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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
12/395.484	02/27/2009	Mahapathy Kadirkamanathan	82948369	4419
56436	7590	10/26/2016	EXAMINER	
Hewlett Packard Enterprise 3404 E. Harmony Road Mail Stop 79 Fort Collins, CO 80528			VILENA, MARK	
			ART UNIT	PAPER NUMBER
			2658	
			NOTIFICATION DATE	DELIVERY MODE
			10/26/2016	ELECTRONIC

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Ex parte MAHAPATHY KADIRKAMANATHAN

Appeal 2015-006526
Application 12/395,484
Technology Center 2600

Before ROBERT E. NAPPI, NORMAN H. BEAMER, and
STEVEN M. AMUNDSON, *Administrative Patent Judges*.

AMUNDSON, *Administrative Patent Judge*.

DECISION ON APPEAL

Appellant¹ seeks our review under 35 U.S.C. § 134(a) from a final rejection of claims 1–7, 10, and 17–31, i.e., all pending claims. We have jurisdiction under 35 U.S.C. § 6(b).

We reverse.

¹ According to Appellant, the real party in interest is Longsand Limited (a subsidiary of Hewlett-Packard Company). App. Br. 1.

STATEMENT OF THE CASE

The Invention

According to the Specification, the invention “relates to speech recognition using multiple resolution analysis and then performing speech analytics on the resultant text.” Spec. ¶ 2.² Among other things, the Specification describes a “continuous speech recognition engine” that “uses robustness as a confidence measure for words output by a speech recognition system as a measure of how confident the system is that each individual word was correctly identified to either or both 1) a database of spoken words and 2) one or more language models.” *Id.* ¶ 9. “The continuous speech recognition engine uses a multiple resolution analysis to create and calculate word recognition confidence rating associated with each work [sic] supplied in an audio file.” *Id.* ¶ 10.

Representative Claim

Independent claim 1 exemplifies the subject matter of the claims under consideration and reads as follows, with italics identifying the limitations at issue in claim 1:

1. A continuous speech recognition engine, comprising
an input subsystem configured to convert input audio data into a time coded sequence of sound feature frames for speech recognition;
a fine speech recognizer to apply a speech recognition process to the sound feature frames and determine at least a

² This decision uses the following abbreviations: “Spec.” for the Specification, filed February 27, 2009; “Final Act.” for the Final Office Action, mailed July 18, 2014; “App. Br.” for the Appeal Brief, filed December 9, 2014; “Ans.” for the Examiner’s Answer, mailed April 24, 2015; and “Reply Br.” for the Reply Brief, filed June 23, 2015.

candidate recognized word that corresponds to the sound feature frames;

a coarse sound representation generator to output a series of individual phonemes occurring within a time duration of the recognized word as a coarse sound representation of the recognized word; and

at least one processor to:

compare the coarse sound representation of the recognized word to a known sound of the recognized word in a database, and

assign a confidence level parameter to the recognized word from the fine speech recognizer according to the comparing.

App. Br. App. i.

The Prior Art Supporting the Rejections on Appeal

As evidence of unpatentability, the Examiner relies on the following prior art:

Baker	US 6,122,613	Sept. 19, 2000
Thong et al. (“Thong”)	US 2003/0110035 A1	June 12, 2003
Scahill et al. (“Scahill”)	US 2005/0216269 A1	Sept. 29, 2005
Strope et al. (“Strope”)	US 2010/0004930 A1	Jan. 7, 2010 (filed July 2, 2008)
Ogata et al. (“Ogata”)	US 2010/0057457 A1	Mar. 4, 2010 (filed Nov. 30, 2007)
Apple et al. (“Apple”)	US 8,031,849 B1	Oct. 4, 2011 (filed Sept. 2, 2005)

The Rejections on Appeal

Claims 1–7, 10, 17, and 20–31 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Baker, Ogata, and Thong. Final Act. 5–15.

Claim 18 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Baker, Ogata, Thong, and Strope. Final Act. 15–16.

Claim 19 stands rejected under 35 U.S.C. § 103(a) as unpatentable over Baker, Ogata, Thong, Scahill, and Apple. Final Act. 17–19.

ANALYSIS

We have reviewed the final rejection, Appellant’s arguments, and the Examiner’s response to Appellant’s arguments. We agree with Appellant that the Examiner erred in finding that the references disclose the limitations concerning assigning a confidence level parameter recited in the independent claims.

The Rejection of Independent Claims 1, 17, and 29 Under 35 U.S.C. § 103(a)

Independent claim 1 requires, among other things, (1) a “fine speech recognizer” that applies “a speech recognition process . . . and determine[s] at least a candidate recognized word,” (2) a “coarse sound representation generator” that outputs “a coarse sound representation of the [candidate] recognized word,” and (3) a “processor” that “compare[s] the coarse sound representation of the [candidate] recognized word to a known sound of the [candidate] recognized word in a database, and assign[s] a confidence level parameter to the [candidate] recognized word from the fine speech recognizer according to the comparing.” Although the “processor” compares the output of the “coarse sound representation generator” to a “known sound” (reference sound) from a database, the “processor” assigns the “confidence level parameter” to the output of the “fine speech recognizer.” *Id.* Independent claims 17 and 29 include similar limitations. *See App. Br. 2–3.*

The Examiner interprets claim 1, and the other independent claims, as not requiring that the “confidence level parameter” assigned to the

“candidate recognized word” provided by the “fine speech recognizer” results from the comparison of a different component’s output to a known sound in a database. Ans. 3; *see* Final Act. 2–3.

Appellant disputes the Examiner’s claim interpretation. App. Br. 6–7; Reply Br. 2–3. Appellant asserts that “the confidence level parameter assigned to a recognized word from the fine speech recognizer” recited in claim 1 results from “comparing the output of another component (*i.e.* the coarse sound representation generator) to a known sound in a database.” App. Br. 7; *see* Reply Br. 2, 6–7.

We agree with Appellant. The independent claims require (a) comparing the coarse sound representation generator’s output to a known sound of the candidate recognized word and (b) based on that comparison assigning a confidence level parameter to the fine speech recognizer’s output, *i.e.*, the candidate recognized word. The independent claims specify that the confidence level parameter is assigned to the fine speech recognizer’s output “according to the comparing.” The claims also specify that the “comparing” involves the coarse sound representation generator’s output, not the fine speech recognizer’s output.

Appellant argues that Baker, Ogata, and Thong do not teach assigning a confidence level parameter as required by the independent claims. App. Br. 7–9, 11–12; Reply Br. 3–7. We agree with Appellant that the Examiner erred in finding that the cited portions of the references teach the limitations concerning assigning a confidence level parameter as recited in the independent claims.

The Examiner finds that each of Ogata and Thong teaches comparing the results of a coarse sound recognition with a database and that Thong teaches assigning a confidence to a word. Answer 3-4.

We disagree with the Examiner that this meets the limitation of the independent claims. Thong teaches that a subword decoder processes input speech and produces a sequence of phonemes representing the “best hypothesis” for a word, and the subword decoder “returns the best hypothesis along with associated confidence scores.” Thong ¶ 41. Thus, the confidence scores (corresponding to the claimed confidence level parameter) assigned to the subword decoder’s output do not result from the comparison of a different component’s output to a known sound in a database. *Id.* Abstract, ¶¶ 35, 41–42, Fig. 1, Fig. 2.

In addition, Thong teaches that a word decoder also processes input speech. Thong ¶ 46. Using the word decoder’s output, a first vocabulary look-up produces a first ordered list of words with the most likely matches nearest the top. *Id.* ¶ 47. Using the subword decoder’s output, a second vocabulary look-up produces a second ordered list of words with the most likely matches nearest the top. *Id.* ¶ 42. A list fusion module combines words from the two lists to generate a final list by taking the top word from the first vocabulary look-up and adding it at the top of the list from the second vocabulary look-up. *Id.* ¶¶ 48–49, Fig. 2. The list fusion module does not rank or score the words in the two lists when generating the final list. *Id.* ¶¶ 48–51. Thus, we disagree with the Examiner’s finding that “the results of the different processes” in Thong “are compared and assigned confidence scores.” Ans. 5.

Based on the record before us, we do not sustain the obviousness rejection of claims 1, 17, and 29 based on Baker, Ogata, and Thong.

*The Rejections of Dependent Claims 2–7,
10, 18–28, 30, and 31 Under 35 U.S.C. § 103(a)*

Claims 2–7, 10, 18–28, 30, and 31 depend directly or indirectly from claims 1, 17, or 29. Appellant presents the same patentability arguments for these dependent claims as for the independent claims. App. Br. 3–7; Reply Br. 1–6. The Examiner has not found that the teachings of the additional references used in the rejections of these dependent claims make up for the deficiency noted for the independent claims. Thus, for the reasons discussed regarding the independent claims, we do not sustain the obviousness rejection of these dependent claims. Because this determination resolves the appeal with respect to these claims, we need not address Appellant’s other arguments regarding Examiner error.

DECISION

We reverse the rejections of claims 1–7, 10, and 17–31 under 35 U.S.C. § 103(a).

REVERSED