UNITED STATES PATENT AND TRADEMARK OFFICE

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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Ex parte FREDERIK NAGEL, SASCHA DISCH,
GUILLAUME FUCHS, JUERGEN HERRE, and
CHRISTIAN GRIEBEL

(Applicant: Fraunhofer-Gesellschaft zur Foerderung der
angewandten Forschung e.V.)

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Appeal 2017-011729
Application 14/709,804[1]
Technology Center 2600

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Before CARL W. WHITEHEAD JR., NABEEL U. KHAN, and
PHILLIP A. BENNETT, *Administrative Patent Judges.*

BENNETT, *Administrative Patent Judge.*

DECISION ON APPEAL

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STATEMENT OF THE CASE

Appellant appeals under 35 U.S.C. § 134(a) from the Examiner's final rejection of claims 2–18, which constitute all of the pending claims in this application. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

RELATED APPEAL

Appellant identifies Appeal No. 2017-003074 (Application No. 14/250,139), decided Dec. 26, 2017, as a related appeal. Supp. App. Br. 1 (filed Mar. 8, 2018).

CLAIMED SUBJECT MATTER

The claims are directed to an audio encoder and bandwidth extension decoder. Spec., Title. Claim 2, reproduced below, is illustrative of the claimed subject matter:

> 2. Audio encoder for providing an output signal using an input audio signal, comprising:
> a patch generator configured to generate a bandwidth extension high-frequency signal, wherein the bandwidth extension high-frequency signal comprises a high-frequency band, wherein the high-frequency band of the bandwidth extension high-frequency signal is derived from a low frequency band of the input audio signal by shifting the low-frequency part by a fixed value using a side band modulation;
> a comparator configured to perform a comparison of the input audio signal filtered by a bandpass filter and the bandwidth extension high-frequency signal using a cross correlation calculation in regular time intervals between amplitude spectra of windowed signal sections of the input audio signal filtered by the bandpass filter and the bandwidth extension high- frequency

signal to determine a lag for a maximum correlation for a signal section; and

an output interface configured to provide the output signal for transmission or storage, wherein the output signal comprises a parameter indication based on the lag for the maximum correlation;

wherein at least one of the patch generator, the comparator, and the output interface comprises a hardware implementation.

App. Br. 13 (Claims Appendix).

REJECTIONS

Claims 2–18 stand rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1–16 of U.S. Patent No. 9,058,802 and claims 1–8 of U.S. Patent No. 8,401,862.[2]

Claims 2–18 stand rejected under 35 U.S.C. § 101 as being directed to patent-ineligible subject matter.

ANALYSIS

We have reviewed the Examiner's rejection in light of Appellant's arguments. We agree with Appellant's conclusions as to the rejection of claims 2–18 under 35 U.S.C. § 101.

In issues involving subject matter eligibility, our inquiry focuses on whether the claims satisfy the two-step test set forth by the Supreme Court in *Alice Corp. v. CLS Bank Int'l.*, 134 S. Ct. 2347 (2014). The Supreme Court

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[2] On May 24, 2017, together with its Appeal Brief, Appellant filed and the Office granted, a terminal disclaimer to overcome the double patenting rejection. However, the Examiner did not withdraw the rejection in the Answer. We agree with Appellant that the terminal disclaimer is sufficient to overcome the double patenting rejections. *See* App. Br. 11.

instructs us to "first determine whether the claims at issue are directed to a patent-ineligible concept," *Alice*, 134 S. Ct. at 2355, and, in this case, the inquiry centers on whether the claims are directed to an abstract idea. If the initial threshold is met, we then move to the second step, in which we "consider the elements of each claim both individually and 'as an ordered combination' to determine whether the additional elements 'transform the nature of the claim' into a patent-eligible application." *Id.* (*quoting Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 79, 78 (2012)). The Supreme Court describes the second step as a search for "an 'inventive concept'—*i.e.*, an element or combination of elements that is 'sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [ineligible concept] itself.'" *Id.* (quoting *Mayo*, 566 U.S. at 72–73).

In rejecting the claims under Section 101, the Examiner determines the claims are "directed to the mathematical calculation (abstract idea) of regenerating digitized spectral band coefficients, without claiming significantly more." Final Act. 6. The Examiner determines the claims do not find eligibility under *Alice* step 2 because:

> [They] do not include additional elements that are sufficient to amount to significantly more than the judicial exception because the claim elements of "generator", comparator", "patching", and "storage medium" are all examples of generic computing elements performing generic computer functions that are well understood, routine, and conventional activities previously known to the industry.

Final Act. 8.

Appellant argues "[c]laims 2–18 are not directed to simply performing a mathematical calculation of regenerating digitized spectral band

coefficients," but "[i]nstead is directed to specific improvements in devices and methods of processing (e.g., encoding) audio signals." App. Br. 8. Appellant contends the invention is not an abstract idea because "[a]n audio encoder or an audio decoder (bandwidth extension decoder) is a particular machine with a specific purpose, such as encoding an input audio signal or decoding/providing a bandwidth extended audio signal, which requires substantially more than simply performing routine mathematical calculations of 'regenerating digitized spectral band coefficients' on a general purpose computer." Reply Br. 3. Appellant further argues that the "claimed invention corresponds to an innovation in computer technology, namely devices and methods of processing audio signals, which in this case reflects both an improvement in the functioning of the computer and an improvement in another specific technology of using a non-abstract hardware component to make unexpected improvements in the processing audio signals." Reply Br. 4.

We are persuaded by Appellant's arguments. We agree with Appellant the Examiner's characterization of the invention as being merely a "mathematical calculation" is an overgeneralization and is inconsistent with the focus of the claim. As noted above, the Examiner finds the claims are "directed to the mathematical calculation (abstract idea) of regenerating digitized spectral band coefficients." Final Act. 6. However, we agree with Appellant that the invention recited in Appellants' claims is more accurately described as being directed to "audio encoder or an audio decoder (bandwidth extension decoder) . . . [for] as encoding an input audio signal or decoding/providing a bandwidth extended audio signal." App. Br. 8. We also agree with Appellant that the encoding/decoding operations recited in

the claims "require[] substantially more than simply performing routine mathematical calculations." App. Br. 8–9. Appellant explains in the Specification that the focus of the claimed invention seeks to address problems in bandwidth extension methods which either "provide audio signals at a low bitrate, but with poor audio quality or a good audio quality at high bit rate." Spec. ¶ 15. Appellant's invention seeks to avoid these trade-offs with "an improved coding scheme for audio signals" implemented in "an audio encoder" which provides an "output signal suitable for a bandwidth extension at a decoder." Spec. ¶¶ 16, 67. The output signal is generated using (1) a patch generator that generates bandwidth extension high frequency signals (Spec. ¶ 68), (2) a comparator that calculates comparison parameters by comparing the input signal to the generated bandwidth extension high frequency signals (Spec. ¶ 69), and (3) an output interface that outputs a signal which includes a parameter indication based on an offset frequency corresponding to the determined comparison parameter (Spec. ¶ 70). The Specification further describes a technological improvement effected by the claimed invention—that "[b]y calculating a plurality of comparison parameters for different offset frequencies, a bandwidth extension high-frequency signal may be found which fits well to the original input audio signal." Spec. ¶ 71 (reference numbers omitted).

Enfish instructs us that the *Alice* step 1 inquiry asks "whether the focus of the claims is on the specific asserted improvement in computer capabilities (i.e., the self-referential table for a computer database) or, instead, on a process that qualifies as an 'abstract idea' for which computers are invoked merely as a tool." *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335–36 (Fed. Cir. 2016). In *Enfish*, the improvement in computer

capabilities was embodied in a self-referential database table which obviated the need for a programmer to "preconfigure a structure to which a user must adapt data entry." *Id.* at 1337. We are persuaded that the claimed improvement in this case provides a similar benefit in that it obviates the need for computationally expensive operations to achieve improved audio quality. *See, e.g.* Spec. ¶¶ 15, 111, 113. We also agree with Appellant that, as was the case in *DDR Holdings,* "the claimed solution is necessarily rooted in computer technology." *DDR Holdings, LLC v. Hotels.com, L.P.,* 773 F.3d 1245, 1257 (Fed. Cir. 2014). Appellant's invention solves challenges arising from existing "[h]armonic bandwidth extension methods [which] often exhibit[] a high complexity, while methods of complexity-reduced bandwidth extension show quality losses." Spec. ¶ 12. These problems arise solely in the context of audio signal processing, and do not occur in any analogous offline context. Because the claims provide a technological solution to a technological problem, we are persuaded the Examiner has erred in determining the claims are directed to an abstract idea.[3] Accordingly, we do not sustain the rejection of claim 2, nor of independent claims 9, and 15–18 which are rejected based on the same reasoning. For the same reasons, we also do not sustain the rejection of dependent claims 3–8 and 10–14.

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[3] Because we find the Examiner erred with respect to *Alice* step 1, we do not reach the second step of the *Alice* inquiry. Nevertheless, we note in passing that we do not discern sufficient evidentiary support for the Examiner's finding that the recited "generator," "comparator," and "patching" are "generic computing elements performing generic computer functions that are well understood, routine, and conventional activities known to the industry" (Final Act. 7) under *Alice* step 2.

DECISION

We reverse the Examiner's rejection of claims 2–18.

<u>REVERSED</u>