

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HISENSE CO., LTD. and LG ELECTRONICS, INC.,
Petitioners,

v.

POLARIS POWERLED TECHNOLOGIES, LLC,
Patent Owner.

Case: IPR2020-01337
U.S. Patent No. 8,223,117

**PETITION FOR *INTER PARTES* REVIEW OF CLAIMS 1-2, 4-7, 9, 15-
16, and 18 OF U.S. PATENT NO. 8,223,117**

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PETITIONERS' EXHIBIT LIST

Exhibit No.	Description
1001	U.S. Patent No. 8,223,117 B2 to Ferguson (the “117 patent”)
1102	Declaration of Ralph V. Wilhelm, Jr., Ph.D.
1103	English Translation of Japanese Patent Application Publication No. 2003-150291A (“Okii”) with Declaration.
1104	Japanese Patent Application Publication No. 2003-150291A to Okii
1105	Patent Owner Preliminary Response, <i>VIZIO, Inc. v. Polaris PowerLED Techs., LLC</i> , IPR2020-00043, Paper 10 (Feb. 6, 2020) (redacted)
1106	Decision Denying Institution of <i>Inter Partes</i> Review 35 U.S.C. § 314, <i>VIZIO, Inc. v. Polaris PowerLED Techs., LLC</i> , IPR2020-00043, Paper 30 (May 4, 2020).
1107	Order Regarding Motions to Strike, <i>Polaris PowerLED Techs., LLC v. VIZIO, Inc.</i> , No. SACV 18-1571 JVS (DFMx), Dkt. 406 (May 14, 2020)
1108	Order of Non-Infringement of U.S. Patent No. 8,223,117, <i>Polaris PowerLED Techs., LLC v. VIZIO, Inc.</i> , No. SACV 18-1571 JVS (DFMx), Dkt. 413 (Jun. 8, 2020)
1109	Vizio Inc.’s Answer, <i>Polaris PowerLED Techs., LLC v. VIZIO, Inc.</i> , No. SACV 18-1571 JVS (DFMx), Dkt. 22 (Nov. 30, 2018)
1110	Order on Pretrial Motions and Motions <i>In Limine</i> , <i>Polaris PowerLED Techs., LLC v. Samsung Electronics Am., Inc.</i> , No. 2:17-cv-00715-JRG, Dkt. 333 (Jun. 7, 2019).
1111	U.S. Patent No. 6,337,675 B1 (“Toffolo”)
1112	EP 1 217 598 A2
1113	U.S. Patent Publication No. 2002/0118182 A1

Exhibit No.	Description
1114	U.S. Patent No. 7,236,154
1115	U.S. Patent No. 6,388,388
1116	U.S. Patent No. 5,105,127
1117	U.S. Patent No. 5,202,668
1118	U.S. Patent No. 5,617,112
1119	Reporter's Transcript of Proceedings, <i>Polaris PowerLED Techs., LLC v. VIZIO, Inc.</i> , No. 8:18-cv-01571-JVS-DFM, Dkt. 219 (filed Dec. 1, 2019) (transcript of proceedings from Nov. 20, 2019)
1120	LX1970 Visible Light Sensor Application Note, Microsemi, Rev. 1.2 (Feb. 13, 2004)
1121	Patent Owner Preliminary Response, <i>VIZIO, Inc. v. Polaris PowerLED Technologies, LLC</i> , IPR2020-00043 (filed Feb. 6, 2020)
1122	File History for U.S. Patent Application No. 12/336,990 (as obtained from PAIR)
1123	File History for U.S. Patent Application No. 11/023,295 (as obtained from PAIR)
1124	File History for U.S. Provisional Application No. 60/543,094 (as obtained from PAIR)
1125	Declaration of Dr. Ravin Balakrishnan in Support of Plaintiff's Opening Claim Construction Brief, <i>Polaris PowerLED Techs., LLC v. VIZIO, Inc.</i> , No. 8:18-cv-01571-JVS (DFMx), Dkt. 106-1 (Filed Sept. 13, 2019).
1126	Plaintiff Polaris PowerLED Techs., LLC's Responsive Claim Construction Brief, <i>Polaris PowerLED Technologies, LLC v. VIZIO, Inc.</i> , No. 8:18-cv-01571-JVS (DFMx), Dkt. 140 (Filed Oct. 3, 2019)

Exhibit No.	Description
1127	Plaintiff Polaris PowerLED Technologies, LLC's Opening Claim Construction Brief, <i>Polaris PowerLED Technologies, LLC v. VIZIO, Inc.</i> , No. 8:18-cv-01571 (DFMx), Dkt. 106 (Filed Sept. 13, 2019).
1128	Declaration of Ravin Balakrishnan in Support of Plaintiff's Supplemental Claim Construction Brief, <i>Polaris PowerLED Technologies, LLC v. VIZIO, Inc.</i> , No. 8:18-cv-01571-JVS (DFMx), Dkt. 237-1 (filed Dec. 9, 2019).
1129	Plaintiff Polaris Power LED Technologies, LLC's Supplemental Claim Construction Brief, <i>Polaris PowerLED Technologies, LLC v. VIZIO, Inc.</i> , No. 8:18-cv-01571-JVS (DFMx), Dkt. 237 (filed Dec. 9, 2019).
1130	U.S. Patent No. 7,202,458 to Park
1131	U.S. Patent No. 5,406,305 to Shimomura et al.
1132	U.S. Patent No. 4,386,345 to Narveson et al.
1133	Decision Denying Institution of <i>Inter Partes</i> Review 37 C.F.R. § 42.108, <i>Samsung Electronics Co., Ltd., et al. v. Polaris PowerLED Techs., LLC</i> , IPR2018-01262 (PTAB Jan. 17, 2019).
1134	Patent Owner Preliminary Response, <i>VIZIO, Inc. v. Polaris PowerLED Techs., LLC</i> , IPR2020-00043 (filed Oct. 26, 2018)
1135	Order re Claim Construction, <i>Polaris PowerLED Technologies, LLC v. VIZIO, Inc.</i> , No. 8:18-cv-01571-JVS (DFMx), Dkt. 212 (Nov. 26, 2019)
1136	Plaintiff's Reply Claim Construction Brief Pursuant to Local P.R. 4-5(C), <i>Polaris Power LED Techs., LLC v. Samsung Elecs. Am., Inc.</i> , No. 2:17-cv-00715, Dkt. 123 (E.D. Tex., filed Oct. 26, 2018).
1137	Claim Construction Memorandum Opinion and Order, <i>Polaris Power LED Techs., LLC v. Samsung Elecs. Am., Inc.</i> , No. 2:17-

Exhibit No.	Description
	cv-00715, Dkt. 138 (E.D. Tex., filed Oct. 26, 2018).
1138	Order re Supplemental Claim Construction Disputes, <i>Polaris PowerLED Technologies, LLC v. VIZIO, Inc.</i> , No. 8:18-cv-01571 (DFMx), Dkt. 264 (Filed Dec. 23, 2019).
1139	U.S. Patent No. 6,198,234 to Henry (“Henry”)
1140	Cases Filed Involving U.S. Patent No. 8,223,117 from DocketNavigator.
1141	U.S. Patent No. 4,514,727
1142	RESERVED
1143	Order re Scheduling Dates, <i>Polaris PowerLED Techs., LLC v. LG Electronics Inc., et al.</i> , No. SACV 20-00125JVS(DFMx), Dkt. 27 (Apr. 2, 2020)
1144	Joint Rule 26(f) Report, <i>Polaris PowerLED Techs., LLC v. LG Electronics Inc., et al.</i> , No. SACV 20-00125JVS(DFMx), Dkt. 25 (March 30, 2020)
1145	Order re Scheduling Dates, <i>Polaris PowerLED Techs., LLC v. Hisense Electronics Manufacturing Company of Am. Corp., et al.</i> , No. SACV 20-00123JVS(DFMx), Dkt. 22 (Apr. 2, 2020)
1146	Joint Rule 26(f) Report, <i>Polaris PowerLED Techs., LLC v. Hisense Electronics Manufacturing Company of Am. Corp., et al.</i> , No. SACV 20-00123JVS(DFMx), Dkt. 25 (March 30, 2020)
1147	Plaintiff’s Disclosure of Asserted Claims and Infringement Contentions to LG Electronics, Inc., et al. (Patent L.R. 3-1) (served Apr. 20, 2020)
1148	Plaintiff’s Disclosure of Asserted Claims and Infringement Contentions to Hisense, et al. (Patent L.R. 3-1) (served Apr. 20, 2020)
1149	Lex Machina, Motions Metrics Report (Generated Jul. 14, 2020) for Central District of California for September 2012-July 14,

Exhibit No.	Description
	2020
1150	DocketNavigator Search Results for Judge Selna Stay Decisions Pending <i>Inter Partes</i> Review
1151	“China Judicial Assistance Information,” U.S. Department of State, Bureau of Consular Affairs, at https://travel.state.gov/content/travel/en/legal/Judicial-Assistance-Country-Information/China.html , last accessed 7/13/20
1152	U.S. Department of State: China Travel Advisory, https://travel.state.gov/content/travel/en/traveladvisories/traveladvisories/china-travel-advisory.html , last visited 7/13/20
1153	U.S. Embassy & Consulate in the Republic of Korea, COVID-19 Information, https://kr.usembassy.gov/022420-covid-19-information/ , last visited 7/13/20
1154	“Chapter 599C, Compulsory Quarantine of Certain Persons Arriving at Hong Kong Regulation,” Hong Kong e-Legislation, Feb. 8, 2020, at https://www.elegislation.gov.hk/hk/cap599C , last accessed 7/13/20
1155	Proclamation Suspending Entry of Aliens Who Present a Risk to the U.S. Labor Market Following the Coronavirus Outbreak, https://www.whitehouse.gov/presidential-actions/proclamation-suspending-entry-aliens-present-risk-u-s-labor-market-following-coronavirus-outbreak/ , last visited 7/13/20
1156	Order re Scheduling Dates, <i>Polaris PowerLED Techs., LLC v. TCL Corporation, et al.</i> , No. SACV 20-00127JVS(DFMx), Dkt. 217 (Apr. 2, 2020)
1157	Second Contingent Election Regarding Invalidity Defenses and Counterclaims, <i>Polaris PowerLED Techs., LLC v. LG Electronics Inc., et al.</i> , No. SACV 20-00125JVS(DFMx) (filed Jul. 21, 2020)
1158	Second Contingent Election Regarding Invalidity Defenses and Counterclaims, <i>Polaris PowerLED Techs., LLC v. Hisense Electronics Manufacturing Company of Am. Corp., et al.</i> , No. SACV 20-00123JVS(DFMx) (filed Jul. 21, 2020)

CLAIM LISTING

<u>Claim 1</u>	
[1.Pre]	A brightness control circuit with selective ambient light correction comprising:
[1A]	a first input configured to receive a user signal indicative of a user selectable brightness setting;
[1B]	a light sensor configured to sense ambient light and to output a sensing signal indicative of the ambient light level;
[1C]	a multiplier configured to selectively generate a combined signal based on both the user signal and the sensing signal; and
[1D]	a dark level bias configured to adjust the combined signal to generate a brightness control signal that is used to control a brightness level of a visible display such that the brightness control signal is maintained above a predetermined level when the ambient light level decreases to approximately zero.
<u>Claim 2</u>	
	The brightness control circuit of claim 1, wherein the dark level bias is provided to the multiplier such that the amount of adjustment to the

	combined signal is dependent on the user selectable brightness setting.
<u>Claim 4</u>	
	The brightness control circuit of claim 1, wherein the dark level bias is added to the combined signal such that the amount of adjustment to the combined signal is independent of the user selectable brightness setting.
<u>Claim 5</u>	
	The brightness control circuit of claim 4, wherein the dark level bias is added to an output of the multiplier.
<u>Claim 6</u>	
	The brightness control circuit of claim 1, further comprising an overdrive clamp circuit coupled to the brightness control signal to limit its amplitude to a predefined range.
<u>Claim 7</u>	
	The brightness control circuit of claim 1, wherein the brightness control signal is provided to a display driver to control backlight illumination of a liquid crystal display.

<u>Claim 9</u>	
	The brightness control circuit of claim 1, further comprising a second input configured to receive a selection signal to selectively operate the brightness control circuit in an auto mode or a manual mode, wherein the selection signal enables the light sensor in the auto mode and disables the light sensor in the manual mode.
<u>Claim 15</u>	
[15.Pre]	A method to selectively provide ambient light correction, said method comprising:
[15A]	receiving a user input signal indicative of a user selectable brightness setting;
[15B]	selectively multiplying the input signal with a sense signal to generate a combined signal, wherein the sense signal indicates an ambient light level; and
[15C]	adjusting the combined signal with a dark level bias to generate a brightness control signal for controlling brightness of a visible display such that the brightness control signal is maintained above a predetermined level when the ambient light level decreases to approximately zero.

<u>Claim 16</u>	
	The method of claim 15, wherein the step of selectively multiplying the input signal with the sense signal is performed by a software algorithm, an analog circuit, or a mixed-signal circuit.
<u>Claim 18</u>	
	The method of claim 15, wherein the dark level bias is added to the combined signal after selective multiplication such that the amount of adjustment to the combined signal is independent of the input signal and the sense signal.

LG Electronics, Inc. and Hisense Co., Ltd. hereby petition for *inter partes* review of claims 1-2, 4-7, 9, 15-16, and 18 of U.S. Patent No. 8,223,117.

I. OVERVIEW

The '117 patent describes a way of controlling a display backlight which performs mathematical operations on a user signal, a signal reflecting ambient light levels, and something called a “dark level bias,” which avoids the display going completely dark when the ambient light level is “approximately zero.” This was no invention.

Before the alleged invention, those skilled in the art had known for years that displays needed to be adjusted to accommodate for ambient light conditions. Ex. 1132, 1:56-2:5. By the 1980’s backlit displays were increasingly prevalent in aircraft and vehicles. *Id.*; Ex. 1141, 1:19-45; Ex. 1116, 1:10-22. Under high ambient light conditions, brighter backlighting was needed for a user to see the display. Ex. 1116, 1:18-22; Ex. 1112, ¶ [0006]; Ex. 1113, ¶ [0006]; Ex. 1114, Fig. 2; Ex. 1115, 1:28-42. Users could see the display with dimmer backlighting in a dark environment. Ex. 1112, ¶ [0006].

Some early backlit displays allowed manual adjustment of the backlight brightness. Ex. 1116, 2:50-59; Ex. 1117, 1:23-29, 4:44-55. These manual systems were inconvenient and could lead to the user overdriving the display. Ex. 1106, 1:9-17; Ex. 1117, 4:66-5:2.

Automatic systems using ambient light sensors to detect ambient light levels were also used to automatically adjust backlight brightness. Ex. 1118, Ex. 1117, Ex. 1141; Ex. 1132. The concept of a dark level bias was known to be important for these systems to avoid having the display going dark when ambient light levels dropped to zero. Ex. 1141, 8:14-16; Ex. 1112, ¶ [0036].

Complete manual control and completely automatic control also had drawbacks as there were limits on customization to accommodate user preferences. Ex. 1103, ¶ [0003]. To give the user more flexibility, systems were devised which automatically controlled backlight brightness based on user settings and ambient light levels. Ex. 1103, ¶ [0030]; Ex. 1117, Fig. 12, 8:12-41; Ex. 1112, ¶¶ [0046]-[0059]; Ex. 1132, Abst.

Such solutions included systems which performed certain mathematical operations on signals representing ambient light levels, user preferences, and settings which kept the backlight display at a certain minimum level of brightness even under dark conditions. The reference relied upon in this petition, namely the Oki reference, describes and renders obvious the claimed signals, values, circuits, and mathematics as explained in detail in this petition.

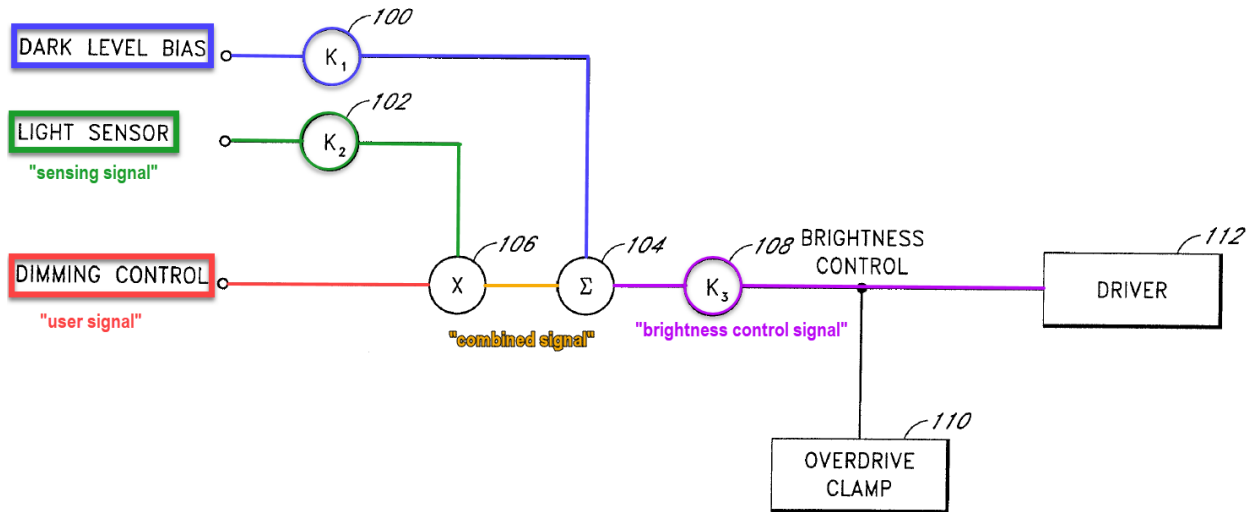
The grounds presented in this petition have never been evaluated on the merits by the Office before. They are based on a Japanese-language reference that was not before the examiner during examination. While it was presented in an earlier IPR,

the Board found certain factors weighed against considering the merits of the petition. While this is Petitioners' second petition, it is being filed before a filing date was accorded on their earlier petition and before any action has been taken by Polaris on that petition. There are good reasons to institute on both petitions as explained below and as set forth in Petitioners' Notice Ranking Petitions, filed herewith. Petitioners have satisfied their burden to show institution is appropriate, and the Board should exercise its discretion and institute trial and, ultimately, cancel all challenged claims.

II. U.S. PATENT NO. 8,223,117

The alleged invention includes “a light sensor control system that” allows “a fully automatic and fully adaptable method of adjusting display brightness in response to varying ambient lighting conditions in combination with various user preferences.” Ex. 1001, 1:60-64. The alleged invention manipulates, through operations including multiplication, (1) a user signal, (2) a sensing signal from an ambient light sensor, and (3) a “dark level bias” to generate a signal for controlling the backlight of a display. Ex. 1001, Figs. 1, 2, Abstract, 1:64-67, 2:54-61.

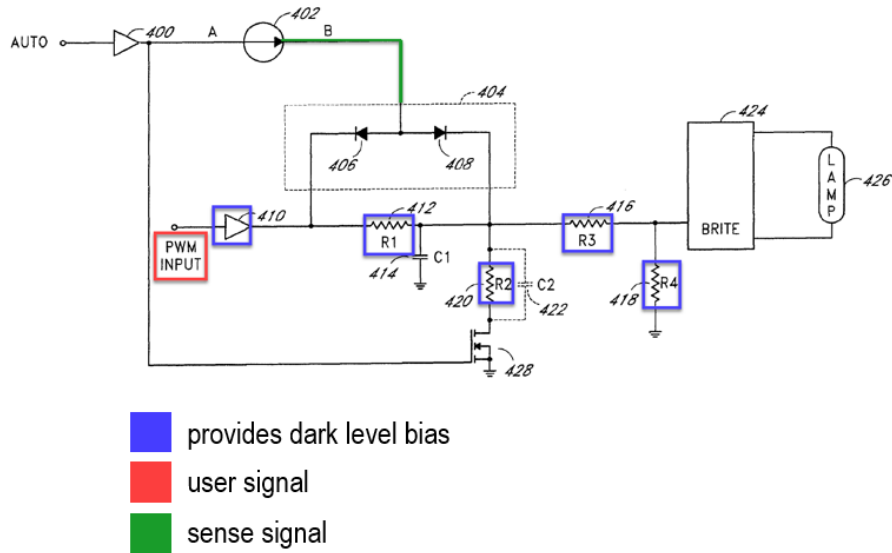
In one embodiment a “brightness control signal” is created “using dark level bias, a sensing signal from the light sensor, and a user signal indicative of a user selectable brightness setting (called ‘dimming control’).” Ex. 1125, ¶ 16 (citing Ex. 1001, 5:15-43). This embodiment is illustrated below.



Ex. 1001, Fig. 2 (annotated). A sensing signal (“LIGHT SENSOR”) may be adjusted (K_2) and is input into multiplier circuit (106) along with user signal (“DIMMING CONTROL”). *Id.*, 5:16-20. “The multiplier circuit 106 outputs a signal that is the product of the user input and scaled light sensor output.” *Id.*, 5:20-22; Ex. 1121, pp.52-53. “A summing circuit 104 adds the product to a dark level bias (DARK LEVEL BIAS),” which may also be adjusted (K_1). The summing circuit produces a “brightness control signal (BRIGHTNESS CONTROL) for a display driver 112.” Ex. 1001, 5:24-27.

Polaris has described embodiments of the '117 patent. For example, the following annotated version of Figure 4 and its corresponding equation shows how Polaris and its expert find certain signals and values in the '117 patent.

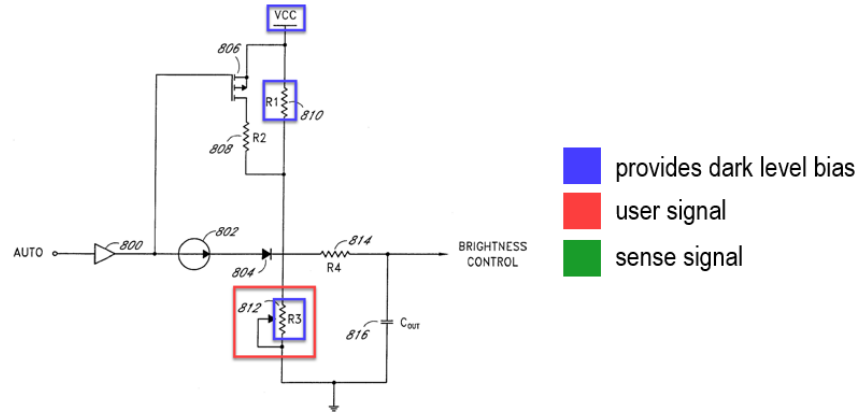
$$BCS1 = \text{duty cycle} \times \left[\left(\frac{VCC \times R2 \times R4}{[(R1 + R2) \times (R3 + R4)] + (R1 \times R2)} \right) + \left(\frac{ISRC \times R1 \times R2 \times R4}{[(R1 + R2) \times (R3 + R4)] + (R1 \times R2)} \right) \right]$$



Ex. 1001, Fig. 4 (annotated), 7:3-24; Ex. 1121, p.60 (annotating Ex. 1001, 7:17-24); Ex. 1126, pp.10-11; Ex. 1127, p.5, Ex. 1129, p.1 (correlating “PWM input” to “user signal”).

Another example is found in Figure 8 and its corresponding equation, which Polaris explains includes a combination of the sensing signal, user signal, and dark level bias.

$$BCS3 = \left[VCC \times \frac{R3}{(R1 + R3)} \right] + \left[ISRC \times \frac{(R1 \times R3)}{(R1 + R3)} \right]$$

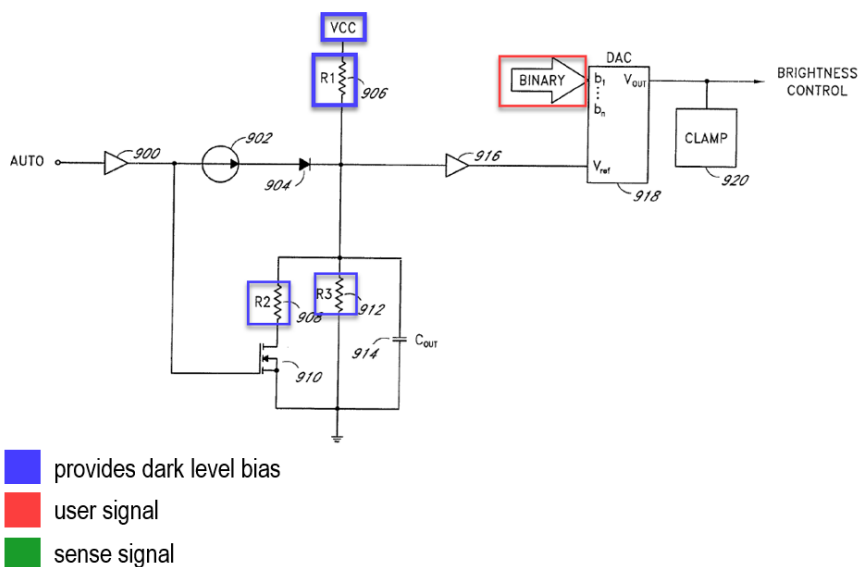


Ex. 1001, Fig. 8 (annotated), 9:38-10:19; Ex. 1121, pp.60-61; Ex. 1126, p.12; Ex. 1127, p.16. In this example, “a user adjustable potentiometer (R3)” provides the user selectable brightness setting. Ex. 1001, 3:28-30, 9:38-42. As can be seen from Polaris’s annotations (re-colored and reproduced here), the user setting impacts the dark level bias by the inclusion of the R3 term.

Another example is shown in Figure 9 and the equation for signal “BCS5.” Ex. 1001, Fig. 9, 11:10-15. Based on Polaris’s description and annotations of the figure and equation, they show the combination of a user signal, sense signal, and dark level bias.

BCS5 =

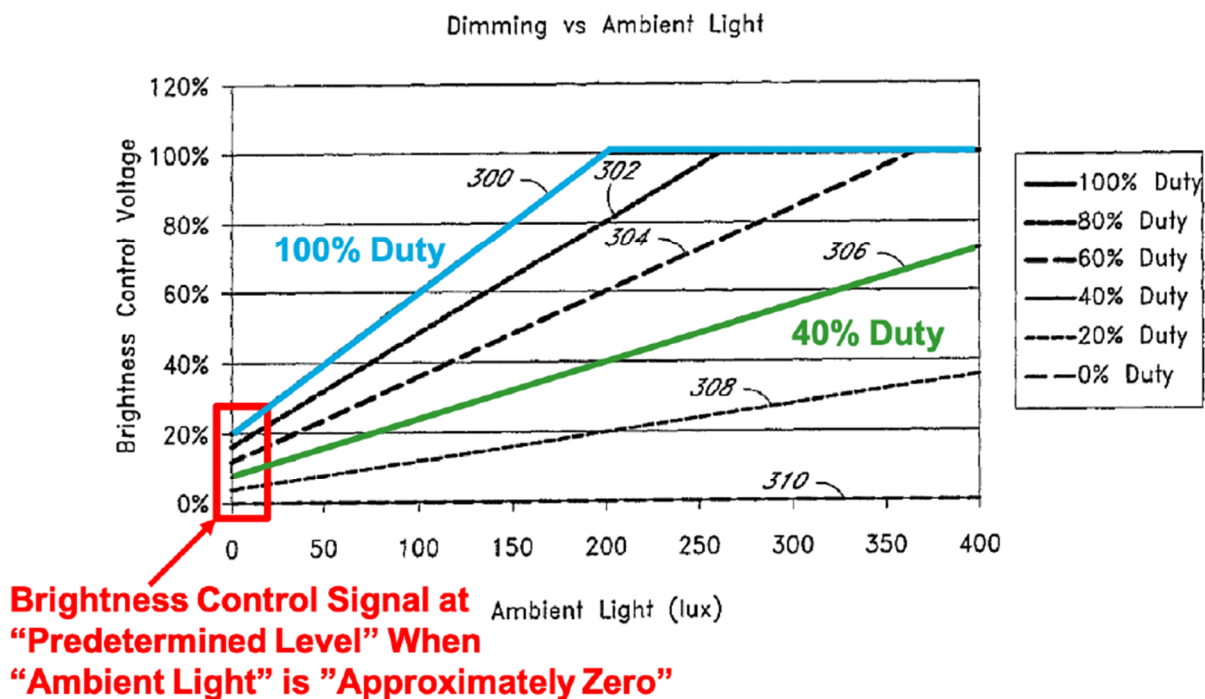
$$\text{binary \% fullscale} \times \left[\frac{[VCC \times (R2 \times R3)] + [ISRC \times R1 \times R2 \times R3]}{(R1 \times R2) + (R1 \times R3) + (R2 \times R3)} \right]$$



Ex. 1001, Fig. 9, 11:10-15; Ex. 1121, pp.45, 51, 61, 70; Ex. 1126, pp.11-12 (“dark level bias’ is a signal value generated by the brightness control circuit involving the supply voltage (VCC)” and resistors R1, R2, and R3); Ex. 1127, pp.6, 16; Ex. 1128, ¶ 13; Ex. 1129, pp.4-5.

Each of the examples shown in Figures 4, 8, and 9 “can operate in an automatic or manual mode,” depending on the state of the “AUTO” signal. Ex. 1125, ¶¶ 18, 20, 22 (citing Ex. 1001, 7:3-8:90 [sic 9], 9:28-10:32, 10:33-11:26); Ex. 1001, 6:38-42. The equations for generating BCS1, BCS3, and BCS5 are used in the “auto” mode. Ex. 1125, ¶¶ 18, 20, 22. In the manual mode, the sense signal from the ambient light sensor is not used to adjust the brightness. Ex. 1001, 6:38-42, 9:61-64.

The effect of a dark level bias is illustrated in Figure 3. As shown in the graph, as ambient light levels reach approximately zero, the display is still driven by a signal such that the display does not go completely dark. Ex. 1001, Fig. 3, 2:57-61, 5:44-67. This annotated version of Figure 3 was created by Polaris:



Ex. 1126, p.24 (annotating Ex. 1001, Fig. 3).

III. PROSECUTION HISTORY

The '117 patent is a continuation of Application No. 11/023,295 and claims the benefit of Provisional Application No. 60/543,094. The '295 application's original claims were rejected over, *inter alia*, a reference related to U.S. Patent No. 7,202,458 to Park, Ex. 1123-431 to -433, which shows a system in which a user can select whether to adjust brightness of a display backlight based on ambient light or

“brightness distribution data of an inputted video signal” using “selector 20.” Ex. 1130, 3:64-4:21, Fig. 1.

In response, Applicant amended the claims to require a “dimming control input signal” that “indicate[s] a desired brightness level for one or more light sources” and a multiplier circuit that generates the brightness control signal “based on a mathematical product of” the sensor signal and input signal. Ex. 1123-186. Applicant contended that the claimed multiplier was not found in Park because “[t]he output of the environmental sensor 22 is not multiplied with a dimming control input signal used by a user to indicate a desired brightness level.” Ex. 1123-190.

The examiner disagreed, maintained the rejection, and also rejected the claims over U.S. Patent No. 5,406,305 to Shimomura et al. as a primary reference. Ex. 1123-142 to -164. Shimomura teaches a system for adjusting a backlight using a signal from an ambient light sensor and a “desired luminance level” input by the user. Ex. 1131, 2:40-55; Ex. 1122-151. In response Applicant further limited the multiplier to include a “pair of current steering diodes,” “a network of resistors,” and “at least one capacitor.” Ex. 1123-55. The claims were then allowed. Ex. 1123-39 to -42.

In the continuation application resulting in the ’117 patent, the Applicant broadened aspects of the multiplier and added the requirement for the dark level bias to independent claim 21 (issued claim 1). Ex. 1122-172. The claims were rejected

over U.S. Patent No. 4,386,345 to Narveson (among others), which disclosed a CRT display for an airplane cockpit that automatically adjusted the brightness setting of the display based on ambient light, light levels from outside of the cockpit, and other considerations. Ex. 1132, Abstract, 1:56-2:5, 6:25-38. Applicant amended each independent claim to recite that the dark level bias adjusted the brightness control signal to be “maintained above a minimum level when the ambient light level decreases to approximately zero.” Ex. 1122-70. According to Applicant, Narveson did not “disclose, teach or suggest the use of [such] a dark level bias,” which the applicant characterized as “ensur[ing] a predefined (or minimum) brightness in total ambient darkness.” *Id.* The ’117 claims were allowed without further comment. Ex. 1122-60.

IV. PRIOR PETITIONS FOR IPR

In addition to Petitioner’s petition filed last week (IPR2020-01283), there have been two petitions for IPR have been filed against the ’117 patent. One of them was considered on the merits under the “reasonable likelihood” standard. 35 U.S.C. §314(a). IPR2018-01262 (“the -1262 IPR”) challenged certain claims of the ’117 patent on three grounds, all involving U.S. Patent No. 5,554,912 (“Thayer”) and EP0570037 (“Godwin”). The Board denied institution because the petition failed to explain how Thayer and Godwin taught the “dark level bias” limitation. Ex. 1133, p.12. The petition relied on an “adjusted look-up table value” as the claimed

“combined signal” and a “minimum brightness setting” as the “dark level bias.” *Id.* The problem was that Thayer did not use the minimum brightness setting to adjust the look-up table value, but instead “the minimum brightness level adjusts the instrument display intensity” *Id.*, p.13. And, the petition failed to articulate how the combination rendered the claimed features obvious. *Id.*, p.14.

The second petition, filed as IPR2020-00043 (“the -00043 IPR”), was denied based on an exercise of discretion under §314(a) in light of an upcoming trial date. A rehearing request was filed, but, at time of this filing, has not been acted upon. The arguments presented in that petition were not evaluated on the merits. Because the challenge in this petition is similar to the one presented in the -00043 IPR, that IPR is discussed in detail in the next section.

V. DISCRETIONARY DENIAL UNDER §314(A) IS UNWARRANTED

This is the second petition filed by Petitioners within a week. Petitioners submit that both petitions should be instituted for the reasons stated on their Notice Ranking Petitions.

This Petition challenges certain claims based on the Oki publication, which was previously raised in the -00043 IPR. That should not impede institution of trial here. Unique facts have led to the filing of this second petition—none of which are the fault of Petitioners and each of which counsel in favor of institution here. Therefore, under *General Plastic* and *NHK Spring*, the Board should exercise its

discretion and institute trial on Petitioners' petitions.

A. The -00043 IPR Institution Decision Discretionarily Denied The Petition In Part Based on A District Court Trial Date, But The '117 Patent Was Later Dismissed From the Action.

While the Oki reference was presented in the -00043 IPR, the Board did not examine the merits of the challenge based on Oki.¹ At the time of the institution decision, the Board observed that “the District Court’s trial is scheduled to precede our final written decision by more than seven months,” which favored exercising discretion to deny the petition. Ex. 1106, p.8. Two claim construction orders had issued and fact discovery had closed. *Id.*, pp.8-9. Considering certain factors, the Board concluded that

the arguments and evidence weigh in favor of exercise of our discretion to deny institution. The facts weighing in favor of a discretionary denial include (1) the advanced stage of the California District Court proceeding; (2) the investment of time and resources by the District Court and the parties in the California District Court proceeding; (3) overlap in the invalidity theories that Petitioner is pursuing here and in the California District Court proceeding; and (4) overlap in the claims challenged in the California District Court proceeding.

Ex. 1106, p.12. Because of the denial of IPR in June, Petitioners could not seek to

¹ Additional grounds were presented based on Toffolo.

join the VIZIO IPR.

After the Board denied institution the Central District of California struck parts of Polaris's expert's report, Ex. 1107, pp.5-6, which led Polaris to admit that it "cannot establish that VIZIO's accused products infringe the '117 patent," resulting in a judgment of noninfringement, Ex. 1108, pp.2-3. VIZIO pled invalidity only as an affirmative defense. Ex. 1109, p.7. Thus, the validity issues presented in the VIZIO petition will not be resolved by the district court. While VIZIO has requested rehearing of the Board's denial of its petition due to a change in circumstances, at the time of this filing VIZIO's request has not been acted upon.

B. Petitioners Have Filed Two Petitions Because Polaris Is Poised to Dispute The Priority Date and Date of Invention

Each prior art reference presented in Petitioners' first petition qualifies as prior art under §102(b). Therefore, regardless of any attempt by Polaris to show earlier conception and reduction to practice, those references cannot be antedated.

Both grounds presented in this Petition are based on the Oki reference. That reference published May 23, 2003. While Petitioners contend that the challenged claims are not entitled to the benefit of the provisional filing date (making Oki prior art under §102(b)), Polaris has indicated that the date of invention is about nine months before the provisional application filing date. Ex. 1147, p.5. Polaris has contended that it reduced the invention to practice "not later than May 14, 2003"—seven days before the Oki reference published. *Id.* Therefore, while Petitioners

submit that there are some problems with Polaris's contention about prior invention, *see infra* §III.A, Polaris is likely to attempt to swear behind Oki, thus disqualifying it from serving as prior art. Given this possibility, Petitioners present challenges based on the Oki reference in this second Petition. Petitioners have restricted their challenge in this Petition to grounds relying on Oki to streamline proceedings. Thus, the overall patentability dispute between Petitioners and Polaris presents one of the factual situations in which presenting challenges in multiple petitions is justified, and institution of proceedings on both petitions is warranted. *See Patent Trial and Appeal Board Consolidated Trial Practice Guide November 2019*, p.59 available at <https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf?MURL=>.

C. The *General Plastic* Factors Favor Institution

While this is Petitioners' second petition against the '117 patent, it is being filed within days of their first petition and is warranted based on Polaris's allegations regarding date of invention. Petitioners were not involved with the filing of the earlier petitions for IPR and there is no close relationship between Petitioners and the prior petitioners (i.e., Samsung and VIZIO). Prior petitioners used different law firms from those representing Petitioners here. *Valve Corp. v. Elec. Scripting Prods., Inc.*, IPR2019-00062 (PTAB Apr. 2, 2019) (precedential).

Moreover, Polaris's serial litigation tactics have result in parties sued years apart thus producing different petitions over the years. Polaris sued Samsung in

2017 and VIZIO in 2018, Ex. 1140, leading to petitions filed in June of 2018 and October 2019—before Polaris filed suit against either LG or Hisense, *id.* Thus, the timing of filings is “a direct result of [Polaris’s] litigation activity.” *Alphatech Holdings, Inc. v. Nuvasive, Inc.*, IPR2019-00361, Paper 19 (PTAB Jul. 9, 2019). While all claims challenged here were challenged in one or more prior petitions, no trial has been instituted as to any of them. This favors institution.

Petitioners knew of the Oki reference since at least late January 2020. Petitioners would not have known if joinder was a possibility under the Board’s institution decision in May 2020 on the VIZIO petition. Because the Board issued a discretionary denial, and the Oki reference will not be presented at trial before the district court in the VIZIO case, Petitioners seek resolution on the merits of the challenges based on the Oki reference to resolve in part their dispute as to patentability. There is nothing unreasonable or dilatory about the timing of this Petition. This too favors institution.

Petitioners have Polaris’s preliminary responses filed in both earlier IPRs and the decisions denying institution. Only Polaris’s preliminary response in the -00043 IPR is relevant to this *General Plastic* factor because it addresses Oki. Petitioners rely on district court claim constructions in their challenges—not arguments as to the meaning of the claims made in Polaris’s preliminary responses. This Petition shows how Oki anticipated certain claims and Oki alone and in view of other

references render certain claims obvious. While Petitioners have seen Polaris's arguments about VIZIO's application of Oki, the Board did not pass on those issues in its institution decision. Access to the institution decision is therefore neutral.

Petitioners have diligently pursued this petition by evaluating rafts of prior art to determine its applicability to the challenged claims. More than 400 documents are cited on the '117 patent, which is one of two patents asserted against LG and Hisense. Ex. 1001, pp.1-3. Petitioners commissioned prior art searches, evaluated prior art from earlier litigations, and obtained translations of relevant references, and sought expert opinion. This Petition is filed the week invalidity contentions are due in the co-pending litigations. Ex. 1143, p.1; Ex. 1144, p.10; Ex. 1145, p.1; Ex. 1146, p.10. Petitioners recognized that Oki was one of a number of patents and printed publications that mapped very tightly to the claims. While other prior art is available—including sales and public uses—that material cannot be presented in an IPR. Reaching this conclusion was a time-consuming endeavor. This factor therefore favors institution, or at the very least is neutral.

Based on the timing of the Samsung and VIZIO litigations and petitions, Petitioners had little incentive to pay the significant fees and costs to partake in IPRs addressing allegations of patent infringement against their competitors before they were sued for infringement. After suit was filed against Petitioners in late January 2020, they answered the Complaint in April 2020, and received Polaris's

infringement contentions on April 20, 2020. Ex. 1147, p.8; Ex. 1148, p.9. This Petition is filed several months after Petitioners' answers and nearly contemporaneously with the service of invalidity contentions. During this time, a pandemic impacted business, extensive prior art review has been undertaken, translations and expert opinion have been obtained. Thus, to the extent there is any delay, it should not weigh against institution because Petitioners acted promptly under the circumstances.

The PTAB has not instituted any prior trial on the '117 patent. The PTAB can resolve the patentability issues presented in this petition in the one-year period. There are thus no efficiency concerns raised by instituting this proceeding.

That this Petition rests on prior art and combinations of prior art that have not been substantively evaluated by the Office in the context of the '117 patent before, Petitioners have been diligent in challenging the '117 patent, coupled with the fact that no prior IPRs have been instituted on the '117 patent, collectively weigh heavily in favor of institution. *LG Elecs., Inc. v. Bell N. Research, LLC*, IPR2020-00319, Paper 15 (PTAB Jun. 23, 2020). Polaris's serial litigation over several years, and the fact that Petitioners have indicated that they elect to proceed before the Board on these challenges rather than before the district court, *infra* §V.D, also supports institution. *Microsoft Corp. v. Iron Oak Techs., Inc.*, IPR2019-00107, Paper 8, pp.53-54 (PTAB May 15, 2019).

D. Institution is Warranted Under *NHK Spring* and *Fintiv*

The factors set forth in *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (Mar. 20, 2020) warrant granting institution.

Stay. To avoid duplication of efforts, Petitioners will promptly move to stay the co-pending litigation. 70% of such motions are granted in the Central District of California, and since *SAS Institute* was decided, Judge Selna has stayed 86% of cases pending IPR. Ex. 1149; Ex. 1150 (12 of 14 cases stayed, all cases stayed since *SAS* decided).

Trial. Hisense is scheduled to start trial on September 14, 2021 and LG is scheduled to start trial on October 5, 2021. Ex. 1143; Ex. 1145. This is before a final written decision is expected here. To avoid duplicating efforts, Petitioners have filed a contingent election of defenses indicating that if institution is granted, they will not present invalidity defenses based on the grounds presented herein or any other defenses based on Oki as primary references at any jury trial or on summary judgment. Ex. 1157, Ex. 1158. This will avoid duplicative efforts. In fact, an institution decision is expected well before expert discovery commences in April 2021, and thus, even if the case is not stayed, the parties will avoid the expense of addressing these references in expert discovery if trial is instituted. Ex. 1143; Ex. 1145. Institution will therefore add to the efficiency of the underlying litigation even if the litigation is not stayed.

Additionally, the district court trial dates, which are 14 months away, are speculative. Hisense witnesses are in China, which prohibits depositions, Ex. 1151, p.2, thus requiring travel which is currently limited and there are mandatory quarantine periods of two weeks in Hong Kong and Korea (where LG's witnesses will primarily be located), Exs. 1152, p.1, 1153, p.2, 1154, p.2, 1155. LG's trial date is scheduled for the same day as a trial in another case brought by Polaris on a different patent, thus suggesting that maintaining such a trial schedule is speculative. Ex. 1143, 1156.

Investment in parallel proceedings. This Petition was filed well before the §315(b) date and the week invalidity contentions are due in the co-pending litigations. Exs. 1143, 1144. At the time of this filing, the parties have not exchanged claim construction disclosures and those are a month away. While a claim construction hearing is scheduled before an institution decision is expected in this proceeding, the court has already issued multiple claim construction orders and has ordered that “[n]o technology tutorial is necessary,” indicating that the Court will not need to invest significant effort to address any claim construction issues that may be presented. Exs. 1143, 1145.

Overlap. While there is overlap between the parties and the challenged claims here and those asserted in the district court, Petitioners have sought to avoid duplication of efforts in parallel proceedings. Ex. 1157, Ex. 1158. Therefore, efforts

will not be duplicated between invalidity proceedings. Additionally, this Petition also challenges claim 18, which has similarities to asserted claim 4, but is not asserted in the district court action. Thus, there is not a wholesale parity between this proceeding and the district court action.

Other circumstances. This Petition presents a strong challenge. This favors institution because an instituted trial here may continue even if the litigation ends. Petitioners further submit that: (1) the PTAB, as a technically-proficient fact-finder is well-suited to address the technical issues raised in this proceeding in an efficient manner; (2) a preliminary decision on the merits of the challenges at the institution phase may aid the parties in resolving their disputes through ADR, which must be completed by June 30, 2021, Exs., 1143, 1145, and (3) a patentability ruling will benefit the public based on a complete record that would otherwise be absent from a black-box jury verdict form. Thus, as to the latter point, proceedings before the Board will perform an important public function concerning the patentability of the '117 patent in ways that a jury trial cannot. This will be especially helpful to the public given Polaris's staged litigation strategy and the remaining patent term. Given Polaris's litigation strategy to date, it is reasonable to expect that Polaris will file suit against other TV and mobile phone makers. Thus, trial should be instituted.

VI. DENIAL UNDER §325(D) IS UNWARRANTED

Under *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte*

GmbH, IPR2019-01469, Paper 6 (PTAB Feb. 13, 2020) (precedential) and *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 (Dec. 15, 2017 (precedential-in-part)), the Board should not deny this Petition under §325(d). All grounds for trial in this Petition rely on Oki, a Japanese-language reference, that has not been evaluated by the Office on the merits either in prior IPR proceedings, or in allowing the claims during examination. Oki teaches specific ways of calculating display brightness using multiplication of the claimed signals, and adjustment with a dark level bias, in a way that none of the prior art addressed by the Office has before. Oki thus bears directly on the reasons for allowance, and denial of the -1262 IPR—i.e., the presence of a dark level bias to maintain the brightens control signal over a certain level. Ex. 1022-70. Therefore, the grounds presented herein are new and have not been previously considered on the merits by the Office.

VII. THE PERSON OF ORDINARY SKILL IN THE ART (“POSA”)

A person of ordinary skill in the art (“POSA”) at the time of the alleged invention in the 2003-2004 time-frame would have had at least a bachelor’s degree in electrical engineering, physics, optics or a related field, and approximately three years of experience with field of visual displays, circuit design, and related technologies. Ex. 1102, ¶¶ 19-20.

I. CLAIM CONSTRUCTION

Claim terms are construed according to their ordinary and customary meaning as understood by a POSA in light of the intrinsic record of the patent. 37 C.F.R. §42.100(b). Certain terms have been construed by the Eastern District of Texas and the Central District of California. Petitioners apply these constructions in this Petition for consistency.

A. “a first input configured to receive a user signal indicative of a user selectable brightness setting” (claim 1)

This term has been construed as “first input actually programmed or implemented with hardware or software to receive a user signal indicative of a user selectable brightness setting.” Ex. 1138, pp.7-8.

B. “a multiplier configured to selectively generate a combined signal based on both the user signal and the sensing signal” (claim 1) / “selectively multiplying the input signal with a sense signal to generate a combined signal, wherein the sense signal indicates an ambient light level” (claim 15)

The Eastern District of Texas held that the “combined signal includes, but is not necessarily limited to, the product of the user signal and the sensing signal,” and its construction otherwise reflected the claim language. Ex. 1137, p.29. According to the Central District of California, the phrase “multiplier configured to” meant that the multiplier be “actually programmed or implemented with hardware or software” to perform the selective generation of the claim. Ex. 1135, p.12.

C. “a dark level bias configured to adjust the combined signal to generate a brightness control signal that is used to control a brightness level of a visible display” (claim 1) / “adjusting the combined signal with a dark level bias” (claim 15)

The term “dark level bias” has been construed to mean “a value that causes a deviation from the combined signal, where the value is a voltage value of an electrical signal or value of a software variable.” Ex. 1135, p.34. The broader phrase from claim 1 was construed to mean “a dark level bias actually programmed or implemented with hardware or software to adjust the combined signal to generate a brightness control signal that is used to control a brightness level of a visible display.” Ex. 1135, p.34.

D. “approximately zero” (claims 1, 15)

This term has been construed as “zero or a level close enough to zero that a light sensor would measure zero or a corresponding sensing signal would round to zero.” Ex. 1135, p.35.

E. “an overdrive clamp circuit coupled to the brightness control signal to limit its amplitude to a predefined range” (claim 6)

The phrase “to limit its amplitude to a predefined range” has been interpreted, in the context of this phrase, to mean “limit the absolute value of the brightness control signal’s amplitude to be less than a predefined level.” Ex. 1137, p.30.

F. “second input configured to receive a selection signal to selectively operate the brightness control circuit in an auto mode or a manual mode” (claim 9)

This term has been construed to mean “second input actually programmed or

implemented with hardware or software to receive a selection signal to selectively operate the brightness control circuit in an auto mode or a manual mode.” Ex. 1138, pp.7-8.

II. OVERVIEW OF THE CHALLENGE AND RELIEF REQUESTED

Petitioners request institution of trial and cancellation of claims 1-2, 4-7, 9, 15-16, and 18 of the ’117 patent on the following grounds:

Ground 1: Claims 1-2, 4-5, 7, 15-16, and 18 are anticipated under §102(a) and (b)² by Oki.³

Ground 2: Claims 1-2, 4-5, 7, 9, 15-16, and 18 would have been obvious under §103(a) over Oki.

Ground 3: Claim 6 would have been obvious under §103(a) over Oki in view of Henry.

Ground 4: Claim 9 would have been obvious under §103(a) over Oki in view of Toffolo.

² References to statutory sections are to 35 U.S.C. unless otherwise noted.

³ References to Oki in this petition are to the translation found as Ex. 1103.

III. THE GROUNDS FOR TRIAL ARE BASED ON PRIOR ART PRINTED PUBLICATIONS

A. Oki

Oki is a Japanese Patent Publication published on May 23, 2003. Ex. 1103, cover. Oki qualifies as prior art under §102(b) because the '117 patent is not entitled to the benefit of the filing date of the provisional application. While all claims have been interpreted to require a multiplier/multiplication performed with software and a dark level bias implemented as a value in software, the provisional lacks such a disclosure. Instead, as is clear from the *Markman* briefing, arguments, and orders, the support for the software aspects was new matter added to the non-provisional application. Thus, Oki cannot be sworn behind because it is a bar to patentability.

Even if the '117 patent was entitled to the benefit of the provisional application, Oki is prior art under §102(a). As explained below, it is questionable that Polaris can make all proofs needed to support the claim to an earlier invention.

1. The challenged claims are not entitled to the benefit of the provisional application

All challenged claims have been construed to encompass software in one way or another. They were construed this way at Polaris's insistence. Ex. 1136, p.1 ("This is important as the claims are entitled to cover software, which is well-known to be able to perform complicated mathematical functions and multiple simultaneous calculations."); *id.*, p.7 (arguing that "dark level bias" should be construed to as a "value" to ensure that it "encompasses . . . software embodiments in which a

software variable value would be used.”). As a result of the software-encompassing claim interpretations urged by Polaris, the claims recite and encompass something that is not supported by the provisional application. Thus, Oki is prior art as to the claims under §102(b).

- a. Polaris must show that the full scope of the claims as construed are described in the provisional application.

“[A] patent’s claims are not entitled to an earlier priority date merely because the patentee claims priority.” *In re NTP*, 654 F.3d 1268, 1276 (Fed. Cir. 2011). The patentee must show entitlement to the earlier priority date. *Id.*, 1276-77.

“Claims deserve [a] provisional application’s earlier filing date so long as that application contains adequate written description under 35 U.S.C. §112.” *Star Scientific, Inc. v. R.J. Reynolds Tobacco Co.*, 655 F.3d 1364, 1371 (Fed. Cir. 2011). “To satisfy the written description requirement the disclosure of 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.” *PowerOasis, Inc. v. T-Mobile USA, Inc.*, 522 F.3d 1299, 1306 (Fed. Cir. 2008) (internal modification and quotation omitted). The written description must allow a person of ordinary skill in the art to recognize that the patentee invented what is claimed. *Synthes USA, LLC v. Spinal Kinetics, Inc.*, 734 F.3d 1332, 1341 (Fed. Cir. 2013).

It is not enough that a later claimed invention be obvious over what is disclosed. “It is the disclosures of the applications that count. Entitlement to a filing

date does not extend to subject matter which is not disclosed, but would be obvious over what is expressly disclosed.” *Lockwood v. American Airlines, Inc.*, 107 F.3d 1565, 571-72 (Fed. Cir. 1997). It is “not sufficient for purposes of the written description requirement of §112 that the disclosure, when combined with the knowledge in the art, would lead one to speculate as to modifications that the inventor might have envisioned, but failed to disclose.” *Id.*

When a claim is broader than the invention described in the specification, that claim does not satisfy the written description requirement. For example, in *Gentry Gallery, Inc. v. Berkline Corp.*, patent claims directed to a sectional sofa with controls that were not required to be on a console were invalidated where the specification showed that the controls should be on the console. 134 F.3d 1473, 1478–79 (Fed. Cir. 1998). In other words, the claims were broader than what was disclosed because they permitted the controls to be located somewhere other than the console when the patent’s text made clear that the controls should be on the console. Similarly, in *ICU Med., Inc. v. Alaris Med. Sys., Inc.*, the Federal Circuit held that claims to medical valves for transferring fluids to and from patients that did not require a “spike” that pierced a seal were invalid because the specification only described embodiments that included a spike. 558 F.3d 1368, 1376–77 (Fed. Cir. 2009); *see also D Three Enters., LLC v. SunModo Corp.*, 890 F.3d 1042 (Fed. Cir. 2018) (affirming the invalidation of claims that did not recite “washers” for use

in a sunroof installation kit where the only disclosed “washerless” embodiment was used with a specific type of bracket, which was not required by the claims); *Synthes USA, LLC v. Spinal Kinetics, Inc.*, 754 F.3d 1332, 1340 (Fed. Cir. 2013) (affirming the invalidation of claims that generically claimed “openings” in an intervertebral implant where the written description described implants with “grooves”).

PowerOasis is instructive here because it illustrates what happens when the claims are construed to recite embodiments first described in a later-filed application. In *PowerOasis* patent claims were directed to a vending machine for providing telecommunications services. The claims were construed to allow a claimed “customer interface” to be on *either* a vending machine or a customer’s laptop. 522 F.3d at 1302–03. The question was whether under this construction the claims were entitled to the earliest filing date in the chain of applications. *Id.* The only disclosures in the family of applications associated with placing the interface on a laptop were added by way of a continuation-in-part. *Id.* at 1302–03, 1307. The original disclosure only included a display on the vending machine. The claims, however, were construed to cover two embodiments: one with a customer interface on the vending machine, and another with the interface on a laptop. The claims, therefore, were only entitled to the CIP filing date. *Id.* at 1307, 1309 (“There is simply no disclosure in the Original Application of a user interface that is either located on a customer’s laptop or even separate from the vending machine itself.”).

It did not matter that it would have been obvious to implement the interface on a laptop. *Id.* at 1310.

- b. Polaris advocated for and obtained claim constructions that explicitly encompass software implementations.

All claims have been construed as claiming, at least in part, software. For example, at Polaris’s insistence, the challenged “circuit” claims’ “multiplier” term was construed to include a multiplier “*actually programmed or implemented in hardware or software*” to perform the selective generation required by the claims. Ex. 1135, p.34 (emphasis added); Ex. 1126, pp.5-7 (Polaris arguing that the claims encompass software). Moreover, each challenged claim requires a “dark level bias.” That phrase was construed—again at Polaris’s insistence—to encompass “a value . . . where the value is a . . . value of a software variable.” Ex. 1135, p.34; Ex. 1136, pp.6-7; Ex. 1126, p.7 (“[I]f the *software algorithm* multiplier is multiplying the ‘dark level bias’ by the ‘sum of the user signal and sensing signal,’ then these values must be implemented in software.”). Similar arguments were made for the first input which were premised in part on the implementation of the multiplier in software. Ex. 1119, 4:10-7:11, 7:23-24.

- c. Multipliers and dark level bias implemented in software are not described in the provisional application, but passing references to software were added to the alternative software “embodiment” in the non-provisional application.

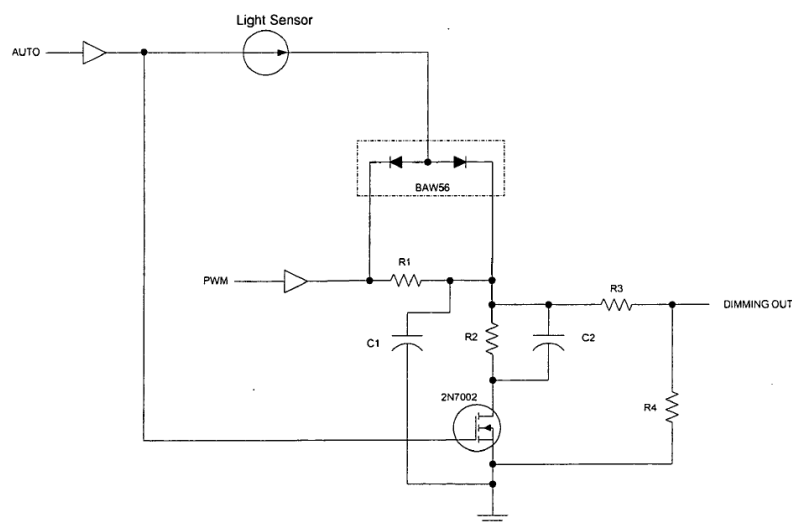
The provisional application does not mention a multiplier implemented in

software. Ex. 1102, ¶¶ 64-67. Nor does it mention a dark level bias implemented as a value in software. In fact, it teaches the opposite. *Id.*, ¶ 64. The provisional application says that “[d]igitizing of the ambient light sensor output or a digital processing to combine the user brightness contour selection with the level of ambient lighting *is advantageously not needed.*” Ex. 1124, p.2. Thus, the provisional teaches that the light sensor value to combine with user brightness settings was not needed and that this was an advantage of what was disclosed in the provisional. Ex. 1102, ¶ 64. Moreover, “[t]he light sensor control system can be autonomous to the main processor in a computer system”—i.e., it is independent of the main processor. Ex. 1124, p.2.

But, the non-provisional application filed on December 27, 2004, makes clear that it adds another embodiment—new matter—to the disclosure of the provisional:

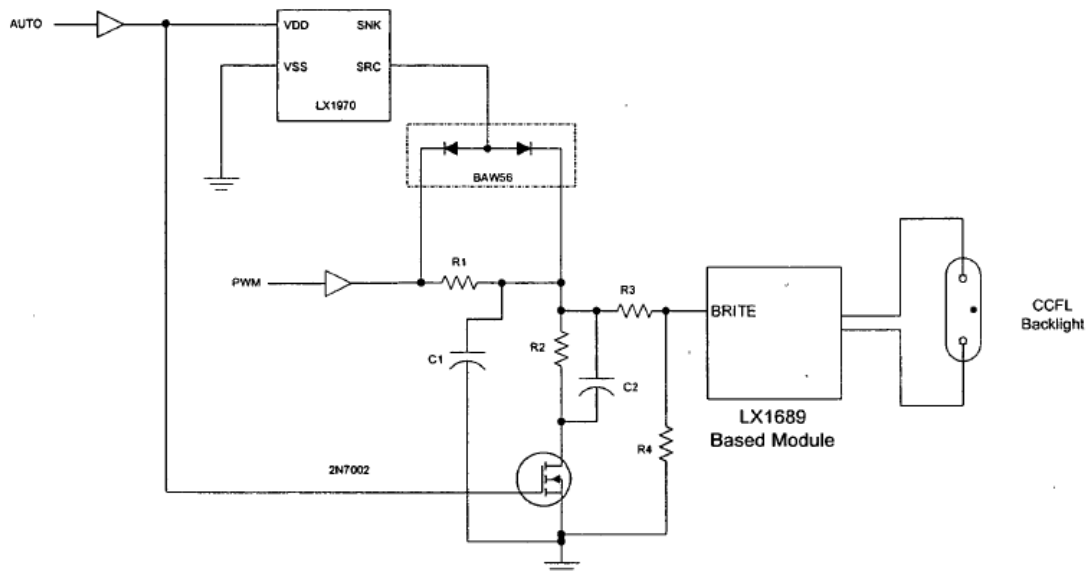
In one embodiment, software algorithm can be used to multiply the light sensor output with the user selectable brightness control. *In another embodiment*, analog or mixed-signal circuits can be used to perform the multiplication. Digitizing the light sensor output or digital processing to combine the user brightness contour selection with the level of ambient lighting is advantageously not needed. The light sensor control system can be autonomous to a processor for a display device (e.g., a main processor in a computer system of a LCD device).

Ex. 1001, 2:7-16 (emphasis added); *see also id.*, 5:37-38 (“The multiplier circuit 106 can be implemented using software algorithm or analog/mixed-signal circuitry.”), Fig. 9 (receiving binary user input). That these are different embodiments is reflected in the alternatives for the step of “selectively multiplying”—i.e., “software algorithm, an analog circuit, or a mixed-signal circuit.” *Id.*, 14:10-13. While there is some reference to programming and the user selecting the “two corners on the maximum brightness setting contour: the percent full-scale at 0 lux, and the ambient level that produces a full-scale output,” the next sentence discusses “[t]he best approach to designing the brightness controls system” which includes “[d]esign[ing] the dark level brightness control bias.” Ex. 1124, p.A-6. Each of the figures show multipliers in hardware. Ex. 1102, ¶¶ 64-65, 68. A figure described as “multiplier function for dimming interface” shows:



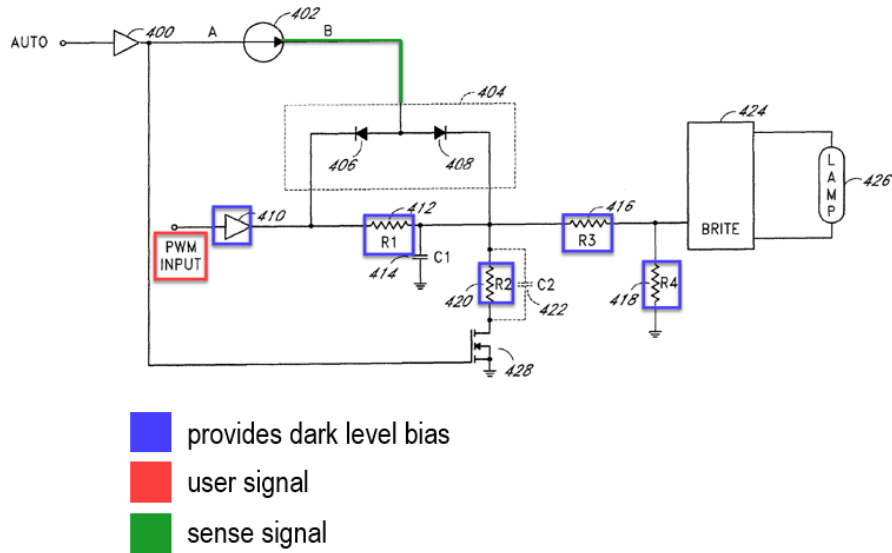
Ex. 1124, p.5. This same multiplier circuit is illustrated as being used in connection with a microprocessor-based application, again still using analog circuits to perform

the multiplication and addition of a dark level bias:



Ex. 1124, p.A-7. If there was any ambiguity about what is performing the alleged multiplication and inclusion of the alleged dark level bias, one need to look no further than Polaris's characterization of this circuit derived from its briefing:

$$BCS1 = \text{duty cycle} \times \left[\left(\frac{VCC \times R2 \times R4}{[(R1 + R2) \times (R3 + R4)] + (R1 \times R2)} \right) + \left(\frac{ISRC \times R1 \times R2 \times R4}{[(R1 + R2) \times (R3 + R4)] + (R1 \times R2)} \right) \right]$$



Ex. 1001, Fig. 4 (annotated), 7:3-24; Ex. 1121, p.60 (annotating Ex. 1001, 7:17-24); Ex. 1126, pp.10-11; Ex. 1127, p.5, Ex. 1129, p.1 (correlating “PWM input” to “user signal”); Ex. 1119, 4:10-9:5, 20:2-15. Thus, even though there is passing reference to programming and a microprocessor in the provisional application, there is absolutely no description of a multiplier or dark level bias implemented in software. In fact, the provisional teaches the contrary and says that not having to digitize the signal from the light sensor is an advantage. Ex. 1124, p.2.

On these facts, this case presents like *PowerOasis*, where the applicant added an embodiment in a continuation-in-part, the claims were construed to include both a previously-disclosed embodiment and the newly-added embodiment, and as a

consequence the claims were only entitled to the benefit of the CIP filing date. 522 F.3d at 1308-10. In construing the claimed multiplier and dark level bias (which are “configured to” do certain things), the Eastern District of Texas pointed to the newly added matter as supporting the construction that when the claim recited “configured to” it meant that the element configured to do something was “actually programmed or implemented with hardware or software to.” Ex. 1110, p.3 (citing Ex. 1001, 2:7-10 for the proposition that “In one embodiment, *software* algorithm can be used to multiply” (emphasis in original)); *see also* Ex. 1136, p.6 (citing text added in non-provisional related to software to support claim construction).

At Polaris’s urging, this was adopted into the dark level bias and multiplier constructions for the ’117 patent in the Central District of California. Ex. 1135, pp.10-12 (citing “Samsung Summary Judgment Order,” defined therein as Ex. 1110 (i.e., Dkt. 333 in the Eastern District of Texas case). This further makes this case like *PowerOasis*, where the claim construction was supported “only by material added” to the CIP. *PowerOasis*, 552 F.3d at 1309-10. Here too, the Eastern District of Texas focused on the software embodiment added for the first time in the non-provisional, and the Central District of California followed suit. Ex. 1135, p.12; Ex. 1110, p.2.

d. Oki is prior art under §102(b) and cannot be antedated.

Given the new matter added to the non-provisional application and claimed

under the constructions above, the challenged claims are not entitled to the benefit of the provisional application. Because Oki published in May 2003, Ex. 1103, cover, and the claims are at best entitled to a filing date of December 2004, Ex. 1001, cover, Oki is prior art under §102(b). Such a reference cannot be “sworn behind.”

2. *Patent Owner Cannot Show Prior Conception/Reduction to Practice*

Polaris has alleged prior invention of claims 1-2, 6-7, and 13-16.⁴ Ex. 1015, p.16. Any factual support for Polaris’s position is redacted.

While Petitioners cannot address Polaris’s redacted arguments and evidence at this time, the issues between the provisional application and the later-filed non-provisional application raise certain questions that Polaris would bear the burden of addressing. First, were the inventors in possession of software multipliers and dark level bias values when their provisional suggests that they sought to avoid such applications with the invention? Ex. 1124, p.2. Second, if the inventors were in possession of such an application, why is it not mentioned in their provisional application; did they abandon, suppress, or conceal it?

The differences in text between the provisional and non-provisional cast considerable doubt that the embodiments that the claims have been construed to

⁴ Polaris apparently cannot show an earlier date of invention for claims 4-5 and 9.

Ex. 1015, pp.41-42.

cover had been fully conceived and reduced to practice before Oki's publication date. Therefore, Petitioners submit that Oki is at least prior art under §102(a).

B. Henry

Henry issued on March 6, 2001 and is prior art under §102(b). Ex. 1139, cover.

C. Toffolo

Toffolo issued on January 8, 2002 and is prior art under §102(b). Ex. 1111, cover.

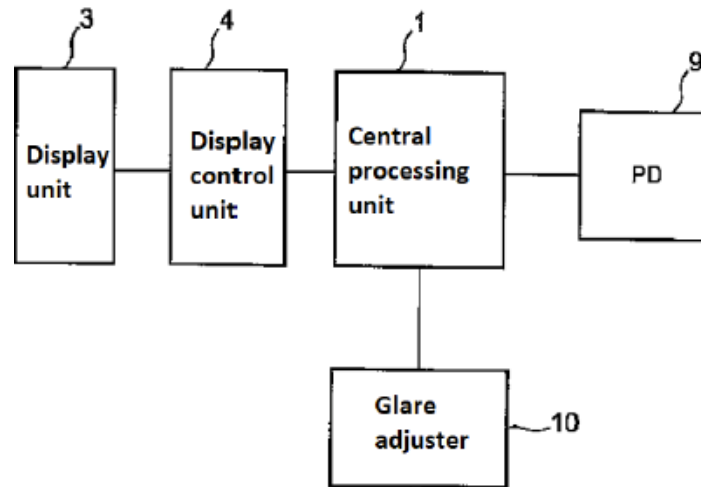
IV. DETAILED DISCUSSION OF UNPATENTABILITY

A. Claims 1-2, 4-5, 7, 15-16, and 18 Are Anticipated by Oki (Ground 1) and Claims 1-2, 4-5, 7, 9, 15-16, and 18 Would Have Been Obvious Over Oki (Ground 2)

1. Oki Overview

Oki discloses selective control of a display using user input and sensed ambient light levels to adjust a display brightness level, and maintaining a minimum display brightness level at low ambient light levels. Ex. 1103, ¶¶ [0026]-[0035], FIGs. 5-6, cl. 4-5; Ex. 1102, ¶ 77.

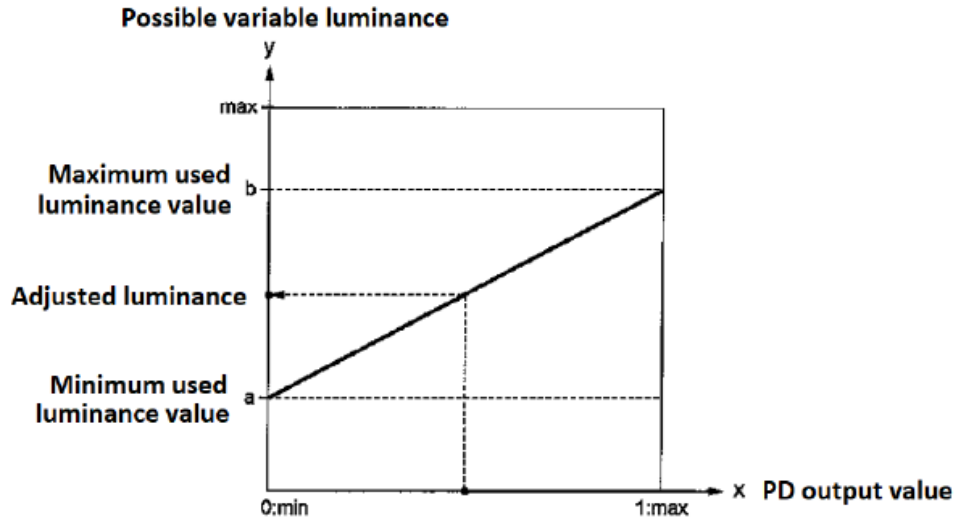
[FIG. 5]



Specifically, Oki's system uses a photodiode to measure ambient light levels. *Id.*, ¶ [0035]. A brightness level of a display is adjusted based on user signals and a sensor signal indicative of ambient light levels measured by the photodiode 9. Oki uses the following equation, including multiplication, to produce a combined signal and the addition of a dark level bias, and to arrive at a luminance value:

$$Y = (b - a)x + a$$

Id., ¶ [0029]; Ex. 1102, ¶¶ 78-79. The values “*a*” and “*b*” are based on user settings for a “maximum used luminance value,” and a “minimum used luminance value,” the latter of which is a setting that controls the brightness level of the display such that it is maintained above a predetermined level when the ambient light level is low, such as when it is dark outside. Ex. 1103, ¶¶ [0026], [0029]. The effect of maintaining display brightness as the ambient light levels drop to zero is shown in Oki's Figure 6:



Ex. 1103, Fig. 6. The value “x” is the “PD output value,” which indicates the ambient light level surrounding display unit 3. Ex. 1103, ¶¶ [0026]-[0029]. Based on these values, the luminance of the display is calculated (“Y” or “y,” used interchangeably in Oki). *Id.*, ¶ [0029]. The luminance value is passed from glare adjuster, to CPU, and then to display control unit 4, which uses it to control the brightness of the display. *Id.*

The display brightness controller may automatically adjust the display luminance of the display unit 3. *Id.*, ¶ [0031]. Alternatively, the automatic adjustment may be selectively disabled, and the user can manually adjust the brightness of the display unit. *Id.*

Oki’s display controller may be used in an electronic device like a mobile telephone. Ex. 1103, ¶¶ [0026]-[0027].

2. *Independent Claim 1*

- a. [1.Pre] “A brightness control circuit with selective ambient light correction comprising:”

Oki teaches the preamble because it discloses a “display controller” that processes display data based on (1) an electrical signal (e.g., ambient “illumination information” converted into a PD output value “x”) from a photodiode 9 and/or (2) values reflecting user selections. Ex. 1103, ¶¶ [0006], [0026], FIG. 5; Ex. 1102, ¶ 93. The brightness control circuit is shown in Figure 5. *Id.* The display controller can adjust a luminance value based on the photodiode output value, that may be used by a display control unit 4 to control the luminance (i.e., brightness) of a display unit 3, and thus performs ambient light correction. Ex. 1103, ¶¶ [0026], [0031], FIG. 5.

Oki’s brightness control circuit performs “selective” ambient light correction in at least two ways. First, it allows the user to select the maximum used luminance value and/or the minimum used luminance value “to suit the user’s own vision characteristics.” *Id.*, ¶ [0027]; Ex. 1102, ¶ 94. Oki’s brightness control circuit also allows users to “finely adjust[]” the luminance between the minimum used luminance and the maximum used luminance. *Id.*, ¶ [0030]. The user’s ability to select and change these values makes Oki’s ambient light correction “selective” because the ambient light adjustment is user-selectable. Ex. 1102, ¶ 94.

A second way Oki discloses selective ambient light correction is by explaining “although the external brightness is periodically measured . . . the automatic

adjustment may be made subject to disabling.” Ex. 1103, ¶ [0031]. When the automatic display screen luminance adjustment is disabled, a user may provide input to manually adjust the display screen luminance. *Id.*, ¶ [0031]. Thus, allowing the user to choose between an automatic ambient light adjustment and a manual setting also means that Oki’s brightness control circuit has selective ambient light adjustment. Ex. 1102, ¶ 94.

- b. [1A] “a first input configured to receive a user signal indicative of a user selectable brightness setting;”

Oki discloses this limitation. This phrase has been construed to require a “first input actually programmed or implemented with hardware or software to receive a user signal indicative of a user selectable brightness setting.” Ex. 1138, pp.4-5. Oki discloses the hardware implementation and discloses or renders obvious the software programming. Ex. 1102, ¶ 95.

Hardware “first input.” Oki teaches two user selectable brightness settings. The first is “the minimum used luminance value” and the second is “the maximum used luminance value.” Ex. 1103, ¶ [0029]. A user signal represents each of these settings in Oki’s system, as indicated by the variables “*a*” and “*b*.” These representations “*a*” and “*b*” of the settings are used, with the PD output value from the photodiode (“*x*”), to calculate the expression for the brightness control signal “*y*.” *Id.* The user selectable brightness settings are entered, for example, using keys of the mobile terminal, and (2) user signals indicative of these settings are received

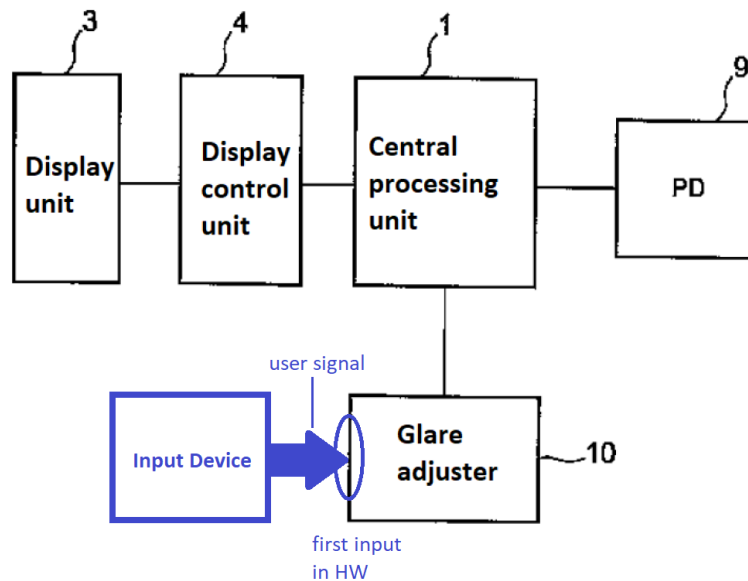
through circuitry and fed into “glare adjuster” for purposes of performing the specified calculations. *Id.*, ¶¶ [0027]-[0030]; *see also* Ex. 1102, ¶ 96. Indeed, the POSA would have understood that the values selected for these brightness settings would have been stored for use by the glare adjuster because when “the central processing unit 1 sends the PD output value to the glare adjuster 10 . . . the glare adjuster 10 calculates the display screen luminance value based on this PD output value.” Ex. 1103, ¶ [0029]. This calculation is performed with the following equation:

$$Y = (b - a)x + a$$

Id. Because the glare adjuster performs the calculations, it needs to have access to the user defined values “*a*” and “*b*” as values for the PD output, “*x*” are provided to update value “*y*.” The representation of these values as they pass through hardware in Oki’s system reflect user signals indicating user selectable brightness settings. Ex. 1102, ¶ 96.

Although not shown in Oki’s figures, Ex. 1103, ¶ [0027], the hardware-based first input is illustrated below in annotated Fig. 5:

[FIG. 5]



Ex. 1103, Fig. 5 (annotated); Ex. 1102, ¶ 96.

Each “user signal” is “indicative” of a user selectable brightness settings (i.e., the user’s preference for maximum and minimum display brightness) because the signals reflecting variables “*a*” and “*b*” indicate the user’s minimum and maximum brightness settings as input into the glare adjuster. Ex. 1102, ¶ 96.

Software “first input.” Oki discloses or renders obvious an input actually programmed or implemented with software to receive a user signal indicative of a user selectable brightness setting. As explained above, Oki’s system is designed to perform calculations for “*y*” based on values associated with the user’s chosen minimum and/or maximum luminance values. Ex. 1103, ¶ [0029]. Oki states: “[i]f the PD output value that changes is substituted into the equation, the luminance value *y* for use in the luminance adjustment is calculated.” *Id.* The POSA would have

understood the calculation to be performed in software because the electrical signal from photodiode is read by a CPU, and PD output value “x” (reflecting the electrical signal) is then sent to glare adjuster for calculation. Ex. 1103, ¶¶ [0028]-[0029]; Ex. 1102, ¶ 97. At the very least programming Oki’s brightness control circuit with software to allow the software to operate upon user signals representing “a” and “b” along with sense signal represented by value “x” would have been obvious because (1) software was ubiquitous in LCD backlight controls to perform routine calculations, and thus implementing calculations like those described by Oki in software was routine and had predictable results, (2) and to the extent it can be contended that Oki does not use software inputs to calculate luminance value “y,” using software code to perform that calculation would have required only simple application of software for a rudimentary purpose—i.e., repeatedly calculating the result for “y” based on signals representing the variables “a,” “b,” and “x.” Ex. 1102, ¶¶ 98-99. The results of such an implementation would have been predictable and simple, Ex. 1102, ¶ 99; Polaris has even said that a single line of code would be acceptable to calculate an expression like that found in Oki, thus confirming only routine skill would have been needed to devise software to perform equation 1 and receive the user signals for performing that calculation. Ex. 1136, p.4.

- c. [1B] “a light sensor configured to sense ambient light and to output a sensing signal indicative of the ambient light level;”

Oki discloses “a photodiode 9 that has the function of sensing and outputting as an electrical signal (the PD output value) the brightness surrounding the display unit 3.” Ex. 1103, ¶ [0026]; *id.*, ¶ [0028] (“[T]he central processing unit 1 uses the photodiode 9 to periodically measure the brightness outside the mobile terminal.”). The “brightness surrounding the display unit 3” is an ambient light level. Ex. 1103, ¶ [0026]; Ex. 1102, ¶ 100. The electrical signal output by the photodiode is a signal indicative of that ambient light level, and it is read to create a sense signal called the “PD output value” reflected by “ x ” in Oki’s equation. Ex. 1102, ¶ 100; Ex. 1103, ¶¶ [0026], [0029]. Therefore, Oki discloses this limitation.

- d. [1C] “a multiplier configured to selectively generate a combined signal based on both the user signal and the sensing signal; and”

Oki discloses this limitation. This phrase has been construed to mean “a multiplier actually programmed or implemented with hardware or software to selectively generate a combined signal based on both the user signal and the sensing signal,” Ex. 1135, p.34, and the combined signal “includes, but is not necessarily limited to, the product of the user signal and the sensing signal,” Ex. 1137, pp.20-21.

Oki discloses the “multiplier” because the brightness control circuit includes

a glare adjuster, which uses multiplication to selectively generate a combined signal. Ex. 1103, ¶ [0029]. The “combined signal” generated by multiplication is the term “ $(b - a)x$ ” in the following expression: $y = (b - a)x + a$. As explained above, a “user signal” includes signals representing user selected brightness settings “ a ” and/or “ b ” and “ x ” is a sensing signal from photodiode. *Id.*; Ex. 1102, ¶ 102. Thus, Oki discloses a multiplier as part of the brightness control circuit that is configured to generate a combined signal based on the user signal and the sensing signal. The POSA would have understood Oki’s multiplier was implemented in software. Ex. 1102, ¶¶ 97-99, 102. At least the POSA would find it obvious to implement the multiplier in software to perform the calculations set forth in Oki. Ex. 1102, ¶¶ 97-99, 102; *supra* §IV.A.2.b.

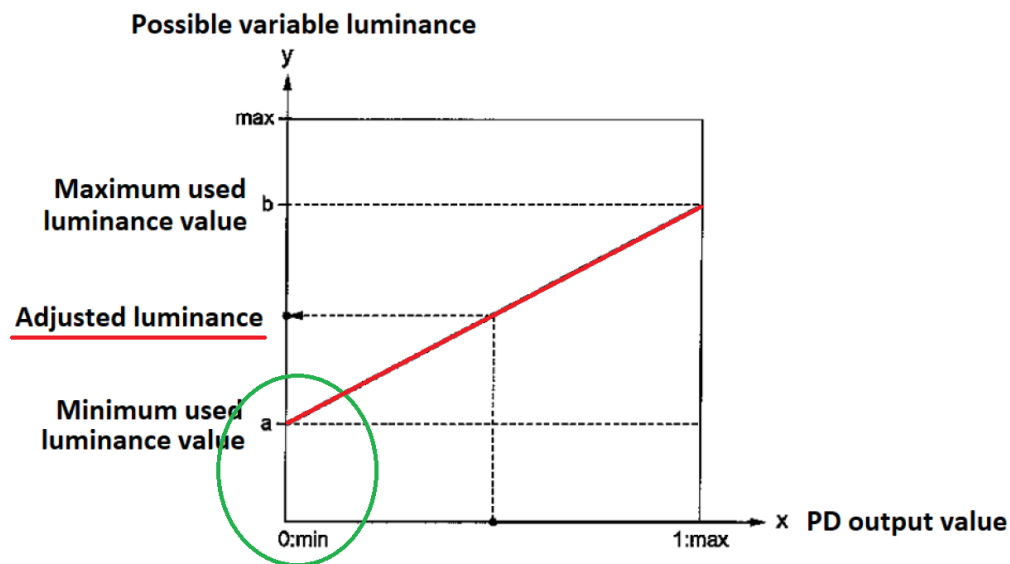
Oki’s multiplier is configured to “selectively generate” the combined signal because the combined signal is generated when automatic adjustment has been selected by the user, the electrical signal is received from the photodiode, and the value for the brightness control signal “ y ” is determined. Ex. 1103, ¶¶ [0028]-[0029], [0031]; Ex. 1102, ¶ 102. If manual mode is instead selected (thereby disabling automatic mode), the automatic mode is not implemented and the combined signal is not generated. Ex. 1103, ¶¶ [0029], [0031]; Ex. 1102, ¶ 102. At the very least, based on Oki’s statement that “the automatic adjustment may be made subject to disabling,” it certainly would have been obvious to avoid performing the

calculations to arrive at the brightness control signal “y,” including the calculation of the combined signal when the result is not needed. Ex. 1102, ¶ 104. The POSA would have understood that disabling the automatic adjustment would have disabled the “glare adjuster 10 that adjusts the luminance value,” Ex. 1103, ¶ [0026], by “calculating the display screen luminance value,” *id.*, ¶ [0029], when Oki’s automatic mode is disabled, *id.*, ¶ [0031]; Ex. 1102, ¶ 104. The POSA would have appreciated that performing unnecessary processing—like generating a combined signal and obtaining a sensing signal—would have been a waste of power for the mobile device in instances in which the device is operating in manual mode. Ex. 1102, ¶ 104. Therefore, Oki’s multiplier “selectively” generates the combined signal, and it also would have been obvious to do so.

- e. [1D] “a dark level bias configured to adjust the combined signal to generate a brightness control signal that is used to control a brightness level of a visible display such that the brightness control signal is maintained above a predetermined level when the ambient light level decreases to approximately zero.”

Oki discloses this limitation. In Oki’s equation $y = (b - a)x + a$, the added variable “a” is a dark level bias. As shown below, *a* is used to adjust the combined signal to generate brightness control signal “y” for all PD output values between “a” and “b.”

[FIG. 6]



Ex. 1103, Fig. 6, ¶ [0029] (annotated); Ex. 1102, ¶ 106.

A “dark level bias” was construed to mean “a value that causes a derivation from the combined signal, where the value is a voltage value of an electrical signal or value of a software variable.” Ex. 1138, p.4. Oki’s variable “ a ” is a value that causes a deviation from the combined signal (*i.e.*, the signal resulting from the product of $(b - a)$ and x) through the addition of “ a .” Ex. 1103, ¶ [0029]; Ex. 1102, ¶ 106. Oki discloses or renders obvious implementing its disclosed automatic brightness control technique in software for the reasons discussed above. *Supra* §IV.A.2.b.

This limitation was also construed to require “a dark level bias actually programmed or implemented with hardware or software to adjust the combined signal to generate a brightness control signal that is used to control a brightness level

of a visible display.” Ex. 1135, p.34. This is taught by Oki, or at least rendered obvious by Oki. Specifically, for the reasons discussed above, a POSA would have understood that Oki’s equation was implemented in software, or at the very least would have found it obvious to implement Oki’s equation in software, such that “*a*” is a software variable actually programmed or implemented in software. Ex. 1102, ¶ 97-99, 106.

Moreover, by adjusting the combined signal, Oki’s dark level bias generates a “brightness control signal that is used to control a brightness level of a visible display.” Ex. 1135, p.34. Specifically, the brightness control signal is reflected by the value “*y*” and is described by Oki as “the luminance value *y* for use in luminance adjustment.” Ex. 1103, ¶ [0029]. Once the brightness control signal “*y*” is calculated, it is sent to CPU, which then sends it to “the display control unit 4.” *Id.* “Next, the display control unit 4 changes the display luminance of the display unit 3, based on the luminance value.” *Id.* This shows that the brightness control signal represented by the value “*y*” is used to control a brightness level of a visible display. Ex. 1102, ¶ 107.

Oki also shows that the “dark level bias” is “configured to adjust the combined signal to generate a brightness control signal that is used to control a brightness level of a visible display such that the brightness control signal is maintained above a predetermined level when the ambient light level decreases to approximately zero.”

Oki provides an example in which the “minimum value and the maximum value of the PD output are 0 and 1.” Ex. 1103, ¶¶ [0028]-[0029], Fig. 6. The PD output is variable based on the photosensor. *Id.* According to Oki, as the ambient light level decreases, the PD output value, x , correspondingly decreases, and the display screen luminance value (highlighted in red in annotated FIG. 6 above) also decreases until reaching the minimum used display screen luminance value as a function of photodiode light sensor signal luminance value, a , as illustrated in FIG. 6. *Id.*, ¶ [0029], Fig. 6; Ex. 1102, ¶ 106.

The phrase “approximately zero” was construed to mean “zero or at level close enough to zero that a light sensor would measure zero or a corresponding sensing signal would round to zero.” Ex. 1135, p.35. In Oki, as the photodiode is exposed to darkness—i.e., an ambient light level of “approximately zero,” it measures zero or its corresponding sensor signal rounds to zero, thus allowing the output value of the photodiode to have a minimum value of zero. Ex. 1103, ¶ [0029]; Ex. 1102, ¶ 106. At this sensed ambient light level of approximately zero, Oki’s display has a minimum brightness of “ a ,” which is above predetermined values of less than “ a ,” which can be seen using Oki’s equation because “ x ” drops to zero, resulting in the first term dropping to zero, simplifying the expression to “ $+a$.” Ex. 1103, Fig. 3; Ex. 1102, ¶ 106.

3. *Claim 2*

This claim requires that the “dark level bias” be “provided to the multiplier such that the amount of adjustment to the combined signal is dependent on the user selectable brightness setting.” As explained above, Oki describes two user selectable brightness settings: “the minimum used luminance” (represented as “ a ”) and the “maximum used luminance” (represented as “ b ”).

Here, the dark level bias—i.e., “ $+a$ ” in the following expression: $y = (b - a)x + a$ —is “provided to the multiplier” because it is added to the result of the multiplication. Ex. 1103, ¶ [0029]; Ex. 1102, ¶ 108. Because the dark level bias is input by the user as a user-configurable brightness setting, the amount of adjustment ($+a$) provided to the combined signal $((b - a)x)$ is dependent on the user selectable brightness setting for the “minimum used luminance.” Ex. 1103, ¶ [0029]; Ex. 1102, ¶ 108.

4. *Claim 4*

This claim requires that the “dark level bias is added to the combined signal such that the amount of adjustment to the combined signal is independent of the user selectable brightness setting.” Oki discloses this.

As noted above, a user selectable brightness setting is the “maximum used luminance,” which is represented as variable “ b ” in Oki’s equation for calculating

the user-selectable brightness setting (y). Ex. 1103, ¶ [0029]. In Oki’s equation for calculating the brightness control signal—i.e., $y = (b - a)x + a$, the dark level bias, a , is added to the combined signal $(b - a)x$ such that amount of adjustment ($+a$) is independent of the user selectable brightness setting for the “maximum used luminance” which is associated with Oki’s variable “ b .” *Id.*; Ex. 1102, ¶ 110.

5. *Claim 5*

Claim 5 calls for the “dark level bias” to be “added to an output of the multiplier.” Oki teaches this because in the equation for producing the brightness control signal, the dark level bias (a) is added to the result of the multiplication—and thus the output of the multiplier because the multiplication would occur before the adding based on the order of operations. Ex. 1103, ¶ [0029]; Ex. 1102, ¶ 111.

6. *Claim 7*

Claim 7 requires that “the brightness control signal is provided to a display driver to control backlight illumination of a liquid crystal display.” Oki discloses this limitation. Oki explains that

the glare adjuster 10 sends the calculated luminance value y to the central processing unit 1. Next, the central processing unit 1 sends the luminance value y to the display control unit 4. Next, the display control unit 4 changes the display luminance of the display unit 3, based on the luminance value y .

Ex. 1103, ¶ [0029], Fig. 5. The “display unit 3 [] displays an image on a liquid crystal panel or the like.” *Id.*, ¶ [0006]. Based on this disclosure, Oki’s brightness control signal, *y*, is provided to the display driver—i.e., display control unit 4—to control the illumination of the liquid crystal display. *Id.*, ¶ [0029]; Ex. 1102, ¶ 113.

7. *Claim 15*

- a. [15.Pre] “A method to selectively provide ambient light correction, said method comprising:”

See [1.Pre], above. Oki’s brightness control circuit performs, and renders obvious, the claimed method as described with respect to claim 1.

- b. [15A] “receiving a user input signal indicative of a user selectable brightness setting;”

See [1A], above. To implement Oki’s “luminance adjustment,” this step of the method is performed such “*y*” can be calculated based on “*a*” and “*b*,” as described above. Ex. 1102, ¶ 115. The user signals reflecting the user selectable settings are needed to complete Oki’s equation. Ex. 1103, ¶ [0029].

- c. [15B] “selectively multiplying the input signal with a sense signal to generate a combined signal, wherein the sense signal indicates an ambient light level; and”

See [1B] and [1C], above. As discussed above, Oki discloses or renders obvious selective multiplication of the input signal with the sense signal, to generate the combined signal $((b - a)x)$. Moreover, the sense signal indicates the ambient light level according to Oki. Ex. 1103, ¶ [0026] (“[A] photodiode 9 that has the

function of sensing an outputting as an electrical signal the brightness surrounding the display unit 3.”).

The step of “selectively multiplying” is disclosed by Oki. *Supra* §IV.A.2.d.

- d. [15C] “adjusting the combined signal with a dark level bias to generate a brightness control signal for controlling brightness of a visible display such that the brightness control signal is maintained above a predetermined level when the ambient light level decreases to approximately zero.”

See [1D], above. Performing the step of adjusting the “ $(b - a)x$ ” term found in Oki’s equation by a dark level bias (a) is disclosed by Oki. *Supra* §IV.A.2.e. This process results in the generation of a brightness control signal that is maintained above a predetermined level—i.e., levels below the minimum used luminance value associated with “ a ”—under the conditions stated in this claim. *Id.*

8. *Claim 16*

See [1C] and [15B] above. Oki describes and renders obvious the use of selective multiplication using a software algorithm—which is one of the recited alternatives in this claim. *Supra* §IV.A.2.b; *see also* [1C] and [15B] above.

9. *Claim 18*

Claim 18 recites a method that includes a requirement that the “dark level bias is added to the combined signal after selective multiplication such that the amount of adjustment to the combined signal is independent of the input signal and the sense signal.” This is discussed in connection with claims 4 and 5, above. *Supra*

§§IV.A.4, IV.A.5.

**B. Claim 6 Would Have been Obvious Over Oki In View of Henry
(Ground 3)**

1. Henry Overview

Henry discloses a dimmable backlight system for controlling a cold cathode fluorescence lamp (CCFL) that is particularly useful in permitting lamp overdrive in cold environments, such as those occurring in automobiles, until such time as the lamp warms up, and then preventing damage to the lamp by avoiding overdrive using clamp circuits. Ex. 1139, 1:6-9, 1:65-2:29, 5:65-67, 6:49-59, 12:1-17, 13:61-14:27, 14:50-63, Figs. 4, 5. Henry discloses inverter circuits (16, 18) that receive signals DUTYCTRL and AMPLCTRL, respectively. *Id.*, 11:1-5, 12:42-46, Fig. 4. Inverter 14 “effectively passes a DC voltage input signal at the DUTYCTRL input to the BRITE input of the PWM circuit 802, but clamps the output voltage at 2.5 volts.” *Id.*, 12:14-17, 11:40-41, 11:47-54. “[I]ntegrator 18 effectively offsets a DC voltage input signal at the AMPLCTRL input to the BRT input of the PWM circuit 802, but clamps the output voltage at 2.5 volts.” *Id.*, 14:25-27. The values of AMPLCTRL input and DUTYCTRL input are determined by a processor “based on the dimming level set,” and these signals may be adjusted “independently or in combination to achieve the desired dimming level.” *Id.*, 14:50-55. A PWM circuit can monitor these signals so the PWM circuit can control lamp brightness, and can allow overdriving of the lamp in low temperatures when it is safe to do so. *Id.*, 5:24-30, 14:56-63. In

this way, Henry teaches an overdrive clamp circuit that is coupled to brightness control signals (e.g. AMPLCTRL and/or DUTYCTRL) to limit their amplitudes to predefined ranges (e.g., not to exceed 2.5V). Ex. 1102, ¶¶ 81-84.

2. *Claim 6 Would Have Been Obvious Over Oki In View of Henry*

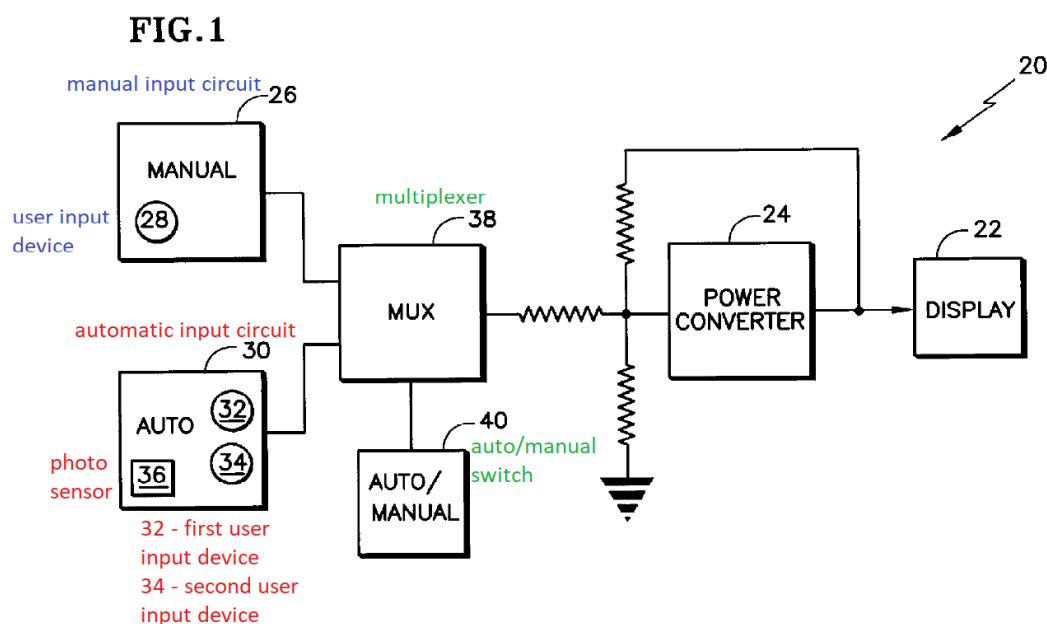
Oki does not expressly teach the overdrive clamp circuit of claim 6. Henry does. A POSA would have found it obvious to look to Henry for ideas about how to improve Oki's system. For example, both Oki and Henry describe mobile applications such as mobile phones and PDAs, Ex. 1103, p.1 ("Solution Means"), ¶ [0027] ("mobile telephone"); Ex. 1139, 3:14-18. The POSA would have recognized that a mobile phone (Oki) and PDAs (Henry) would have been started in a cold environment where a CFL backlight posed problems in cold conditions. Ex. 1039, 1:23-30; Ex. 1102, ¶ 122. Moreover, Henry explains that CFLs may be overdriven, and thus damaged. Ex. 1139, 2:3-6, 4:42-43, 58-60. CFL's were well-known backlights for LCD's and thus, those skilled in the art would have looked to Henry for a way to initially start a CFL, but once proper temperature was reached, to avoid overdriving the lamp by limiting the amplitude of the brightness control signal to a predetermined range (e.g., between zero and a safe maximum depending on the CFL). Ex. 1102, ¶¶ 122-124. The POSA would have understood this was a beneficial feature to have because of the user's ability set the value for the minimum and maximum used luminance values in Oki. Ex. 1102, ¶ 123; Ex. 1103, ¶ [0029].

In cold conditions, the user programs a much higher brightness setting than would be appropriate after the CFL warms up, thus potentially overdriving the lamp. Ex. 1102, ¶ 123. Therefore, it would have been obvious and common sense to include an overdrive clamp circuit as claimed to prevent the user from inadvertently overdriving and damaging the lamp. Ex. 1102 ¶¶ 123-124. Adding an overdrive clamp circuit as claimed would have merely been the combination of known elements (Oki's display brightness control) to obtain predictable results—i.e., allowing Oki's dimming control in a manner that prevented overdriving the backlight and thus damaging the equipment. Ex. 1102, ¶ 124. This modification to Oki would have required simply applying a known technique (Henry's overdrive prevention at normal operating temperatures), to a device ready for improvement (i.e., Oki's system). Ex. 1102, ¶ 125. Henry explicitly motivates the POSA to add an overdrive clamp circuit to avoid damaging the CFL under varying temperature conditions and user-controlled dimming conditions. *Id.* The POSA would have equally wanted to avoid overdriving any backlight in a brightness adjusting system in which the user had control over the relevant settings. Thus, adding an overdrive clamp circuit would have improved the Oki system in a similar manner to the way it improved Henry's. Ex. 1102, ¶ 125. Claim 6 would therefore have been obvious.

C. Claim 9 Would Have Been Obvious Over Oki (Ground 2) and Oki in view of Toffolo (Ground 4)

1. Toffolo Overview

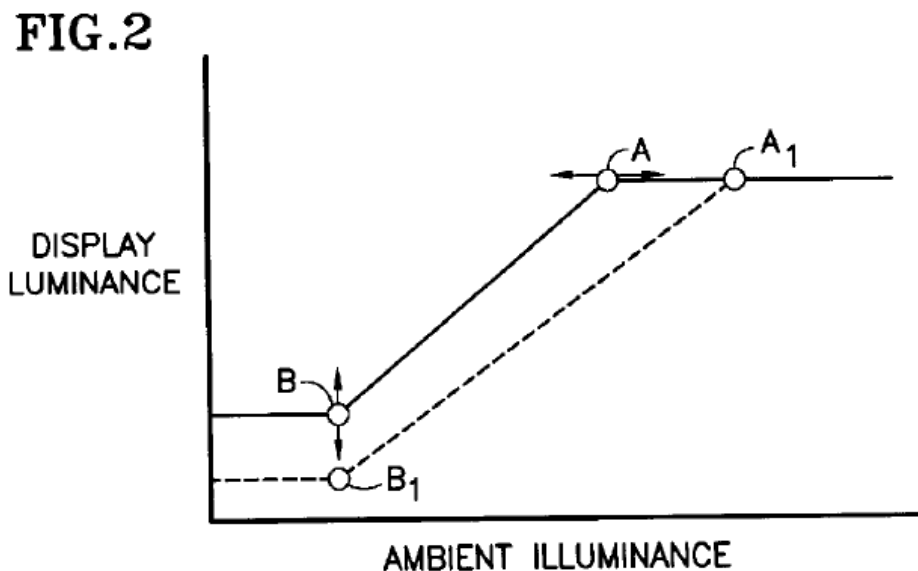
Toffolo discloses a backlight control system for vehicles. Ex. 1111, Abstract, 1:6-8, 1:20-21. Toffolo's uses "automatic and manual brightness control" which allows a user to input values for minimum and maximum display brightness, or override the automatic adjustments in a manual mode. *Id.*, 1:35-40, 2:6-13, 2:29-47, Figs. 1, 2. Toffolo includes a "MUX" to select between automatic and manual brightness adjustment modes. *Id.*, 2:6-9.



Id., Fig. 1 (annotated).

Toffolo may be driven at system limits at the brightness level extremes. In Figure 2, the display luminance at point A is the maximum display luminance for the backlight, and point B corresponds to the lowest amount of light that can be

sensed by the sensor. *Id.*, 2:18-24. The user adjusts the display luminance at the minimum detectable ambient light and can adjust the point at which the ambient light causes the display to reach its brightest level.



Id., Fig. 2.

2. *Claim 9*

Claim 9 requires “a second input configured to receive a selection signal to selectively operate the brightness control circuit in an auto mode or a manual mode.” This phrase has been construed to mean “second input actually programmed or implemented with hardware or software to receive a selection signal to selectively operate the brightness control circuit in an auto mode or a manual mode.” Ex. 1138, pp.7-8. Claim 9 further requires that “the selection signal enables the light sensor in the auto mode and disables the light sensor in the manual mode.” These features would have been obvious over Oki alone (Ground 2) and Oki in view of Toffolo

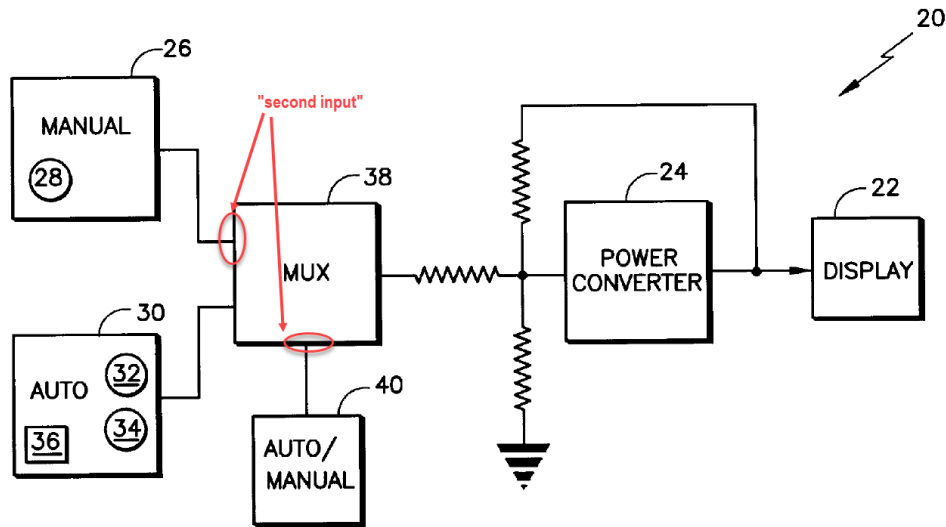
(Ground 4).

Oki explains that “the automatic adjustment may be made subject to disabling.” Ex. 1103, ¶ [0031]. Oki further explains that “in the case in which the automatic display screen luminance adjustment is disabled, manual adjustment, that is, by the user, of the display screen luminance may be made possible by making input to the glare adjuster 10, using numerical keys or the like of the mobile terminal.” Ex. 1103, ¶ [0031]. Yet, Oki leaves it to the POSA to implement a way to select between the automatic and manual modes. Ex. 1102, ¶ 128.

It would have been obvious to implement a “second input” in either or both of hardware or software for receiving a selection signal—such as a signal generated by a key press, a switch, or other data entry into the mobile device—that indicates that the user wants the mobile device to operate in either a manual or automatic brightness adjustment mode. Indeed, the POSA would have understood that the user would need some way to indicate which mode was desired and the electronics would have needed some way to interpret the user’s selection through the receipt of a signal reflecting the user’s preference. Ex. 1102, ¶ 129. Therefore, the POSA would have found it obvious to include a second input actually programmed or implemented with hardware or software to receive a selection signal to selectively operate the brightness control circuit in an auto mode or a manual mode to allow Oki’s electronics to operate based on the user’s choice. Ex. 1102, ¶ 130.

Additionally, it would have been obvious to have a selection signal indicating the user's choice of manual or automatic mode that "enables the light sensor in the auto mode and disables the light sensor in the manual mode," as required by claim 9. In manual mode, Oki's "automatic adjustment" is disabled. Ex. 1103, ¶ [0031]. Because automatic adjustment is disabled, using the photodiode to collect ambient light measurements for the generation of the PD output value "x" would not have been necessary. Ex. 1102, ¶ 131. Under these circumstances and in accordance with Oki's teachings, the POSA would have found it obvious to disable the photodiode in the manual mode when it was not needed and to enable it in the automatic mode when it was needed. *Id.* This would have resulted in power savings in manual mode, thus improving Oki's efficiency in a predictable manner. Ex. 1102, ¶ 131.

The combined teachings of Oki and Toffolo also render obvious claim 9. Toffolo teaches a "second input," which includes an "input actually programmed or implemented with hardware or software to receive a selection signal to selectively operate the brightness control circuit in an auto mode or a manual mode," Ex. 1138, pp.7-8, as shown below:



Ex. 1111, Fig. 1 (annotated). Switch 40 provides a selection signal to control the state of MUX (38) to selectively operate the brightness control circuit in an auto or manual mode using automatic or manual input circuits (30, 26). *Id.*, 2:6-9. The input from manual input circuit is another example of a second input that allows the MUX to be controlled to override automatic mode when the user manually adjusts the brightness. *Id.*, 2:9-13. The “automatic” circuit (Fig. 3), shows a voltage applied across it, and when that voltage drops to zero (i.e., no voltage is applied), the sensor would be disabled. Ex. 1102, ¶ 135 Toffolo also teaches that the input from the manual circuit and the MUX can be implemented in software. Ex. 1111, 3:6-19.

Using the “selection signal” to enable and disable the light sensor as claimed would also have been obvious over Oki in view of Toffolo. The POSA implementing Toffolo’s circuits in software would have found it obvious to disable the photosensor (36) when it was not in use, and to enable it when it was in use,

because the POSA would have recognized that in a manual mode, the photosensor was unnecessary. Ex. 1102, ¶¶ 136-138. Therefore, the POSA would have sought to preserve power in applications that can operate on battery power (such as mobile devices) when the sensor was not needed because the POSA would have wanted to avoid unnecessarily draining the battery. Ex. 1102, ¶¶ 136-137.

It would have been obvious to include at least one of Toffolo's second inputs and the claimed selection signal for choosing between modes in Oki because while Oki mentions both automatic and manual modes, it does not discuss any implementation details. The POSA would have found exemplary implementations in Toffolo, and thus would have sought to utilize Toffolo's techniques for toggling between manual and automatic modes in hardware or software. Ex. 1102, ¶ 138. Toffolo thus would have provided the needed circuitry to Oki to permit the functionality described in Oki to be implemented. Ex. 1102, ¶ 138. Additionally, Toffolo shows a circuit for the automatic adjustment that includes light sensor (36). Ex. 1111, Fig. 3. The POSA would have understood that when a voltage was not applied across that circuit, the light sensor would be disabled, and when a voltage is applied across that circuit, the light sensor is enabled. Ex. 1102, ¶ 135. Moreover, Toffolo describes implementing such a circuit, along with the manual selection circuit and the MUX in software. Ex. 1111, 3:10-19. The POSA implementing Toffolo's circuits in software would have found it obvious to disable the light sensor

when the system was operating in manual mode for the reasons provided above with respect to the obviousness of this feature over Oki. Therefore, the POSA would have found including the claimed “second input” and the claimed “selection signal” for performing the functionality recited by the claim in Oki’s system because it would have been an obvious way to implement Oki’s technique of selecting between automatic and manual modes of brightness control and would have preserved battery power when the automatic mode was not in use. Ex. 1102, ¶¶ 137-138.

V. GROUNDS FOR STANDING

Petitioners submit that the ’117 patent is available for IPR and that it is not estopped from challenging the ’117 patent. This Petition is being filed well in advance of the one-year bar under 35 U.S.C. §315(b).

VI. MANDATORY NOTICES

A. Real Party-In-Interest

The real-parties-in-interest are LG Electronics, Inc., LG Electronics U.S.A., Inc., Hisense Co., Ltd., Hisense Electronics Manufacturing Co. of America Corp., Hisense Int’l Co., Ltd., Hisense Int’l (HK) Co., Ltd., Hisense Int’l (Hong Kong) America Investment Co. Ltd., Hisense USA Corp., and Qingdao Hisense Electronics Co. Ltd.

B. Related Matters

The ’117 patent is currently being challenged in IPR2020-01283.

The '117 patent is also currently involved in the following civil actions:

Polaris PowerLED Technologies, LLC v. LG Electronics, Inc., et al., No. 8-20-cv-00125 (C.D. Cal.); and

Polaris PowerLED Technologies, LLC v. Hisense Elecs., Mfg. Co. of Am. Corp., et al., No. 8-20-cv-00123 (C.D. Cal.).

The '117 patent was at issue in *Polaris PowerLED Technologies, LLC v. VIZIO, Inc., et al.*, 8-18-cv-01571 (C.D. Cal.), but a judgment of no infringement has been entered. It is identified here because Patent Owner contends it may appeal the District Court's ruling and the deadline for filing a Notice of Appeal has not yet run.

While IPR2020-00043 was denied, a request for rehearing has been filed and is currently pending. Therefore, Petitioners identify that matter here as well.

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D. Service

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VII. FEES

Fees were paid through PTAB E2E.

VIII. CONCLUSION

Claims 1-2, 4-7, 9, 15-16, and 18 of the '117 patent are unpatentable. Trial should be instituted and the claims should be cancelled.

Dated: July 21, 2020

Respectfully Submitted,

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/Andrew R. Sommer/

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CERTIFICATE OF COMPLIANCE

This petition complies with the word count limits set forth in 37 C.F.R. § 42.24(a)(i), effective May 2, 2016, because this Petition contains 13,498 words, excluding the parts of the petition exempted by 37 C.F.R. § 42.24(a), as determined using the word count provided by Microsoft Word, which was used to prepare this Petition.

Dated: July 21, 2020

Respectfully Submitted,

/Matias Ferrario/

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §§ 42.6(e) and 42.105(a), the undersigned certifies that on July 20, 2020, I caused a true and correct copy of Petition for *Inter Partes* Review, the associated Powers of Attorney, and Exhibits 1001 and 1102-1158 by EXPRESS MAIL on the Patent Owner at the correspondence address of record for U.S. Patent No. 8,223,117 as follows:

Knobbe Martens Olson & Bear LLP
2040 Main Street
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I further certify that a courtesy copy of the above-identified materials were served on litigation counsel by electronic means upon the foregoing individuals:

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