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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte JUAN JENNY LI, COLIN L. MALLOWS, and JAMES M. LANDWEHR

Appeal 2018-000063
Application 13/645,823[1]
Technology Center 2400

Before MICHAEL J. STRAUSS, JON M. JURGOVAN, and NABEEL U. KHAN, *Administrative Patent Judges*.

KHAN, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellants appeal under 35 U.S.C. § 134(a) from the Final Rejection of claims 1–20. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

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[1] Appellants identify Avaya Inc. as the real party in interest. App. Br. 2.

BACKGROUND

THE INVENTION

The Specification discusses notification services that alert a large number of recipients of emergency events. Spec. ¶ 2. To insure timely alert delivery, notification services provide multi-modal messages via voice calls, videos, instant messages, social network sites, SMS, and the like. Spec. ¶ 2. Different modes of communication may have different effects on the load created on the notification system. Spec. ¶ 3. For example, short text messages may have different notification loads than complex video conferencing. Spec. ¶ 3. Thus, embodiments of the invention provide a way for evaluating performance stress in a multi-modal network notification service. Spec. ¶ 4.

Exemplary independent claim 1 is reproduced below.

> 1. A method of operating a notification test system to test a notification system configured to transfer notifications to end devices using a plurality of modes, comprising:
>
> generating a covering array of test factors corresponding to the plurality of modes and a plurality of test level values for each node[2], wherein each of the plurality of test level values comprises a level of communication load for a corresponding mode of the plurality of modes;
>
> determining an escalation hierarchy of the covering array comprising a plurality of nodes, wherein each node corresponds

[2] The recitation of "each node" here does not appear to have any antecedent basis. Language from the Specification nearly identical to the claim language here makes use of the term "each mode" rather than "each node" when describing the generating step of the invention. *See* Spec. ¶ 4. For purposes of this appeal we consider the use of the word "node" instead of "mode" as a typographical error. Upon further prosecution, the Examiner may want to consider whether the claim should be amended or otherwise address the issue appropriately.

to a set of test factors in the covering array, and wherein each child node of the plurality of nodes includes test level values greater than or equal to test level values included in a node of the plurality of nodes that is a parent to the child node;

performing a notification test run of the set of test factors for each node in the escalation hierarchy to determine performance stress on the notification system for each set of test factors, wherein performing the notification test run comprises instructing the notification system to generate test notifications at the test level values in accordance with the set of test factors for each node in the escalation hierarchy;

based on test data resulting from the notification test run, generating a first factor-level-run table with the notification test runs corresponding to each of n-wise test factors and possible test level values; and

indicating which of the notification test runs in the factor-level-run table resulted in performance stress.

REFERENCES AND REJECTIONS

1. Claims 1–20 stand rejected under 35 U.S.C. § 101. Final Act. 8–13.

2. Claims 1, 2, 4–11, and 13–20 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Alexander (US 2009/0309742 A1, pub. Dec. 17, 2009) and Cemal Yilmaz, *Covering Arrays for Efficient Fault Characterization in Complex Configuration Spaces*, IEEE Transactions on Software Engineering, (January 2006) (hereinafter "Yilmaz"). Final Act. 13–19.

3. Claims 3 and 12 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Alexander, Yilmaz, and Lorenzen (US 5,253,331, iss. Oct. 12, 1993).

DISCUSSION

REJECTION UNDER 35 U.S.C. § 101

Legal Principles

An invention is patent-eligible if it claims a "new and useful process, machine, manufacture, or composition of matter." 35 U.S.C. § 101. However, the Supreme Court has long interpreted 35 U.S.C. § 101 to include implicit exceptions: "[l]aws of nature, natural phenomena, and abstract ideas" are not patentable. *E.g.*, *Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014).

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*. *Id.* at 217–18 (citing *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 75–77 (2012)). In accordance with that framework, we first determine what concept the claim is "directed to." *See Alice*, 573 U.S. 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, 191

(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 176; *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.* (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.* (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. *2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. 50 (Jan. 7, 2019) ("Guidance"). Under the Guidance, we first look to whether the claim recites:

> (1) any judicial exceptions, including certain groupings of abstract ideas (i.e., mathematical concepts, certain methods of organizing human activity such as a fundamental economic practice, or mental processes); and
>
> (2) additional elements that integrate the judicial exception into a practical application (*see* MPEP § 2106.05(a)–(c), (e)–(h)).

Only if a claim (1) recites a judicial exception and (2) does not integrate that exception into a practical application, do we then 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)); or
>
> (4) simply appends well-understood, routine, conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception.

See Guidance.

Guidance Step 2A - Whether the Claims are Directed to a Judicial Exception

The Examiner finds the claims are "directed to operating a notification test system to test a notification system using covering arrays." Ans. 2. This, the Examiner finds, is an idea of itself that can be "performed by a person using pen [and] paper." Ans. 3. The Examiner turns to each of claim 1's limitations and finds that all of them, save one, can be performed in the human mind with the aid of pen and paper. *See* Final Act. 8–11; Ans. 3–6.

For example, the Examiner finds "A human being using his mind can generate a simple version of a covering array, and determine a performance escalation by incrementing the test factors by one and identify the point where the factor levels show only failures in the test run." Final Act. 8. The only limitation the Examiner finds cannot be performed in the human mind is the limitation reciting "performing a notification test run." Final Act. 10; Ans. 4–5. Here the Examiner finds "[w]hile 'performing a notification test run' and 'generating test notifications' may arguably require a machine and are not abstract, however executing a stress test according to a test schedule is old and well known, as evidenced by the prior art rejections established in the appealed Office Action." Ans. 5.

We agree with the Examiner that the claimed "covering array" and "escalation hierarchy" are mathematical and logical constructs that can be generated and determined by mental processes. However, we also agree with the Examiner that the step of "performing a notification test run" is not abstract. Ans. 5. The Examiner finds this step is "old and well known" under step 2B of the test. Ans. 5. Under the new Guidance, however, before we turn to step 2B, we must first determine whether this additional element integrates the judicial exception into a practical application. We find that it does. In particular, once the "covering array" and "escalation hierarchy" are generated and determined, they are used to actually test the notification system to "determine the performance stress on the notification system." The act of performing a notification test run applies and makes use of the recited covering array and escalation hierarchy in a meaningful way beyond generally linking them to a particular technological environment.

Because we find the claim limitation of "performing a notification test run" integrates the claims into a practical application, we need not determine whether the Examiner is correct in finding that this step is "old and well known" (Ans. 5).

Accordingly, we do not sustain the Examiner's rejection of claims 1–20 under 35 U.S.C. § 101.

REJECTION UNDER 35 U.S.C. § 103

Claim 1 recites an "escalation hierarchy . . . comprising a plurality of nodes . . . wherein each child node of the plurality of nodes includes test level values greater than or equal to test level values included in a node of the plurality of nodes that is a parent to the child node." The Examiner finds Yilmaz's Table 4 teaches an "escalation hierarchy" between sets of test factors in a covering array, where the root node of the escalation hierarchy corresponds to the 0, 0, 0, configuration of Table 4 and other configurations, such as the 0, 0, 1, and 0, 0, 2, configuration are children nodes. Final Act. 15 (citing Yilmaz, Table 4).

Appellants argue "***Table 4 fails to disclose the parent/child relationship required by claim 1***." App. Br. 8. As Appellants explain,

> Table 4 lists a configuration of 0, 1, 2, which is followed by a configuration of 0, 2, 1. While the second number increases from 1 to 2, the third number decreases from 2 to 1, which is in conflict with claim 1 's requirement that test level values in a child be greater than or equal to that of a parent.

App. Br. 8. Thus, even if the configurations identified by the Examiner (0, 0, 0, followed by 0, 0, 1, followed by 0, 0, 2,) show the claimed test values being greater than or equal to values in a parent node, Appellants argue that the inclusion of some configurations (such as the 0, 1, 2, followed by 0, 2, 1,

configuration) that do not follow the claimed ordering of test values shows that "Table 4 as a whole does not always satisfy the definition of an escalation hierarchy." App. Br. 8. Additionally, Appellants argue

> Table 4 does not provide any sort of order that would be representative of a parent child relationship required by claim 1. As such, there is no teaching that even the above example provided by the final Office action would actually occur in the order asserted by the final Office action.

App. Br. 9; *see also* Reply Br. 3.

We are unpersuaded by Appellants' arguments for several reasons. First, Yilmaz depicts a 0, 0, 0, test value configuration in the first row of Table 4. Yilmaz, 4. The next two rows depict a 0, 0, 1, and 0, 0, 2 configuration respectively. *Id.* We agree with the Examiner that these three rows show test values of child nodes that are greater than or equal to the test values of the previous rows. This suffices to teach the claimed "escalation hierarchy" because the claim only requires the escalation hierarchy to have each node of a "plurality of nodes" follow the recited ordering. The Examiner's finding of three rows that follow the recited ordering, therefore, teaches the claimed "plurality of nodes" even if, *arguendo*, other rows of Table 4 do not follow the recited ordering.

Second, the claims only require each child node to *include* test level values greater than or equal to test level values included in a parent node. So long as some test values in the child node are greater than or equal to corresponding values in the parent node, the claim is satisfied. Thus, even Appellants' example of the 0, 1, 2, configuration followed by 0, 2, 1, configuration includes the first and second values of the child node being greater than or equal to the first and second values of the parent node.

Finally, we agree with the Examiner that if the row depicting the 0, 0, 0, configuration is taken to be the root node, then "every consequent configuration" in Table 4 of Yilmaz consists of values that are greater than or equal to 0, 0, 0, and thus each of these configurations can be taken to be the children of the root node.

Accordingly, we sustain the Examiner's rejection of claim 1 under 35 U.S.C. § 103. Appellants argue the remaining claims 2–20 on the same basis as claim 1 (App. Br. 9), and therefore we sustain the Examiner's rejection of these claims as well.

DECISION

The Examiner's rejection of claims 1–20 under 35 U.S.C. § 101 is reversed.

The Examiner's rejection of claims 1–20 under 35 U.S.C. § 103 is affirmed.

Because we have affirmed at least one ground of rejection with respect to each claim on appeal, the Examiner's decision is affirmed. *See* 37 C.F.R. § 41.50(a)(1).

No time period for taking any subsequent action in connection with this appeal may be extended. *See* 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED