UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APPLE INC.,
Petitioner
v.

THETA IP, LLC,
Patent Owner

Case No. IPR2024-00819
Patent No. 11,564,164

PRELIMINARY REPLY IN SUPPORT OF PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 11,564,164

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All Challenged Claims require dynamically varying impedance of and/or bias current for a circuit or component in the receiver signal path. The Petition relied on *Behbahani's* variable filter block—a "variable bandwidth adaptive dynamic range band pass filter"—as the dynamically varied circuit/component in the signal path. Paper 1, 24-62. Evidencing that *Behbahani's* variable filter block satisfies the claims, Inventor Tsividis's academic article (Ex. 1011)—published within months of the presumed priority date—expressly identified *Behbahani's* variable filter block as an exemplary means of dynamically varying impedance. *Id*., 36-39.

PO does not dispute that *Behbahani's* variable filter block is in the signal path, as claimed. It does not dispute that switching between high-power and low-power modes changes the impedance of and the bias current applied to *Behbahani's* variable filter block. Nor does PO dispute that Inventor Tsividis's article describes the claimed invention. PO's Preliminary Response ("POPR") only takes issue with the way in which *Behbahani's* variable filter block internally switches between two modes. PO incorrectly argues that the patent demands interpreting the claims narrowly to capture only variable filters that adjust individual circuit elements, rather than larger filter branches as in *Behbahani*. Paper 8, 33-49. This narrow interpretation finds no intrinsic support. The Challenged Patent does not describe, let alone dictate, how circuit changes are made within a filter block. PO also incorrectly argues that Inventor Tsividis's article teaches away from *Behbahani's*

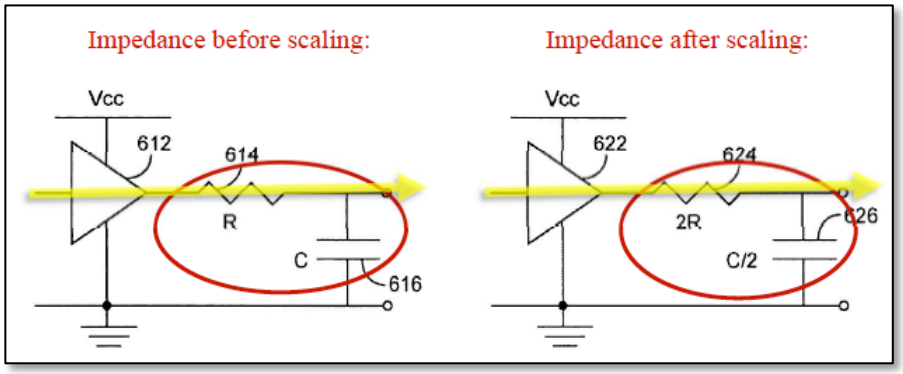
approach. *Id*. In fact, Inventor Tsividis's article does not reject, but rather embraces, *Behbahani's* approach to dynamically varying impedance.

I. PATENT OWNER'S NARROW INTERPRETATION FINDS NO SUPPORT IN THE INTRINSIC RECORD

Under PO's interpretation, as a received signal flows through *Behbahani's* variable filter block, it passes through a high-power branch or low-power branch of an LPF before passing through an HPF. Paper 8, 36. PO wrongly argues that *Behbahani's* variable filter block must be treated as two distinct static filters, rather than a single function block, despite the fact that an HPF portion is shared in both operating modes. *Id*., 34-37. PO argues that "[s]witching operation from one static filter to another is a different, and inferior, approach [to] dynamically changing the components or structure of a single filter block" and that "*Behbahani's* filter swap approach does not fit with the claim language[.]" *Id*., 36-37. There is no support in the patent for excluding a variable filter block like *Behbahani's*, and PO's attempt to portray the patent otherwise significantly mischaracterizes its actual disclosure.

PO notes that, in the Challenged Patent, "impedance (or bias) variation is uniformly depicted as an adjustment within a single 'Function Block'" that "may be ***a filter***." *Id*., 39-40. Beyond identifying different types of function blocks (e.g., filter, mixer, amplifier), the patent does not elaborate on <u>how</u> adjustments are made within a function block. Nor does PO allege otherwise. The sole example of dynamic impedance scaling that the POPR discusses is Fig. 6. *Id*., 41-42. Even if it were

proper to limit the claims to this example (which it is not), PO mischaracterizes Fig. 6 and the corresponding disclosure. Namely, PO argues that "Figure 6 does not depict a circuit swap like *Behbahani's*, but rather a single RC circuit before and after its impedance is dynamically scaled." *Id*., 41-42 (insisting that patent teaches changing the values of individual resistor and capacitor elements).



Id. Contrary to PO's suggestion, the patent does not explain how this impedance scaling works. It says nothing about whether resistor 614 is related to resistor 624 or whether capacitor 616 is related to capacitor 626, let alone describe <u>how</u> the values might be changed if the components were related. In fact, disputing PO's interpretation, Fig. 6 illustrates <u>different drivers</u> (612 and 622), strongly suggesting that even this example permits switching between <u>different paths</u> within a function block. Ex. 1001, 7:47-59 (noting that distinct driver 612 and driver 622 see different loads and require different output currents).

While Fig. 6 does indeed illustrate how load impedances impact drive current, Fig. 6 does not, as PO claims, describe scaling impedance by adjusting discrete

resistor and capacitor values. More importantly, it falls far short of supporting PO's interpretation that all claims should be limited to adjusting discrete circuit elements, excluding implementations like *Behbahani's* where different filter branches are switched in and out within a variable filter block. This record simply cannot support PO's narrow view that the claims exclude switching or changing between the circuit paths within a variable filter block component.

II. INVENTOR TSIVIDIS'S ARTICLE EMBRACES BEHBAHANI'S VARIABLE FILTER BLOCK

Faced with the sole inventor's article that was published within months of the presumed priority date and that identifies *Behbahani's* variable filter block as an explicit example of how to implement dynamic impedance scaling, PO starkly mischaracterizes the article to argue that Ex. 1011 teaches away from, rather than promotes, *Behbahani's* approach. Paper 8, 36-38.

In a section titled, "Technique 2: Dynamic Impedance Scaling," Ex. 1011 explains that "[o]ne way to achieve the [paper's goal] would be to use two filters, designed with different capacitance values, and place one or the other in service as required [34], turning the other filter off." Ex. 1011, 8. Reference [34] is the *Behbahani* article. The POPR highlights two identified downsides with *Behbahani's* approach. But PO does not address the fact that Ex. 1011 and the Challenged Patent propose *solutions* to mitigate these downsides, strongly suggesting that *Behbahani's* approach was intended to be—and is—captured by the Challenged Patent.

First, PO correctly notes that Ex. 1011 identifies "output transients" as a downside to *Behbahani's* approach. Paper 8, 37. But PO ignores that Ex. 1011 expressly proposes a "[d]elayed output switching" approach to *Behbahani's* circuit that would allow *Behbahani's* variable filter approach to be used while "prevent[ing] the system from seeing [] output transients[.]" Ex. 1011, 8. Second, PO correctly notes that Ex. 1011 identifies "loss of data" that could result from the "delayed output switching" approach. Again, PO fails to acknowledge that the Challenged Patent and *Behbahani* teach making the dynamic circuit adjustments during receipt of a preamble to avoid loss of data, and related U.S. Patent 7,010,330 even claims this approach. IPR2024-00816, Paper 1, Claim 2 (*Behbahani* teaches that dynamic changes made during a preamble avoid loss of important post-preamble data). Thus, the Challenged Patent teaches and related patent <u>claims</u> an accommodation that permits *Behbahani's* approach to be implemented without "loss of data."

Simply identifying relative downsides in a prior art approach does not teach away from employing that approach. *Meiresonne v. Google, Inc.*, 849 F.3d 1379, 1382-84 (Fed. Cir. 2017) (finding references did not teach away where they merely identified areas for improvement). Where, as here, a reference identifies relative downsides of a prior art approach and proposes <u>how</u> to mitigate those downsides, it cannot be held to teach away from the prior art approach.

Respectfully submitted,

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COUNSEL FOR PETITIONER

CERTIFICATE OF SERVICE ON PATENT OWNER
UNDER 37 C.F.R. § 42.105(a)

Pursuant to 37 C.F.R. §§ 42.6(e) and 42.105(b), the undersigned certifies that on October 15, 2024, a complete and entire copy of this *Preliminary Reply In Support Of Petition For Inter Partes Review Of U.S. Patent No. 11,564,164* was served on Patent Owner via email.

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