

NOTE: This disposition is nonprecedential.

**United States Court of Appeals  
for the Federal Circuit**

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**VICOR CORPORATION,**  
*Appellant*

v.

**SYNQOR, INC.,**  
*Appellee*

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2014-1578

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Appeal from the United States Patent and Trademark  
Office, Patent Trial and Appeal Board in No. 95/001,702.

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Decided: March 13, 2015

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MATTHEW A. SMITH, Turner Boyd LLP, Redwood City,  
CA, argued for appellant.

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Reston, VA.

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Before TARANTO, MAYER, and CLEVINGER, *Circuit Judges*.

CLEVINGER, *Circuit Judge*.

This appeal is from an inter partes reexamination of U.S. Patent No. 7,072,190 (“the ’190 patent”), owned by SynQor, Inc. (“SynQor”). The examiner rejected claims 20-23, 27, 29, 30, 32, and 33 as anticipated by two prior art patents to Steigerwald, all but one remaining claims as obvious over the Steigerwald patents in view of other references, and all claims as obvious over other references. The Patent Trial and Appeal Board (“Board”) reversed all rejections, *Vicor Corp. v. SynQor, Inc.*, No. 2014-001733 (P.T.A.B. Apr. 10, 2014), and third-party requestor Vicor Corporation (“Vicor”) appeals.

We reverse as to the anticipation rejection and vacate and remand each obviousness rejection.

#### BACKGROUND

##### I

##### A

The ’190 patent, entitled “High Efficiency Power Converter,” issued on July 4, 2006, and claims priority to an application filed January 23, 1998.

It describes a direct current-to-direct current (“DC-to-DC”) power converter that takes direct current power as input and outputs direct current at a different voltage level. The claimed invention accomplishes this conversion using two stages: an isolation stage, followed by a plurality of regulation stages. The invention’s isolation stage uses what the patent sometimes calls controlled rectifiers and sometimes calls synchronous rectifiers. *See, e.g.*, ’190 Patent col.6 ll.22-41. Any difference between the terms is immaterial for present purposes.

The '190 patent issued with 33 claims, of which claims 1, 20, 27, 30, and 33 are independent. During this reexamination, SynQor amended its claims to add dependent claims 34-38.

Claim 20 is the patent's broadest system claim:

A power converter system comprising:

a DC power source;

a non-regulating isolation stage comprising:

a primary transformer winding circuit having at least one primary winding connected to the source; and

a secondary transformer winding circuit having at least one secondary winding coupled to the at least one primary winding and having plural controlled rectifiers, each having a parallel uncontrolled rectifier and each connected to a secondary winding, each controlled rectifier being turned on and off in synchronization with the voltage waveform across a primary winding to provide an output; and

a plurality of non-isolating regulation stages, each receiving the output of the isolation stage and regulating a regulation stage output.

The '190 patent has been the subject of both infringement litigation before this court and a prior inter partes reexamination. Vicor was not a party to either proceeding.

In *SynQor, Inc. v. Artesyn Technologies, Inc.*, the jury found that claims 2, 8, 10, and 19 were infringed and were not invalid as anticipated or obvious, and the trial court denied judgment as a matter of law. No. 2:07-CV-497-TJW-CE, 2011 WL 3625051 (E.D. Tex. Aug. 17, 2011). This court affirmed, holding that sufficient evidence supported the jury's finding that the asserted prior art did

not teach or suggest a converter with “a plurality of non-isolated regulation stages.” 709 F.3d 1365, 1374-75 (Fed. Cir. 2013), *cert. denied*, 134 S.Ct. 648 (*SynQor I*).<sup>1</sup>

Inter Partes Reexamination No. 95/001,207 confirmed the patentability of claims 1-33 in a certificate issued September 15, 2014. The examiner considered the two Steigerwald patents at issue here, among other references. Information Disclosure Statement by Patentee, Reexamination No. 95/001,207 (May 8, 2014).

## B

Two prior art patents to Steigerwald et al. are at issue: U.S. Patent No. 5,274,539 (filed Dec. 4, 1991) (“Steigerwald ’539”) and U.S. Patent No. 5,377,090 (filed Jan. 19, 1993) (“Steigerwald ’090”).

Both patents teach DC-to-DC power converters and are directed to similar fields of invention, specifically, power converters for supplying pulsed loads. Steigerwald ’090 cites Steigerwald ’539 as a related patent and incorporates it by reference as follows:

This application is related to commonly assigned U.S. Pat. No. 5,274,539 of R. L. Steigerwald and R. A. Fisher, issued Dec. 28, 1993, and to commonly assigned abandoned U.S. patent application Ser. No. 811,631 of R. L. Steigerwald, filed Dec.

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<sup>1</sup> Defendants presented evidence about Steigerwald ’090 during the trial, but jurors were instructed to disregard testimony about its relationship to the ’190 patent’s claims. Transcript of Jury Trial at 43-50, *SynQor, Inc. v. Artesyn Techs., Inc.*, No. 2:07-cv-00497-RWS (E.D. Tex. Dec. 17, 2010) (Dkt. 901). When it affirmed the denial of judgment as a matter of law, this court discussed only references not at issue here. *SynQor I*, 709 F.3d at 1374.

23, 1991, both of which are incorporated by reference herein.

Steigerwald '090 col.1 ll.6-12. The two patents issued from separate applications.

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Steigerwald '539 teaches a converter that has a single regulation stage followed by a single isolation stage. In its primary embodiment, the isolation stage uses diodes as rectifiers. In an alternative embodiment, Steigerwald '539 teaches substituting controlled rectifiers for the diodes:

In other alternative embodiments, such as those of FIGS. 7-9, synchronous rectifiers SRa and SRb are used instead of diodes CRa and CRb of FIGS. 4 and 6.

Steigerwald '539 col.4 ll.58-60.

Figure 4, for example, shows where this substitution takes place. In Figure 4, the output of a pre-regulator circuit 30 feeds into the isolation stage, which is a capacitance-multiplying converter 20. Diodes CRa and CRb are within the capacitance-multiplying converter:

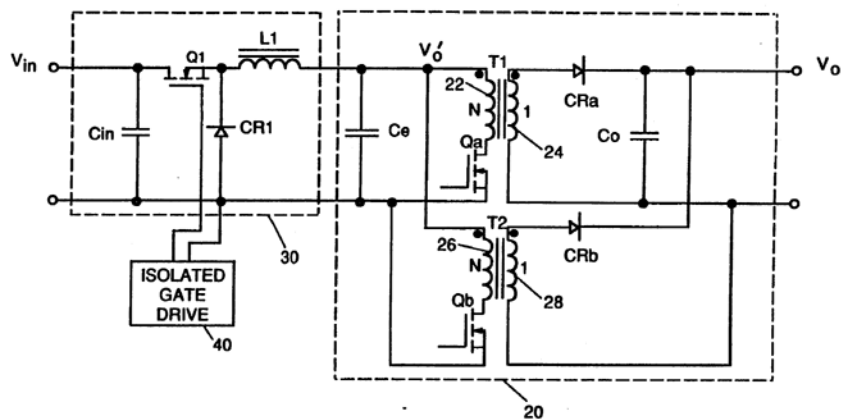
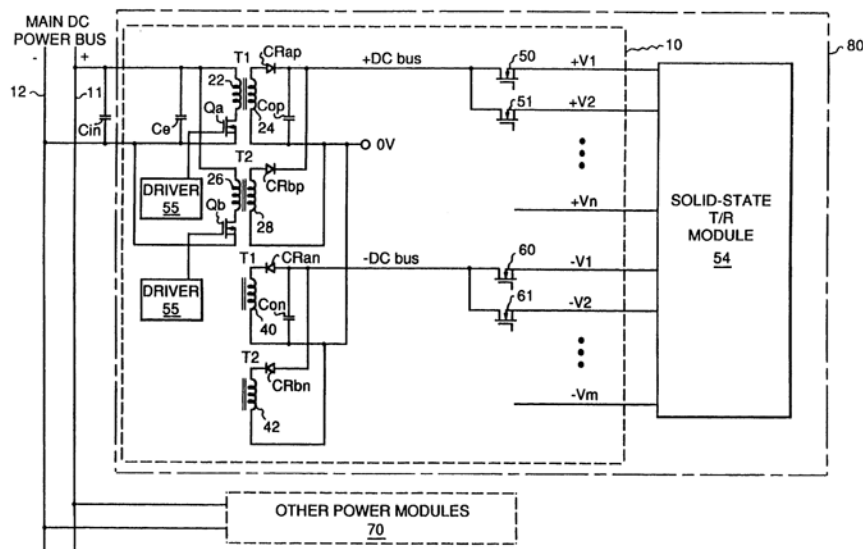


FIG. 4

## 2

Steigerwald '090 teaches a converter that has a single isolation stage followed by a plurality of regulation stages. These regulation stages allow Steigerwald '090 to provide multiple output voltages. The isolation stage uses diodes as rectifiers, and Steigerwald '090 does not disclose using controlled rectifiers in place of the diodes.

Its only figure, Figure 1, is as follows:



Although no item 20 is labeled on this figure, Steigerwald '090's specification explains that Figure 1 shows a power module that "includes a capacitance-multiplying converter 20." The specification further says that the items with labels prefixed CR are diode rectifiers, and that they are within the capacitance-multiplying converter. Steigerwald '090 col.2 ll.14-40.

Steigerwald '090 explains the capacitance-multiplying converter in Figure 1 using language that is identical, apart from a rearranged sentence, to Steigerwald '539's description of that converter in its Figure 4. *Compare*

Steigerwald '090 col.2 ll.14-33 *with* Steigerwald '539 col.3 ll.14-32.

## C

The examiner's rejections relied on two additional prior art references: Abraham I. Pressman, *Switching and Linear Power Supply Converter Design*, Hayden Book Co., NJ (1977) ("Pressman") and J.A. Cobos & J. Uceda, *Low Output Voltage DC/DC Conversion*, IEEE (1994) ("Cobos"). Their teachings are not relevant to our disposition of this appeal.

## II

### A

The examiner instituted inter partes reexamination and ultimately rejected all claims, including both issued claims 1-33 and new claims 34-38. Right of Appeal Notice, Reexamination No. 95/001,702 (Nov. 26, 2011).

The examiner found that Steigerwald '090 incorporates the text and drawings of Steigerwald '539 by reference. He reasoned that Steigerwald '090 expressly incorporates Steigerwald '539, the two are directed to the same type of converter, and their figures and text teach "nearly identical" isolation stages. *Id.* at 8-9.

The examiner then concluded that the combined reference teaches applying Steigerwald '539's alternative embodiment, which replaces diodes in the isolation stage with controlled rectifiers, to Steigerwald '090, which teaches an isolation stage that uses diodes, followed by multiple regulation stages. *Id.* at 3 (adopting proposed rejection from Corrected Request for Inter Partes Reexamination, Reexamination No. 95/001,702, at 8-14 (Sept. 8, 2011)). He accordingly rejected claims 20-23, 27, 29, 30, 32, and 33 as anticipated under 35 U.S.C. § 102(b) by the combined reference. *Id.*

All other claims, apart from new claim 34, were rejected as obvious over the combined Steigerwald reference in view of various permutations of Cobos, Pressman, and the knowledge of a person of ordinary skill in the art. *Id.* at 4-7.

The examiner also rejected all claims as obvious over Cobos in view of Pressman. *Id.* at 5-6.

## B

SynQor appealed, and the Board reversed all rejections. *Vicor Corp. v. SynQor, Inc.*, No. 2014-001733 (P.T.A.B. Apr. 10, 2014).

The Board first reversed the anticipation rejection. It found that Steigerwald '090 “does not identify any particular sections or specific subject matter [within Steigerwald '539] to be associated with particular embodiments,” and concluded that it incorporates no more than Steigerwald '539's text. *Id.*, slip op. at 7. The Board then found that the combined reference did not teach a single embodiment that has an isolation stage that uses controlled rectifiers, followed by multiple regulation stages. In reaching this conclusion, the Board did not consider whether the combined reference taught applying Steigerwald '539's alternative embodiment to Steigerwald '090. Instead, it reasoned that Steigerwald '090 does not teach “swapping around” Steigerwald '539's stages to create an isolation stage followed by multiple regulation stages. *Id.*, slip op. at 7-8.

The Board then reversed each of the obviousness rejections that were based on the Steigerwald patents because it found that a person of skill in the art would not have been motivated to combine the Steigerwald patents' teachings. *Id.*, slip op. at 9-13, 17-18.

Finally, the Board reversed the obviousness rejections over Cobos and Pressman. Relevant here, it concluded that SynQor had shown commercial success “sufficient to



overcome the Examiner’s conclusion” that the claims were nonobvious over those references. *Id.*, slip op. at 21.

## DISCUSSION

### I

An invention is not patentable if “the invention was patented or described in a printed publication . . . more than one year prior to the date of the application.” 35 U.S.C. § 102(b) (2006).<sup>2</sup>

A patent claim is invalid as anticipated if “the four corners of a single, prior art document describe every element of the claimed invention, either expressly or inherently, such that a person of ordinary skill in the art could practice the invention without undue experimentation.” *Advanced Display Sys., Inc. v. Kent State Univ.*, 212 F.3d 1272, 1282 (Fed. Cir. 2000). Other material may be considered as part of the single document if the host document incorporates it by reference. *Id.*

A host document incorporates material by reference if it “identif[ies] with detailed particularity what specific material it incorporates and clearly indicate[s] where that material is found in the various documents.” *Id.* Whether the host document describes the material with sufficient particularity is determined from the point of view of a person of reasonable skill in the art. *Id.* at 1283.

This court reviews the Board’s legal conclusions de novo and its factual determinations for substantial evidence. *Randall Mfg. v. Rea*, 733 F.3d 1355, 1362 (Fed. Cir. 2013). Anticipation is a question of fact, while incorporation by reference, and therefore “what material . . . consti-

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<sup>2</sup> Because the application that led to the ’190 patent was filed before the America Invents Act was adopted, the prior version of §§ 102 and 103 applies.

tutes the single reference” for anticipation purposes, is a question of law. *Advanced Display Sys.*, 212 F.3d at 1283.

On appeal, SynQor asserts that, although Steigerwald '090 expressly incorporates Steigerwald '539, it fails to identify specific portions of Steigerwald '539's teaching with the “detailed particularity” required for incorporation. If Steigerwald '090 incorporates Steigerwald '539's text, SynQor contends that the combined reference does not anticipate because it does not teach applying Steigerwald '539's substitution of controlled rectifiers for diodes to Steigerwald '090's embodiment.

We reject both arguments. As the examiner observed, the two patents teach an isolation stage that is “nearly identical.” Right of Appeal Notice, Reexamination No. 95/001,702, at 9 (Nov. 26, 2011). The top left portion of Steigerwald '090's Figure 1 shows the same circuit as the portion of Steigerwald '539's Figure 4 labeled the capacitance-multiplying converter 20. The patents' specifications describe this stage identically apart from variations in item numbers and one rearranged sentence. *Compare* Steigerwald '539 col.3 ll.14-32 *with* Steigerwald '090 col.2 ll.14-33. Most compellingly, Steigerwald '090's specification refers to the “capacitance-multiplying converter 20” even though no item 20 is labeled in its own figures. Instead, the converter is labeled in Figure 4 of Steigerwald '539. A person of ordinary skill in the art would have understood that Steigerwald '090 identifies the capacitance-multiplying converter in Steigerwald '539 with detailed particularity.

We therefore hold that Steigerwald '090 incorporates by reference at least those teachings of Steigerwald '539 that relate to its capacitance-multiplying converter 20. The incorporated teachings include Steigerwald '539's alternative embodiment, which teaches a substitution that takes place within the isolation stage:

In other alternative embodiments, such as those of FIGS. 7-9, synchronous rectifiers SRa and SRb are used instead of diodes CRa and CRb of FIGS. 4 and 6.

Steigerwald '539 col.4 ll.58-60; *see also id.* at fig.4 (showing that diodes CRa and CRb are within the capacitance-multiplying converter 20).

SynQor argues that this substitution, even if taught by the combined reference, does not apply to the converter of Steigerwald '090 because that embodiment is “separate and distinct.” For support, it points to the Board’s conclusion that the substitution “is contrary to the express purpose of both patents.” SynQor also highlights differences between the circuits’ induction stages, including Steigerwald '090’s use of series regulators and addition of various connections.

These arguments are unavailing. First, “teaching away is not relevant to an anticipation analysis.” *Krippelz v. Ford Motor Co.*, 667 F.3d 1261, 1269 (Fed. Cir. 2012). Second, the differences SynQor identifies in the inventions’ isolation stages occur at their periphery and would not stop a person of skill in the art from recognizing the overall identity between them. The differences also appear driven by the circuits’ reversed ordering of the isolation and regulation stages; for example, SynQor tells us that Steigerwald '090’s isolation stage includes series regulators because it is not preceded by a regulation stage. Brief of Appellee at 29.

We accordingly hold that the combined reference teaches substituting controlled rectifiers for diodes within the capacitance-multiplying converter 20 of both Steigerwald '539’s Figure 4 and Steigerwald '090’s Figure 1. The combined reference teaches a single embodiment that anticipates all elements of representative claim 20, and we reverse the Board’s conclusion to the contrary.

## II

An invention is not patentable if “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” 35 U.S.C. § 103(a) (2006). This test requires consideration of four factors, among them “objective evidence of nonobviousness” such as commercial success. *Mintz v. Dietz & Watson, Inc.*, 679 F.3d 1372, 1375, 1378-79 (Fed. Cir. 2012).

We vacate and remand each of the Board’s obviousness rejections for further consideration in light of our conclusion that the combined Steigerwald reference anticipates claims 20-23, 27, 29, 30, 32, and 33.

The Board’s reversal of the obviousness rejections that involved the Steigerwald patents was premised on its conclusion that the combined reference did not anticipate those claims.

While the obviousness rejection over Cobos and Pressman does not directly involve the Steigerwald patents, the teachings of the combined Steigerwald reference may be relevant to any objective evidence of nonobviousness. For example, commercial success is evidence of obviousness only when there is a “nexus . . . between the merits of the claimed invention and evidence of commercial success.” *Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1324 (Fed. Cir. 2004). Vicor should have the opportunity to argue that SynQor’s evidence of commercial success is attributable not to the claimed invention, but to the prior art converter taught by the combined Steigerwald references.

**REVERSED IN PART, VACATED IN PART, AND  
REMANDED**

COSTS

No costs.