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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte AVI STEINER and HANAN WEINGARTEN

Appeal 2018-006397
Application 14/736,772
Technology Center 2100

Before JOSEPH L. DIXON, JAMES W. DEJMEK, and
STEPHEN E. BELISLE, *Administrative Patent Judges*.

DEJMEK, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant¹ appeals under 35 U.S.C. § 134(a) from a Final Rejection of claims 1–20. We have jurisdiction over the pending claims under 35 U.S.C. § 6(b).

We affirm-in-part.

¹ Throughout this Decision, we use the word “Appellant” to refer to “applicant” as defined in 37 C.F.R. § 1.42 (2017). Appellant identifies Avago Technologies General IP (Singapore) Pte. Ltd. as the real party in interest. App. Br. 2.

STATEMENT OF THE CASE

Introduction

Appellant's disclosed and claimed invention generally relates to multi-dimensional decoding. Spec. ¶ 3.

Claim 1 is exemplary of the subject matter on appeal and is reproduced below with the disputed limitations emphasized in *italics*:

1. A method for multi-dimensional decoding, the method comprising:

receiving, at a decoder circuit, a multi-dimensional encoded codeword that comprises a payload and a redundancy section; wherein the payload comprises data and an error detection process signature;

applying, with the decoder circuit, during a multi-dimensional decoding process of the multi-dimensional encoded codeword, a hypothesis to a content of the payload;

applying to the hypothesis, with the decoder circuit, an error detection process to provide an indication about a validity of the hypothesis; and

enabling the decoder circuit to proceed with the multi-dimensional decoding process and find a second hypothesis to be error detection process validated when the hypothesis is invalid based on the application of the hypothesis to the error detection process.

The Examiner's Rejections²

1. Claims 1–20 stand rejected under 35 U.S.C. § 101 as being directed to patent-ineligible subject matter. Final Act. 2–4.

² The Examiner had also rejected claims 1–20 under 35 U.S.C. § 112(b) as being indefinite. Final Act. 4–5. The Examiner has withdrawn this rejection. Ans. 2.

2. Claims 1, 19, and 20 stand rejected under 35 U.S.C. § 103 as being unpatentable over Steiner et al. (US 9,397,706 B1; July 19, 2016 (filed Oct. 9, 2013)) (“Steiner ’706”) and Steiner et al. (US 2012/0005560 A1; Jan. 5, 2012) (“Steiner ’560”). Final Act. 7–8.

ANALYSIS³

Rejection under 35 U.S.C. § 101

Appellant disputes the Examiner’s conclusion that the pending claims are directed to patent-ineligible subject matter. App. Br. 6–13; Reply Br. 2–5. In particular, Appellant asserts that *RecogniCorp, LLC v. Nintendo Co., Ltd.*, 855 F.3d 1322 (Fed. Cir. 2017), as relied on by the Examiner, does not conclude that *all applications* related to encoding and decoding of data are patent ineligible, but that the court did not find the claims at issue *in that case* to be patent eligible.⁴ Reply Br. 2–4. Additionally, Appellant argues

³ Throughout this Decision, we have considered the Appeal Brief, filed November 21, 2017 (“App. Br.”); the Reply Brief, filed June 5, 2018 (“Reply Br.”); the Examiner’s Answer, mailed April 5, 2018 (“Ans.”); and the Final Office Action, mailed June 21, 2017 (“Final Act.”), from which this Appeal is taken.

⁴ To the extent that Appellant believes the Examiner set forth an undesignated new ground of rejection in the Answer (*see* Reply Br. 2), that is a petitionable matter not properly before the Board. *See* 37 C.F.R. § 41.40(a) (“Any request to seek review of the primary examiner's failure to designate a rejection as a new ground of rejection in an examiner’s answer must be by way of a petition to the Director.”); *see also* Manual of Patent Examining Procedure (“MPEP”) § 706.01 (9th ed. Rev. 08.2017, Jan. 2018) (“[T]he Board will not hear or decide issues pertaining to objections and formal matters which are not properly before the Board.”); *see also* MPEP § 1201 (“The Board will not ordinarily hear a question that should be decided by the Director on petition . . .”).

that applying a hypothesis to a payload, as recited in the pending claims, is not similar to the collection and analysis of information the Federal Circuit concluded to be patent ineligible in *Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350 (Fed. Cir. 2016). Reply Br. 4. Moreover, Appellant argues the claims recite an improvement in computer-related technology, i.e., the way in which data is retrieved/decoded from computer memory. App. Br. 9–13 (citing Spec. ¶¶ 112, 131; *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327 (Fed. Cir. 2016); and *BASCOM Global Internet Services, Inc. v. AT&T Mobility LLC*, 827 F.3d 1341 (Fed. Cir. 2016)).

The Supreme Court’s two-step framework guides our analysis of patent eligibility under 35 U.S.C. § 101. *Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 573 U.S. 208, 217 (2014). In addition, the Office recently published revised guidance for evaluating subject matter eligibility under 35 U.S.C. § 101, specifically with respect to applying the *Alice* framework. USPTO, *2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. 50 (Jan. 7, 2019) (“Office Guidance”). If a claim falls within one of the statutory categories of patent eligibility (i.e., a process, machine, manufacture, or composition of matter) then the first inquiry is whether the claim is directed to one of the judicially recognized exceptions (i.e., a law of nature, a natural phenomenon, or an abstract idea). *Alice*, 573 U.S. at 217. As part of this inquiry, we must “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. DIRECTV, LLC*, 838 F.3d 1253, 1257 (Fed. Cir. 2016). Per Office Guidance, this first inquiry has two prongs of analysis (i) does the claim recite a judicial exception (e.g., an abstract idea); and (ii) if so, is the judicial

exception integrated into a practical application. 84 Fed. Reg. at 54. Under the Office Guidance, if the judicial exception is integrated into a practical application, *see infra*, the claim is patent eligible under § 101. 84 Fed. Reg. at 54–55. If the claims are not directed to an abstract idea, the inquiry ends. *See McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1312 (Fed. Cir. 2016). However, if the claim *is* directed to a judicial exception (i.e., recites a judicial exception and does not integrate the exception into a practical application), the next step is to determine whether any element, or combination of elements, amounts to significantly more than the judicial exception. *See Alice*, 573 U.S. at 217; *see also* 84 Fed. Reg. at 56.

Although the independent claims each broadly fall within the statutory categories of patentability, the Examiner concludes the claims are directed to abstract ideas similar to encoding and decoding and collecting and analyzing information. Ans. 3. In particular, the Examiner determines the claimed “decoding process and find a second hypothesis to be error detection process validated when the hypothesis is invalid based on the application of the hypothesis to the error detection process” is similar to the decoding process at issue in *RecogniCorp* and that “receiving a multi-dimensional encoded codeword that comprises a payload [(sic: payload)] and a redundancy section, wherein the payload comprises data and an error detection process signature” and “applying a hypothesis to a content of the payload, and applying to the hypothesis an error detection process to provide an indication about a validity of the hypothesis” are merely collecting and analyzing information, as in *Electric Power*. Ans. 3–4. Moreover, the Examiner finds “the claims are not directed to an improvement in computer-related technology, they are not directed to a specific improvement to the way

computers operate and they are not directed to improve an existing technology process.” Ans. 4. In addition, the Examiner finds the claims do not recite significantly more than the abstract ideas. Final Act. 2–3.

As an initial matter, we do not understand the court’s conclusion in *RecogniCorp* to hold that *all* claims directed to *any type* of encoding and decoding are abstract ideas, such as a mathematical concept. Rather, the court concluded the pending claims “reflect[] *standard* encoding and decoding.” *RecogniCorp*, 855 F.3d at 1326 (emphasis added). Further, the court explained, “RecogniCorp has not alleged a particularized application of encoding and decoding.” *RecogniCorp*, 855 F.3d at 1328.

In addition, we do not understand the court’s conclusion in *Electric Power* to hold that *any* collection and analysis of information is an abstract idea and therefore, patent ineligible. Instead, the court noted the “focus” of the pending claims was “on collecting information, analyzing it, and displaying certain results of the collection and analysis.” *Electric Power*, 830 F.3d at 1353. Further, the court noted the advance the claims purport to make is merely a process of gathering and analyzing information rather than any inventive technology for performing the functions of collection and analysis. *Electric Power*, 830 F.3d at 1354.

Here, although the claims generally relate to a decoding method, we conclude, more specifically, the claims are directed to testing a hypothesis (and possibly testing a second hypothesis) on the payload content of a multi-dimensional encoded codeword during a multi-dimensional decoding process. The testing of the hypothesis comprises the application of an error detection process to provide an indication of the validity of the hypothesis. As described in the Specification, the use of multi-dimensional codes is

widespread, however, “[i]n multi-dimensional codes which are obtained from small component codes, the decoding status of each component code has a limited reliability.” Spec. ¶¶ 50–51. To increase the decoding success status reliability, an error detection signature is added to the data. Spec. ¶ 51. According to the Specification, use of an error detection signature (e.g., a Cyclic Redundancy Check (CRC) signature) for the data may provide for a successful decoding process despite errors in a redundancy portion of the encoded codeword. Spec. ¶¶ 54, 99, and 114.

Thus, Appellant’s disclosed (and claimed) decoders do not reflect *standard* decoding. *Cf. RecogniCorp*, 855 F.3d at 1326. Accordingly, we conclude Appellant’s claims are not directed to an abstract idea of merely any type of decoding, but rather the patent-eligible concept of multi-dimensional decoding by applying an error detection process to a hypothesis of payload content.

Further, as the court discussed in *Enfish*, claims that improve an existing technology might not succumb to the abstract idea exception of patent eligibility. *Enfish*, 822 F.3d at 1335. In *Enfish*, the court framed the first step of the *Alice* inquiry as whether the focus of the claims is on a specific asserted improvement in computer capabilities or, instead on an abstract idea that merely uses a computer as a tool for carrying out the abstract idea. *Enfish*, 822 F.3d at 1335–36. As discussed above, the claimed testing a hypothesis (and possibly testing a second hypothesis) on the payload content of a multi-dimensional encoded codeword during a multi-dimensional decoding process improves the way data is retrieved/decoded from computer memory. *See* Spec. ¶¶ 112, 131.

Moreover, analysis under the Office Guidance does not alter our conclusion. The Examiner finds the claims are directed to an abstract idea. *See* Final Act. 2–3; Ans. 3. In particular, the Examiner finds the claims are directed to encoding and decoding, which are mathematical concepts (i.e., a mathematical relationship between the encoded data and decoded data); and, therefore an abstract idea. Ans. 3; *see also* 84 Fed. Reg. at 52; *RecogniCorp*, 855 F.3d at 1326–27 (concluding the pending claims were “directed to the abstract idea of encoding and decoding”).⁵

Claim 1 is reproduced below and includes the following claim limitation(s) that recite encoding and decoding, emphasized in *italics*:

1. A method for multi-dimensional decoding, the method comprising:

receiving, at a decoder circuit, a multi-dimensional encoded codeword that comprises a payload and a redundancy section; wherein the payload comprises data and an error detection process signature;

applying, with the decoder circuit, during a multi-dimensional decoding process of the multi-dimensional encoded codeword, a hypothesis to a content of the payload;

applying to the hypothesis, with the decoder circuit, an error detection process to provide an indication about a validity of the hypothesis; and

enabling the decoder circuit to proceed with the multi-dimensional decoding process and find a second hypothesis to be error detection process validated when the hypothesis is invalid based on the application of the hypothesis to the error detection process.

⁵ Although the Examiner also concludes the claims are directed to collecting and analyzing information, which is a mental process and therefore, an abstract idea (*see* Ans. 3), we confine our discussion here to the Examiner’s conclusion that the claim is directed to encoding and decoding.

More particularly, the decoding process comprises decoding the content payload of an encoded codeword (i.e., the claimed step of applying a hypothesis to a content of the payload).

Although the Examiner finds the claims recite an abstract idea, “an invention is not rendered ineligible for patent simply because it involves an abstract concept.” *Alice*, 573 U.S. at 217. Accordingly, we next determine whether the claim integrates the judicial exception into a practical application. *See* 84 Fed. Reg. at 54. To determine whether the judicial exception is integrated into a practical application, we identify whether there are “*any additional elements recited in the claim beyond the judicial exception(s)*” and evaluate those elements to determine whether they integrate the judicial exception into a recognized practical application. 84 Fed. Reg. at 54–55 (emphasis added); *see also* MPEP § 2106.05(a)–(c), (e)–(h).

Here, we find the additional limitations integrate the concept of standard encoding into a practical application. In particular, we find the claim does not merely decode the content payload of an encoded codeword, but rather, tests the validity the hypothesis by applying it to an error detection process. If the results of the test indicates the hypothesis is not valid, a second hypothesis is used in the decoding process. As discussed above, and as described in the Specification, the use of multiple error detection signatures (e.g., CRCs) may be used to reduce the false correction probability; enable partial decoding of a codeword; and support short read requests. *See* Spec. ¶ 112; *see also* MPEP § 2106.05(a) (“An indication that the claimed invention provides an improvement can include a discussion in the specification that identifies a technical problem and explains the details

of an unconventional technical solution expressed in the claim, or identifies technical improvements realized by the claim over the prior art.”).

For the reasons discussed *supra*, we conclude that independent claim 1 is patent eligible under 35 U.S.C. § 101. For similar reasons, dependent claim 2–18 are also patent eligible under 35 U.S.C. § 101. Additionally, for similar reasons, we also conclude that independent claims 19 and 20, which recite commensurate limitations, are also directed to patent eligible subject matter. 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

In rejecting independent claims 1, 19, and 20, the Examiner relies on the combined teachings of Steiner ’706 and Steiner ’560. Final Act. 7–8. In particular, the Examiner finds Steiner ’706 teaches a multi-dimensional decoding of multi-dimensional encoded codeword comprising a payload and redundancy section, wherein the payload comprises data and an error detection process signature. Final Act. 7 (citing Steiner ’706, col. 1, ll. 33–45, Abstract). In addition, the Examiner finds Steiner ’706 teaches applying a hypothesis to a content of the payload during the multi-dimensional decoding process. Final Act. 7 (citing Steiner ’706, col. 5, ll. 50–51). Appellant does not challenge these findings.

Further, the Examiner finds Steiner ’560 teaches applying an error detection process on the hypothesis to provide an indication about the validity of the hypothesis and proceeding (enabling to proceed) with the multi-dimensional decoding process with a second hypothesis to which the error detection process may be applied to validate the second hypothesis if

the initial hypothesis is invalid (as determined by the error detection process). Final Act. 7–8 (citing Steiner '560 ¶ 44, Abstract); Ans. 6.

Appellant disputes the Examiner's finding that Steiner '560 teaches (either inherently or explicitly) applying an error detection process to provide an indication about a validity of a hypothesis. App. Br. 16–18; Reply Br. 6. Similarly, Appellant disputes the Examiner's finding that Steiner '560 teaches “enabling the decoder circuit to proceed with the multidimensional decoding process and find a second hypothesis to be error detection process validated when the hypothesis is invalid based on the application of the hypothesis to the error detection process.”⁶ App. Br. 18.

As relied on by the Examiner, Steiner '560 teaches “decoding a set of bits using a plurality of hypotheses” Additionally, Steiner '560 discloses:

A current hypothesis may be decoded for correcting the set of bits, wherein the current hypothesis defines different bit states and associated reliability metrics for the set of bits. If decoding

⁶ We note that the last limitation of claim 1 is a conditional limitation. Conditional steps employed in a method claim need not be found in the prior art if, under the broadest reasonable construction, the method need not invoke the steps. *Ex parte Schulhauser*, No. 2013-007847, 2016 WL 6277792, at *3–6 (PTAB April 28, 2016) (concluding the broadest reasonable interpretation of a claim encompassed situations in which conditional method steps “need not be reached”) (precedential). Because the broadest reasonable interpretation of the claim does not require performing the conditional method steps at issue, the Examiner does not need to present evidence of obviousness for these steps. *See Schulhauser*, 2016 WL 6277792, at *4 (“The Examiner did not need to present evidence of the obviousness of the remaining method steps of claim 1 that are not required to be performed under a broadest reasonable interpretation of the claim.”). Because independent claims 19 and 20, however, are not method claims, *Schulhauser* is inapposite, and the prior art must teach or suggest all of the recited limitations.

the current hypothesis is not successful, a subsequently ordered hypothesis may be decoded, wherein the hypotheses are ordered such that their associated reliability metric is a monotonically non-decreasing sequence. Decoding may proceed iteratively until the current hypothesis is successful.

Steiner '560 ¶ 6. Further, Steiner '560 discloses use of a CRC “to validate the integrity of data.” Steiner '560 ¶ 44. “To verify the decoded input data, the associated decoded CRC data may be compared to the original signature of the input bits.” Steiner '560 ¶ 44.

The test for obviousness is what the combined teachings of the references would have suggested to one of ordinary skill in the art. *See In re Young*, 927 F.2d 588, 591 (Fed. Cir. 1991); *see also In re Keller*, 642 F.2d 413, 425 (CCPA 1981).

Contrary to Appellant’s assertions, Steiner '560 teaches or reasonably suggests applying an error detection process (i.e., a CRC, similar to the method disclosed in the instant Specification, *see Spec.* ¶ 46) to a hypothesis to a content of the payload during the multi-dimensional decoding process, as taught by Steiner '706. Moreover, Steiner '560 in combination with Steiner '706, teaches if a current hypothesis is not successful (i.e., invalid), applying an error detection process to a subsequently ordered hypothesis (i.e., a second hypothesis) to a content of the payload during the multi-dimensional decoding process.

Appellant also argues the Examiner fails to provide a rational underpinning to support the conclusion of obviousness.⁷ App. Br. 18–19; *see also* Reply Br. 6–7.

⁷ To the extent that Appellant believes the Examiner’s rationale to combine the references, as set forth in the Answer amounts to an undesignated new

The Examiner explains that an ordinarily skilled artisan would have been motivated to combine the teachings from Steiner '706 and Steiner '560 to improve decode efficiency by generating, evaluating, and storing hypotheses for all possible combinations of potential error corrections. Ans. 12 (citing Steiner '560 ¶ 43).

The U.S. Supreme Court has held the relevant inquiry in an obviousness analysis is whether the Examiner has set forth “some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (cited with approval in *KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398, 418 (2007)).

Appellant does not persuasively rebut this rationale and, thus, we find the Examiner has set forth the requisite reasoning with rational underpinning to support the conclusion of obviousness.

For the reasons discussed *supra*, we are unpersuaded of Examiner error. Accordingly, we sustain the Examiner’s rejection of claims 1, 19, and 20 under 35 U.S.C. § 103.

DECISION

| Claims Rejected | Basis | Affirmed | Reversed |
|-----------------|-----------------|---------------|----------|
| 1–20 | 35 U.S.C. § 101 | | 1–20 |
| 1, 19, and 20 | 35 U.S.C. § 103 | 1, 19, and 20 | |

ground of rejection (*see* Reply Br. 6–7), that is a petitionable matter not properly before the Board. *See* 37 C.F.R. § 41.40(a).

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| Claims Rejected | Basis | Affirmed | Reversed |
|------------------------|--------------|-----------------|-----------------|
| Overall Outcome | | 1, 19, and 20 | 2–18 |

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. § 41.50(f).

AFFIRMED-IN-PART