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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte QUANG HA, MARTIN AUST, and
FRANK PUSCHMANN

Appeal 2019-000433
Application 14/671,547
Technology Center 2800

BEFORE KAREN M. HASTINGS, RAE LYNN P. GUEST, and
DEBRA L. DENNETT, *Administrative Patent Judges*.

HASTINGS, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Pursuant to 35 U.S.C. § 134(a), Appellant¹ appeals from the Examiner's decision to reject claims 1–13 under 35 U.S.C. § 101 as being directed to judicially excepted subject matter. We have jurisdiction under 35 U.S.C. § 6(b).

We REVERSE.

¹ We use the word Appellant to refer to “applicant” as defined in 37 C.F.R. § 1.42(a). Appellant identifies the real party in interest as dSPACE GmbH. Appeal Br. 2.

CLAIMED SUBJECT MATTER

Claim 1, reproduced below, is illustrative of the claimed subject matter:

1. A computer-implemented method for real-time testing of a control unit with a simulator, the simulator having a simulator I/O interface and the control unit having a control unit I/O interface,

the control unit and the simulator being connected to one another through their I/O interfaces via at least one data channel, the method comprising:

transmitting, via the control unit, converter control data to the simulator through the data channel;

calculating by the simulator a load current and a load voltage as electrical load state variables via the converter control data and via an electrical load model that excludes current discontinuities caused by the converter;

transmitting by the simulator at least a portion of the load state variables to the control unit;

implementing a control observer on the simulator;

calculating via the control observer at least the load current as a load state variable, based on the converter control data and an observer load model;

detecting, via the control observer, a zero-crossing of the load current and a current discontinuity caused thereby from the calculated load current; and

upon detection of a current discontinuity, calculating via the control observer an electrical compensating quantity such that when the compensating quantity is additionally applied to the electrical load in the load model, the calculation of the load current using the load model takes place with reduced error in the presence of current discontinuities.

OPINION

Preliminary comment

The 2019 Revised Patent Subject Matter Eligibility Guidance, 84 Fed. Reg. 50 (Jan. 7, 2019), hereinafter “2019 Revised 101 Guidance,” supersedes the earlier guidance that was in effect at the time the Appeal Brief was filed June 1, 2018; Reply Br. filed October 24, 2018. *Id.* at 51 (“Eligibility-related guidance issued prior to the Ninth Edition, R-08.2017, of the MPEP (published Jan. 2018) should not be relied upon.”) Accordingly, we will not analyze the sufficiency of the Examiner’s rejection against the Office’s previous guidance. Rather, our analysis will comport with the 2019 Revised 101 Guidance.

Introduction

35 U.S.C. § 101 provides that “[w]hoever 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.”

In that regard, illustrative claim 1 (above) covers a “process” and is thus statutory subject matter for which a patent may be obtained.² This is not in dispute (e.g., Ans. 11).

However, the § 101 provision “contains an important implicit exception: Laws of nature, natural phenomena, and abstract ideas are not patentable.” *Alice Corp. v. CLS Bank Int’l*, 573 U.S. 208, 216 (2014);

² This corresponds to Step 1 of the 2019 Revised 101 Guidance which requires determining whether a “claim is to a statutory category.” *Id.* at 53. *See also* sentence bridging pages 53 and 54 (“consider[] whether the claimed subject matter falls within the four statutory categories of patentable subject matter identified by 35 U.S.C. [§] 101 . . .”).

(quoting *Ass’n for Molecular Pathology v. Myriad Genetics, Inc.*, 569 U.S. 576, 589 (2013)).

In that regard, notwithstanding, independent claim 1 is statutory subject matter (as are the claims depending therefrom), the Examiner has raised a question of patent-eligibility on the ground that they are directed to an abstract idea.

Alice identifies a two-step framework for determining whether claimed subject matter is directed to an abstract idea. *Alice*, 573 U.S. at 217.

Alice step one – the “directed to” inquiry

According to *Alice* step one, “[w]e must first determine whether the claims at issue are *directed to* a patent-ineligible concept” (*Id.* at 218 (emphasis added)).

The Examiner determined, *inter alia*, that the claims are “directed to an abstract idea,” reproducing the claim and highlighting portions of the method steps. Final Act. 3. *See also id.* at 4:

The highlighted portion of the claim constitute an abstract idea because it is analogous to other ideas identified as abstract in court decisions. . . . This abstract idea is transmitting data to [a] simulator, performing calculations using the data and making some observations (analogous to collecting data in *Electric Power Group* and *CyberSource* and analyzing [it] in *Electric Power Goup*) and detecting high error (*Grams*), at least in principal.

With respect to claim 1, Appellant contends, *inter alia*, that the invention

is a process for detecting and correcting current discontinuities in an integrated circuit by transmitting duty cycles over

hardware to a simulator. The claimed process involves at least three integrated circuits or processors as well as connections between them. The functions of the recited structure and the recited descriptions of the interaction between various structural pieces of the system are not abstract.

Appeal Br. 9.

See also id. at 11 (“The claim recites a method for more accurately modeling and correcting current discontinuities in an integrated circuit. To perform this process, the claims recite various structural devices all working in concert to produce the result.”) and Spec. ¶ 3 (“The present invention relates to a computer-implemented method for real-time testing of a control unit with a simulator.”).

Accordingly, there is a dispute over what the claims are directed to. Are they directed to “performing a simulation” (Ans. 14) or a “process for detecting and correcting current discontinuities in an integrated circuit by transmitting duty cycles over hardware to a simulator” (Appeal Br. 9)?

*Claim Construction*³

We consider claim 1 as a whole⁴ giving it the broadest reasonable construction⁵ as one of ordinary skill in the art would have interpreted it in light of the Specification⁶ at the time of filing.

Claim 1 describes a method “for real-time testing of a control unit with a simulator”. This testing is accomplished via the seven listed “computer-implemented steps” including “implementing a control observer on the simulator” that detect[s] . . . a zero-crossing of the load current and a

³ “[T]he important inquiry for a § 101 analysis is to look to the claim.” *Accenture Global Servs., GmbH v. Guidewire Software, Inc.*, 728 F.3d 1336, 1345 (Fed. Cir. 2013). “In *Bancorp Servs., L.L.C. v. Sun Life Assurance Co. of Can.*, 687 F.3d 1266, 1273 (Fed. Cir. 2012), the court observed that ‘claim construction is not an inviolable prerequisite to a validity determination under § 101.’ However, the threshold of § 101 must be crossed; an event often dependent on the scope and meaning of the claims.” *Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1347–48 (Fed. Cir. 2015).

⁴ “In determining the eligibility of respondents’ claimed process for patent protection under § 101, their claims must be considered as a whole.” *Diamond v. Diehr*, 450 U.S. 175, 188 (1981).

⁵ 2019 Revised 101 Guidance, page 52, footnote 14 (“If a claim, under its *broadest reasonable interpretation*”) (Emphasis added.)

⁶ “First, it is always important to look at the actual language of the claims. . . . Second, in considering the roles played by individual limitations, it is important to read the claims ‘in light of the specification.’” *Smart Sys. Innovations, LLC v. Chicago Transit Authority*, 873 F.3d 1364, 1378 (Fed. Cir. 2017) (R. Linn, dissenting in part and concurring in part), citing *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335 (Fed. Cir. 2016), among others.

current discontinuity” and “upon detection of a current discontinuity, calculating via the control observer an electrical compensating quantity [that is] additionally applied to the electrical load in the load model [so that] the calculation of the load current . . . takes place with reduced error” (*see* claim 1).

Specifically, according to claim 1, “a control observer” analyzes and calculates the load current of the control circuit as a load state variable, and detects “a zero-crossing of the load current and a current discontinuity caused thereby from the calculated load current” and when such a discontinuity is detected, the control observer calculates a control “compensating quantity such that when the compensating quantity is additionally applied to the electrical load in the load model, the calculation of the load current . . . takes place with reduced error in the presence of current discontinuities.”

According to the Specification, current methods have various disadvantages including not taking into account current discontinuities caused by the converter control data, and the claimed method obviates these disadvantages by using a control observer as recited in claim 1 (e.g., Spec. ¶¶ 13–18).

Consistent with the intrinsic evidence, we reasonably broadly construe claim 1 as being directed to a computer-implemented method “for real-time testing of a control unit with a simulator” as claimed; that is, a method for more accurately modeling and correcting current discontinuities in an integrated circuit. To perform this process, the claims recite various structural devices all working in concert to produce the result. When

accurately viewed (i.e., in Appellant’s view), the claims do not fall in any of the enumerated classes of abstract ideas under current guidance.

*The Abstract Idea*⁷

Normally, we would identify in italics in the illustrative claim the limitations that recite an abstract idea.⁸ However, based on our claim construction analysis (above), it is unnecessary to do so. The subject matter to which claim 1 is directed to, i.e., “a computer-implemented method for real-time testing of a control unit with a simulator” as claimed, is not a matter that falls within the enumerated groupings of abstract ideas; that is “Mathematical concepts,” “Certain methods of organizing human activity,” and “Mental processes.”⁹

⁷ See Step 2A of the 2019 Revised 101 Guidance. Step 2A determines “whether a claim is ‘directed to’ a judicial exception,” such as an abstract idea. 84 Fed. Reg. at 53. Step 2A is a two prong inquiry.

⁸ See Prong One (a) of Step 2A of the 2019 Revised 101 Guidance. “To determine whether a claim recites an abstract idea in Prong One, examiners are now to: (a) Identify the specific limitation(s) in the claim under examination (individually or in combination) that the examiner believes recites an abstract idea” *Id.* at 54.

⁹ See Prong One [“Evaluate Whether the Claim Recites a Judicial Exception”] (b) of Step 2A of the 2019 Revised 101 Guidance. “To determine whether a claim recites an abstract idea in Prong One, examiners are now to . . . (b) determine whether the identified limitation(s) falls within the subject matter groupings of abstract ideas enumerated in Section 1 of the [2019 Revised 101 Guidance].” *Id.* at 54.

*Improvement in the Functioning of a Computer*¹⁰ (*Appellant's Argument*)

Even assuming that the claim recites an abstract idea, we find that it is integrated into a practical application under Step 2A, Prong 2 of the Guidance.

The Examiner's characterization of what the claim is directed to is inaccurate. The Examiner indicated that the claim is directed to "performing a simulation." Ans. 14. The claimed method, however, calls for "real-time testing of a control unit" that has specific steps which use a control unit, a simulator, a converter, a data channel, and a control observer. The method as claimed includes steps for detecting and correcting current discontinuities in an integrated circuit; the Examiner's analysis "ignores the improved consideration of current discontinuities by the claimed system with reduced error and the novel application of an electrical compensation quantity to correct the current discontinuities." Reply Br. 5, citing to Spec. ¶¶ 15, 16.

The characterization the Appellant has put forward, e.g., claim 1 "recites significant improvements to the field of testing control units" by

¹⁰ See Prong Two ("**If the Claim Recites a Judicial Exception, Evaluate Whether the Judicial Exception Is Integrated Into a Practical Application**") of Step 2A of the 2019 Revised 101 Guidance. "A claim that integrates a judicial exception into a practical application will 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 judicial exception." 2019 Revised 101 Guidance, 84 Fed. Reg. at 54. One consideration, implicated here, that is "indicative that an additional element (or combination of elements) may have integrated the exception into a practical application" (*id.* at 55) is if "[a]n additional element reflects an improvement in the functioning of a computer, or an improvement to other technology or technical field" (*id.*).

“the combination of ordered steps recited in claim 1 [which] explains how the recited hardware performs the unique process and reaches the improved result with reduced error” with “detailed transactions between test hardware and the development environment limit[ing] the I/O and the control observer” (Reply Br. 5), is the more accurate characterization.

“The ‘abstract idea’ step of the inquiry calls upon us to look at the ‘focus of the claimed advance over the prior art’ to determine if the claim’s ‘character as a whole’ is directed to excluded subject matter.” *Affinity Labs of Tex., LLC v. DIRECTTV, LLC*, 838 F.3d 1253, 1257 (Fed. Cir. 2016) (quoting *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016)); *see also Enfish*, 822 F.3d at 1335. As the Federal Circuit stated in *Ancora Technologies, Inc. v. HTC America, Inc.*, 908 F.3d 1343, 1347 (Fed. Cir. 2018):

We examine the patent’s “‘claimed advance’ to determine whether the claims are directed to an abstract idea.” *Finjan, Inc. v. Blue Coat System, Inc.*, 879 F.3d 1299, 1303 (Fed. Cir. 2018). “In cases involving software innovations, this inquiry often turns on whether the claims focus on ‘the specific asserted improvement in computer capabilities . . . or, instead, on a process that qualifies as an “abstract idea” for which computers are invoked merely as a tool.’” *Id.* (quoting *Enfish*, 822 F.3d at 1335–36); *see BSG Tech LLC v. Buyseasons, Inc.*, 899 F.3d 1281, 1285–86 (Fed. Cir. 2018). Computers are improved not only through changes in hardware; “[s]oftware can make non-abstract improvements to computer technology” *Enfish*, 822 F.3d at 1335; *see Finjan*, 879 F.3d at 1304. We have several times held claims to pass muster under *Alice* step one when sufficiently focused on such improvements.

The Specification’s description of the problem and solution shows the advance over the prior art by the claimed invention is in crafting an element

of a computer device such that it functions to compensate for electrical load current discontinuities of a control unit.

In our view, the claim as a whole reflects a specific asserted improvement in technology, rooted in computer technology, over that which was available in the prior art. *See Spec.*, paras. 12–17. Accordingly, we find the Appellant’s arguments that the claimed subject matter is not directed to merely performing a simulation but to a technical improvement persuasive, given the present record.

Specific asserted improvements, when claimed, can render claimed subject matter not directed to an abstract idea. *Cf. McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1316 (Fed. Cir. 2016) (“When looked at as a whole, claim 1 is directed to a patentable, technological improvement over the existing, manual 3–D animation techniques.”)

It should be noted that we have addressed purported specific asserted improvements in technology under step one of the *Alice* framework. This is consistent with the case law. *See Ancora*, 908 F.3d at 1347 (“We have several times held claims to pass muster under *Alice* step one when sufficiently focused on such improvements.”). It can be discussed under step two of the *Alice* framework as well. *See buySAFE, Inc. v. Google, Inc.*, 765 F.3d 1350, 1354–55 (Fed. Cir. 2014). “[R]ecent Federal Circuit jurisprudence has indicated that eligible subject matter can often be identified either at the first or the second step of the *Alice/Mayo* [framework].” 2019 Revised 101 Guidance, 84 Fed. Reg. at 53; *see also id.* n.17.

In any case, there is sufficient evidence in the record before us that the claimed subject matter reflects a specific asserted improvement in

technology over that which was practiced in the art and for that reason we determine that independent claim 1, and the claims depending therefrom, are not directed to an abstract idea. Accordingly, within the meaning of the 2019 Revised 101 Guidance, we find there is an integration into a practical application.

For the foregoing reasons, the Examiner's determination under *Alice* step one is not sustainable. Consequently, we do not reach the merits of Examiner's determination under *Alice* step two.

The rejection is not sustained.

CONCLUSION

The decision of the Examiner to reject claims 1–13 is reversed.

More specifically:

The rejection of claims 1–13 under 35 U.S.C. § 101 as being directed to judicially excepted subject matter is reversed.

In summary:

| Claims Rejected | 35 U.S.C. § | Reference(s)/Basis | Affirmed | Reversed |
|------------------------|--------------------|---------------------------|-----------------|-----------------|
| 1–13 | 101 | | | 1–13 |

REVERSED