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EXAMINER
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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* YANG GAO and ADIL BENYASSINE

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Appeal 2017-011791  
Application 12/381,036  
Technology Center 2600

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Before ERIC B. CHEN, JEREMY J. CURCURI, and  
AMBER L. HAGY, *Administrative Patent Judges*.

CURCURI, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant appeals under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 78–92. Final Act. 1. We have jurisdiction under 35 U.S.C. § 6(b).

Claims 78–89 and 92 are rejected under 35 U.S.C. § 101 as directed to non-statutory subject matter. Final Act. 2–3.

Claims 78–92 are rejected under pre-AIA 35 U.S.C. § 103(a) as obvious over Swaminathan (US 5,596,676; Jan. 21, 1997) and Foodeei (US 6,240,385 B1; May 29, 2001). Final Act. 3–6.

We reverse.

STATEMENT OF THE CASE

Appellants' invention relates to "an improved code-excited linear prediction coding system and method of coding the gain quantization parameters of a speech signal with fewer bits." Spec. 2:17–19. Claim 78 is illustrative and reproduced below, with the key disputed limitation emphasized:

78. A speech encoding system comprising:  
at least one processing circuit; and  
a memory storing a first vector quantization codebook and a second vector quantization codebook, and instructions executable by the at least one processing circuit to cause the speech encoding system to transform an input speech signal into an output bitstream by:  
generating a plurality of subframes of a frame of the input speech signal;  
generating unquantized pitch gains for the respective subframes;  
selecting a mode from a plurality of modes based on the frame of the input speech signal;  
in response to the mode being a first of the modes:  
selecting a quantized pitch gain vector from the first vector quantization codebook based on the unquantized pitch gains, wherein the quantized pitch gain vector is selected in an open loop fashion, wherein the quantized pitch gain vector includes adaptive-codebook gain components corresponding respectively to the subframes of the frame;

performing subframe processing based on data including the quantized pitch gain vector to select a first excitation from a fixed excitation codebook;

and

*selecting a second gain vector from the second vector quantization codebook using the first excitation and a closed loop minimization, wherein the second gain vector includes fixed-codebook gain components corresponding respectively to the subframes of the frame;*

generating the output bitstream that includes first information indicating the quantized pitch gain vector and second information indicating the second gain vector in response to the mode being the first mode; and

transmission circuitry operable to transmit the output bitstream via a radiofrequency link, wherein the output bitstream includes information that is decodable by a remote handheld device to play a reproduced version of the input speech signal.

#### PRINCIPLES OF LAW

We review the appealed rejections for error based upon the issues identified by Appellants, and in light of the arguments and evidence produced thereon. *Ex parte Frye*, 94 USPQ2d 1072, 1075 (BPAI 2010) (precedential).

## ANALYSIS

### THE NON-STATUTORY SUBJECT MATTER REJECTION OF CLAIMS 78–89 AND 92

#### *Contentions*

The Examiner finds

Claims 78–89, 92 are rejected under 35 U.S.C. 101 because the claimed invention is directed to a judicial exception (i.e., a law of nature, a natural phenomenon, or an abstract idea) without significantly more. Claims 78-91 [*sic*] are directed to the abstract idea of calculating pitch parameters and mathematically calculating related speech parameters. The claims do not include additional elements that are sufficient to amount to significantly more than the judicial exception because the claimed elements toward a processor, memory, transmission circuitry, and generated bitstream require generic computational elements well known in the industry of digital signal processing as applied to speech signal processing. Lastly, the claim amendment toward “wherein the output bitstream is a transformed version of the input speech signal” is descriptive in nature and does not actively claim a valid significantly more transformation (the claim language is toward ‘what the bitstream is’, and NOT an actual active transform). Similarly, the claim language “to play”, “configured to play” (claims 78, 88) is in intended-use format (which has been determined to be, not “significantly more”; in contra-distinction, using an action verb of transforming, such as synthesizing/playing ‘the speech signal’, would over [*sic*] the ‘intended use’ format).

Final Act. 2–3; *see also* Ans. 8–11.

Appellants argue claim 78 is directed to statutory subject matter. *See* App. Br. 12–18; *see also* Reply Br. 2–4. Among other arguments, Appellants argue the claims are directed to improvements in computer-related technology and are analogous to *McRO* (*McRO, Inc. v. Bandai*

*Namco Games Am. Inc.*, 837 F.3d 1299, 1316 (Fed. Cir. 2016)). App. Br. 15–16. In particular, Appellants argue the following:

Similarly, although coding of speech is an existing process, Appellant submits that the particular features of claim 78 improve this process rather than simply using computers as a tool. In particular, the claims include technical features that enable a lower bit rate for periodic-like speech frames, which may reduce bandwidth and storage requirements for encoded speech without significantly reducing speech quality. *See* specification at page 16, lines 12–16. Examples of features of claim 78 that enable these improvements include, without limitation: “generating unquantized pitch gains for the respective subframes,” “selecting a quantized pitch gain vector from the first vector quantization codebook based on the unquantized pitch gains,” and “selecting a second gain vector from the second vector quantization codebook using the first excitation and a closed loop minimization.”

App. Br. 16; *see also* Reply Br. 2–3.

#### *Our Review*

In *Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 134 S. Ct. 2347 (2014), the Supreme Court applied the framework as set forth in *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 132 S. Ct. 1289 (2012) for determining whether the claims are directed to patent-eligible subject matter. *Alice*, 134 S. Ct. at 2355. The first step in the analysis is to “determine whether the claims at issue are directed to one of [the judicially-recognized] patent-ineligible concepts.” *Id.* If the claims are directed to a patent-ineligible concept, then the second step in the analysis is to consider the elements of the claims “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*, 132 S. Ct. at 1298, 1297).

However, the Federal Circuit has articulated that “the first step in the *Alice* inquiry . . . asks whether the focus of the claims is 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.” *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335–36 (Fed. Cir. 2016). Accordingly, the Federal Circuit determined, if “the claims are directed to a specific implementation of a solution to a problem in the software arts,” then “the claims at issue are not directed to an abstract idea.” *Id.* at 1339. The Federal Circuit also determined claims directed to “limited rules in a process specifically designed to achieve an improved technical result in conventional industry practice” are not directed to an abstract idea. *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1316 (Fed. Cir. 2016).

We agree with Appellants that the claims are directed to improvements in computer-related technology and are analogous to *McRO*. See App. Br. 15–16. In *McRO*, the court found that a claim reciting a system of automated facial animation through the use of rules, rather than by artists setting weights, to automate tasks that humans perform is directed to patent-eligible subject matter. *McRO*, 837 F.3d at 1313. The court found that the process performed by human animators is not the same as the rules-based process recited in the claimed automation, as the human process is driven by subjective determinations. *McRO*, 837 F.3d at 1314. Thus, the court in *McRO* held that it was the use of rules that improved the technological process, and by incorporating the specific rules, the claim is limited to a specific process for animation that is not an abstract idea. *McRO*, 837 F.3d at 1315–16.

We conclude the instant claim limitations are similar to the claim limitations at issue in *McRO*. Although the claim limitations directed to the quantized pitch gain vector and the second gain vector involve mathematical operations, similar to *McRO*, the Examiner has not shown that they are the same as conventionally performed. Further, similar to *McRO*, the claims do not merely organize information into a new form. Rather, the claim limitations recite a specific technique that enables a lower bit rate for period-like speech frames. *McRO*, 837 F.3d at 1315. As such, the claim limitations are directed to improving a technological process. Accordingly, we do not sustain the Examiner’s rejection of independent claim 78.

Independent claims 83 and 88 each recite, in essence, the same claim limitations directed to the quantized pitch gain vector and the second gain vector. We, therefore, also do not sustain the Examiner’s rejection of independent claims 83 and 88 for the same reasons.

Claims 79–82 and 92 depend from claim 78; claims 84–87 depend from claim 83; and claim 89 depends from claim 88. We, therefore, also do not sustain the Examiner’s rejection of dependent claims 79–82, 84–87, 89, and 92 for the same reasons.

THE OBVIOUSNESS REJECTION OF CLAIMS 78–92  
OVER SWAMINATHAN AND FOODEEI

*Contentions*

The Examiner finds Swaminathan and Foodeei teach all limitations of claim 78. Final Act. 3–5. In particular, the Examiner finds Swaminathan teaches the key disputed limitation: “selecting a second gain vector from the second vector quantization codebook using the first excitation and a closed

loop minimization, wherein the second gain vector includes fixed-codebook gain components corresponding respectively to the subframes of the frame.” Final Act. 4 (citing Swaminathan col. 8, ll. 47–59).

Appellants argue, with respect to the key disputed limitation, the following principal argument:

“What is actually described in [the cited] passage is the processing in Figure 16A, which computes absolute time-differences of a filtered speech signal related to a determination of whether transients are present in the speech signal.” App. Br. 22–23. “There is no such ‘closed loop’ feature suggested by Swaminathan, either in the cited portion or elsewhere. The Examiner thus has not advanced any cogent theory on how Swaminathan is believed to disclose a ‘closed loop’ or a ‘closed loop minimization.’” App. Br. 23.

In response, the Examiner further finds “Swaminathan, col. 10, lines 30–65, in the three modes A, B, C, disclos[es] a discussion of closed loop pitch analysis.” Ans. 13.

Appellants reiterate, in the Reply Brief, that Swaminathan does not teach the key disputed limitation. *See* Reply Br. 5–6.

#### *Our Review*

Swaminathan (col. 8, ll. 47–59, cited in the Final Action) discloses determining whether transients are present in the speech signal. *See* Swaminathan col. 8, ll. 47–59. Thus, this cited portion of Swaminathan does not teach the key disputed limitation: “selecting a second gain vector from the second vector quantization codebook using the first excitation and a closed loop minimization, wherein the second gain vector includes fixed-

codebook gain components corresponding respectively to the subframes of the frame” because we find this cited portion of Swaminathan does not disclose closed loop minimization for selecting the fixed-codebook gain components.

Swaminathan (col. 10, ll. 30–65, cited in the Answer) discloses closed loop pitch estimates. *See* Swaminathan col. 10, ll. 30–65. However, this cited portion of Swaminathan does not teach the key disputed limitation: “selecting a second gain vector from the second vector quantization codebook using the first excitation and a closed loop minimization, wherein the second gain vector includes fixed-codebook gain components corresponding respectively to the subframes of the frame” because we find this cited portion of Swaminathan does not disclose closed loop minimization for selecting the fixed-codebook gain components.

On the record before us, the Examiner’s findings that Swaminathan teaches the key disputed limitation are not adequately supported with citations to Swaminathan. In particular, the key disputed limitation is directed to closed loop minimization for selecting the fixed-codebook gain components rather than determining whether transients are present in the speech signal (*see* Final Act. 4) or closed loop pitch estimates (*see* Ans. 13).

We, therefore, do not sustain the Examiner’s rejection of claim 78.

Independent claims 83, 88, and 90 each recite, in essence, the same key disputed limitation. We, therefore, also do not sustain the Examiner’s rejection of independent claims 83, 88, and 90 for the same reasons.

Claims 79–82 and 92 depend from claim 78; claims 84–87 depend from claim 83; claim 89 depends from claim 88; and claim 91 depends from

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claim 90. We, therefore, also do not sustain the Examiner's rejection of dependent claims 79–82, 84–87, 89, 91, and 92 for the same reasons.

**ORDER**

The Examiner's decision rejecting claims 78–92 is reversed.

**REVERSED**