

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

TOSHIBA CORPORATION, FUNAI ELECTRIC CO., LTD., and
SAMSUNG DISPLAY CO., LTD.,
Petitioner,

v.

GOLD CHARM LIMITED,
Patent Owner.

Case IPR2015-01479
Patent 6,417,833 B1

Before MICHAEL R. ZECHER, BRYAN F. MOORE, and
CHARLES J. BOUDREAU, *Administrative Patent Judges*.

BOUDREAU, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
37 C.F.R. § 42.108

I. INTRODUCTION

Toshiba Corporation, Funai Electric Co., Ltd., and Samsung Display Co., Ltd. (collectively, “Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting *inter partes* review of claims 1–8 and 16 of U.S. Patent No. 6,417,833 B1 (Ex. 1001, “the ’833 patent”). Pet. 1. Gold Charm Limited (“Patent Owner”) filed a Preliminary Response. Paper 7 (“Prelim. Resp.”).

We review the Petition under 35 U.S.C. § 314, which provides that an *inter partes* review may not be instituted “unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a).

For the reasons that follow and on this record, we are not persuaded that Petitioner demonstrates a reasonable likelihood of prevailing in showing the unpatentability of any of the challenged claims on any of the asserted grounds. Accordingly, we *deny* Petitioner’s request to institute an *inter partes* review.

A. Related Proceedings

The ’833 patent has been asserted against multiple defendants, including, among others, Toshiba Corporation and Funai Electric Co., Ltd., in three lawsuits in the United States District Court for the District of Delaware, captioned as follows: (1) *MiiCs & Partners, America, Inc. v. Toshiba Corp.*, 1:14-cv-00803-RGA; (2) *MiiCs & Partners, America, Inc. v. Funai Electric Co.*, 1:14-cv-00804-RGA; and (3) *MiiCs & Partners, America, Inc. v. Mitsubishi Electric Corp.*, 1:14-cv-00805-RGA. Pet. 1–2; Paper 5, 2–3.

B. The '833 Patent

The '833 patent, entitled "Liquid Crystal Display Apparatus and Method for Lighting Backlight Thereof," issued July 9, 2002, from U.S. Patent Application No. 09/591,580, filed June 9, 2000. Ex. 1001, [21], [22], [45], [54]. The '833 patent also claims priority from Japanese Patent Application No. 11-165393, filed June 11, 1999. *Id.* at [30].

The '833 patent generally describes a liquid crystal display (LCD) apparatus and backlight illumination method. *Id.* at col. 1, ll. 6–7. In the described apparatus and methods, lamps constituting "a first backlight" and "a second backlight" are driven simultaneously, but with oscillation waves having opposite phases. *Id.* at col. 2, ll. 15–25.

According to the '833 patent, the lamps used in conventional LCD backlight apparatuses are all driven in the same period and in synchronization with each other, such that they also are lighted in the same period and in synchronization, in order to avoid a type of interference noise referred to as the "ripple phenomenon." *Id.* at col. 1, ll. 23–45. In the conventional backlight apparatus, "the lamp oscillation frequency is selected so that the oscillation wave does not interfere [with] the horizontal synchronization signal" of the LCD video signal, which would similarly result in ripple noise. *Id.* at col. 1, ll. 53–56. According to the '833 patent, however, plural horizontal synchronization frequencies are used in multiscanning monitors, while the lamp oscillation frequency is fixed, and "the interference of the horizontal synchronization signal with the lamp oscillation wave [therefore] cannot be avoided." *Id.* at col. 1, ll. 58–62. In particular, although a lamp oscillation frequency may be selected to avoid interference with one particular horizontal synchronization signal, there will

still be ripple noise generated by interference between the lamp oscillation wave and some other horizontal synchronization signals. *Id.* at col. 1, ll. 62–67. Moreover, the ripple noise increases further with an increasing number of lamps. *Id.* at col. 2, ll. 1–5.

By using first and second backlights that are driven simultaneously but have inverted phase with respect to one another, the apparatus and method of the '833 patent purportedly reduce the ripple noise of the conventional apparatuses. *Id.* at col. 2, ll. 27–34.

An embodiment of the '833 patent is described with reference to Figures 4 and 6, reproduced below, with color coding added by Petitioner.

FIG. 4

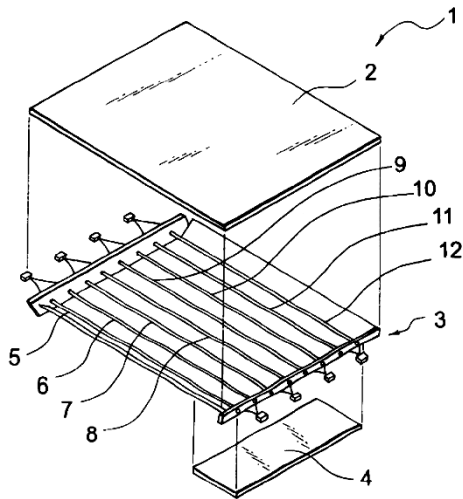


FIG. 6

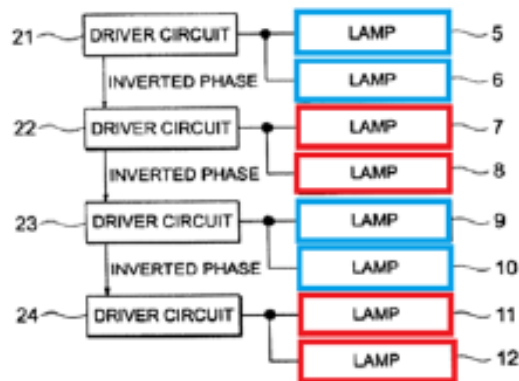


Figure 4 is a perspective view of an embodiment of the LCD apparatus described by the '833 patent. *Id.* at col. 2, ll. 48–50. Figure 6 is a block diagram showing a configuration of the embodiment. *Id.* at col. 2, ll. 54–56.

Figure 4 of the '833 patent illustrates an LCD light source having eight tube lamps, 5–12, positioned in parallel with one another in LCD display apparatus 1. *Id.* at col. 3, ll. 18–23. In the configuration shown in

Figure 6 of the '833 patent, lamps 5, 6, 9, and 10, outlined in blue by Petitioner, are driven in synchronization by driver circuits 21 and 23 and represent the first backlight. *Id.* at col. 3, l. 45–col. 4, l. 7; Pet. 6–7. Lamps 7, 8, 11, and 12, outlined in red, are driven by driver circuits 22 and 24 in synchronization with, but with inverted phase relative to, lamps 5, 6, 9, and 10, and represent the second backlight. Ex. 1001, col. 3, l. 45–col. 4, l. 7; Pet. 6–7. The '833 patent also discloses an embodiment in which lamps 5, 7, 9, and 11 constitute the first backlight and lamps 6, 8, 10, and 12 constitute the second backlight. Ex. 1001, col. 4, ll. 60–64, Fig. 11. The '833 patent also states that, although it describes an embodiment with eight lamps, “any number of lamps more than or equal to two can be used.” *Id.* at col. 3, ll. 23–25.

C. The Challenged Claims

Of the challenged claims, claims 1 and 16 are independent. Claims 1 and 16 of the '833 patent read as follows:

1. A liquid crystal display apparatus, comprising:
a first backlight; and
a second backlight which is driven simultaneously with said first backlight, said second backlight having an oscillation wave whose phase is inverted with respect to an oscillation wave of the first backlight.
16. A method for lighting a backlight of a liquid crystal display apparatus, the method comprising the steps of:
lighting a first backlight; and
lighting a second backlight simultaneously with said first backlight by inverting phase of an oscillation wave with respect to an oscillation wave of the first backlight.

Ex. 1001, col. 5, ll. 25–30, col. 6, ll. 40–46.

The remaining challenged claims—claims 2–8—all depend directly or indirectly from claim 1. *Id.* at col. 5, l. 31–col. 6, l. 7.

D. Applied References and Declaration

Petitioner relies on the following references and declaration in support of its asserted grounds of unpatentability:

Exhibit	Reference or Declaration
1002	Declaration of Aris Silzars, Ph.D.
1003	US 5,325,024, issued June 28, 1994 (“GTE”)
1004	JP H11-003039 A, published January 6, 1999 (“Tanaka”)
1005	US 5,387,921, issued Feb. 7, 1995 (“Zhang”)
1006	PCT WO 98/12470, published Mar. 26, 1998 (“FPD”)

See Pet. 4–5.

E. Asserted Grounds of Unpatentability

Petitioner challenges the patentability of claims 1–8 and 16 on the following five grounds:

Reference	Basis	Claims Challenged
GTE	35 U.S.C. § 102	1–8 and 16
GTE	35 U.S.C. § 103	1–8 and 16
Tanaka	35 U.S.C. § 102	2 and 6
Zhang	35 U.S.C. § 102	1, 3–5, 7, 8, and 16
FPD	35 U.S.C. § 102	1–8 and 16

See Pet. 5.

II. DISCUSSION

A. Claim Construction

In an *inter partes* review proceeding, claims of an unexpired patent are given their broadest reasonable interpretation in light of the specification

of the patent in which they appear. 37 C.F.R. § 42.100(b); *Office Patent Trial Practice Guide*, 77 Fed. Reg. 48,756, 48,766 (Aug. 14, 2012); *see also In re Cuozzo Speed Techs., LLC*, 793 F.3d 1268, 1278 (Fed. Cir. 2015) (“We conclude that Congress implicitly approved the broadest reasonable interpretation standard in enacting the AIA.”). Within that framework, terms generally are given their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art, in the context of the entire patent disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

Petitioner proposes interpretations for various claim terms and also contends that the preambles of independent claims 1 and 16 merely state a purpose or intended use of the invention and should not be construed as claim limitations in our patentability analysis. Pet. 13–23. Patent Owner counters with interpretations for three claim terms, specifically, “first backlight,” “second backlight,” and “oscillation wave,” and contends that the remaining claim terms should be given their plain and ordinary meaning. Prelim. Resp. 27–35. Patent Owner additionally argues that the preambles of independent claims 1 and 16 give “life, meaning, and vitality” to the challenged claims and that there is no basis to disregard them as claim limitations. Prelim. Resp. 21–27.

We conclude that it is not necessary for our determination of whether to institute *inter partes* review of the ’833 patent to construe expressly any claim terms other than “backlight.”

1. “*backlight*”

The terms “first backlight” and “second backlight” are explicitly recited in each of claims 1–5 and 16. Ex. 1001, col. 5, ll. 25–44, col. 6,

ll. 40–46. The term “backlight,” by itself, is additionally recited in each of claims 6–8. *Id.* at col. 5, l. 45–col. 6, l. 7.

Petitioner proposes that “first backlight” and “second backlight” should both be construed the same way, as “comprising either (i) a single lamp or (ii) multiple lamps each of which is driven using an oscillation wave that is synchronized in terms of frequency and phase with the oscillation waves used to drive the other of the multiple lamps.” Pet. 13 (citing Ex. 1002 ¶ 40). Petitioner further argues that “the determining factor for whether a set of multiple lamps comprises a ‘first backlight’ or a ‘second backlight’ is whether the multiple lamps are driven by oscillation waves having the same period and oscillating in synchronization in the same phase.” *Id.* at 14 (citing Ex. 1002 ¶ 43). According to Petitioner, “[i]f that factor is met, it is apparent that multiple lamps can comprises a claimed ‘backlight,’ regardless of other factors such as whether the lamps are located next to one another or driven using the same circuitry.” *Id.*

Patent Owner responds that:

The plain and ordinary meaning given to the term “backlight” by those of ordinary skill in the art is a form of illumination from behind, which . . . is used in liquid crystal displays (LCDs). However, the terms “first backlight” and “second backlight,” when viewed by themselves, may not necessarily be well-defined terms in the art. Accordingly, the exact meaning of these terms and the relationship between them should be construed in light of the ’833 Patent. In particular, the context in which they are used (LCDs) and the problem being solved (the ripple effect), as described in the specification, are relevant to how one of ordinary skill in the art would interpret the “first backlight” and “second backlight” in the claims of the ’833 patent.

As initial matter, the backlights would be understood to be backlights in a liquid crystal display. The use of the term

“backlight” rather than simply “light” indicates that something is being illuminated from behind. While devices other than LCDs can incorporate a backlight, the ’833 patent makes clear that it is only addressing LCD backlights. It should also be noted, even if the preambles of the claims were not properly considered limiting, they would still inform the interpretation of the term “backlight” in the remainder of the claims.

Prelim. Resp. 28–29.

Patent Owner further contends that Petitioner’s proposed construction “is incomplete in that it ignores the necessary property of the ‘first backlight’ and ‘second backlight’ as defining *all* of the lamps that are used in the backlight 3.” *Id.* at 31. According to Patent Owner, “[t]he ’833 patent eliminates the ripple effect in LCDs because interference between the oscillation wave of the backlight and the horizontal synchronization signal is eliminated.” *Id.* at 29 (citing Ex. 1001, col. 2, ll. 8–14). This is only possible, according to Patent Owner, if all of the lamps in the backlight belong to either the first or the second backlight. *Id.* “[I]f additional lamps driven by additional oscillation waveforms were included in the liquid crystal display, there would still be interference with horizontal synchronization signal[s] and the problem addressed by the ’833 patent would not be solved.” *Id.* at 29–30. Thus, according to Patent Owner, whether there are only two lamps in the backlight (e.g., one in the first backlight and one in the second) or more than two (e.g., four lamps in the first backlight and four in the second, “as shown in the exemplary embodiment of the ’833 Patent”), “the ‘first backlight’ and the ‘second backlight’ described in the ’833 Patent are defined by *all* of the lamps that are used in the backlight 3.” *Id.* at 31.

Patent Owner further contends “Petitioner’s proposed claim construction is also needlessly redundant . . . because the entire clause, ‘each of which is driven using an oscillation wave that is synchronized in terms of . . . phase with the oscillation waves used to drive the other of the multiple lamps,’ is already expressly recited in the claims of the ’833 Patent.” *Id.*

Patent Owner urges in conclusion that “the broadest reasonable construction of ‘first backlight’ and ‘second backlight,’ in the LCD apparatus of the claims as specified in the preamble, when read in light of the specification, as it would be interpreted by one of ordinary skill in the art,” are “a lamp or set of lamps for illumination from behind of the preamble’s liquid crystal display apparatus” and “all remaining lamps of the preamble’s liquid crystal display apparatus that are not in the first backlight,” respectively. *Id.* at 32.

We agree with Patent Owner that “[t]he use of the term ‘backlight’ rather than simply ‘light’ indicates that something is being illuminated from behind.” *Id.* at 28. Petitioner’s proposed constructions (Pet. 13–16) are unreasonably broad insofar as they do not account for the use of the term “*backlight*.”

We also agree with Patent Owner (*see id.*) that it is clear in the context of the ’833 patent that the recited backlights are in a liquid crystal display apparatus. *See Toro Co. v. White Consol. Indus. Inc.*, 199 F.3d 1295, 1301 (Fed. Cir. 1999) (words used in a claim are not construed in a “lexicographic vacuum, but in the context of the specification and drawings”); *In re Marosi*, 710 F.2d 799, 802 (Fed. Cir. 1983) (“[C]laims are not to be read in a vacuum, and limitations therein are to be interpreted in light of the specification in giving them their ‘broadest reasonable interpretation.’”

(emphasis omitted) (quoting *In re Okuzawa*, 537 F.2d 545, 548 (CCPA 1976)). Petitioner, and its expert Dr. Silzars, recognize in their statements regarding the level of ordinary skill in the art that the relevant art here is “display technologies.” See Pet. 12; Ex. 1002 ¶ 13. Notably, however, despite Petitioner’s assertions and Dr. Silzars’ opinions that “[t]he alleged invention boils down to a method for minimizing the electrical noise generated when simultaneously driving multiple lights,” that the “‘liquid crystal display’ modifier” in the preambles of the challenged claims “merely states a purpose or intended use of the invention” (Pet. 20–22; Ex. 1002 ¶¶ 58–59), and that “there is no structure that is specific to LCDs recited in the body of any of the claims,” neither Petitioner nor Dr. Silzars identifies any context in which *backlights* would be employed by those of ordinary skill in the art of display technologies, *other than in an LCD*.

Accordingly, on this record and for purposes of this Decision, we determine that the broadest reasonable interpretation of the term “backlight” is “a lamp or set of lamps that illuminates a liquid crystal display from behind.”

Because the claims already explicitly define the relationship between the “first backlight” and the “second backlight”—for example, claim 1 recites, in relevant part, that the second backlight is “driven simultaneously with said first backlight” and “ha[s] an oscillation wave whose phase is inverted with respect to an oscillation wave of the first backlight”—we discern no need to provide separate interpretations of “first backlight” and “second backlight.” We also decline to adopt Patent Owner’s proposal to limit the “second backlight” to include “all remaining lamps of the . . . apparatus that are not in the first backlight.” Because independent claims 1

and 16 use the open-ended transitional phrase “comprising,” those claims do not exclude additional, unrecited elements and method steps, respectively. See Manual of Patent Examining Procedure § 2111.03 (9th ed., Rev. 07.2015 Nov. 2015).

2. Other Claim Terms

For purposes of this Decision, no other claim terms require express interpretation. *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011) (“claim terms need only be construed ‘to the extent necessary to resolve the controversy’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

B. Anticipation and Obviousness

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros., Inc. v. Union Oil Co. of Cal.*, 814 F.2d 628, 631 (Fed. Cir. 1987). The elements must be arranged as required by the claim, but this is not an *ipsissimis verbis* test. *In re Bond*, 910 F.2d 831, 832 (Fed. Cir. 1990).

[U]nless a reference discloses within the four corners of the document not only all of the limitations claimed but also all of the limitations arranged or combined in the same way as recited in the claim, it cannot be said to prove prior invention of the thing claimed[,] and thus, cannot anticipate under 35 U.S.C. § 102.

Net MoneyIN, Inc. v. VeriSign, Inc., 545 F.3d 1359, 1371 (Fed. Cir. 2008); accord *In re Arkley*, 455 F.2d 586, 587 (CCPA 1972). Moreover, “it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom.” *In re Preda*, 401 F.2d 825, 826 (CCPA 1968).

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are “such that the subject matter[,] as a whole[,] would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) objective evidence of nonobviousness, i.e., secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). We analyze the asserted grounds with the principles identified above in mind.

C. Asserted Grounds of Unpatentability

1. Anticipation of Claims 1–8 and 16 by GTE

GTE is directed to a “light source” having “multiple fluorescent lamp tubes driven in parallel by a single [radio frequency (RF)] source.” Ex. 1003, Abstract. According to GTE, “[l]ow pressure fluorescent lamps cannot normally be operated in parallel electrical paths because the breakdown/starting voltage is larger than the operating voltage, and the lamps cannot be made such that a discharge is initiated in all lamps simultaneously.” *Id.* at col. 1, ll. 14–18. In particular, when several lamps are connected in parallel and all are ignited, one lamp normally operates at a higher current and lower discharge voltage than the others, causing all of the other lamps to be extinguished. *Id.* at col. 1, ll. 27–31. GTE also explains that, although compact fluorescent lamps (CFLs) are more efficient than incandescent lamps, they are limited in total lumen output and, for various

practical and economic reasons, are limited to four tubes driven in series. *Id.* at col. 1, ll. 32–60.

GTE, thus, states, as its general objects, to “provide improved fluorescent light sources,” to “provide a fluorescent light source wherein multiple fluorescent lamp tubes are electrically connected in parallel to a single RF source,” to “provide a compact fluorescent lamp having high lumen output,” and to “provide fluorescent light sources which are low in cost and which are easy to manufacture.” *Id.* at col. 2, ll. 38–49. According to GTE:

These and other objects and advantages are achieved in . . . a fluorescent light source comprising a plurality of fluorescent lamp assemblies, each including first and second fluorescent lamp tubes having capacitive coupling electrodes at or near the ends thereof for capacitive coupling of RF electrical energy to a low pressure discharge therein, each fluorescent lamp tube having a driven end and an opposite end, and means for electrically coupling the electrodes at the opposite ends of the first and second fluorescent lamp tubes together. . . .

In the above-described light source, the RF source preferably includes means for applying RF voltages of equal amplitudes and opposite polarities to the electrodes at the driven ends of the first and second fluorescent lamp tubes.

Id. at col. 2, l. 52–col. 3, l. 9.

Figures 1–3 of GTE are reproduced below.

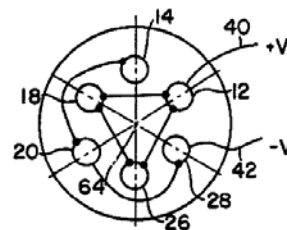
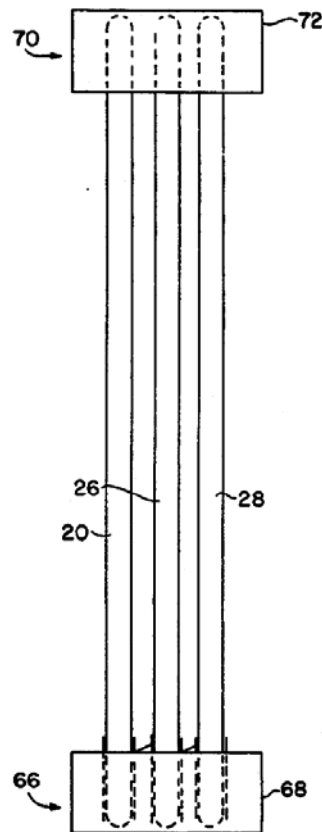
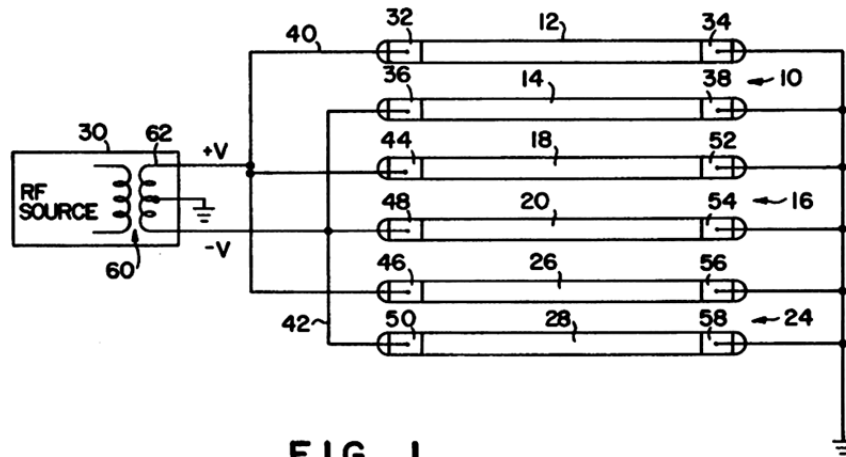


Figure 1 is “a schematic diagram of a fluorescent light source . . . wherein multiple straight fluorescent lamp tubes are driven by a single RF

source.” *Id.* at col. 4, ll. 16–19. Figure 2 is “an elevation view of a suitable mounting arrangement for the fluorescent lamp tubes shown in [Figure] 1.” *Id.* at col. 4, ll. 20–22. Figure 3 is “an end view of the fluorescent lamp tubes of [Figure] 2, showing a preferred electrical phasing of the lamp tubes.” *Id.* at col. 4, ll. 23–25.

GTE discloses that output terminals 40 and 42 carry opposite phases of the RF output from source 30. *Id.* at col. 5, ll. 23–25. Output terminal 40 connects to electrodes 32, 44, and 46 at the driven ends of lamps 12, 18, and 26, respectively; and output terminal 42 connects to electrodes 36, 48, and 50 at the drive ends of lamps 14, 20, and 28, respectively. *Id.* at col. 5, ll. 16–31. Electrodes 34 and 38 at the opposite ends of lamps 12 and 14 are connected electrically, as are electrodes 52 and 54 of lamps 18 and 20 and electrodes 56 and 58 of lamps 26 and 28. *Id.* at col. 5, ll. 19–22, 31–36. In preferred embodiments, lamp assemblies 10, 16, and 24 are driven with RF voltages that are balanced with respect to ground, and the RF voltage on output terminal 40 is 180° out of phase with respect to the output voltage on terminal 42. *Id.* at col. 5, ll. 48–55. According to GTE, a suitable mounting arrangement for fluorescent lamp tubes 12, 14, 18, 20, 26 and 28 is shown in Figures 2 and 3, wherein the lamp tubes “are mounted side-by[-]side and parallel in a circular arrangement around a central axis 64.” *Id.* at col. 6, ll. 9–13.

Petitioner asserts that Figure 1 of GTE “illustrates a configuration in which six elongated, straight lamps are positioned in parallel with one another, very similar to the configuration of lamps depicted in Figure 4 of the ’833 Patent,” and that lamps 12 and 14, respectively, comprise the “first backlight” and “second backlight” recited in claim 1 of the ’833 patent. Pet.

23–25. Moreover, according to Petitioner, GTE discloses that the second backlight is driven simultaneously with the first backlight, and that the second backlight has an oscillation wave whose phase is inverted with respect to an oscillation wave of the first backlight. *Id.* at 26–29. Finally, according to Petitioner, “[a]lthough GTE does not expressly state that the disclosed light source was designed for use as LCD backlights, the reference in claim 1’s preamble to ‘liquid crystal display’ is not a claim limitation.” *Id.* at 29. “Therefore,” Petitioner concludes, “GTE anticipates claim 1 of the ’833 Patent even though GTE does not expressly reference LCD backlights.” *Id.* Petitioner contends that “GTE anticipates claim 16 for the same reasons that it anticipates claim 1.” Pet. 35.

Based on the record before us, we are not persuaded that Petitioner demonstrates a reasonable likelihood that it would prevail at trial in showing that claims 1–8 and 16 are anticipated by GTE. Not only does GTE not expressly state that the disclosed light source was designed for use as LCD backlights, as Petitioner concedes (Pet. 29), but, as Patent Owner points out (Prelim. Resp. 37), there is no disclosure in GTE of light sources that illuminate *anything* from behind. Thus, GTE does not disclose a “backlight” within the broadest reasonable interpretation of that term. *See* Section II.A.1, *supra*. Nor has Petitioner persuasively shown that GTE’s light source would even be capable of use as a backlight. Contrary to Petitioner’s assertion that Figure 1 of GTE illustrates a configuration “very similar to the configuration of lamps depicted in Figure 4 of the ’833 Patent” (Pet. 23), GTE explicitly states that lamp tubes 12, 14, 18, 20, 26, and 28 are mounted side-by-side and parallel in a circular arrangement around a central axis, as depicted in Figures 2 and 3 (Ex. 1003, col. 6, ll. 11–13). Petitioner does not

explain, and we cannot discern, how lamp tubes mounted in such an arrangement could be employed as a backlight.¹

On this record, Petitioner has not presented sufficient evidence that would support a finding that GTE discloses “a first backlight” and “a second backlight,” as recited in both of the challenged independent claims 1 and 16. Consequently, we are not persuaded that Petitioner demonstrates a reasonable likelihood that it would prevail at trial in showing that any of the challenged claims are anticipated by GTE.

2. Obviousness of Claims 1–8 and 16 over GTE

Petitioner contends that, “[e]ven if the Board were to . . . conclude that the reference to ‘liquid crystal display’ in claim 1’s preamble limits the scope of claim 1 to backlights for LCDs, GTE renders claims 1–8 and 16 obvious because a person of ordinary skill in the art would have found it obvious to implement GTE’s teachings in LCDs.” Pet. 36.

According to Petitioner, it was well-known as of the ’833 patent’s effective filing date that “fluorescent lamps like the ones taught by GTE were useful as backlights.” *Id.* In support of that assertion, Petitioner points to a Japanese patent application cited in the ’833 patent that Petitioner alleges is directed to fluorescent lamp backlights; a 1996 article (“the OSRAM Article,” Ex. 1014), authored by GTE’s named inventors, which states that “[s]ubminiature fluorescent lamps (SMFL) are becoming more

¹ GTE additionally discloses “[t]hree suitable patterns for configuring twin tube fluorescent lamps . . . shown in FIGS. 7A–7C.” Ex. 1003, col. 8, ll. 26–28. Petitioner has not alleged that GTE’s twin-tube fluorescent lamps would anticipate the challenged claims, and notably, each of the “suitable patterns” of such lamps shown in Figures 7A–7C of GTE also features a circular arrangement.

widely used these days mainly as a backlight source for LCD displays”; and U.S. Patent No. 5,333,073 (“the ’073 patent,” Ex. 1015), which states that “[t]he conventional backlight device has a plurality of fluorescent lamps as a light source thereof.” *Id.* (citing Ex. 1001, col. 1, ll. 16–20; Ex. 1014, 1; Ex. 1015, col. 1, ll. 24–25). Petitioner argues that “GTE is directed to the ‘SMFLs’ addressed by the OSRAM Article,” asserting, in particular, that GTE teaches the use of fluorescent lamps having the very same dimensions, gas, and gas pressure as the lamps that the OSRAM Article addresses, and that both GTE and the OSRAM Article teach using RF sources to drive the lamps. Pet. 36 n.5. According to Petitioner, “[i]n view of the OSRAM Article’s teaching regarding the usefulness of SMFLs as backlights for LCDs, a person of ordinary skill in the art would have understood that the GTE inventors in fact intended the concepts described in GTE to be implemented in LCD backlights.” *Id.*

Based on the record before us, we are not persuaded that Petitioner demonstrates a reasonable likelihood that it would prevail at trial in showing that claims 1–8 and 16 are unpatentable over GTE. As pointed out by Patent Owner, Figure 1 of GTE, relied upon by Petitioner as illustrating “a configuration . . . very similar to the configuration of lamps depicted in Figure 4 of the ’833 Patent” (Pet. 23), is described by GTE merely as a “schematic diagram.” Prelim. Resp. 39. As explained in Section II.C.1, *supra*, GTE explicitly states that the disclosed lamp tubes are mounted side-by-side and parallel in a circular arrangement around a central axis, as depicted in Figures 2 and 3 of GTE (Ex. 1003, col. 6, ll. 11–13). Even if the fluorescent lamps disclosed by GTE have the same dimensions, gas, gas pressure, and driving method as the SMFLs addressed by the OSRAM

Article, Petitioner does not explain adequately how GTE's disclosed configuration of fluorescent tubes would be suitable for implementation in LCD backlights. (citing Ex. 1003, col. 4, ll. 16–19).

On this record, Petitioner has not presented sufficient evidence that would support a finding that GTE teaches or suggests “a first backlight” and “a second backlight,” as recited in both of the challenged independent claims 1 and 16. Consequently, we are not persuaded that Petitioner demonstrates a reasonable likelihood that it would prevail at trial in showing that any of the challenged claims would have been obvious over GTE.

3. Anticipation of Claims 2 and 6 by Tanaka

Tanaka is directed to a lighting circuit for illumination of an LCD backlight. Ex. 1004 ¶ 1.² According to Tanaka:

Hitherto, conventional backlights for use in liquid crystal displays have had fixed frequency illumination, and concerning said illuminated irradiation light, there were differences in the transparency in parts of the display showing in text and images, etc.

. . . In these instances, low frequency fixed duty signal backlight starters illuminate, and in parts of the display, transparency differences were visible in text and images with flickers, and the problem of interference between the display frame rate and the backlight illumination occurred.

The current invention aims to solve these problems by alternating the illumination of multiple backlights to eliminate flicker and by synchronizing backlight illumination with the frame rate to eliminate frame rate flicker interference.

Id. at ¶¶ 2–4.

² Citations to Tanaka are to the certified English-language translation in Exhibit 1004.

Figure 1 of Tanaka is reproduced below, with color and English translation provided by Petitioner. Pet. 44.

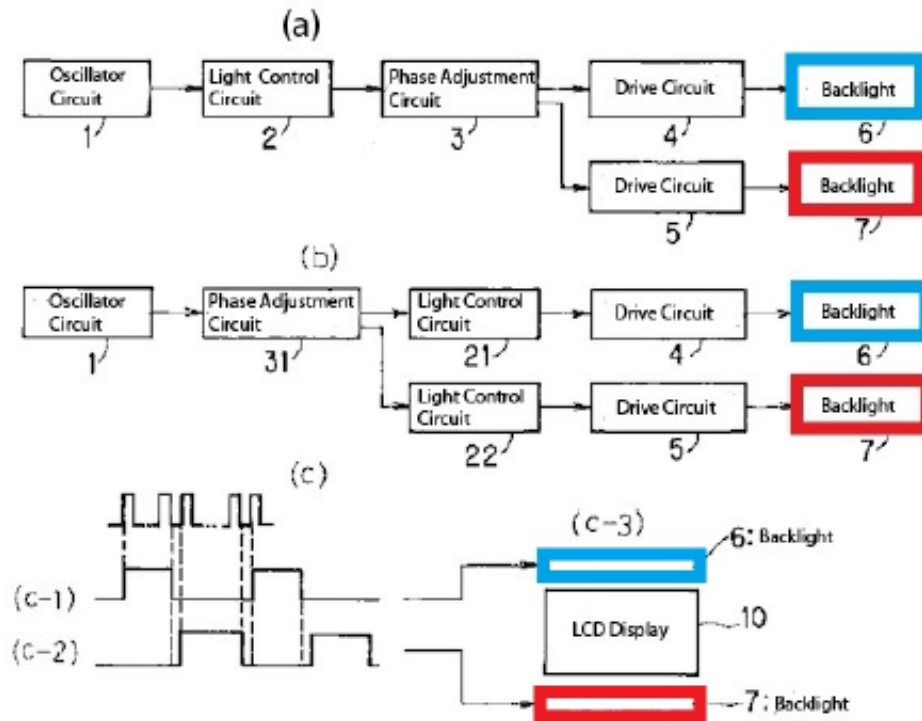


Figure 1 is a “[s]ystem diagram of . . . [Tanaka’s] invention.” Ex. 1004 ¶ 40. In an embodiment shown in Figure 1(a), oscillation circuit 1 oscillates a backlight-illumination signal, lighting control circuit 2 produces a “fixed duty cycle” to illuminate the backlight based on the signal oscillated by oscillation circuit 1, phase adjustment circuit 3 shifts the phase of the fixed duty signal produced by lighting control circuit 2, and drive circuits 4 and 5 illuminate backlights 6 and 7, respectively, in accordance with the unshifted (c-1) and shifted (c-2) fixed duty signal from phase adjustment circuit 3. *Id.* at ¶¶ 8, 15–20, 25, 26, Fig. 1(c). “In this way,” according to Tanaka, “backlights 6 and 7 are alternately illuminated, doubling the number of times lighting is performed and making possible the elimination of flicker.” *Id.* at ¶ 20. In the embodiment shown in Figure 1(b), phase

adjustment circuit 31 shifts the phase of the oscillated signal produced by oscillation circuit 1 and then light control circuits 21 and 22 produce fixed duty signals based on the unshifted (c-1) and shifted (c-2) signals, respectively, from phase adjustment circuit 31, and drive circuits 4 and 5 again alternately illuminate backlights 6 and 7, respectively. *Id.* at ¶¶ 9, 21–26, Fig. 1(c).

Petitioner contends that Tanaka anticipates claims 2 and 6 of the '833 patent. Pet. 43. As noted in Section I.C, *supra*, claims 2 and 6 depend from claim 1. Accordingly, claims 2 and 6 incorporate by reference all limitations of claim 1, including, *inter alia*, “a second backlight which is driven simultaneously with said first backlight.” 35 U.S.C. § 112 ¶ 4.³ With respect specifically to that limitation, Petitioner contends:

Tanaka teaches an embodiment in which the two drive signals used to drive the illumination of the two backlights are derived from a single fixed duty signal produced by a light control circuit 2 based on a signal from an oscillation circuit 1. Ex. 1004 ¶¶ 8, 15–20, Fig. 1(a); Ex. 1002 ¶ 125. As illustrated in Figures 1(a) and (c), a phase adjustment circuit simultaneously produces two signals – one signal that is unchanged from the signal produced by the light control circuit 2 and another signal whose phase is shifted approximately 180 degrees from the phase of the signal produced by the light control circuit. Ex. 1002 ¶¶ 73, 125. Figure 1(c) illustrates that these two signals are simultaneously applied to backlights 6 and 7, such that a person of ordinary skill in the art would have

³ Section 4(c) of the Leahy-Smith America Invents Act (AIA) re-designated 35 U.S.C. § 112 ¶ 4, as 35 U.S.C. § 112(d). Because the '833 patent has a filing date before the September 16, 2012 effective date of AIA Section 4, we refer to the pre-AIA version of 35 U.S.C. § 112.

understood that the second backlight 7 is driven simultaneously with the first backlight 6. Ex. 1002 ¶ 125.

Pet. 44–45.

Based on the record before us, we are not persuaded that Petitioner demonstrates a reasonable likelihood that it would prevail at trial in showing that claims 2 and 6 are anticipated by Tanaka. Whether or not Tanaka’s phase adjustment circuits 3 and 31 *simultaneously produce* two signals, Tanaka repeatedly states that the backlights 6 and 7 are “alternatively”—i.e., *not simultaneously*—driven. See, e.g., Ex. 1004 ¶¶ 20 (disclosing that “illumination of backlight 6 is driven by a fixed duty signal based on an unshifted frequency signal from drive circuits 4 and 5, wherein the fixed duty signal based on the shifted signal also drives backlight 7 [sic],” and that “[i]n this way, backlights 6 and 7 are alternately illuminated, doubling the number of times lighting is performed and making possible the elimination of flicker.”), 24 (disclosing the same), 27 (disclosing the same). As Patent Owner points out, “[d]epending upon the state of the input pulse (ON or OFF) shown in signal (c-1) of Fig. 1(c), the drive circuit 4 is either ON and thus driving backlight 6 so as to illuminate backlight 6, or OFF, resulting in no illumination of backlight 6,” and “[l]ikewise, depending upon the state of the input pulse (ON or OFF) shown in signal (c-2) of Fig. 1(c), the drive circuit 5 is either ON and thus driving backlight 7 so as to illuminate backlight 7, or OFF, resulting in no illumination of backlight 7. Prelim. Resp. 45.

On this record, Petitioner has not presented sufficient evidence that would support a finding that Tanaka discloses a second backlight “which is driven simultaneously with said first backlight,” as recited by independent

claim 1. Consequently, we are not persuaded that Petitioner demonstrates a reasonable likelihood that it would prevail at trial in showing that dependent claims 2 and 6 are anticipated by Tanaka.

4. *Anticipation of Claims 1, 3–5, 7, 8 and 16 by Zhang*

Zhang is directed to a “scanning flat back light source for use with light valve devices such as liquid crystal displays.” Ex. 1005, Abstract. Zhang’s light source is “formed by an array of parallel fluorescent tubes with fluorescent layers therein,” where “[o]ne end of each tube is provided with an electrode and the other end connected together through a transverse chamber to form a single vacuum unit.” *Id.* Those and other elements of Zhang’s light source are illustrated in Figure 1A, reproduced below.

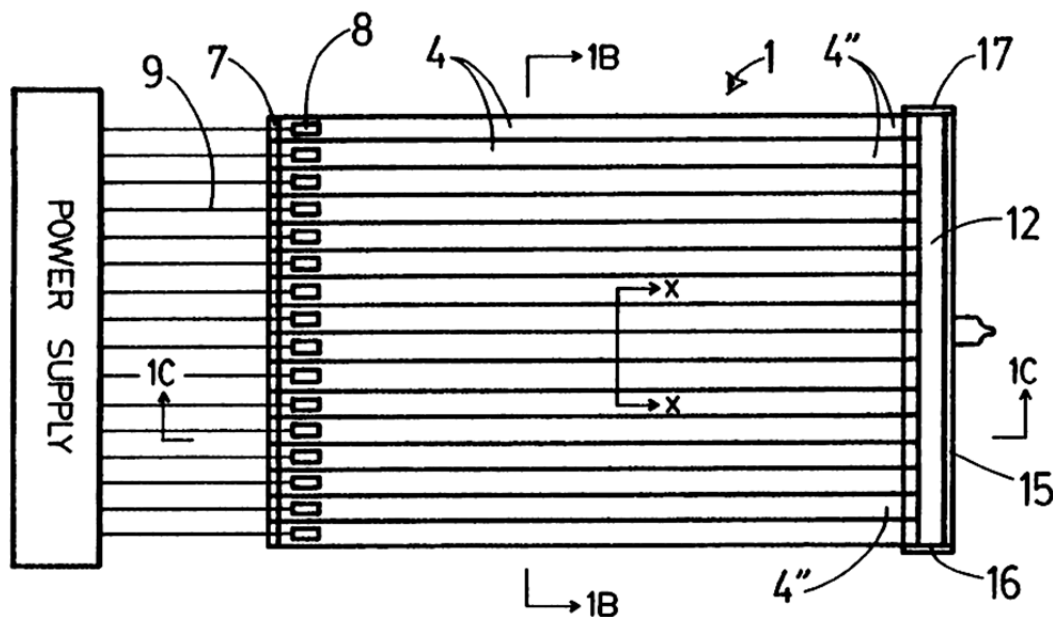


FIG. 1A.

Figure 1A is “a top view of a back light source for use with a light valve front end unit (not shown) to illustrate the invention.” *Id.* at col. 4, ll. 35–37. Plate 1 encloses and defines “an array of parallel channels or chambers 4 that are elongated and have ends 4.” *Id.* at col. 4, ll. 38–40.

One end of each chamber 4 houses cathodes 8 connected to a power supply through wires 9. *Id.* at col. 4, ll. 57–59. The other ends 4" of parallel chambers 4 communicate with each other through transverse chamber 12. *Id.* at col. 4, l. 68–col. 5, l. 2. The array of chambers 4 and transverse chamber 12 form a single vacuum system. *Id.* at col. 5, ll. 10–11.

A driving method of Zhang's back light source is illustrated in Figure 4A, reproduced below.

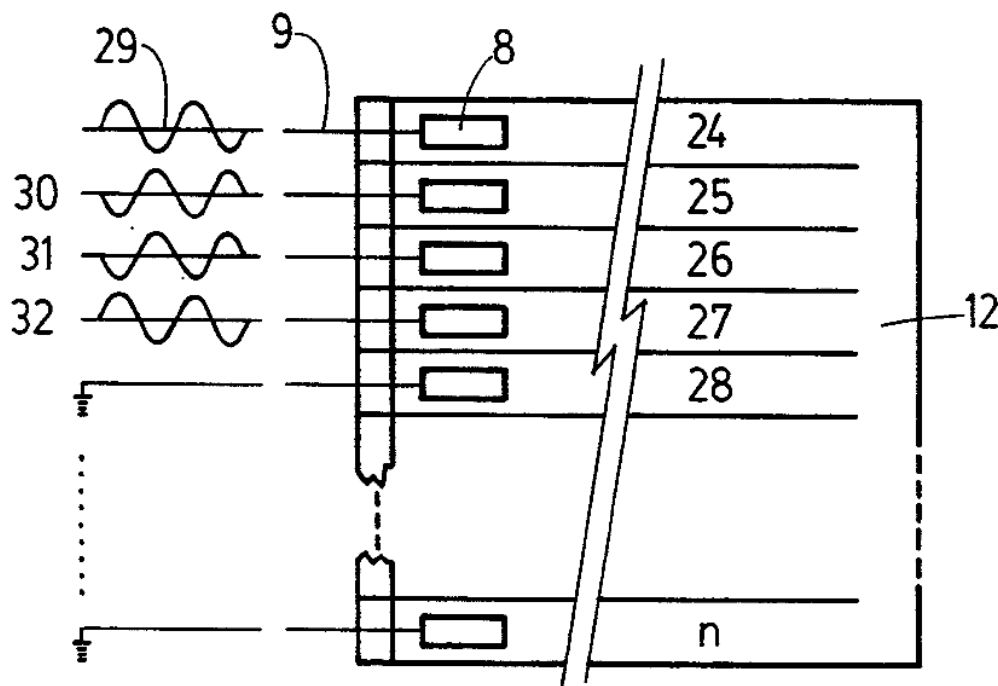


FIG. 4A.

Figure 4A is a “schematic view[] of plate 1 of the back light source of FIG. 1A and wave forms 29–32 . . . of electrical potentials applied to the electrodes 8, . . . for causing gas discharges to illustrate . . . [a] driving method[] of the invention.” *Id.* at col. 6, ll. 16–20.

With reference to Figure 4A, Zhang describes the driving of the back light source as follows:

[D]uring the first time interval of a sequence of consecutive time intervals of a scanning cycle, an electrical potential is applied between electrodes 8 in chambers 24 and 25. . . . During the second time interval . . . , an electrical potential is applied between the electrodes 8 in chambers 25 and 26. Since the second time interval follows immediately after the conclusion of the first, at the beginning of the second time interval, a large number of charged particles present during the first time interval in chamber 25 would still be present. For this reason, gas discharge in chambers 25 and 26 would be quickly initiated even though there may be few charged particles in chamber 26 at the beginning of the second time interval. In the same vein, during the third time interval, an electrical potential is applied between the electrodes in chambers 26 and 27 and so on until in the last time interval in the first scanning cycle, an electrical potential is applied between the electrodes in chambers n and 24. At this point, the entire cycle may be repeated in the manner described.

In the above-described operation, every two chambers to which electrical potential is applied defines a single lamp, and during each time interval in the scanning cycle each lamp is caused to emit light. In order to increase the brightness of the back light source, it is possible to cause more than two chambers to emit light at the same time. For example, it is possible to cause the two lamps formed by the two chambers 24, 25 and 26, 27 to emit light during the first time interval, and during the second time interval cause the lamp formed by chambers 25, 26 and the chamber formed by the chambers 27, 28 to emit light and so on.

Id. at col. 6, ll. 21–60.

In contending that Zhang anticipates claims 1, 3–5, 7, 8, and 16, Petitioner points to Zhang’s statement in the above quotation that “every two chambers to which electrical potential is applied defines a single lamp,” and

asserts that chambers 24 and 25 define a “first backlight” and chambers 26 and 27 define a “second backlight.” Pet. 47–48 (quoting Ex. 1005, col. 6, ll. 49–51). Petitioner further asserts that “Zhang teaches that the second backlight is driven simultaneously with the first backlight.” *Id.* at 48. In support of that contention, Petitioner argues that “Zhang teaches that the two lamps formed by the two pairs of chambers 24, 25 and 26, 27 are caused to emit light ‘at the same time’ during a ‘first time interval.’” *Id.* at 48–49 (citing Ex. 1005, col. 6, ll. 52–60; Ex. 1002 ¶ 134).

Based on the record before us, we are not persuaded that Petitioner demonstrates a reasonable likelihood that it would prevail at trial in showing that claims 1, 3–5, 7, 8 and 16 are anticipated by Zhang. As Patent Owner points out (Prelim. Resp. 47–48), it is clear from the block-quoted passage above that Zhang describes a sequential scanning operation in which the chambers of the described light source are driven sequentially and transiently in overlapping groups of two or four. Specifically, Zhang discloses that “an electrical potential is applied between electrodes 8 in chambers 24 and 25” during a first time interval, “an electrical potential is applied between electrodes 8 in chambers 25 and 26” during a second time interval that “follows” the first interval, “an electrical potential is applied between the electrodes in chambers 26 and 27” during a third time interval, “and so on.” Ex. 1005, col. 6, ll. 23–24, 31–36, 43–45. Thus, to the extent that Zhang would refer to chambers 26 and 27 as defining a different “lamp”⁴ than chambers 24 and 25, the lamp defined by chambers 26 and 27

⁴ As Patent Owner points out, Zhang describes “a singular vacuum unit which is operated on a scanning cycle,” and although Zhang “[o]perating as his own lexicographer . . . notes . . . that a set of two neighboring chambers

is not driven in Zhang's method until two time intervals after the driving of the lamp defined by chambers 24 and 25, with the lamp defined by chambers 25 and 26 being driven in the intervening interval. Further, although the quoted portion of Zhang also states that "it is possible to cause more than two chambers to emit light at the same time" (Ex. 1005, col. 6, ll. 53–55) and, specifically, that "it is possible to cause the two lamps formed by the two chambers 24, 25 and 26, 27 to emit light during the first time interval" (*id.* at col. 6, ll. 55–57), those statements are not reasonably read to disclose "a second backlight which is driven simultaneously with said first backlight." It is clear in the context provided by the full quoted sentence that Zhang is still describing a scanning cycle in which the chambers of a single light source are driven sequentially, the only difference being that four chambers, rather than only two, are driven at a time. See Ex. 1005, col. 6, ll. 55–60. Accordingly, we are not persuaded that Zhang describes two backlights being driven simultaneously.

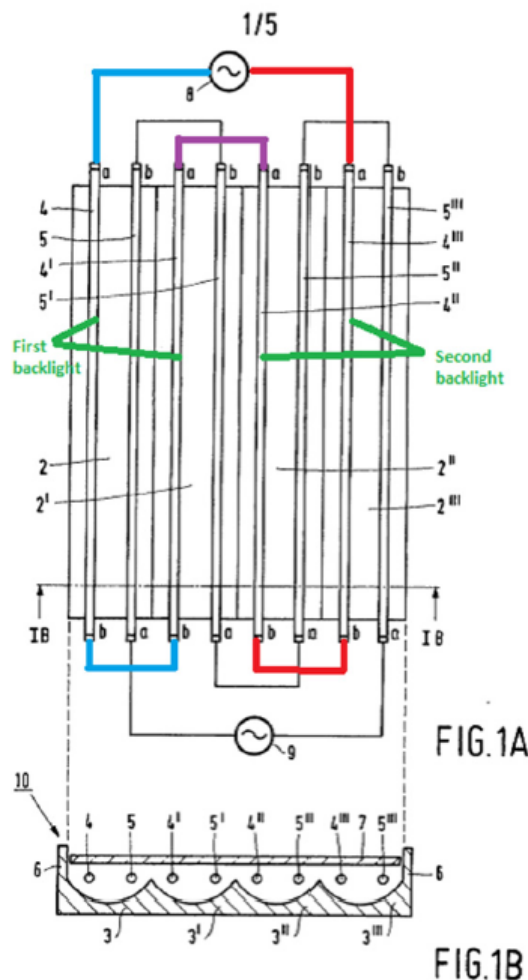
On this record, Petitioner has not presented sufficient evidence that would support a finding that Zhang discloses "a second backlight which is driven simultaneously with said first backlight," as recited in both of the challenged independent claims 1 and 16. Consequently, we are not persuaded that Petitioner demonstrates a reasonable likelihood that it would prevail at trial in showing that any of the challenged claims are anticipated by Zhang.

will be referred to as 'a lamp,'" "[t]here are no distinct, discrete 'lamps' in Zhang." Prelim. Resp. 49.

5. Anticipation of Claims 1–8 and 16 by FPD

FPD is directed to a “backlight luminaire” having at least two fluorescent lamps, with portions of the lamps “exhibiting a variation in spectral characteristic in the longitudinal direction.” Ex. 1006, 1 (Abstract).⁵ The portions of the lamps are positioned relative to each other such that the spectral characteristics vary in opposite directions. *Id.*

Figures 1A and 1B of FPD are reproduced below, with annotations and color coding provided by Petitioner (Pet. 56):



⁵ Citations to FPD refer to the page numbers provided by Petitioner at the bottom of each page of Exhibit 1006. Pet. 55 n.10.

Figure 1A is a plan view of an embodiment of FPD's backlight luminaire. *Id.* at 8, ll. 9–10. Figure 1B is a cross-sectional view of the luminaire, taken on the line IB–IB in Figure 1A. *Id.* at 8, ll. 11–12. Figure 1A shows eight fluorescent lamps, with one half (i.e., lamps 4–4'') connected in series to first power source 8 and the other half (lamps 5–5'') connected in series to second power source 9 (5–5''), such that different lamps with portions in the same sub-reflector (e.g., lamps 4 and 5 in sub-reflector 3) are not connected to the same power source. *Id.* at 10, ll. 20–25; *see also id.* at 7, l. 33–8, l. 1 (disclosing that no “two [] lamps in one sub-reflector are connected to one power source”).

Petitioner alleges that FPD discloses every element of claim 1. According to Petitioner, a person of ordinary skill in the art would have understood that components 8 and 9 in FPD's Figure 1 are alternating current (AC) power sources. Pet. 55 (citing Ex. 1006, 7, ll. 16–21, 10, ll. 22–25, Fig. 1A; Ex. 1002 ¶ 148). Petitioner contends that the person of ordinary skill in the art would also have understood that “the output shown on the left side of each AC power source would produce an oscillating output voltage” and that “the output shown on the right side of each power source would simultaneously produce an oscillating output voltage having an inverted phase with respect to the phase of the output voltage on the left hand side.” *Id.* at 55–56 (citing Ex. 1002 ¶ 148).

Focusing on the lamps driven by power source 8, Petitioner alleges:

FPD discloses a “first backlight” (lamps 4 and 4') and a “second backlight” (lamps 4'' and 4'''), because a person of ordinary skill in the art would have understood that lamps 4 and 4' are driven using the same oscillation wave (corresponding to the oscillating voltage produced at the output shown on the left side of each AC power source (shown here in red [*sic*])), while

lamps 4" and 4'" are driven using the same oscillation wave (corresponding to the oscillating voltage produced at the output shown on the right side of each AC power source (shown here in blue [sic])). See Ex. 1006 at Fig. 1A; Ex. 1002 ¶ 149. A person of ordinary skill in the art would have understood that the jumper connection connecting lamps 4' and 4" would essentially be at ground, which is shown in purple. Ex. 1002 ¶ 149.

A person of ordinary skill in the art would also have understood that the second backlight is driven simultaneously with the first, because the outputs at the left and right side of the AC power source necessarily provide voltages simultaneously. Ex. 1002 ¶ 150. And, because Figure 1A depicts the use of AC power sources with two outputs and no external separate connection to ground, a person of ordinary skill in the art would have understood that the oscillation wave provided to the second backlight is inverted with respect to the oscillation wave provided to the first backlight. See Ex. 1006 at Fig. 1A; Ex. 1002 ¶ 150.

Id. at 56–57. Further, according to Petitioner, “FPD anticipates claim 16 for the same reasons that it anticipates claim 1.” *Id.* at 60.

Based on the record before us, we are not persuaded that Petitioner demonstrates a reasonable likelihood that it would prevail at trial in showing that claims 1–8 and 16 are anticipated by FPD. As Patent Owner points out (Prelim. Resp. 54), “there is no discussion in FPD of providing more than one oscillation wave, let alone one . . . ‘whose phase is inverted’ with respect to another,” and Petitioner’s assertions to the contrary appear to be based upon Petitioner’s arbitrary labeling of certain lamps as a “first backlight,” others as a “second backlight,” and the connection between those as being a “jumper” that “would essentially be at ground” (*see* Pet. 56–57). Apart from conclusory statements in Dr. Silzars’ Declaration that merely repeat Petitioner’s arguments (*compare* Ex. 1002 ¶¶ 149–150, *with* Pet. 56–

57), Petitioner provides no evidence for its assertions as to what “a person of ordinary skill in the art would have understood” from FPD’s disclosure. Of particular importance here, we discern no support on this record for Petitioner’s assertion that “[a] person of ordinary skill in the art would have understood that the jumper connection connecting lamps 4' and 4" would essentially be at ground.” Pet. 56. Indeed, the identification of that connection, as opposed to any other connection depicted in Figure 1A, as the ground appears to be no more than an arbitrary selection made to support Petitioner’s desired conclusion that lamps 4" and 4''' are driven with an oscillation wave that is inverted with respect to the oscillation wave provided to lamps 4 and 4'. Because Petitioner has not provided an adequate rationale for selecting that connection as the ground, Petitioner fails to demonstrate that FPD discloses, expressly or inherently, a second backlight having an oscillation wave whose phase is inverted with respect to an oscillation wave of a first backlight.

On this record, Petitioner has not presented sufficient evidence that would support a finding that FPD discloses “second backlight having an oscillation wave whose phase is inverted with respect to an oscillation wave of the first backlight,” as recited in claim 1, or “lighting a second backlight . . . by inverting phase of an oscillation wave with respect to an oscillation wave of the first backlight,” as recited in claim 16. Consequently, we are not persuaded that Petitioner demonstrates a reasonable likelihood that it would prevail at trial in showing that any of the challenged claims are anticipated by FPD.

D. Remaining Contentions

The above determination makes it unnecessary to resolve any other disputes, including Patent Owner's assertion that Petitioner failed to list all of the real parties in interest. *See* Prelim. Resp. 4–14; Petitioners' Reply to Patent Owner's Preliminary Response, Paper 9; Patent Owner's Sur-Reply to Petitioners' Reply, Paper 10.

III. CONCLUSION

For the foregoing reasons, we determine that the information presented does not show that there is a reasonable likelihood that Petitioner would prevail at trial with respect to at least one claim of the '833 patent, based on any grounds presented in the Petition. We, therefore, deny the Petition for *inter partes* review of claims 1–8 and 16.

IV. ORDER

Accordingly, it is

ORDERED that that the Petition is DENIED as to all challenged claims, and no trial is instituted.

IPR2015-01479
Patent 6,417,833 B1

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