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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/025,889	02/05/2008	Mathias Kohler	2058.280US1	2085

50400 7590 10/24/2018
SCHWEGMAN LUNDBERG & WOESSNER/SAP
P.O. BOX 2938
MINNEAPOLIS, MN 55402

EXAMINER
LOFTIS, JOHNNA RONEE

ART UNIT	PAPER NUMBER
3683	

NOTIFICATION DATE	DELIVERY MODE
10/24/2018	ELECTRONIC

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MATHIAS KOHLER and ANDREAS SCHAAD

Appeal 2017-008343[1]
Application 12/025,889[2]
Technology Center 3600

Before JEAN R. HOMERE, JAMES B. ARPIN, and
AARON W. MOORE, *Administrative Patent Judges*.

ARPIN, *Administrative Patent Judge*.

DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134(a) of a rejection of claims 1–4, 6–15, and 17–24. Br. 1. Claims 5 and 16 are cancelled. RCE Amend. 3, 6. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

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[1] In this Decision, we refer to Appellants' Appeal Brief ("Br.," filed December 7, 2016) and Reply ("Reply," filed May 10, 2017); the Final Office Action ("Non-Final Act.," mailed May 19, 2016); the Amendment & Response Under 37 C.F.R. § 1.116 ("RCE Amend.," filed October 29, 2015); the Examiner's Answer ("Ans.," mailed March 10, 2017); and the Specification ("Spec.," filed July 20, 2011).

[2] According to Appellants, the real party-in-interest is SAP SE. Br. 2.

STATEMENT OF THE CASE

Appellants' claimed subject matter relates to methods, systems, and media for "determin[ing] whether the minimum number of resources is available to be assigned to the roles and tasks in order to avoid deadlock and, if so, then assigning actual resources to the relevant roles and tasks." Spec. ¶ 19.

> The workflow may include tasks, roles assigned to the tasks, and security constraints related to the tasks. A workflow[] may contain branches and therefore parallel executions of tasks in an arbitrary order during run-time may be specified (e.g., as a non-linear workflow). A data structure (e.g., a constraint-based relation graph) may be generated to represent relationships between the tasks and the security constraints (e.g., the assignment of various security constraints to one or more tasks of the workflow).

Id. ¶ 13. Security constraints "may include separation of duty (SoD) constraints or binding of duty (BoD) constraints. A separation of duty constraint[] may require that certain tasks or processes of a workflow, which are declared as exclusive, have to be performed by or using different resources (e.g., different users)." *Id.* ¶ 21. A deadlock occurs when an allocation of resources does not permit all tasks in a workflow to be completed. *See id.* ¶ 24. With a proper allocation of resources to roles and tasks, a workflow can be completed without a deadlock. *Id.* ¶ 25.

Figure 5 is reproduced below.

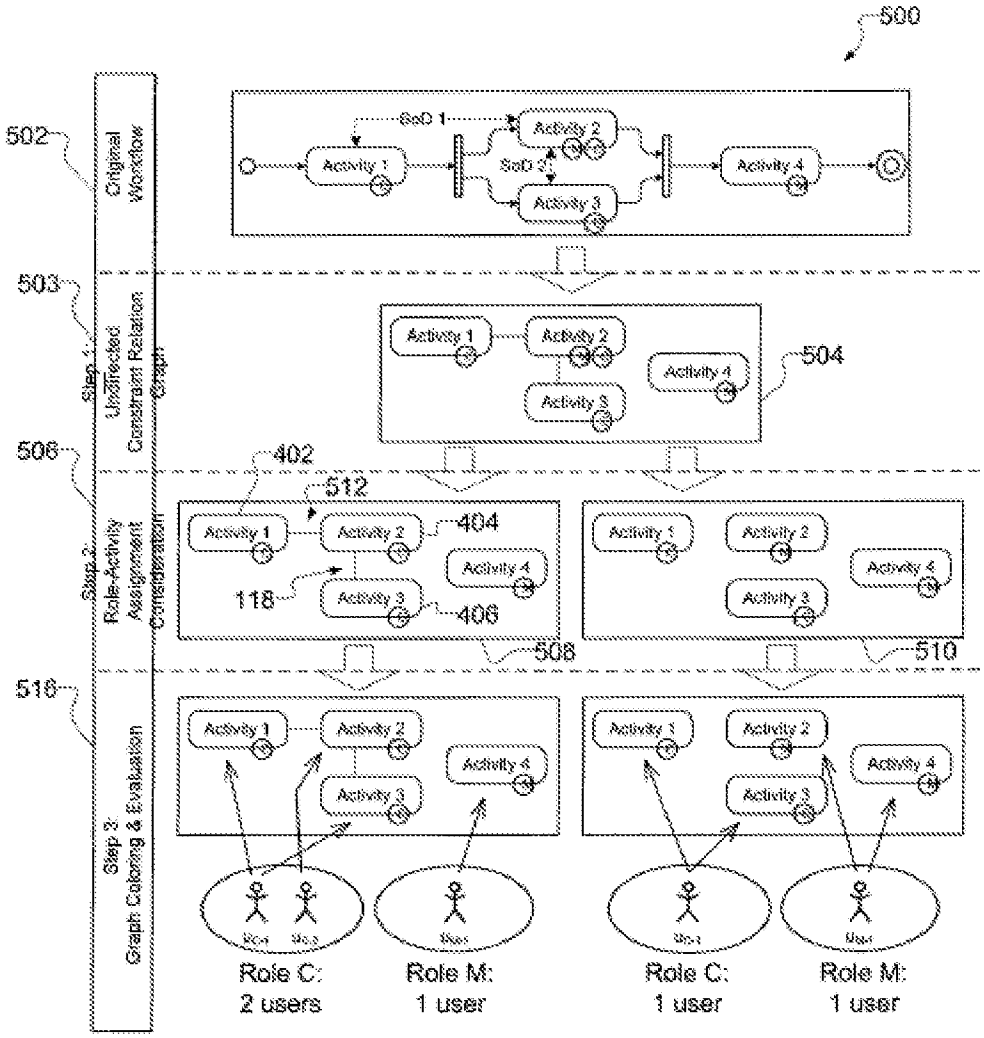

FIG. 5

Spec. Fig. 5. Figure 5 depicts original workflow 502 and the resulting user (e.g., resource) allocations for each of graph variants 508 and 510. *Id.* ¶¶ 76, 77. Referring to workflow 502, SoD 1 defines activities 1 and 2 as exclusive, and SoD 2 defines activities 104 and 106 as exclusive. *Id.* ¶ 23. Thus, the same user may not perform either activities 102 *and* 104 or activities 104 *and* 106. *Id.* Specifically, for graph variant 508, *two* users U_{C-1} and U_{C-2} are allocated to role "C," and *one* user U_{M-1} is allocated to role "M." *Id.* ¶ 77 (operation 516 (Step 3)). In graph variant 510, *one* user U_{C-1}

is allocated to role "C," and *one* user U_{M-1} is allocated to role "M." *Id.* Either allocation of resources depicted in step 516 allows for completion of workflow 502, but the second allocation employs fewer resources than the first allocation.

As noted above, claims 1–4, 6–15, and 17–24 are pending, and claims 1, 12, 23, and 24 are independent. Br. Claims App'x. Claim 1 is directed to methods, claims 12 and 23 are directed to systems, and claim 24 is directed to non-transitory machine-readable media. *Id.* Claims 2–4 and 6–11 depend directly or indirectly from claim 1, and claims 13–15 and 17–22 depend directly or indirectly from claim 12. *Id.*

Claim 1, reproduced below, is illustrative.

1. A computer-implemented method comprising:

> retrieving information from a database, the information describing a processing workflow including a plurality of processing tasks, roles assigned to the plurality of processing tasks, and security constraints related to the plurality of processing tasks including at least one separation of duty constraint that defines a portion of the plurality of processing tasks as exclusive and requiring performance by different resources;
>
> automatically generating, using at least one processor, a data structure representative of relationships between the plurality of processing tasks and the security constraints including the at least one separation of duty constraint, the data structure including the plurality of processing tasks, with at least one processing task assigned to more than one role;
>
> splitting the data structure into multiple data structures, each of the multiple data structures including all of the plurality of processing tasks from the data structure, defining an organization of the processing tasks in a manner so that the

> security constraints and relationships are preserved but no processing task is assigned to more than one role; and
>
> determining, for each of the multiple data structures and using the at least one processor, a minimum number of resources needed to execute the plurality of processing tasks in the data structure;
>
> selecting one of the multiple data structures based on a determination of which of the multiple data structures has the least number of resources needed to execute the plurality of processing tasks defined therein;
>
> assigning, using the at least one processor, the plurality of processing tasks to resources using the organization defined in the selected one of the multiple data structures, thereby avoiding processing deadlocks.

Id.

THE REJECTION

Claims 1–4, 6–15, and 17–24 stand rejected under 35 U.S.C. § 101 "because the claimed invention is directed to a judicial exception (i.e., a law of nature, a natural phenomenon, or an abstract idea) without significantly more," i.e., because the claimed methods and systems are patent-ineligible subject matter. Final Act. 4.

Specifically, the Examiner concludes that

> gathering processing workflow information, generating data structure representing relationships between processing tasks and security constraints, splitting the data structure, determining a minimal number of resources to execute the processing tasks, selecting one of the data structures and assigning tasks to

> resources would be directed towards an idea of itself, which is an example identified by the courts as an abstract idea.

Id. at 4.

The Examiner also concludes that the claims do not add "significantly more" to the abstract idea. In particular:

> The claims do not include improvements to another technology or technical field; nor do they include improvements to the functioning of the computer itself. The claims merely amount to the application or instructions to apply the abstract idea on a general purpose computer, and require nothing more than a generic computer system (e.g. a computer system comprising a generic processor and a generic associated server) to carry out the abstract idea itself. Further, the claims do not include specific limitations adding unconventional steps that confine the claim to a particular useful application. Nor do they include limitations beyond generally linking the use of the abstract idea to a particular technological environment. *As such, the claims, when considered as a whole, are nothing more than the instruction to implement the abstract idea in a well-understood, routine and conventional technological environment.*

Id. at 5 (emphasis added); *see* Br. 10. The Examiner further concludes that "[t]he dependent claims further limit the abstract idea without adding significantly more." *Id.*

PRINCIPLES OF LAW

We have reviewed the appealed rejection for error based upon the issues identified by Appellants, given the arguments and evidence produced thereon. *Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential).

As to eligibility under 35 U.S.C. § 101, a patent may be obtained for "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof." The U.S. Supreme Court has "long held that this provision contains an important implicit

exception: Laws of nature, natural phenomena, *and abstract ideas* are not patentable." *Alice Corp. v. CLS Bank Int'l*, 134 S. Ct. 2347, 2354 (2014) (emphasis added; quoting *Ass'n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576, 589 (2013)).

The Court in *Alice* reiterated the two-step framework previously set forth in *Mayo Collaborative Services v. Prometheus Laboratories, Inc.*, 566 U.S. 66, 82–83 (2012), "for distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of those concepts." *Alice*, 134 S. Ct. at 2355. The first step in that analysis is to "determine whether the claims at issue are directed to one of those patent-ineligible concepts," such as an abstract idea. *Id.*

The Court acknowledged, in *Mayo*, that "all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas." *Mayo*, 566 U.S. at 71. We, therefore, look to whether the claims focus on a specific method or means that improves the relevant technology or instead are directed to a result or effect that itself is the abstract idea and merely invoke generic processes and machinery. *See Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335–36 (Fed. Cir. 2016) ("*Enfish*"). If the claims are not directed to an abstract idea, the inquiry ends. *Id.* at 1339. Otherwise, the inquiry proceeds to the second step, in which the claim limitations are considered "individually and 'as an ordered combination' to determine whether the additional elements 'transform the nature of the claim' into a patent-eligible application." *Alice*, 134 S. Ct. at 2355 (quoting *Mayo*, 566 U.S. at 79).

Central to our analysis is the fundamental principle that the *Alice* framework must be applied *to the claims*, as properly construed. As our

reviewing court has stated, "[t]he § 101 inquiry must focus on the language of the Asserted Claims themselves." *Synopsys. Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1149 (Fed. Cir. 2016); *see also Accenture Global Servs., GmbH v. Guidewire Software, Inc.*, 728 F.3d 1336, 1345 (Fed. Cir. 2013) (admonishing that "the important inquiry for a § 101 analysis is *to look to the claim*" (emphasis added)); *Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat'l Ass'n*, 776 F.3d 1343, 1346 (Fed. Cir. 2014) (focusing on "whether the *claims* of the asserted patents fall within the excluded category of abstract ideas" (emphasis added)).

ANALYSIS

Appellants present four contentions allegedly demonstrating why the pending claims are not directed to an abstract idea without significantly more. We address these contentions below.

A. Alice Step One

1. Proper Identification of Abstract Idea

First, Appellants contend that the Examiner erred by failing to "*explain why specific claim limitations are directed to an abstract idea, as required for a prima facie rejection, and did not reasonably tie the facts in any of the cited cases to the presently pending claims*." Br. 11; Reply 2–3. Under Office guidance,

> when making a subject matter eligibility rejection and reciting a judicial exception, in addition to identifying specific claim limitations, "[t]he rejection **must** . . . explain why those claim limitations set forth a judicial exception (e.g., an abstract idea) Examiners should **be familiar with any cited decision** relied upon in making or maintaining a rejection **to ensure that the rejection is reasonably tied to the facts of the case** and to avoid relying upon language taken out of context."

Br. 11 (quoting Comm'r for Patents Memorandum, "Formulating a Subject Matter Eligibility Rejection and Evaluating the Applicant's Response to a Subject Matter Eligibility Rejection," 2–3 (May 4, 2016) (bolding added)). As noted above, the pending claims allegedly are directed to the abstract idea of "determining a minimal number of resources to be assigned to roles in order to execute a plurality of tasks of each of the multiple data structures; the determination based on relationships between the plurality of tasks and security constraints including at least one separation of duty constraint." Final Act. 4; *see* Br. 11. Appellants contend that this statement fails to meet the requirements of the Office guidance.

Here, the Examiner explained that "Applicant argues the claims have been amended to make clear that the tasks are *processing* tasks and that the determining, selecting, and assigning operations allow *processing* deadlocks to be avoided." Final Act. 2 (emphasis added). The Examiner found that, although the claims were amended during prosecution specifically to tie the recited steps to a processor, i.e., computer technology (RCE Amend. 2, 10); the processor is used merely to perform steps that may be performed by pen and paper (*see* Final Act. 2). In support of this conclusion, the Examiner cites to *SmartGene, Inc. v. Advanced Biological Labs., SA*, 555 F. App'x 950 (Fed. Cir. 2014). As the Manual of Patent Examining Procedure indicates, analyzing information by the steps people go through in their minds, without more, is essentially a mental process within the abstract-idea category. MPEP 2106.04(a)(2)(III) (citing *SmartGene,* 555 F. App'x at 955).

Although the embodiment depicted in Figure 5, reproduced above, is encompassed within the scope of the pending claims (*see* Spec. ¶¶ 4, 8, 9), a person may avoid a deadlock and determine the minimum number of

resources necessary to complete workflow 502 without the use of a processor. Final Act. 2–3 ("For instance, someone could gather all the data and create tables or spreadsheets to perform the analysis."). Here, the processor does not improve the functioning of a computer or related technology; it simply allows the method or computer implemented steps—the abstract idea—to be performed more quickly or to avoid deadlocks more easily and to determine the minimum resources in more complicated workflows. *Id.* at 3 ("If the tasks of the process are assigned and performed more quickly and without delay (avoiding processing deadlocks), it is considered a business improvement not an improvement to the computer or technology."); *see* Spec. ¶¶ 22 ("The confirmation of the amount or number of resources minimally needed to complete a workflow becomes substantially more complicated as the number of constraints applicable to the workflow increases."), 26 ("One approach is to simulate every possible resource-task assignment for a process or workflow, and in this way determine whether the workflow can be completed in a deadlock free manner. However, the performance of such a 'brute force' series of simulations becomes increasingly difficult as the quantity of resources (e.g., a number of users) which may perform the tasks of a process increases. Further, every time a particular resource becomes available or unavailable (e.g., a user joins or leaves a set of users), new simulations and calculations are required."). Thus, we agree with the Examiner's identification of the abstract idea and the reference to *SmartGene* in support of this identification.

2. *Level of Abstraction and Claim Language*

Second, Appellants contend that, given the Federal Circuit's *Enfish* decision, the Examiner erred by "describing the claims at such a high level

of abstraction and untethered from the language of the claims." Br. 13 (quoting *Enfish*, 822 F.2d at 1337); Reply 3–4. In particular, Appellants contend that whether the pending claims recite an improvement to the functioning of a computer is relevant to step one of the *Alice/Mayo* analysis. Br. 13. Appellants assert that the Examiner failed to consider such improvement here. *Id.* We disagree.

As the Examiner notes, "[a]s claimed, data is collected describing a processing workflow. Given the broadest reasonable interpretation, a processing workflow could be any workflow describing any process." Final. Act. 2. The Examiner found that "the steps of retrieving, generating, splitting, determining, selecting and assigning steps may all be performed by pen and paper, thus requiring the rejection under 35 USC 101." *Id.* at 3. Because the claims recite "*processing* tasks" contained in a "*processing* workflow" and the result of the recited processes is avoiding "*processing* deadlocks," however, Appellants contend that "the claims cannot be properly interpreted to cover such an assignment of resources in a manual workflow." Reply 3.

Appellants misunderstand the Examiner's rejection. The Examiner does not find that the claims cover the manual task, but, instead, that the claims merely describe the implementation of a mental process by means of conventional computer components. Ans. 3 ("[E]ven if the invention requires the use of a computer, the claim does not constitute a technological invention because this is not a technical solution but more akin to creating organizational data structures used to assign tasks to resources."); *see Cybersource Corp. v. Retail Decisions, Inc.*, 654 F.3d 1366, 1373 (Fed. Cir. 2011) ("Methods which can be performed entirely in the human mind are

unpatentable not because there is anything wrong with claiming mental method steps as part of a process containing non-mental steps, but rather because computational methods which can be performed entirely in the human mind are the types of methods that embody the 'basic tools of scientific and technological work' that are free to all men and reserved exclusively to none."). Here, the recited "processing" limitations are directed to the abstract idea, rather than any improvement in the employed computer technology. Final Act. 3; *see* Ans. 3. Further, the level of abstraction at which the Examiner describes the invention does not change the accuracy of the Examiner's determination. *Apple v. Ameranth Inc.*, 842 F.3d 1229, 1240 (Fed. Cir. 2016) ("An abstract idea can generally be described at different levels of abstraction."). Thus, the Examiner considered the improvements allegedly recited in the pending claims but found that the claims recited an abstract idea. Final Act. 2–3. We agree.

3. "Avoiding Processing Deadlocks" Is Not a Technological Improvement

Third, Appellants contend that the Examiner erred in determining that the recitation "thereby avoiding processing deadlocks" was a statement of intended use and did not recite a technological improvement in computer capabilities. Br. 13. If a deadlock occurs, the computer becomes "stuck." *Id.* at 10. Appellants assert that processing deadlocks are a problem that does not exist outside of computer technology and that avoiding such deadlocks is an improvement to computer technology. *Id.* ("In the instant claims, 'thereby avoiding processing deadlocks' unambiguously ties the claims to an improvement in computer capabilities."); *see* RCE Amend. 10–11. We disagree.

As the Specification explains, "[t]he integration of such security constraints into a workflow may result in policy-based deadlocks, as the constraints imply the requirement that a certain number of resources (e.g. users) are available to perform the processes or tasks of a workflow." Spec. ¶ 21. Further, the Specification explains that "with a proper allocation of resources to roles . . . and tasks, the workflow 100 can complete without deadlock occurring." *Id.* ¶ 25. Thus, avoidance of deadlocks depends on the proper allocation of resources to perform the desired tasks, rather than the use of a processor or other computer technology.

We are not persuaded that the Examiner erred in determining that the pending claims are directed to an abstract idea.

B. Alice Step Two

Fourth, Appellants contend that the Examiner erred by addressing the recited claim limitations with inappropriate brevity, thereby failing to convey sufficient context when alleging that additional claim limitations do not amount to significantly more than a judicial exception. Br. 14; Reply 4–6. In particular, Appellants contend that the Examiner fails to address the additional limitations of the pending claims, apart from the processor. Reply 5. Thus, Appellants allegedly cannot tell which limitations of the pending claims are allegedly, conventional computer elements. *Id.* We disagree.

Pending claims 1, 12, and 23 recite only a few structural limitations, namely, a memory, including a database or first and second components, and one or more processors. *See* Br. Claims App'x. (Claims 1, 12, and 23). Pending claim 24 recites a "non-transitory machine-readable medium"

storing instructions that are performed by "at least one processor." *See id.* (Claim 24). Moreover, the Specification explains that:

> A module, logic, component or mechanism (herein after collectively referred to as a "module") may be a tangible unit capable of performing certain operations and is configured or arranged in a certain manner. In example embodiments, one or more computer systems (e.g., a standalone, client or server computer system) or one or more components of a computer system (e.g., a processor or a group of processors) may be configured by software (e.g., an application or application portion) as a "module" that operates to perform certain operations as described herein.
>
> In various embodiments, a "module" may be implemented mechanically or electronically. For example, a module may comprise dedicated circuitry or logic that is permanently configured (e.g., within a special-purpose processor) to perform certain operations. *A module may also comprise programmable logic or circuitry (e.g., as encompassed within a general-purpose processor or other programmable processor) that is temporarily configured by software to perform certain operations.* It will be appreciated that the decision to implement a module mechanically, in dedicated and permanently configured circuitry, or in temporarily configured circuitry (e.g., configured by software) may be driven by cost and time considerations.

Spec. ¶¶ 93, 94 (emphasis added); *see id.* ¶¶ 95–105 (describing other conventional computer elements). According to Appellants, the Examiner determined that "the additional limitations, including the claimed processor, are viewed as conventional computer elements . . . and do not add significantly more to the abstract idea." Reply 5 (quoting Br. 14). The additional limitations of the methods and systems of the pending claims, as well as the instructions stored on non-transitory machine-readable media and their operating processor, may be conventional computer elements of hardware and software. Final Act. 5; Ans. 4; *see* MPEP 2106.05(d). Thus,

the Examiner persuasively explained the basis for concluding that the additional claim limitations do not amount to significantly more than a judicial exception and in sufficient detail to support the rejection.

We are not persuaded that the Examiner erred in rejecting claims 1–4, 6–15, and 17–24, and we sustain the rejection.

DECISION

For the above reasons, we affirm the Examiner's decision rejecting claims 1–4, 6–15, and 17–24.

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