

United States Court of Appeals for the Federal Circuit

2007-1441, -1463

TECHNOLOGY LICENSING CORPORATION,

Plaintiff-Appellant,

v.

VIDEOTEK, INC.,

Defendant,

and

GENNUM CORPORATION,

Defendant-Cross Appellant.

Timothy J. Vezeau, Katten Muchin Rosenman LLP, of Chicago, Illinois, argued for plaintiff-appellant. With him on the brief were Michael A. Dorfman, Rachel M. Vorbeck, and James A. Gromada, of Washington, DC.

J. Donald McCarthy, Duane Morris LLP, of Los Angeles, California, argued for defendant-cross appellant. With him on the brief were Todd R. Miller, Jones Day, of Los Angeles, California, and Gregory A. Castanias, of Washington, DC.

Appealed from: United States District Court for the Northern District of California

Magistrate Judge Richard Seeborg

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Appeals from the United States District Court for the Northern District of California in case no. 01-CV-4204, Magistrate Judge Richard Seeborg.

DECIDED: October 10, 2008

Before NEWMAN, PLAGER, and SCHALL, Circuit Judges.

PLAGER, Circuit Judge.

This is a patent case. It is not unusual for a patent case on appeal to turn more on a question of law or legal procedure than on the complexities of the particular technology that underlies the dispute. This is not such a case. This case has both legal issues and technical issues in roughly equal measure. There is, among other issues, a complex, though ultimately not difficult, question of allocation of the burdens of

proof between the patentee and the alleged infringer when entitlement to an earlier filing date is at issue. And there is, among other issues, a complex, and rather difficult, question of whether the written description of the earlier application supports the later-claimed technology. As the reader will see, in the course of deciding the case the court had to parse the terms of the four applications that led to the two patents governing the particular aspect of video technology at issue.¹

After weighing carefully the findings and judgment of the trial court, which followed from a lengthy bench trial, and the arguments of counsel for the parties regarding the several issues in contention, we affirm the trial court's judgment.

BACKGROUND

I. Technology and the Patents-in-Suit

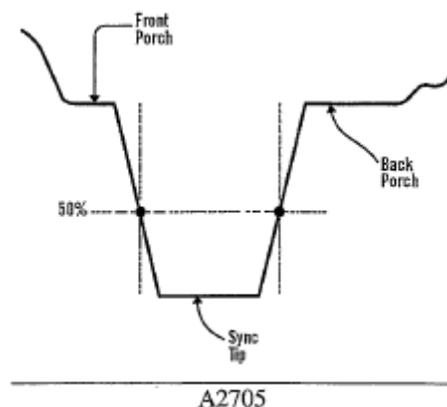
The Technology Licensing Corporation ("TLC") patents at issue in this case relate to the separation of synchronization signals from video signals. In general, the composite video signal received by a television contains information that allows the television to reproduce pictures on its screen one line at a time. The incoming video signal includes a synchronization signal (also referred to as a "sync signal" or "sync pulse") to indicate the beginning of the information for each line. The sync signal must be extracted precisely from the composite video signal so that the television can accurately reproduce the transmitted image. This function is performed by circuits

¹ One small benefit the (older) reader may gain from a study of the technology is a better understanding of why the picture on the video screen would occasionally roll, a problem this technology has mostly solved.

referred to as “sync separators,” which have been in existence since the advent of television. Sync separators are implemented today as integrated circuits.

In an analog video signal (one that follows, for example, the National Television System Committee (“NTSC”) standard used in the United States), the sync signal is a downward, or negative-going, pulse, preceded by an interval called a “front porch” and followed by an interval called a “back porch.” The NTSC sync signal is said to be a two-level signal because the signal is at one voltage level during the front porch and back porch intervals and reaches a different, lower voltage level during the sync pulse. Digital video signals such as HDTV use a more complex, three-level sync signal.

The process of sync separation involves two fundamental steps. First, the “tip,” or negative peak, of the pulse (known as the “sync tip”) is “clamped,” or held, to a known voltage level by adding current to or draining current from the signal. Second, the clamped sync pulse is “sliced” by comparing it to a “slicing voltage,” typically midway between the sync tip voltage level and the back porch voltage level in a two-level signal. The following diagram (J.A. 2705) shows a sync pulse with a front porch, a back porch, and a sync tip that has been clamped to a known voltage:



The sync separator produces a logic level sync signal that is, for example, high when the video signal is below the slicing voltage, indicating the presence of a sync pulse, and low at all other times. The TLC patents in this case are directed to methods for sync separation that may be used with different types of sync signals, as required by various standards, and that minimize the effect of noise in the video signal, thereby providing reliable and precise recovery of sync signals.

The patents-in-suit issued from a chain of continuation and continuation-in-part applications.² J. Carl Cooper, the sole inventor, filed the first patent application, Serial No. 837,323 (“the ’323 application”), on February 28, 1992. On December 13, 1993, he filed a continuation application, which eventually issued as U.S. Patent No. 5,486,869 (“the ’869 patent”). Before that patent issued, Cooper filed a continuation-in-part (“CIP”) application, Serial No. 493,661 (“the ’661 application”), on June 22, 1995. The final application, a CIP of the ’661 application, was filed on December 4, 1995, and later issued as U.S. Patent No. 5,754,250 (“the ’250 patent”). In sum, there are two patents-in-suit derived from four applications for patent. Cooper assigned the patents to TLC, which he formed for the purpose of licensing and asserting his patents.

The ’869 patent describes, inter alia, a sync separator that involves two separate clamping operations. Claim 27 of the ’869 patent is directed to the two-clamp aspect of the patented invention:

² The difference between a continuation application and a continuation-in-part application is that a continuation contains the same disclosure found in an earlier application, whereas a continuation-in-part contains a portion or all of the disclosure of an earlier application together with added matter not present in the earlier application. See Transco Prods. Inc. v. Performance Contracting, Inc., 38 F.3d 551, 555 (Fed. Cir. 1994).

27. An apparatus for deriving a logic level version of the sync portion of a video type signal, said sync portion having a plurality of levels, one of which may be a blanking level, said apparatus including:

(a) *circuitry responsive to said sync portion to clamp the sync tip thereof to a known level thereby providing a clamped sync portion and to generate at least a first logic level sync signal in response to said clamped sync portion;*

(b) *circuitry for clamping said sync portion to a known level to provide a second clamped sync portion;*

(c) *circuitry for providing at least one reference signal in response to said first logic level sync signal and said second clamped sync portion;*

(d) *circuitry for comparing said second clamped sync portion to said reference signal to provide said logic level version.*

'869 patent col.17 ll.15-31 (emphases and paragraph lettering added).

The '869 patent also describes a sync separator that is able to recover sync signals from different types of video signals, e.g., both NTSC and HDTV signals. Claim 31 of the '869 patent relates to that aspect of the invention:

31. An apparatus for deriving a logic level version of the sync portion of a video type signal, said sync portion having a number of levels N, one of which may be a blanking level, and where N may be two or more depending on the format of said video type signal, said apparatus including:

(a) *circuitry to provide a format signal changeable in response to the format of said video type signal;*

(b) *circuitry responsive to said sync portion to generate at least a first separated sync signal;*

(c) *circuitry for providing at least N-1 reference signal(s) in response to said sync portion and said first separated sync signal; and*

(d) *circuitry responsive to said sync portion and said format signal and said reference signal(s) for comparing said sync portion to said reference signal(s) to provide said logic level version.*

'869 patent col.17 ll.41-57 (emphasis and paragraph lettering added).

Cooper added new matter to the written description in June 1995 when he filed the '661 CIP application and again in December 1995 when he filed the CIP application that led to the '250 patent. The '250 patent contains claims that involve only a single clamp, including claim 33:

33. The method of recovering sync from a video type signal including the steps of:

(a) coupling said video type signal through a capacitor *or other circuit* thereby establishing a level shifted signal having a sync portion;

(b) comparing said level shifted signal to a first known reference to provide a compared signal;

(c) *selectively adding a current to said level shifted signal wherein the amount and/or polarity of said current is responsive to said compared signal* and the D.C. level of said level shifted signal is changed in response to said current;

(d) comparing said level shifted signal to a second known reference to provide a second compared signal, which second compared signal is a logic level representation of said sync portion.

'250 patent col.28 ll.13-29 (emphasis added and paragraph lettering modified).

When Cooper added claim 33 to the '250 patent application by amendment in December 1996, he stated that "Claim 33 element [(a)] corresponds to [capacitor] C3 of figure 2, or alternatively to [capacitor] 1603, or [resistors] 1604 and 1605 of Figure 16." J.A. 2030. What this means as a technical matter is that the "capacitor" specified in step (a) necessarily corresponds to one of the two capacitors he identified—either to capacitor C3 in Figure 2 or to capacitor 1603 in Figure 16. This leaves resistors 1604 and 1605 in Figure 16 to correspond with the "other circuit" specified in step (a). Figure

16 was part of the new matter added when the CIP was filed in 1995.³ Exactly where the written description support for the phrase “other circuit” is to be found is a major point of contention in the case.

II. Procedural History

TLC filed a complaint against Videotek, Inc. (“Videotek”), alleging infringement of the ’869 patent and ’250 patent. Videotek filed a third-party complaint against its sync separator chip supplier, Gennum Corporation (“Gennum”), seeking a right to indemnification. Gennum then filed a third-party complaint against TLC seeking a declaratory judgment that TLC’s patents were invalid, unenforceable, and not infringed. TLC filed compulsory counterclaims against Gennum, alleging that Gennum was liable for direct and indirect infringement. TLC and Videotek settled, leaving only the dispute between TLC and Gennum for adjudication by the trial court.

Gennum initially requested a jury trial. After a ruling by the trial court that would have had the effect of significantly reducing the amount of damages TLC could recover if infringement were found, TLC withdrew its claim for damages and sought only injunctive relief. Gennum then withdrew its request for a jury trial. After the magistrate judge assigned to the case rejected TLC’s argument that it had a right to a jury trial in a declaratory judgment action to invalidate its patents, TLC filed a petition for a writ of mandamus with this court. We agreed with the magistrate judge that TLC was not

³ It is unclear from the excerpts of the record provided by the parties on appeal whether Figure 16 and its accompanying text were added as new matter when the ’661 CIP application was filed in June 1995 or when the subsequent CIP application that became the ’250 patent was filed in December 1995. For purposes of this opinion, we will assume that Figure 16 and its textual description were added when the application that matured into the ’250 patent was filed. As will become evident, whether the new matter was added in June or December 1995 is of no consequence, as long as it was after 1993.

entitled to a jury trial and denied the petition. In re Tech. Licensing Corp., 423 F.3d 1286 (Fed. Cir. 2005). That decision is law of the case.

Subsequently, a bench trial was held before the magistrate judge sitting as the trial court in October 2006. TLC asserted that Gennum's GS 1881, GS 4881, and GS 4981 chips ("the '81 family") infringed certain claims of the '250 patent and that Gennum's GS 4882 and GS 4982 chips ("the '82 family") infringed certain claims of both the '250 patent and the '869 patent. As discussed in more detail below, the chips in the '82 family contain both a "hard clamp" circuit and a "soft clamp" circuit, whereas the chips in the '81 family contain only a one-clamp circuit.

The trial court found that the '81 family of chips did not infringe the asserted claims of the '250 patent (independent claim 33 and dependent claims 34-37 and 39). With regard to the '82 family of chips, the trial court noted that Gennum presented no evidence to rebut TLC's showing that the soft clamp circuitry of the '82 family infringed the asserted claims. The court, therefore, found that TLC would be entitled to judgment in its favor on infringement by the '82 family of chips in the absence of a finding that the claims were invalid.

The trial court then addressed the validity of claim 33 and the asserted dependent claims of the '250 patent. Gennum argued that the claims were anticipated by several different prior art references. The trial court, however, found that four of those references did not satisfy step (c) of claim 33 ("selectively adding a current to said level shifted signal wherein the amount and/or polarity of said current is responsive to said compared signal") because the disclosed methods inject only a *fixed* amount of

current rather than a *variable* amount.⁴ Deciding the issue not as a matter of claim construction but as an “evaluation of the prior art,” the trial court concluded that a method that adds a fixed amount of current is not within the scope of the claim because a fixed amount of current cannot be “responsive” to another signal.

The remaining pieces of prior art relied on by Gennum were the EL4581C and EL4583C sync separator chips made by Elantec, which are described in data sheets published in May 1993 and November 1993, respectively. TLC did not dispute that the Elantec chips met all the limitations of the asserted claims of the '250 patent. Thus the issue before the trial court was whether the Elantec chips were indeed prior art, a question that turned on the ‘priority’ date, or more accurately the effective filing date, of the asserted claims.⁵

As discussed in more detail later, a patent must contain a written description of the claimed invention in “full, clear, concise, and exact” terms. 35 U.S.C. § 112, ¶ 1. In a situation like the one here, in which a patentee seeks the benefit of the filing date of an earlier filed application, compliance with the written description requirement may turn on whether the disclosure of the earlier application provides “adequate support” for the claims at issue. See Vas-Cath Inc. v. Mahurkar, 935 F.2d 1555, 1560 (Fed. Cir. 1991).

⁴ One of the four references was the LM 1881 sync separator chip, which makes a later appearance in this case.

⁵ “Priority” is a term which, like “jurisdiction,” has many meanings and which depends for its meaning on context. The term is sometimes used, as here, when a patent application is entitled to the benefit of the filing date of an earlier United States patent application. The statute that provides for that entitlement is 35 U.S.C. § 120, which does not use the term “priority.” The term does appear in 35 U.S.C. § 119, which provides that an application is entitled to the benefit of the filing date of an earlier foreign application, subject to certain limitations and conditions. And, of course, the term is commonly used in connection with interference practice. For clarity, we refer not to a priority date but to entitlement to the benefit of a filing date, or simply the effective filing date.

In this case, Gennum contended that claim 33 was entitled to an effective filing date of 1995 because the only written description support in the '250 patent for claim 33 is found in the new matter that was added in 1995. Therefore, in Gennum's view, the 1993 Elantec chips were anticipatory prior art rendering claim 33 invalid. TLC responded that the claims were entitled to a 1992 filing date, when the original '323 application was filed, because the written description of the '323 application provides adequate support for claim 33. Thus, TLC argued, the Elantec chips were not available as prior art to invalidate the claims.

In its opinion, the trial court first discussed the allocation of burdens and the standard of proof in a footnote:

TLC asserts that Gennum must prove by "clear and convincing" evidence that the claims are *not* entitled to the priority date TLC claims. Even though the ultimate issue in this case is the validity of the claims, TLC has not pointed to authority for the proposition that the "clear and convincing" standard applies when resolving the priority date issues. The Court need not decide the applicable standard, however, because the result would be the same under either the preponderance of the evidence or a "clear and convincing" standard.

Tech. Licensing Corp. v. Gennum Corp., No. 01-CV-4204, slip op. at 31 n.40 (N.D. Cal. May 4, 2007) ("TLC Order and Opinion"). The trial court then found in Gennum's favor, concluding that the '323 application did not provide adequate written description support for the "other circuit" language in step (a) of claim 33. In response to TLC's argument that two resistors, R21 and R26, in Figure 3 of the '323 application⁶ supported that limitation, the trial court said:

⁶ The '323 application and the '869 patent have the same written description. The trial court's opinion sometimes refers to the published '869 patent; for clarity and because timing is a critical issue, we will refer to the '323 application when appropriate.

[T]he only “support” for claim 33 is the fact that R21 and R26 appear in one of several circuit diagrams and that there is a passing reference to R21 (albeit mislabeled) in the text. While it may be possible that a person of ordinary skill in the art could study Figure 3 and determine that R21 and R26 might have the *effect* of establishing a level shifted signal, there is nothing from which anyone could determine with any confidence that R21 and R26 were the “other circuit” being claimed.

Id. at 33. Having determined that the asserted claims of the '250 patent were not entitled to the benefit of the '323 application's filing date, the trial court found that the Elantec chips were prior art that rendered the claims invalid for anticipation.

Gennum also argued at trial that the '250 patent was unenforceable due to inequitable conduct because during prosecution Cooper failed to disclose to the United States Patent and Trademark Office (“PTO”) the LM 1881 prior art chip, effectively the industry standard at the time, manufactured by National Semiconductor. The trial court, however, found that Gennum made no effort to rebut TLC's showing that every element of the LM 1881 that was pertinent to the asserted claims of the '250 patent was disclosed in a Japanese patent reference that was already in the application file. The trial court therefore found that the LM 1881 reference was not material because it was cumulative to other prior art already before the examiner.

With respect to the '869 patent, the trial court found that Gennum's '82 family of chips did not infringe independent claim 27 and dependent claims 29 and 30. Although the chips in the '82 family contain two clamp circuits, a hard clamp and a soft clamp, the trial court found that they did not generate two “clamped sync portions” in the manner required by the claims. The trial court also found that the '82 family of chips did not infringe claims 31, 32, and 40, the other asserted claims of the '869 patent. Finally, the trial court rejected Gennum's challenge to the validity of claim 31 of the '869 patent on

the grounds that it did not meet the written description, enablement, and definiteness requirements of 35 U.S.C. § 112.

Accordingly, the trial court entered final judgment in favor of Gennum on all issues except Gennum's declaratory claims for unenforceability of the '250 patent and invalidity of claim 31 of the '869 patent. TLC filed a timely appeal, and Gennum filed a timely cross-appeal. We have jurisdiction pursuant to 28 U.S.C. § 1295(a)(1).

DISCUSSION

TLC appeals the trial court's invalidity judgment with respect to claims 33-37 and 39 of the '250 patent. TLC also appeals the judgment that Gennum's '82 family of chips do not infringe claims 27, 29, and 30 of the '869 patent.⁷ On cross-appeal, Gennum challenges the judgment of the trial court regarding inequitable conduct and the judgment regarding the validity of claim 31 of the '869 patent. Gennum also challenges the trial court's claim construction of step (c) in claim 33 of the '250 patent, an issue we need not decide for reasons explained below. We consider the issues on appeal in turn, beginning with those raised by TLC in the main appeal.

I. Validity of Claim 33 of the '250 Patent

We turn first to the '250 patent. Since TLC has conceded that the Elantec chips, described in data sheets published in May and November of 1993, meet all the limitations of the asserted claims of the '250 patent (independent claim 33 and dependent claims 34-37 and 39), the issue is whether the Elantec chips were in fact

⁷ TLC does not challenge the judgment of non-infringement of the '250 patent by the '81 family of chips or the judgment of non-infringement of claims 31, 32, and 40 of the '869 patent by the '82 family of chips.

prior art. The '250 patent issued from a CIP application filed in 1995. If claim 33 is only entitled to the benefit of the 1995 date, as Gennum maintains, the Elantec data sheets were indeed prior art that anticipates claim 33.

TLC's counterargument is that claim 33 is entitled, under 35 U.S.C. § 120, to the benefit of the 1992 filing date of its ancestor, the original '323 application. That statute provides that a patent application for an "invention disclosed in the manner provided by the first paragraph of section 112 of this title in an application previously filed in the United States . . . shall have the same effect, as to such invention, as though filed on the date of the prior application" 35 U.S.C. § 120 (emphasis added). In essence, this means that in a chain of continuing applications, a claim in a later application receives the benefit of the filing date of an earlier application so long as the disclosure in the earlier application meets the requirements of 35 U.S.C. § 112, ¶1, including the written description requirement, with respect to that claim. See Transco Prods. Inc. v. Performance Contracting, Inc., 38 F.3d 551, 556 (Fed. Cir. 1994). If the effective filing date of claim 33 under § 120 is 1992, then the Elantec data sheets, dated in 1993, are not prior art to the claim.

The dispute as to whether claim 33 is entitled to the benefit of the '323 application's filing date involves the "other circuit" limitation in step (a) of claim 33. Gennum maintains that the only written description support for that limitation in the '250 patent is new matter that was added in 1995, specifically resistors 1604 and 1605 in Figure 16, along with accompanying text. TLC's position is that resistors R21 and R26 in Figure 3 of the '250 patent, which were originally disclosed in Figure 3 of the '323 application, also correspond to and thus support the "other circuit" limitation in claim 33.

The ultimate question, then, is whether the disclosure of the '323 application satisfies the written description requirement with respect to claim 33, and particularly with respect to the “other circuit” limitation in step (a). The trial court answered this question in the negative, and therefore found that claim 33 was not entitled to the 1992 effective filing date of the '323 application. Accordingly, the trial court found that the Elantec data sheets were indeed prior art, and concluded that claim 33 is invalid for anticipation.

On appeal, TLC argues that in so doing the trial court erred in two respects: first, by shifting the burden of proof to TLC to show that it is entitled to the benefit of the 1992 filing date of the '323 application; and second, even if the trial court applied the burden of proof correctly, in concluding that the disclosure of the '323 application does not provide adequate written description support for claim 33 of the '250 patent. We address these issues in turn, beginning with a discussion of the allocation of burdens of proof.

A. The Burdens of Proof

First, a clarification of terminology. We will refer to the generic problem of burdens only in the plural—*burdens* of proof—because there are within that phrase two distinct, and quite different, ideas. One is the burden of persuasion. That is the ultimate burden assigned to a party who must prove something to a specified degree of certainty—beyond a reasonable doubt (the criminal law standard of proof for guilt); by a preponderance of the evidence (the usual civil law standard for proof of a fact); or, perhaps, something in between, such as “clear and convincing,” the patent law evidentiary standard for establishing that a patent, otherwise presumed valid, is invalid,

see 35 U.S.C. § 282; Am. Hoist & Derrick Co. v. Sowa & Sons, Inc., 725 F.2d 1350, 1360 (Fed. Cir. 1984). Failure to prove the matter as required by the applicable standard means that the party with the burden of persuasion loses on that point—thus, if the fact trier of the issue is left uncertain, the party with the burden loses. See generally Christopher B. Mueller & Laird C. Kirkpatrick, Evidence § 3.1 (1995); Charles Alan Wright & Kenneth W. Graham, Jr., Federal Practice & Procedure § 5122 (2d ed. 2005).

In the case before us, plaintiff/patentee TLC, alleging infringement by Gennum, has the burden of persuasion that Gennum infringes, under the usual civil law standard of preponderance of the evidence. In response to the argument by TLC that Gennum infringes claim 33 of the '250 patent, Gennum raises the affirmative defense that claim 33 is invalid because it is anticipated by the prior art. When an alleged infringer attacks the validity of an issued patent, our well-established law places the burden of persuasion on the attacker to prove invalidity by clear and convincing evidence. See Hybritech Inc. v. Monoclonal Antibodies, Inc., 802 F.2d 1367, 1375 (Fed. Cir. 1986); Ralston Purina Co. v. Far-Mar-Co, Inc., 772 F.2d 1570, 1573 (Fed. Cir. 1985); Am. Hoist, 725 F.2d at 1360. Neither TLC's burden to prove infringement nor Gennum's burden to prove invalidity, both ultimate burdens of persuasion, ever shifts to the other party—the risk of decisional uncertainty stays on the proponent of the proposition. See Hybritech, 802 F.2d at 1375; Ralston, 772 F.2d at 1574; Am. Hoist, 725 F.2d at 1360.

A quite different burden is that of going forward with evidence—sometimes referred to as the burden of production—a shifting burden the allocation of which depends on where in the process of trial the issue arises. See generally Christopher B.

Mueller & Laird C. Kirkpatrick, Evidence §§ 3.1, 3.2 (1995); Charles Alan Wright & Kenneth W. Graham, Jr., Federal Practice & Procedure § 5122 (2d ed. 2005). We understand, and we shall use here, the phrase 'going forward with evidence' to mean both producing additional evidence and presenting persuasive argument based on new evidence or evidence already of record, as the case may require.

Here, TLC, the plaintiff in the suit, has the initial burden of going forward with evidence to support its allegation that Gennum infringes claim 33. Gennum, having the ultimate burden of proving its defense of invalidity based on anticipating prior art, then has the burden of going forward with evidence that there is such anticipating prior art, which in Gennum's view means art that is prior to the 1995 application date of the '250 patent. See Ralston, 772 F.2d at 1573.

At that point TLC has the burden of going forward with evidence either that the prior art does not actually anticipate, or, as was attempted in this case, that it is not prior art because the asserted claim is entitled to the benefit of a filing date prior to the alleged prior art. See id. This requires TLC to show not only the existence of the earlier application, but why the written description in the earlier application supports the claim. In the context of the allegedly anticipating Elantec prior art, that means producing sufficient evidence and argument to show that an ancestor to the '250 patent, with a filing date prior to the Elantec date, contains a written description that supports all the limitations of claim 33, the claim being asserted.

Assuming then that TLC's evidence and argument in support of the earlier filing date is now before the court, the burden of going forward again shifts to the proponent of the invalidity defense, Gennum, to convince the court that TLC is not entitled to the

benefit of the earlier filing date. “Convince” is the operative word, because if the court is not persuaded by clear and convincing evidence that Gennum is correct, Gennum has failed to carry its ultimate burden of persuasion, and its defense of invalidity, based on anticipation by the Elantec art, fails.

TLC argues on appeal that the trial court improperly shifted the burden of persuasion to TLC to prove that the 1992 written description supported the claim, when the burden of persuasion on invalidity should have remained on the challenger. Gennum responds that is not what the trial court did, but argues that in any event our recent decision in PowerOasis, Inc. v. T-Mobile USA, Inc., 522 F.3d 1299 (Fed. Cir. 2008), relieved Gennum of that burden.

PowerOasis was issued between the time the briefing in this case was completed and the time oral argument in the case was held. At oral argument, Gennum took the position that the rule in PowerOasis is that if the trier of fact is left in doubt about whether the effective date resides in an ancestor patent application, the patentee, not the challenger, loses. In effect, Gennum’s argument is that the risk of non-persuasion falls on the patentee, because the patentee has the burden of proving that it is entitled to the earlier effective filing date.

In PowerOasis, the alleged infringer, T-Mobile, argued that the claims asserted against it by the patentee, PowerOasis, were anticipated by the MobileStar Network, a system that was in public use more than one year before the date of the CIP application from which the asserted claims arose. Since PowerOasis conceded that the MobileStar Network included all the limitations of the asserted claims, PowerOasis countered T-Mobile’s position by arguing that the claims were entitled to the benefit of the filing date

of an earlier application. As in this case, the issue then before the trial court was whether the earlier written description provided sufficient support for the asserted claims. The judgment of the trial court was that PowerOasis was not entitled to the benefit of the earlier filing date.

In affirming the trial court's judgment, this court's opinion noted that the trial court "held that PowerOasis had the burden of proving that it is entitled to claim priority to the filing date of the Original application." 522 F.3d at 1303. In our affirmance, however, we stated that once T-Mobile satisfied its initial burden of production by coming forward with evidence that the MobileStar Network was anticipatory prior art, "the burden was on PowerOasis to *come forward with evidence* to the contrary." Id. at 1305 (emphasis added). We then concluded that the "district court therefore correctly placed the burden on PowerOasis *to come forward with evidence* to prove entitlement to claim priority to an earlier filing date." Id. at 1305-06 (emphasis added).

Nevertheless, Gennum is not alone in reading PowerOasis to have modified the traditional burdens rule so that the patentee has the burden of persuasion to prove it was entitled to the earlier filing date.⁸ Carefully read, however, PowerOasis says nothing more than, and should be understood to say, that once a challenger (the

⁸ See, e.g., Peter J. Karol, The Presumption of Validity: A New Crack in the Armor?, 76 Pat. Trademark & Copyright J. 127, 128 (2008) ("[PowerOasis] went on to hold that, where such a determination [of entitlement to an earlier filing date] has not previously been made by the PTO, and where the defendant has introduced clearly anticipatory intervening art, the burden to establish Section 120 priority *is on the patent owner*."). The article goes on to speculate that PowerOasis could mean that a defendant should not be made to demonstrate invalidity by clear and convincing evidence in other areas of patent law as well, thus placing "a bedrock [principle] of U.S. patent law . . . on shakier ground." Id. at 129. See also David O. Taylor, Will High Court Change Burden of Proving Invalidity?, Law360 (Aug. 01, 2008), *available at* <http://www.law360.com/articles/64798>.

alleged infringer) has introduced sufficient evidence to put at issue whether there is prior art alleged to anticipate the claims being asserted, prior art that is dated earlier than the apparent effective date of the asserted patent claim, the patentee has the burden of going forward with evidence and argument to the contrary. As we noted earlier, it is a long-standing rule of patent law that, because an issued patent is by statute presumed valid, a challenger has the burden of persuasion to show by clear and convincing evidence that the contrary is true. That ultimate burden never shifts, however much the burden of going forward may jump from one party to another as the issues in the case are raised and developed. Correctly understood, PowerOasis is fully consistent with this understanding; until such time as these rules are abrogated by statute, by this court sitting en banc, or by the Supreme Court, the opinion in PowerOasis could not be otherwise.

B. Application of the Burdens of Proof in this Case

In our case, what burdens of proof did the trial court apply, and did the court misapply the applicable burdens? The trial court's only direct reference to the burdens of proof appears in the footnote quoted earlier, in which the court also addressed the standard of proof. In the footnote the court acknowledges TLC's assertion "that Gennum must prove by 'clear and convincing' evidence that the claims are *not* entitled to the priority date TLC claims," but then goes on to discuss the applicable standard of proof, clear and convincing vs. preponderance, concluding that the court did not need to decide which standard applied because "the result would be the same under either." TLC Opinion and Order, slip op. at 31 n.40.

TLC cites to the passage in the trial court's opinion in which the court discussed whether the written description of the '323 application, specifically the proffered Figure 3 (also Figure 3 in the '869 patent and the '250 patent), provided support for the "other circuit" limitation. That passage reads:

[T]he only "support" for claim 33 is the fact that R21 and R26 appear in one of several circuit diagrams and that there is a passing reference to R21 (albeit mislabeled) in the text. While it may be possible that a person of ordinary skill in the art could study Figure 3 and determine that R21 and R26 might have the *effect* of establishing a level shifted signal, there is nothing from which anyone could determine with any confidence that R21 and R26 were the "other circuit" being claimed.

TLC Opinion and Order, slip op. at 33. TLC argues that this passage indicates that the trial court placed the burden on TLC to show that "anyone" would know that the written description supported claim 33. TLC adds that this statement further shows that the trial court gave no deference to the examiner's decision to approve the claim.

TLC's burdens argument is not without reason. The trial court's footnote is at best ambiguous regarding the burdens of proof issue. The court certainly did not explicitly address the question of which party had what burden of proof. Furthermore, the statement regarding what "anyone" could determine can be read to support TLC's position.

We think, however, that the statement should be read somewhat differently. In the context of the case and the opinion in which this paragraph appears, we understand the court to mean by "anyone" the judicial trier of fact, and the following phrase to summarize the court's conclusion that, giving TLC's evidence due weight, Gennum's evidence and arguments were sufficient for the trier to conclude by clear and convincing evidence that Figure 3 does not provide adequate written support for the "other circuit"

limitation. The footnote certainly demonstrates that TLC had fully communicated to the trial court where on the question of invalidity the ultimate burden of persuasion lay, and we think the quoted passage is too thin a reed on which to build a conclusion that the trial court failed to understand this, or failed to view the evidence accordingly.

The deference issue raised by TLC also needs addressing. TLC argues that the trial court, in rejecting its position that claim 33 was entitled to the earlier filing date of the '323 application, failed to give proper deference to the expertise of the PTO in the matter. The PTO had of course issued the '250 patent, thus imbuing it with the statutory presumption of validity. More than that, TLC has now informed the court that, subsequent to the oral argument in the case, the previously-filed reissue application regarding the '250 patent has been acted on by the PTO. On July 1, 2008, the original patent was reissued with the original claims, including claim 33, unchanged. TLC suggests this new information is "pertinent and significant" to this appeal.⁹

In PowerOasis this court went to some lengths to distinguish an earlier case, Ralston, on this question of deference. Ralston had set out a description of the burdens of proof and the function of the burden of going forward which we have followed here. 772 F.2d at 1573-74. At the same time, as PowerOasis explained, in Ralston the issue of what effective date the patent-in-suit was entitled to had been addressed by the PTO because the issue was before it in the form of an interference contest. PowerOasis, 522 F.3d at 1304. In addition, as the record below showed, the examiner had specifically considered the prior art on which the defendant in that case relied. Id.

⁹ Letter to the Clerk of the Court from counsel for TLC, providing supplemental authority (July 1, 2008) (stating that the '250 patent has been reissued as RE40,411 and the '869 patent as RE40,412).

Thus, “the defendant had the added burden of overcoming the deference due to the PTO.” Id.

By contrast, in the PowerOasis case, the PTO had not made any determination with regard to the effective filing date of the various claims of the asserted patents. Beyond that, the prior art at issue had not even been before the examiner. In this court’s view, there was no basis to “presume” anything about the filing date, and “no finding for the district court to defer to.” Id. at 1305.

With regard to whether there was a determination by the PTO of an effective filing date, the facts of our case fall somewhere between those of Ralston and PowerOasis. Although the Elantec data sheets were listed as prior art in the patent application, and thus were before the examiner, there is nothing in the record to indicate that the PTO determined during the original examination that claim 33 was or was not entitled to the filing date of the ancestor. Counsel for TLC when queried during oral argument acknowledged that there was no express evidence that the examiner ever addressed the point.

Thus, whether the trial court gave proper deference to the PTO’s expertise in initially issuing the ’250 patent is, in the first instance, a question of evidentiary weight. In this circumstance, the deference question is subsumed into the overall assessment by the trial court of the evidence on the basic issue of whether TLC is entitled to the earlier filing date. In the absence of some specific indication otherwise, we assume that the trial court properly included the PTO’s expertise in its calculations and rendered judgment accordingly.

Whether the later reissuance of the '250 patent by the PTO, subsequent to the decision by the trial court in this case, is pertinent to the appeal is a different question. It is self-evident that the PTO's subsequent reaffirmation of its earlier position, that claim 33 is a valid claim despite the alleged prior art, can have no legal effect as such on the already-rendered judgment of a court of competent jurisdiction. No one suggests that the PTO has power to exercise review authority over a judgment of a federal trial court.

That said, there remains the question of what deference, if any, needs to be accorded on appeal to such an administrative re-determination when it first appears at the last moment in an appeal from a trial court's final judgment. It hardly needs noting that it is the trial court's decision, not the PTO's, that is before us on appeal. The reissuance of the patent occurred after the trial court rendered its final judgment. An appellate court ordinarily declines to consider new evidence or argument not previously presented to the trial forum whose judgment is under review. We think that, in a circumstance such as this, judicial efficiency and the policy of repose counsels against our re-weighing of the evidence to add an additional deference-thumb to the scale, or, even more disruptive, our asking the trial court to reopen the entire invalidity question to reweigh the intangible worth of additional deference.

This is not to say that the determinations made by the corps of examiners are not important, or should not be worthy of appropriate deference to their expertise in these technical matters, especially when we have the benefit of well-reasoned explications. It is to say that when dealing with the intangible worth to be accorded an administrative agency's decision making, the judicial process cannot be held hostage to the timing of either the agency or the litigants who have invoked the agency's further review. In

some circumstances a party may be able to obtain a stay from the trial court while awaiting the sought-for agency action; absent that, and absent extenuating circumstances not here present, the case must be decided on the record the litigants present for appeal.

C. Review of the Trial Court's Written Description Determination

We turn now to the merits of the question of whether the trial court, on the record before it, correctly determined that Figure 3 of the '323 application does not provide adequate written description support for the "other circuit" limitation in step (a) of claim 33. To satisfy the written description requirement, the disclosure of the earlier filed application must describe the later claimed invention "in sufficient detail that one skilled in the art can clearly conclude that the inventor invented the claimed invention as of the filing date sought." Lockwood v. Am. Airlines, Inc., 107 F.3d 1565, 1572 (Fed. Cir. 1997). While the earlier application need not describe the claimed subject matter in precisely the same terms as found in the claims at issue, Eiselstein v. Frank, 52 F.3d 1035, 1038 (Fed. Cir. 1995), the prior application must "convey with reasonable clarity to those skilled in the art that, as of the filing date sought, [the inventor] was in possession of the invention," Vas-Cath, 935 F.2d at 1563-64. Compliance with the written description requirement is a question of fact, which, following a bench trial, we review for clear error. Lampi Corp. v. Am. Power Prods., Inc., 228 F.3d 1365, 1378 (Fed. Cir. 2000).

TLC argues that the resistors R21 and R26 in the written description of the '323 application provide adequate support for the "other circuit" in step (a) of claim 33, the circuit through which the video signal is coupled to establish a level-shifted signal. As

the trial court correctly noted, R21 and R26 appear only in Figure 3, one of several circuit diagrams in the application:

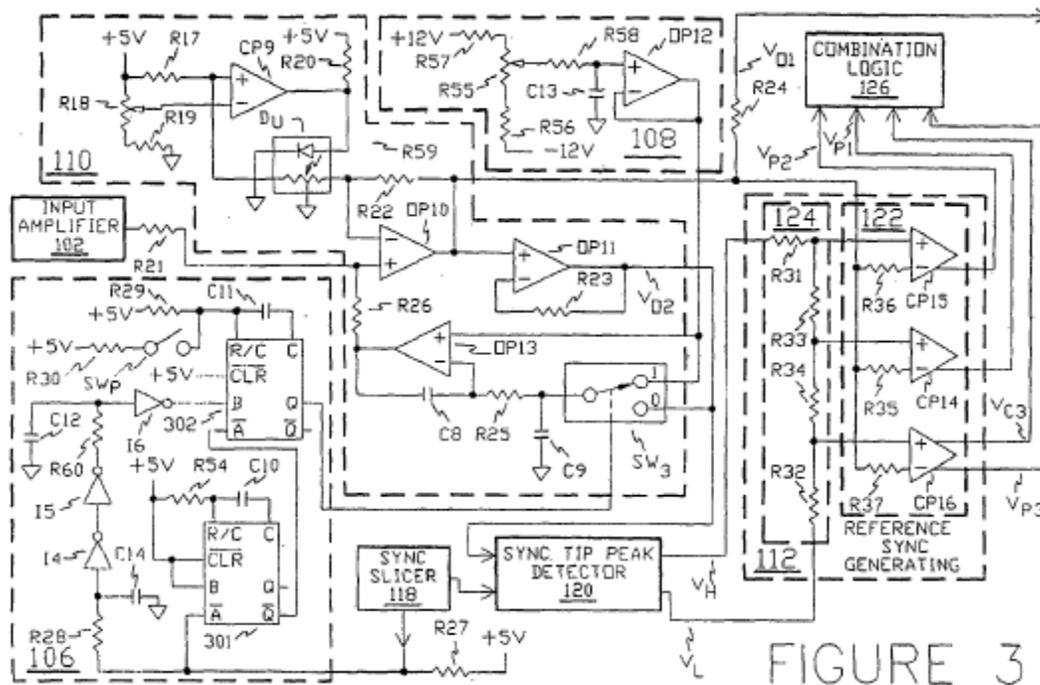


FIGURE 3

The text of the written description makes no mention of R26 and only briefly refers to R21 in passing: “The output of the input amplifier 102 is coupled to the positive input of the amplifier OP10 of DC restoration 110, via a resistor [R21] of 330Ω.” ’869 patent col.8 ll.18-20.¹⁰ There is no reference whatsoever in the text to a level shifting circuit, much less one that consists of the resistors R21 and R26.

In contrast, the ’250 patent contains new matter describing a level shifting circuit that supports the “other circuit” limitation in claim 33. Figure 16 contains two resistors, 1604 and 1605:

¹⁰ As noted earlier, the ’869 patent has the same written description as the ’323 application, except that the text of the ’869 patent as printed mistakenly refers to R1 instead of R21.

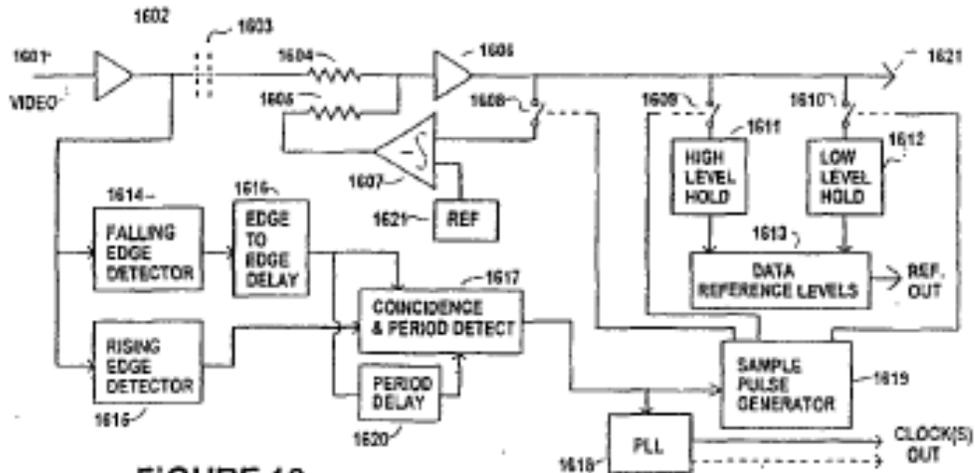


FIGURE 16

Those resistors are referred to in the following passage from the written description: “The output of 1602 is coupled to a falling edge detector 1614 to a rising edge detector 1615, and to a D.C. level adjustment circuit shown in this preferred embodiment as a resistor network 1604 and 1605.” ’250 patent col.18 ll.4-8 (emphasis added). As noted earlier, when the inventor added claim 33 during prosecution of the ’250 patent, he identified only resistors 1604 and 1605 as corresponding to the “other circuit.” At the same time, he identified two alternatives for the capacitor recited in claim 33—capacitor C3 in Figure 2, which was included in the original ’323 application, and capacitor 1603 in Figure 16. Thus, although he found support for the capacitor in the original written description, the only support that the inventor acknowledged for the “other circuit” was the new matter added in 1995.

TLC makes much of the alleged similarity between the portion of Figure 3 containing R21 and R26 and the portion of Figure 16 containing resistors 1604 and 1605. TLC also points to a passage in the ’250 patent that compares the operation of some circuit elements in Figure 16 (including resistor 1605 but not resistor 1604) to circuit 110, which is the portion of Figure 3 containing R21 and R26. See ’250 patent

col.19 ll.45-48 (“Sample switch 1608 along with reference 1621, negative integrator 1607 and current providing resistor 1605 operate to D.C. restore the video signal the same as that of circuit 110.”). Essentially, TLC argues that if resistors 1604 and 1605 in Figure 16 provide adequate written description support for the “other circuit,” so too must R21 and R26 in Figure 3 because of the similarities between the two circuits.

We are not convinced. First, the '250 patent has text that describes the resistors 1604 and 1605 as part of a level shifting circuit; there is no corresponding description regarding resistors R21 and R26 in the '323 application. More importantly, a comparison of Figure 3 with Figure 16 in the '250 patent does not address whether the '323 application itself has sufficient written description for claim 33. The pertinent question is not whether a person skilled in the art could look at both Figure 3 and Figure 16 and determine that the resistors in the former perform a similar function to the resistors in the latter. Rather, the issue is whether a person skilled in the art would understand from the earlier application alone, without consulting the new matter in the '250 patent, that the inventor had possession of the claimed “other circuit” in 1992 when the '323 application was filed.

TLC contends that Cooper’s testimony shows that the '323 application itself adequately supported the “other circuit” limitation because he explained how R21 and R26 establish a level shifted signal. This evidence persuaded the trial court that a person skilled in the art might conclude that R21 and R26 would have the effect of establishing a level shifted signal, but that was all. Based on the entire record before the court, the trial court concluded that a person skilled in the art would not understand the '323 application to show that the inventor had actually invented the claimed subject

matter as of 1992. Based on our review of the same record, we are not convinced that the trial court clearly erred in finding there was clear and convincing evidence that the '323 application did not show the inventor was in possession of the invention as of the filing date. We therefore affirm the trial court's finding that claim 33 and the asserted dependent claims were not entitled to the benefit of the 1992 filing date and the resultant finding that the Elantec data sheets anticipate those claims.

Genum makes an additional argument regarding the validity of claim 33 that we need not address. Specifically, Genum argues that the trial court erred in construing claim language in step (c) of claim 33, and that under the correct claim construction there are four non-Elantec prior art references that anticipate claim 33. Because we affirm the trial court's determination that claim 33 is invalid as anticipated by the Elantec prior art, we need not decide this issue.

II. Infringement of the '869 Patent

TLC appeals the trial court's non-infringement judgment with respect to independent claim 27 and dependent claims 29 and 30 of the '869 patent. Infringement is a question of fact, and thus, following a bench trial, we review the trial court's judgment for clear error. Scanner Techs. Corp. v. ICOS Vision Sys. Corp., 528 F.3d 1365, 1382 (Fed. Cir. 2008).

Claim 27 requires two so-called clamp circuits, which clamp the sync pulses of the incoming video signal to a known voltage level. Limitations (a) and (b) recite a first and second clamp, respectively: "(a) circuitry responsive to said sync portion to clamp the sync tip thereof to a known level thereby providing a clamped sync portion . . . (b)

circuitry for clamping said sync portion to a known level to provide a *second* clamped sync portion.” ’869 patent col.17 ll.18-24 (emphasis added).

Gennum’s ’82 family of chips contain a “hard clamp” circuit and a “soft clamp” circuit that operate in the following manner: The hard clamp circuitry continuously compares the voltage of the incoming video signal to a fixed voltage level V_{HC} . If the voltage of the video signal is less than V_{HC} , current is injected to raise the voltage level of the video signal. In practice, the video signal will be lower than V_{HC} only during start-up conditions, which is why Gennum refers to the hard clamp as a “start-up circuit.” Once the voltage of the video signal has reached V_{HC} , the soft clamp circuitry begins operation to clamp the sync tips to a higher fixed voltage level V_{SC} . The following figure from the trial court’s opinion (based on a Gennum data sheet, with lettering added by the trial court) illustrates the effect of the hard clamp followed by the soft clamp on the voltage level of the video signal:

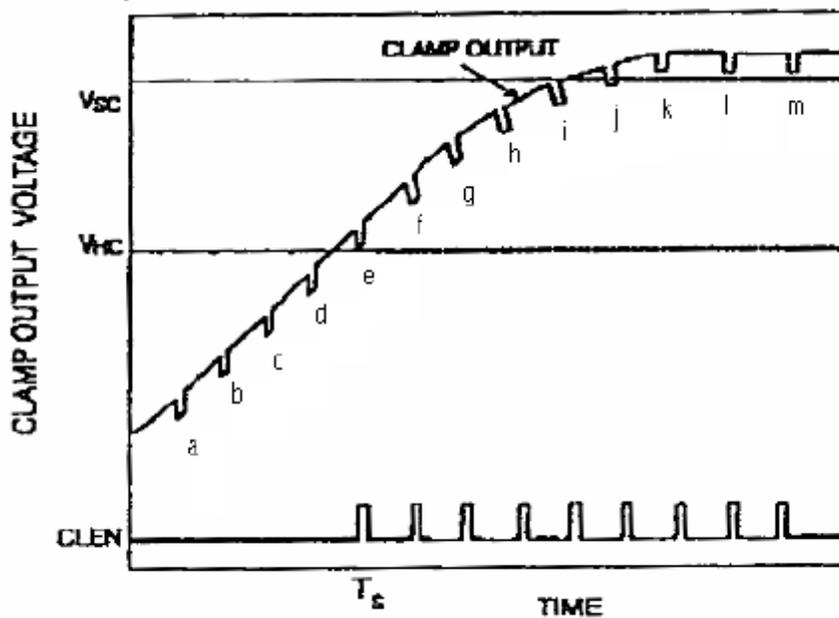


Fig. 3 Dual Mode Input Clamp Operation during Start-Up (Hard Clamp On)

Sync tips (a)-(d) occur during the start-up period while the hard clamp circuit injects current to raise the voltage level to V_{HC} . Once the voltage reaches V_{HC} , the soft clamp circuit takes over, raising the voltage level to V_{SC} and then holding the sync tips at the V_{SC} level.

TLC's infringement theory is that Gennum's hard clamp circuit satisfies limitation (a) of claim 27 (the first clamp) and that Gennum's soft clamp circuit satisfies limitation (b) (the second clamp). As the trial court found, there is no dispute that Gennum's soft clamp operates in the manner envisioned by the patent, clamping sync tip to V_{SC} and providing a clamped sync portion (sync tips (k)-(m) in the figure above). The controversy between the parties is whether Gennum's hard clamp circuitry also performs the functions of the clamp circuitry recited in the claim.

The critical question addressed by the trial court was whether Gennum's hard clamp circuit produces a "clamped sync portion" as required by the claims. TLC argued that a clamped sync portion is generated because one or more sync tips may happen to be at or near the V_{HC} level. For example, in the figure above, sync tip (e) is approximately at the V_{HC} level. TLC also relied on another demonstrative trial exhibit that shows two successive sync tips at or close to V_{HC} . Despite the possibility that one or more sync pulses might occur at the V_{HC} level, the trial court found that "the Gennum chips are not designed to, and do not, ever attempt to produce a 'clamped' sync portion at the level of V_{HC} ." TLC Order and Opinion, slip op. at 10. The trial court ultimately concluded that "it simply cannot be said that the Gennum chips are designed to or do in practice produce a 'clamped sync portion' at the known level of V_{HC} , even if a few pulses at that level sometimes occur in actual operation." Id. at 11. Because the hard clamp does not provide a clamped sync portion, the trial court found that Gennum's '82 family of chips do not infringe claim 27 and its dependent claims.

The trial court also provided an alternative basis for finding non-infringement. After interpreting the claims to require that the first and second clamped sync portions exist simultaneously, the court found that, even if the hard clamp provides a clamped sync portion, it does not coexist temporally with the clamped sync portion provided by the soft clamp.

On appeal, TLC argues that the trial court erred as a matter of law in excusing infringement by Gennum as de minimis. The trial court, however, did not make a finding of infringement, de minimis or otherwise. Based on our reading of the opinion, we understand the trial court to have found that the few pulses that might occur at the V_{HC}

level would not be a clamped sync portion within the meaning of the claims because the hard clamp circuit does not perform the function of clamping or holding the sync tips to that voltage level. The court did not find, as TLC contends, that those few pulses actually would infringe very quickly or briefly.

TLC also argues that the trial court erred as a matter of law in requiring TLC to prove that Genum intended to infringe. This argument is based on the trial court's statement that if there were any pulses at V_{HC} , it would be "a matter of happenstance rather than design." *Id.* at 10. Nothing in the opinion, however, indicates that the court equated design with intent. The fact that the Genum chips were not designed to produce a clamped sync portion at V_{HC} was merely part of the evidence considered by the trial court in concluding that the hard clamp circuit does not provide a clamped sync portion.

Thus we conclude that the trial court committed no error of law in determining that the hard clamp does not produce a clamped sync portion, nor did the court clearly err in any of its fact findings. We affirm the trial court's non-infringement judgment on that basis. Because we agree with the trial court that the hard clamp does not provide a clamped sync portion, we need not address TLC's arguments regarding the trial court's holding that two clamped sync portions must exist simultaneously, which was only an alternative basis for the trial court's judgment.

III. Inequitable Conduct

In its cross-appeal, Genum challenges the trial court's conclusion that Cooper did not commit inequitable conduct during prosecution of the '250 patent by failing to disclose to the PTO the LM 1881 prior art. We review the trial court's underlying factual

determinations regarding materiality and intent for clear error, and the trial court's ultimate decision on inequitable conduct for abuse of discretion. Star Scientific, Inc. v. R.J. Reynolds Tobacco Co., 537 F.3d 1357, 1365 (Fed. Cir. 2008).

The trial court found that the LM 1881 prior art was not material because it was cumulative to a Japanese patent reference already in the PTO's application file. Gennum does not dispute that finding. Instead, Gennum argues that the LM 1881 anticipates claim 33 of the '250 patent and urges us to hold that an anticipatory prior art reference is material as a matter of law, regardless of whether it was cumulative to other prior art of record in the patent application. We decline to so hold.

Gennum's assertion that the LM 1881 anticipates claim 33 is predicated on its argument that the trial court erroneously construed step (c) of claim 33. We did not reach that issue in connection with the validity of claim 33, and we need not reach it here. Even if the LM 1881 is anticipatory prior art, as proposed by Gennum, under our case law a cumulative reference is not material for inequitable conduct purposes.

In some of our cases we have looked to the current PTO rule on the duty of disclosure for a definition of materiality. See Purdue Pharma L.P. v. Endo Pharms. Inc., 438 F.3d 1123, 1129 (Fed. Cir. 2006); Bruno Indep. Living Aids, Inc. v. Acorn Mobility Servs., Ltd., 394 F.3d 1348, 1352 (Fed. Cir. 2005). That rule, which became effective in 1992, explicitly provides that an undisclosed reference is not material when it is cumulative to information already of record in the patent application. 37 C.F.R. § 1.56 (“[I]nformation is material to patentability when it is not cumulative to information already of record or being made of record in the application . . .”). We have recently held that the materiality standard based on PTO Rule 56 did not replace, but merely

supplemented, the pre-1992 standard established by this court. Digital Control, Inc. v. Charles Mach. Works, 437 F.3d 1309, 1316 (Fed. Cir. 2006). Under that standard, which was based on an earlier version of Rule 56, a reference is material “when a reasonable examiner would consider it important in deciding whether to allow the application to issue as a patent.” Star Scientific, 537 F.3d at 1367 (quoting Symantec Corp. v. Computer Assocs. Int’l, Inc., 522 F.3d 1279, 1297 (Fed. Cir. 2008)); see also Digital Control, 437 F.3d at 1314. Even under the “reasonable examiner” test, however, it has long been established that a reference is not material if it is cumulative to other references already before the examiner. Star Scientific, 537 F.3d at 1367; Scripps Clinic & Research Found. v. Genentech, Inc., 927 F.2d 1565, 1582 (Fed. Cir. 1991); Halliburton Co. v. Schlumberger Tech. Corp., 925 F.2d 1435, 1440 (Fed. Cir. 1991).

Genum suggests that we can “modify” the PTO rule regarding cumulative references because it was promulgated pursuant to the judicially-created doctrine of inequitable conduct. Whether we have the power to do so is immaterial, however, because we are bound to follow our own precedent. As noted, even before the PTO amended its rule to expressly state that a material reference is non-cumulative, our cases consistently held that a cumulative reference is not material for purposes of inequitable conduct. There has never been an exception for anticipatory cumulative references, and we are not inclined to create one now.

Because Genum has failed to show clear error in the trial court’s finding that the LM 1881 chip was not material and has not established that the trial court abused its discretion by applying the wrong law, we affirm the trial court’s judgment that the ’250 patent is not unenforceable due to inequitable conduct.

IV. Validity of Claim 31 of the '869 Patent

The trial court concluded that claim 31 was not invalid for any of the reasons asserted by Gennum: failure to satisfy the written description and enablement requirements of 35 U.S.C. § 112, ¶ 1, and indefiniteness under 35 U.S.C. § 112, ¶ 2. On cross-appeal, Gennum challenges only the trial court's determination regarding indefiniteness, arguing that the claim is fatally indefinite because there is no structure in the written description corresponding to limitation (a). That limitation reads: "circuitry to provide a format signal changeable in response to the format of said video type signal." '869 patent col.17 ll.46-47. The trial court held, and the parties agree, that the limitations in claim 31, including limitation (a), should be construed as means-plus-function limitations in accordance with 35 U.S.C. § 112, ¶ 6.

Judge Rich, writing for the en banc court, explained the relationship between the second and sixth paragraphs of section 112:

[I]f one employs means-plus-function language [per paragraph 112-6] in a claim, one must set forth in the specification an adequate disclosure showing what is meant by that language. If an applicant fails to set forth an adequate disclosure, the applicant has in effect failed to particularly point out and distinctly claim the invention as required by the second paragraph of section 112.

In Re Donaldson Co., 16 F.3d 1189, 1195 (Fed. Cir. 1994) (en banc). Therefore, if a claim includes a means-plus-function limitation, failure to disclose adequate structure corresponding to the claimed function results in the claim being invalid for indefiniteness. In re Dossel, 115 F.3d 942, 946 (Fed. Cir. 1997). Whether the written description adequately sets forth structure corresponding to the claimed function must be considered from the perspective of a person skilled in the art. Intel Corp. v. VIA Techs., Inc., 319 F.3d 1357, 1365-66 (Fed. Cir. 2003) (citing Budde v. Harley-Davidson,

Inc., 250 F.3d 1369, 1376 (Fed. Cir. 2001)). The question is not whether one of skill in the art would be capable of implementing a structure to perform the function, but whether that person would understand the written description itself to disclose such a structure. Biomedino, LLC v. Waters Techs. Corp., 490 F.3d 946, 953 (Fed. Cir. 2007) (citing Med. Instrumentation & Diagnostics Corp. v. Elekta AB, 344 F.3d 1205, 1212 (Fed. Cir. 2003)).

“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.” Personalized Media Commc’ns, LLC v. Int’l Trade Comm’n, 161 F.3d 696, 705 (Fed. Cir. 1998). To the extent there are any factual findings upon which a trial court’s indefiniteness conclusion depends, they must be proven by the challenger by clear and convincing evidence. Intel, 319 F.3d at 1366 (citing Budde, 250 F.3d at 1376-77). Though we review the ultimate question of indefiniteness without deference to the trial court, Personalized Media, 161 F.3d at 702, any factual findings made by the court in a bench trial in support of that conclusion are reviewed for clear error, see Allen Eng’g Corp. v. Bartell Indus., Inc., 299 F.3d 1336, 1343-44 (Fed. Cir. 2002) (holding that findings of fact from a bench trial are reviewed for clear error).

In this case, the parties agree that video standard detector 103 in Figure 1 of the ’869 patent corresponds to limitation (a) of claim 31. That circuit element is shown as a “black box,” i.e., nothing in the figures or text of the written description describes the details of its inner circuitry. As our cases demonstrate, however, the absence of internal circuitry in the written description does not automatically render the claim indefinite. In Intel, 319 F.3d at 1366, for example, we held that generic “core logic” of a computer

modified to perform a particular program was adequate corresponding structure for a claimed function although there was no specific circuitry disclosed to show how the core logic was modified. Similarly, in S3 Inc. v. nVIDIA Corp., 259 F.3d 1364, 1370-71 (Fed. Cir. 2001), we held that a “selector” adequately disclosed structure for a “means . . . for selectively receiving” limitation even though neither the electronic structure of the selector nor the details of its operation were described. In that case, it was unnecessary for the written description to disclose additional detail because a person skilled in the art would have recognized that the selector as shown in the patent was an electronic device with a known structure. Id.

Genum argued before the trial court that no detector known in the art in 1992 when Cooper filed his original patent application could detect both analog and HDTV signals. Presumably Genum intended that argument to support a conclusion that claim 31 was indefinite because a person skilled in the art would not have understood the detector in the written description of the '869 patent to have a well-known structure. See id. The only evidence that Genum presented on this point, however, was the testimony of its expert that he personally was not aware of any then-existing hardware that could perform the claimed function. Cooper, on the other hand, testified for TLC that technology to perform the claimed function was available at the relevant time and would have been known to a person skilled in the art. Because Genum's expert had done no research into what circuitry was actually available, the trial court, considering the evidence as a whole, and taking into account the presumption of validity, concluded that Genum did not carry its burden to prove claim 31 was indefinite. On the record before us, we agree that Genum failed to show that the written description of the '869

patent lacks structure corresponding to the function in limitation (a) of claim 31, and thus the trial court did not err in concluding that the claim is not invalid for indefiniteness.

CONCLUSION

The judgment of the trial court is

AFFIRMED.¹¹

COSTS

Each party shall bear its own costs.

¹¹ The trial court's judgment makes reference to claims 27-29 of the '869 patent, though the trial court's opinion and TLC's briefs indicate that the asserted claims at issue were 27, 29, and 30. Our affirmance is with regard to the latter. If we have read the record incorrectly, the parties may so advise.