

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

WANGS ALLIANCE CORPORATION D/B/A WAC LIGHTING CO.,
Petitioner,

v.

KONINKLIJKE PHILIPS N.V.,
Patent Owner.

Case IPR2015-01292
Patent 6,586,890 B2

Before GLENN J. PERRY, TREVOR M. JEFFERSON, and
MIRIAM L. QUINN, *Administrative Patent Judges*.

PERRY, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
Inter Partes Review
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

This is a Final Written Decision in an *inter partes* review issued pursuant to 35 U.S.C. §318(a). We have jurisdiction under 35 U.S.C. § 6. For reasons discussed herein, and in view of the trial record, we determine that Petitioner has shown by a preponderance of the evidence that claims 15 and 23 of the '890 patent are unpatentable. However, Petitioner has not shown by a preponderance of the evidence that claims 7 and 31 of the '890 patent are unpatentable

A. Procedural History

This is a final written decision in an *inter partes* review. Wangs Alliance Corporation d/b/a Wac Lighting Co. ("Petitioner") filed a Petition (Paper 2, "Pet.") to institute *inter partes* review of claims 7, 15, 23, and 31 (the "challenged claims") of U.S. Patent No. 6,586,890 B2 ("the '890 Patent"). 35 U.S.C. § 311.

On November 25, 2015, we entered a Decision to Institute a trial (Paper 8, "Dec. Inst.") on claims 15 and 23. Following Petitioner's Request for Rehearing (Paper 11, Reh'g Req.), we expanded the scope of trial to include claims 7 and 31. Paper 18, "Reh'g. Dec."

Koninklijke Philips N.V. ("Patent Owner") filed a Patent Owner Response (Paper 32, "PO Resp.") arguing Petitioner's challenge to claims 7 and 31 only. Petitioner filed a Reply. Paper 40, "Pet. Reply." Petitioner filed a Motion to Exclude Evidence. Paper 50, "Mot. To Exclude." Patent Owner opposed. Paper 54, "Opp. Motion To Exclude." Petitioner filed a Reply in support of its Motion to Exclude. Paper 58, "Reply Mot. To Exclude." Patent Owner filed a Notice of New Arguments. Paper 52,

“Motion New Arg.” Petitioner opposed. Paper 57, “Opp. Mot. New Arg.” Patent Owner filed a Revised Motion for Observations.” Paper 55, “Rev. Mot. Obs’n.” Petitioner responded. Paper 59, “Pet. Resp. Obs’n.” A transcript of oral argument held Aug. 23, 2016, is of record as Paper 62 (“Tr.”).

B. Related Matters

Petitioner reports the following pending litigation matter related to the '890 Patent: *Koninklijke Philips N.V. et al. v. Wangs Alliance Corporation*, Case No. 14-cv-12298-DJC (D. Mass.). Pet. 1.

Petitioner further reports that the Patent Owner is suing the Petitioner and/or other parties under one or more of U.S. Patent Nos. 6,013,988; 6,147,458; 6,250,774; 6,561,690; 6,788,011; 7,038,399; 7,352,138; 6,094,014; and 7,262,559, all of which generally relate to light emitting diodes (“LEDs”). *Id.* Petitioner indicates filing additional petitions for *inter partes* review petitions challenging U.S. Patent Nos. 6,013,988; 6,147,458; 6,586,890 B2; 6,250,774 B1; 7,038,399 B2; and 7,352,138 B2. *Id.*

C. Instituted Grounds of Unpatentability

We instituted trial based on the following grounds (Reh’g Dec. 3):

Reference(s)	Basis	Claim(s) challenged
Biebl ¹	35 U.S.C. § 102(a)	15, and 23
Biebl and ST Micro ²	35 U.S.C. § 103(a)	7, 15, 23, and 31

D. The ’890 Patent (Ex. 1001)

1. Described Invention

The ’890 Patent describes a driver circuit for supplying power to light emitting diodes (LEDs). Ex. 1001, 1:6–7. It explains that the electrical characteristics of LEDs are such that small changes in the voltage applied to a LED cause appreciable changes in current flowing through it. LED light output is proportional to LED current, and, therefore, a controlled current source is the preferred method of driving LEDs. *Id.* at 1:18–22.

Figure 1 of the ’890 Patent is reproduced below.

¹ U.S. Patent 6,400,101 B1, issued June 4, 2002 (Ex. 1003, “Biebl”).

² ST Micro Data Sheet for UC2842/3/4/5 and UC3842/3/4/5 (Ex. 1005, “ST Micro”).

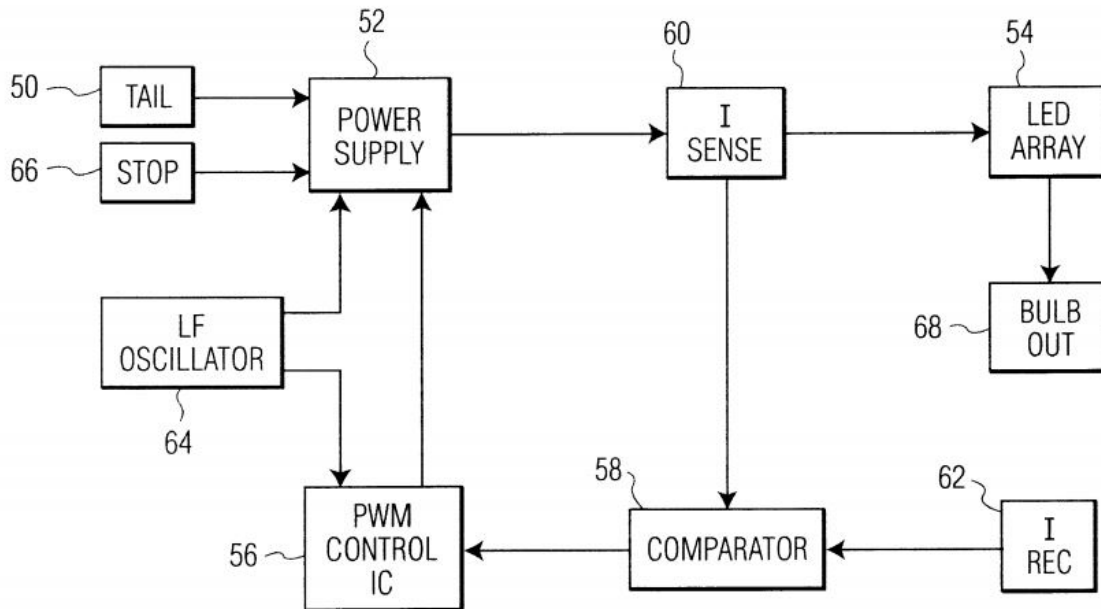


FIG. 1

Figure 1 is a block diagram of a driver for LEDs incorporated into a tail light assembly of a vehicle.

Power supply 52, providing a regulated current, includes a DC to DC converter (e.g. buck-boost power supply, boost, buck, or flyback converter). A PWM signal from PWM control IC 56 controls power supply 52 by providing a periodic drive signal of varying pulse width to control power supply 52 in response to a feedback signal related to current flowing through LED array 54. Comparator 58 compares sensed current from current sensor 60 with a reference signal from current reference 62. The output of comparator 58 controls the pulse width of the drive signal. *Id.* at 2:1–27.

2. Illustrative Claim

Petitioner and Patent Owner arguments focused on claims 7 (reproduced below) and 13.

7. A system for supplying power for an LED array, said system comprising:
- means for sensing current to the LED array, said current sensing means generating a sensed current signal;
 - means for generating a reference signal;
 - means for comparing the sensed current signal to the reference signal, said comparing means generating a feedback signal;
 - means for modulating pulse width responsive to the feedback signal, said pulse width modulating means generating a drive signal; and
 - means for supplying power responsive to the drive signal, said power supplying means supplying current to the LED array.

Petitioner relies on the testimony of Robert Neal Tingler, Ph.D., presented as a Declaration. Ex. 1006.

II. DISCUSSION

A. Claim Construction

1. Claim Construction Standard

The Board interprets claims using the “broadest reasonable construction in light of the specification of the patent in which [they] appear[.]” 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard as the claim interpretation standard to be applied in *inter partes* reviews). Under this standard, we interpret claim terms using “the broadest reasonable meaning of the words in their ordinary usage as they would be understood by one of ordinary skill in the art, taking into account whatever enlightenment by way of definitions or otherwise that

may be afforded by the written description contained in the applicant’s specification.” *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997). We presume that claim terms have their ordinary and customary meaning. *See Trivascular, Inc. v. Samuels*, 812 F.3d 1056, 1062 (Fed. Cir. 2016) (“Under a broadest reasonable interpretation, words of the claim must be given their plain meaning, unless such meaning is inconsistent with the specification and prosecution history.”); *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007) (“The ordinary and customary meaning is the meaning that the term would have to a person of ordinary skill in the art in question.” (internal quotation marks omitted)). A patentee, however, may rebut this presumption by acting as his or her own lexicographer, providing a definition of the term in the specification with “reasonable clarity, deliberateness, and precision.” *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

2. “*Means for Supplying Power Responsive to the Drive Signal, said Power Supplying Means Supplying Current to the LED Array*”

We preliminarily construed “means for supplying power responsive to the drive signal, said power supplying means supplying current to the LED array” as a means plus function clause. We found that structures described in the Specification corresponding to the recited function include “buckboost, boost, buck, and flyback power suppl[ies]” and equivalents . Dec. Inst. 7–8.

Petitioner argues for a broader construction, suggesting that the corresponding structure is a “power supply with at least one transistor or

switch for receiving a drive signal.” Pet. 8.

Patent Owner argues that the function described by the means plus function clause is “supplying power responsive to the drive signal” and “supplying current to the LED array.” PO Resp. 4–5 (citing Ex. 1001 at Abstract, 1:65–67 (“The power supply uses current feedback to adjust power to the LEDs”), 2:1–13 (“a buck-boost power supply or other alternatives, such as a boost, buck, or flyback converter”), Figs. 1, 2A-D; Ex. 2001 at 61–62, 64–69; Ex. 2006 ¶¶ 30–31). Patent Owner agrees that the Specification-described structure performing the function is “a buck-boost, boost, buck, or flyback power supply.” *Id.*

According to Patent Owner, Petitioner’s proposed construction is inconsistent with 35 U.S.C. § 112 ¶ 6 because a “power supply with at least one transistor or switch for receiving a drive signal” is not limited to the structures disclosed in the specification and could cover almost any power supply, including those not disclosed in the ’890 specification or equivalents thereof. PO Resp. 5 (citing Ex. 2006 ¶¶ 32–34). According to Patent Owner, one of ordinary skill in the art would understand that the power supplies listed in the Specification have specific circuit topologies and components. PO Resp. 6 (citing Ex. 1008, ¶ 17; Ex. 2001 at 61–62, 64–65; Ex. 2006 ¶¶ 32–33).

We agree with Patent Owner’s argument that Petitioner’s proposed construction goes beyond what is disclosed in the ’890 Specification because power supplies “with at least one transistor or switch for receiving a drive signal” would cover distinctly different topologies that the ’890 patent neither discloses nor links to the recited functions. *Id.* (citing Ex. 2001, 64

(Fig. 3–8, Cuk converter), 65 (Fig. 3–10, push-pull converter), 66 (Fig. 3–11, half-bridge converter), 67 (Fig. 3–12, full-bridge converter), 68 (Fig. 3–13, transformer-isolated Cuk converter), 68–69 (Table 3-1, Comparison of Converter Topologies); Ex. 2006 ¶ 34).

Patent Owner notes that in a District Court proceeding Petitioner advocated a narrower view of the corresponding structure. PO Resp. 7 (citing Ex. 2002, 15 (proposing that the corresponding structure for “means for supplying . . .” is “[a] buckboost, boost, buck, or flyback power supply; with a transistor Q1A, inductor L1A, and diode D4A; or transistor Q1B, inductor L1B, and diode D4B”)). According to Patent Owner, [c]laims should not be construed one way for purposes of noninfringement and another way for purposes of invalidity, as Petitioner urges here. PO Resp. 7 (citing *Source Search Techs., LLC v. LendingTree, LLC*, 588 F.3d 1063, 1075 (Fed. Cir. 2009) (“[I]t is axiomatic that claims are construed the same way for both invalidity and infringement.” (citation omitted))).

The parties agree that the disputed claim term is a means plus function clause, and we construe it as such. We find that the function associated with this term is supplying a regulated current, consistent with the focus of the ’890 patent. The structures associated with this function are enumerated in the Specification as a list of alternative power supplies including “a buck-boost power supply or . . . a boost, buck, and flyback converter.” Ex. 1001, 2:4–6. According to the ’890 Patent, these listed power supplies are consistent with the stated goal of regulating current flowing through the LEDs, as opposed to regulating voltage across them. Ex. 1001, 1:41–43.

Petitioner’s proposed construction (“a power supply with at least one

transistor or switch for receiving a drive signal”) is unreasonable in that it embraces power supplies beyond the function set forth in the means plus function clause and beyond the specific list of power supply types enumerated in the Specification. We therefore confirm our preliminary construction. The means plus function clause embraces the enumerated power supplies and a range of equivalents appropriate for means plus function clauses.

Although it is informative that Petitioner advocated a different construction in District Court, we do not attribute much weight to this evidence. Rather, we rely more heavily on the intrinsic evidence from the ’890 patent itself. It would be unreasonable to construe a claim term to be inconsistent with the Specification’s specifically enumerated structures and the language of the claims. We construe the disputed term so as to embrace a buck-boost, boost, buck, and flyback power supply and equivalents that regulate current.

B. Claims 15 and 23

Claims 15 and 23 do not include the means plus function clause discussed above and are broader in scope than are claims 7 and 31 in that they are not limited to particular power supplies. In its Response, Patent Owner argued only against Petitioner’s challenge to claims 7 and 31. It did not present arguments with respect to claims 15 and 23. At Oral Argument, Patent Owner confirmed that it does not contest Petitioner’s challenge to claims 15 and 23. Tr. 19.

We have reviewed Petitioner's presentation at Petition pages 22–27, which provides a detailed read of claims 15 and 23 on Biebl and establishes that Biebl describes all of the limitations of claims 15 and 23. We find that the Petition, with the support of the Declaration testimony of Dr. Tingler establishes by a preponderance of the evidence of record that claims 15 and 23 are unpatentable based on Biebl.

C. Claims 7 and 31

Claims 7 and 31 are limited to particular power supplies because of the recitation of the means plus function clause. Petitioner relies upon the combination of Biebl and ST Micro to meet the limitations of these claims.

1. Overview of Biebl

Biebl Figure 8 is reproduced below.

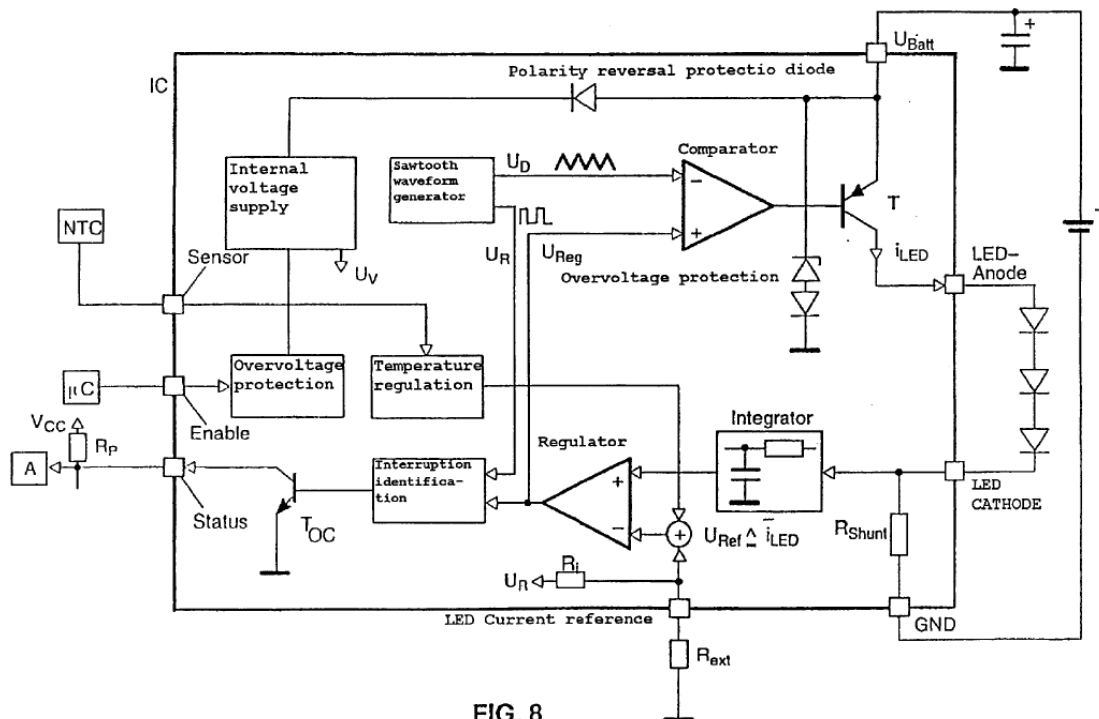


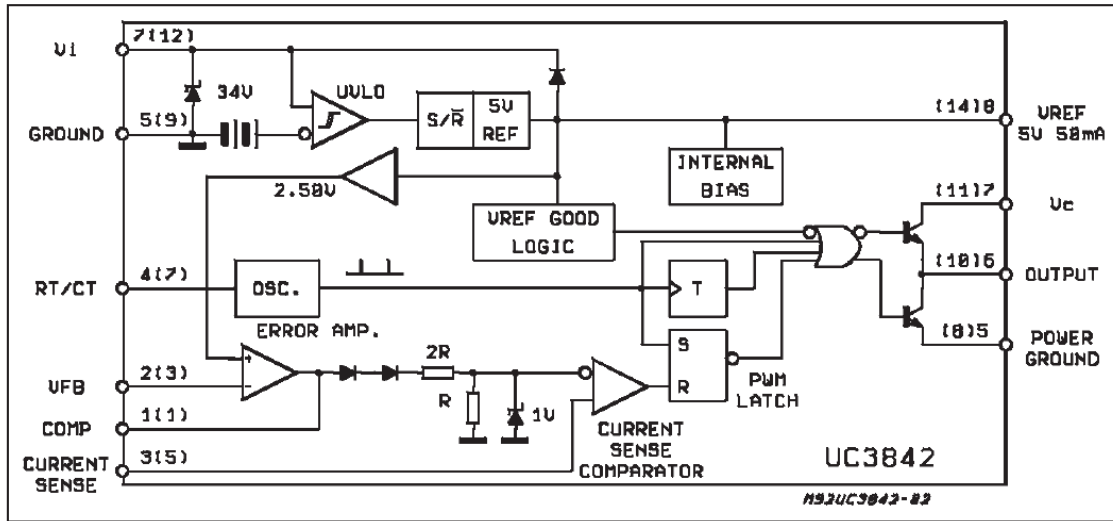
Figure 8 shows a block diagram of an LED drive circuit. Ex. 1003, 5:51–52.

Biebl describes a drive circuit that controls the operation of a switching transistor T that connects a battery node U_{Batt} in series with an LED array. The “on” time of the transistor is controlled by the width of pulses applied to its base by a comparator. Pulse width is controlled by a feedback signal indicative of current flowing through the LEDs, determined by integrating a voltage across a shunt resistor R_{Shunt} .

2. Overview of ST Micro

ST Micro is a datasheet describing a current mode PWM (pulse-width modulator) controller. Internally implemented circuits include an under voltage lockout featuring start-up current less than 1 mA, a precision reference trimmed for accuracy at the error amp input, logic to insure latched operation, a PWM comparator which also provides current limit control, and a totem pole output stage designed to source or sink high peak current. The output stage, suitable for driving N-Channel MOSFETs, is low in the off-state. A block diagram of the controller is set forth below.

BLOCK DIAGRAM (toggle flip flop used only in U3844 and UC3845)



A block diagram of the ST Micro PWM controller. Ex. 1005, p. 1.

One of its illustrated uses is shown in Figure 11, reproduced below.

Figure 11 : Off-line Flyback Regulator.

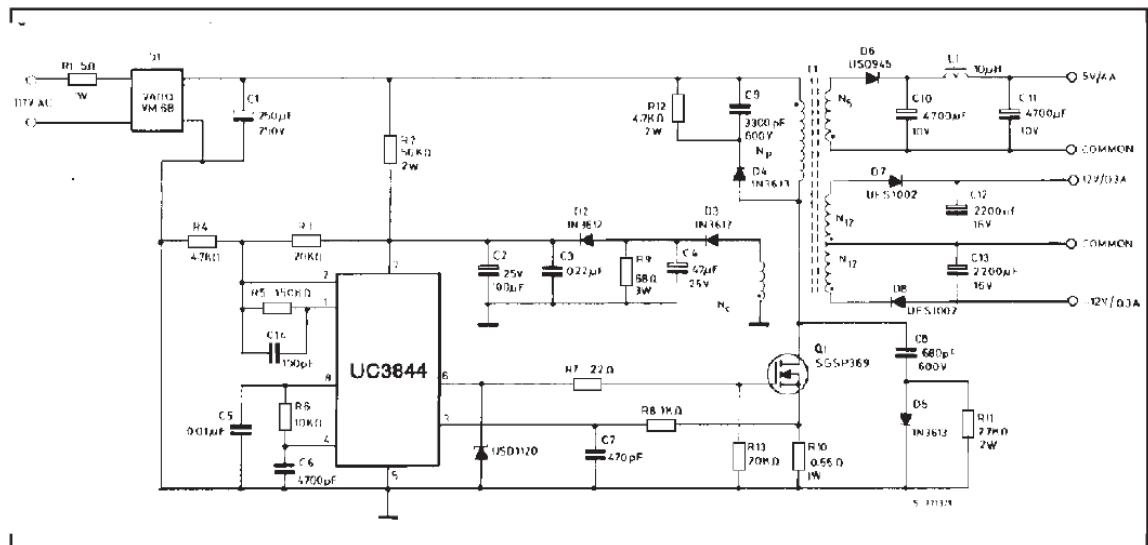


Figure 11 illustrates an application (exemplary use) of a UC3844 PWM controller to control a flyback regulator.

In Figure 11 of ST Micro, the PWM Controller is shown controlling a “flyback regulator.”

3. *ST Micro a Reference*

Patent Owner argues that ST Micro (Ex. 1005), asserted by Petitioner to be “prior art under § 102(b)” and “published and made publicly available in October 1998” (Pet. 3, 13), is not properly citable against the ’890 patent. PO Resp. 52–57.

Patent Owner correctly notes that to qualify as a printed publication, a document “must have been sufficiently accessible to the public interested in the art” prior to the critical date. *In re Lister*, 583 F.3d 1307, 1311 (Fed. Cir. 2009). The determination of whether a reference is a ‘printed publication’ involves a case-by-case inquiry into the facts and circumstances surrounding the reference’s disclosure to members of the public. According to Patent Owner, Petitioner has not carried its burden of showing that Exhibit 1005 was “disseminated or otherwise made accessible to persons interested and ordinarily skilled in the subject matter.” PO Resp. 52–53.

Petitioner introduced testimony purporting to show that Exhibit 1005 is available as prior art. Dr. Tingler asserts that “the ST Micro Datasheet was published and made publicly available at least as of the copyright date of October 1998,” based on his “many years of experience reading and working with datasheets.” Ex. 1006, ¶ 89.

Patent Owner challenges Dr. Tingler’s ability to provide this testimony because at the time of alleged publication, Dr. Tingler was a college sophomore. PO Resp. 53. Patent Owner notes that Dr. Tingler claims no personal knowledge of Exhibit 1005 and claims no knowledge of

datasheet publication practices. PO Resp. 53. We are unpersuaded by this argument. Patent Owner has not shown sufficiently that the law requires that Dr. Tingler’s knowledge of data sheets must have existed as of the alleged date of publication.

During trial Petitioner introduced Declaration testimony of two former engineers at ST Microelectronics, Duane Laurent (Ex. 1012) and Joel Hanna (Ex. 1013) in order to attest to the status of ST Micro. Pet. Reply. 20. Patent Owner challenges these declarations because neither declarant claims ever having responsibility for datasheet publication or testifies to any personal remembrance of Exhibit 1005. PO Resp. 54 (citing Ex. 1012 ¶¶ 2, 3, and 5; Ex. 1013 ¶ 4). Patent Owner points out that Mr. Hanna had barely started at ST Microelectronics when Exhibit 1005 was allegedly published (PO Resp. 54 citing Ex. 1013 ¶ 4), and that Mr. Laurent’s work focused on engineering and product development—his declaration lists no responsibility for development or publication of any datasheet (*Id.* citing Ex. 1012 ¶ 2).

Patent Owner argues that the Tingler Declaration refers to the “October 1998” date as a “copyright date.” Ex. 1006 ¶ 88. Although there is no copyright notice on the document, we find that “October 1998” represents a likely publication date. Dr. Tingler states that “I have experience working with products and datasheets from ST Microelectronics in particular. Based on my experience, it is my opinion that the ST Micro Datasheet was published and made publically available at least as of the copyright date of October 1998.” *Id.* at ¶ 89.

Further, according to Dr. Tingler, the controller referred to in ST Micro is referred to in the '890 Patent as the "PWM Control IC" used in the preferred embodiment. *Id.* at ¶ 89 (citing Ex. 1001, 3:17–27).

We credit the intrinsic evidence of the '890 patent, which issued from an application filed December 5, 2001. It refers to the UC2842 series manufactured by ST Microelectronics. Ex. 1001, 3:17–27. This citation supports a finding that ST Micro was disseminated before the filing on the application (Dec. 5, 2001) on which the '890 patent issued. The date set forth on the ST Micro document is "October 1998." Ex. 1005, 1. This date is more than three years prior to the application date of the '890 patent. It appears contrary to reason that a commercial producer of integrated circuits would create, but not publish data sheets for its products for three years. On the contrary, it would want to encourage sales of its products.

Mr. Laurent testifies that he gained personal knowledge of ST's standard procedures regarding datasheets during the course of his employment. He further testifies that it was standard ST procedure for datasheets made available to the public, to indicate the date (for example, a month and year) when the datasheet was published. Each datasheet was made available to the public no later than one or two months after this date. Ex. 1012 ¶ 4. Mr. Laurent also identified that the UC numbers appearing on ST Micro are commercial designations for this family of ICs and that such designations are commonly used by ST and in the broader semiconductor industry. *Id.* at ¶ 6. Mr. Laurent notes that Exhibit 1005 bears the date "October 1998" in its lower left corner of its first page. He states that based on his employment with ST Microelectronics he developed personal

knowledge of ST's practices regarding datasheets and that the "October 1998" date indicates that this datasheet became available to the public no later than two months after October 1998. *Id. at* ¶ 7.

Mr. Hanna testifies that he gained personal knowledge of ST's standard procedures regarding datasheets during the course of his employment. He states that it was standard ST procedure for datasheets made available to the public, to indicate the date (for example, a month and year) when the datasheet was published. Ex. 1013 ¶ 6. Each datasheet was made available to the public no later than one or two months after this date. *Id.* Each datasheet accompanied sales of its corresponding product (for example, an integrated circuit), in either printed or in electronic format. *Id. at* ¶ 7. He also testifies that the "October 1998" date on the datasheet indicates that this datasheet became available to the public no later than two months after October 1998. *Id. at* ¶ 9.

Given all of these facts and circumstances, we find that ST Micro is a typical commercial datasheet of the type design engineers are familiar with. Even though Mr. Hanna and Mr. Laurent did not have personal or direct knowledge of this particular datasheet, we are persuaded that it is authentic and likely distributed on or about the date indicated on its front page in accordance with the established business practices of ST. The '890 patent application was filed December 5, 2001, about three years after the date printed on the cover sheet of ST Micro. It is unlikely that this datasheet would not have been widely distributed to design engineers who might have use for the described product. We conclude that ST Micro was available to

those of ordinary skill at the critical date of the '890 patent, and is, therefore, citable against it.

4. Petitioner's Contentions

Petitioner contends that claims 7 and 31 are obvious over Biebl and ST Micro. Pet. 31–50.

Petitioner relies upon Biebl as describing a circuit for supplying power to an LED array. Pet. 31 (citing Ex. 1003, Figure 8; Ex. 1006 ¶ 92). Petitioner relies upon ST Micro as describing a commercially available control circuit that uses pulse width modulation to drive a load. Pet. 31. According to Petitioner, both Biebl and the ST Micro Datasheet disclose sensing current and comparing sensed current to a reference in order to generate a feedback signal that is used to modulate pulse width of a drive signal that drives one or more transistors in order to power the load. Pet. 31.

Petitioner acknowledges that ST Micro does not explicitly disclose driving an LED array. Pet. 32. Petitioner argues that one of ordinary skill, in view of Biebl, would be motivated to implement the UC2842 according to the ST Micro Datasheet in order to drive an LED array. According to Petitioner, utilizing PWM to drive LEDs was known at the time of invention. Pet. 32–33 (citing Ex. 1006 ¶ 96).

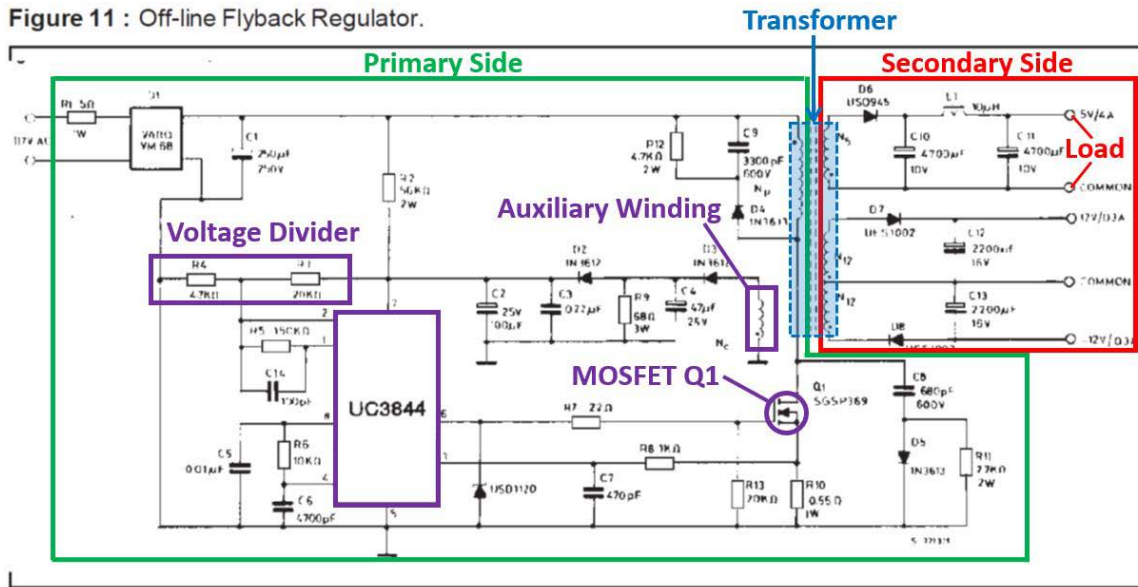
5. Patent Owner's Contentions

Patent Owner argues that the combination of ST Micro and Biebl does not render claims 7 and 31 unpatentable. PO Resp. 8–57.

According to Patent Owner, there is no motivation to combine ST Micro and Biebl to achieve the claimed invention in that they describe

different and incompatible PWM control mechanisms. PO Resp. 10 and 17–24.

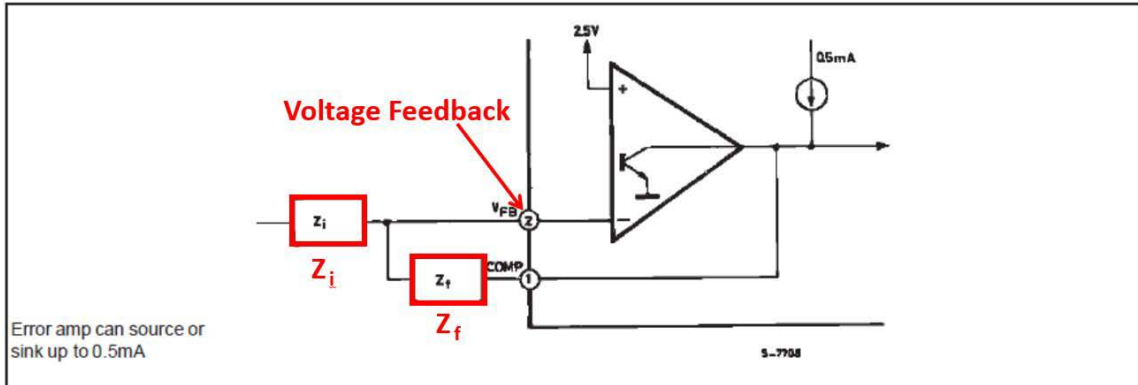
Patent Owner provides an annotated version of ST Micro Figure 11, reproduced below.



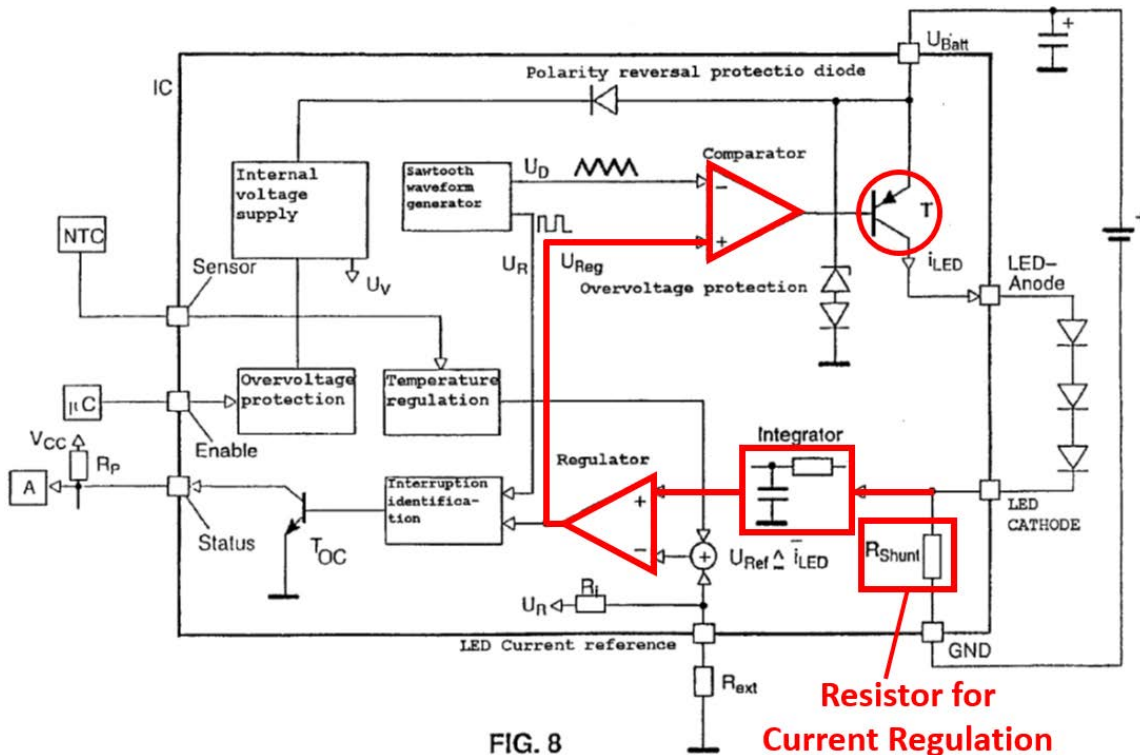
Patent-Owner annotated ST Micro Figure 11.

Patent Owner notes that as shown in ST Micro’s Figure 11, relied upon in the Petition, the ST Micro PWM controller is being used to control a power supply that has a flyback topology (circuit arrangement), but regulates *voltage*, not *current*. PO Resp. 12. The primary and secondary sides of a transformer are annotated by green and red color, respectively. Output voltage is regulated by controlling voltage on the primary side of the power supply by controlling current in the primary of the transformer using MOSFET Q1 using the “error amplifier” configuration of UC3844. PO Resp. 12–13. A Patent Owner-annotated version of ST Micro Figure 1, reproduced below, shows the error amplifier configuration.

Figure 1 : Error Amp Configuration.

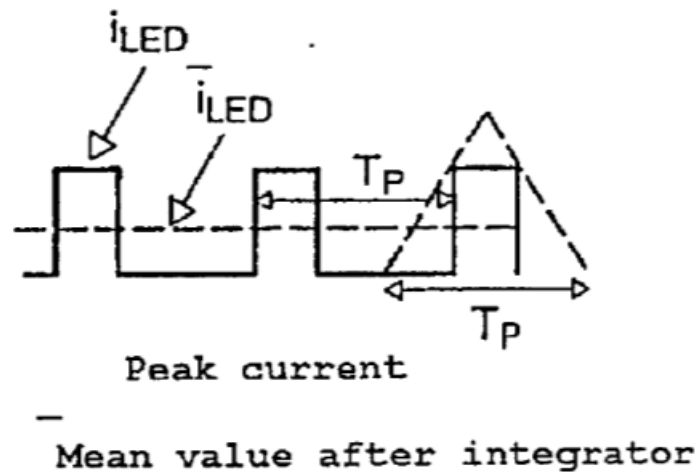


Patent Owner notes that Petitioner’s Declarant, Dr. Tingler, acknowledged that this circuitry utilizes voltage feedback. PO Resp. 14. In contrast, Biebl uses a DC chopper topology, as depicted in a Patent Owner annotated copy of Biebl Figure 8, reproduced below. PO Resp. 14–15.



Ex. 1003 Figure 8 as annotated by Patent Owner. PO Resp. 15.

Patent Owner notes that Biebl's DC chopper uses a control circuit to turn transistor T on and off, either providing the battery voltage U_{Batt} or no voltage, 0 volts, to the LEDs between the LED-Anode and LED CATHODE pins. PO Resp. 15 (citing Ex. 2006, ¶¶ 54–55). By turning on and off transistor T, the DC chopper provides pulsed current to the LEDs. *Id.* at ¶ 55; Ex. 2008 at 13:5–9. According to Patent Owner, Dr. Tingler acknowledged that Biebl provides a pulsed current through the LEDs. PO Resp. 15 (citing Ex. 1003 at 2:53–56 (“The current flowing via the LEDs is pulsed in this way (FIG. 4b). The square-wave pulses have a pulse width which corresponds to a fraction of T_p .”)).



Biebl Figure 4(b) provides an explanation of the peak current and mean value.

Ex. 1003 at Fig. 4b (pulsed current i_{LED}); Ex. 2006 ¶ 55.
In contrast to ST Micro's application shown in Figure 11, which regulates voltage, Biebl, regulates the mean value of current flowing through the LEDs. PO Resp. 16 (citing Ex. 2006 ¶¶ 59–60; Ex. 2008 at 13:10–14:4).

Patent Owner argues that in addition to having different and incompatible power supplies, ST Micro and Biebl use different and incompatible PWM control mechanism. PO Resp. 17–23. Thus, according to Patent Owner, it is a misleading simplification for Petitioner to argue that ST Micro and Biebl 1) both use PWM to control current, and 2) disclose sensing current. PO Resp. 17–18 (citing Pet. 31). Patent Owner explains that ST Micro uses a “current mode control” (PO Resp. 18), while Biebl uses a “direct duty cycle control” (PO Resp. 22). According to Patent Owner, Dr. Tingler admitted on cross-examination that the use of “current mode” in the context of PWM control is completely different from Petitioner’s misuse “current mode” to refer to LEDs. Specifically, when referred to the statement that “LEDs are current mode devices,” Mr. Tingler conceded that it was “poorly phrased,” and that he actually meant that “LEDs are current control devices” and “[t]hat by driving a constant current through them, you can achieve a consistent light output.” PO Resp. 26–27 (citing Ex. 2008, 39:10–40:15). These very different modes of control would not, according to Patent Owner, suggest combining these circuits. Patent Owner argues that the Petition ignores these differences and fails to provide the required “articulated reasoning with some rational underpinning” that a finding of obviousness requires. PO Resp. 24–25.

Motivation to combine aside, Patent Owner argues that the combination of ST Micro and Biebl does not disclose each limitation of claims 7 and 31. PO Resp. 29–43.

According to Patent Owner, the combination of ST Micro and Biebl fails to disclose the “means for supplying power” (or “power supply”)

required by claims 7 and 31. PO Resp. 29 (citing Ex. 2006 ¶¶ 76–78). Moreover, according to Patent Owner, ST Micro does not disclose “sensing current to the LED array” as required by claims 7, 15, and 23 (from which claim 31 depends). PO Resp. 29–30.

Assuming the combination of Biebl and ST Micro, Patent Owner argues that Biebl does not disclose the claimed “means for supplying power” (buck-boost, boost, buck, or flyback power supply or equivalent power supply that regulates current). PO Resp. 30. Patent Owner argues that the Biebl chopper does not meet this limitation and Petitioner has not argued that the Biebl chopper is equivalent to any of the enumerated power supplies in the ’890 Specification. PO Resp. 31. Similarly, Patent Owner argues, ST Micro does not disclose any of the Specification-listed “means for supplying power” (claim 7) or “power supply” (claim 31). PO Resp. 32.

According to Patent Owner, Dr. Tingler conceded that one of ordinary skill would not use the ST Micro flyback regulator to power an LED because it regulates voltage (not current). PO Resp. 33–34 (citing Ex. 2008, 44:9–45:13).

Patent Owner argues that ST Micro does not disclose “sensing current to the LED array” as required by the claims at issue. PO Resp. 37–43.

Patent Owner argues that one of ordinary skill would not have been motivated to achieve the claimed invention based on by using UC2842 to drive an LED array as a load. Nor would one of ordinary skill have had a reasonable expectation of success in doing so, absent hindsight. PO Resp. 43–57.

Patent Owner also argues that Petitioner fails to demonstrate how one of ordinary skill would have combined ST Micro and Biebl. PO Resp. 35.

6. Analysis

We are not persuaded that Petitioner has established a motivation for one of ordinary skill to apply the ST Micro to pulse width control the power supply of Biebl. Furthermore, we are not persuaded that making the proffered combination of references meets the limitations of the claims at issue.

In response to the incompatibilities between Biebl and ST Micro argued by Patent Owner, Petitioner argues in its Reply that Patent Owner does not present any evidence that combining the Biebl and ST Micro references would have been “uniquely challenging or difficult for one of ordinary skill in the art” at the time of the invention. Pet. Reply 6. Petitioner argues that the combined teachings of the two references would have suggested to one of ordinary skill to implement ST Micro to drive the Biebl LED load. Pet. Reply 7–10. Petitioner argues that one of ordinary skill would have been familiar with both current and voltage regulation and would have understood how to implement ST Micro. Petitioner points to a patent owned by Patent Owner and that issued prior to the ’890 patent that discloses a flyback converter that regulates current to drive an LED load. Pet. Reply 8 (citing Ex. 1018 ¶ 9).

Additionally, Petitioner points to a patent assigned to STMicroelectronics that discloses a regulator with two operating modes, one as a voltage regulator and the other as a current regulator, as enabled by separate control loops. Pet. Reply 8 (citing Ex. 1018 ¶ 9, Ex. 1022 at 2:5–

31, 3:19–34). Finally, Petitioner points to yet another patent that discloses a flyback converter that regulates both current and voltage. *Id.* (citing Ex. 1018 ¶ 9, Ex. 1023, 3:33–38; 3:58–60). Further, Petitioner provides reply argument as to why one of ordinary skill would have been motivated to combine ST Micro and Biebl. Pet. Reply 11–19. We are not persuaded by Petitioner’s approach in establishing motivation. Petitioner points to various patents that are allegedly prior to the ’890 patent, but does not sufficiently demonstrate how one of ordinary skill would apply the teachings of these patents to the combination of references at issue.

We are persuaded by Patent Owner’s detailed discussion of incompatibilities between ST Micro and Biebl. The Petition does not sufficiently explain how one of ordinary skill would have reached the challenged claims based on ST Micro and Biebl. For example, it does not explain why one of ordinary skill would have looked to a circuit designed to control a flyback voltage regulator (ST Micro) to regulate a chopper circuit (Biebl).

Putting aside the issue of motivation to combine, Biebl does not describe a power supply that meets the requirements of claim 7 or claim 31, as construed. Petitioner’s citation to additional patents in its Reply is to no avail. The Petition argued that it would have been obvious to combine ST Micro with Biebl, and doing so, yields the claims at issue. It does not. Perhaps Petitioner could have made a challenge based in part on the additional patents cited in its Reply, but it did not do so in its Petition.

In addition, the Petition does not establish that Biebl’s chopper is among the types of power supplies enumerated in the Specification as

corresponding to the function of the claimed “means for supplying power.” The Petition does not argue that Biebl’s chopper circuit is equivalent to one of the current regulating power supplies listed.

We therefore conclude that Petitioner has not established by a preponderance of the evidence that claims 7 and 31 are unpatentable based on Biebl and ST Micro.

D. Petitioner’s Motion to Exclude Evidence

Petitioner moved (Paper 50) to exclude Exhibit 2010, which purports to be a document titled “Closing the Feedback Loop” by Lloyd H. Dixon Jr. Paper 50, 1. Patent Owner opposed. Paper 54, “Opp. Pet. Mot. to Exclude.” Petitioner filed a Reply in support of its Motion to Exclude. Paper 58, “Pet. Reply Mot. to Exclude.” Exhibit 2010 was not cited in Patent Owner’s Response (Paper No. 32), but was cited in paragraphs 63, 66, and 88 of the declaration of Regan Zane (Ex. 2006), Patent Owner’s expert. The first eight pages of this document contain a footer indicating that it has some relation to Unitrode Corporation of Lexington, MA. The final page appears to relate to the sale of products by Texas Instruments. It bears a copyright date of 2001, to Texas Instruments Corporation.

Petitioner argues that the 2001 copyright date is hearsay under Fed. R. Evid. 803. Therefore Exhibit 2010 should be considered undated. Paper 50, 1. Petitioner argues that this date is an out of court statement offered for the truth of the matter asserted (that this document was published in 2001), and no hearsay exception applies.

We do not rely on Ex. 2010 and therefore Petitioner's Motion is dismissed as moot.

E. Patent Owner's Notice of New Arguments

Patent Owner filed a Notice of New Arguments. Paper 52, "Not. New Argument." Petitioner opposed. Paper 57, "Opp. Not. New Argument."

Patent Owner points to Petitioner's Reply (Paper 40), Section III.B. and to a second declaration of Robert Neal Tingler, Ph.D. (Ex. 1018) Section II, as containing new Argument.

Dr. Tingler second Declaration addresses Patent Owner's arguments regarding why one of ordinary skill would not have been motivated to combine references. This Declaration supports arguments made in Petitioner's Reply.

Although these arguments were not made in the Petition, they directly respond to Patent Owner's arguments (PO Resp.) that one of ordinary skill would not have been motivated to combine the references. Thus, we conclude that it is appropriate to consider these arguments and weigh them accordingly.

F. Patent Owner's Revised Motion for Observations

Patent Owner filed a Revised Motion for Observations." Paper 55, "Rev. Mot. Obs'v." Petitioner responded. Paper 59, "Pet. Resp. Obs'v."

When a cross-examination occurs after a final opportunity for briefing, it is appropriate for the cross-examining party to make observations for which there is no further opportunity to brief. We have taken into

account both the observations made by Patent Owner and Petitioner's response to those observations.

III. CONCLUSIONS

Patent Owner no longer defends against Petitioner's challenge to claims 15 and 23. We conclude, based on a preponderance of the evidence, that claims 15 and 23 are unpatentable.

Petitioner has not established by a preponderance of the evidence that claims 7 and 31 are unpatentable based on ST Micro and Biebl.

IV. ORDER

For the reasons given, it is:

ORDERED that Petitioner's Motion to Exclude Evidence is dismissed as moot.

FURTHER ORDERED that claims 15 and 23 of U.S. Patent 6,586,890 have been shown to be unpatentable; and

FURTHER ORDERED that claims 7 and 31 of U.S. Patent 6,586,890 have not been shown to be unpatentable; and

FURTHER ORDERED that this is a Final Written Decision. Parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

IPR2015-01292
Patent 6,586,890 B2

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