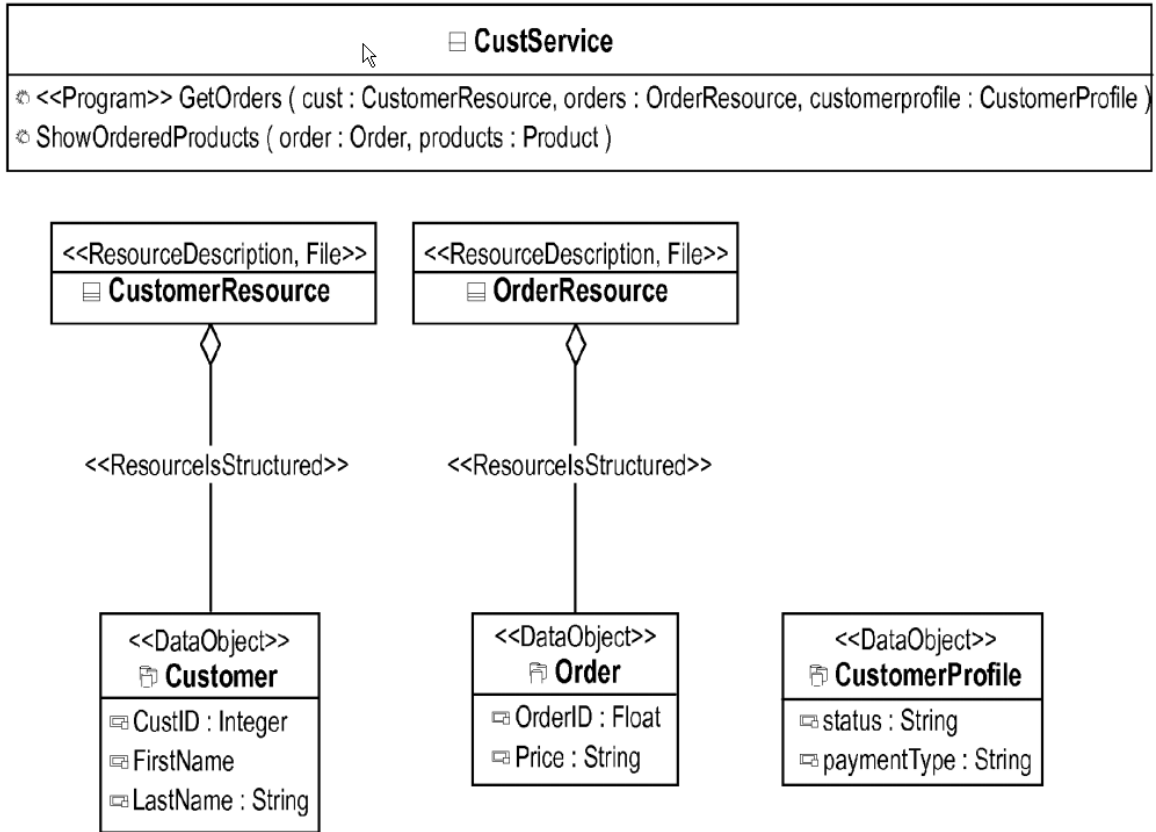
applying a program stereotype to the identified class operations, wherein

the data definition classes represent logical data, and

the class operations represents programs.

Appeal Br. 17 (Claims Appendix).

An example UML class diagram is shown below.⁶



In the UML diagram above, the **DataObject** stereotype has been applied to **Customer**, **Order**, and **CustomerProfile**. Spec. ¶ 57. As for the recited “class operations,” the class called “**CustService**” has two: `GetOrders` and `ShowOrderedProducts`. *Id.* Because `GetOrders` has been identified as a program, the **Program** stereotype has been applied to it. *Id.* Considering this disclosure (*id.*), modifying the diagram by applying the stereotype encompasses a person performing the claimed steps mentally with the assistance of pencil and paper.

⁶ Figure 4 is substantially similar to Figure 4 of the parent application 12/247,339. We show parent application’s Figure 4 here for clarity because the diagram is more legible.

According to Appellant, a UML class diagram is a data structure. Appeal Br. 8; *see also* Appeal Br. 12; Reply Br. 3–5 (discussing an improved data structure). To be sure, a computer can be used to create and modify a diagram. But it is not required. Rather, a UML diagram itself can be a printed image. *See* Final 5 (discussing non-functional descriptive material). The recited modifications to the diagram essentially convert a UML diagram to another type of UML diagram (i.e., the “extended UML diagram”).

Similarly, the Federal Circuit has held that a claim to “translating a functional description of a logic circuit into a hardware component description of the logic circuit” was directed to an abstract idea because the claim “read on an individual performing the claimed steps mentally or with pencil and paper.” *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1139, 1149 (Fed. Cir. 2016), *cited in* Guidance, 84 Fed. Reg. at 53 n.15. Likewise, claim 7 recites a mental process that translates one description to another. *See* Final 5 (discussing how the claims are directed to modifying the UML). Thus, the step of modifying, by a processor, the initial UML class diagram to generate an extended UML class diagram is part of the recited mental process.

For all the above reasons, claim 7 recites an abstract idea.

V. Step 2A, Prong Two of the Guidance

Because claim 7 recites an abstract idea, we now proceed to determine whether the recited judicial exception is integrated into a practical application. Guidance, 84 Fed. Reg. at 51. When a claim recites a judicial exception and fails to integrate the exception into a practical application, the claim is “directed to” the judicial exception. *Id.*

We use the term *additional elements* for claim features, limitations, or steps that the claim recites beyond the identified judicial exception. *See id.* at 55 n.24. In claim 7, the additional elements are (1) “receiving an initial UML class diagram modelizing the software application” and (2) a processor to modify “the initial UML class diagram to generate an extended UML class diagram.”

1. Receiving the Diagram

Claim 7 recites, in part, “receiving an initial UML class diagram modelizing the software application.” Appeal Br. 17 (Claims Appendix).

The Guidance explains that a series of data gathering steps that collect a necessary input for an abstract idea can be insignificant extra-solution activity in Step 2A. Guidance, 84 Fed. Reg. at 56 (citing *OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359, 1363 (Fed. Cir. 2015)). Similarly, the receiving step recited in claim 7 is claimed generically. In the context of claim 7 as a whole, the UML diagram is a necessary input to the rest of the method. So the receiving step here is insignificant extra-solution activity and does not indicate that the judicial exception is integrated into a practical application.

2. The Processor

Claim 7 recites, in part, “modifying, by a processor, the initial UML class diagram to generate an extended UML class diagram.” Appeal Br. 17 (Claims Appendix).

An additional element may integrate a judicial exception into a practical application when, for example, the “additional element implements a judicial exception with, or uses a judicial exception in conjunction with, a

particular machine or manufacture that is integral to the claim.” Guidance, 84 Fed. Reg. at 55.

In this case, claim 7 lacks such a machine. Claim 7 does not recite any details about the processor. Rather, the recited processor encompasses a general-purpose processor that simply executes the mental process described above. *Supra* § IV. A general-purpose processor that merely executes the judicial exception is not a particular machine. See *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 716–17 (Fed. Cir. 2014), *cited in* MPEP § 2106.05(b)(I). Essentially, the claimed processor is used as a tool to perform an otherwise mental process. Thus, the processor limitation does not indicate that the judicial exception is integrated into a practical application.

3. *The Combination*

Appellant argues that the claimed invention improves computer technology. Appeal Br. 6–7. Appellant asserts that UML has not been used with procedural languages. *Id.* at 9. According to Appellant, the claimed invention extends UML’s functionality to procedural languages. *Id.* Appellant characterizes this extended functionality as “a solution to a problem in the software arts.” *Id.* In Appellant’s view, the UML diagram “is a tool by which software is generated, which constitutes ‘computer technology.’” Reply Br. 2.

The Specification describes that software developers use the UML diagram for modeling. Spec. ¶ 4. Traditionally, procedural languages are represented with a flow chart. *Id.* ¶ 5. UML is commonly used for object-oriented languages. *Id.* ¶ 4. Being able to represent procedural languages in UML would create a uniform representation for things across an enterprise. *Id.* ¶ 6.

To be sure, the UML diagrams are eventually used to derive the actual programming code. *Id.* ¶ 4. Yet claim 7 does not recite deriving the code. *See* Final 5 (discussing how the claimed entities are not implemented). Instead, we agree with the Examiner that the claimed invention is merely directed to modifying the diagram. *See id.* For instance, the Appeal Brief stated that the claimed invention is directed to a “series of rules that *improve upon prior art UML class diagrams* by extending them.” Appeal Br. 12 (emphasis added). That is, the purported improvement is to the diagram. *See* Spec. ¶ 6.

As discussed above, modifying the diagram is part of the mental process. *Supra* § IV. Even when viewed in combination, the additional elements do no more than automate that mental process. There is no change to the processor or other technology other than automating the abstract idea. So claim 7 does not improve computer technology or functionality in a way that indicates that the recited judicial exception is integrated into a practical application. *See* Final 5 (explaining that the claims are not directed to improving technology).

Thus, the claim is directed to the judicial exception.

VI. Step 2B of the Guidance

Under step 2B, we determine whether a claim provides an inventive concept. Guidance, 84 Fed. Reg. at 56. To this end, we consider the additional elements—individually and in combination—to determine whether they (1) add a specific limitation beyond the judicial exception that is not well-understood, routine, and conventional in the field or (2) simply append well-understood, routine, and conventional activities previously known to the industry, specified at a high level of generality, to the judicial

exception. *Id.* Also, we reevaluate our conclusions about the additional elements discussed in the previous step. *Id.*

As discussed in Step 2A, Prong Two, claim 7’s additional elements are (1) “receiving an initial UML class diagram modelizing the software application” and (2) a processor to modify “the initial UML class diagram to generate an extended UML class diagram.”

1. Receiving the Diagram

Claim 7 recites, in part, “receiving an initial UML class diagram modelizing the software application.” Appeal Br. 17 (Claims Appendix).

Of relevance to this step, in *OIP Techs.*, the Federal Circuit determined that “routine data-gathering” was well-understood, routine, and conventional activity in the claims at issue. 788 F.3d at 1363; *see also Content Extraction & Transmission LLC v. Wells Fargo Bank*, 776 F.3d 1343, 1347 (Fed. Cir. 2014) (“The concept of data collection . . . is undisputedly well-known.”). In claim 7, the receiving step merely collects the data for the remaining steps. An architect can simply use a computer to read the data into a software program. *See* Spec. ¶ 48 (discussing using IBM Rational Software Architect), *cited in* Final 4. Here, the Specification indicates that the receiving step is routine data gathering. Thus, the receiving step is well-understood, routine, and conventional.

2. The Processor

Claim 7 recites, in part, “modifying, by a processor, the initial UML class diagram to generate an extended UML class diagram.” Appeal Br. 17 (Claims Appendix).

Using a computer “only for its most basic function, the performance of repetitive calculations,” may not impose meaningful limits on the claim’s

scope. *Bancorp Servs. v. Sun Life Assurance Co. of Can. (U.S.)*, 687 F.3d 1266, 1278 (Fed. Cir. 2012). Similarly, the MPEP instructs examiners that courts recognize that using a computer for performing repetitive calculations may be well-understood, routine, and conventional when claimed generically. MPEP § 2106.05(d)(II)(ii) (citing *Parker v. Flook*, 437 U.S. 584, 594 (1978); *Bancorp*, 687 F.3d at 1278).

Here, we agree with the Examiner that the processor is generic. *See* Final 4 (citing Spec. ¶¶ 24, 35, 48). The processor merely executes the abstract idea. *See id.* at 5. For instance, according to the Specification, the method can be embodied as a program executing on a computer. Spec. ¶¶ 24, 35, 48. These paragraphs indicate that the processor is part of that general-purpose computer. Final 5. Thus, we agree with the Examiner that the recited processor is well-understood, routine, and conventional. *Id.*

3. Conclusion to Step 2B

Because the additional elements add nothing more than well-understood, routine, and conventional activity, our conclusions about whether the recited additional elements integrate the abstract idea into a practical application stand. *See* Guidance, 84 Fed. Reg. at 56. Considering both our previous conclusions and the findings about well-understood, routine, and conventional activity, we determine that the claim does not provide an inventive concept.

VII. Summary

Appellant has not persuaded us of error in the rejection of representative claim 7 under 35 U.S.C. § 101. Thus, we sustain the rejection. We also sustain the rejection of claims 8, 10–13, 15, and 16, which are not argued separately. *See supra* n.4.

DECISION SUMMARY

Claims Rejected	35 U.S.C. §	Reference(s)/Basis	Affirmed	Reversed
7, 8, 10–13, 15, 16	101	Eligibility	7, 8, 10–13, 15, 16	

TIME PERIOD FOR RESPONSE

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