

# United States Court of Appeals for the Federal Circuit

2008-1117, -1165

LINEAR TECHNOLOGY CORPORATION,

Appellant,

v.

INTERNATIONAL TRADE COMMISSION,

Appellee,

and

ADVANCED ANALOGIC TECHNOLOGIES,

Intervenor.

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ADVANCED ANALOGIC TECHNOLOGIES, INC.,

Appellant,

v.

INTERNATIONAL TRADE COMMISSION,

Appellee,

and

LINEAR TECHNOLOGY CORPORATION,

Intervenor.

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Appealed from: United States International Trade Commission

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On appeal from the United States International Trade Commission in  
Investigation No. 337-TA-564.

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DECIDED: May 21, 2009

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Before MAYER, LOURIE, and SCHALL, Circuit Judges.

SCHALL, Circuit Judge.

Linear Technology Corporation (“Linear”) filed a complaint with the United States International Trade Commission (“the Commission”) under section 337 of the Tariff Act of 1930, 19 U.S.C. § 1337(a)(1)(B), alleging that Advanced Analogic Technologies, Inc. (“AATI”) imported and/or sold for importation certain electronic voltage regulators that infringe U.S. Patent No. 6,580,258 (“the ’258 patent”). See *In re Certain Voltage Regulators, Components Thereof and Products Containing Same*, 71 Fed. Reg. 14,545 (Int’l Trade Comm’n Mar. 22, 2006) (“Notice of Investigation”). Linear now appeals the Commission’s final determination, ruling that certain AATI imported voltage regulators do not infringe asserted claims 2, 3, 34, and 35 of the ’258 patent and that claim 35 is invalid as anticipated by a device made by Maxim Integrated Products, Inc. (“the MAX782”). In re Certain Voltage Regulators, No. 337-TA-564, slip op. (Int’l Trade Comm’n Oct. 19, 2007) (“Final Determination”). In addition, AATI cross-appeals the Commission’s ruling that one of its imported voltage regulators infringes asserted claims 2, 3, and 34 and that asserted claims 2, 3, and 34 are not invalid as anticipated. Id. For the reasons stated in this opinion, we affirm-in-part, reverse-in-part, vacate-in-part, and remand.

## BACKGROUND

### I

Linear is the owner of the '258 patent. The '258 patent is titled “Control Circuit and Method for Maintaining High Efficiency Over Broad Current Ranges in a Switching Regulator Circuit.” The '258 patent is a continuation of U.S. Patent No. 5,481,178 (“the '178 Patent”) of the same title. See '258 patent. The '258 patent describes voltage regulators, which “provide a predetermined and constant output voltage to a load from a poorly-specified and fluctuating input voltage source.” Id. col.1 ll.24–27. In other words, because an input source—such as a battery—may supply either an unstable voltage or a voltage level not usable by a device—such as a laptop computer—a voltage regulator changes the input voltage level to an output voltage level that is both stabilized and at a level usable by the device. More specifically, the '258 patent is directed to switching-type voltage regulators that, “[b]ecause of their improved efficiency[,] . . . are typically employed in battery-operated systems such as portable and laptop computers and hand-held instruments.” Id. col.2 ll.3–6.

The switching voltage regulators described in the '258 patent employ a switch that provides power to a device using “pulses” of current from the input source, rather than a steady stream of power or current. See id. col.1 ll.29–43. The switch is formed by two transistors<sup>1</sup> connected to the input source, e.g., a battery. Id. fig.2, items 16 & 17. The switch creates current pulses by alternatively turning the two transistors on and off—when the top transistor is on, the bottom transistor is off, and vice versa—called

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<sup>1</sup> A transistor is a semiconductor component used in an electronic circuit. It can act like an electronic switch, either allowing or preventing current passage through it.

synchronous switching. See, e.g., id. col.1 ll.29–43; id. col. 7 ll.48–51. Because the switch is either OFF—when the input source provides no power to the device—or ON—when the input source provides only a small amount of power with a small current “pulse”—switching regulators generally “result[ ] in reduced amounts of power dissipation.” Id. col.1 ll.56–62.

While switching voltage regulators generally improve efficiency and battery life, efficiency nonetheless decreases under certain operating conditions, such as during “low output current.” Id. col.2 ll.3–18. Thus, to accomplish higher efficiency, the ’258 patent proposes two improvements that are pertinent to this appeal. In the first improvement, the ’258 patent describes a “sleep mode,” where additional power is saved, thereby increasing efficiency, by maintaining the regulated output voltage using only the electrical charge in a capacitor.<sup>2</sup> See id. col.2 ll.40-50; col.6 ll.43–55. Because the regulated output voltage is maintained by a capacitor, rather than the input power source (e.g., a battery), the device “does not consume power from the input power source.” Id. col.2 ll.47–49. The second improvement increases efficiency by preventing “reverse current” situations. See, e.g., id. col.14 l.14-col.15 l.10. In “reverse current” situations, efficiency is decreased because power is drawn from the load device back into the voltage regulator circuitry and eventually dissipated. See id. col.14 ll.62–67. Thus, otherwise usable power is not used by the load device, but is instead “wasted.”

AATI manufactures a variety of electronic components and products. Linear instituted a section 337 action against AATI, alleging that numerous AATI voltage regulator products imported or sold for importation infringe the asserted claims of the

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<sup>2</sup> A capacitor is a component used in electronic circuits that can store an electric charge.

'258 patent. The parties agreed to designate four representative AATI voltage regulator products: the AAT1143, AAT1146, AAT1151, and AAT1265. Linear alleged that all four accused products infringe claims 2, 3, and 34, which cover an apparatus and method for implementing the above described "sleep mode" of operation. The asserted "sleep mode" claims, as well as claim 1 from which claims 2 and 3 depend, are reproduced below:

1. A circuit for controlling a switching voltage regulator, the regulator having (1) a switch coupled to receive an input voltage and including a pair of synchronously switched switching transistors and (2) an output for supplying current at a regulated voltage to a load which includes an output capacitor, the circuit comprising:

a first circuit for monitoring the output to generate a first feedback signal;

a second circuit for generating a first control signal during a first state of circuit operation, the first control signal being responsive to the first feedback signal to vary the duty cycle of the switching transistors to maintain the output at the regulated voltage; and

a third circuit for generating a second control signal during a second state of circuit operation to cause both switchin[g] transistors to be OFF for a first period of time during which the output capacitor maintains the output substantially at the regulated voltage.

2. The circuit of claim 1 wherein the second control signal is generated in response to the first feedback signal.

3. The circuit of claim 2 wherein the circuit changes from the second to the first state of operation in response to the magnitude of the first feedback signal falling below a first threshold level.

34. A method for controlling a switching voltage regulator, the regulator having (1) a switch coupled to receive an input voltage and including a pair of synchronously switched switching transistors and (2) an output for supplying current at a regulated voltage to a load which includes an output capacitor, the method comprising the steps of:

(a) monitoring the output to generate a first feedback signal;

(b) varying the duty cycle of the switching transistors in response to the first feedback signal to maintain the output at the regulated voltage during a first state of circuit operations;

(c) turning both switching transistors OFF for a first period of time following the first state of circuit operation so as to allow the output capacitor to maintain the output substantially at the regulated voltage by discharging during a second state of circuit operation; and

(d) turning at least one of said switching transistors ON to recharge the output capacitor following the second state of circuit operation.

Id. col.16 ll.40–67; col.18 l.57–col.19 l.10.

In addition, Linear alleged infringement of claim 35 by AATI's AAT1143 and AAT1146. Claim 35 purportedly covers the above-described "reverse current" protection and reads as follows:

35. A circuit for controlling a switching voltage regulator, the regulator having (1) a switch coupled to receive an input voltage and including a pair of synchronously switched switching transistors and (2) an output for supplying current at a regulated voltage to a load which includes an output inductor, the circuit comprising:

a first circuit for monitoring the output to generate a first feedback signal;

a second circuit for generating a first control signal during a first state of circuit operation, the first control signal being responsive to the first feedback signal to vary the duty cycle of the switching transistors to maintain the output at the regulated voltage; and

a third circuit for monitoring the current to the load to generate a second control signal during a second state of circuit operation to cause one of said switching transistors to be maintained OFF when the magnitude of the monitored current falls below a current threshold.

Id. col.19 l.11–col.20 l.15.

On May 22, 2007, the Administrative Law Judge ("ALJ") to whom the investigation was assigned issued an Initial Determination ("ID"), finding that AATI did not violate section 337, either because its accused products do not infringe the asserted claims or because asserted claim 35 is invalid. In re Certain Voltage Regulators, No. 337-TA-564, slip op. (Int'l Trade Comm'n May 22, 2007) ("Initial Determination"). Subsequently, Linear petitioned the Commission for review. On July 24, 2007, the



Commission decided to review certain portions of the ID—specifically, relating to claim construction, infringement, and validity of the '258 patent.

Upon review, the Commission modified the ALJ's construction of several disputed claim limitations and reversed the holding that the AAT1143 does not infringe claims 2, 3, and 34. See, e.g., Final Determination, slip op. at 43, 80. The Commission, however, sustained the ALJ's ID in all other respects. Specifically, the Commission held that (1) all of the other accused products—the AAT1146, AAT1151, and AAT1265—do not infringe claims 2, 3, 34, and 35; (2) claims 2, 3, and 34 are not anticipated by a reference entitled “Application Note 35—Step Down Switching Regulators” (“AN35”); and (3) claim 35 is invalid as anticipated by the MAX782 product. See, e.g., id. at 80. The Commission declined to address indirect infringement. Based upon its rulings, the Commission “exclude[d] from entry for consumption into the United States AATI’s voltage regulators that infringe one or more of claims 2, 3, and 34 of the '258 patent.” Id. at 80. Linear has timely appealed, and AATI has cross-appealed, the Commission’s rulings regarding claim construction, infringement, and validity. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(6).

## DISCUSSION

### I

Before addressing infringement and validity, we must first turn to the parties’ arguments about the Commission’s claim constructions. Claim construction is a question of law that we review de novo. Finnigan Corp. v. Int’l Trade Comm’n, 180 F.3d 1354, 1362 (Fed. Cir. 1999).

A. “switch . . . including a pair of synchronously switched switching transistors”

The first disputed claim construction concerns the language “switch . . . including a pair of synchronously switched switching transistors,” which appears in claims 2, 3, 34, and 35. The Commission construed this language according to the explicit definition in the '258 patent to mean “a switch including two switching transistors that are driven out of phase to supply current at a regulated voltage to a load.” Final Determination, slip op. at 15. Because the Commission construed this limitation in accordance with the express definition in the '258 patent's specification, both Linear and the Commission argue that the Commission's construction is correct. AATI, however, contends that, because a single control signal controls both switching transistors, the proper construction requires “a switch that includes a pair of transistors connected for complementary switching and controlled as a single unit.”

Because the Commission construed this limitation according to the definition in the specification, the Commission's construction—“a switch including two switching transistors that are driven out of phase to supply current at a regulated voltage to a load”—is correct. See, e.g., 3M Innovative Props. Co. v. Avery Dennison Corp., 350 F.3d 1365, 1374 (Fed. Cir. 2003) (providing a definition in the specification controls the meaning of the term). As pointed out by the Commission and Linear, this construction is consistent with the definition in the '258 patent's specification, which reads “[a]s used herein, the term ‘synchronously-switched switch’ refers to a switch including two switching transistors that are driven out of phase to supply current at a regulated voltage to a load.” '258 patent col.7 ll.48–51. Thus, we see no error in the

Commission's construction of the language "switch . . . including a pair of synchronously switched switching transistors."

B. "second circuit" and "third circuit"

We now turn to the "second circuit" and "third circuit" limitations, which appear in apparatus claims 2, 3, and 35, but not method claim 34. The Commission modified the ALJ's initial construction because the ALJ "too narrowly construed the asserted claims as requiring that the 'second' and 'third' circuits be entirely distinct without common circuit elements, that every element in the second circuit be completely distinct from every element in the third circuit, and as precluding shared use of the same circuitry by the 'second' and 'third' circuits of the asserted sleep mode claims." Final Determination, slip op. at 46. Accordingly, the Commission found that "even a difference such as having an additional [component] can cause the circuits to be different and distinct in their topology and their operation." Id. AATI does not appear to take issue with allowing the second and third circuits to differ by merely including an additional component, but instead contends that the proper construction requires that the additional component must "participate[ ] in performing the claimed function." More specifically according to AATI, the additional component in the "third circuit" must at least help perform the function of that circuit and cannot be an arbitrary component, which is unrelated to the function of the "third circuit." In contrast, both Linear and the Commission advocate that the Commission's construction is correct.

We agree with the Commission's construction of "second circuit" and "third circuit," defining the terms broadly to not require entirely separate and distinct circuits. Indeed, there is nothing in the claim language or specification that supports narrowly

construing the terms to require a specific structural requirement or entirely distinct “second” and “third” circuits. Rather, the “second” and “third” circuits must only perform their stated functions. For example, what is required is that the “second circuit” “generat[es] a first control signal . . . to vary the duty cycle,” not that any particular components make up this circuit. ’258 patent col.16 ll.48–52. In fact, the ’258 patent’s specification expressly discloses that the “second circuit” and “third circuit” can share common components. For example, figure 2 shows that components of the “second circuit”—such as the reference circuit **37**—can also be part of the “third circuit.” See id. fig.2 (disclosing that the reference circuit **37** sends a signal to the hysteretic comparator **74**, which can be a part of the “third circuit for generating a second control signal”). Accordingly, we think the terms “second circuit” and “third circuit” should be accorded their full scope. See, e.g., Home Diagnostics, Inc. v. LifeScan, Inc., 381 F.3d 1352, 1358 (Fed. Cir. 2004) (“Absent a clear disavowal or contrary definition in the specification or the prosecution history, the patentee is entitled to the full scope of its claim language.”); Linear Tech. Corp. v. Impala Linear Corp., 379 F.3d 1311, 1320 (Fed. Cir. 2004) (construing the term “circuit” in the parent ’178 patent of this case and acknowledging that the term is normally recognized broadly as “the combination of a number of electrical devices and conductors that, when interconnected to form a conducting path, fulfill some desired function”); cf. In re Translogic Tech., Inc., 504 F.3d 1249, 1257–58 (Fed. Cir. 2007) (construing “input terminals coupled to receive” without a specific structural requirement because “the claim terms [did] not specify any structural connection for the input terminals . . . and the . . . figures show[ed] no structural connection for the input terminals . . . or the control input terminals”).

Moreover, AATI does not contest that the “second circuit” and “third circuit” can contain overlapping components. Rather, it advocates that the distinct component must aid in the function of the claimed circuit.<sup>3</sup> As pointed out by the Commission, however, the claim language itself mandates that the components comprising the claimed second and third “circuits” must aid in the claimed function—e.g., the “third circuit” must “cause both switching transistors to be OFF.” ’258 patent col.16 ll.53–57. Thus, because the claim language already requires the components to aid in the circuit’s function, AATI’s proposed additional language is unnecessary. See, e.g., Linear Tech., 379 F.3d at 1320 (construing the nearly identical claim limitations “second circuit” and “third circuit” of the ’178 patent, although under § 112 ¶ 6 analysis, to not require additional structural clarification because the “limitations . . . are accompanied by . . . language [in the claims] reciting their respective objectives or operations”). The Commission did not err in its construction of the “second circuit” and “third circuit” limitations.

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<sup>3</sup> In particular, AATI argues that the Commission’s construction is erroneous because it allowed “a difference such as having an additional ZC comparator” to distinguish the second and third “circuits.” Final Determination, slip op. at 46 (a comparator is an electronic device that can compare two voltages or currents and subsequently output a signal to indicate which is larger). Accordingly, AATI apparently does not contest that the second and third circuits can generally be distinguished by an additional component, if that component aids in the function of the claimed circuit. In contrast, AATI takes specific issue with identifying the “ZC comparator” as the distinguishing component because, according to AATI, it does not aid in the function of the “third circuit”—namely, causing both switching transistors to be OFF. This argument—whether the ZC comparator aids in the function of the third circuit—however, is one of AATI’s noninfringement positions and does not impact our claim construction analysis. See Int’l Rectifier Corp. v. IXYS Corp., 361 F.3d 1363, 1369 (Fed. Cir. 2004) (“Although IXYS’s arguments on claim construction often conflate with its arguments on infringement, we address these issues separately, turning first to claim construction.”).

C. “a second control signal . . . to cause both transistors to be OFF”

AATI also contests the Commission’s construction of the language “a second control signal . . . to cause both transistors to be OFF,” which is required by claims 2 and 3, but not method claim 34. The Commission construed this language as “broad enough to cover a signal which causes, or ultimately results in, both switching transistors being OFF.” Final Determination, slip op. at 50. AATI argues that the proper construction of this language requires “the third circuit [to] produce[ ] a signal whose transition necessarily leads to both transistors being OFF,” “without the intervention of any other independently-generated signal.” According to AATI, this is because including “ultimately results in” removes the concept of “causation” and, therefore, is contrary to the claim language itself. Linear and the Commission defend the current construction, contending that the language, and in particular “cause,” was correctly given its broad ordinary meaning—to make happen, to result in, requiring neither a “direct” nor immediate cause.

We hold that the Commission properly construed the limitation “a second control signal . . . to cause both transistors to be OFF” as requiring the second control signal to neither directly cause both transistors to be OFF nor be entirely distinct from the first control signal. The ’258 patent’s specification does not indicate that the “second control signal” must directly cause both transistors to be OFF. Indeed, a direct causation requirement—without the intervention of other signals or components—would be nearly unworkable to articulate or ascertain. Also, such a requirement would allow an accused infringer to evade infringement by merely identifying an intermediary signal or component that allegedly breaks the “chain of causation.” Cf. Resonate Inc. v. Alteon

Websys., Inc., 338 F.3d 1360, 1365 (Fed. Cir. 2005) (“The patentee’s . . . choice not to specify a transmission path from the server to the client” did not require direct transmission to the client because “such a rule likely would prove unworkable.”). In addition, such a requirement would be contrary to the specification, which in fact discloses components that are located between the generation of the second control signal and the switching transistors. See, e.g., ’258 patent fig.2. Tellingly, in construing the nearly identical, but more restrictive, claim limitations of the parent ’178 patent, we held that “to cause both switching transistors to be simultaneously OFF for a period of time” should not be construed to include a narrow causation requirement. See Linear Tech., 379 F.3d at 1324 (holding that the district court construed the limitations too narrowly “because simultaneously merely requires a condition to exist at the same time or concurrently,” “encompasses the simultaneous state of both switching transistors being disabled or held off,” and “does not require the switching transistors to be turned off or disabled at the same instant”).

Nor does the specification indicate that the “second control signal” must be entirely distinct from the claimed “first control signal.” In fact, the specification discloses the contrary—that a portion of the “first control signal” impacts whether the “second control signal” turns both transistors OFF. Indeed, figure 2 discloses that the signal from hysteretic comparator **74** in combination with the signal **25A** from constant off time one-shot circuit **25**—part of the disclosed “first control signal” that “var[ies] the duty cycle of the switching transistors”—“cause[s] both switching transistors to be OFF.” See, e.g., ’258 patent fig.2; id. col.6 ll.38–55. Thus, the patent shows that the first control signal can be a part of the second control signal, precluding a requirement that

the two control signals must be entirely distinct. The Commission's construction of "a second control signal . . . to cause both transistors to be OFF" is correct.

D. "first state of circuit operation" and "second state of circuit operation"

We now reach the parties' dispute concerning the claim limitations "first state of circuit operation" and "second state of circuit operation," which are required by claims 2, 3, 34, and 35. The Commission construed these terms to mean "that the first state of operation can be linked to high load currents, and the second state can be linked to low load currents, although the states of operation do not necessarily have to be linked to a high or low load current." Final Determination, slip op. at 24. AATI contends that the "first state" should "occur[] at high load currents," while the "second state" should "occur[] only at low load currents." AATI argues that its construction is supported by the '258 patent's specification and by statements Linear made in prosecuting similar claims in the parent '178 patent. Linear and the Commission contend that the current constructions of these terms are correct, arguing that neither the specification of the '258 patent nor the prosecution history of the parent '178 patent clearly disavow any claim scope.

We decline to disturb the Commission's constructions of "first state of circuit operation" and "second state of circuit operation." While the '258 patent specification provides examples and embodiments where the "first state of circuit operation" may occur at high load currents and the "second state of circuit operation" may occur at low load currents, there is no "clear intention to limit the claim scope using 'words or expressions of manifest exclusion or restriction,'" which is necessary to further narrow the claim language. Liebel-Flarsheim Co. v. Medrad, Inc., 358 F.3d 898, 906 (Fed. Cir.



2004) (quoting Teleflex, Inc. v. Ficosa N. Am. Corp., 299 F.3d 1313, 1327 (Fed. Cir. 2002)); see also Brookhill-Wilk 1, LLC v. Intuitive Surgical, Inc., 334 F.3d 1294, 1301 (Fed. Cir. 2003) (“Absent a clear disclaimer of particular subject matter, the fact that the inventor anticipated that the invention may be used in a particular manner does not limit the scope to that narrow context.”). We have repeatedly held that, even in situations when only one embodiment is disclosed, the claims generally should not be narrowed to cover only the disclosed embodiments or examples in the specification. See, e.g., Liebel-Flarsheim, 358 F.3d at 906 (“Even when the specification describes only a single embodiment, the claims of the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope . . . .”); Brookhill-Wilk 1, 334 F.3d at 1301 (“The statements from the description of the preferred embodiment are simply that—descriptions of a preferred embodiment . . . [which] do not indicate that the invention can only be used in such a manner.”). In fact, the ’258 patent specification discloses situations contrary to AATI’s suggested construction—operating in the “first state of circuit operation” at low load currents. For example, at low load current levels when the output capacitor has fully discharged—thus being incapable of maintaining the regulated voltage—the “first mode of circuit operation” is initiated to “vary the duty cycle of the switching transistors” in order to turn the top transistor **16** ON long enough to “recharge” the output capacitor. See, e.g., ’258 patent col.9 l.63–col.10 l.10.

Nor do the statements made during prosecution of the parent ’178 patent evince a “clear and unmistakable’ disavowal of claim scope that would compel a result different than the claim language.” ResQNet.com, Inc. v. Lansa, Inc., 346 F.3d 1374, 1383 (Fed. Cir. 2003). As an initial matter, the statements made in the prosecution of

the parent '178 patent do not remotely relate to the “first state of circuit operation” and, as such, do not narrow this limitation, as urged by AATI. See, e.g., id. (finding no “clear and unmistakable” disavowal of claim scope where the prosecution history of the parent patent did not address the same claim limitations); Advanced Cardiovascular Sys., Inc. v. Medtronic, Inc., 265 F.3d 1294, 1305-06 (Fed. Cir. 2001) (declining to construe a term more narrowly based on the parent patent’s prosecution history because common claim terms were not in dispute). Moreover, while the prosecution history of the '178 patent does mention “low output current levels,” it neither “clearly and unmistakably” addresses the “second state of circuit operation” nor limits that state to occurring only at low output load current. See, e.g., ResQNet.com, 346 F.3d at 1383; Advanced Cardiovascular Sys., 265 F.3d at 1305–06. Indeed, the claim amendments do not “clearly and unmistakably” modify “the second state of circuit operation,” but instead more directly address claim language not disputed in this case. In addition, the amendments do not “clearly and unmistakably” limit the second mode to operating at only low load currents. Rather, the amendments address when the second mode is activated—specifically, when the current to the load falls lower than a predetermined threshold. In other words, the amendments specify entering the second state when the load current drops below some value in comparison to a threshold value—a value that could be relatively high or low. Thus, the amendments and statements in the parent '178 patent are plainly different than the limitations in AATI’s proposed construction.

In any event, the remainder of the claim language that modifies the “first state” and “second state” of circuit operations clearly describes the terms. See, e.g., Linear Tech., 379 F.3d at 1324 (looking to the other portions of the claim language in finding

that further narrowing of a limitation was unnecessary). In particular, the claim language states with specificity that the “first state of circuit operation” corresponds to when the duty cycle of the switching transistors is varying “to maintain the output at the regulated voltage.” ’258 patent col.16 ll.50–52. Similarly, the claim language clarifies that the “second state of circuit operation” corresponds to when the “output capacitor maintains the output substantially at the regulated voltage.” Id. col.16 ll.55–57; see id. col.2 ll.42–46; id. col.6 ll.4–8 (“when the voltage at output is capable of being maintained substantially at the regulated voltage by the charge on the output capacitor”). We therefore affirm the Commission’s claim construction of the “first state” and “second state” of circuit operation.

E. “monitoring the current to the load”

Lastly, we address the Commission’s ruling regarding the “monitoring the current to the load” limitation in claim 35. See ’258 patent col. 20 ll.9–14 (“a third circuit for monitoring the current to the load to generate a second control signal during a second state of circuit operation to cause one of said switching transistors to be maintained OFF”). During its infringement analysis, the Commission excluded “monitoring voltage” from meeting this limitation. Final Determination, slip op. at 51–53. In effect, because a device can indirectly monitor current by monitoring voltage, the Commission limited the “monitoring current” limitation to instances of directly monitoring current. Thus, although the Commission did not explicitly address the “monitoring current” limitation under its claim construction section, it effectively construed the limitation. We thus address the parties’ dispute regarding this limitation as a claim construction issue. See, e.g., Board of Regents of Univ. of Tex. Sys. v. BenQ Am. Corp., 533 F.3d 1362, 1367 (Fed. Cir.

2008) (treating the parties' dispute over a limitation as a claim construction issue because the district court "effectively construed the claim phrase" in its summary judgment order). Linear argues that the exclusion of indirectly monitoring current is incorrect, arguing that the '258 patent's specification and Ohm's Law<sup>4</sup> support the proposition that "monitoring the current to the load" in claim 35 can be accomplished either directly or indirectly. In response, AATI contends that the Commission properly rejected Linear's reliance on Ohm's Law and, thus, correctly found that monitoring current could not include monitoring a voltage.

We agree with Linear that the Commission improperly narrowed this claim limitation to exclude indirectly monitoring current through the measurement of voltage. The claim limitation does not state directly monitoring current. Rather, it simply reads "monitoring the current to the load." '258 patent col. 20 ll.9–10. As such, this limitation should be accorded a scope commensurate with the '258 patent's specification. See, e.g., Tegal Corp. v. Tokyo Electron Am., Inc., 257 F.3d 1331, 1342 (Fed. Cir. 2001) (construing a limitation broadly based on the specification). In this case, the '258 patent not only discloses monitoring current directly by using a current comparator, see, e.g., id. col.14 ll.43–61, but also indirectly by some other means. Explicitly, the specification states that "other means of detecting current reversals in the inductor current could be used as well," id. col.15 ll.1-10, including "generating a feedback signal indicative of current reversal in inductor current . . . (see, e.g., resistor R<sub>sense</sub> in Fig. 7)," id. col.15 ll.8-10 (emphases added). Generating a feedback signal based on resistor R<sub>sense</sub>

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<sup>4</sup> Ohm's Law is a principle of electrical circuits and is represented by the equation  $I$  (current) =  $V$  (voltage) /  $R$  (resistance). Thus, it states that the current through a conductor between two points is directly proportional to the voltage across the two points, and inversely proportional to the resistance between them.

measures the voltage across resistor  $R_{\text{sense}}$ , therefore indirectly “indicat[ing] [] current reversal in inductor current” by measuring voltage. Thus, the ’258 patent expressly contemplates indirectly monitoring current by using a voltage measurement as a proxy. Moreover, once voltage is known, one skilled in the art would recognize that Ohm’s Law easily allows current to be calculated, therefore monitoring current indirectly by monitoring voltage. Without support for limiting this limitation as it did, we think the Commission interpreted this limitation incorrectly when it excluded the accused devices. See, e.g., Cohesive Tech., Inc. v. Waters Corp., 543 F.3d 1351, 1367–68 (Fed. Cir. 2008) (“[I]t is not appropriate for the court to construe a claim solely to exclude the accused device.”). Thus, because there is no basis in the patent specification for adding the negative limitation—excluding monitoring voltage—we hold that the Commission erred in construing this limitation. See, e.g., Omega Eng’g, Inc. v. Rayteck Corp., 334 F.3d 1314, 1323 (Fed. Cir. 2003) (“Our independent review of the patent document reveals . . . there is no basis in the patent specification for adding the negative limitation.” (citations omitted)). In contrast to the Commission’s ruling, this limitation can encompass monitoring voltage to indirectly monitor current.

In sum, we affirm the Commission’s claim construction of “switch . . . including a pair of synchronously switched switching transistors”; “second circuit” and “third circuit”; “a second control signal . . . to cause both transistors to be OFF”; and “first state of circuit operation” and “second state of circuit operation.” Regarding “monitoring the current to the load” in claim 35, however, we disagree with the Commission’s narrow construction; we hold that this limitation can be satisfied by monitoring voltage to indirectly monitor current.

## II

Having determined the proper construction of the disputed claim limitations, we now turn to the Commission's infringement rulings regarding the "sleep mode" claims. The Commission's findings regarding infringement are questions of fact, which we review under the substantial evidence standard. See 19 U.S.C. § 1337(c); 5 U.S.C. § 706(2)(E); Finnigan, 180 F.3d at 1361–62. "Substantial evidence' has been defined as 'more than a mere scintilla' and as 'such relevant evidence as a reasonable mind might accept as adequate to support a conclusion.'" Honeywell Int'l, Inc. v. Int'l Trade Comm'n, 341 F.3d 1332, 1338 (Fed. Cir. 2003) (quoting Consol. Edison Co. v. NLRB, 305 U.S. 197, 229 (1938)). To prove infringement, a patentee must show "that a defendant has practiced each and every element of the claimed invention," and may do so by relying on either direct or circumstantial evidence. See, e.g., BMC Res., Inc. v. Paymentech, L.P., 498 F.3d 1373, 1380 (Fed. Cir. 2007); Liquid Dynamics Corp. v. Vaughan Co., 449 F.3d 1209, 1219 (Fed. Cir. 2006). "A method claim is directly infringed only by one practicing the patented method." Joy Techs., Inc. v. Flakt, Inc., 6 F.3d 770, 775 (Fed. Cir. 1993).

For clarity, we proceed with our infringement analysis of the "sleep mode" claims by separately discussing the several accused devices. The parties' dispute focuses on the limitations: "switch . . . including a pair of synchronously switched switching transistors"; "second circuit" and "third circuit"; "a second control signal . . . to cause both transistors to be OFF"; and "first state of circuit operation" and "second state of circuit operation." However, because AATI's infringement arguments regarding the "switch . . . including a pair of synchronously switched switching transistors" limitation in

all asserted claims rely entirely on its proposed claim construction, which we have already rejected, we have no need to further address this limitation.

A. AAT1143 device

We first address the AAT1143 accused device, which the Commission found to infringe all of the asserted “sleep mode” claims—namely, claims 2, 3, and 34. AATI argues that the Commission’s infringement finding is not supported by substantial evidence because various claim limitations are not met. AATI contends that the “second circuit” and the “third circuit” limitations are not satisfied because the component identified by the Commission that distinguishes the two “circuits”—the ZC comparator circuitry—plays no role in the claimed function of the “third circuit.” In addition, AATI argues that the “second control signal . . . to cause both switching transistors to be OFF” limitation is not met because the second control signal identified by the Commission—the CMP signal—does not “cause” both transistors to be OFF. Linear and the Commission assert that the Commission properly found claims 2, 3, and 34 infringed.

We hold that there is substantial evidence supporting the Commission’s finding that the AAT1143 device infringes claims 2 and 3. This evidence consists of circuit schematics, graphs of the device in operation, and explanatory expert testimony. We therefore affirm the Commission’s ruling in this regard. Concentrating on the disputed limitations, there is substantial evidence that the AAT1143 operates in a “first mode” and “second mode” of circuit operation.<sup>5</sup> Substantial evidence indicates that the

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<sup>5</sup> As a reminder, the claim language describes the “first state of circuit operation” as corresponding to when the duty cycle of the switching transistors is varying “to maintain the output at the regulated voltage,” ’258 patent col.16 ll.50–52,

AAT1143 operates in two modes of operation—one when the switching transistors are synchronously switching to maintain the output voltage, and the other when both transistors are OFF maintaining the output voltage using an output capacitor (i.e., “sleep mode”). Indeed, AATI does not contend that the AAT1143 does not go into a “sleep mode,” as it seemingly acknowledges that “at high load current levels, the switching transistors of the accused products sometimes happen to switch alternately, while at low load current levels there can be a time period when both switching transistors happen to be OFF.” AATI’s Reply Br. 71-72. Rather, AATI arguments focus on limitations not required by the claims and rely on proposed claim constructions that we have already rejected.

Regarding the “second circuit” and “third circuit” limitations, as well as the “a second control signal . . . to cause both switching transistors to be OFF” limitation, AATI does not contest how the AAT1143 device actually operates. Rather, it argues that the AAT1143 does not infringe under its proposed narrow claim constructions. Under the correct claim constructions, however, the presence of these limitations in the AAT1143 is supported by substantial evidence. As explained by expert testimony and supported by circuit schematics, the ZC comparator circuitry distinguishes the claimed “third circuit” from the claimed “second circuit” and aids in the function of the “third circuit”—namely, causing both switching transistors to be OFF. Thus, under the proper claim

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and the “second state of circuit operation” as corresponding to when the “output capacitor maintains the output substantially at the regulated voltage” while both switching transistors are OFF, *id.* col.16 ll.55-57. We have left undisturbed the Commission’s construction of these terms, requiring neither the first state of circuit operation to necessarily be linked to high load current nor the second state of circuit operation to necessarily be linked to low load current.



construction, there is substantial evidence that the “second circuit” and “third circuit” limitations are satisfied.

Similarly, under the correct construction, there is substantial evidence that the “second control signal” causes “both switching transistors to be OFF.” According to the circuit schematics, documents, and expert testimony, the CMP signal in the AAT1143 device—acknowledged as the “second control signal”—turns the top transistor OFF. Turning the top transistor OFF consequently and necessarily causes the ZC comparator circuitry to output a ZC signal, which then shuts the bottom transistor OFF and causes the AAT1143 to maintain the regulated voltage using the output capacitor. Thus, because the CMP signal turns the top transistor OFF, which sequentially and necessarily causes the ZC signal to turn the bottom transistor OFF, there is substantial evidence that the AAT1143 has a second control signal to cause both transitions to be OFF.

AATI argues that Linear admits that the CMP signal—i.e., the “second control signal”—does not directly turn OFF both transistors. AATI’s argument, however, relies again on a claim construction that we have already rejected. Indeed, the correct construction does not require the “second control signal” to directly cause both transistors to shut OFF. Rather, according to the correct construction—neither requiring direct causation nor precluding the use of intermediary signals or components—the CMP signal nonetheless “causes” both transistors to be OFF.

Turning now to method claim 34, the substantial evidence discussed above regarding the AAT1143’s operation similarly supports that the limitations of this claim are also satisfied. AATI contends, however, that there is not substantial evidence that

AATI actually practiced the claimed method, which is required to prove infringement of a method claim. Contrary to AATI's contentions, substantial evidence supports that it actually practiced the claimed method and, therefore, infringed claim 34. For example, there is testimony that AATI tested all of the accused products and generated voltage output graphs, as well as documentation and charts evidencing this testing. As such, we affirm the Commission's finding that the AAT1143 infringes claim 34.

For the foregoing reasons, there is substantial evidence that the AAT1143 infringes claims 2, 3, and 34. Accordingly, we affirm the Commission's finding of infringement of these claims.

B. AAT1146 device

We now address the second accused product, the AAT1146 device. Despite the fact that the AAT1146 is extremely similar to the AAT1143, the Commission found that the AAT1146 does not infringe claims 2, 3, and 34. Linear urges that, mainly because of the extreme similarity between AAT1143 and AAT1146, not only is the Commission's finding of noninfringement unsupported by substantial evidence, but that we should find infringement in its favor. Conversely, AATI and the Commission support the Commission's noninfringement finding, arguing that Linear failed to show that the AAT1146—although having similar components to the AAT1143—functions in the same way as the AAT1143.

We agree with Linear regarding the AAT1146. The Commission's finding of noninfringement is not supported by substantial evidence. Indeed, the evidence of record compels a finding of infringement of claims 2, 3, and 34 by the AAT1146. We

therefore reverse the Commission's ruling and hold that the AAT1146 infringes claims 2, 3, and 34.

As far as claims 2 and 3 are concerned, in addition to testimony and documentation specific to how the AAT1146 operates, there is substantial evidence that the AAT1146 is nearly identical to the AAT1143—whose infringement is supported by substantial evidence. In particular, both the AAT1143 and AAT1146 are 400mA step-down converters and share the identical circuit schematic. In addition to independent graphs and tests demonstrating two states of operation—one when the transistors are synchronously switching and the other during a “sleep mode”—there was testimony that the AAT1146 functions almost identically to the AAT1143 with respect to each claim limitation. Importantly, it is undisputed that the AAT1146 has CMP circuitry and ZC circuitry, which, as in the case of the AAT1143 device, cause both transistors to be OFF. Indeed, one of the only apparent differences between the two accused devices is that the AAT1146 is capable of switching the two transistors at a higher frequency (i.e., 1.4MHz compared to the 1MHz), which is irrelevant to the claims.

Substantial evidence likewise supports finding that the method of claim 34 is practiced using the AAT1146 device. That evidence consists of testimony of AATI testing, as well as voltage output graphs and documentation and charts evidencing this testing. Not only do we think that the finding that the AAT1146 infringes claim 34 is supported by substantial evidence, but we have difficulty discerning the Commission's rationale for its decision to the contrary. Specifically, although the Commission stated that the AAT1146 does not infringe apparatus claims 2 and 3 because the product lacks the requisite “third circuit” limitation, a finding we have rejected above, it simultaneously

emphasized that method claim 34 does not require such a limitation. Final Determination, slip op. at 46 (“[T]he ALJ appears to have erred in interpreting claim 34 as requiring second and third circuits and first and second control signals.”). In other words, the Commission apparently found that the absence of this limitation in the AAT1146 device did not support a finding of noninfringement with respect to claim 34. At the same time, the Commission apparently found all of the required claim limitations present in the AAT1146. Id. at 44–46. However, it decided, without identifying a missing claim limitation, that the AAT1146 does not infringe claim 34. Id. at 51.<sup>6</sup>

For the foregoing reasons, the Commission’s decision is not supported by substantial evidence. We reverse its determination that the AAT1146 does not infringe claims 2, 3, and 34 and hold that it does infringe those claims.

#### C. AAT1151 and AAT1265 devices

As the last infringement ruling regarding claims 2, 3, and 34 of the ’258 patent, the Commission found that the AAT1151 and AAT1265 do not infringe. Concerning claims 2 and 3, despite admitting that the AAT1151 and AAT1265 do not contain the ZC comparator circuitry, Linear contends that it sufficiently identified other circuitry that maintains the two transistors OFF. Thus, according to Linear, it presented sufficient evidence showing that the “third circuit” claim limitation is met and, therefore, the Commission’s finding is not supported by substantial evidence. Linear makes an

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<sup>6</sup> The Commission’s noninfringement finding concerning claim 34 is noted in an opinion from the Office of Unfair Import Investigations (“OUII”). Resp. of OUII to Complainant’s Pet. for Recons. of the Comm’n’s Final Determination, In re Certain Voltage Regulators, No. 337-TA-564 (Int’l Trade Comm’n Oct. 16, 2007) (“This section of the Opinion discusses six claim elements, but only elements (1), (2), and (3) are identified as relevant to claim 34, and the opinion explicitly states that these claim [ ] limitations are met by the AAT1146 . . . .”).

additional argument specific to claim 34—that the Commission’s opinion is internally inconsistent and provides no explanation why the AAT1151 and AAT1265 do not infringe other than the absence of the “third circuit” limitation, which undisputedly is not required by claim 34.

In response, the Commission and AATI argue that Linear made the same argument below as it makes on appeal—an argument the Commission correctly rejected. Specifically, the Commission and AATI point out that it is undisputed that both the AAT1151 and the AAT1265 devices lack the ZC comparator circuitry. Next, they contend that the other circuitry identified by Linear does not meet the required “third circuit” limitation.

Because there is substantial evidence that neither the AAT1151 nor the AAT1265 meet the “third circuit” limitation, we affirm the Commission’s finding of noninfringement with regards to claims 2 and 3. As noted, Linear concedes that neither accused product contains the ZC comparator circuitry of the AAT1143 or AAT1146, which “causes” both transistors to be OFF. In contrast, Linear argues that the CLK circuitry in the AAT1151 and the STPCLK circuitry in the AAT1265 cause both transistors to be OFF. As pointed out by the Commission, however, not only did Linear fail to provide specified testimony explaining how the CLK and STPCLK circuits meet the claim limitations, there was also substantial evidence and testimony expounding that those circuits were operably different from the ZC circuitry in marked ways. In short, in addition to the absence of particularized evidence of infringement, there is evidence that the CLK and STPCLK signals have nothing to do with the “third circuit.” We therefore

affirm the Commission's finding that the AAT1151 and AAT1265 do not infringe claims 2 and 3.

At the same time, however, we think the Commission's finding that the AAT1151 and AAT1265 do not infringe claim 34 is internally inconsistent and not supported by substantial evidence. We therefore vacate its finding of noninfringement with regard to claim 34.

As pointed out by Linear, the Commission first noted that method claim 34 was broader than apparatus claims 2 and 3—namely, that method claim 34 “simply does not contain the limitations of ‘a second circuit for generating a first control signal . . .’ and ‘a third circuit for generating a second control signal.’” Final Determination, slip op. at 46. Thus, the Commission stated that it was erroneous to “interpret[ ] claim 34 as requiring second and third circuits and first and second control signals.” In addition, the Commission also stated that all of the accused products had two different states of circuit operation. Id. at 45. Inconsistently, on that same page the Commission ruled that the AAT1265 does not infringe claim 34 because it does not have “two separate states of operation.”<sup>7</sup> Id. Other than this contradictory statement, the Commission failed to provide any further rationale explaining why the AAT1265 does not infringe

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<sup>7</sup> Attempting to explain this paradox, the Commission argues that it did not find “two separate states of operation” present in the AAT11265 because Linear failed to assert in its Review Brief to the Commission that the AAT1265 in fact met this limitation. Instead, according to the Commission, Linear solely argued that the AAT1143, AAT1146, and AAT1151 contained “two separate states of operation.” It is quite apparent, however, that Linear did not specifically mention the AAT1265 as meeting this limitation because the ALJ's ID did not specifically find this limitation missing from the AAT1265 device. Initial Determination, slip op. at 55-56. Tellingly, the ALJ explicitly found only that “at least the AAT1143, AAT1146, and AAT1151 representative products” do not meet this limitation. Id. Thus, because the ALJ did not find this limitation missing from the AAT1265, it would have been irrational for Linear to contest the ALJ's finding—presumably finding this limitation satisfied in the AAT1265—in its Petition for Review.

claim 34, let alone any reason why the AAT1151 does not infringe claim 34. Indeed, other than the ultimate conclusion of noninfringement, the Commission’s opinion is devoid of any statement that the AAT1151 does not include a particular limitation required by claim 34. The only other possible explanation as to why these products do not infringe is the Commission’s statement that both the AAT1151 and the AAT1265 do not meet the “third circuit” or “second control signal” limitations. Id. at 48–51. As noted by the Commission itself, however, method claim 34 does not require these limitations and therefore these omissions cannot be the basis for a finding of noninfringement. In short, the Commission’s finding of noninfringement is not supported by substantial evidence. We therefore vacate and remand for further proceedings to determine whether the AAT1151 and AAT1265 infringe method claim 34.<sup>8</sup>

For the foregoing reasons, we affirm the Commission’s finding that the AAT1151 and AAT1265 devices do not infringe claims 2 and 3. However, we vacate its finding regarding claim 34 and remand for further consideration of whether the AAT1151 and AAT1265 infringe claim 34.<sup>9</sup>

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<sup>8</sup> In its briefing to this court, the Commission acknowledged that the noninfringement finding of claim 34 was problematic. Comm’n Br. 48 (“A review of the Commission’s opinion does indicate, as Linear argues, that the Commission’s separate conclusions regarding the disputed limitations of the asserted claims could be read as supporting the conclusion that all disputed limitations of claim 34 are met by the AAT1146 and AAT1151 products . . . .”); id. 49 (“While there is an apparent inconsistency as to the two conclusions as they relate to the AAT1265 . . . .”).

<sup>9</sup> We acknowledge that evidence similar to the type supporting that two states of circuit operation are present in the AAT1143 and AAT1146 devices—for example, the ripple graphs—was also provided to prove that the AAT1151 and AAT1265 devices meet that same limitation. Based on the record before us on appeal, however, we are not prepared to rule that the AAT1151 and AAT1265 definitively meet all the limitations of claim 34 and therefore infringe. In particular, we note that the other evidence that supported infringement of claims 2 and 3 by the AAT1143 and AAT1146 also suggested infringement of claim 34 by those devices. This additional supporting evidence,

### III

We turn now to the validity of claims 2, 3, and 34, which the Commission found to be not invalid as anticipated by the AN35 reference. Final Determination, slip op. at 61-62. “Whether a prior art reference anticipates a patent claim is a question of fact,” which we review for substantial evidence. 19 U.S.C. § 1337(c); 5 U.S.C. § 706(2)(E); Finnigan, 180 F.3d at 1362. “The burden is on the party asserting invalidity to prove it with facts supported by clear and convincing evidence.” Finnigan, 180 F.3d at 1365 (quoting SSIH Equip., S.A. v. Int’l Trade Comm’n, 718 F.2d 365, 375 (Fed. Cir. 1983)).

In particular, the Commission found that claims 2, 3, and 34 were not invalid because the AN35 discloses “an asynchronous switching voltage regulator as opposed to a synchronous switching voltage regulator, and that the [AN35] therefore does not disclose the second switching transistor required by the asserted claims.” Final Determination, slip op. at 61. While AATI argued to the Commission that the AN35 reference anticipated, as well as rendered obvious, claims 2, 3, and 34, it did not do so in its appeal to this court. Rather, AATI has only challenged the Commission’s finding that the claims 2, 3, and 34 are not anticipated. Specifically, AATI argues that the Commission ignored Appendices A and D, which are allegedly part of the AN35 reference and describe adding a second synchronous transistor. The Commission and Linear contend that, as found by the Commission, the AN35 reference cannot anticipate

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however, was not present regarding the AAT1151 and AAT1265, as there was substantial evidence supporting noninfringement of claims 2 and 3 by those devices. We also consider the fact that the Commission’s opinion was inconsistent and leaves open the possibility that the AAT1151 and AAT1265 devices do not infringe because of the absence of other limitations. Thus, in these circumstances, we believe remanding is the appropriate course of action.



the claims because it does not show a synchronous switching voltage regulator including two transistors, as required by the construed claims.

Because there is substantial evidence that the AN35 reference does not disclose each limitation of claims 2, 3, and 34, we affirm the Commission’s ruling that the “sleep mode” claims are not invalid. See, e.g., Finnigan, 180 F.3d at 1365 (“A prior art reference anticipates a patent claim if the reference discloses, either expressly or inherently, all of the limitations of the claim.”). For example, claims 2, 3, and 34 all require a “switch . . . including a pair of synchronously switched switching transistors,” which, according to the correct claim construction, means “a switch including two switching transistors that are driven out of phase to supply current at a regulated voltage to a load.” There is substantial evidence, however, that the AN35 reference does not disclose a synchronous switching voltage regulator that includes two switching transistors. Rather, it discloses an asynchronous switching voltage regulator with one transistor.

Indeed, AATI admitted, through its expert, that the AN35 reference by itself does not meet all of the claim limitations. Instead, it argues that the Commission failed to consider Appendices A and D of the AN35 reference, which allegedly show using two synchronously switched transistors. Even considering Appendices A and D in combination with the AN35 disclosure itself, however, there is still substantial evidence that claims 2, 3, and 34 are not anticipated. For example, assuming that the components in Appendices A and D could be combined with the components in the AN35, this combination still does not explicitly show the “identical invention” as required by the claims—“two switching transistors that are driven out of phase to supply current

at a regulated voltage to a load.” Continental Can Co. v. Monsanto Co., 948 F.2d 1264, 1268 (“Anticipation . . . requires that the identical invention that is claimed was previously known to others and thus is not new.”); see Net MoneyIn, Inc. v. VeriSign, Inc., 545 F.3d 1359, 1370 (Fed. Cir. 2008) (“[A]n anticipatory reference [must] show all of the limitations of the claims arranged or combined in the same way as recited in the claims.”). Indeed, there is no explanation as to how substituting the components in Appendices A and D would necessarily result in the exact operational circuit as claimed.

For the foregoing reasons, the Commission’s ruling that there is not clear and convincing evidence of anticipation is supported by substantial evidence. We therefore affirm the Commission’s determination that claims 2, 3, and 34 are not invalid.

#### IV

We next address the Commission’s ruling that claim 35 of the ’258 patent is not infringed by the AAT1143 and AAT1146 devices, as well as its ruling that claim 35 is invalid.<sup>10</sup>

##### A. Infringement of claim 35 by the AAT1143 and AAT1146 devices

The Commission found that the AAT1143 and AAT1146 do not infringe, either literally or by equivalents, because the accused products monitor voltage and “monitoring voltage using a voltage threshold do[es] not meet the limitations of ‘monitoring the current to the load’ or ‘monitoring the current’ using a ‘current threshold.’” Final Determination, slip op. at 51. We have already determined, however, that construing claim 35 to exclude monitoring voltage to indirectly monitor current was an error. See supra Discussion I.E. Thus, because this error caused the Commission

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<sup>10</sup> Linear asserted that only the AAT1143 and AAT1146 infringe claim 35.

to improperly conclude that the “monitoring the current to the load” limitation was not met and because the Commission did not identify any other missing claim limitation in the accused products, its finding of noninfringement is not supported by substantial evidence. We therefore vacate its ruling that the AAT1143 and AAT1146 do not literally infringe claim 35, as well as its decision relating to infringement of claim 35 under the doctrine of equivalents. See, e.g., Transmatic, Inc. v. Gulton Indus., Inc., 53 F.3d 1270, 1275 (Fed. Cir. 1995) (“[T]he court clearly erred in finding no literal infringement. We therefore vacate as moot that part of the court’s decision relating to infringement under the doctrine of equivalents.”). Accordingly, we remand for a determination of infringement according to the correct claim construction. See, e.g., Free Motion Fitness, Inc. v. Cybex Int’l, Inc., 423 F.3d 1343, 1353 (Fed. Cir. 2005) (“We vacate the district court’s grant of summary judgment of non-infringement and remand for a determination of literal infringement and infringement under the doctrine of equivalents under the correct claim construction.”).

#### B. Validity of claim 35

Regarding the validity of claim 35, the Commission found claim 35 invalid as anticipated by the prior art MAX782 product. It did so because it was undisputed that the MAX782 disclosed each claim limitation—a finding which remains undisputed on appeal—and because it found that Linear had failed to sufficiently antedate the ’258 patent’s invention date prior to the MAX782 product. See Final Determination, slip op. at 63-64. Citing circuit schematics and laboratory notebooks, Linear argues that claim 35 was reduced to practice August 22, 1991, which precludes the MAX782 from being

prior art. In response, the Commission and AATI contend that Linear did not show a complete conception or reduction to practice of all of the limitations of claim 35.

As was the case with its finding of noninfringement, what we have held to be the Commission's incorrect construction of the "monitoring the current" limitation in claim 35 infected its validity analysis. For that reason, its invalidity finding is not supported by substantial evidence. We therefore vacate the finding that claim 35 is invalid. Specifically, focusing on the invention date of the '258 patent, the Commission found that claim 35 did not have a prior invention date solely because reducing to practice "monitoring voltage" was not sufficient to show the claimed "monitoring the current to the load." Id. The Commission stated that "Linear at best established reduction to practice of a circuit that monitors a voltage using a voltage threshold." Id. As discussed above, however, by monitoring voltage a device can indirectly monitor current and, therefore, prior invention of monitoring voltage is sufficient to show a prior invention date of the "monitoring the current" limitation. While the Commission did appropriately acknowledge that "in order to establish actual reduction to practice, the inventor must prove that he constructed an embodiment . . . that met all the limitations," see, e.g., Slip Track Systems, Inc. v. Metal-Lite, Inc., 304 F.3d 1256, 1265 (Fed. Cir. 2002), it did not identify any other missing limitations. See Final Determination, slip op. at 63-64. As such, although failing to prove the prior invention of some other limitation could support that claim 35 is not entitled to an earlier invention date, the Commission solely relied on its erroneous belief that the "monitoring the current" limitation was not previously invented. Thus, we remand for further consideration of whether, despite the fact that prior invention of the "monitoring the current" limitation can be shown by prior disclosure

of monitoring voltage, there is some other absent limitation that precludes a prior invention date of claim 35. See, e.g., Slip Track Sys., 304 F.3d at 1269 (“On remand, the district court should consider whether those features of the Second Prototype whose dates have been corroborated meet the limitations of the interfering subject matter.”).

The Commission’s opinion regarding the noninfringement and invalidity of claim 35 is not supported by substantial evidence. We therefore vacate its decision and remand for further proceedings, consistent with this opinion and our modified claim construction, to determine both whether claim 35 is infringed and whether the claim is entitled to an invention date prior to the MAX782 product.

#### CONCLUSION

To summarize, with the exception of the “monitoring the current” limitation in claim 35, we affirm the Commission’s claim construction in all respects. We also affirm its finding that the AAT1143 infringes claims 2, 3, and 34 and that claims 2, 3, and 34 are not invalid as anticipated. In addition, we affirm the Commission’s finding that the AAT1151 and AAT1265 do not infringe claims 2 and 3. We, however, reverse the Commission’s finding that the AAT1146 does not infringe claims 2, 3, and 34 and, consequently, rule that the AAT1146 does infringe claims 2, 3, and 34. In addition, we vacate the Commission’s findings that the AAT1151 and AAT1265 do not infringe claim 34 and remand for further proceedings. We also vacate its ruling that the AAT1143 and AAT1146 do not infringe claim 35, as well as its finding that claim 35 is invalid, and

remand for further proceedings, consistent with this opinion and our modified claim construction, to determine whether claim 35 is infringed and invalid.<sup>11</sup>

#### COSTS

Each party shall bear its own costs.

AFFIRMED-IN-PART, REVERSED-IN-PART, VACATED-IN-PART, and REMANDED.

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<sup>11</sup> Linear also argues that the Commission erred by not reaching issues of indirect infringement. We find no error with the Commission's decision to not address indirect infringement. See, e.g., Personalized Media Commc'n, LLC v. Int'l Trade Comm'n, 161 F.3d 696, 708 (Fed. Cir. 1998) (acknowledging that "[i]t was the Commission's prerogative to review only questions of indefiniteness and noninfringement"); Beloit Corp. v. Valmet Oy, 742 F.2d 1421, 1423 (Fed. Cir. 1984) (reinforcing the Commission's requirement to address only one dispositive issue).