

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SEMICONDUCTOR COMPONENTS INDUSTRIES, LLC d/b/a
ON SEMICONDUCTOR,
Petitioner,

v.

POWER INTEGRATIONS, INC.,
Patent Owner.

Case IPR2018-01815
Patent 6,337,788 B1

Before TREVOR M. JEFFERSON, KRISTINA M. KALAN, and
SCOTT B. HOWARD, *Administrative Patent Judges*.

JEFFERSON, *Administrative Patent Judge*.

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

I. INTRODUCTION

Semiconductor Components Industries, LLC d/b/a ON Semiconductor (“Petitioner”) requests *inter partes* review of claims 14–17, 22, and 23 of U.S. Patent No. 6,337,788 B1 (“the ’788 patent,” Ex. 1001) pursuant to 35 U.S.C. §§ 311 *et seq.* Paper 2 (“Petition” or “Pet.”). Power Integrations, Inc. (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”).

Petitioner requested a reply on February 12, 2019, to request admission of testimony from a named inventor of the ’788 patent that Petitioner deemed relevant to claim construction and obviousness. Ex. 1031, 6:5–7:14 (conference transcript). We granted Petitioner’s request and allowed Patent Owner to file a paper opposing admission. Ex. 1031, 20:21–25:2. Petitioner filed a Preliminary Reply along with the disputed testimony, Exhibit 1032. Paper 8 (“Pet. Prelim. Reply”). Patent Owner filed a Response challenging admission of the testimony. Paper 9 (“PO Resp. to Pet. Reply”).

Under 37 C.F.R. § 42.4(a), we have authority to determine whether to institute review. Institution of an *inter partes* review is authorized when “the information presented in the petition . . . and any 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.” 35 U.S.C. § 314(a). Upon consideration of the Petition, Patent Owner’s Preliminary Response, and the record before us, we conclude the information presented shows there is a reasonable likelihood that Petitioner would prevail in establishing the unpatentability of the challenged claims of the ’788 patent.

A. Related Proceedings

The parties inform us that the '788 patent is presently asserted against Petitioner in *ON Semiconductor Corp. v. Power Integrations, Inc.*, No. 1:17-cv-00247-LPS (D. Del.) (the "related Litigation"). Pet. 1–2; Paper 4, 2. The instant Petition was filed concurrently with IPR2018-01814, which challenges claims 1–4, 7, and 13 of the '788 patent, and various petitions filed against U.S. Patent No. 7,456,475 ("the '475 patent"), which is a continuation of the '788 patent. Pet. 1–2, Paper 4, 2–3. The parties are also involved in additional pending IPR proceedings (IPR2018-00160, IPR2018-00165, and IPR2018-00166) involving Patent Owner's other patents. Pet. 1–2, Paper 4, 2–3.

B. The '788 Patent

The '788 patent is titled, "Fault Condition Protection" and discloses an "invention [that] protects a power supply from fault conditions." Ex. 1001, at [54], 1:45–46. Specifically, the circuit of "[t]he power supply has an output and a feedback control loop, the feedback control loop having a feedback signal which cycles periodically when the power supply operates normally and which remains idle when the power supply is in a fault condition." *Id.* at 1:46–51. In sum, the '788 patent describes:

A circuit protects a power conversion system with a feedback control loop from a fault condition. The circuit has an oscillator having an input for generating a signal with a frequency and a timer connected to the oscillator input and to the feedback control loop. The timer disables the oscillator after a period following the opening of the feedback control loop to protect the power conversion system.

Id. at [57].

Figure 1 of the '788 patent, shown below, illustrates a fault condition protection device of the invention. *Id.* at 4:32–33

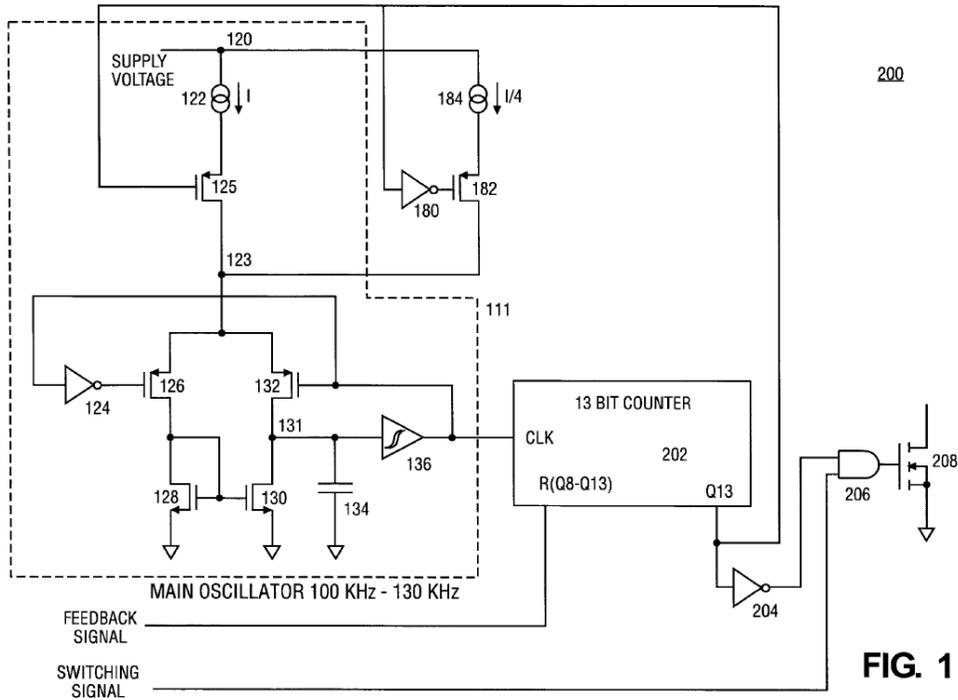


FIG. 1

Figure 1 shows fault protection circuit 200, primary oscillator 111 connected to counter 202, which can be reset by feedback signal to registers Q8–Q13 of counter 202. *Id.* at 4:45–49. The switching signal is derived from the output of oscillator 111 and the feedback signal so that the “switching signal cycles periodically when the power supply operates normally” and “is idled when the power supply encounters a fault condition.” *Id.* at 4:54–60. In that process, AND-gate 206 output is provided to the gate of switching transistor 208 and “[c]ounter 202 eventually causes AND-gate 206 to shut-off switching transistor 208 and to perform auto-restart.” *Id.* at 4:58–60.

Figure 5 of the '788 patent shown below, illustrates a switched mode power supply embodiment of the '788 patent invention. *Id.* at 4:41–42.

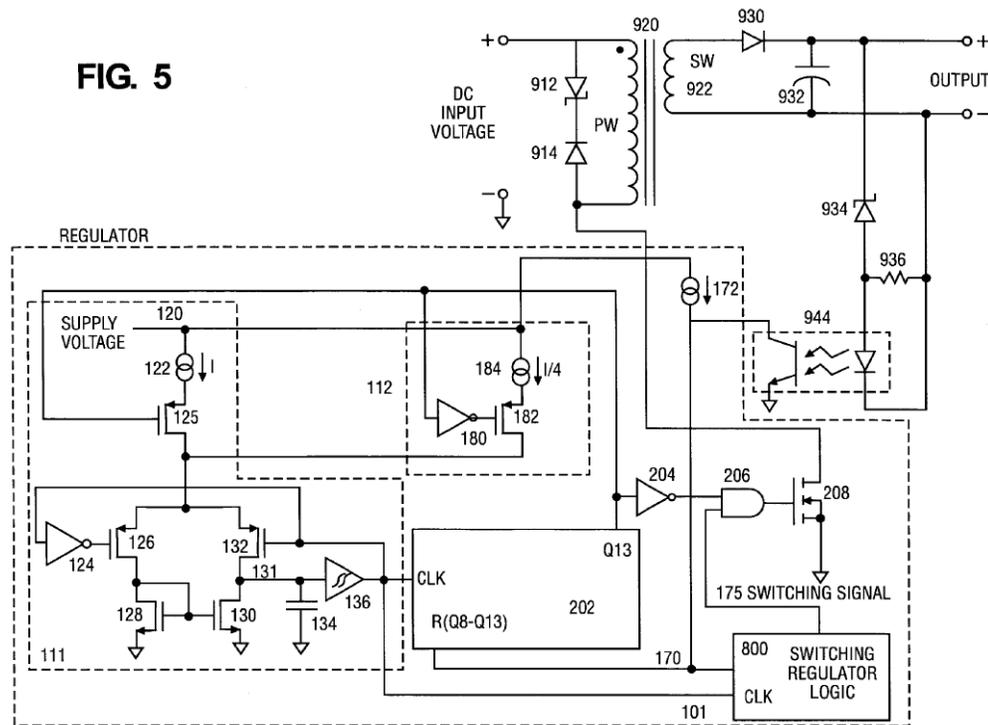


Figure 5 depicts switched mode power supply with a DC input voltage provided to Zener diodes 912–914, which are connected in series across primary transformer winding 920. *Id.* at 7:7–12. Secondary transformer winding 922 is coupled to the primary winding 920. *Id.* The secondary transformer winding 922 provides regulated output. *Id.* at 7:15–18. Zener diode 934 is connected to the regulated output that operates a light emitting diode and opto-isolator 944. The collector of opto-isolator 944 is connected to current source 172 that is provided to switching regulator logic 800. *Id.* at 7:18–28.

In reference to Figures 1 and 5, the '788 patent explains that

[d]uring operation, the feedback signal periodically pulses between a low state and a high state depending on the amount of power required on a secondary winding 922 [shown in Fig. 5]. Every time the feedback signal is low, the feedback signal resets a counter whose states are reflected by outputs Q8-Q13 of

counter 202. The resetting of the counter associated with outputs Q8-Q13 thus occurs regularly when no fault is present in the power supply. The cycling of the feedback signal constantly clears the output bit Q13 such that the power transistor 208 is controlled by the switching signal when no fault is present.

Id. at 5:24–35. The '788 patent further states that when a fault is present, “the feedback signal remains high for a sufficiently long time such that the counter . . . increment[s] output bit Q13,” which causes inverter 204 output to go low, the output of AND-gate 206 to be “deasserted,” which, in turn, disables switching transistor 208. *Id.* at 5:35–42. When counter output bit Q13 goes high, transistor 125 turns off to isolate primary current source 122 from node 123 and reduces the power delivered by the power supply under a fault condition. *Id.* at 5:42–51.

C. Illustrative Claim

Claim 14 is independent, and claims 15–17, 22, and 23 are dependent. Claim 14 (a method claim) is illustrative and reproduced below with bracketed lettering added (Ex. 1001, 8:31–46).

14. [preamble] A method for protecting a power supply from fault conditions, comprising:

[a] switching a switching device in response to a switching signal to control power delivery to an output of the power supply;

[b] timing a feedback signal of a feedback control loop coupled to the output of the power supply to detect whether a fault condition exists in the power supply, [c] the feedback signal cycling periodically between a first state and a second state when the power supply operates normally and remaining idle when the power supply is in a fault condition, the switching signal cycling separately from cycling of the feedback signal; and

[d] disabling the switching device from switching in response to the feedback signal

Ex. 1001, 8:31–46 (bracketed annotations added).

D. Asserted Grounds of Unpatentability

The information presented in the Petition sets forth the following proposed grounds of unpatentability for the challenged claims of the '788 patent (Pet. 15–16, 55):

References	Basis	Claims Challenged
Barbehenn, ¹ King, ² and Grebene ³	35 U.S.C. § 103	14–17, 22, and 23
Krupka ⁴ and Kent ⁵	35 U.S.C. § 103	14–17, 22, and 23

Petitioner also relies on the Declaration of Dr. Vijay Madiseti (Ex. 1002) in support of the Petition.

II. ADMISSION OF EXHIBIT 1032

Petitioner requested the admission of Exhibit 1032, the testimony of Mr. Alex Djenguerian, a named inventor of the '788 patent. Pet. Prelim. Reply 1. Petitioner asserts that the testimony given by Mr. Djenguerian on January 31, 2019, was not available at the time of filing of the Petition, and that good cause for admission of this exhibit exists because the testimony

¹ U.S. Patent No. 5,914,865, issued June 22, 1999 (Ex. 1004, “Barbehenn”).

² U.S. Patent No. 5,694,305, issued Dec. 2, 1997 (Ex. 1005, “King”).

³ Alan B. Grebene, BIPOLAR AND MOS ANALOG INTEGRATED CIRCUIT DESIGN, 1984 (Ex. 1006, “Grebene”).

⁴ U.S. Patent No. 4,413,224, issued Nov. 1, 1983 (Ex. 1008, “Krupka”).

⁵ U.S. Patent No. 4,447,841, issued May 8, 1984 (Ex. 1009, “Kent”).

contradicts Patent Owner's proposed construction and analysis of the prior art. *Id.* Patent Owner opposes, arguing that the testimony is both irrelevant to construction and not inconsistent with Patent Owner's position. PO Resp. to Pet. Reply 1.

Upon review of the parties' arguments, we admit the deposition testimony for the reasons discussed below.

Although Patent Owner cites numerous cases regarding the use of inventor testimony, we find that these cases do not support the *exclusion* of such evidence, but pertain to the weight or import of such testimony to contradict the plain meaning. PO Resp. to Pet. Reply 1–2 (citing, *inter alia*, *Voice Techs Grp., Inc. v. VMC Systems, Inc.*, 164 F.3d 605, 613–14 (Fed. Cir. 1999), *Bell Howell Document Mgmt. v. Altek Sys.*, 132 F.3d 701, 705–06 (Fed. Cir. 1998); *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 983 (Fed. Cir. 1995) (en banc), *aff'd*, 517 U.S. 370 (1996); *Southwall Techs. v. Cardinal IG Co.*, 54 F.3d 1570, 1578 (Fed. Cir. 1995); *Continental Circuits LLC v. Intel Corp.*, Case No. 2018-1076, slip op. 16–17 (Fed. Cir. 2019); *Howmedica Osteonics Corp. v. Wright Medical Tech., Inc.*, 540 F.3d 1337, 1347 (Fed. Cir. 2008)). Indeed, these cases, which discuss the scope of use and weight afforded inventor testimony, especially when asserted to *change* the invention and the claims from the meaning at the time of patenting, do not address whether such evidence is properly admissible. *See, e.g., Southwall Techs.*, 54 F.3d at 1578 (stating that “evidence extrinsic to the patent and prosecution history, such as expert testimony, cannot be relied on to change the meaning of the claims when that meaning is made clear by those documents”).

In sum, we find no direction in the relevant case law to broadly exclude, as Patent Owner requests, inventor testimony directed to claim construction or issues regarding prior art. Indeed, the Federal Circuit has relied on such testimony, and expressly noted it does not disqualify an inventor as a fact witness or exclude the reliance on such testimony. *See Verizon Servs. Corp. v. Cox Fibernet Virginia, Inc.*, 602 F.3d 1325, 1340 (Fed. Cir. 2010) (allowing inventor factual testimony); *Medrad Inc. v. MRI Devices Corp.*, 401 F.3d 1313, 1317 (Fed. Cir. 2005) (using inventor testimony, in part, to reject patent owner’s construction); *Voice Techs. Group*, 164 F.3d at 615–16 (stating that the inventor may provide testimony explaining the claimed invention and its development, but that “the inventor cannot by later testimony change the invention and the claims from their meaning at the time the patent was drafted and granted”).

In the present case, Petitioner asserts that “Mr. Djenguerian’s testimony is offered for the permitted purpose of ‘explain[ing] the technology and what was invented and claimed.’ *Voice Techs. Grp. Inc.*, 164 F.3d at 615.” Pet. Prelim. Reply 2. We also note that the parties have submitted other portions of Mr. Djenguerian’s testimony in IPR2018-00165 and IPR2018-00166, which are related to the present case. *See, e.g.*, IPR2018-00165 (Paper 33 and Paper 34 addressing evidentiary arguments regarding Mr. Djenguerian’s testimony).

The portions of Mr. Djenguerian’s testimony cited by Petitioner do not provide testimony of what the inventor believes the claim terms to mean. *See Ex. 1032*. That is, he is not explicitly testifying about the meaning of any claim limit. Instead, the testimony provides his understanding of what is being shown in various figures and how the devices shown in those figures

operated. *See, e.g., id.* at 146:7–147:15. Based on the present record, we admit Exhibit 1032 for purposes of this Decision to Institute.⁶

III. ANALYSIS

A. Level of Ordinary Skill in the Art

The Petition does not provide a statement regarding the person of ordinary skill in the art related to the '788 patent at the time of filing. Petitioner's declarant opines that an ordinarily skilled artisan "would be a person having a B.S. in Electrical Engineering or a related field with at least two years of experience in designing power electronics, or having an M.S. in Electrical Engineering or a related field." Ex. 1002 ¶ 25. Patent Owner does not contest Petitioner's level of skill. On the record before us and for purposes of this Decision, we adopt Petitioner's declarant testimony regarding the level of ordinary skill in the art with the exception of the "at least" description.⁷

B. Claim Interpretation

The '788 patent is expired. *See* Ex. 1001, [22]; Pet. 13; Prelim Resp. 12. The parties agree that the claim construction principles outlined in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc) apply in

⁶ We draw no conclusions at this time regarding the weight to be given to Mr. Djenguerian's testimony (Ex. 1032). We also note that the decision to admit Exhibit 1032 does not preclude Patent Owner from challenging Ex. 1032 pursuant to 37 C.F.R. §§ 42.64(b)(1) and (c).

⁷ We adopt the level of ordinary skill as articulated by Petitioner, except that we delete the qualifier "at least" to eliminate vagueness as to the amount of practical experience as the qualifier expands the range indefinitely without an upper bound.

this proceeding. Pet. 13; Prelim Resp. 12. For claims of an expired patent, our claim interpretation is similar to that of a district court. *See In re Rambus, Inc.*, 694 F.3d 42, 46 (Fed. Cir. 2012). Moreover, for claims of an expired patent, the Board construes claims to generally have their ordinary and customary meaning, as that meaning would be understood by one of ordinary skill in the art in the context of the entire patent disclosure. *Phillips*, 415 F.3d at 1312–19; *Thorner v. Sony Comput. Entm’t Am. LLC*, 669 F.3d 1362, 1365–66 (Fed. Cir. 2012). “In determining the meaning of the 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) (citing *Phillips*, 415 F.3d at 1312–17). We also consider decisions of other tribunals construing claim terms at issue and give them appropriate weight. *See also* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (“The PTAB will consider prior claim constructions from courts or the ITC, if timely made of record, and give them appropriate weight.”) (amending 37 C.F.R. § 42.100(b) and effective November 13, 2018 for petitions filed thereafter). “[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.” *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

Petitioner proposes that no construction is necessary to resolve the issues in dispute, but criticizes Patent Owner’s proposed constructions in the related Litigation as being overly narrow. Pet. 13–14. Specifically,

Petitioner states that Patent Owner’s proposed construction “of ‘the feedback signal cycling periodically between a first state and a second state when the power supply operates normally’ [limitation] excludes improperly a feedback signal that “var[ies] in an analog fashion.”” *Id.* at 14 (citing Ex. 1025, 2–3; Ex. 1026, 4–5, 7–9, 14–15, 19–20). Petitioner argues that “there is no basis for this proposed exclusion [of signals that continuously vary in an analog fashion]” because “[Patent Owner’s] construction replaces the generic term “cycling” found in the claims with the “specialized narrower term ‘pulsing’” from the ’788 specification. *Id.* (citing Ex. 1025, 2–3; Ex. 1026, 4–5, 7–9, 14–15, 19–20).

Patent Owner informs us that, subsequent to the filing of the Petition, the District Court adopted Patent Owner’s construction for “the feedback signal cycling periodically between a first state and a second state” limitation of claim 14, construing it to mean that “the feedback signal cycles between discrete first and second logic states; i.e. does not continuously vary in an analog fashion.” Prelim. Resp. 12, 15; Ex. 2002, 21–22 (construing claim term). Patent Owner proposes the same construction in this proceeding. *Id.* Patent Owner’s proposed construction relies on the same portion of the ’788 patent specification cited by the District Court (Ex. 2002, 21–22), which states that “[d]uring operation, the feedback signal periodically *pulses* between a low state and a high state depending on the amount of power required on a secondary winding.” Ex. 1001, 5:25–27 (emphasis added); Prelim. Resp. 13. To further support this interpretation, Patent Owner turns to dictionary definitions of the term “pulse,” which is used in the specification (*see* Ex. 2003, Ex. 2004, Ex. 2005), and the functions of two specific embodiments to support its contention that the

feedback signal behaves in a *binary* or discrete state fashion that cycles and excludes signals that continuously vary in an analog fashion. Prelim. Resp. 13–15.

While claims are to be read in view of the specification, of which they are a part, we are admonished not to read limitations from the embodiments in the specification into the claims absent the patent owner acting as lexicographer or absent a clear disavowal of claim scope. *Liebel–Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 904 (Fed. Cir. 2004). In the present case, we note that Patent Owner’s construction as adopted by the District Court appears to limit the claim term based on the specification. Patent Owner relies on the description of “pulsing” from embodiments of the invention to construe “cycling” of the feedback signal as recited in the claims. *See* Ex. 1001, 5:25–27; Prelim. Resp. 13–15; Pet. 13. Patent Owner also argues that Figure 3 of the ’788 patent contrasts “analog signal” 400 with the “binary signal” of feedback signal 402 and that Figure 2 shows an embodiment with a similar “binary” signal. Prelim. Resp. 14.

Patent Owner further argues that it is “fundamental to . . . the inventions [of the ’788 patent] that the feedback signal cycles between discrete first and second states” and the such a feedback signal is ““digital” in nature and does not continuously vary in an analog fashion.” Prelim. Resp. 12; *see id.* at 13–14 (citing Ex. 1001, 4:45–55, 5:25–35, 5:54–59 (discussing Fig. 1), 6:15–54 (discussing Fig 3)).

In the present case, Petitioner argues that the asserted prior art teaches the limitations of claim 14 under either party’s construction. Pet. 14–15. Accordingly, because we agree with Petitioner in this regard, we need not construe this claim term to resolve the present Institution Decision. On the

present record, the parties also have not fully addressed claim construction in light of the District Court’s claim construction opinion issued after the filing of the petition, or the recently admitted inventor testimony (Ex. 1032) discussed above. In light of these issues, and because we agree with Petitioner’s contentions that the asserted prior art teaches the limitations of claim 14 regardless of the construction applied and are obligated to apply the same *Phillips* standard, we adopt the District Court’s construction for purposes of this Institution Decision. Thus, we adopt the District Court’s construction of “the feedback signal cycling periodically between a first state and a second state” limitation of claim 14 to mean that “the feedback signal cycles between discrete first and second logic states; i.e. does not continuously vary in an analog fashion.”⁸ *See* Ex. 2002, 21–22.

Although we are adopting the District Court’s claim construction for purposes of this Institution Decision, this is *not* a final determination and we will reconsider the claim construction based on the entire trial record, including arguments made in the briefs filed after institution. To the extent the parties address the claim construction in those briefs, they may consider addressing the following questions.⁹

The first question is whether a person of ordinary skill in the art would consider “pulses” as used in the description of Figure 5 in the

⁸ The parties should address the claim interpretation of “the feedback signal cycling periodically between a first state and a second state” limitation of claim 14. The parties may discuss any other issues relevant to the construction of this claim in their post-institution briefs.

⁹ This list of topics is not meant to be exhaustive or mandatory. The parties are free to address any issue they feel appropriate.

specification the same as “cycling” as used in claim 14. *Compare* Ex. 1001, 5:25–28 (using “pulses”), *with id.* at 8:30–46 (using “cycling”).

The second question is whether such a modification of the word “pulse” was appropriate. It appears that the District Court and Patent Owner modified the definition of “pulse” for the claim construction. *Compare* Ex. 2002, 22 (“[A] POSA would understand ‘pulse’ to connote ‘a sudden change in state, not gradually decaying over time.’”), *with id.* (construing disputed limitation to mean “the feedback signal cycles between discrete first and second logic states; i.e. does not continuously vary in an analog fashion”).

With respect to the third question, the District Court’s claim construction contains an example of what is not covered. *Id.* The parties should address whether it is appropriate to have a claim construction that contains both a positive construction (“the feedback signal cycles between discrete first and second logic states”) and an example of what the claim construction is not meant to cover (“i.e. does not continuously vary in an analog fashion”).

The fourth question concerns the impact of Mr. Djenguerian’s testimony—which was not before the district court—on the claim construction and whether the examples in the Specification are limited to logic states.

The fifth question concerns the meaning of “does not continuously vary in an analog fashion” and how much variation is allowed without falling outside of the scope of the claim.

C. Principles of Law

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter 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) objective evidence of nonobviousness, i.e., secondary considerations.¹⁰ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

The Supreme Court has made clear that we apply “an expansive and flexible approach” to the question of obviousness. *KSR*, 550 U.S. at 415. Whether a patent claiming the combination of prior art elements would have been obvious is determined by whether the improvement is more than the predictable use of prior art elements according to their established functions. *KSR*, 550 U.S. at 417. Reaching this conclusion, however, requires more than a mere showing that the prior art includes separate references covering each separate limitation in a claim under examination. *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011). Rather, obviousness requires the additional showing that a person of ordinary skill at the time of the invention would have selected and combined those prior art elements in

¹⁰ Patent Owner does not present arguments or evidence of such secondary considerations in its Preliminary Response. Therefore, at this stage, we do not consider secondary considerations as part of our analysis.

the normal course of research and development to yield the claimed invention. *Id.*

D. Asserted Prior Art References

1. Overview of Barbehenn (Ex. 1004)

Barbehenn is a patent titled “Simplified AC-DC Switching Converter with Output Isolation.” Ex. 1004, at [54]. Barbehenn discloses:

a non-linear, limit cycle mode, sometimes called “bang-bang” control. This means that the applied power is either furnished at maximum rate to the load filter, or it is turned off altogether. The control system alternates between these states by utilizing an inhibit connection to the oscillator which supplies the switching signal. By using an optocoupler to generate the inhibit signal, a small voltage variation across the load will turn the oscillator on and off.

Ex. 1004, 1:60–2:2.

Barbehenn provides a circuit diagram of the AC-DC converter of the invention shown in Figure 1 below. *Id.* at 2:38–39.

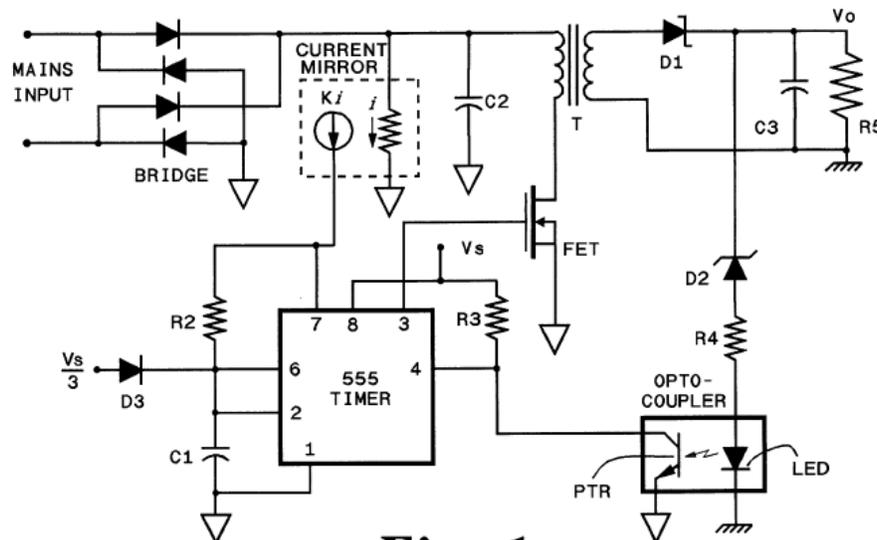


Fig. 1

Figure 1 shows AC mains connected to diode bridge that converts the AC to DC, which is provided to transformer T. *Id.* at 2:50–55. Barbehenn states that R3, R4, opto-coupler, and Zener diode D2 are circuit components of the feedback control loop. *Id.* at 3:29–32. This loop controls power delivered to C3 by varying the voltage on reset pin 4 of the 555 TIMER. *Id.* at 3:31–34. Barbehenn discloses that “[b]y using an opto[-]coupler to generate the inhibit signal, a small voltage variation across the load will turn the oscillator on and off.” *Id.* at 1:67–2:2

2. *Overview of King (Ex. 1005)*

King is a patent titled “Method and Apparatus for Protection of Electronic Circuitry” and discloses a circuit for protecting switching type power supplies from damage during short circuit loads. Ex. 1005, at [54], [57], 2:28–31, 2:50–53. King “employs a first signal representative of the power output of the power supply apparatus or of the power delivered to the load, detection and timer circuits, and circuitry for reducing the power output of the power supply apparatus.” *Id.* at 4:67–5:4. Figure 1, reproduced below, illustrates the components of a switching-type power supply. *Id.* at 5:27–29.

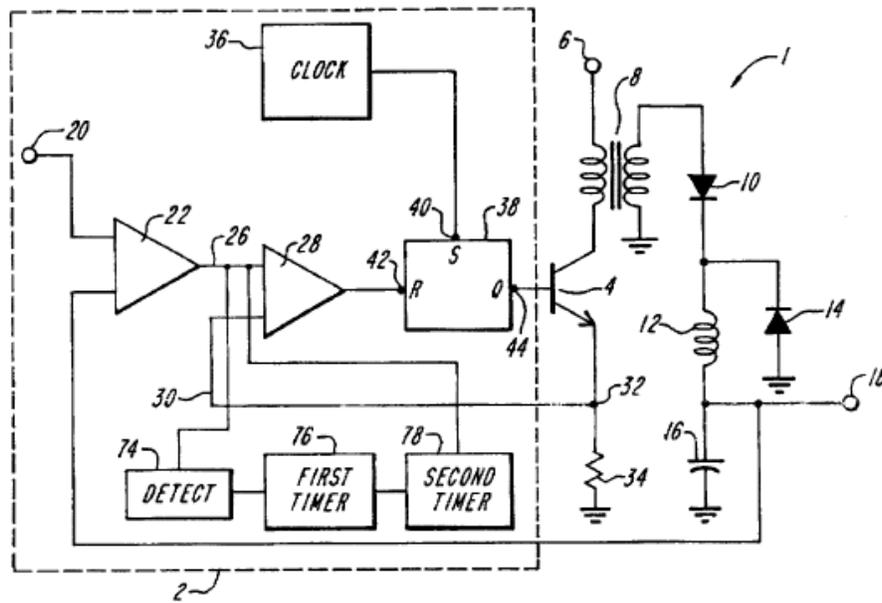


FIG. 1

Figure 1 shows detector 74, first timer 76, and second timer 78. *Id.* at 6:64–7:16. Detection circuit 74 detects potentially damaging voltage or current. *Id.* King discloses using resistors and a capacitor in first timer 76 in response to a fault condition. *Id.* at 7:26–27, 8:11–20. Once a fault is detected, a first timer is started; if the output is excessive for the first period, the first timer initiates a second timer that reduces output of the power supply for a second period of time. *Id.* at 2:61–3:6, 4:6–19, 5:11–15. This cycle repeats if the short circuit re-occurs. *Id.* at 7:39–55.

3. Overview of Grebene (Ex. 1006)

Grebene is a textbook entitled “Bipolar and MOS Analog Integrated Circuit Design.” Ex. 1006, 2. Grebene shows the circuitry of the “industry standard” 555 timer. Ex. 1006, 32–33, Fig. 11.45. The 555 timer is expressly referenced in Barbehenn (Ex. 1004, Fig. 1) and King (Ex. 1005, Fig. 5, 8:21–23).

The voltage regulation is achieved by application of a sample of output voltage 14 to the voltage detection circuit 9, the output of which (generally being a digital output) is applied as signal 2 to AND-gate 3. A logic ZERO on the control signal 2 signifies that the voltage is of the predetermined voltage whereas a logic ONE means a drop of output voltage and thus a voltage value below the predetermined value. The AND-gate 3 passes driving pulses from pulse generator 1 as long as the control signal 2 is in logic ONE, i.e. as long as the output voltage is lower than desired. The pulses activate the switching device 7 via pulse driver means 5, resulting in a commutation of the inductor 8 for charge/discharge, resulting in an increase of the output voltage until the predetermined value is attained, changing the control signal 2 to logic ZERO, thus closing the regulation loop providing the desired voltage output at 15-16.

Id. at 3:7–23.

5. Overview of Kent (*Ex. 1009*)

Kent is a patent titled “Overcurrent Protection Circuit for a Multiple Output Switching Power Supply and Method Therefor.” *Ex. 1009*, at [54]. Kent discloses a circuit for use in switching power supplies when a short circuit or overload in an output circuit is detected. *Id.* at [57]. When a threshold is reached “the power supply is switched off and then on again during the cycling of a low frequency oscillator until the short or overload is removed in order to maintain the average power through the output circuit at a safe level.” *Id.*; *see also id.* at 7:32–63, 8:15–66, Figs. 2, 3.

E. Obviousness Based on Barbehenn, King, and Grebene

Petitioner argues that Barbehenn, King, and Grebene would have rendered claims 14–17, 22, and 23 obvious to a person of ordinary skill in the art under 35 U.S.C. § 103. *Pet.* 15–56; *see also Ex. 1002* ¶¶ 51–62, 97–129.

With respect to a motivation to combine the references, Petitioner argues that an ordinarily skilled artisan would have been motivated to combine the bang-bang architecture of Barbehenn with King, and Barbehenn and King with Grebene. Pet. 17–24. Specifically, Petitioner argues that the application of the short circuit output scheme of King to Barbehenn’s switching converter is application of a known technique to a known device that would yield predictable results. *Id.* at 19 (noting that both references relate to switching power converters). It was also well known in the art, Petitioner contends, that power supplies need protection from fault conditions. *Id.* (citing Ex. 1002 ¶¶ 53–60). In addition, Petitioner provides evidence that a person of ordinary skill in the art would understand that Barbehenn could be modified to include King’s fault protection circuit. Pet. 20–22; Ex. 1002 ¶¶ 58–60.

With respect to Grebene, Petitioner asserts that a person of ordinary skill in the art would have been motivated to combine Barbehenn and King with Grebene (Ex. 1006, 13–24, 32–38), which includes sections on switching regulators, 555 timers and their CMOS equivalents, based on the express references to those well-known 555 timers in Barbehenn (Ex. 1004, 3:24–27, Fig. 1) and King (Ex. 1005, 8:21–23, 9:8–9, Figs. 5 and 6). Pet. 23–24.

Petitioner provides evidence, argument, and a claim chart mapping the limitations of claim 14 to the teachings of Barbehenn, King, and Grebene. Pet. 25–48. With respect to limitation 14[a], the switching device, Petitioner argues that Barbehenn discloses a power supply protected from fault conditions with a switching device, identifying the FET coupled to receive a switching signal from the 555 timer shown in Barbehenn’s Figure 1. *Id.*

at 25–28; Ex. 1002 ¶¶ 99–101. For limitation 14[b], the timer coupled to the switch and that receives a feedback signal from a feedback control loop, Petitioner provides an annotated Figure 1 from Barbehenn showing the 555 timer with a switching signal, a feedback signal connected to the output, and the switching FET. *Id.* at 28–30; Ex. 1002 ¶ 103. Petitioner argues that the opto-coupler shown in Barbehenn is the same structure disclosed in Figure 4 of the '788 patent and provides a similar feedback signal from the output to the 555 timer. Pet. 29–30; Ex. 1002 ¶¶ 104. Petitioner further argues that King discloses the details of the 555 timer that shows operation of Barbehenn's feedback signal to the 555 timer and discloses the same timing capacitor structure disclosed in the '788 patent. Pet. 31–36; Ex. 1002 ¶¶ 106–109.

For limitation 14[c], which recites that “the feedback signal cycling periodically between a first state and a second state when the power supply operates normally and remaining idle when the power supply is in a fault condition, the switching signal cycling separately from cycling of the feedback signal,” Petitioner argues that Barbehenn discloses receiving a feedback signal representative of the output V_o (i.e., representing a comparison between V_o and a threshold level). “In combination with King, a POSITA would have understood that during normal operation, V_o would repeatedly cycle between a value above and below the threshold.” Pet. 39 (citing Ex. 1002 ¶ 112; Ex. 1004, 4:5–13, Figs. 2, 3). Petitioner argues that Barbehenn teaches two discrete states via the opto-coupler, which is expressly described to function as a “comparator, rather than as a linear transfer-function device.” Pet. 39–40 (quoting Ex. 1004, 4:14–17). Petitioner also provides evidence and argument that Barbehenn's opto-

coupler provides a feedback signal voltage that conducts current when above a threshold and does not conduct when below. Pet. 40–41; Ex. 1002 ¶¶ 114–117.

In light of Barbehenn, Petitioner further contends that it was widely known in the art that digital circuitry voltages fall into ranges which indicate discrete states as opposed to continuous analog variation. Pet. 41; Ex. 1002 ¶ 116. Because “Barbehenn’s feedback signal cycles between two discrete states representing V_o either above or below the threshold and pin 4 of the 555 timer interprets the feedback signal as logic high or low. [Ex. 1004, 3:29–42],” Petitioner argues that “the combination teaches and discloses a feedback signal with discrete first and second logic states that does not continuously vary in an analog fashion.” Pet. 42 (citing Ex. 1002 ¶ 82). Furthermore, Petitioner argues that Barbehenn teaches the feedback signal remains idle as required in claim limitation 1[c]. Pet. 41–42; Ex. 1002 ¶ 118.

Finally, Petitioner provides argument and evidence that the timer of Barbehenn and King disables the switching device as recited in claim limitation 1[d]. Pet. 45–48. Petitioner asserts that Barbehenn and King disclose a timer that is coupled to receive feedback and disables the switch to prevent power delivery to the output based on the feedback signal. Pet. 47–48; Ex. 1002 ¶¶ 123–124.

Patent Owner argues that “Barbehenn’s feedback loop does not provide a digital feedback signal that periodically cycles between a first and second feedback state during normal operation” as recited in claim limitation 14[c], because “Barbehenn’s feedback input . . . is a continuously varying analog voltage that is representative of the real time magnitude of the power

supply output.” Prelim. Resp. 24 (emphasis omitted); Ex. 1004, 3:29–67. Moreover, Patent Owner asserts that Petitioner errs in “assert[ing] that ‘the voltage at pin 4 of the 555 timer is either logic high or low.’” Prelim. Resp. 24–25 (quoting Pet. 39 (citing Ex. 1004, 3:29–42, 4:29–31)). Patent Owner further argues that because the voltage ranges discussed in Barbehenn’s feedback at pin 4 of the 555 timer vary across regions of operation of the threshold of the opto-coupler, which include an “on,” “off,” and “threshold” region, Barbehenn does not disclose two logic signals (high and low), but instead shows varying analog voltage at pin 4 that varies above and below the threshold. Prelim. Resp. 25–26; Ex. 1004, 3:29–32, 3:44–4:4. In sum, Patent Owner asserts that Barbehenn’s feedback signal is an analog signal having a varying voltage, which is excluded by the claim construction. *See id.*

The parties dispute whether the opto-coupler signal to the 555 timer is a “feedback signal cycles between discrete first and second logic states; i.e. does not continuously vary in an analog fashion” as the claim limitation is construed. At this stage, Petitioner has provided sufficient evidence that that opto-coupler of Barbehenn “cycle[s] between discrete first and second logic states,” because Barbehenn describes the opto-coupler as comparator that causes the reset voltage on the 555 timer to vary back and forth between the ON and OFF regions. Ex. 1004, 4:14–17, 4:29–31; *see* Pet 38–44.

Patent Owner argues that the varying voltage on pin 4 indicates that the signal varies in an analog fashion. Prelim. Resp. 25–26. On this limited record, however, we find Petitioner’s evidence and argument persuasive that the opto-coupler has a narrow threshold region and functions as a *comparator* rather than a linear-transfer-function device in a conventional

pulsewidth modulation converter. Pet. 40; Ex. 1004, 4:14–27. This supports Petitioner’s argument that a person of ordinary skill in the art would have understood that the receiving circuit, such as the 555 timer, interprets the signal as having two discrete states that do not continuously vary in an analog fashion. Pet. 40–41; Ex. 1002 ¶¶ 115–117; Ex. 1028, 473. Thus, we do not agree with Patent Owner’s arguments that the signal has to be a “digital signal that pulses between two—and only two—discrete logic states” (Prelim. Resp. 27), as the claim language requires a signal cycling between discrete first and second logic states that does not vary in an analog fashion and is not expressly required to be “digital.” On the record before us, Petitioner has provided sufficient evidence at this stage that it would prevail in showing that Barbehenn and King teach limitation 14[c].

Patent Owner also argues that Barbehenn, King, and Grebene fail to teach a feedback signal “remaining idle when the power supply is in a fault condition” because Barbehenn does not discuss fault conditions. Prelim. Resp. 27–30. Patent Owner’s arguments focus on Barbehenn’s lack of disclosure for fault conditions. *Id.*

Petitioner’s arguments, however, assert that Barbehenn in combination with King teaches the fault condition that would yield Barbehenn operating continuously below the threshold and remaining idle. Pet. 20–22 (discussing the combination of Barbehenn and King for short circuit protection), 42–43; Ex. 1002 ¶¶ 58–59, 117–118. Accordingly, Patent Owner’s arguments directed to Barbehenn alone are inapposite. *See In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986) (citation omitted) (“Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a

combination of references.”); *In re Keller*, 642 F.2d 413, 425 (CCPA 1981) (citations omitted) (“The test for obviousness is not whether . . . the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.”).

Therefore, on the present record, we find that Petitioner has provided sufficient evidence that it would prevail in showing that Barbehenn, King, and Grebene teach “remaining idle when the power supply is in a fault condition” as recited in claim 14.

Additionally, with regard to the limitations not disputed by Patent Owner at this time, we determine, for the reasons stated in the Petition and discussed above, Petitioner has sufficiently shown for the purpose of institution that the cited prior art teaches those limitations.

Finally, Patent Owner asserts that a person of ordinary skill in the art would not have been motivated to combine Barbehenn and King in the manner Petitioner asserts. Prelim. Resp. 30–35. We disagree with Patent Owner that Barbehenn’s lack of reference to detecting or preventing faults or design indicates that it does not require any fault protection. *Id.* at 30–31. Petitioner provides articulated reasoning based on Barbehenn’s teachings regarding protection from high input voltages and well known output faults. Pet. 17 (citing Ex. 1002 ¶ 53; Ex. 1005, Abstract, 2:37–49, 6:42–49; Ex. 1009, 1:13–23, 3:26–51; Ex. 1010; Ex. 1015; Ex. 1016, 5:7–27; Ex. 1018, 6; Ex. 1020, Abstract, 1:22–65; Ex. 1028, 316, 341).

With respect to the modification and design choices, Patent Owner argues that Petitioner has not shown Barbehenn’s design choices are insufficient or demonstrated why a skilled artisan would have plucked

King’s short circuit protection from many well-known fault protection solutions for use with Barbehenn. Prelim. Resp. 31–32. Patent Owner argues that “Petitioner’s analysis does not specify exactly what [well known fault protection] techniques were or why a POSITA would have chosen the specific technique disclosed in King to solve the purported problem.” *Id.* (citing *Commerce Bancshares, Inc. v. Intellectual Ventures II LLC*, IPR2014-00793, slip op. at 13–14 (PTAB Dec. 1, 2014) (Paper 7)).

We disagree. The Board’s decision in *Commerce Bancshares* rejected Petitioner’s argument that expressly relied on the references to obtain the invention of the challenged claims, and found the testimony failed to provide sufficient explanation or citation to objective evidence. *See Commerce Bancshares*, Paper 7, at 13–14. However, unlike in *Commerce Bancshares*, Petitioner has provided sufficient argument and evidence from the references and the knowledge of skilled artisans regarding fault protection circuits to demonstrate articulated reasoning and rationales to combine the references. *See* Pet. 16–24; *see id.* at 6–10 (discussing well known fault protection).

We also do not agree with Patent Owner that there is no logical reason to employ Petitioner’s specific modification. Prelim. Resp. 34–35. On this record, we find sufficient Petitioner’s argument that combines King’s fault protection circuit with the teachings of Barbehenn. *See* Pet. 16–24; Ex. 1002 ¶¶ 53–62.

Based on the foregoing, we determine that Petitioner’s arguments and evidence are sufficient on this preliminary record to show a reasonable likelihood Petitioner would prevail in demonstrating the unpatentability of independent claim 14. *See* Pet. 24–48.

We have reviewed Petitioner's argument and evidence that Barbehenn, King, and Grebene teach the limitations of dependent claims 15–17, 22, and 23. Pet. 49–56. Patent Owner does not address separately Petitioner's challenges to the dependent claims. Based on the preliminary record before us, we also find that Petitioner's argument and evidence are sufficient to show a reasonable likelihood Petitioner would prevail in proving unpatentability of dependent claims 15–17, 22, and 23. Pet. 49–56.

F. Obviousness Based on Krupka and Kent

Petitioner provides argument and evidence in support of its contentions that Krupka and Kent would have rendered claims 14–17, 22, and 23 obvious. Pet. 55–90; Ex. 1002 ¶¶ 130–141, 174–203.

Petitioner provides argument and analysis that a skilled artisan would have “been motivated to combine Krupka and Kent to apply the known output short-circuit fault protection technique of Kent to Krupka's switching power converter.” Pet. 58. Specifically, Petitioner asserts that the protection circuit of Kent is applicable to the problem of fault protection using a zener diode addressed in Krupka. *See* Pet. 56–58; Ex. 1008, 4:3, Fig. 2; Ex. 1009, 1:19–23. Petitioner also argues that it was well known that switching power supplies required fault protections, and that one of ordinary skill in the art would have been motivated to look to Kent to provide techniques to protect Krupka. Pet. 56–59; Ex. 1002 ¶ 137. Petitioner also asserts that it is within the knowledge of a skilled artisan to modify Krupka to include Kent's fault protection circuit. Pet. 59–62; Ex. 1002 ¶¶ 139–141.

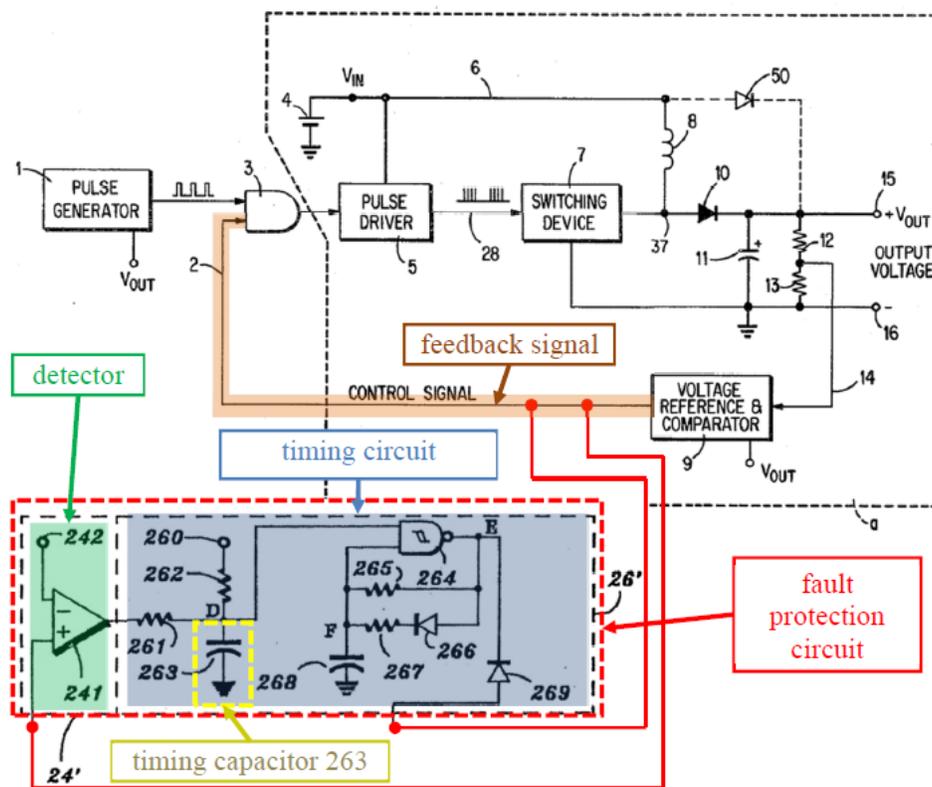
With respect to the limitations of claim 14, Petitioner provides argument, evidence, and claim charts supporting its assertions that Kent and

Finally, Petitioner asserts that Krupka and Kent teach the timer-disabling limitation 14[d] based on the combination of the timing circuit of Kent modifying the feedback signal circuit of Krupka. Pet. 80–82.

Patent Owner contends that “Krupka’s feedback loop does not provide a digital feedback signal that periodically cycles between first and second feedback states during normal operation.” Prelim. Resp. 37. Patent Owner further argues that Petitioner’s feedback loop is misidentified as the control signal of Figure 1, when input signal 14 is the proper feedback that is a continuously varying analog voltage that represents the real time output of the power supply. Prelim. Resp. 37–38. Because Krupka never calls control signal 2 of Figure 1 a feedback signal, Patent Owner argues control signal 2 cannot be mapped to the feedback signal of the challenged claims. *Id.* (citing Ex. 1008, 3:7–23). Indeed, Patent Owner asserts that the only use of the term “feedback” refers to “feedback resistor” used as an input to voltage detector circuit 9, which corresponds to input signal 14 of Figure 1 and not control signal 2. *Id.* (citing Ex. 1008 2:3–5; 3:58–63). Patent Owner contends that because “feedback signal” commonly refers to comparison to a reference input signal, the proper feedback signal includes feedback circuitry and input line 14. Prelim. Resp. 37–39 (citing Ex. 1008 3:7–10, Fig. 1). Thus, according to Patent Owner, the appropriate feedback signal from the feedback circuit (i.e. the signal 14 input to voltage detection circuit 9) shows that Krupka’s feedback input is a continuously varying analog voltage that is representative of the real time magnitude of the power supply output. *Id.* at 39–40 (Ex. 1008, 2:58–59).

We are persuaded, on this record, that control signal 2 in Figure 1 of Krupka teaches the feedback signal of the challenged claims. Pet. 68–70,

75–80. Patent Owner’s restriction to the input signal 14 based on general references to feedback systems being used to compare inputs (Prelim. Resp. 38–39 (citing Ex. 2006, 11)) are not availing, because Patent Owner’s general references do not necessarily apply to the feedback systems of the challenged claims. Instead, we are persuaded, on this record, by Petitioner’s arguments and evidence that rely on the combination of Krupka and Kent, which show the timing circuitry of Kent coupled to the feedback signal (control signal 2) of Krupka. Pet. 69–71, 83–86. Petitioner’s annotated figure combining Krupka and Kent below illustrates the combination Petitioner asserts.



The combination of Krupka and Kent shown in reference to limitation 14[b] identifies the timing circuit connected to the feedback signal of Krupka [highlighted in brown] and subsequently to switching device 7 by AND-gate

3. Pet. 70–71; *see* Ex. 1002 ¶ 182; Ex. 1008, Fig. 1; Ex. 1009, Fig. 2, 7:25–31, 7:32–39, 7:64–68, 9:14–17. Patent Owner’s argument does not address Petitioner’s combination. Patent Owner’s assertion that limits the feedback signal to input line 14 arbitrarily removes voltage detection circuit 9 and its output (control signal 2) upon which Petitioner expressly relies in the combination of references. *See* Prelim. Resp. 38–39; Pet. 60–62, 79–80. Accordingly, we are persuaded on this preliminary record by Petitioner’s evidence and argument that the feedback signal in the combination of Krupka and Kent teaches the limitations of claim 14[c].

With respect to the limitation 14[c] requirement to remain idle in a fault condition, we disagree with Patent Owner’s contention that Krupka’s control signal 2 cannot satisfy this requirement because Krupka, which the Petition solely relies on, does not disclose a relationship between idling of a control signal and a fault condition. *See* Prelim. Resp. 40. Petitioner provides sufficient evidence and argument that the combination of Krupka and Kent, which discloses fault conditions, teaches the operation of the feedback signal remaining high when a fault is detected. Pet. 61–62; Ex. 1002 ¶ 140; *see also* Pet. 79. Thus, we do not agree that Petitioner relies solely on Krupka’s control signal 2. Patent Owner’s arguments based solely on Krupka do not address the combination of Kent’s fault protection circuit with Krupka’s power switch circuit and control signal 2 that Petitioner asserts in the motivation to combine. *See* Pet. 61–63, 79. Accordingly, we find that Petitioner has shown that Krupka and Kent teach the limitation for the feedback signal “remaining idle when the power supply is in a fault condition” as recited in limitation 14[c]. *See Merck*, 800 F.2d at 1097; *Keller*, 642 F.2d at 425.

Patent Owner also asserts that Petitioner has failed to show why an ordinarily skilled artisan would have combined Kent and Krupka, which Patent Owner asserts are two incongruous references directed to different objectives. Prelim. Resp. 43. Patent Owner argues that Krupka’s fleeting reference to an “overvoltage protection device” is not sufficient motivation, that Krupka makes no mention of fault conditions, and that Krupka has no need for Kent’s complicated circuitry to protect against faults. *Id.* at 43–44. Further, Patent Owner argues Krupka’s low voltage operating environment differs from Kent’s and implements sufficient fault protection design choices. *Id.* at 45.

With respect to the modification and design choices, Patent Owner argues that Petitioner has not shown Krupka’s design choices are insufficient or demonstrated why particular aspects of Kent’s circuitry could be incorporated into Krupka over other well-known fault protection solutions. Prelim. Resp. 45–46. “Because Petitioner’s analysis does not specify exactly why a POSITA would have chosen the specific technique disclosed in Kent to solve Krupka’s fault protection problem,” Patent Owner argues that Petitioner’s “motivation to combine [Krupka and Kent] should be rejected.” *Id.* at 47 (citing *Commerce Bancshares, Inc.*, slip op. at 13–14).

We disagree. The Board’s decision in *Commerce Bancshares* rejected Petitioner’s argument that expressly relied on the references to obtain the invention of the challenged claims, and found the testimony failed to provide sufficient explanation or citation to objective evidence. *See Commerce Bancshares*, Paper 7, at 13–14. However, unlike in *Commerce Bancshares*, Petitioner has provided sufficient argument and evidence from the references and the knowledge of skilled artisans regarding fault protection circuits to

demonstrate articulated reasoning and rationales to combine the references. *See* Pet. 55–62; *see id.* at 6–10 (discussing well known fault protection).

We also do not agree with Patent Owner that there is no logical reason to employ Petitioner’s specific modification. Prelim. Resp. 47–49. On this record, we find sufficient Petitioner’s argument that combines Kent’s fault protection circuit including detector with the control signal output from Krupka’s circuit 9 based on Krupka’s operation and Kent’s approach to timers for fault protection. *See* Pet. 61–62; Ex. 1002 ¶¶ 138–140.

Moreover, Patent Owner argues that

to the extent there would have been any motivation to employ the fault detection scheme disclosed in Kent, it would have been to compare Krupka’s actual feedback signal (i.e. the analog signal 14 input to voltage detection circuit 9) to a threshold and to determine whether or not that signal exceeds the threshold for a predetermined period of time

Prelim. Resp. 48–49. Patent Owner’s admission that Krupka could employ Kent’s fault detection scheme supports that there are different design choices available to an ordinarily skilled artisan for the combination of Krupka and Kent. *See id.* However, that does not change the fact that Petitioner has persuasively argued that a different design choice could be used. *Cf.*

Unwired Planet, LLC v. Google Inc., 841 F.3d 995, 1002 (Fed. Cir. 2016) (“It does not matter that the use of alphabetical order for locations would not always result in farther-over-nearer ordering. It is enough that the combination would sometimes perform all the method steps, including farther-over-nearer ordering.”) (citing *Hewlett-Packard Co. v. Mustek Sys., Inc.*, 340 F.3d 1314, 1326 (Fed. Cir. 2003)). Accordingly, at this stage,

Petitioner presents sufficient and persuasive arguments and evidence supporting the motivation to combine and modify Krupka and Kent.

Additionally, with regard to the limitations not disputed by Patent Owner at this time, we determine, for the reasons stated in the Petition and discussed above, Petitioner has sufficiently shown for the purpose of institution that the cited prior art teaches those limitations.

Based on the foregoing, we determine that Petitioner's arguments and evidence are sufficient on this preliminary record to show a reasonable likelihood Petitioner would prevail in proving unpatentability of independent claim 14.

We have reviewed Petitioner's arguments and evidence with respect to the asserted obviousness of claims 15–17, 22, and 23 over Krupka and Kent. Pet. 82–90. Patent Owner does not address separately Petitioner's challenges to these dependent claims. Based on the preliminary record before us, we find that Petitioner's argument and evidence are sufficient to show a reasonable likelihood Petitioner would prevail in proving unpatentability of dependent claims 15–17, 22, and 23.

IV. CONCLUSION

For the foregoing reasons, we determine that the information presented establishes a reasonable likelihood that Petitioner would prevail in showing that at least one claim of the '788 patent is unpatentable.

At this preliminary stage, we have not made a final determination with respect to the patentability of the challenged claims or *any* underlying factual and legal issues.

V. ORDER

Accordingly, it is

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 14–17, 22, and 23 of U.S. Patent No. 6,337,788 B1 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 U.S. Patent No. 6,337,788 B1 shall commence on the entry date of this Order, and notice is hereby given of the institution of a trial.

IPR2018-01815
Patent 6,337,788 B1

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