

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner,

v.

ZENTIAN LIMITED,
Patent Owner.

IPR2023-00037
Patent 10,971,140 B2

Before KEVIN F. TURNER, JEFFREY S. SMITH, and
CHRISTOPHER L. OGDEN, *Administrative Patent Judges*.

SMITH, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

A. Background and Summary

Petitioner filed a Petition (Paper 1, “Pet.”) requesting *inter partes* review of claims 1–8 of U.S. Patent No. 10,971,140 B2 (Ex. 1001, “the ’140 patent”) pursuant to 35 U.S.C. § 311(a). Patent Owner filed a Preliminary Response (Paper 6, “Prelim. Resp.”) pursuant to 35 U.S.C. § 313.

Pursuant to 35 U.S.C. § 314(a), the Director may not authorize an *inter partes* review unless the information in the petition and preliminary response “shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” For the reasons that follow, we institute an *inter partes* review as to claims 1–8 of the ’140 patent on all grounds of unpatentability asserted in the Petition.

B. Related Matters

The parties indicate that the following matters relate to the ’140 patent: *Zentian Ltd v. Apple Inc.*, 6:22-cv-00122, (W.D.Tex. Feb. 2, 2022); *Zentian Ltd v. Amazon.com, Inc.*, 6:22-cv-00123, (W.D.Tex. Feb. 2, 2022); *Apple Inc. v. Zentian Ltd.*, *Inter Partes* Review No. IPR2023-00033; *Apple Inc. v. Zentian Ltd.*, *Inter Partes* Review No. IPR2023-00034; *Apple Inc. v. Zentian Ltd.*, *Inter Partes* Review No. IPR2023-00035; and *Apple Inc. v. Zentian Ltd.*, *Inter Partes* Review No. IPR2023-00036. Paper 4, 1; Pet. 64.

C. The ’140 Patent

The ’140 patent is related to a speech recognition circuit which uses parallel processors for processing the input speech data in parallel. Ex. 1001, 1:18–20.

The patent describes that in speech recognition, there are generally two processes: “front end processing to generate processed speech parameters such as feature vectors, followed by a search process which attempts to find the most likely set of words spoken from a given vocabulary (lexicon).” *Id.* at 1:21–26. According to the ’140 patent, “for large vocabulary, speaker independent speech recognition, it is the search process that presents the biggest challenge.” *Id.* at 1:28–30.

The ’140 describes that in order to speed up the search function, parallel processing techniques have been suggested. *Id.* at 1:45–47. The patent further describes that “one algorithm for performing the search is the Viterbi algorithm,” which “is a parallel or breadth first search through a transition network of states of Hidden Markov Models.” *Id.* at 1:36–39. This search algorithm is computationally intensive, but in one paper cited by the ’140 patent, “a multi-threaded implementation of a fast beam search algorithm is disclosed.” *Id.* at 1:47–52. This “multi-threading implementation requires a significant amount of communication and synchronization among threads,” but in another paper, “the parallel processing of input speech parameters is disclosed in which a lexical network is split statically among processors.” *Id.* at 1:52–58.

To implement parallel processing of the search function, the ’140 describes a special circuit, in which a “plurality of lexical tree processors are connected in parallel to the input port and perform parallel lexical tree processing for word recognition by accessing the lexical data in the lexical memory arrangement.” *Id.* at 2:4–8. In addition, a “controller controls the lexical tree processors to process lexical trees identified in the results memory arrangement by performing parallel processing of a plurality of lexical tree data structures.” *Id.* at 2:12–15.

Figure 2 is a diagram of the circuit of the '140 patent, and is reproduced below.

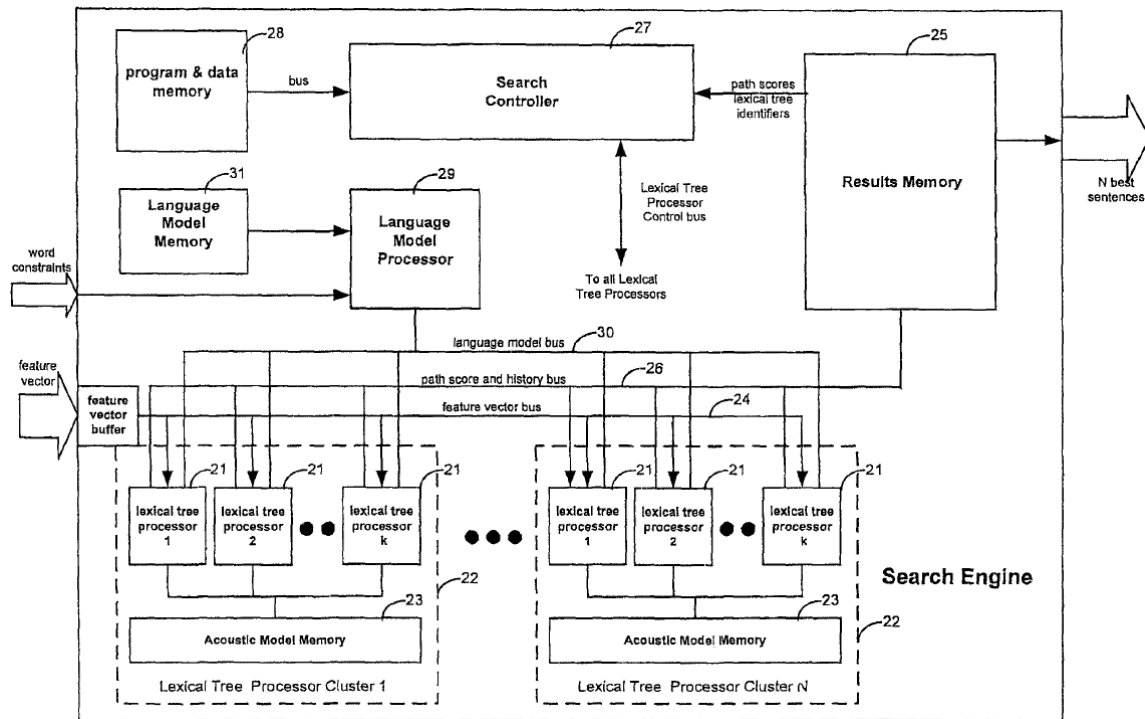


Figure 2, showing a plurality k of lexical tree processors 21, arranged in a lexical tree processor cluster 22, with acoustic model memory 23.

D. Illustrative Claim

Challenged claim 1 of the '140 patent recites:

1. [Pre] A speech recognition circuit comprising:
 - [a] one or more clusters of processors, each of the one or more clusters of processors comprising:
 - a plurality of processors; [b] and
 - an acoustic model memory storing acoustic model data, [c]
 wherein each of the plurality of processors is configured to compute a probability using the acoustic model data in the acoustic model memory,
 [d] wherein:
 - the speech recognition circuit is configured to generate an initial score for an audio sample;
 - [e] and

the initial score is used to determine whether to continue processing to determine a final score via processing a larger amount of model data than that was processed to generate the initial score.

Ex. 1001, 6:13–26; Pet. 66 (showing Petitioner’s bracketed claim annotations).

E. Evidence

Petitioner relies on the following prior art:

US Patent No. 6,374,219 B1, issued April 16, 2002 (Ex. 1004, “Jiang”);

US Patent No. 5,428,803, issued June 27, 1995 (Ex. 1005, “Chen”);

US Patent Appl. Publ. No. 2001/0053974 A1, published December 20, 2001 (Ex. 1008, “Lucke”);

US Patent No. 5,983,180, issued November 9, 1999 (Ex. 1009, “Robinson”);

US Patent No. 5,036,539, issued July 30, 1991 (Ex. 1010, “Wrench”).

F. Prior Art and Asserted Grounds

Petitioner asserts that claims 1–8 of the ’140 patent are unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1–3, 5, 7, 8	103(a)	Jiang, Chen
1–3, 5, 7, 8	103(a)	Jiang, Chen, Lucke
4	103(a)	Jiang, Chen, Robinson
4	103(a)	Jiang, Chen, Lucke, Robinson
6	103(a)	Jiang, Chen, Wrench

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
6	103(a)	Jiang, Chen, Lucke, Wrench

Pet. 6. Petitioner relies on the Declaration testimony of Christopher Schmandt. Ex. 1003.

II. ANALYSIS

A. *Legal Standards*

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)); *see also* 37 C.F.R. § 42.104(b) (requiring a petition for *inter partes* review to identify how the challenged claim is to be construed and where each element of the claim is found in the prior art patents or printed publications relied upon).

A claim is unpatentable under 35 U.S.C. § 103(a) if “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) when in evidence, objective evidence of obviousness or nonobviousness, i.e., secondary considerations. *See Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). An obviousness

analysis “need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.”

KSR, 550 U.S. at 418.

Additionally, the obviousness inquiry typically requires an analysis of “whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2016) (requiring “articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”)). Furthermore, Petitioner does not satisfy its burden of proving obviousness by employing “mere conclusory statements,” but “must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

B. Level of Ordinary Skill in the Art

Petitioner contends that a person having ordinary skill in the art (“POSITA”) would have had “a master’s degree in computer engineering, computer science, electrical engineering, or a related field, with at least two years of experience in the field of speech recognition, or a bachelor’s degree in the same fields with at least four years of experience in the field of speech recognition,” and that “[a]dditional education or experience might substitute for the above requirements.” Pet. 5 (citing Ex. 1003 ¶¶ 24–26). At this stage of the proceeding, “Patent Owner does not dispute the Petition’s proposed level of skill for a person of skill in the art.” Prelim. Resp. 4.

Based on the record presented, including our review of the ’140 patent and the types of problems and solutions described in the ’140 patent and cited prior art, we agree with Petitioner’s proposed definition of the level of

ordinary skill in the art and apply it for purposes of this Decision.¹ *See, e.g.*, Ex. 1001,1:21–2:45 (describing various methods of speech recognition systems).

C. Claim Interpretation

We interpret the challenged claims

using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.

37 C.F.R. § 42.100(b) (2022). “In determining the meaning of [a] disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006). Claim terms are given their plain and ordinary meaning as would be understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc). “There are only two exceptions to this general rule: 1) when a patentee sets out a definition and acts as his own lexicographer, or 2) when the patentee disavows the full scope of a claim term either in the specification or during prosecution.” *Thorner v. Sony Comput. Entm’t Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012).

¹ To the extent the parties dispute the level of ordinary skill in the art for the ’140 patent or the effective filing date of any of the challenged claims, the parties are encouraged to address the issue in their papers during trial.

Petitioner “applies the plain and ordinary meaning of all claim terms as understood by a POSITA for all terms.” Pet. 7. Patent Owner contends its “arguments in this Preliminary Response are based on the plain and ordinary meaning of the words of the claims themselves in view of the associated teachings of the specification.” Prelim. Resp. 3.

We conclude that no terms require express construction at this time. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“Because we need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy,’ we need not construe [a particular claim limitation] where the construction is not ‘material to the . . . dispute.’” (citation omitted)).

D. Discretionary Denial under 35 U.S.C. § 314(a)

Institution of *inter partes* review is discretionary. *See Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1367 (Fed. Cir. 2016) (“[T]he [U.S. Patent and Trademark Office (‘USPTO’)] is permitted, but never compelled, to institute an IPR proceeding.”). Patent Owner urges us to exercise discretion to deny institution of *inter partes* review under § 314(a) based on the factors established in *Apple Inc. v. Fintiv Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) (precedential) (“*Fintiv*”). Prelim. Resp. 5–8. Petitioner urges us not to exercise such discretion. Pet. 76–77.

On June 21, 2022, the Director of the USPTO issued an Interim Procedure for Discretionary Denials in AIA Post Grant Proceedings with Parallel District Court Litigation, *available at* https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621.pdf (the “Interim Procedure”). The Interim Procedure explains that “[c]onsistent with *Sotera Wireless, Inc.*, the PTAB will not discretionarily deny institution

in view of parallel district court litigation where a petitioner presents a stipulation not to pursue in a parallel proceeding the same grounds or any grounds that could have reasonably been raised before the PTAB.” Interim Procedure 3 (internal footnote omitted) (citing *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 (PTAB Dec. 1, 2020) (precedential as to § II.A)). The Interim Procedure explains that such a *Sotera* stipulation “mitigates concerns of potentially conflicting decisions and duplicative efforts between the district court and the PTAB . . . [and] allows the PTAB to review grounds that the parallel district court litigation will not resolve.” *Id.* at 7–8.

In this proceeding, Petitioner stipulates that “[i]f the instant IPR is instituted, Petitioner will not pursue in the parallel district court proceeding the same grounds as in the Petition or any grounds that could have been reasonably raised in the pending Petition.” Paper 9. In light of Petitioner’s stipulation, we decline to deny institution under *Fintiv*. Interim Procedure 3.

E. Challenge to Independent Claim 1

Petitioner contends that claim 1 would have been obvious over the combined teachings of Jiang and Chen. Pet. 9–44.

1. Overview of Jiang

Jiang, entitled “System for Using Silence in Speech Recognition,” is related to “computer speech recognition performed by conducting a prefix tree search of a silence bracketed lexicon.” Ex. 1004, code (54), 1:16–18.

Figure 2 shows a block diagram of speech recognition system 60, and is reproduced below.

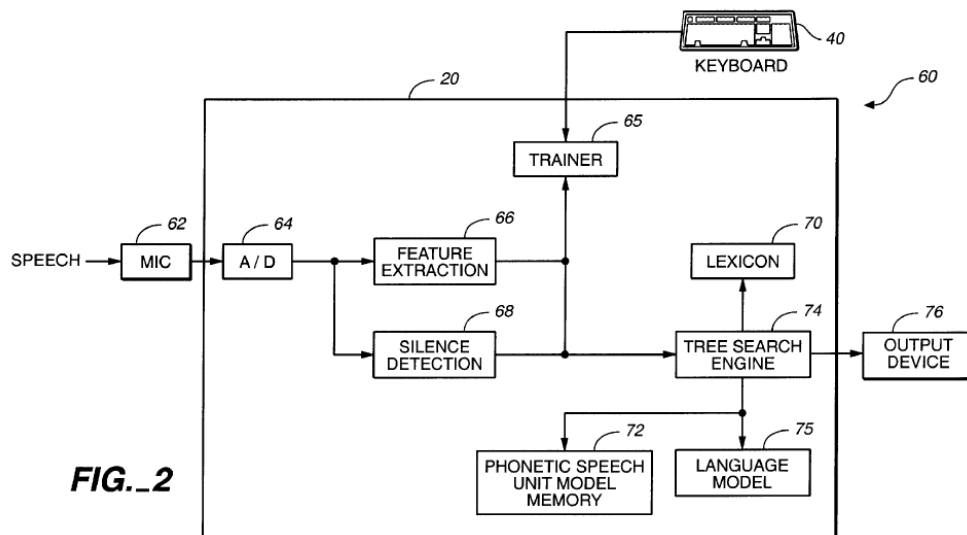


Figure 2 above shows microphone 62, analog-to-digital (A/D) converter 64, training module 65, feature extraction module 66, silence detection module 68, lexicon storage module 70, phonetic speech unit storage module 72, tree search engine 74, and output device 76. *Id.* at 6:20–25.

Jiang discloses that the speech recognition system:

recognizes speech based on an input data stream indicative of the speech. Possible words represented by the input data stream are provided as a prefix tree including a plurality of phoneme branches connected at nodes. The plurality of phoneme branches are bracketed by at least one input silence branch corresponding to a silence phone on an input side of the prefix tree and at least one output silence branch corresponding to a silence phone on an output side of the prefix tree.

Id. at 4:7–16. Lexicon storage module 70 contains information which is representative of all of the words in the vocabulary of speech recognition system 60. *Id.* at 7:65–67. The words are presented to tree search engine 74 in the form of a prefix tree which can be traversed from a root to a leaf to

arrive at the word most likely indicative of the utterance of the user. *Id.* at 7:67–8:4. As the tree is traversed from an input node to an output node, a score is assigned to each node connected to a phoneme branch then under consideration. *Id.* at 8:16–20.

A pruning technique can be used by comparing the score at a given node with the largest score from the other nodes of a frame being considered. *Id.* at 8:52–55. If the score at that node is sufficiently lower than the largest score, that branch is pruned from the tree, thereby drastically reducing the search space. *Id.* at 8:55–64; 11:6–12. A threshold level can be implemented for the comparison. *Id.* at 11:6–8. The lower the threshold level, the more branches will be retained throughout the search, and thus the more accurate the recognition system will be. *Id.* at 11:18–21. The threshold level can be determined empirically so as to gain an increase in computational savings, while significantly reducing the error rate associated with the pruning technique. *Id.* at 11:21–24.

2. Overview of Chen

Chen “relates generally to parallel processing computer systems for performing multiple-instruction-multiple-data (MIMD) parallel processing.” Ex. 1005, 1:29–31. Chen describes an architecture for high performance MIMD multiprocessors, which organizes the multiprocessors into four or more physically separable clusters, and provides for a shared memory model to be used with programs executed in the floating shared memory space, and a distributed memory model to be used with any programs executed across non-adjacently interconnected clusters. *Id.* at 1:32–43.

Figure 4 is a block diagram of the architecture of the Chen system, annotated by Petitioner, and is reproduced below.

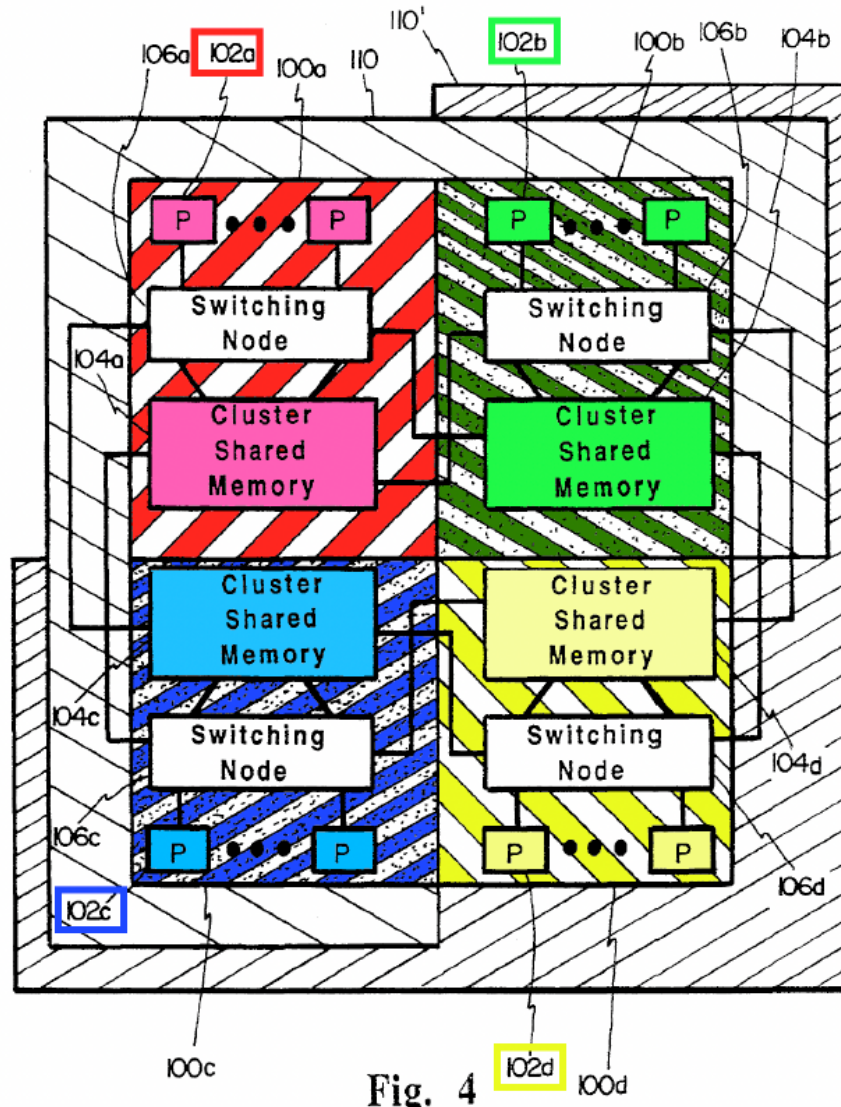


Fig. 4

Figure 4 above shows computer clusters 100a (in red), 100b (in green), 100c (in blue), and 100d (in green), processors (P) 102a-d, and memories 104a-d. Chen's architecture provides all three of the major memory types for parallel processing:

A true shared memory model with symmetrical access to a common shared memory 104a is provided for all processors 102a in cluster 100a. An extended shared memory model is provided for all of the processors 102a, 102b and 102c that adjacently access the cluster shared memories 104a, 104b and 104c in the floating shared memory 110, for example. Finally, a distributed shared memory model is provided for all processors 102a that

need to access the cluster shared memory 104d of a non-adjacently connected cluster 100d, for example.

Id. at 9:44–56.

3. Claim 1

A speech recognition circuit comprising

The preamble of claim 1 recites a “speech recognition circuit.” Petitioner contends that to the extent the preamble is limiting, Jiang describes the preamble in disclosing a speech recognition system implemented on a computer. Pet. 12–13.

Based on the evidence and arguments currently of record, for purposes of institution, we determine that Petitioner has demonstrated that Jiang teaches the features recited in the preamble of claim 1. Because we determine that Jiang teaches the preamble, we need not decide whether the preamble is limiting at this stage.

One or more clusters of processors

Claim 1 recites “one or more clusters of processors, each of the one or more clusters of processors comprising: a plurality of processors.” Petitioner contends that the combination of Jiang and Chen teaches this limitation. Petitioner contends that Jiang teaches calibrating a pruning threshold to ensure that computation time keeps pace with the rate at which new frames are received. Pet. 18. Petitioner contends that limited computational resources require a high pruning threshold in order to reduce the search space. *Id.* Petitioner contends that the high pruning threshold comes at the cost of an increased error rate. *Id.* Petitioner contends that Chen teaches a parallel processing computer system comprising a cluster of processors. *Id.* at 15–17. Petitioner contends that a person of ordinary skill would have implemented the speech recognition techniques of Jiang on the

clustered processors of Chen to efficiently process state sequences of hidden Markov models (HMMs) in parallel, in order to improve computational resources, allowing the pruning threshold to be relaxed, yielding a decreased error rate. *Id.* at 17–19.

Patent Owner contends that Chen’s processing architecture is incompatible as a substitute for Jiang’s processor. Prelim. Resp. 8. Patent Owner contends that Jiang implements its speech recognition techniques on a central processing unit (CPU) of a conventional personal computer. *Id.* at 9–10. Patent Owner contends that Chen’s system of parallel processing is directed towards improving upon prior supercomputers. *Id.* at 10–11. Patent Owner further contends that Chen’s system requires at least eight processors and four cluster shared memories, as well as complex connections between the processors, resulting in greater cost, complexity, and space requirements that what would have been suitable for a conventional personal computer at the time. *Id.* at 11–12.

Mr. Schmandt testifies that the strictness to which a pruning threshold is set in a speech recognition system depends upon the computing resources available, where a higher pruning threshold uses less computational resources but has a higher chance of errors, and a more relaxed pruning threshold has a lower chance of errors but uses more computational resources and is thus more expensive. Ex. 1003 ¶ 74. Mr. Schmandt testifies that Chen contemplates reducing the cost of a parallel processing computing platform as a goal of its invention. *Id.* Mr. Schmandt testifies that modifying Jiang’s speech recognition circuit to use clusters of processors as taught by Chen yields the predictable result of providing a more powerful computing platform that enables a more relaxed pruning

threshold, while reducing the expense incurred by grouping commercially available, simple processors into clusters. *Id.*

On the preliminary evidence, we do not agree with Patent Owner that Chen’s system of parallel processing is directed to supercomputers. Chen teaches that commercially available single-chip microprocessors and memory chips can be used to build its parallel processing computer system. Ex. 1005, 10:17–21. We also do not agree with Patent Owner that a person of ordinary skill in the art would have regarded the cost of using multiple processors to perform Jiang’s techniques of speech recognition to outweigh the known benefits. The U.S. Court of Appeals for the Federal Circuit has stated that “a given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine.” *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006). “Instead, the benefits, both lost and gained, should be weighed against one another.” *Id.* (quoting *Winner Int’l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000)). At this stage, we agree with Mr. Schmandt, that using Chen’s clusters of processors to perform Jiang’s method of speech recognition provides the speed and processing power needed to relax the pruning threshold while reducing the expense of grouping commercially available processors into clusters.

Patent Owner contends that modifying a standard personal computer to implement Chen’s processor and memory architecture would have required a level of expertise in parallel computer design that would have exceeded the qualifications of a person of ordinary skill. Prelim. Resp. 12. Patent Owner contends “an ordinary artisan would not have been motivated to substitute Jiang’s generic ‘processing unit 21’/‘CPU 21’ with the Cray supercomputer” disclosed in Chen, because such a combination would have

been the work of a highly unusual artisan using highly unordinary creativity. *Id.* at 13–14. According to Patent Owner, Jiang’s speech recognition technique is directed to a CPU which operates in serial mode, and is not suited for a parallel processing environment. *Id.* at 14.

Mr. Schmandt testifies that many speech recognition systems recognized the advantages of employing clusters of processors, such as power, flexibility, scalability, and cost management. Ex. 1003 ¶¶ 59–60 (citing Ex. 1006; Ex. 1024; Ex. 1025; Ex. 1026; Ex. 1027; Ex. 1028). Mr. Schmandt testifies that a person of ordinary skill in the art would have been familiar with systems using clustered processors for speech recognition and would have been familiar with the advantages gained by using a clustered processor architecture. *Id.* at ¶ 60. Mr. Schmandt testifies that a person of ordinary skill would have been able to substitute the clustered processing architecture of Chen for Jiang’s processing architecture to yield the predictable result of improving processing speed and power. *Id.* at ¶ 67. Mr. Schmandt further testifies that a person of ordinary skill would have been able to add necessary hardware, such as a microphone, to Chen’s computing platform, as well as programming Chen’s platform with speech recognition software as taught by Jiang, to yield the predictable results of increasing speed and efficiency. *Id.* at ¶ 68. On this record, we are sufficiently persuaded that programming Chen’s computing platform with speech recognition software as taught by Jiang was within the level of ordinary skill.

Based on the evidence and arguments currently of record, for purposes of institution, we determine that Petitioner has demonstrated that the combination of Jiang and Chen teaches the features recited in this limitation of claim 1.

An acoustic model memory storing acoustic model data states

Claim 1 recites “an acoustic model memory storing acoustic model data.” Petitioner contends that Jiang teaches acoustic model data in disclosing phonetic speech models such as Hidden Markov Models (HMMs) stored in memory. Pet. 19–22. Petitioner contends that Chen teaches that each cluster of two or more processors includes a shared memory. Pet. 22–24. Petitioner contends that a person of ordinary skill would have stored at least a portion of the acoustic model data of Jiang in the shared cluster memories of Chen in order to leverage shared memory amongst clustered processors during speech recognition. Pet. 24–25.

Based on the evidence and arguments currently of record, for purposes of institution, we determine that Petitioner has demonstrated that the combination of Jiang and Chen teaches the features of this limitation of claim 1.

Wherein each of the plurality of processors . . .

Claim 1 recites “wherein each of the plurality of processors is configured to compute a probability using the acoustic model data in the acoustic model memory.” Petitioner contends that Jiang teaches computing a probability using the acoustic model data in disclosing determining a most likely phoneme based on the stored HMMs. Pet. 25–28. Petitioner contends that the combination of Jiang and Chen teaches that each of the plurality of processors is configured to compute using the acoustic model data in the acoustic model memory. *Id.* at 28. Petitioner contends that Jiang modified by Chen teach an acoustic model, accessible to its plurality of processors, used to perform a tree search to determine a most likely phoneme represented by features extracted from a user’s utterance. Pet. 31.

Patent Owner contends the Petition “provides no reason *why* the ordinary artisan would have been motivated to specifically utilize *each* of Chen’s shared cluster memories 104a-d as an ‘acoustic model memory’ storing ‘acoustic model data,’ as recited in limitations 1(a)-(c) of the challenged claims,” other than impermissible hindsight. Prelim. Resp. 18 (citing Ex. 2002 ¶ 37). Patent Owner contends “an ordinary artisan would know that even using each of Chen’s clustered processors for performing the speech recognition taught in Jiang would not necessarily lead to each of the processors being ‘configured to compute a probability,’ as limitation 1(c) requires.” Prelim. Resp. 21.

Mr. Schmandt testifies that a person of ordinary skill would have stored at least a portion of the acoustic model data of Jiang in the shared cluster memories of each of the clusters of Chen for access by the corresponding processors during speech recognition, to yield the benefits of a relaxed pruning threshold at a reduced financial cost. Ex. 1003 ¶ 76. Mr. Schmandt testifies that a person of ordinary skill would have recognized that it would have been a waste for any particular processor not to be configured to compute a probability using the acoustic model data in the acoustic model memory. *Id.* at ¶ 83. Mr. Schmandt testifies that in order to maximize both computational and cost efficiency, a person of ordinary skill “would have configured the Jiang+Chen modified speech recognition circuit to compute a probability using the acoustic model data stored in the acoustic model memory.” *Id.*

Based on the evidence and arguments currently of record, for purposes of institution, we determine that Petitioner has demonstrated that the combination of Jiang and Chen teaches the features of this limitation of claim 1.

Wherein: the speech recognition circuit is configured

Claim 1 recites “wherein: the speech recognition circuit is configured to generate an initial score for an audio sample.” Petitioner contends that Jiang describes this limitation in disclosing a tree search engine using sampled audio to generate scores as a lexical tree is traversed. Pet. 32–36.

Based on the evidence and arguments currently of record, for purposes of institution, we determine that Petitioner has demonstrated that the combination of Smyth and Mozer teaches the features recited in this limitation of claim 1.

And the initial score is used

Claim 1 recites “the initial score is used to determine a final score via processing a larger amount of model data than was processed to generate the initial score.” Petitioner contends that Jiang describes this limitation in disclosing using an initial score to determine whether to continue processing to determine a final score, where the final score is determined by processing more nodes and branches than were processed to generate the initial score. Pet. 36–44.

Based on the evidence and arguments currently of record, for purposes of institution, we determine that Petitioner has demonstrated that the combination of Jiang and Chen teaches the features of this limitation of claim 1. We determine that Petitioner demonstrates a reasonable likelihood that independent claim 1 is unpatentable under 35 U.S.C. § 103(a) over Jiang and Chen.

F. Additional Grounds and Claims

Petitioner challenges claims 1–8 as unpatentable over various combinations of Jiang, Chen, Lucke, Robinson, and Wrench. Pet. 53–62.

Patent Owner does not separately argue against Petitioner's showing with respect to the additional grounds and claims. *See* Prelim. Resp.

At this stage, because Petitioner demonstrates a reasonable likelihood of prevailing with respect to its challenge of the independent claim based on the combination of Jiang and Chen, we do not see the need to further address the challenges of the additional grounds and claims. Further analysis is best left for trial after full development of the record. Because “[e]qual treatment of claims and grounds for institution purposes has pervasive support in *SAS*,” we institute on all claims and all grounds as challenged in the Petition. *PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1360 (Fed. Cir. 2018).

III. CONCLUSION

Based on the arguments presented in the Petition, we conclude that Petitioner has demonstrated a reasonable likelihood of prevailing with respect to at least one claim of the '140 patent challenged in the Petition. Accordingly, we institute a trial on all claims and all grounds asserted in the Petition. The Board has not made a final determination under 35 U.S.C. § 318(a) with respect to the patentability of the challenged claims.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–8 of the '140 patent is instituted with respect to all grounds set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), *inter partes* review of the '140 patent shall commence on the entry date of this Decision, and notice is hereby given of the institution of a trial.

IPR2023-00037
Patent 10,971,140 B2

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