United States District Court,
D. Massachusetts.

VLT, INC,
Plaintiff.
v.
ARTESYN TECHNOLOGIES, INC., et al,
Defendants.

No. CIV.A.00-10238-PBS

Jan. 3, 2003.

Owner of patent for electrical power transformer sued competitor for infringement. On defendant's motions to find patent indefinite and for claim construction, the District Court, Saris, J., held that: (1) claim requiring transfer of energy during primary switch's "on period" was not invalid as indefinite, and (2) requirement that auxiliary switch be opened "prior" to on period of primary switch, meant that there had to be some delay between on periods of switches.

Patent held valid; claims construed.

"Single ended forward converter," called for in patent for electrical power transformer, meant device in which (1) power flow from source to load was controlled by single solid state primary switch; (2) energy was transferred forward from primary winding to secondary winding of transformer during on period of switch; and (3) transformer was simultaneously connected to source and load.

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Robert D. Yeager, Kirkpatrick & Lockhart, Pittsburgh, PA, for Artesyn Technologies, Defendant.

MEMORANDUM AND ORDER

SARIS**, District Judge.**

Artesyn Technologies, Inc. ("Artesyn") raises multiple new issues in its multiple claim construction briefs regarding the construction of Claim One of U.S. Patent No. Re. 36,098 ("the '098 patent"). First, it argues that the term "ON period" appearing in Claim One of the '098 patent is indefinite under 35 U.S.C. s. 112, para. 2. Second, it urges the Court to construe the terms "prior to," "opened," "closed," and "recycle." On May 9, 2002, the Court held an evidentiary hearing in which John Bassett, the Vice President of Technology for defendant Artesyn, testified as an expert. A second hearing took place on September 19, 2002 at which he testified again. Post hearing briefs and post-post hearing briefs were submitted.

DISCUSSION

A. ***Indefiniteness***

Artesyn argues that Claims 1 and 5 of the '098 patent are invalid under 35 U.S.C. s. 112, para. 2 because the phrase "ON period", as construed by the Court, is indefinite. Artesyn assumes, for the moment, the correctness of the Court's claim construction in the *Unitrode* and *Lucent* litigation. VLT Corp. v. Unitrode Corp., 130 F.Supp.2d 178, 191 (D.Mass.2001) (" *Unitrode* "); Lucent claim construction Memorandum and Order, VLT, Inc. v. Lucent Tech., Inc., 193 F.Supp.2d 285 (D.Mass.2001) (" *Lucent* ").

Claim One reads:

1. In a single ended forward converter in which energy is transferred from a primary winding to a secondary winding of a transformer during the ON period of a primary switch, circuitry for recycling the magnetizing energy stored in said transformer to reset it during the OFF period of said primary switch, compromising:

a storage capacitor;

an auxiliary switch connected in series with said storage capacitor;

a switch control circuit operating said auxiliary switch in accordance with a control logic such that (a) said auxiliary switch is opened prior the ON period [sic] of said primary switch, (b) said auxiliary switch remains open throughout the ON period of said primary switch, (c) said auxiliary switch is closed after the ON period of said primary switch.

The specification states:

[A] delay between the opening of the auxiliary switch and the closing of the primary switch represents dead time. For this reason it is efficient to keep such a delay to a minimum, consistent with the requirement to avoid an overlap between switches. However, a small delay is useful to allow the magnetizing current to charge and discharge parasitic capacitances associated with the switches and windings.

Col. 7, 11. 2-11.

In *Unitrode* and *Lucent*, I construed "ON period" of the primary switch to mean the "time period when the switch is enabled to conduct current that it could otherwise block." *Lucent* at 18.

1. ***The Indefiniteness Standard***

Section 112 of the Patent Act provides:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

35 U.S.C. s. 112, para. 2.

[1] [2] [3] It is well established that the determination whether a claim is invalid as indefinite "depends on whether those skilled in the art would understand the scope of the claim when the claim is read in light of the specification." Atmel Corp. v. Information Storage Devices, Inc., 198 F.3d 1374, 1379 (Fed.Cir.1999) (citing North Am. Vaccine, Inc. v. American Cyanamid Co., 7 F.3d 1571, 1579 (Fed.Cir.1993)) (reversing a grant of summary judgment of invalidity based on indefiniteness because the trial judge failed to consider the knowledge of one skilled in the art in determining whether sufficient structure was disclosed). *See also* Miles Labs., Inc. v. Shandon, Inc., 997 F.2d 870, 875 (Fed.Cir.1993) (holding that a claim term is definite if one skilled in the art would understand the bounds of the claim when read in light of the specification). "Provided that the claims are enabled, and no undue experimentation is required, the fact that some experimentation may be necessary to determine the scope of the claims does not render the claims

indefinite." Exxon Research and Engineering Co. v. United States, 265 F.3d 1371, 1380 (Fed.Cir.2001). The fact that some claim language may not be precise does not automatically render a claim invalid because only a "reasonable degree of particularity and definiteness" is required. Id. at 1381 (holding that claim was not invalid because one of skill in the art would understand that specification taught that "substantial absence of slug flow" would be determined "with reference to whether reactor efficiency is materially affected").

[4] On the other hand, a claim term is indefinite if it can have more than one meaning to a person of ordinary skill in the art, and the appropriate meaning of the term is not explained in the specification. *See* Union Pacific Resources Co. v. Chesapeake Energy Corp., 236 F.3d 684, 692 (Fed.Cir.2001) (finding the term "comparing" indefinite); In re Cohn, 58 C.C.P.A. 996, 438 F.2d 989, 993 (Cust. & Pat.App.1971) (finding claim term indefinite where the patentee's conflicting use of the term rendered the scope of the claims uncertain).

To be definite, a claim must simply be "amenable to construction, however difficult that task may be." Exxon Research and Engineering, 265 F.3d at 1375. Only if the claim is "insolubly ambiguous" is it invalid as indefinite. *Id*. In light of the statutory presumption of validity, 35 U.S.C. s. 282, "close questions of indefiniteness in litigation involving issued patents are properly resolved in favor of the patentee." *Id*. at 1379. "A determination of claim indefiniteness is a legal conclusion that is drawn from the Court's performance of its duty as the construer of patent claims." Atmel, 198 F.3d at 1377 (internal citation omitted). An indefiniteness analysis under s. 112, para. 2 is "inextricably intertwined with claim construction." *Id*. at 1379.

2. ***Analysis***

[5] Artesyn points out that (1) the phrase "ON period" had no single accepted meaning in the field of electronics in 1981 and 1982; (2) the term "ON period" is nowhere expressly defined in terms of either the current or the voltage across the switch; (3) Dr. Paul Horowitz, Vicor's expert, acknowledged he did not reach a conclusion as to which definition to apply until he looked at the prior art; and (4) the '098 patent uses the term "ON period" in ways consistent with a current-based definition ('098, Col.7, 11.4-11) and a voltage-based definition. (Fig.4b.)

While the claim construction was complex, it was not insolubly difficult. To be sure, the Court did consider extrinsic evidence to understand the technology. However, the heart of the analysis was the claim language, read in light of the specification. The fact that Dr. Horowitz looked at the prior art does not mandate a conclusion of indefiniteness since in engaging in the indefiniteness inquiry, as well as claim construction, the Court must construe the claim terms as would one of ordinary skill in the art in 1982. Zelinski v. Brunswick, 185 F.3d 1311, 1315 (Fed.Cir.1999) ("[A]bsent an express definition in the specification of a particular claim term, the words are given their ordinary and accustomed meaning; if a term of art, it is given the ordinary and accustomed meaning as understood by those of ordinary skill in the art."). It is true that "ON period" is not a defined term, that electrical experts agreed that the term "ON" did not have a single meaning in the field of electrical engineering, and that a voltage-based definition derived from Figure 4b was one reasonable approach to construing the word "ON period." Nonetheless, the claim was quite amenable to construction because of the use of the word "dead time" in the specification. The undisputed evidence (i.e., the testimony of Bassett, Carsten, and Horowitz) demonstrates that "dead time" had a current-based definition to one of ordinary skill in the art in 1982. (Col.7, 11.3-11.)

2. ***Prior***

[6] Artesyn urges the Court to define the words "prior to" as meaning "before" in the element of the claim that states "a switch control circuit operating said auxiliary switch in accordance with a control logic such that (a) said auxiliary switch is opened prior [to] the ON period of said primary switch."

In *Unitrode,* I held: "By its usage of the word 'prior,' Claim One requires some delay between the 'ON period' of the auxiliary switch and the 'ON period' of the primary switch. The claim does not, however, specify the length of the delay." 130 F.Supp.2d at 191. The term "prior" was not a focus of either proceeding because neither Unitrode nor Lucent disputed that the claim language required a delay prior to the "ON period." Artesyn urges the Court to reconsider this construction based on three arguments.

First, citing the dictionary definition, Artesyn argues that the words "prior to" do not require a delay between the ON period of the primary and auxiliary switches, so long as the ON period of the auxiliary switch immediately precedes chronologically the ON period of the primary switch. According to the dictionary, "prior to" means "preceding; before: *Prior to that time, buffalo had roamed the Great Plains in tremendous numbers*." *Random House Unabridged Dictionary,* 1540 (2d ed. 1987) (*Random House*). *See* Texas Digital Sys. Inc. v. Telegenix, 308 F.3d 1193, 1202 (Fed.Cir.2002) (emphasizing the importance of ordinary meaning as defined in dictionaries). The words "prior to" mean before or preceding, but the dictionary definition does not indicate how long before. Artesyn fairly argues that in some contexts "prior to" can mean immediately prior to, without a delay. As illustration, counsel explicated: "Yesterday was prior to today, your Honor. But there is no dead time between yesterday and today.... If A happens prior to B, there doesn't have to be a delay in between them. One can happen immediately after, the instant in time after the other one." (Hearing Tr. 20.)

Shoehorning its "anticipation" argument into the *Markman* hearing, Artesyn argues that the claim captures "coincident switching" as it existed in prior art. In idealized coincident switching there is a point in time when the controllable current in each switch is zero. (See Hearing Ex. 2,4.) The element is met, they explain, so long as the auxiliary switch enables current (that could otherwise be blocked) *before* the primary switch enables current (that could otherwise be blocked). Bassett, Artesyn's expert, testified that "for a coincident switching, the auxiliary switch stops conducting controllable current prior to the [time the] primary switch starts to conduct it." (May Hearing Tr. 33.)

There are two problems with this construction. First, it is inconsistent with the structure of the claim read in light of the specification. Vicor points out that Claim One contains a switch timing "control logic" in three phases. Clause (b) states "Said auxiliary switch remains open throughout the ON period of said primary switch." Vicor argues that Clause (b) ensures no overlap of the switches. If Claim One simply meant no overlap of the switches and permitted coincident switching, then, according to Vicor, Clause (a) and Clause (c) would be redundant. Instead, Vicor explicates, these two clauses are needed to specify delay in the switch timing. This is clarified by the specification, which requires a "delay" and a period of "dead time" in which no current is flowing. Mr. Bassett agreed with the "concept that dead time means there's no current that could otherwise be blocked." (Hearing Tr. 51.) Because the switch-timing requires the delay in the specification, the words "prior to" do not include coincident switching. FN1 Rather, Claim One requires a delay between the opening of the auxiliary switch and the "ON period" of the primary switch.

FN1. Moreover, while the discussion can become a bit metaphysical, in idealized coincident switching, the transition point could be understood as a theoretical time when the "ON" periods overlap.

Second, a definition of "prior" that included coincident switching would capture prior art. Because the "word to the wise" in 1982 was that overlap was to be avoided, those skilled in the art in 1982 (like Mr. Carsten) practiced coincident switching. The patent history demonstrates that neither the applicant nor the examiner considered coincident switching to be included within Claim One. *See* Ex. 7 to Vicor's Response to Lambda's Claim Construction Memorandum (Interview Summary of April 1, 1998). Specifically, the examiner noted that Claim One was distinguished over Carsten and Polykarpov based upon the "switch timing." *See Id.* ("Applicant's attorney was informed that the above two references even if they were earlier art wouldn't anticipate or wouldn't have been obvious over claims 1 and 18, nor do the references disclose the switch timing.")

[7] "Claims amenable to more than one construction should, when it is reasonably possible to do so, be construed to preserve their validity." Karsten Manuf. Corp. v. Cleveland Golf Co., 242 F.3d 1376, 1384 (Fed.Cir.2001). "However when the claim's language embraces the prior art, the Court is not unlimited in the extent to which it can interpret the claims." *Id*. Claims cannot be rewritten by the Court to avoid the impact of newly discovered prior art. *Id*. "Therefore, if the only claim construction that is more consistent with the claim's language and the written description renders the claim invalid, then the axiom does not apply and the claim is simply invalid." Rhine v. Casio, Inc., 183 F.3d 1342, 1345 (Fed.Cir.1999).

[8] Where there are two reasonable definitions, one which adumbrates prior art, and one which does not, the Court should choose the latter. This is particularly true when the definition that does not embrace the prior art is consistent with the specification and prosecution history. *See* Vivid Technologies, Inc. v. American Science and Engineering Inc., 200 F.3d 795, 804 (Fed.Cir.1999) (holding that the "prosecution history is often helpful in understanding the intended meaning as well as the scope of technical terms"); Ekchian v. The Home Depot, Inc., 104 F.3d 1299, 1303 (Fed.Cir.1997) (suggesting statements made to the patent office can be the basis for a court to interpret the scope of the claims).

Taking a different tact, Artesyn makes a third argument that one skilled in the art would have taken switch tolerances (measured by the number of nanoseconds it takes for a switch to open and close a circuit) into account in the control switch timing in order to avoid overlap. Artesyn points to the statutory declaration FN2 of the inventor filed in the United Kingdom in 1977:

FN2. While a statement of a party in a foreign related judicial proceeding is an admission, *see* Fed.R.Evid. 801(d)(2), the Federal Circuit has never defined it as part of the "intrinsic" evidence used to construe a claim, which has been primarily limited to the claim, the specification and the prosecution history. *See* Vitronics Corp. v. Conceptronic, Inc., 90 F.3d 1576, 1583 (Fed.Cir.1996). However, if the foreign pleadings (like the German briefs) were submitted during the reissue proceedings, they morph into intrinsic evidence. It is unclear whether this British statutory declaration was filed during these reissue proceedings.

Both suggest only coincident switching. I was the only one of the three to teach the use of both coincident switching (no overlap, minimized delays) and non-coincident switching (no overlap; small, purposeful, delay to utilize the reversed flow of magnetizing current to charge and discharge parasitic capacitances). (Hearing Ex. 5.) Mr. Bassett explained:
Well, Mr. Vinciarelli is saying there, that his invention would put in just some little bit of delay just to account for some guard-band on your [switch] tolerances, but put in some significant purposeful delay in addition to whatever delay was required just to avoid overlap, considering all tolerances.

(Hearing Tr. 4.) Although the desired outcome was to accomplish coincident switching with no overlap and no dead time, Bassett testified: "And when you strive for coincident switching, just meeting the requirement to avoid overlap, you will likely end up with some of that dead time." (Hearing Tr. 51.) Only in the "worst case" switches (when the tolerances are at their maximum) would there be no dead time because one current would hit zero while the other current began to rise. (Hearing Tr. 51-52.) Bassett believes that it was well known in the prior art of Carsten and Polykarpov to use delay in the control circuit to avoid overlap by considering switch tolerances. (Hearing Tr. 43-45.)
Again, Artesyn is seeking to bootstrap its anticipation argument into the *Markman* hearing by using extrinsic evidence (i.e., the Bassett testimony and affidavits from related foreign patent proceedings) to explain why the prior art actually, as a practical matter, sometimes had minimized delays in switch-timing, albeit for a different purpose-to avoid switch overlap, not to discharge parasitic capacitances.

[9] Vicor disputes the contention by pointing out that Carsten's device actually had overlap as did those of others skilled in the art. Moreover, Vicor contends that a small amount of overlap was tolerable in the prior

art, and any delays amounted only to accidental anticipation. *See generally* Tilghman v. Proctor, 102 U.S. 707, 711-712, 12 Otto 707, 26 L.Ed. 279 (1880) (unintended and unappreciated occurrences do not constitute anticipation); Eibel Process Co. v. Minnesota & Ontario Paper Co., 261 U.S. 45, 66, 43 S.Ct. 322, 67 L.Ed. 523 (1923) (same). Similarly, Vicor floats the doctrine of "inherent anticipation." *See* Rosco Inc. v. Mirror Lite Co., 304 F.3d 1373, 1380 (Fed.Cir.2002) ("Inherent anticipation requires that the missing descriptive material is 'necessarily present,' not merely probably or possibly present, in the prior art.") (citation omitted). This debate is beside the point at this stage. Extrinsic evidence concerning possible anticipation cannot vary the meaning of a claim as derived from the intrinsic evidence, specifically, the claim and the specification language itself.

Finally, Artesyn argues that the Court should not import from the specifications a requirement of "purposeful delay" sufficientto discharge parasitic capacitances. The Court need not address this point because Vicor is not pressing for a claim construction that a delay must be "purposeful." (Hearing Tr. 85.) FN3

FN3. However, a related issue has been raised in *VLT, Inc. v. Power-One, Inc.,* Civ. Action No. 10207-PBS. Power-One seeks a functional definition of delay, which I will discuss in the context of the cross-motions for summary judgment in that litigation.

3. *Opened/Closed*

[10] Artesyn seeks a claim construction with respect to the phrases "said auxiliary switch is opened prior [to] the ON period of said primary switch," and "said auxiliary switch is closed after the ON period." It argues that the words "is opened" and "is closed" do not refer to the actual status of the switch and its ability to conduct current, but instead to the sending of a signal from a central control or processor mechanism. Artesyn relies on terms in the specification which indicate action performed by the switch control circuit. *See e.g.* Col. 6, 11. 63-65. ("The flow of positive currents is controlled by the switch control circuit 22 which applies a suitable voltage to the gate of the MOSFET.")

Vicor responds that these words should be defined by reference to the status of the switch because only that definition is consistent with the requirement of "dead time" which means the absence of current flowing through the switches. See Col. 7, 11. 3-8 ("[A] delay between the opening of the auxiliary switch 21 and the closing of the primary switch 10 represents dead time."); (Hearing Tr. 51. Bassett: "I think we've defined here and we could live with the concept that dead time means there's no current that could otherwise be blocked.").

The dictionary definitions of "closed" and "open" in the context of an electrical circuit are also helpful because they use those terms to describe the status of the circuit, not the act of opening the circuit. "Closed circuit" is defined as "Elect. a circuit without interruption, providing a continuous path through which a current can flow". *Random House* at 389. "Open circuit" is defined as "Elect. a discontinuous circuit through which on current can flow." *Id.* at 1356. While the matter is not open and shut, Vicor's argument is more persuasive, and I adopt it.

4. *Transformer Resetting Apparatus*

Claim 5 provides:

The transformer resetting apparatus of Claim One wherein said auxiliary switch is a MOSFET transistor with an integral reverse diode.

Artesyn argues that because Claim One does not recite a "transformer resetting apparatus" because it is

hopelessly vague and indefinite under 35 U.S.C. s. 112, para. 2. However, Claim One refers to "circuitry for recycling the magnetizing energy stored in said transformer to reset it during the OFF period of said primary switch ...." The meaning of "transformer resetting apparatus" is self-evident from a perusal of Claim One.FN4

FN4. This argument represents the kind of mud-sling-see-what-sticks approach to claim construction that drives judges crazy. Happily, Artesyn did not press it in later briefs.

5. *Recycle/Reset*

[11] The Court discussed in detail the '098 patent's language claiming "[c]ircuitry for recycling the magnetizing energy stored in the transformer to reset it during the OFF period of the primary switch ...." in its claim construction Memorandum and Order in *VLT Corp. v. Lambda,* 01-cv-10957 (D.Mass. December 31, 2002) (" *Lambda* "). The Court incorporates the reasoning and construction reached there:

"[R]ecycling the magnetizing energy stored in said transformer to reset it" means that all the magnetizing energy stored in the transformer (except that lost due to the non-ideal nature of the circuit elements) must be recycled from the transformer, back to the transformer, for the purpose of resetting the transformer.

Lambda at 21.

6. *Single Ended Forward Converter*

[12] Artesyn opposes Vicor's proposed claim construction of single ended forward converter. This term was also discussed at length in the *Lambda* opinion and I again adopt the reasoning and construction reached there:

"[S]ingle ended forward converter" means a device in which (a) the power flow from source to load is controlled (gated) by a single solid state primary switch; (b) energy is transferred forward from the primary winding to the secondary winding of the transformer during the ON period of the switch; and (c) the power transformer is simultaneously connected to the source and the load.

Lambda at 21.

ORDER

The Court orders as follows:

1. Claims 1 and 5 of the '098 patent are not invalid as indefinite;

2. "Closed" means that a switch is enabled to conduct current that it could otherwise block;

3. "Open" means that a switch is not enabled to conduct current that it could otherwise block;

4. "Prior to" means "before" and requires a delay FN5 during which neither the primary nor the auxiliary switch is enabled to conduct current that it could otherwise block;

FN5. The Court will be construing "delay" in the Power-One litigation.

5. "Recycling the magnetizing energy stored in said transformer to reset it" means that all the magnetizing energy stored in the transformer (except that lost due to the non-ideal nature of the circuit elements) must

be recycled from the transformer, back to the transformer, for the purpose of resetting the transformer.

6. "Single Ended Forward Converter" means a device in which (a) the power flow from source to load is controlled (gated) by a single solid state primary switch; (b) energy is transferred forward from the primary winding to the secondary winding of the transformer during the ON period of the switch; and (c) the power transformer is simultaneously connected to the source and the load.

The Court declines to construe any claim not subject to briefing, and declines to accept any further briefing.

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