

IPR2023-00037
Apple Inc.
v.
Zentian Limited
Patent 10,971,140

Patent Owner's Demonstratives

Presented March 11, 2024

Argument Roadmap

- ❖ Petitioner has failed to show obviousness for limitations 1(d) and 1(e)
- ❖ The evidence proves a POSA would *not* have had a reasonable expectation of success
- ❖ Petitioner's counter-arguments rest on false logic
- ❖ The evidence proves *no* motivation to combine

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Petitioner has failed to show obviousness for limitations 1(d) and 1(e)

Limitation 1(d): “the speech recognition circuit is configured to generate an initial score for an audio sample;”

Limitation 1(e): “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”

Petitioner has failed to show obviousness for limitations 1(d) and 1(e)

Mr. Schmandt admitted his declaration does not state *how* Jiang's tree search engine 74 *modified in view of Chen* would operate to meet limitations 1(d) and 1(e)

8 Q. So in your discussion of claim
9 1(d) in paragraphs 84 to 87, you don't
10 provide an explanation as to how Chen's
11 clustered processors and memory would be
12 used to generate an initial score in view of
13 Jiang if they would be so used at all;
14 right?

15 A. As I have just said, I don't
16 mention Chen in those paragraphs, but I have
17 previously discussed how Chen -- how Chen's
18 teaching suggest an improvement to the
19 performance of Jiang's tree search engine,
20 and as we've just discussed, the tree search
21 engine is the focus of all that I've written
22 in those paragraphs.

15 Q. In your paragraphs regarding
16 claim 1(e), you don't expressly discuss
17 anything about Chen; correct?

18 A. Yes. I make no mention of Chen.

Petitioner has failed to show obviousness for limitations 1(d) and 1(e)

Mr. Schmandt's deposition proposed a new "one processor" theory for limitations 1(d) and 1(e)

19 Just so I'm clear, your
20 testimony now at your deposition is that the
21 result would be compiling or scored in one
22 processor within one cluster in Jiang -- in
23 Chen -- excuse me -- for instance; is that
24 fair?

25 A. Yes. At that point we have
2 finished our parallel operation and we're
3 back to serial operations.

Petitioner has failed to show obviousness for limitations 1(d) and 1(e)

Patent Owner proved Mr. Schmandt's new "one processor" theory would not function to meet 1(d) & 1(e)

1. "One processor" theory would require one processor in one cluster to receive necessary information from ***all four memories*** in Chen's Fig. 4 embodiment
2. Mr. Schmandt's declaration states, and Chen teaches, that the four memories are ***not*** all "interconnected"
3. No one processor in one cluster can directly or adjacently access all of the data stored across the four memories

No one processor in one cluster can directly or adjacently access all of the data stored across the four memories



9:5-19, 9:30-43.

Petitioner has failed to show obviousness for limitations 1(d) and 1(e)

Petitioner's Reply pivoted to an "*all processors*" theory

"Jiang's algorithm of generating an initial score and using the initial score to determine whether to continue processing (the functionality of claims 1(d)-1(e)) would be ***replicated across*** Chen's processors."

Petitioner has failed to show obviousness for limitations 1(d) and 1(e)

Petitioner's new "*all processors*" theory also fails

1. "All processors" theory abandons Schmandt's "one processor" theory and undermines both
2. Requires **every** processor across four clusters to calculate the **same** initial score and make the **same** determination whether to continue, which is both illogical and not shown to have been obvious
3. Contradicted by Schmandt's testimony that "at that point, we have finished our parallel processing operation and we're back to serial operation"
4. Still requires **each** processor to obtain necessary information from **every** memory, whereas no processor can directly or adjacently access **every** memory
5. Not disclosed in Petition and thus improper

Petitioner has failed to show obviousness for limitations 1(d) and 1(e)

Petitioner's new "all processors" theory also fails

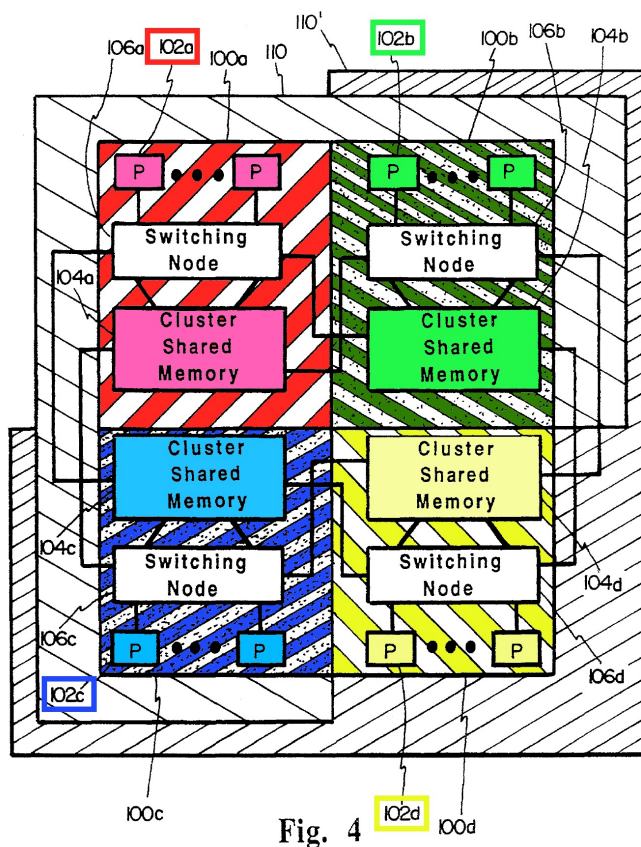


Fig. 4

Additionally, *Chen* teaches that some, but not all, the clusters are interconnected, stating that the processors 102a in cluster 100a can directly access memories 104a, 104b, and 104c of clusters 100a, 100b, and 100c, respectively, but cannot directly or adjacently access the memory 104d of cluster 100d, while the processors 102d in cluster 100d can directly access memory 104d, 104b, and 104c, but cannot directly or adjacently access the memory 104a. *Chen*, 9:5-19, 9:30-43.

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An *ordinary* artisan would ***not*** have had a reasonable expectation of success

The Petition's combination requires performing Jiang's techniques on Chen's clustered processor and memory architecture

But Jiang does not enable performing its speech recognition on Chen's clusters, and Chen does not enable using its clusters to perform Jiang

9 Chen itself doesn't specifically
10 teach how to implement Jiang's methods or
11 system; right?
12 A. Correct.
13 Q. Jiang does not expressly teach
14 how to implement Chen's processor to memory
15 architecture with Jiang's methods or
16 systems; right?
17 A. Of course not.

An *ordinary* artisan would ***not*** have had a reasonable expectation of success

Mr. Schmandt's admissions refute a reasonable expectation of success

Mr. Schmandt admitted he has ***not***:

- ❖ Provided the underlying details to support his conclusion as to the POSA's capability, Ex. 2017 at 48:1–21
- ❖ Supervised anyone involved in mapping a speech recognition model to a clustered processor and memory architecture like Chen's, Ex. 2017 at 145:20-24

Mr. Schmandt admitted he has ***not***:

- ❖ Built the processor to memory architecture of ***any*** speech recognition system identified in his background experience, Ex. 2017, 34:24-35:5, 32:3-9, 106:10-23;
- ❖ Explained ***how*** the POSA could have achieved his combination. Ex. 2017 at 48:13-21.

Mr. Schmandt's conclusion of reasonable success is not credible

An *ordinary* artisan would ***not*** have had a reasonable expectation of success

Dr. Anderson's testimony disproves a reasonable expectation of success

- ❖ Jiang's Viterbi algorithm was unlikely to run successfully on Chen's clusters in a practical system, Ex. 2020 ¶¶ 29-30
 - ❖ Jiang's Viterbi algorithm requires extensive communication, whereas Chen's cluster memories are not all directly or adjacently accessible to other clusters
- ❖ Even Dr. Anderson, a person of ***extraordinary skill***, and a team of engineers including a DSP expert, could not successfully port a far simpler signal processing software to a parallel processing architecture after six months, Ex. 2020 ¶ 31

An *ordinary* artisan would **not** have had a reasonable expectation of success

Dr. Anderson's testimony disproves a reasonable expectation of success

- ❖ Petitioner's combination would have been beyond the capabilities of the POSA, Ex. 2020 ¶¶ 17-19, 27 (p. 16)
 - ❖ Coordinating multiple caches, avoiding memory conflicts, controlling task sharing efficiently, resolving synchronous bottlenecks, addressing bandwidth and latency issues, and developing messaging strategy across and within clusters
- ❖ Person of *ordinary* skill specialized in digital signal processing and speech recognition, **not** parallel processing architectures or high performance computing, *id.* ¶ 28

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Petitioner's arguments rest on false logic

Pet. Arg. 1: POSITA must be *assumed* to have requisite knowledge because '140 Patent did not address Petitioner's problems

The problems with Petitioner's combination arise out of *the combination*, not the invention of the '140 Patent

The '140 Patent does not teach Petitioner's specific combination, and its *silence* cannot support Petitioner

Dr. Anderson testified that the '140 Patent does provide novel teachings that are distinct from the combination

Petitioner's arguments rest on false logic

Pet. Arg. 2: A POSA's *general* knowledge of parallel processing architectures for speech recognition would have sufficed to achieve the *combination*

Prior art is only enabled ***for what it teaches***. None of the cited art taught implementing Jiang's techniques on a clustered processor/memory architecture like Chen's

General knowledge of parallel processing architectures is not adequate knowledge to achieve the combination

Chen cannot be ***assumed*** to be enabled for ***every speech recognition architecture imaginable***

Petitioner's arguments rest on false logic

Pet. Arg. 2: A POSA's *general* knowledge of parallel processing architectures for speech recognition would have sufficed to achieve the *combination*

- ❖ Jiang's Viterbi algorithm was unlikely to run successfully on Chen's clusters in a practical system, Ex. 2020 ¶¶ 29-30
 - ❖ Jiang's Viterbi algorithm requires extensive communication, whereas Chen's cluster memories are not all directly or adjacently accessible to other clusters

- ❖ Even Dr. Anderson, a person of ***extraordinary skill***, and a team of engineers including a DSP expert, could not successfully port a far simpler signal processing software to a parallel processing architecture after six months, Ex. 2020 ¶ 31

Petitioner's arguments rest on false logic

Pet. Arg. 3: “Zentian does not argue that the combination is inoperable, [or] could not be done”

Patent Owner need only show Petitioner's failure of proof

Patent Owner need not show impossibility

Petitioner conflates *ordinary* skill with *extraordinary* skill

Petitioner's arguments rest on false logic

Pet. Arg. 4: Zentian's alleged complications would arise with *any* clustered processor architecture

Petitioner has *no evidence* to support its allegation

Petitioner again attempts to improperly shift its burden

Petitioner's problems arise out of Petitioner's own requirements and the prior art's teachings

Petitioner's arguments rest on false logic

Pet. Arg. 5: Chen envisions its processors and memories are directly and adjacently accessible

Chen's "node switching mechanism" relates to access by processors *within* a cluster to *that* cluster's memory, not across clusters

Mr. Schmandt, Dr. Anderson, and Chen itself all explain that Chen's relevant embodiment does not permit direct or adjacent access to all memories

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The evidence proves no motivation to combine

Dr. Anderson's testimony disproves a motivation to combine

- ❖ Converting Jiang's shared memory architecture to Chen's memory architecture would require significant reprogramming effort that would defeat a motivation to combine
- ❖ Chen's memory architecture would require onerous messaging overhead to pass information across its memory clusters, as shown by Mathew I
- ❖ Chen does not allow direct communication between all clusters, which would be critical for Jiang's Viterbi technique
- ❖ The POSA would not have expected to successfully manage the combination's complications to achieve worthwhile benefits

The evidence proves no motivation to combine

Pet. false motivation 1: increased power and speed

Mr. Schmandt provided no analysis as to *why* Chen would allegedly speed up Jiang or relax its pruning threshold, or by *how much*

Mathew I taught that a five-processor parallel processing speech recognition system was ***slower*** than a two-processor one due to high synchronization overhead

POSA would not have assumed the combination of Jiang and Chen would have improved processing or relaxed Jiang's pruning threshold

The evidence proves no motivation to combine

Pet. false motivation 2: cost

- ❖ Mr. Schmandt admitted he did not specify any costs that would be saved, nor did he state *what* the combination would be cheaper *than*
- ❖ He did not compare the cost of Chen's clustered processing architecture to any other system
- ❖ He did not compare the cost of Jiang's unmodified system with the cost of Jiang modified by Chen
- ❖ Cost alone would not suffice as a motivation in view of the incompatibility between Jiang and Chen and the POSA's level of skill

The evidence proves no motivation to combine

Pet. false motivation 3: flexibility and scalability

- ❖ Mr. Schmandt admitted that MARS was flexible because its pipeline was programmable, and scalable because more processors could be added to it
- ❖ Mr. Schmandt further admitted that MARS was being compared to SRI-Berkeley, which did not have those features
- ❖ Petitioner has no showing that Jiang or Chen were not already flexible (programmable pipeline) or scalable (more processors could be added)

The evidence proves no motivation to combine

Pet. false motivation 4: known technique to improve a similar device in a similar way

1. Chen's clustered processor and memory architecture was not "known" for use in speech recognition
2. Chen's architecture was not known to *improve* speech recognition
3. Using more processors was not "known" to improve parallel processing speech recognition systems, per Mathew I
4. Evidence proves that the combination would *not* have improved Jiang and that Jiang and Chen were ill-suited for combination