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BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte SVEN JOZEF JEANNE van den BOSCH, GERT van HOEY, PALOMA de la VALLEE-POUSSIN, and NATALIE MARIA CORNELIA DeGRANDE[1]

Appeal 2018-005761
Application 14/483,922
Technology Center 2400

Before ROBERT E. NAPPI, ERIC S. FRAHM, and MICHAEL T. CYGAN, *Administrative Patent Judges*.

FRAHM, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants seek our review under 35 U.S.C. § 134(a) of the Examiner's final rejection of claims 11–30. Claims 1–10 have been canceled. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

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[1] Appellants identify Nokia Corporation as the real party in interest, as a result of (i) an assignment from the inventors to Alcatel Lucent; and (ii) a merger of Nokia and Alcatel Lucent (App. Br. 1).

STATEMENT OF THE CASE

Appellants' invention relates to a "NETWORK MANAGEMENT SYSTEM, NETWORK, METHOD AND COMPUTER PROGRAM PRODUCT" (Title). More particularly, Appellants' disclosed and claimed invention pertains to a network management system for managing traffic signals in a network made up of nodes/links with the help of a calculator (Fig. 1, 110), comparator (Fig. 1, 114), and selector (Fig. 1, 113) to select a solution for transporting traffic signals from a source node (e.g., node A) to a destination node (e.g., node G) (Abstract; Spec. 1:4–13; Figs. 1, 2; claims 11, 21, 26, 29).

Claims 11, 21, 26, and 29 are the independent claims on appeal. Claim 11, reproduced below, is illustrative of the subject matter on appeal (emphases added):

> 11. A network management system for managing traffic signals in a network comprising nodes/links, comprising:
>
> *a calculator for calculating solutions for each of a plurality of situations, each of the solutions defining a path in a network for transporting traffic signals from a source node to a destination node via intermediate nodes/links*;
>
> *a comparator for*:
>
> *comparing solutions* of a same situation with each other based on a number of amendments of the path of one solution of the same situation required to transition the one solution of the same situation to another solution of the same situation, and
>
> *comparing solutions* of different situations with each other based on a number of amendments of the path of one solution of the different situations required to transition the one solution of the different situations to another solution of the different situations; and
>
> *a selector for selecting one of the solutions for transporting the traffic signals from the source node to the*

> *destination node for each of the plurality of situations based on the comparing solutions of the same situation and the comparing solutions of different situations, wherein the traffic signals are transported based on the selected solutions.*

REJECTION[2]

Claims 11–30 are rejected under 35 U.S.C. § 101 as directed to patent ineligible subject matter. Final Act. 2–3; Ans. 3–5.

PRINCIPLES OF LAW

Patent-eligible subject matter is defined in 35 U.S.C. § 101 of the Patent Act, which recites:

> Whoever 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.

There are, however, three judicially created exceptions to the broad categories of patent-eligible subject matter in 35 U.S.C. § 101: "[l]aws of nature, natural phenomena, and abstract ideas." *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014); *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 70 (2012).

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[2] In light of the terminal disclaimer approved on September 5, 2017, we consider the non-statutory obviousness-type double-patenting rejection of claims 11, 12, 16, 19–21, and 26–29 over claims 1 and 4 of U.S. Patent No. 8,868,714 to have been withdrawn (*see* Ans. 2–3; *see also* App. Br. 12). Therefore, we do not reach the merits or otherwise review this rejection in our decision.

In determining whether a claim falls within an excluded category, we are guided by the Supreme Court's two-step framework, described in *Mayo* and *Alice*. *Alice*, 573 U.S. at 217–18 (citing *Mayo*, 566 U.S. at 75–77). In accordance with that framework, we first determine what concept the claim is "directed to." *See id.* at 219 ("On their face, the claims before us are drawn to the concept of intermediated settlement, *i.e.,* the use of a third party to mitigate settlement risk."); *see also Bilski v. Kappos*, 561 U.S. 593, 611 (2010) ("Claims 1 and 4 in petitioners' application explain the basic concept of hedging, or protecting against risk . . . .").

Concepts determined to be abstract ideas, and thus patent ineligible, include certain methods of organizing human activity, such as fundamental economic practices (*Alice*, 573 U.S. at 219–20; *Bilski*, 561 U.S. at 611); mathematical formulas (*Parker v. Flook*, 437 U.S. 584, 594–95 (1978)); and mental processes (*Gottschalk v. Benson*, 409 U.S. 63, 69 (1972)). Concepts determined to be patent eligible include physical and chemical processes, such as "molding rubber products" (*Diamond v. Diehr*, 450 U.S. 175, 192 (1981)); "tanning, dyeing, making water-proof cloth, vulcanizing India rubber, smelting ores" (*id.* at 182 n.7 (quoting *Corning v. Burden*, 56 U.S. 252, 267–68 (1854))); and manufacturing flour (*Benson*, 409 U.S. at 69 (citing *Cochrane v. Deener*, 94 U.S. 780, 785 (1876))).

In *Diehr*, the claim at issue recited a mathematical formula, but the Supreme Court held that "[a] claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula." *Diehr*, 450 U.S. at 187; *see also id.* at 191 ("We view respondents' claims as nothing more than a process for molding rubber products and not as an attempt to patent a mathematical formula."). Having

said that, the Supreme Court also indicated that a claim "seeking patent protection for that formula in the abstract . . . is not accorded the protection of our patent laws, and this principle cannot be circumvented by attempting to limit the use of the formula to a particular technological environment." *Id.* (citation omitted) (citing *Benson* and *Flook*); *see, e.g.*, *id.* at 187 ("It is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.").

If the claim is "directed to" an abstract idea, we turn to the second step of the *Alice* and *Mayo* framework, where "we must 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*, 573 U.S. at 221 (quotation marks omitted). "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.* (alterations in original) (quoting *Mayo*, 566 U.S. at 77). "[M]erely requir[ing] generic computer implementation[] fail[s] to transform that abstract idea into a patent-eligible invention." *Id.*

The PTO recently published revised guidance on the application of § 101. USPTO's January 7, 2019 Memorandum, *2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. 50 (hereinafter, "Memorandum"). Under that guidance, we first determine whether the claim recites:

(1) any judicial exceptions, including certain groupings of abstract ideas (i.e., mathematical concepts, mental processes, or certain methods of organizing human activity such as a fundamental economic practice or

managing personal behavior or relationships or interactions between people) (hereinafter, "*Step 1 of the Memorandum*"); and

(2) additional elements that integrate the judicial exception into a practical application (*see* Manual of Patent Examining Procedure ("MPEP") §§ 2106.05(a)–(c), (e)–(h)) (hereinafter, "*Step 2 of the Memorandum*").[3] Memorandum, 84 Fed. Reg. at 51–52, 55.

A claim that integrates a judicial exception into a practical application applies, relies on, or uses the judicial exception in a manner that imposes a meaningful limit on the judicial exception, such that the claim is more than a drafting effort designed to monopolize the judicial exception. Memorandum, at 54. When the judicial exception is so integrated, then the claim is not directed to a judicial exception and is patent eligible under § 101. *Id.*

Only if a claim: (1) recites a judicial exception, and (2) does not integrate that exception into a practical application, do we then evaluate whether the claim provides an inventive concept. Memorandum, at 56; *Alice*, 573 U.S. at 217–18. For example, we look to whether the claim:

(3) adds a specific limitation beyond the judicial exception that is not "well-understood, routine, conventional" in the field (*see* MPEP § 2106.05(d)) (hereinafter, "*Step 3 of the Memorandum*"); or

(4) simply appends well-understood, routine, and conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception (hereinafter, "*Step 4 of the Memorandum*"). Memorandum, at 56.

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[3] All references to the MPEP are to the Ninth Edition, Revision 08–2017 (rev. Jan. 2018).

Step 1 of the Memorandum – Judicial Exception/Abstract Idea

Because there is no single definition of an "abstract idea" under *Alice* step 1, the PTO has recently synthesized, for purposes of clarity, predictability, and consistency, key concepts identified by the courts as abstract ideas to explain that the "abstract idea" exception includes the following three groupings:

1. Mathematical concepts—mathematical relationships, mathematical formulas or equations, mathematical calculations;

2. Mental processes— concepts performed in the human mind (including an observation, evaluation, judgment, opinion); and

3. Certain methods of organizing human activity—fundamental economic principles or practices (including hedging, insurance, mitigating risk); commercial or legal interactions (including agreements in the form of contracts; legal obligations; advertising, marketing or sales activities or behaviors; business relations); managing personal behavior or relationships or interactions between people (including social activities, teaching, and following rules or instructions).

According to the Memorandum, "claims that do not recite [subject] matter that falls within these enumerated groupings of abstract ideas should not be treated as reciting abstract ideas," except in rare circumstances. Even if the claims recite any one of these three groupings of abstract ideas, these claims are still not "directed to" a judicial exception (abstract idea), and thus are patent eligible, if "the claim as a whole integrates the recited judicial exception into a practical application of that [judicial] exception." *See* Memorandum, at 53.

Under the Memorandum, if the claim does not recite a judicial exception (a law of nature, natural phenomenon, or subject matter within the

enumerated groupings of abstract ideas above), then the claim is patent-eligible at *Step 1 of the Memorandum*. This determination concludes the eligibility analysis, except in situations identified in the Memorandum.[4]

Step 2 of the Memorandum – Practical Application

If a claim recites a judicial exception in *Step 1 of the Memorandum*, we determine whether the recited judicial exception is integrated into a practical application of that exception in *Step 2 of the Memorandum* by: (a) identifying whether there are any additional elements recited in the claim beyond the judicial exception(s); and (b) evaluating those additional elements individually and in combination to determine whether they integrate the exception into a practical application.

"[I]ntegration into a practical application" requires an additional element or a combination of additional elements in the claim to apply, rely on, or use the judicial exception in a manner that imposes a meaningful limit on the judicial exception, such that the claim is more than a drafting effort designed to monopolize the exception. *See* Memorandum, at 54.

The seven identified "practical application" sections of the MPEP,[5] cited in the Memorandum under *Step 2 of the Memorandum*, are:

(1) MPEP § 2106.05(a) Improvements to the Functioning of a Computer or To Any Other Technology or Technical Field

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[4] In the rare circumstance in which an Examiner believes a claim limitation that does not fall within the enumerated groupings of abstract ideas should nonetheless be treated as reciting an abstract idea, the procedure described in the Guidance for analyzing the claim should be followed. *See* Memorandum, Section III.C.

[5] *See* MPEP § 2106.05(a)–(c), (e)–(h). Citations to the MPEP herein refer to revision [R-08.2017].

(2) MPEP § 2106.05(b) Particular Machine

(3) MPEP § 2106.05(c) Particular Transformation

(4) MPEP § 2106.05(e) Other Meaningful Limitations

(5) MPEP § 2106.05(f) Mere Instructions To Apply An Exception

(6) MPEP § 2106.05(g) Insignificant Extra-Solution Activity

(7) MPEP § 2106.05(h) Field of Use and Technological Environment

If the recited judicial exception is integrated into a practical application as determined under one or more of the MPEP sections cited above, then the claim is not directed to the judicial exception, and the patent-eligibility inquiry ends. If not, then analysis proceeds to *Steps 3 and 4 of the Memorandum.*

ANALYSIS

Step 1 of the Memorandum – Judicial Exception/Abstract Idea

In the instant case before us, the Examiner finds the claims (i) recite limitations drawn to "mathematical operations" such as calculating, comparing, and selecting solutions (Final Act. 3; Ans. 4); and (ii) are directed to the abstract idea of "mathematical relationships/formulas" (Final Act. 2; Ans. 4) and "mathematical calculation" (Ans. 4), and not to an improvement to computer systems.

Step 2 of the Memorandum – Practical Application

For the reasons given below, we are persuaded that, even if claims 11–30 recite an abstract idea (mathematical concepts/formulae/calculations), the claims recite additional elements that integrate the judicial exception into

a practical application, and are, therefore, directed to patent-eligible subject matter.

In the instant case on appeal, claim 11 recites a network management system for managing traffic in a network of nodes/links by (i) calculating and comparing solutions for routing traffic signals in the network of nodes/links; (ii) selecting one of the solutions for transporting the traffic signals from a source node to a destination node in the network based on the compared solutions; and then (iii) transporting the traffic signals based on the selected solution.

Claim 11 recites the additional elements of "a network" having "nodes/links," "a calculator," "a comparator," and "a selector." Considering the claim as a whole, the "selector" applies or uses the abstract idea in a meaningful way such that the claim as a whole is more than a drafting effort designed to monopolize the exception. The selector, taken in combination with the calculator and comparator, operates to transport traffic signals from the source node to the destination node more efficiently based on the comparisons and calculations made by the comparator and calculator. The last clause in particular, "wherein the traffic signals are transported based on the selected solutions" (claim 11), provides a technological improvement and integrates the abstract idea into a practical application. The claims here specify how interactions within a specifically claimed network are manipulated through the selection of solutions to cause signals to be rerouted through an existing connection of nodes in a different manner, similar to the claims found eligible in *DDR Holdings v. Hotels.com. DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1258-59 (Fed. Cir. 2014) (finding patent eligible claims that "specify how interactions with the Internet are

manipulated to yield a desired result – a result that overrides the routine and conventional sequence of events ordinarily triggered by the click of a hyperlink").

Claims 21, 26, and 29 recite similar calculating, comparing, and selecting limitations, including the same "wherein" clause as recited in claim 11 ("wherein the traffic signals are transported based on the selected solutions").

We conclude that even if the claims are directed to mathematical relationships/formulas/calculations, and therefore directed to an abstract idea, claims 11, 21, 26, and 29 integrate such an idea into a practical application. In particular, claims 11, 21, 26, and 29 recite elements/steps that allow for the selection of traffic signal solutions that solve traffic engineering problems by taking into account dependencies between traffic engineering problems. Our reviewing court has held that claims which recite rules that allow automation of animation tasks that could only be performed manually were not directed to an abstract idea. *See McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1313–14 (Fed. Cir. 2016); *see also* MPEP 2106.015(a). Like *McRO*, the claims here improve an existing technology (e.g., network management systems, methods, and computer program products) and are, therefore, not directed to an abstract idea.

In this light, we agree with Appellants' contentions that claims 11–30 provide an improvement in computer related technology (App. Br. 9) by providing "an improved network management system for determining a path for transporting traffic signals through the network in an unconventional manner by taking into account the dependencies between traffic engineering

problems when determining a path in a network, unlike conventional systems" (App. Br. 9). Similarly, we agree with Appellants' contentions that (i) the claims "are directed towards an improved network management system for transporting traffic signals through a network" (Reply Br. 2); and (ii):

> Advantageously, claims 11-30 provide for an improved network management system that can handle a group of interacting traffic engineering problems, thereby accounting for the dependencies between traffic engineering problems. Specification; page 2, lines 20-22; page 3, lines 20-24. The improved network management system thus selects an optimized solution which defines a path in the network for transporting traffic signals by taking into account dependencies between traffic engineering problems.

Reply Br. 3.

As a result, under *Step 2 of the Memorandum*, claims 11–30 provide improvements to the functioning of computer networks, and more particularly the technology or technical field of network management. *See* MPEP § 2106.05(a). Because the selector/selection limitation, e.g., in claims 11, 21, 26, and 29, integrates the judicial exception into a practical application, we find persuasive Appellants' assertion that the claims are patent eligible.

This determination (*Step 2 of the Memorandum – Practical Application*) concludes the eligibility analysis. Because we conclude that Appellants' claims include additional elements that integrate the judicial exception (mathematical concepts) into a practical application (*see* MPEP

§ 2106.05(a) discussed above), we do not reach and address Appellants' arguments pertaining to *Steps 3 and 4* of the Memorandum (*see* App. Br. 9–12; Reply Br. 3–4).

In view of the foregoing, under the Memorandum, and informed by our governing case law concerning 35 U.S.C. § 101, the Examiner erred in concluding claims 11–30 are directed to a judicial exception, i.e., an abstract idea, without significantly more, and thus are patent-ineligible under § 101. Under *Step 2 of the Memorandum*, we conclude the claims recite additional elements (namely, the selection of a traffic signal solution wherein traffic signals are transported through the claimed network based on the selected solution) that integrate the judicial exception (the abstract idea of mathematical concepts/formulae/calculations) into a practical application, and thus claims 11–30 are patent-eligible.

Accordingly, we cannot sustain the Examiner's § 101 rejection of independent claims 11, 21, 26, and 29, as well as the Examiner's rejection of dependent claims 12–20, 22–25, 27, 28, and 30, which stand or fall with the independent claims from which they depend.

DECISION[6]

We reverse the Examiner's decision rejecting claims 11–30 under 35 U.S.C. § 101.

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[6] We have decided the appeal before us. However, should there be further prosecution of the claims, the Examiner's attention is directed to 35 U.S.C. §§ 112(a), (b), and (f), for consideration of whether the claims comport with the requirements therein.

REVERSED