

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re: Ex Parte Reexamination of

U.S. Patent No.: 8,223,117

Control No.: 90/019,119

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Examiner: LAROSE, COLIN M

Atty. Docket: 5173.001RPO0

Title: **METHOD AND APPARATUS TO CONTROL DISPLAY BRIGHTNESS WITH
AMBIENT LIGHT CORRECTION**

Patent Owner's Reply to Office Action in *Ex Parte* Reexamination

Mail Stop "*Ex Parte* Reexam"

Attn: Central Reexamination Unit
Commissioner for Patents
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Commissioner:

In reply to the Office Action dated June 2, 2023 ("Office Action"), Patent Owner Polaris PowerLED Technologies, LLC, timely submits the following remarks. It is not believed that fees are required. However, if any fees are necessary to prevent abandonment of this reexamination, then such fees are hereby petitioned and hereby authorized to be charged to our Deposit Account No. 19-0036.

EXHIBIT LIST

Exhibit	Description
A	Declaration of Dr. Robert Stevenson, Ph.D. (“Stevenson Decl.”)
B	<i>Samsung Elec. Co., Ltd. et al. v. Polaris PowerLED Techs., LLC</i> , IPR2018-01262, Paper 14 (P.T.A.B. Jan. 17, 2019)
C	<i>VIZIO, Inc. v. Polaris PowerLED Techs., LLC</i> , IPR2020-00043, Paper 32 (P.T.A.B. Sept. 15, 2020)
D	<i>LG Elec., Inc. and Hisense Co. Ltd. v. Polaris PowerLED Techs., LLC</i> , IPR2020-01283, Paper 9 (P.T.A.B. Mar. 9, 2021)
E	<i>Hisense Co. Ltd. and LG Elec., Inc. v. Polaris PowerLED Techs., LLC</i> , IPR2020-01337, Paper 11 (P.T.A.B. Mar. 9, 2021)
F	Claim Construction Memorandum Opinion and Order, <i>Polaris PowerLED Techs., LLC v. Samsung Elecs. America</i> , Case No. 2:17-cv-00715-JRG (E.D. Tex.), January 7, 2019
G	Order re Claim Construction, <i>Polaris PowerLED Techs., LLC v. VIZIO, Inc.</i> , Case No. 8:18-cv-01571-JVS-DFM (C.D. Cal.), November 26, 2019
H	<i>IEEE Standard Dictionary of Electrical and Electronic Terms</i> (7th ed. 2000) [excerpts]
I	Gabree, et al., “Use of Color on Airport Moving Maps and Cockpit Displays of Traffic Information (CDTIs),” Federal Aviation Administration White Paper, June 2014
J	“Minimum Illumination - an overview ScienceDirect Topics,” including Vlado Damjanovski, Minimum Illumination in CCTV (3d. ed.) (2014). (“Damjanovski”)
K	Curriculum Vitae of Dr. Robert Stevenson (“Curriculum Vitae”)
L	<i>Samsung Elec. Co., Ltd. et al. v. Polaris PowerLED Techs., LLC</i> , IPR2018-01262, Paper 4 (P.T.A.B. June 15, 2018)
M	<i>VIZIO, Inc. v. Polaris PowerLED Techs., LLC</i> , IPR2020-00043, Paper 2 (P.T.A.B. Oct. 15, 2019)
N	<i>LG Elec., Inc. and Hisense Co. Ltd. v. Polaris PowerLED Techs., LLC</i> , IPR2020-01283, Paper 3 (P.T.A.B. July 16, 2020)
O	<i>Hisense Co. Ltd. and LG Elec., Inc. v. Polaris PowerLED Techs., LLC</i> , IPR2020-01337, Paper 1 (P.T.A.B. July 21, 2020)
P	Order re Supplemental Claim Construction Disputes, <i>Polaris PowerLED Tech., LLC v. VIZIO, Inc.</i> , Case No. 8:18-cv-01571-JVS-DFM (C.D. Cal.), Dec. 23, 2019
Q	Order re VIZIO’s Motion for Clarification, <i>Polaris PowerLED Tech., LLC v. VIZIO, Inc.</i> , Case No. 8:18-cv-01571-JVS-DFM (C.D. Cal.), Jan. 21, 2020

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	THE “MULTIPLIER” AND “DARK LEVEL BIAS” IN THE ’117 PATENT	4
A.	The ’117 Specification Teaches the “Dark Level Bias” As Performing Mathematical Adjustment and the “Multiplier” as Not Requiring Any Specific Order of Operations	4
B.	The Claims Confirm that the Dark Level Bias Can Adjust the Combined Signal Before, Concurrently With, or After Multiplication.....	15
C.	The Office Action’s Exclusion of Preferred Embodiments From the Scope of the Claims Based on the Ability to Manually Turn Off the Display System Is Improper and Has No Basis in the Claim Language.....	19
III.	PIONEER DOES NOT RENDER OBVIOUS CLAIMS 1, 4-7, 15, 16, OR 18 OF THE ’117 PATENT	24
A.	Pioneer Teaches Controlling Brightness With a Quadratic Function And Not Equation 1	24
B.	Pioneer Does Not Disclose or Suggest The “Multiplier” Element of Claim 1 or the “Multiplying” Element of Claim 15.	28
C.	Pioneer Does Not Disclose or Suggest the “Dark Level Bias” Recited in Claims 1 and 15.....	33
D.	Pioneer Does Not Disclose or Suggest “A First Input Configured To Receive a User Signal” and “Receiving a User Input Signal Indicative of a User Selectable Brightness Setting” in Claims 1 and 15.	41
IV.	THE COMBINATION OF PIONEER AND OTTENSTEIN DOES NOT RENDER OBVIOUS CLAIM 9 OF THE ’117 PATENT	45
V.	THE COMBINATION OF NARVESON AND WHITTED DOES NOT RENDER OBVIOUS CLAIM 15 OR 16 OF THE ’117 PATENT.....	47
A.	There Is No Motivation to Combine Narveson and Whitted Regarding the “Dark Level Bias” Limitation of Claim 15.....	47
B.	Narveson Does Not Disclose or Suggest a “Combined Signal” When the “Ambient Light Decreases to Approximately Zero” And Thus There Can Be No “Dark Level Bias” That Adjusts the “Combined Signal” to Generate a “Brightness Control Signal” When the “Ambient Light Decreases to Approximately Zero”..	51
C.	The Combination of Narveson and Whitted Would Not Result in the “Dark Level Bias” Limitation of Claim 15 Because the Minimum Power Level in Whitted Is Not a Dark Level Bias.....	54
VI.	THE COMBINATION OF WHITTED AND OTTENSTEIN DOES NOT RENDER OBVIOUS CLAIM 15 OR 16 OF THE ’117 PATENT.....	55

A.	One of Ordinary Skill in the Art Would Not Have Combined Whitted and Ottenstein	55
B.	The PTAB Already Found That There Is No Rationale to Combine Ottenstein’s Multiplication With a Minimum Brightness Level of Another Reference as the Office Action Proposes	59
C.	Whitted Does Not Disclose or Suggest the “Dark Level Bias” Limitations of Claim 15 Because the Pre-Programmed “Minimum Power Level” Is Not a “Dark Level Bias” And There Is No Disclosure of a “Brightness Control Signal”	60
VII.	THE OFFICE ACTION IMPROPERLY CONSTRUES THE “FIRST INPUT” AND “SECOND INPUT” TERMS AS INVOKING 35 U.S.C. § 112, ¶6.	63
A.	There is a Legal Presumption That § 112 ¶6 Does Not Apply to the “First Input” and “Second Input” Limitations.....	64
B.	The Legal Presumption That § 112 ¶6 Does Not Apply to the “First Input” and “Second Input” Terms Cannot Be Overcome Because “Input” Connotes Sufficient Structure	65
C.	The Office Action’s Application of § 112 ¶6 to “First Input” and “Second Input” Is Contrary to Legal Precedent	66
D.	The Office Action’s Application of § 112 ¶6 to “First Input” and “Second Input” Is Contrary to Prior District Court Constructions	68
E.	The Requester, Patent Owner, and Their Experts All Agree That The “First Input” and “Second Input” Limitations Are Not Subject to § 112 ¶6.....	70
VIII.	“A DARK LEVEL BIAS” IS NOT A MEANS-PLUS-FUNCTION TERM AND THE PROPOSED CONSTRUCTION ADDS ADDITIONAL LIMITATIONS THAT ARE NOT RECITED IN THE CLAIM.....	70
A.	The Office Action Improperly Construed “Dark Level Bias” Under § 112 ¶6	71
B.	The Office’s Construction Requires a “Predetermined” Value, Which Is Contrary to the Intrinsic Evidence and Inconsistent with the Prior District Court Order Rejecting That Construction	73
C.	The Office Action’s Construction Requiring the “Dark Level Bias” To Be “Added” to the Combined Signal Is Contrary to the Intrinsic Evidence And Has Been Rejected By the District Court.....	76
D.	The Phrase “When the ‘Light Sensor’ Value Is Zero” in Office’s Construction Is Contrary to the Claim Language And the Intrinsic Evidence.....	79
E.	The Office Action’s Construction of “Dark Level Bias” Excludes Almost All Preferred Embodiments And Is Thus Contrary to Federal Circuit Precedent	80
F.	The Requester, Patent Owner, and Their Experts All Agree That The “Dark Level Bias” Limitation Is Not Subject to § 112 ¶6.....	89
IX.	INTERVIEW SUMMARY PURSUANT TO 37 C.F.R. § 1.560(B)	89
X.	CONCLUSION.....	91

I. INTRODUCTION

Patent Owner thanks the Examiner for confirming the patentability of claims 2, 3, and 17 of U.S. Patent No. 8,223,117 (“the ’117 patent”) and for the interview with Patent Owner’s representatives on July 18, 2023. With respect to the remaining claims under reexamination, claims 1, 4-7, 9, 15, 16, and 18, Patent Owner respectfully disagrees with the Office Action’s assessment of the prior art and its construction of the claims of the ’117 patent. Patent Owner’s position is supported by a declaration from Dr. Robert Stevenson, Ph.D. (Ex. A, “Stevenson Decl.”), who is a Professor and Associate Chair of Electrical Engineering at Notre Dame University. Dr. Stevenson is an expert in the technical areas relevant to the ’117 patent. Stevenson Decl., ¶¶5-10; Ex. K, Curriculum Vitae.

The Office Action asserts that Pioneer renders obvious claims 1, 4-7, 15, 16, and 18, and that the combination of Pioneer and Ottenstein renders obvious claim 9. However, Pioneer does not disclose or suggest the “brightness control signal,” “dark level bias,” and the “multiplier” and “multiplying” elements of independent claims 1 and 15. The Office Action points to a linear Equation 1 in Pioneer as containing the alleged “brightness control signal,” “dark level bias,” and the “multiplier” and “multiplying” elements. However, Pioneer uses a quadratic equation based only on the ambient light detection value, and not Equation 1, to calculate the brightness of the display. Therefore, Pioneer fails to disclose or suggest these limitations.

The Office Action asserts that the combination of Narveson and Whitted renders obvious claims 15 and 16. However, the combination of Narveson and Whitted fails to teach “adjusting the combined signal with a dark level bias . . . when the ambient light level decreases to approximately zero.” The Office Action relies on Narveson for the element “multiplying the input signal with a sense signal to generate a combined signal, wherein the sense signal indicates an ambient light level.” When the “ambient light level decreases to approximately zero,” there is

no “combined signal” to be adjusted because Narveson calculates brightness at low ambient light levels without using a “sense signal” by using only a constant and a potentiometer input. Further, Whitted’s threshold minimum power level is not “dark level bias” because a “dark level bias” is a mathematical adjustment and not a hard minimum as in Whitted.

Finally, the Office Action asserts that the combination of Whitted and Ottenstein renders obvious claims 15 and 16. However, the combination of Whitted and Ottenstein fails to teach “adjusting the combined signal with a dark level bias . . . when the ambient light level decreases to approximately zero.” The Office Action relies on Ottenstein for the element “multiplying the input signal with a sense signal to generate a combined signal, wherein the sense signal indicates an ambient light level.” However, when the “ambient light level decreases to approximately zero,” there is no “combined signal” to be adjusted because Ottenstein does not calculate brightness at low ambient light levels using a “sense signal.” Rather, Ottenstein solves the problem of visibility at low ambient light levels by using a “night mode.” Moreover, Whitted’s threshold minimum power level is not a “dark level bias” because a “dark level bias” is a mathematical adjustment and not a hard minimum as in Whitted.

Regarding claim construction, Patent Owner respectfully disagrees with the Office Action’s constructions of “first input,” “second input,” and “dark level bias” as being construed under 35 U.S.C. § 112, ¶6 (“§ 112, ¶6”). There is a legal presumption that § 112, ¶6 does not apply to these terms since they lack the word “means.” Both “input” and “bias” connote sufficient structure to one of ordinary skill in the art such that the presumption against § 112, ¶6 cannot be overcome. For example, district courts have repeatedly found that “input” connotes sufficient structure to avoid application of § 112, ¶6. No litigant or petitioner through five *inter partes* review petitions and the current *ex parte* reexamination request has ever proposed to construe “first input” and “second input” under § 112, ¶6. Only one party has ever proposed

construing “dark level bias” under § 112, ¶6; and the district court rejected the application of § 112, ¶6 in that case. Finally, Patent Owner disagrees with the Office Action’s construction of the “dark level bias” terms with respect to “predetermined input,” “added to,” and “when the ‘light sensor’ value is zero,” as these are contrary to the claim language and intrinsic evidence in addition to being inconsistent with prior district court constructions.

Furthermore, ’117 patent has previously been challenged unsuccessfully by four different *inter partes* review petitions filed by four sophisticated petitioners—Samsung, VIZIO, LG, and Hisense. Ex. B (*Samsung Elec. Co., Ltd. et al. v. Polaris PowerLED Techs., LLC*, IPR2018-01262, Paper 14 (P.T.A.B. Jan. 17, 2019)); Ex. C (*VIZIO, Inc. v. Polaris PowerLED Techs., LLC*, IPR2020-00043, Paper 32 (P.T.A.B. Sept. 15, 2020)); Ex. D (*LG Elec., Inc. and Hisense Co. Ltd. v. Polaris PowerLED Techs., LLC*, IPR2020-01283, Paper 9 (P.T.A.B. Mar. 9, 2021)); Ex. E (*Hisense Co. Ltd. and LG Elec., Inc. v. Polaris PowerLED Techs., LLC*, IPR2020-01337, Paper 11 (P.T.A.B. Mar. 9, 2021)).¹ In the previous four petitions, the petitioners asserted over 24 grounds and 10 prior art references, including the assertion of 11 different ground against independent claims 1 and 15. All of these prior *inter partes* reviews were denied institution on the merits. Exs. B-E. All of these prior challenges interpreted the claims consistently with the prior district court constructions regarding the ’117 patent.

¹ A fifth *inter partes* review petition has been filed in *Nintendo Co., Ltd., and Nintendo of America Inc. v. Polaris PowerLED Technologies, LLC*, IPR2023-00778. However, the Patent Trial and Appeal Board (“PTAB”) has not issued a decision on institution.

II. THE “MULTIPLIER” AND “DARK LEVEL BIAS” IN THE ’117 PATENT

A. The ’117 Specification Teaches the “Dark Level Bias” As Performing Mathematical Adjustment and the “Multiplier” as Not Requiring Any Specific Order of Operations

To provide context for the rest of the discussion and clarification as to the scope of the claims, it is important to understand how the “multiplier” and “dark level bias” are used in the ’117 patent and its claims. As will be described below in detail in regard to the preferred embodiments of the ’117 patent, the “multiplier” performs multiplication involving the user [input] signal and sensing signal.² Stevenson Decl., ¶¶15-32. However, this multiplication is not limited to just the product of the user [input] signal and sensing signal. Stevenson Decl., ¶32. As shown in the embodiments, both the sensing signal and the user input signal can be scaled and otherwise modified mathematically. Stevenson Decl., ¶¶15-32. Consistent with the disclosed embodiments, district courts have construed the “multiplier” and “multiplying” limitations such that the “the combined signal includes, but is not necessarily limited to, the product of the user signal and the sensing signal.” Ex. F, E.D. Tex. Claim Construction Order, 7-10.

Term	District Court’s Construction
“a multiplier configured to selectively generate a combined signal based on both the user signal and the sensing signal”	“a multiplier configured to selectively generate a combined signal based on both the user signal and the sensing signal, wherein <i>the combined signal includes, but is not necessarily limited to, the product of the user signal and the sensing signal</i> ”

² “User [input] signal” is being used collectively for both “user signal” in claim 1 and “input signal” in claim 15. “Sensing signal” is being used collectively for both “sensing signal” in claim 1 and “sense signal” in claim 15.

Term	District Court's Construction
“selectively multiplying the input signal with a sense signal to generate a combined signal, wherein the sense signal indicates an ambient light level”	“selectively multiplying the input signal with sense signal to generate a combined signal, wherein the sense signal indicates an ambient light level and wherein the <i>combined signal includes, but is not necessarily limited to, the product of the input signal and the sense signal</i> ”

Id. (emphasis added).

One of ordinary skill in the art would understand the plain and ordinary meaning of “bias” in the context of the ’117 patent to be a value, which can be, for instance, a voltage value of an electrical signal or a value of a software variable in a software implementation as the patent states that the invention can be implemented in hardware or software. ’117 patent, 2:7-10, 5:37-38, 14:9-12; Stevenson Decl., ¶43. One of ordinary skill in the art would thus understand that “dark level bias” refers to the “bias” value when the ambient light level is low (i.e., at a dark level). ’117 patent, 2:57-61, 4:45-55, 5:20-41, 6:1-21; Stevenson Decl., ¶44. The ’117 patent explains that the dark level bias is a bias that ensures brightness at low ambient light levels. For example, the ’117 patent states:

The dark level bias circuit maintains the brightness control signal above a predetermined level when the ambient light level decreases to approximately zero. Thus, the dark level bias circuit ensures a predefined (or minimum) brightness in total ambient darkness.

The brightness control signal near zero lux is a function of a dark bias level and also depends on the user setting.

’117 patent, 2:57-61, 6:9-11.

The district court has similarly understood that the “claimed ‘dark level bias’ is being used consistent with the plain meaning of ‘bias’ as a signal with a particular value.” Ex. G, C.D.

Cal. Claim Construction Order Nov. 2019, 13. This is consistent with how district courts have construed “dark level bias.”

Limitation	Eastern District of Texas Constructions	Central District of California Constructions
“a dark level bias configured to adjust the combined signal”	Plain and ordinary meaning.	
“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”		“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.”
“dark level bias”		“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. G (C.D. Cal. Claim Construction Order Nov. 2019), at 9, 16; Ex. F (E.D. Tex. Claim Construction Order), at *10-13 (E.D. Tex. Jan. 7, 2019).

Importantly, the “dark level bias” is used to *mathematically adjust* the value of the combined signal in generating the brightness control signal. Stevenson Decl., ¶33. Therefore, it is not a threshold or hard minimum, which would replace a signal. Stevenson Decl., ¶¶55-56, 69. Rather, the “dark level bias” is a signal value that mathematically adjusts the value of the combined signal to create the “brightness control signal.” *See, e.g.*, ’117 patent, 7:17-24, 10:8-13, 11:10-15; Stevenson Decl., ¶15. The “dark level bias” can be used to mathematically adjust the output of the multiplier after the combined signal has been generated. *See, e.g.*, ’117 patent, FIG. 2, claim 5; Stevenson Decl., ¶¶33-35. Alternatively, the “multiplier” can generate the “brightness control signal.” *See, e.g.*, ’117 patent, FIG. 1, claims 10-12; Stevenson Decl., ¶¶33-

35. Where the “multiplier” generates the “brightness control signal,” the “dark level bias” can be used to mathematically adjust the combined signal resulting from combining the user [input] signal and sensing signal by, for example, performing the mathematical adjustment prior to, or as part of, the multiplication such that the “multiplier” in fact generates the “brightness control signal.” *See, e.g.*, ’117 patent, FIG. 1, claims 10-12; Stevenson Decl., ¶¶34-35. This is consistent with how one of ordinary skill in the art would understand the operation of a bias. Stevenson Decl., ¶¶33-35, 42-44.

This also is seen in the embodiments of the ’117 patent, which illustrate these principles. In the embodiment of Figure 1, the dark level bias mathematically adjusts the combined signal because it is added to the scaled sensing signal from the ambient light sensor at 104. ’117 patent, FIG. 1, 4:45-5:14; Stevenson Decl., ¶¶17-19. The addition of the dark level bias to the scaled sensing signal occurs before multiplication with the “dimming control,” which is a user [input] signal, thereby adjusting the value of combined signal and generating the “brightness control signal.” ’117 patent, FIG. 1, 4:45-5:14; Stevenson Decl., ¶18. In Figure 1, K₁ (100), K₂ (102), and K₃ (108) are scalar circuits that scale the dark level bias, sensing signal, and the combined signal. ’117 patent, FIG. 1, 4:45-5:14; Stevenson Decl., ¶17. Because the multiplier is using a scaled sensing signal, the combined signal is not limited to only the product of the user and sensing signal. ’117 patent, FIG. 1, 4:45-5:14; Stevenson Decl., ¶32. Further, by adding the dark level bias to the sensing signal before multiplication, the dark level bias is able to adjust the combined signal. Stevenson Decl., ¶¶32-35.

FIG. 1

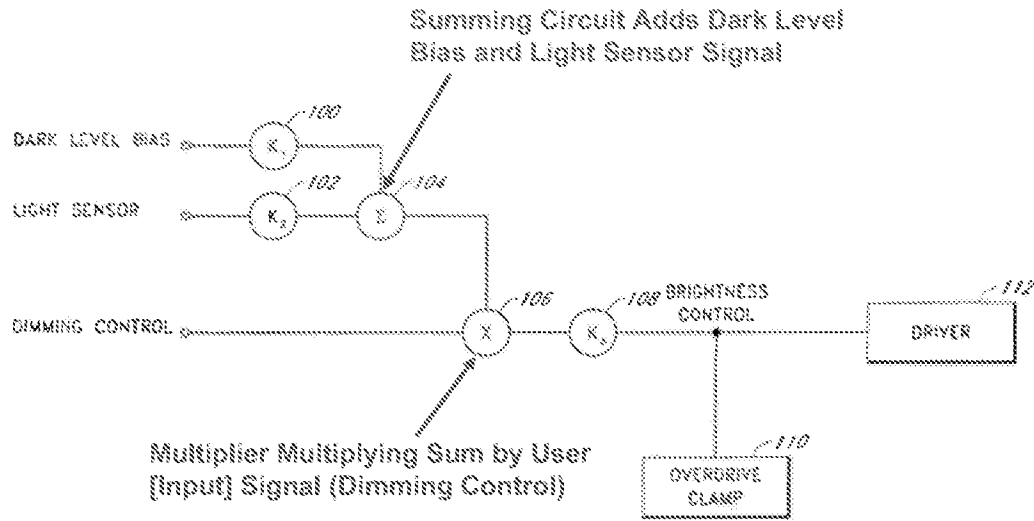


FIG. 1 is a block diagram of one embodiment of a brightness control circuit with ambient light correction. *A user input (DIMMING CONTROL) is multiplied by a sum of a dark level bias (DARK LEVEL BIAS) and a light sensor output (LIGHT SENSOR) to produce a brightness control signal (BRIGHTNESS CONTROL) for a display driver 112.*

Id. at FIG. 1, 4:46-61 (annotations and emphasis added).

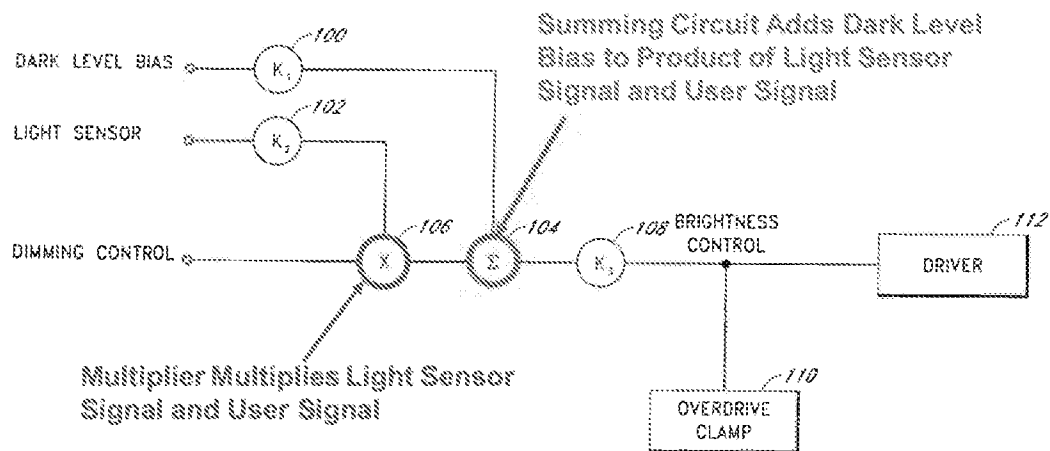
When the sensing signal from the light sensor is its lowest value (e.g., in complete darkness when the ambient light is approximately zero), the dark level bias, which is added to the sensing signal to make it positive and non-zero before multiplication, will make the brightness control signal positive and maintain it at a predetermined level when the ambient light is approximately zero.³ Stevenson Decl., ¶¶17-19. The addition of the dark level bias to the sensing signal mathematically adjusts the combined signal (i.e., user [input] signal x scaled sensing

³ Many light sensors can have a minimum output that is not zero when the ambient light is approximately zero. Stevenson Decl., ¶18.

signal) upward to generate a brightness control signal that is maintained above a predetermined level. *Id.*

In the embodiment of Figure 2, the scaled sensing signal is multiplied by the “dimming control,” which is a user [input] signal, at 106. ’117 patent, FIG. 2, 5:15-29; Stevenson Decl., ¶20. A dark level bias is then added to that product at 104. ’117 patent, FIG. 2, 5:15-29; Stevenson Decl., ¶21. Here, K1 (100), K2 (102), and K3 (108) are again scalar circuits that adjust the dark level bias, sensing signal, and brightness control signal, respectively. ’117 patent, FIG. 2, 5:15-29; Stevenson Decl., ¶20. The dark level bias again mathematically adjusts the combined signal, this time by being added after multiplication to the combined signal. ’117 patent, FIG. 2, 5:15-29; Stevenson Decl., ¶21. Importantly, the dark level bias is a mathematical adjustment and *not* a hard minimum or threshold in any embodiment, including Figures 1 and 2. ’117 patent, FIG. 2, 5:15-29; Stevenson Decl., ¶¶33-35, 55-56, 69.

FIG. 2

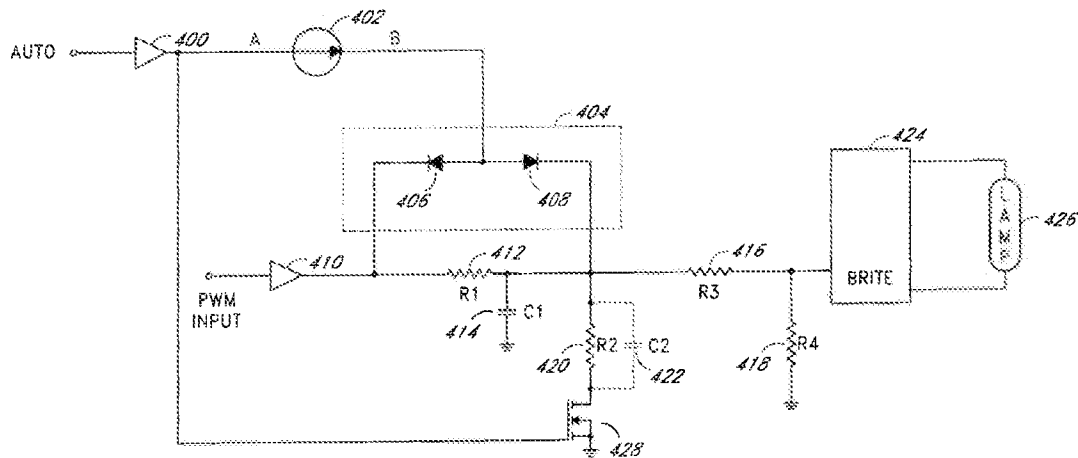


Id. at FIG. 2 (annotations added). In Figure 2, when the sensing signal is its minimum (e.g., in complete darkness when the ambient light is approximately zero), the combined signal resulting from multiplying the sensing signal and user signal would be a relatively lower value. The dark

level bias, which is added to the combined signal in Figure 2, maintains the brightness control signal above a predetermined level when the ambient light level is approximately zero. Stevenson Decl., ¶¶20-22.

Figure 4 shows another embodiment. In automatic mode, the brightness control signal in Figure 4 is calculated according to the following equation wherein the dutycycle is the user signal, the first term in brackets is the dark level bias, and ISRC is the sensing signal. '117 patent, FIG. 4, 7:3-47; Stevenson Decl., ¶¶23-25.

FIG. 4



$$BCS1 = \text{User [Input] Signal} \times \left[\left(\frac{VCC \times R2 \times R4}{[(R1 + R2) \times (R3 + R4)] + (R1 \times R2)} \right) + \text{Dark Level Bias Sensing} \left(\frac{ISRC \times R1 \times R2 \times R4}{[(R1 + R2) \times (R3 + R4)] + (R1 \times R2)} \right) \right]$$

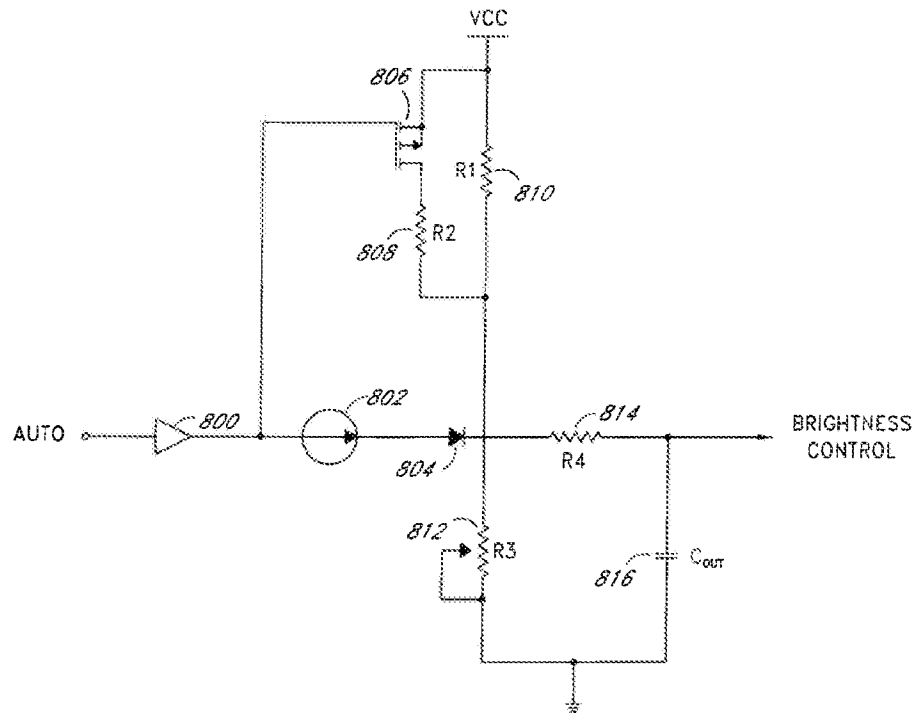
The term “dutycycle” corresponds to the duty cycle of the user adjustable PWM logic signal... The term “ISRC” corresponds to the sensor current signal. The first major term within the brackets corresponds to a scaled dark bias level of the brightness control signal in total ambient darkness.

Id. at FIG. 4, 7:17-32 (annotations added). Although the equation for the Figure 4 preferred embodiment shows a mathematical model of the brightness control signal output by the circuit, the analog circuit in Figure 4 performs the math concurrently rather than sequentially. Stevenson Decl., ¶35. As shown in the equation, the same resistors that are part of the dark level bias appear in other terms in the mathematical equation indicating that the math is performed concurrently rather than sequentially in the circuit. *Id.*

In Figure 4, the dark level bias is added to the scaled sensing signal which is concurrently multiplied by the user [input] signal. '117 patent, FIG. 4, 7:3-47; Stevenson Decl., ¶25. The dark level bias thus mathematically adjusts the combined signal and is not a hard minimum or threshold brightness. '117 patent, FIG. 4, 7:3-47; Stevenson Decl., ¶¶25, 34, 55-56, 69. The addition of the dark level bias to the scaled sensing signal adjusts the combined signal (i.e., user [input] signal x scaled sensing signal) upward to generate a brightness control signal that is above a predetermined level. '117 patent, FIG. 4, 7:3-47; Stevenson Decl., ¶¶25, 34. Therefore, when the sensing signal from the light sensor is its lowest value when the ambient light level is approximately zero, the dark level bias, which is added to the scaled sensing signal, will make the brightness control signal positive and maintain it above a predetermined level when the ambient light level is approximately zero. This adjustment by the "dark level bias" allows the screen to still be visible in the absence of ambient light by maintaining the brightness control signal above a predetermined level. Stevenson Decl., ¶¶15, 34.

The embodiment of Figure 8 shows a scaled user [input] signal being multiplied by the sensing signal. '117 patent, FIG. 8, 9:38-10:19; Stevenson Decl., ¶28.

FIG. 8



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

Dark Level Bias
User [Input] Signal

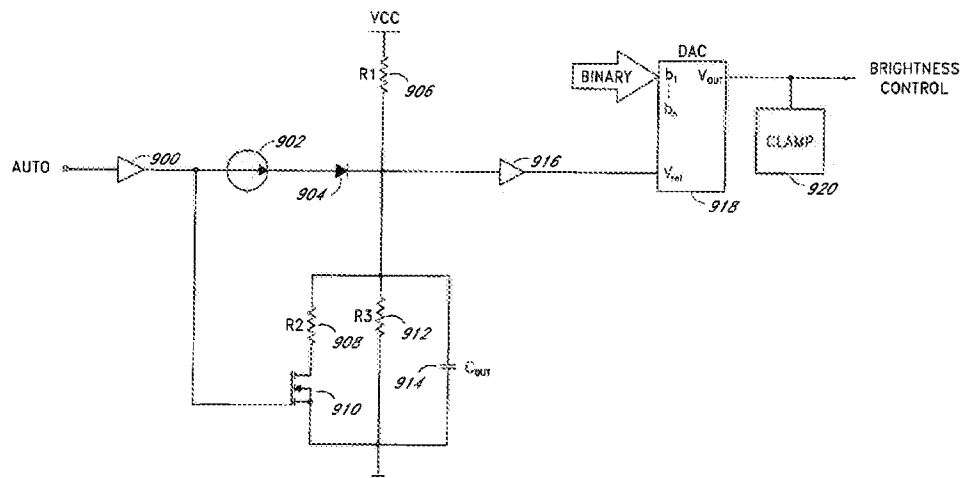
Id. at FIG. 8, 10:9-12 (annotations added). Although the equation for the Figure 8 preferred embodiment shows a mathematical model of the brightness control signal output by the circuit, the analog circuit in Figure 8 performs the math concurrently rather than sequentially. Stevenson Decl., ¶35. As shown in the equation, the same resistors that are part of the dark level bias appear in other terms in the mathematical equation indicating that the math is performed concurrently rather than sequentially in the circuit. *Id.*

The dark level bias in Figure 8 is added to the combined signal concurrently with the multiplication to mathematically adjust the combined signal. '117 patent, FIG. 8, 9:38-10:19; Stevenson Decl., ¶28. When the sensing signal from the light sensor is its lowest value when the

ambient light level is approximately zero, the dark level bias, which is added to the combined signal, will make the brightness control signal positive and maintain it at a predetermined level when the ambient light level is approximately zero. Stevenson Decl., ¶¶15, 34. The dark level bias is thus a bias that performs a mathematical adjustment and not a hard minimum or threshold brightness value. '117 patent, FIG. 8, 9:38-10:19; Stevenson Decl., ¶¶34, 55-56, 69.

In the embodiment of Figure 9, the multiplier adds the dark level bias to a scaled sensing signal concurrently with multiplying by the user [input] signal. '117 patent, FIG. 9, 10:33-11:15; Stevenson Decl., ¶31. The dark level bias thus mathematically adjusts the combined signal and is not a hard minimum or threshold brightness. '117 patent, FIG. 9, 10:33-11:15; Stevenson Decl., ¶¶34, 55-56, 69. The addition of the dark level bias to the sensing signal adjusts the combined signal (i.e., user [input] signal x scaled sensing signal) upward to generate a brightness control signal that is above a predetermined level. '117 patent, FIG. 9, 10:33-11:15; Stevenson Decl., ¶¶33-35.

FIG. 9



$$BCS5 = \overset{\text{User [Input] Signal}}{\text{binary \% fullscale}} \times \overset{\text{Dark Level Bias}}{\left[\left(\frac{VCC \times (R2 \times R3)}{(R1 \times R2) + (R1 \times R3) + (R2 \times R3)} + \overset{\text{Sensing Signal}}{USRC} \times R1 \times R2 \times R3 \right) \right]}$$

'117 patent, FIG. 9, 11:10-15 (annotations added). Although the equation for the Figure 9 preferred embodiment shows a mathematical model of the brightness control signal output by the circuit, the analog circuit in Figure 9 performs the math concurrently rather than sequentially. Stevenson Decl., ¶35. As shown in the equation, the same resistors that are part of the dark level bias appear in other terms in the mathematical equation indicating that the math is performed concurrently rather than sequentially in the circuit. *Id.*

The embodiments of the '117 patent are clear that the brightness control signal is generated from multiplication involving the user [input] signal and sensing signal and a mathematical adjustment by the dark level bias. Stevenson Decl., ¶¶15, 34-35. The specification, as well as the claims, do not require any specific order of operations. Stevenson Decl., ¶¶34-35. The embodiments show that the “dark level bias” can be used to adjust the combined signal based on the user [input] signal and sensing signal before, concurrently with, or after the multiplication. *Id.* For example, Figure 1 shows the dark level bias providing an adjustment prior to multiplication whereas Figure 2 shows the dark level bias providing an adjustment after multiplication. Figures 4, 8, and 9 show the dark level bias providing an adjustment concurrently with the multiplication. Stevenson Decl., ¶¶33-35.

Accordingly, the '117 patent teaches that the multiplier can output the brightness control signal, which occurs after a mathematical adjustment by the dark level bias, thereby encompassing the embodiments in which the dark level bias adjustment happens prior to, or concurrently with, multiplication.

As discussed above, the *multiplier circuit generates the brightness control signal*

using a multiplying function to correct for ambient light variations.

In one embodiment in which the user preference is indicated by a digital word, the *multiplier circuit* includes a digital-to-analog converter (DAC) to receive the digital word and *output a corresponding analog voltage as the brightness control signal*.
Id. at 3:31-33, 3:59-63 (emphasis added).

Finally, the '117 patent states that the multiplier “can be implemented using software algorithm or analog/mixed-signal circuitry.” *Id.* at 5:37-38; *see also id.* at 2:7-9, claim 16. A software multiplier, for instance, could calculate the brightness control signal in a single line of code thereby combining the user [input] signal and sense signal and adjusting with a dark level bias in a single software step not requiring any specific order of operations. Stevenson Decl., ¶¶33-35. In fact, this is exactly how the Office Action is asserting Pioneer by alleging that Equation 1 is the multiplier performing the multiplication and dark level bias adjustment in a single step to yield the alleged “brightness control signal.” Office Action, 12-15, 17.

B. The Claims Confirm that the Dark Level Bias Can Adjust the Combined Signal Before, Concurrently With, or After Multiplication

The Office Action appears to be premised on an incorrect understanding that the claims only cover embodiments where the dark level bias adjusts the output of the multiplier after multiplication, and therefore, excludes all embodiments other than the embodiment of Figure 2. Office Action, 8-10. However, that understanding is contrary to the specification as described in the preceding section and contrary to the language of the claims. Stevenson Decl., ¶¶33-35. The dependent claims of the '117 patent are clear that the claims cover adjustment of the combined signal by the dark level bias both before and after multiplication. Stevenson Decl., ¶34.

17. The method of claim 15, wherein *the dark level bias is added to the sense signal before selective multiplication* such that the amount of adjustment to the combined signal is dependent on the input signal.

18. 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.

Id. at claims 17-18 (emphasis added). Claim 17 specifically covers embodiments, like those in Figure 1, where “the dark level bias is added to the sense signal before selective multiplication.” Stevenson Decl., ¶34. Claim 18, in contrast, covers embodiments, like those in Figures 2 and 8, where “the dark level bias is added to the combined signal after selective multiplication.” *Id.*

Claims 17 and 18 both depend on claim 15, which is shown below.

15. A method to selectively provide ambient light correction, said method comprising:

receiving a user input signal indicative of a user selectable brightness setting;
selectively multiplying the input signal with a sense signal to generate a combined signal, wherein the sense signal indicates an ambient light level; and
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.

’117 patent, claim 15.

Therefore, claim 15, which is independent and necessarily broader than its dependent claims 17 and 18, must cover the adjustment by the dark level bias before, concurrently, and after multiplication thereby encompassing all of the preferred embodiments. If claim 15 only covered adjustments by the dark level bias after multiplication as the Office Action contends, it would be narrower than, and contradict, dependent claim 17, which expressly states “the dark level bias is added to the sense signal *before selective multiplication*.” *Id.* at claim 17. This would be clearly improper. *Littlefuse, Inc. v. Mersen USA EP Corp.*, 29 F.4th 1376, 1380 (Fed. Cir. 2022) (“By definition, an independent claim is broader than a claim that depends from it, so if a dependent claim reads on a particular embodiment of the claimed invention, the corresponding

independent claim must cover that embodiment as well.”); *Trustees of Columbia Univ. in City of New York v. Symantec Corp.*, 811 F.3d 1359, 1370 (Fed. Cir. 2016) (“[C]onstruing the independent claim to exclude material covered by the dependent claim would be inconsistent.”).

Similarly, the claims that depend on claim 1 cover embodiments wherein the dark level bias adjusts the “output of the multiplier” (i.e., dark level bias adjusts after multiplication) and embodiments where the multiplier generates the “brightness control signal” (i.e., dark level bias adjustment occurs before or concurrently with multiplication such that the multiplier generates the “brightness control signal”). Stevenson Decl., ¶¶32-35.

3. The brightness control circuit of claim 2, wherein the ***multiplier*** multiplies a sum of the user signal and the sensing signal by the dark level bias ***to generate an output signal corresponding to the brightness control signal***.

5. The brightness control circuit of claim 4, wherein the ***dark level bias is added to an output of the multiplier***.

10. The brightness control circuit of claim 1, wherein the ***multiplier*** is implemented with a pair of current-steering diodes having commonly connected anodes coupled to the sensing signal and respective cathodes coupled to the user signal and a network of resistors ***to generate the brightness control signal***.

11. The brightness control circuit of claim 1, wherein the user signal corresponds to a setting of a user adjustable potentiometer, and the ***multiplier is implemented*** with an isolation diode having an anode coupled to the sensing signal and a cathode coupled to the user adjustable potentiometer and a network of resistors ***to generate the brightness control signal***.

12. The brightness control circuit of claim 1, wherein the user signal corresponds to a digital word, and the ***multiplier is implemented*** with a digital-to-analog converter configured to receive the digital word and a reference signal determined by the sensing signal ***to generate the brightness control signal***.

Id. at claims 3, 5, 10-12 (emphasis added).

Therefore, claim 1, which is independent and thus necessarily broader than its dependent claims, must cover the adjustment by the dark level bias before, concurrently with, and after multiplication thereby encompassing all of the preferred embodiments. If claim 1 only covered adjustments by the dark level bias after multiplication as the Office Action contends, it would be narrower than, and contradict, dependent claims 3 and 10-12, which expressly state that the “multiplier” is implemented “to generate the brightness control signal” indicating that the dark level bias adjustment happens prior to or concurrent with multiplication as in preferred embodiments 1, 4, 8 and 9. ’117 patent, claims 3, 10-12, 4:46-61, 7:17-32, 10:33-11:15; Stevenson Decl., ¶¶17-19, 23-31. The Office Action’s interpretation is thus incorrect. *Littlefuse*, 29 F.4th at 1380 (“By definition, an independent claim is broader than a claim that depends from it, so if a dependent claim reads on a particular embodiment of the claimed invention, the corresponding independent claim must cover that embodiment as well.”); *Columbia Univ.*, 811 F.3d at 1370 (“[C]onstruing the independent claim to exclude material covered by the dependent claim would be inconsistent.”). The Office Action’s interpretation would similarly exclude all preferred embodiments except Figure 2 by the Examiner’s own admission, which is improper. *CUPP Computing AS v. Trend Micro Inc.*, 53 F.4th 1376, 1381 (Fed. Cir. 2022) (“[A] claim interpretation that excludes a preferred embodiment from the scope of the claim is rarely, if ever, correct.”); Office Action, 8-10.

The claims further confirm that the dark level bias performs a mathematical adjustment (e.g., added to) and is thus not a hard minimum or predefined threshold brightness. Stevenson Decl., ¶¶15, 34, 55-56, 69.

4. 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.
5. The brightness control circuit of claim 4, wherein the ***dark level bias is added*** to

an output of the multiplier.

17. The method of claim 15, wherein the *dark level bias is added* to the sense signal before selective multiplication such that the amount of adjustment to the combined signal is dependent on the input signal.

18. 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.

Id. at claims 4-5, 17-18 (emphasis added).

Therefore, the specification and claims of the '117 patent are unambiguous that the “dark level bias” performs a mathematical adjustment to the combined signal and is not a hard minimum or predefined threshold. Stevenson Decl., ¶¶15, 34, 55-56, 69. Further, the specification and claims of the '117 patent are unambiguous that the adjustment of the combined signal by the dark level bias can occur either before or after multiplication. *Id.* As a result, the claims under reexamination should be interpreted consistent with the specification and claim language to encompass the preferred embodiments in which the dark level bias can perform its mathematical adjustment either before or after multiplication.

C. The Office Action’s Exclusion of Preferred Embodiments From the Scope of the Claims Based on the Ability to Manually Turn Off the Display System Is Improper and Has No Basis in the Claim Language

The Office Action incorrectly interprets the reexamined claims so as to exclude every preferred embodiment except for Figure 2 based on the following reasoning. Office Action, 8-10.

Instead, the *brightness control signal is effectively zero in instances when both ambient light level and the user-selected brightness value are both zero*. That is, *when the user-selected brightness value* (denoted by “duty cycle” in the equation at column 7:20) *is zero, then the brightness control signal is zero*.

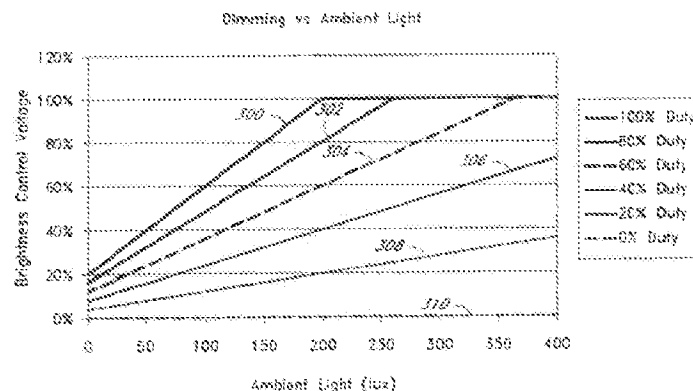
Id. (emphasis added). The Examiner further explained in the interview that the preferred embodiments other than the embodiment of Figure 2 were excluded because the “dark level bias”

does not maintain the brightness control signal above a predetermined level when the user-selected brightness value is zero (i.e., the display system is turned off).

The Office Action's interpretation of the claims, which it admits excludes preferred embodiments 1, 4, 8, and 9, is incorrect in light of the intrinsic evidence. *CUPP Computing*, 53 F.4th at 1381 (“[A] claim interpretation that excludes a preferred embodiment from the scope of the claim is rarely, if ever, correct.”), Office Action, 8-10. The Office Action's reasoning improperly focuses on what happens when the “user-selected brightness value” is “zero.” *Id.* **First**, context is important. Most of the embodiments of the '117 patent allow the user to manually turn off the display device. Stevenson Decl., ¶22. This is sensible considering that most devices with screens can be turned off by a user. *Id.* The '117 patent explains that, when the user setting is 0, the display system is turned off. *Id.* Of course, when the display system is turned off, the display has no brightness because it is off. *Id.*

Graph 310 lies substantially on top of the horizontal axis in accordance with the **sixth user setting corresponding to turning off the visual information display system**. For the other user settings (or user adjustable dimming levels), the brightness control signal increases (or decreases) with increasing (or decreasing) ambient light levels.

FIG. 3



'117 patent, FIG. 3, 6:1-6 (emphasis added). Therefore, because a user may manually turn off the screen, it is not unexpected that in most embodiments the brightness will be zero when the user has chosen to turn off the display system. Stevenson Decl., ¶22. Turning off the display (i.e., 0% duty) will result in the display having no brightness.

The Office Action contends that only the embodiment of Figure 2 is within the scope of the claims. Office Action, 8-10. Noticeably, Figure 2 is an embodiment that is specifically designed to “prevent a user” from turning off the display system. Stevenson Decl., ¶22.

In FIG. 2, the scaled dark level bias is added to the output of the multiplier circuit 106 to provide the predefined level of brightness in this case. This feature may be desired *to prevent a user from using the brightness control circuit to turn off a visual information display system*.

Id. at 5:38-43 (emphasis added).

Therefore, the Office Action’s interpretation of the claims would exclude any display system that can be turned off. This is contrary to the understanding of one of ordinary skill in the art and incorrect in light of the claim language. Stevenson Decl., ¶22. The Office Action does not identify any claim language that would exclude devices that can be turned off. That may be because, in fact, there is no such language in the claims.

Second, the Office Action’s focus on what happens when the “user-selected brightness value” is zero is misplaced. While the claims relate to what happens when the display is on and “the ambient light level decreases to approximately zero,” the question of what happens when the “user-selected brightness value” is zero (i.e., the display device is off) is wholly irrelevant to the claims. The claims have no requirement about what happens when the “user-selected brightness value” is zero (i.e., the display device is off). Stevenson Decl., ¶22.

1. A brightness control circuit with selective ambient light correction comprising:

a first input configured to receive a user signal indicative of a user selectable brightness setting;

a light sensor configured to sense ambient light and to output a sensing signal indicative of the ambient light level;

a multiplier configured to selectively generate a combined signal based on both the user signal and the sensing signal; and

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.

15. A method to selectively provide ambient light correction, said method comprising:

receiving a user input signal indicative of a user selectable brightness setting;

selectively multiplying the input signal with a sense signal to generate a combined signal, wherein the sense signal indicates an ambient light level; and

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.

'117 patent, claims 1, 15. Therefore, the Office Action's exclusion of all preferred embodiments wherein the "user-selected brightness value" can be set to zero (i.e., the display system can be manually turned off) is incorrect and unsupported by the actual language of the claims.

Patent Owner understands that there is no dispute that, if the display system is turned on (i.e., the user setting is not zero), then all preferred embodiments are within the scope of the claims because the dark level bias will maintain the brightness control signal above a predetermined level. Stevenson Decl., ¶22. For example, when the device is turned on (i.e., the user signal is non-zero), the dark level bias will maintain the brightness control signal above a predetermined level when the ambient light level decreases to approximately zero as shown in

the equations for Figures 4 (BCS1), 8 (BCS3), and 9 (BCS5). Stevenson Decl., ¶¶22, 24-25, 27-28, 30-31.

$$\begin{aligned}
 \text{BCS1} &= \overset{\text{User [Input] Signal}}{\boxed{\text{duty cycle}}} \times \left[\left(\frac{\overset{\text{Dark Level Bias}}{VCC \times R2 \times R4}}{[(R1 + R2) \times (R3 + R4)] + (R1 \times R2)} \right) + \right. \\
 &\quad \left. \overset{\text{Sensing Signal}}{\boxed{ISRC}} \times \frac{R1 \times R2 \times R4}{[(R1 + R2) \times (R3 + R4)] + (R1 \times R2)} \right] \\
 \\
 \text{BCS3} &= \left[\overset{\text{Dark Level Bias}}{VCC \times \frac{R3}{(R1 + R3)}} \right] + \left[\overset{\text{Sensing Signal}}{\boxed{ISRC}} \times \frac{\overset{\text{User [Input] Signal}}{\boxed{R3}} \times R1}{(R1 + R3)} \right] \\
 \\
 \text{BCS5} &= \overset{\text{User [Input] Signal}}{\boxed{\text{binary \% fullscale}}} \times \left[\left(\frac{\overset{\text{Dark Level Bias}}{VCC \times (R2 \times R3)}}{(R1 \times R2) + (R1 \times R3) + (R2 \times R3)} \right) + \right. \\
 &\quad \left. \overset{\text{Sensing Signal}}{\boxed{ISRC}} \times \frac{R1 \times R2 \times R3}{(R1 \times R2) + (R1 \times R3) + (R2 \times R3)} \right]
 \end{aligned}$$

Id. at 7:17-32, 10:9-12, 11:10-15 (annotations added).

Therefore, the Office Action improperly interpreted the claims to exclude the preferred embodiments of Figures 1, 4, 8, and 9, based on the fact that the user could turn off the display system in these embodiments by turning the “user-selected brightness value” to zero duty. There is no basis in the claim language to exclude embodiments where the display device can be turned off.

III. PIONEER DOES NOT RENDER OBVIOUS CLAIMS 1, 4-7, 15, 16, OR 18 OF THE '117 PATENT⁴

A. Pioneer Teaches Controlling Brightness With a Quadratic Function And Not Equation 1

Claim 1 relates to a “brightness control circuit,” and claim 15 relates to a “method to selectively provide ambient light correction.” Both claims 1 and 15 result in the generation of a “brightness control signal for controlling brightness of a visible display.” The Office Action points to Equation 1 in paragraph 120 of Pioneer as allegedly disclosing the “multiplier” and “multiplying” limitations of claims 1 and 15, respectively, as well as the “dark level bias” limitations of claims 1 and 15. Office Action, 12. For example, the Office Action points to portions of Equation 1 as allegedly disclosing the “multiplier,” “multiplying,” “user [input] signal,” “sensing signal,” “combined signal,” “dark level bias,” and “brightness control signal” of claims 1 and 15. *Id.*

The Office Action’s reliance on Equation 1 is misplaced and incorrect because Equation 1 is *not* used to control the brightness of the display. Stevenson Decl., ¶¶48-53. Rather, Pioneer discloses that a quadratic function based on the detected ambient brightness is used to calculate the actual illuminance of the display. Pioneer, ¶¶112, 121, 122, 124; Stevenson Decl., ¶48. As Pioneer explains, a quadratic function (not the linear function in Equation 1) is used to set the luminance characteristics line and derive the luminance adjustment value. Pioneer, ¶¶121-122, 124; Stevenson Decl., ¶48.

⁴ As confirmed by Examiner LaRose via telephone call on June 21, 2023, the pending rejection of claims 1, 4-7, 15, 16, and 18 is a single reference obviousness rejection in view of Pioneer.

[0121] *Quadratic function characteristics of the aforementioned luminance, which characteristics are used when setting the luminance characteristics line and deriving a luminance adjustment value* after setting the tentative characteristics line in step S9, are described next using FIG. 7.

Pioneer, ¶121 (emphasis added).

After deriving the luminance adjustment value from the quadratic function, Pioneer then “adjusts the actual luminance of the back light 36 using the set luminance adjustment value corresponding to the surrounding brightness detection value.” Pioneer, ¶124; Stevenson Decl., ¶52.

[0122] That is, in step S9, the *luminance adjustment value of the back light 36 is set so as to operate the drive circuit 37 that changes the actual luminance quadratically* (that is moderates the actual luminance change in a range where luminance in the tentative characteristics line is low or, on the other hand, steepens the actual luminance change in a range where luminance in the tentative characteristics line is high) based on the luminance in the aforementioned tentative characteristics line.

[0124] Next, the process derives the *luminance adjustment values corresponding to the detection value* (the detection valued classified into *50 stages*) of the surrounding brightness detected based on the set luminance characteristics line (step S9) and re-writes the table T in RAM 43 (step S10), and then, *adjusts the actual luminance of the back light 36 using the set luminance adjustment value corresponding to the surrounding brightness detection value*.

Id. at 122, 124 (emphasis added).

Pioneer states that the luminance adjustment values derived from the quadratic function correspond to the “surrounding detection brightness value,” indicating that the quadratic function utilizes the detection brightness value as its only input variable. Pioneer, ¶¶124, 128; Stevenson Decl., ¶52. Pioneer explains that the “surrounding brightness detected by the light sensor 25 [is] separated into, for example, 50 stages.” Pioneer, ¶57; Stevenson Decl., ¶52. The table T is

rewritten in RAM such that there is a luminance adjustment value for each of the 50 stages of ambient brightness detected by the light sensor. Pioneer, ¶¶124, 129; Stevenson Decl., ¶52. The lookup table T thus indexes each of the 50 stages of ambient brightness detected by the light sensor to a luminance adjustment value. Pioneer, FIG. 4, ¶128; Stevenson Decl., ¶52. The Pioneer system then uses the lookup table T to set the illuminance of the display based on the detected ambient brightness by the light sensor. Pioneer, ¶¶124, 128; Stevenson Decl., ¶52.

Pioneer's use of luminance adjustment values derived from a quadratic function that utilizes the detection brightness value as its only input variable is substantially different from the claims of the '117 patent, which require the brightness determination to be based on both the user [input] signal and the sensing signal. Pioneer, ¶¶124, 128; Stevenson Decl., ¶¶52-53.

1. A brightness control circuit with selective ambient light correction comprising: . . . a multiplier configured to selectively generate a ***combined signal based on both the user signal and the sensing signal***; and 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.
15. A method to selectively provide ambient light correction, said method comprising: . . . selectively ***multiplying the input signal with a sense signal to generate a combined signal***, wherein the sense signal indicates an ambient light level; and ***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.

'117 patent, claims 1, 15 (emphasis added).

Therefore, Pioneer discloses and teaches that a quadratic function based on the detected ambient brightness by the light sensor is used to control brightness and ***not*** the linear Equation 1

in paragraph 120. Stevenson Decl., ¶52. The quadratic function offers several advantages over the linear Equation 1. Stevenson Decl., ¶49. For example, the quadratic function generates a smoother curve (i.e., without big inflection points) that “moderates the actual luminance change” when luminance is low and “steepens the actual luminance change” where luminance is high. Pioneer, ¶122; Stevenson Decl., ¶49. This is a significant alteration of the non-linear shape of the curve and the brightness values as compared to Equation 1. Stevenson, ¶49. Using the quadratic function, Pioneer intentionally flattens the curve when ambient light is low and steepens the curve when the ambient light is high to better approximate how the human eye perceives light, which is on a logarithmic scale. Stevenson, ¶49; Pioneer, ¶¶122-23. As a result, the luminance adjustment values calculated by the quadratic will be significantly different from the values calculated by the linear equation. Stevenson Decl., ¶49.

Furthermore, Pioneer offers no explanation of whether or how Equation 1 (shown below) is used in the Pioneer system. Stevenson Decl., ¶48.

$$(A) \ y_n = \{(y_{S2} - y_{S1}) / (x_{S2} - x_{S1})\} (x_n - x_{S1}) + y_{S1} \\ \text{(when } x_n \leq x_{S2})$$

Pioneer, ¶120. Similarly, the Office Action does not explain how the Equation 1 is used in the Pioneer system. There is no disclosure in Pioneer that “ y_n ” in Equation 1 is ever actually calculated for the detected ambient brightness values. Stevenson Decl., ¶¶48, 51, 53.

Additionally, Pioneer does not disclose or suggest that “ y_n ” is ever used for any specific purpose relating to brightness. Stevenson Decl., ¶¶48, 51, 53. There is also no disclosure of whether, or how, “ y_n ” and Equation 1 relate to the quadratic equation actually used to control brightness in the Pioneer system. Stevenson Decl., ¶¶48, 51, 53. There is no disclosure in Pioneer that “ y_n ” or Equation 1 plays any role in setting the luminance adjustment values derived from the quadratic function. While Pioneer does mention setting a “tentative characteristics line,” that does not

mean that “yn” or Equation 1 is every actually calculated. Stevenson, ¶¶48, 51, 53. As Dr.

Stevenson explains, software does not actually draw a line or graph such that it would need to calculate values. Stevenson Decl., ¶¶48, 51, 53. Rather, “setting a line” merely means that Pioneer uses values for user set points S1, S2, and S3 to determining the quadratic formula for the luminance characteristics line, which only takes the ambient light as an input. Stevenson Decl., ¶¶48, 51, 53. Pioneer thus lacks any clear disclosure that “yn” or Equation 1 is used in determining the luminance adjustment values or controlling brightness. Stevenson Decl., ¶¶48, 51, 53.

B. Pioneer Does Not Disclose or Suggest The “Multiplier” Element of Claim 1 or the “Multiplying” Element of Claim 15.

Pioneer does not disclose or suggest “a multiplier configured to selectively generate a combined signal based on both the user signal and the sensing signal” in claim 1 and “selectively multiplying the input signal with a sense signal to generate a combined signal, wherein the sense signal indicates an ambient light level” in claim 15 (collectively “multiplier limitations”). Stevenson Decl., ¶¶48, 51-53. The Office Action points to only the portion of Equation 1 in paragraph 120 of Pioneer that reads “ $\{(yS2 - yS1) / (xS2 - xS1)\} * (xn - xS1)$ ” for the multiplier limitations, wherein “yS2” is purportedly the “user [input] signal” and “xn” is purportedly the sensing signal. Office Action, 12, 16-17.

$$(A) \ y_n = \{(yS2 - yS1) / (xS2 - xS1)\} (x_n - xS1) + yS1 \\ \text{(when } x_n \leq xS2)$$

Pioneer, ¶120.

However, Pioneer does not disclose or suggest the multiplier limitations because it does not use the Equation 1 relied on in the Office Action to control the brightness. Stevenson Decl., ¶¶48, 51-53. Rather, brightness is controlled using a quadratic equation as explained in the

preceding section. Stevenson Decl., ¶¶48, 51-53. Pioneer thus fails to disclose or suggest the multiplier limitations for the reasons discussed below.

Pioneer does not disclose or suggest a “multiplier configured to selectively generate a *combined signal*” or “multiplying the input signal with a sense signal to generate a *combined signal*.” Stevenson Decl., ¶¶48, 51-53. In claims 1 and 15, the “combined signal” is used in generating the brightness control signal that is used to control the actual brightness of the display.

1. A brightness control circuit with selective ambient light correction comprising: . . .

a ***multiplier configured to selectively generate a combined signal*** based on both the user signal and the sensing signal; and

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.

15. A method to selectively provide ambient light correction, said method comprising: . . .

selectively ***multiplying*** the input signal with a sense signal ***to generate a combined signal***, wherein the sense signal indicates an ambient light level; and

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.

’117 patent, claims 1, 15 (emphasis added).

The Office Action asserts that a portion of Equation 1 in paragraph 120 of Pioneer is the “multiplier” that generates the “combined signal” of “ $\{(yS2 - ySl) / (xS2 - xSl)\} * (xn - xSl)$.” Office Action, 12, 16-17. However, there is no disclosure in Pioneer of Equation 1 being used in any way to generate a signal to control the brightness of the display. Stevenson Decl., ¶¶48, 51-

53. Rather, from the user's selected points S1, S2, and S3, the system creates a quadratic fit line based on the detected ambient brightness to control the luminance, or brightness, of the display. Stevenson Decl., ¶¶48, 51-53. As Pioneer explains, a quadratic function (not the linear function in Equation 1) is used to set the luminance characteristics line and derive the luminance adjustment value. Pioneer, ¶¶121-122, 124; Stevenson Decl., ¶¶48, 51-53.

[0121] *Quadratic function characteristics of the aforementioned luminance, which characteristics are used when setting the luminance characteristics line and deriving a luminance adjustment value* after setting the tentative characteristics line in step S9, are described next using FIG. 7.

Id. at ¶121 (emphasis added).

After deriving the luminance adjustment value from the quadratic function, Pioneer then “adjusts the actual luminance of the back light 36 using the set luminance adjustment value corresponding to the surrounding brightness detection value.” Pioneer, ¶124; Stevenson Decl., ¶52.

[0122] That is, in step S9, the *luminance adjustment value of the back light 36 is set so as to operate the drive circuit 37 that changes the actual luminance quadratically* (that is moderates the actual luminance change in a range where luminance in the tentative characteristics line is low or, on the other hand, steepens the actual luminance change in a range where luminance in the tentative characteristics line is high) based on the luminance in the aforementioned tentative characteristics line.

[0124] Next, the process derives the *luminance adjustment values corresponding to the detection value* (the detection valued classified into *50 stages*) of the surrounding brightness detected based on the set luminance characteristics line (step S9) and re-writes the table T in RAM 43 (step S10), and then, *adjusts the actual luminance of the back light 36 using the set luminance adjustment value corresponding to the surrounding brightness detection value.*

Id. at 122, 124 (emphasis added). Pioneer states that the luminance adjustment values derived from the quadratic function correspond to the “surrounding detection brightness value” indicating that quadratic function utilizing the detection brightness value as its only input variable. *Id.* at ¶¶124, 128; Stevenson Decl., ¶52.

Therefore, Pioneer is clear that the system changes the brightness of the display using a quadratic function and **not** the linear Equation 1. Stevenson Decl., ¶¶48, 51-53. The Pioneer system takes the user set points and uses a quadratic function to generate the luminance adjustment values that set the actual brightness of the display. Stevenson Decl., ¶¶48, 51-53. The luminance adjustment values generated by the quadratic equation will be significantly different than those that would be calculated using Equation 1. Stevenson Decl., ¶49. For example, a quadratic function can generate a curve that is smoother (i.e., without big inflection points) with a changing slope throughout the curve that “moderates the actual luminance change” at low ambient light level and “steepens the actual luminance change” when the ambient light level is high. Stevenson Decl., ¶49; Pioneer, ¶122. The reason for the different slopes at different points in the brightness curve is to approximate how the human eye perceives light. Stevenson Decl., ¶49; Pioneer, ¶123. The human eye perceives light on a logarithmic scale, which the quadratic function attempts to approximate by making luminance adjustments smaller in lower ambient light levels and steeper at higher ambient light levels. Stevenson Decl., ¶49; Pioneer, ¶122. The luminance adjustment values derived from the quadratic function are thus significantly different than the values that could be derived from Equation 1. Stevenson Decl., ¶49. As a result, the values calculated from Equation 1 does not resemble the values derived from the quadratic equation.

Furthermore, Pioneer lacks disclosure of whether, and how, Equation 1 is used. Stevenson Decl., ¶¶48, 51-53. There is no disclosure in Pioneer that Equation 1, or the portion

relied on in the Office Action as the “combined signal” (i.e., “ $\{(y_{S2} - y_{S1}) / (x_{S2} - x_{S1})\} * (x_n - x_{S1})$ ”), is used to control brightness. Stevenson Decl., ¶¶48, 51-53. There is no disclosure in Pioneer that Equation 1, or the portion relied on in the Office Action as the “combined signal” (i.e., “ $\{(y_{S2} - y_{S1}) / (x_{S2} - x_{S1})\} * (x_n - x_{S1})$ ”), plays any role in setting the luminance adjustment values derived from the quadratic function. Stevenson Decl., ¶¶48, 51-53. Indeed, the Office Action does not identify any such disclosures in Pioneer.

While Pioneer does mention setting a “tentative characteristics line,” that does not mean that “ y_n ” or Equation 1 is ever actually calculated. Stevenson, ¶51. As Dr. Stevenson explains, software does not actually draw a line or graph such that it would need to calculate values. *Id.* Rather, “setting a line” merely means that Pioneer uses values for user set points S1, S2, and S3 to determine the quadratic formula for the luminance characteristics line, which only takes the ambient light as an input. *Id.* Pioneer thus lacks any clear disclosure that Equation 1 is used in any way in determining the luminance adjustment values derived from the quadratic function or controlling brightness. Stevenson Decl., ¶¶48, 51-53.

Both claims 1 and 15 require that the “combined signal” be used to generate the “brightness control signal that is used to control a brightness level of a visible display.” ’117 patent, claim 1 (“a multiplier configured to selectively generate *a combined signal* . . . 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 15. The result of Pioneer changing brightness using a quadratic equation rather than Equation 1 is that “ $\{(y_{S2} - y_{S1}) / (x_{S2} - x_{S1})\} * (x_n - x_{S1})$,” which is only a portion of Equation 1, cannot be the “combined signal” as it plays no role in setting the actual brightness of the display. Stevenson Decl., ¶¶48, 51-53; Pioneer, ¶¶112, 121, 122. There is no evidence in the record that the alleged “combined signal” (i.e., “ $\{(y_{S2} - y_{S1}) / (x_{S2} - x_{S1})\} * (x_n - x_{S1})$ ”) is actually used in any way in performing brightness control or

in the quadratic function that calculates the luminance adjustment values that actually determine the brightness of the display. Stevenson Decl., ¶¶48, 51-53.

C. Pioneer Does Not Disclose or Suggest the “Dark Level Bias” Recited in Claims 1 and 15

With regard to the “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” limitation of claim 1 or the “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” limitation of claim 15 (collectively “dark level bias limitations”), the Office Action admits that Pioneer does not expressly disclose a “dark level bias” stating “Pioneer does not appear to expressly teach that the dark level bias value (i.e., y_{S1}) is configured to adjust the combined signal so as to generate a brightness control signal ‘such that the brightness control signal is maintained above a predetermined level when the ambient light level decreases to approximately zero,’ as claimed.” Office Action, 12-13. The Office Action also alleges that “the ‘ y_{S1} ’ of Equation 1 at paragraph [0120]” could theoretically be a “dark level bias” in a specific edge case where a non-zero value of y_{S1} is entered where $x_n=0$. Office Action, 12-13. The Office Action further alleges that “ y_n ” is the brightness control signal. Office Action, 12.

Contrary to the Office Action, Pioneer does not disclose or suggest the “dark level bias” limitations of claims 1 and 15. Pioneer fails to disclose or suggest a “brightness control signal” because, as previously discussed, Pioneer does not utilize “ y_n ” and the equation relied upon in the Office Action to control brightness. Additionally, “ y_{S1} ” cannot be a “dark level bias,” not

only because there is no “brightness control signal” or “combined signal” as identified in the Office Action, but also because the hypothetical situation relied upon in the Office Action is contrary to the teachings of Pioneer and the proffered theory has been rejected previously by the PTAB.

First, “yn” is not “a brightness control signal” as alleged by the Office Action because it does not “control a brightness level of a visible display” as required by claims 1 and 15. As an initial matter, Equation 1 is not used to control the brightness of the visible display. As described above in Section III.A, linear Equation 1 is not used to control the brightness of the display in Pioneer. Rather, an entirely different equation, a quadratic function, is used. Pioneer, ¶¶121-124; Stevenson Decl., ¶¶48, 51-53. As Pioneer explains, a quadratic function (not the linear function in Equation 1) is used to set the luminance characteristics line and derive the luminance adjustment value. Pioneer, ¶¶121-122, 124; Stevenson Decl., ¶¶48, 51-53.

[0121] ***Quadratic function characteristics of the aforementioned luminance, which characteristics are used when setting the luminance characteristics line and deriving a luminance adjustment value*** after setting the tentative characteristics line in step S9, are described next using FIG. 7.
Pioneer ¶121 (emphasis added).

After deriving the luminance adjustment value from the quadratic function, Pioneer then “adjusts the actual luminance of the back light 36 using the set luminance adjustment value corresponding to the surrounding brightness detection value.” Pioneer, ¶124; Stevenson Decl., ¶49.

[0122] That is, in step S9, the ***luminance adjustment value of the back light 36 is set so as to operate the drive circuit 37 that changes the actual luminance quadratically*** (that is moderates the actual luminance change in a range where luminance in the tentative characteristics line is low or, on the other hand, steepens the actual luminance change in a range where luminance in the tentative

characteristics line is high) based on the luminance in the aforementioned tentative characteristics line.

[0124] Next, the process derives the *luminance adjustment values corresponding to the detection value* (the detection value classified into *50 stages*) of the surrounding brightness detected based on the set luminance characteristics line (step S9) and re-writes the table T in RAM 43 (step S10), and then, *adjusts the actual luminance of the back light 36 using the set luminance adjustment value corresponding to the surrounding brightness detection value*.

Pioneer, ¶¶122, 124 (emphasis added). Pioneer states that the luminance adjustment values derived from the quadratic function correspond to the “surrounding detection brightness value” indicating that quadratic function utilizing the detection brightness value as its only input variable. Pioneer, ¶¶124, 128; Stevenson Decl., ¶52.

The Pioneer system thus does *not* change the brightness linearly and does *not* use the linear equation shown as Equation 1 in paragraph 120 to change the actual brightness of the display. Stevenson Decl., ¶¶48, 51-53. Rather, the Pioneer system takes the user set points and uses a quadratic function to generate the actual brightness value for the display. Stevenson Decl., ¶51; Pioneer, FIG. 7, ¶¶112, 121, 122. The brightness values generated by the quadratic equation will be significantly different than those that would be calculated using Equation 1. Stevenson Decl., ¶49. For example, a quadratic function can generate a curve that is smoother (i.e., without big inflection points) that “moderates the actual luminance change” when luminance is low and “steepens the actual luminance change” where luminance is high. Pioneer, ¶122. This is a significant alteration of the shape of the curve and the brightness values as compared to Equation 1. Stevenson Decl., ¶49. Using the quadratic function, Pioneer intentionally flattens the curve when ambient light is low and steepens the curve when the ambient light is high to better approximate how the human eye perceives light, which is on a logarithmic scale. Stevenson Decl., ¶49; Pioneer, ¶¶122-23.

There is no disclosure in Pioneer that “yn” from Equation 1 is used in any way in determining the luminance adjustment values from the quadratic function that controls the actual brightness of the display. Stevenson Decl., ¶¶48, 51-53. In fact, there is no disclosure in Pioneer of “yn” being used to control brightness in any manner. Stevenson Decl., ¶¶48, 51-53. There is not even a disclosure of “yn” values even being actually calculated in Pioneer system. Stevenson Decl., ¶¶48, 51-53. Furthermore, “yn” in Equation 1 is described as an “input value” and not a brightness signal. Pioneer, ¶118. For example, Pioneer states “the input value input from the adjusting keys 38a through 38d as yn” and “the setting value set based on the detection value xn and the input value yn.” Pioneer, ¶119. Pioneer itself describes “yn” as an “input value” which contradicts the Office Action’s position that it is a “brightness control signal.” The Office Action similarly does not state specifically how “yn” is “a brightness control signal that is used to control a brightness level of a visible display” when the brightness level is controlled by the luminance adjustment values derived from a quadratic function, which is an entirely different equation than Equation 1.

Therefore, because there is no disclosure in Pioneer that “yn” and Equation 1 are used to control the brightness of the display in Pioneer, “yn” in Equation 1 cannot be a “brightness control signal for controlling brightness of a visible display” as required by claims 1 and 15. As a result, Pioneer does not teach the “dark level bias” limitations.

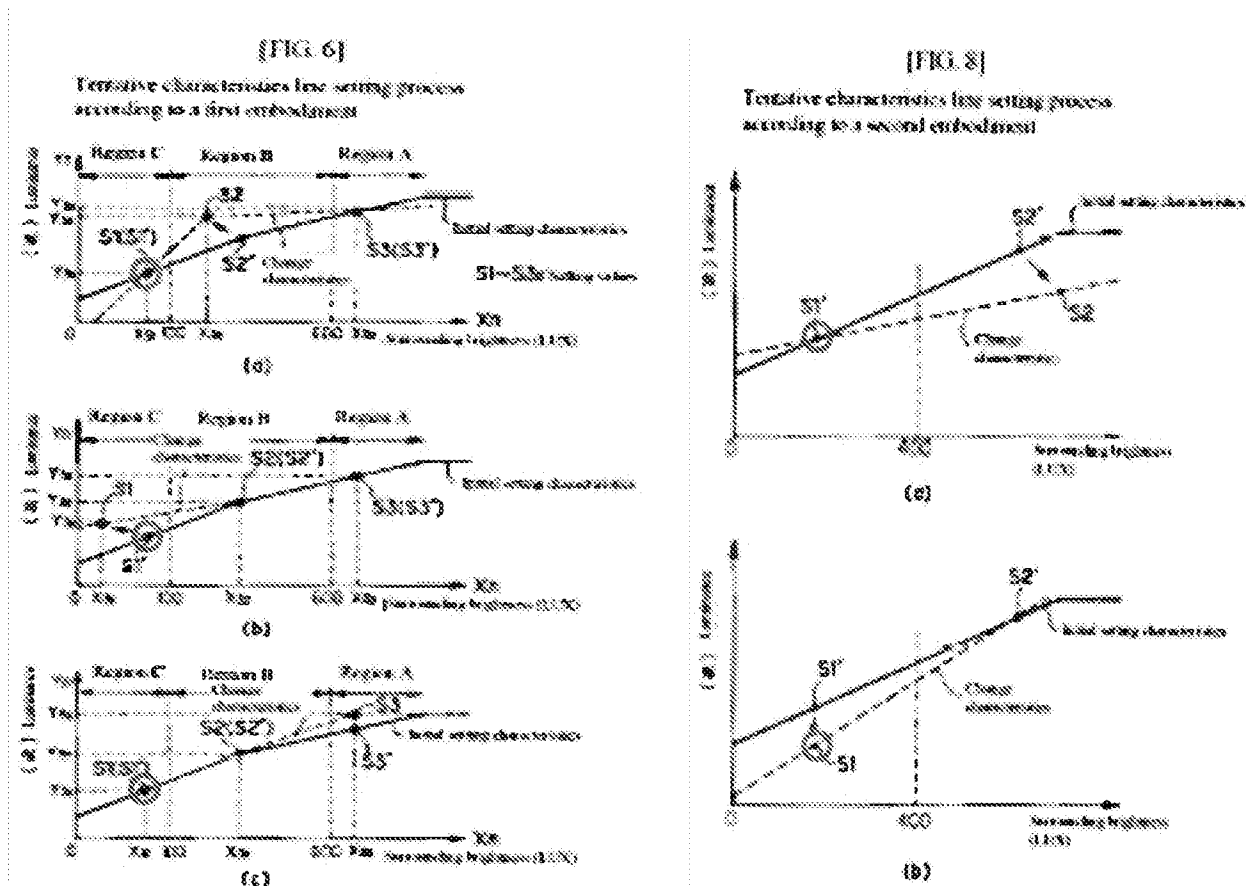
Second, “yS1” cannot be a “dark level bias” because it does *not* maintain the brightness “above a predetermined level when the ambient light level decreases to approximately zero.” There can be no reasonable dispute that “yn” does not set the brightness level of the display in Pioneer. As explained in Section III.A, Pioneer uses a quadratic function to derive luminance adjustment values that are used to actually determine the brightness of the display. Stevenson Decl., ¶¶48, 51-53; Pioneer, ¶¶121-124, 128. There is no disclosure or teaching of how “yS1”

maintains the luminance adjustment values determined from the quadratic function above a predetermined level. Stevenson Decl., ¶¶54-56. Therefore, because “yS1” does not maintain the luminance adjustment values from the quadratic function above a predetermined level, “yS1” is not a “dark level bias” because it cannot maintain the brightness “above a predetermined level when the ambient light level decreases to approximately zero.” Stevenson Decl., ¶¶54-56. There is also no disclosure or teaching that “yn” is actually calculated or used in determining the ultimate brightness of the display. Stevenson Decl., ¶¶48, 51-53. Therefore, any effect of “yS1” on “yn” is irrelevant to the claims of the ’117 patent. As a result, there is no teaching or disclosure of that “yS1” maintains the brightness of the display “above a predetermined level when the ambient light level decreases to approximately zero” as stated in claims 1 and 15. Stevenson Decl., ¶¶54-56.

Third, even if Equation 1 was used (which it is not), the Office Action’s allegation that “yS1” could be a “dark level bias” if set when $x_n = 0$ is contrary to the express teachings of Pioneer. Stevenson Decl., ¶¶54-56. The Office Action admits that Pioneer does not “expressly” teach a “dark level bias,” stating “Pioneer does not appear to expressly teach that the dark level bias value (i.e., yS1) is configured to adjust the combined signal so as to generate a brightness control signal ‘such that the brightness control signal is maintained above a predetermined level when the ambient light level decreases to approximately zero,’ as claimed.” Office Action, 12-13. Thus, there appears to be no dispute that there is no express teaching of setting “yS1” in darkness where $x_n = 0$. Further, there appears to be no dispute that Pioneer does **not** teach using “yS1” as a “dark level bias” to maintain the brightness control signal “above a predetermined level when the ambient light level decreases to approximately zero.”

Given the admitted lack of disclosure of a “dark level bias,” the Office Action speculates that, in an odd, edge case scenario, the “yS1” could theoretically achieve the result of a “dark

level bias.” Office Action, 12-15. Specifically, the Office Action claims that one could set “yS1” in the specific situation of absolute darkness, at $x_n = 0$, to provide a minimum brightness (assuming Equation 1 set the brightness). *Id.* However, this is unsupported by Pioneer’s specification. Stevenson Decl., ¶54. There is no disclosure in Pioneer of setting “yS1” when $x_n = 0$. *Id.* To the contrary, “yS1” is always shown as being set in the middle of the region at an ambient brightness that is not close to $x_n = 0$. *Id.*



Pioneer, Figs. 6, 8 (annotations added).

Further, Pioneer expressly teaches a completely different system for a minimum brightness that does not involve “yS1.” Stevenson Decl., ¶¶55-56. Specifically, Pioneer teaches having a preset minimum brightness that overrides or replaces any brightness calculation. *Id.*

Such minimum thresholds are not a “dark level bias” because they do not perform a mathematical adjustment of brightness signals. *Id.*

At this time, in cases where *luminance maximum and minimum values are preset* after a luminance characteristics line has reached the maximum or minimum value thereof, the *line becomes parallel to each surrounding brightness axis (x axis)*. Pioneer, ¶118 (emphasis added). The fact that the line becomes “parallel” to the x-axis indicates that the minimum would replace any calculated brightness value with a preset value, which is a substitution for, *not* a mathematical adjustment of, any calculated brightness value. Stevenson Decl., ¶¶55-56.

The PTAB previously found that a preset minimum brightness level like that disclosed in Pioneer is *not* a “dark level bias.” In a prior *inter partes* review (“IPR”) proceeding, the PTAB rejected this same argument that a set “minimum” brightness” is a “dark level bias.”

However, the *claim limitation recites more than merely maintaining screen brightness above a minimum level; it recites maintaining the screen brightness above a minimum level in a particular way* that is not sufficiently addressed by Petitioner or Dr. Hobbs. *Even assuming maintaining screen brightness above a minimum level to adapt for dark conditions was a well-known solution, Petitioner has not sufficiently established that one of ordinary skill in the art would apply the solution in the manner claimed by Patent Owner.* Specifically, Petitioner has not established that the combination of Thayer and Godwin teaches *the dark level bias adjustment of the combined signal as claimed*, or that performing the dark level bias adjustment of the combined signal (as opposed to, for example, performing the adjustment in some other manner) would have been obvious to one of ordinary skill in the art.

Ex. B, *Samsung*, IPR2018-01262, Paper 14 at 14-15 (emphasis added). Rather, as the PTAB recognized, the claims require a “dark level bias” that adjusts the “combined signal” to generate a “brightness control signal.” This is not disclosed or suggested by just having a preset minimum brightness as described in Pioneer. *Id.* Therefore, Pioneer, at most, teaches using a “preset”

minimum, which the PTAB already found is **not** a “dark level bias,” and teaches against using “yS1” in any way relating to a minimum brightness. Stevenson Decl., ¶¶55-56.

Fourth, even if Equation 1 was used (which it is not), “yS1” cannot be a “dark level bias” because it is not “*configured to* adjust the combined signal to generate a brightness control signal that is used to control a brightness level of a visible display.” The district court construed “configured to” in the “dark level bias” limitation to mean “actually programmed or implemented with hardware or software to.” Ex. G, 17. This is consistent with how one of ordinary skill in the art would understand “configured to” in the “dark level bias” limitation of claim 1. Stevenson Decl., ¶¶56-57. The Office Action admits that “Pioneer does not appear to expressly teach that the dark level bias value (i.e., yS1) is configured to adjust the combined signal so as to generate a brightness control signal ‘such that the brightness control signal is maintained above a predetermined level when the ambient light level decreases to approximately zero,’ as claimed.” Office Action, 12-13. Further, the Office Action states that “yS1” only “appears to function” as a “dark level bias” “in the instance where a user sets the ySl value when the ambient light level is zero (i.e., xSl = 0).” Office Action, 13.

The fact that the Office Action alleges that “yS1” “appears to function” as a “dark level bias” in only one isolated instance is definitive proof that it is not “*configured to* adjust the combined signal to generate a brightness control signal.” Stevenson Decl., ¶¶56-57. If “yS1” was “*configured to* adjust the combined signal to generate a brightness control signal,” then yS1 would be programmed or implemented to adjust the combined signal as a matter of course in normal operation of the system and not accidentally (and theoretically) in only one isolated instance not taught in Pioneer as the Office Action proposes. Office Action, 12-15; Stevenson Decl., ¶¶56-57. Therefore, as implicitly acknowledged in the Office Action, “yS1” cannot be a

“dark level bias” because it is not “configured to adjust the combined signal to generate a brightness control” because it is not programmed or implemented to do so in the Pioneer system.

D. Pioneer Does Not Disclose or Suggest “A First Input Configured To Receive a User Signal” and “Receiving a User Input Signal Indicative of a User Selectable Brightness Setting” in Claims 1 and 15.

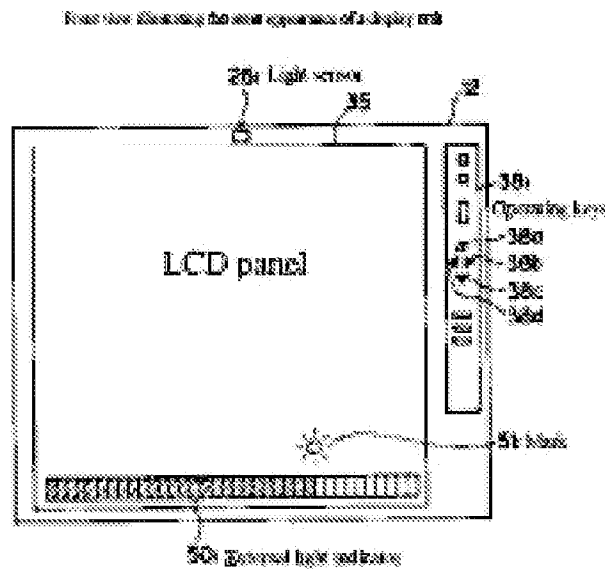
The Office Action relies on Pioneer as allegedly disclosing “a first input configured to receive a user signal indicative of a user selectable brightness setting” in independent claim 1 and “receiving a user input signal indicative of a user selectable brightness setting” in independent claim 15 (collectively, “user [input] signal limitations”).⁵

Pioneer does not disclose or suggest the user [input] signal limitations of claims 1 and 15. *First*, Pioneer does not disclose or suggest “*a first input* configured to receive a user signal indicative of a user selectable brightness setting” in independent claim 1. Claim 1 recites a “brightness control circuit” with “a first input,” which *receives* the “user signal.” The Office Action identifies “keys 38a-38d” as the “first input.” However, “keys 38a-38d” cannot be the “first input” as it is contrary to the plain language of the claims. Specifically, “keys 38a-38d” are physical buttons that are pushed by a human operator and are thus incapable of receiving any hardware or software signals, including a “user signal indicative of a user selectable brightness setting.” Pioneer, FIG. 2, ¶¶54, 72-73, 104-106.

⁵ Claims 1 uses the term “user signal” while claim 15 uses the term “user input signal.”

These are referred to collectively as “user [input] signal.”

[FIG. 2]



Pioneer, FIG. 2. Accordingly, the Office Action fails to identify a “first input configured to receive a user [input] signal indicative of a user selectable brightness setting” as required by claims 1 and 15.

Second, the Office Action fails to identify a “user [input] signal” *and* a “user selectable brightness setting,” which are two separate claim elements recited by claims 1 and 15. Rather, the Office Action appears to state that “yS2” in Pioneer is *both* the “user [input] signal” and a “user selectable brightness setting.” For example, the Office Action states that “the input value is denoted as yS2 and corresponds to a user-selected luminance value” indicating that yS2 is a “user selectable brightness setting.” Office Action, 11-12, 16. Then, the Office Action refers to “the user signal yS2.” Office Action, 12, 17.

The Office Action’s analysis identifying the same structure, “yS2,” as both the “user [input] signal” and a “user selectable brightness signal” is contrary to Federal Circuit precedent and the plain language of the claims. Under well-established precedent, the “user [input] signal” and “user selectable brightness setting” must be two separate structures as they are separate claim limitations. *HTC Corp. v. Cellular Commc’n. Equip. LLC*, 701 F. App’x. 978, 982 (Fed.

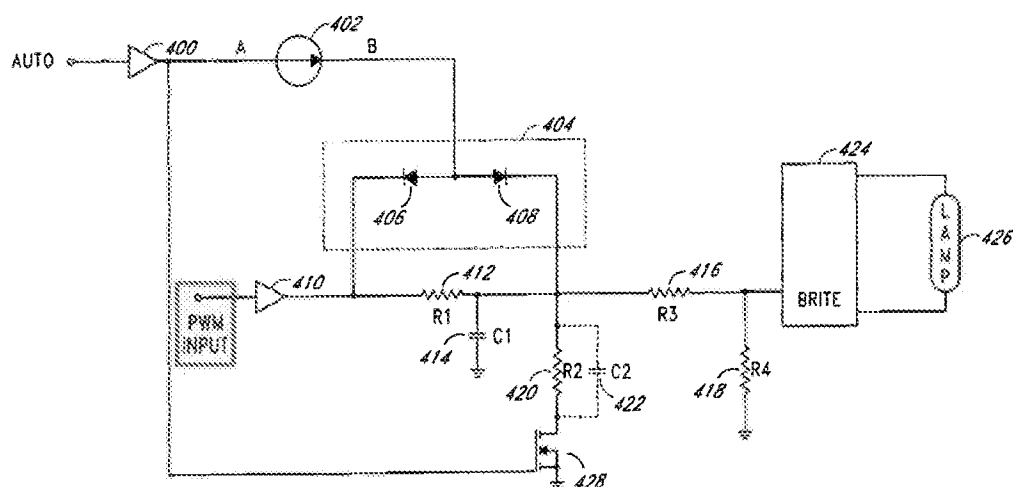
Cir. 2017) (“The separate naming of two structures in the claim strongly implies that the named entities are not one and the same structure.”); *Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010) (“Where a claim lists elements separately, the clear implication of the claim language is that those elements are distinct component[s] of the patented invention.”). Furthermore, because claims 1 and 15 recite “a user [input] signal indicative of a user selectable brightness setting,” the “user [input] signal” and “user selectable brightness setting” must be different elements as one is indicative of the other according to the claim language. Therefore, “yS2” cannot be both a “user [input] signal” and “user selectable brightness setting” as the Office Action contends because that would be contrary to the claim language and Federal Circuit precedent.

In the ’117 patent, the distinction between “user [input] signal” and “user selectable brightness setting” is important. The “user selectable brightness setting” is chosen by the user whereas the “user [input] signal” is a signal (e.g., voltage or software signal) generated by the internal circuitry and/or software of the device. Stevenson Decl., ¶31, 38. For example, in Figure 4, the user chooses a screen brightness setting. The microprocessor takes that information and generates a pulse width modulation (“PWM”) signal, which is the “user [input] signal” received by the “first input” of the “brightness control circuit.” Stevenson Decl., ¶¶23-25. That PWM user signal generated by the microprocessor is different than the “user selectable brightness setting.”

The PWM logic signal can be generated by a microprocessor based on user preference.

A microprocessor can generate the user adjustable PWM logic signal based on user input...

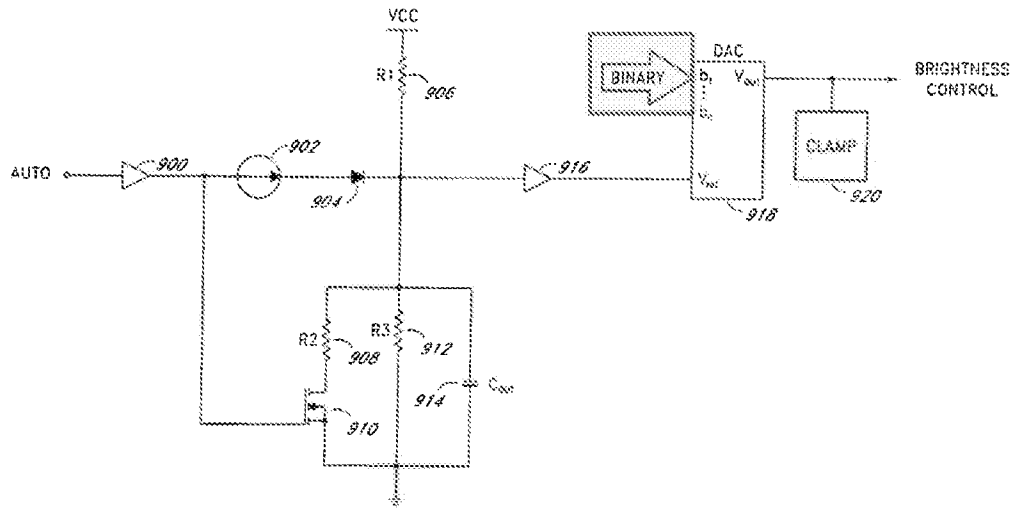
FIG. 4



'117 patent, FIG. 4, 3:23-24, 6:28-31 (annotations and emphasis added).

Similarly, the “user [input] signal” in Figure 9 is a binary word, which is a series of 0s and 1s (e.g., 00101110). '117 patent, 3:59-4:4, 4:35-37, 10:33-43; Stevenson Decl., ¶31. A user does not enter a binary word. *Id.* The binary word is a “user [input] signal” generated by the device’s software. *Id.* While it may be indicative of a “user selectable brightness setting,” the binary word “user [input] signal” is *not* a “user selectable brightness setting.” *Id.*

FIG. 9



'117 patent, FIG. 9 (annotations added). Thus, the specification demonstrates that a “user [input] signal” is different from a “user selectable brightness setting.”

The Office Action fails to identify both an alleged “user [input] signal” and a “user selectable brightness setting.” Accordingly, Pioneer has not been shown to disclose or suggest both of these limitations of the claims of the '117 patent.

* * *

For all of these reasons, Pioneer thus cannot render obvious the claims of the '117 patent.

IV. THE COMBINATION OF PIONEER AND OTTENSTEIN DOES NOT RENDER OBVIOUS CLAIM 9 OF THE '117 PATENT

Claim 9 recites “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.” The Office Action asserts that Claim 9 is unpatentable over Pioneer and Ottenstein. Office Action, 18. For the same reasons

that Pioneer does not disclose or suggest claim 1 (*see* Section III, *supra*), Pioneer cannot render obvious claim 9, even in combination with Ottenstein.

The Office Action asserts that Pioneer does not disclose or suggest the “second input configured to receive a selection signal” limitation of claim 9, for which the Office Action relies on Ottenstein. Office Action, 18. While Patent Owner does not dispute that Ottenstein includes a manual mode and an automatic mode, this alone is not enough to satisfy the recited limitations of Claim 9. Particularly, as explained above in Section III, Pioneer fails to disclose or suggest the “multiplier” and “dark level bias” limitations.⁶ Furthermore, the combination of Ottenstein and Pioneer does not teach or suggest a “selection signal” that “enables the light sensor in the auto mode and disables the light sensor in the manual mode.” Stevenson Decl., ¶61. Tellingly, the Office Action does not identify any teaching in Ottenstein of a “selection signal” that *enables or disables the light sensor* as required by claim 9. Office Action, 18-19. In fact, the Office Action does not even allege that Ottenstein teaches enabling or disabling the light sensors. *Id.* Because neither reference, alone or in combination, teaches the predicate elements of Claim 1 as discussed above in Section III or the new element of claim 9, the combination fails to render Claim 9 obvious.

⁶ The PTAB also has found previously that Ottenstein fails to disclose a “dark level bias.” Ex. D, *LG*, IPR2020-01283, Paper 9 at 40-42.

V. THE COMBINATION OF NARVESON AND WHITTED DOES NOT RENDER OBVIOUS CLAIM 15 OR 16 OF THE '117 PATENT

A. There Is No Motivation to Combine Narveson and Whitted Regarding the “Dark Level Bias” Limitation of Claim 15

Claim 15 requires “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.” The Office Action admits that Narveson does not disclose or suggest this element of claim 15. Office Action, 20. As a result, the Office Action proposes that Narveson would be combined with Whitted to render this “dark level bias” element obvious. *Id.* The Office Action’s underlying rationale for the alleged motivation to combine Narveson and Whitted is that, as ambient light decreases in Narveson, the brightness of the display will decrease until it becomes unreadable, thereby requiring a minimum power level or threshold as stated in Whitted. Office Action, 21.

One of ordinary skill in the art would not have combined Narveson and Whitted with regard to the “dark level bias” limitation of claim 15. Stevenson Decl., ¶¶70-72. The Office’s motivation to combine analysis is premised on an incorrect assumption, and the proposed combination would frustrate the purpose and operation of the references. *First*, the assumption that the display of the Narveson system becomes too dark in low ambient light is directly contrary to the explicit disclosure of Narveson. *Id.* There is no need for a minimum power level or threshold as stated in Whitted because Narveson always maintains sufficient brightness at low ambient light levels. *Id.* Thus, there is no problem to solve with regard to the Narveson display being too dark to read. *Id.* In the Summary of the Invention, Narveson states that the “display brightness and contrast” in the system is “maintained substantially constant over the entire ambient light spectrum” including “substantially total darkness.”

A color cathode ray tube display apparatus of the shadow-mask type or other type of multiple color tube, such as the beam index tube, particularly adapted for use in an aircraft instrument panel, for example, an electronic flight instrument, where the display face and the pilot's eyes are subjected to a *very wide range of ambient light from direct sunlight* (e.g., 10^{+4} foot candles) *to substantially total darkness* (e.g., 10^{-2} foot candles) . . . Thus, the display brightness and contrast relative to the cockpit ambient brightness is maintained substantially constant over the entire ambient light intensity spectrum to which it and the pilot's eyes are subjected.

Narveson, 1:56-2:13 (emphasis added).

Narveson unambiguously teaches that the brightness in its system is maintained over the “entire ambient light intensity spectrum” from “direct sunlight” to “substantial total darkness.” Narveson, 1:56-2:13; Stevenson Decl., ¶71. As a result, the Narveson display is intentionally designed so as to *never* become “not bright enough to be perceived” as the Office Action contends. Stevenson Decl., ¶¶71-72; Office Action, 21. Narveson’s disclosure thus contradicts the Office Action’s rationale to combine, which is premised on the display in Narveson becoming “not bright enough to be perceived” in low ambient light. Office Action, 21; Stevenson Decl., ¶¶70-72. Therefore, there is no problem in Narveson that is solved by Whitted’s minimum power level. Stevenson Decl., ¶¶70-72.

Because Narveson’s system already maintains the “display brightness and contrast” in the system “substantially constant over the entire ambient light intensity spectrum” from “direct sunlight” to “substantial total darkness,” Whitted’s minimum power level or threshold would be redundant and would not affect the visibility of the display. Stevenson Decl., ¶¶73-74. One of ordinary skill in the art would thus not have combined Whitted with Narveson because screen visibility in low ambient light conditions is not a concern with the display in Narveson. Stevenson Decl., ¶¶70-72. This makes sense because Narveson deals with airplane cockpit displays that, if they ever became too dark or unreadable, could have catastrophic effects.

Stevenson Decl., ¶64. As a result, one of ordinary skill in the art would have no motivation to use the minimum power level of Whitted in the system of Narveson, as Narveson already has a mechanism that maintains brightness at low ambient lights including substantial total darkness. Stevenson Decl., ¶¶70-74.

Second, the Office Action's underlying rationale for the motivation to combine Narveson and Whitted is based on the false assumption that, as ambient light decreases in Narveson, the brightness of the display will decrease as sensed ambient light decreases until the display becomes unreadable thereby requiring a minimum power level or threshold as stated in Whitted. Stevenson Decl., ¶¶70-72; Office Action, 20-21. The Office Action's rationale is contrary to the explicit disclosure of Narveson. *At low ambient light levels, the Narveson system does not use sensed ambient light in its calculation of screen brightness.* Stevenson Decl., ¶¶65, 70-72.

Narveson's system calculates nominal brightness B_0 in two different ways, compares them, and only uses the larger one. Narveson, Figs. 2, 4; 8:24-49, 11:23-37; Stevenson Decl., ¶¶65, 70-72. In these calculations, the Office Action alleges that Narveson's output voltage V is the user signal and Narveson's cockpit light sensor voltage A is the sensing signal. Office Action, 19-20. The first way nominal brightness B_0 is calculated is in two steps. "CR-1" is first calculated as equal to K_2V where K_2 is a constant and V is output voltage V set by the "pilot set brightness control potentiometers." Narveson, Figs. 2, 4; 8:24-49, 11:23-37; Stevenson Decl., ¶65. Then nominal brightness B_0 is calculated as equal to $(CR-1)(RA)$. Narveson, Figs. 2, 4; 8:24-49, 11:23-37; Stevenson Decl., ¶65. The Office Action identifies this method as generating the "combined signal" of $(CR-1)(RA)$. Office Action, 20. The second way that nominal brightness B_0 is calculated is as K_1V^2 where K_1 is a constant and V is output voltage V set by the "pilot set brightness control potentiometers." Narveson, Figs. 2, 4; 8:24-49, 11:23-37; Stevenson Decl., ¶65.

It is important to notice that *only one* of these two calculations of nominal brightness B_0 involves information from the light sensor, A. Narveson, Figs. 2, 4; 8:24-49, 11:23-37; Stevenson Decl., ¶65. While the first method of calculation, (CR-1)(RA), involves “light sensor voltage” A, the second method of calculating nominal brightness using K_1V^2 does not involve “light sensor voltage” A or any other input from the light sensor. Narveson, Figs. 2, 4; 8:24-49, 11:23-37; Stevenson Decl., ¶65. Rather, this second method is based on the “pilot set brightness control potentiometers,” without consideration of the ambient light level. Narveson, Figs. 2, 4; 8:24-49, 11:23-37; Stevenson Decl., ¶65.

Narveson thus does not have the problem of Whitted where an ambient light measurement of zero, or near zero, could cause the screen to become too dark because, at low ambient light, Narveson’s calculation of the nominal brightness (i.e., K_1V^2) is independent of the sensed ambient light. Stevenson Decl., ¶¶70-74; Narveson, Figs. 2, 4; 8:24-49, 11:23-37. In other words, Narveson does not use the ambient light level to determine brightness at low ambient light levels. As a result, even if the sensed ambient light is zero in the Narveson system, it will have no effect on the readability of the display in the Narveson system because Narveson determines the brightness of the display in low ambient light levels using K_1V^2 . Stevenson Decl., ¶65.

In contrast, Whitted’s minimum power level only exists to counteract its use of sensed ambient light in the brightness calculation at low ambient light levels where the sensed ambient light approaches zero. Whitted, 8:9-35. That is not an issue in Narveson, which does not use sensed ambient light to calculate brightness at low ambient light levels. Stevenson Decl., ¶65; Narveson, Figs. 2, 4; 8:24-49, 11:23-37. Therefore, there would have been no motivation to combine Whitted and Narveson as the problem in Whitted that the minimum power level

addresses (i.e., low sensed ambient light in the brightness calculation) does not exist in Narveson. Stevenson Decl., ¶¶70-74.

Third, one of ordinary skill in the art at the time of the invention would not have combined Narveson and Whitted because they relate to entirely different systems. Narveson concerns an airplane cockpit cathode ray tube display capable of raster and stroke writing techniques. Narveson, Figs. 1, 2, 4, 1:56-2:30; Stevenson Decl., ¶63. Whitted, on the other hand, concerns a backlit LCD display for a laptop. Whitted, FIG. 12, 1:5-12, 3:20-24; Stevenson Decl., ¶67. These are fundamentally different systems that require different electronics for driving each display. One cannot just cherry-pick random features from Whitted and drop them in Narveson without redesigning the Narveson system. However, the Office Action does not explain any such modifications that could be made without fundamentally disrupting the purpose and operation of the Narveson system.

B. Narveson Does Not Disclose or Suggest a “Combined Signal” When the “Ambient Light Decreases to Approximately Zero” And Thus There Can Be No “Dark Level Bias” That Adjusts the “Combined Signal” to Generate a “Brightness Control Signal” When the “Ambient Light Decreases to Approximately Zero”

Claim 15 requires “adjusting the combined signal with a dark level bias to generate a brightness control signal . . . such that the brightness control signal is maintained above a predetermined level when the ambient light level decreases to approximately zero.” ’117 patent, claim 15. The Office Action contends that the “combined signal” in Narveson is (CR-1)(RA). Office Action, 20. However, as explained below, the alleged “combined signal” is *not* used in determining the brightness of the display at low ambient light levels (i.e., “when the ambient light level decreases to approximately zero”). Stevenson Decl., ¶65. Therefore, because the alleged “combined signal,” (CR-1)(RA), is not used in the brightness determination at low

ambient light levels, there cannot be a “dark level bias” that adjusts the “combined signal” to “generate a brightness control signal . . . such that the brightness control signal is maintained above a predetermined level *when the ambient light level decreases to approximately zero.*” Stevenson Decl., ¶65.

Narveson’s system calculates nominal brightness B_0 in two different ways, compares them, and only uses the larger one. Narveson, Figs. 2, 4; 8:24-49, 11:23-37; Stevenson Decl., ¶65. In these calculations, the Office Action alleges that the output voltage V is the user signal and A is the sensing signal. Office Action, 19-20. The first way nominal brightness B_0 is calculated is in two steps. “CR-1” is first calculated as equal to K_2V where K_2 is a constant and V is output voltage V . Narveson, Figs. 2, 4; 8:24-49, 11:23-37; Stevenson Decl., ¶65. Then nominal brightness B_0 is calculated as equal to $(CR-1)(RA)$. Narveson, Figs. 2, 4; 8:24-49, 11:23-37; Stevenson Decl., ¶65. The Office Action identifies this method as generating the “combined signal” of $(CR-1)(RA)$. Office Action, 20. The second way that nominal brightness B_0 is calculated is as K_1V^2 where K_1 is a constant and V is output voltage V set by the “pilot set brightness control potentiometers.” Narveson, Figs. 2, 4; 8:24-49, 11:23-37; Stevenson Decl., ¶65.

It is important to notice that *only one* of these two calculations of nominal brightness B_0 involves information from the light sensor, A . Narveson, Figs. 2, 4; 8:24-49, 11:23-37; Stevenson Decl., ¶65. While the first method of calculation, $(CR-1)(RA)$, involves “light sensor voltage” A , the second method of calculating nominal brightness using K_1V^2 does not involve “light sensor voltage” A or any other input from the light sensor. Narveson, Figs. 2, 4; 8:24-49, 11:23-37; Stevenson Decl., ¶65. Rather, this method is based on the “pilot set brightness control potentiometers.” Narveson, Figs. 2, 4; 8:24-49, 11:23-37; Stevenson Decl., ¶65.

As shown below, Narveson explains that, at low ambient light levels, the brightness is controlled by the pilot's nominal brightness, V , through the calculation $K_1 V^2$, which determines the brightness *without* using the alleged "sense signal," A. Stevenson Decl., ¶65. In contrast, the Office Action's alleged "combined signal" calculation based on the contrast ratio and "light sensor voltage" A (i.e., $(CR-1)(RA)$) sets the brightness *only* at high ambient light levels. Stevenson Decl., ¶65.

Therefore, ***under low ambient conditions the display brightness should be based on absolute brightness and at higher ambients it should be based on contrast ratio.*** To compute this nominal brightness the potentiometer signal is "squared" ($\log V$ is added to $\log V$) and multiplied by a constant K_1 to convert the result to foot lamberts ($\log K_1$ added to $2 \log V$). It will be appreciated that functions of the pilot's brightness control other than squaring may be utilized in accordance with desired results. The program compares the two values of nominal brightness and selects the maximum, which value is used in the remainder of the programmed computations. Thus, it will be noted that at ***high ambients the brightness of the displayed symbology is controlled primarily in accordance with the ambient light sensor signal as modified by CRT reflectance characteristics and a desired contrast ratio, while at lower ambients, the brightness of the displayed symbology is controlled primarily in accordance with a nominal brightness set by the pilot.***

Narveson, 8:30-49 (emphasis added).

The combination of Narveson and Whitted would thus not yield the method of claim 15. Stevenson Decl., ¶¶73-74. Claim 15, which reads "multiplying the input signal with a sense signal to generate a combined signal," requires the "combined signal" to be calculated using the "sense signal." At low ambient light levels "when the ambient light level decreases to approximately zero," there is no "combined signal" used in determining the brightness of the display because the brightness is determined based on the $K_1 V^2$ calculation, which does ***not*** involve the alleged "sense signal," A , in Narveson. Stevenson Decl., ¶65. As a result, there can

be no “dark level bias” that adjusts the “combined signal” to “generate a brightness control signal . . . such that the brightness control signal is maintained above a predetermined level *when the ambient light level decreases to approximately zero*” because there is no “combined signal” when “the ambient light level decreases to approximately zero.” Stevenson Decl., ¶¶73-74. Therefore, the combination of Narveson and Whitted would not result in “adjusting the combined signal with a dark level bias to generate a brightness control signal . . . such that the brightness control signal is maintained above a predetermined level when the ambient light level decreases to approximately zero” limitation of claim 15.

C. The Combination of Narveson and Whitted Would Not Result in the “Dark Level Bias” Limitation of Claim 15 Because the Minimum Power Level in Whitted Is Not a Dark Level Bias

The combination of Narveson and Whitted would not result in a system that meets the dark level bias limitation of claim 15. The Office Action incorrectly identifies Whitted’s disclosure of a “minimum power level” as a “dark level bias.” Office Action, 20-21; Stevenson Decl., ¶¶69, 74. The “minimum power level” in Whitted is not a “dark level bias” because it does not perform any mathematical adjustment of a combined signal. Stevenson Decl., ¶¶69, 74. It is a “pre-programmed” minimum threshold that overrides or replaces (rather than mathematically adjusts) the signal. Whitted, 8:9-25; Stevenson Decl., ¶¶69, 74. In a prior IPR, the PTAB rejected this same argument that a “minimum” threshold brightness is a “dark level bias.”

However, the *claim limitation recites more than merely maintaining screen brightness above a minimum level; it recites maintaining the screen brightness above a minimum level in a particular way* that is not sufficiently addressed by Petitioner or Dr. Hobbs. Even assuming maintaining screen brightness above a minimum level to adapt for dark conditions was a well-known solution, Petitioner has not sufficiently established that one of ordinary skill in the art would apply the solution in the manner claimed by Patent Owner. Specifically, Petitioner has not

established that the combination of Thayer and Godwin teaches the dark level bias adjustment of the combined signal as claimed, or that performing the dark level bias adjustment of the combined signal (as opposed to, for example, performing the adjustment in some other manner) would have been obvious to one of ordinary skill in the art.

Ex. B, *Samsung*, IPR2018-01262, Paper 14 at 14-15 (emphasis added).

Rather, as the PTAB recognized, the claims require a “dark level bias” that adjusts the “combined signal” to generate a “brightness control signal.” The “preprogrammed” “minimum power level” in Whitted does not mathematically adjust any signal. Whitted, 8:9-25; Stevenson Decl., ¶¶69, 74. Rather, it overrides or replaces the signal, which is not a mathematical adjustment to the signal. Stevenson Decl., ¶¶69, 74.

* * *

Therefore, for the reasons enumerated above, the combination of Narveson and Whitted would not have rendered claims 15 and 16 obvious.

VI. THE COMBINATION OF WHITTED AND OTTENSTEIN DOES NOT RENDER OBVIOUS CLAIM 15 OR 16 OF THE '117 PATENT

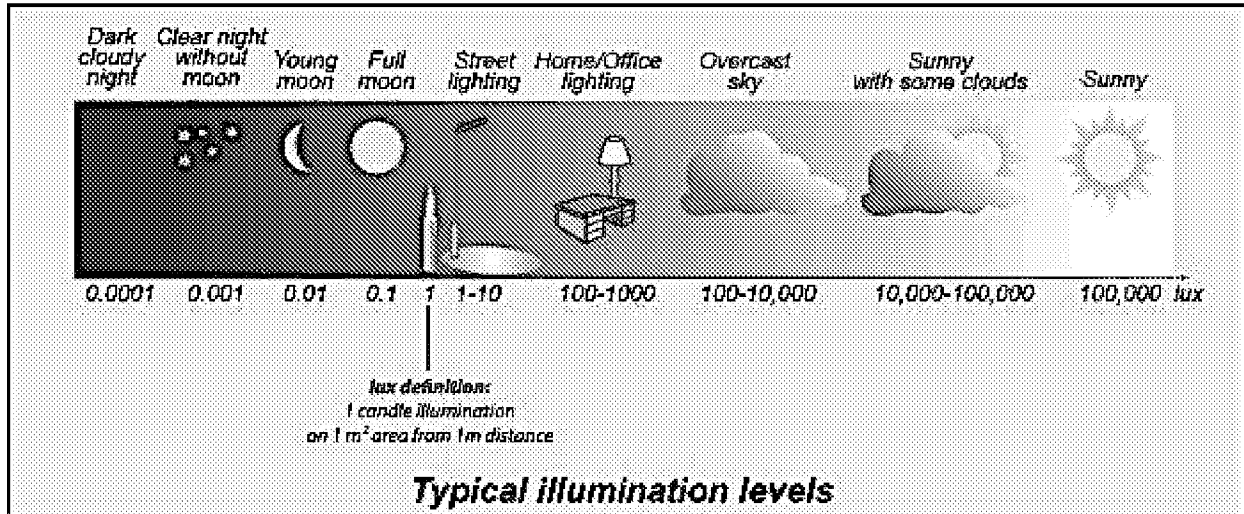
A. One of Ordinary Skill in the Art Would Not Have Combined Whitted and Ottenstein

The Office found that Whitted does not disclose or suggest the “selectively multiplying” limitation of claims 15 and 16. Office Action, 22. For the “selectively multiplying” limitation, the Office Action proposes combining Whitted with Ottenstein. Office Action, 22-23. Specifically, the Office Action contends that Ottenstein teaches the “selectively multiplying” limitation. Office Action, 23-24.

The Office Action’s proposal of combining the automatic brightness algorithm of Ottenstein with Whitted is based on improper hindsight as it is contrary to the actual teachings of the references. Ottenstein expressly teaches that its automatic brightness algorithm that includes

multiplication is *not* operable at low ambient light levels. Ottenstein, 3:65-68, 4:19-31;

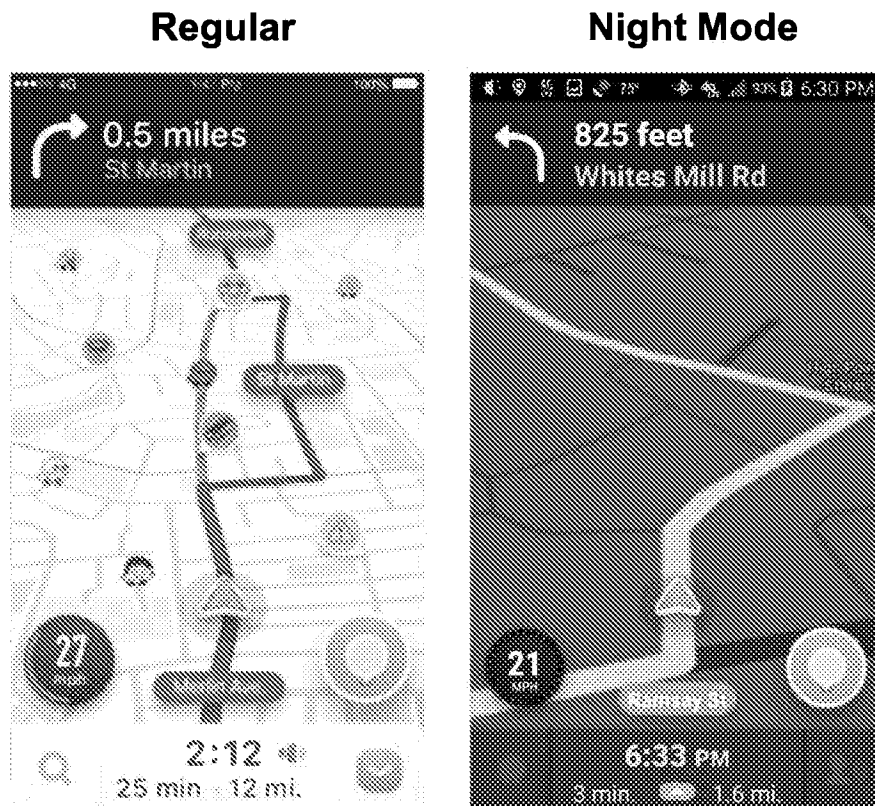
Stevenson Decl., ¶60. In contrast to Whitted’s automatic brightness system that is designed to maintain the “desired brightness” over “a wide range of light conditions without requiring user adjustment” including “in low light conditions,” Ottenstein teaches that, for its automatic brightness system, “[t]he full range of *ambient brightness is supported, from 500 to 4000 Foot-lamberts*.” Ottenstein, 4:19-31; Whitted, 4:19-21, 8:22-25; Stevenson Decl., ¶60. Ottenstein’s automatic brightness system does not function below 500 foot-lamberts (i.e, 1,173 lux), which corresponds to the outdoors on an overcast day. Stevenson Decl., ¶60.



Ex. J, Damjanovski, 2. Consistent with these disclosures, in a prior *inter partes* review, the PTAB found that Ottenstein teaches that *automatic brightness with multiplication “need not and should not operate at low ambient light levels.”* Ex. D, *LG Elec., Inc.*, IPR2020-01283, Paper 9 at 42 (emphasis added).

Below 500 foot-lamberts, Ottenstein teaches using a night mode rather than automatic brightness based on sensed ambient light. Ottenstein, 3:65-68, 4:19-31; Stevenson Decl., ¶60.

Night mode is an inversion of the color scheme (as shown in the example below) to allow easier visibility at night.⁷ Stevenson Decl., ¶60.



Therefore, applying Ottenstein’s multiplication algorithm at low ambient light levels in Whitted’s system “when the ambient light level decreases to approximately zero” as the Office

⁷ As the Federal Aviation Administration and Department of Transportation explain, night mode, which uses a black rather than a white background, is commonly used in cockpit displays such as that described in Ottenstein. Ex. I, FAA White Paper, 19 (“In night mode, the background of the display is typically dark to minimize the amount of brightness being produced by the display, such as white runways on a black background instead of black runways on a white background”).

Action proposes is improper hindsight because it directly contradicts the express teaching of Ottenstein that the automatic brightness algorithm using multiplication “need not and should not be used at low ambient light levels.” Ex. D, *LG*, IPR2020-01283, Paper 9 at 42; Ottenstein, 3:65-68, 4:19-31; Stevenson Decl., ¶60. Thus, the combination proposed by the Office Action does not combine the actual teachings of Ottenstein and Whitted. Rather, using improper hindsight, the Office Action improperly modifies the teaching of Ottenstein in a manner contrary to its disclosure for the sole purpose of trying to recreate the claims of the ’117 patent. Based on the actual disclosures of Ottenstein and Whitted, one of ordinary skill in the art would not have combined these references in the manner stated by the Office Action because it would directly contrary to the teachings of Ottenstein, which is not to use the multiplication algorithm for automatic brightness at low ambient light levels. Stevenson Decl., ¶¶75-78.

Further, one of ordinary skill in the art would not have combined the multiplication algorithm of Ottenstein, which does not operate in low ambient light conditions, with the system of Whitted, which is designed to operate in *all* ambient light conditions. Stevenson Decl., ¶¶75-78; Whitted, 4:19-21, 8:22-25; Ottenstein, 3:65-68, 4:19-31. Incorporating the multiplication algorithm of Ottenstein into the Whitted system would render Whitted inoperable for its intended purpose to provide automatic brightness control across the full range of typical ambient light levels. Whitted, 4:19-21, 8:22-25; Ottenstein, 4:19-31; Stevenson Decl., ¶¶79-80. This is improper. *Plas-Pak Indus., Inc. v Sulzer Mixpac AG*, 600 F. App’x. 755, 758 (Fed. Cir. 2015) (“However, combinations that change the ‘basic principles under which the [prior art] was designed to operate,’ *In re Ratti*, 270 F.2d 810, 813 (C.C.P.A. 1959), or that render the prior art ‘inoperable for its intended purpose,’ *In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984), may fail to support a conclusion of obviousness.”).

Therefore, one of ordinary skill in the art would have no motivation to combine Whitted and Ottenstein. Stevenson Decl., ¶¶75-78.

B. The PTAB Already Found That There Is No Rationale to Combine Ottenstein's Multiplication With a Minimum Brightness Level of Another Reference as the Office Action Proposes

In an analogous case, the PTAB held that the combination of Ottenstein and a second reference, Fujimaki, disclosing a minimum brightness level (L_{min}) for a display does not render the claims of the '117 patent because there is no rationale to combine. In *LG*, Petitioners contended for the “dark level bias” limitations that “it have [sic] would have been obvious to a POSA to modify Ottenstein with the predetermined level described in Fujimaki to ensure the user can continue to view their display screen in dark conditions.” Ex. N (*LG*, IPR2020-01283, Paper 3 at 64 (P.T.A.B. July 16, 2020)). In its decision denying institution, the PTAB found that Ottenstein discloses using a “night mode” at low ambient light levels citing Ottenstein's statement that “Further for very low ambient light levels, a night mode should be used in place of auto mode.” Ex. D, *LG*, IPR2020-01283, Paper 9 at 40-41. The PTAB then found that, based on Ottenstein's disclosure and teaching of using “night mode” at low ambient light levels, there was insufficient rationale to combine Ottenstein's multiplication with a minimum brightness level.

In light of Ottenstein's disclosure discussed above that “*the automatic brightness control need not and should not operate at low ambient light levels,*” we agree with Patent Owner that *Petitioner has not provided sufficient rationale for the combination to support the conclusion of obviousness.* *Id.* at 42 (emphasis added).

The Office proposes nearly the same combination here. The Office Action combines the multiplication algorithm of Ottenstein with the “minimum power level” of Whitted, which is analogous to combining the multiplication algorithm of Ottenstein with the minimum brightness

setting of Fujimaki. Office Action, 20-21. Therefore, the PTAB's same analysis and holding of no motivation to combine should apply here.

Consistent with the PTAB's decision in *LG*, there is no motivation to combine Ottenstein's multiplication algorithm, which does not operate at low ambient light levels, with a minimum power level as taught in Whitted. Ex. D, *LG*, IPR2020-01283, Paper 9 at 40-42; Stevenson Decl., ¶¶75-76. Because Ottenstein solves the issues of visibility in low ambient light by employing a night mode, there is no problem to be solved by combining Ottenstein and Whitted. Stevenson Decl., ¶¶77-80. Rather, it is only improper hindsight in view of the '117 patent that motivates the Office Action to propose the combination of Ottenstein's algorithm with Whitted. Patent Owner thus respectfully requests that the Office withdraw the rejection of claims 15 and 16 in view of Ottenstein and Whitted.

C. Whitted Does Not Disclose or Suggest the "Dark Level Bias" Limitations of Claim 15 Because the Pre-Programmed "Minimum Power Level" Is Not a "Dark Level Bias" And There Is No Disclosure of a "Brightness Control Signal"

The Office Action relies on Whitted as allegedly disclosing the "dark level bias" limitation of claim 15. Office Action, 22. However, Whitted does not disclose or suggest "adjusting the combined signal with a dark level bias to generate a brightness control signal for controlling brightness of a visible display." *First*, the Office Action incorrectly identifies Whitted's disclosure of a "pre-programmed" "minimum power level" as a "dark level bias." Office Action, 20-21. The "pre-programmed" "minimum power level" in Whitted is not a "dark level bias." Stevenson Decl., ¶69. A bias is a value (e.g., voltage value of signal or the value of a software variable or function) that is used to mathematically adjust signals in a system into the desired operating range. Stevenson Decl., ¶¶33-35, 42-44. In contrast, the "minimum power level" is a "pre-programmed" setting that overrides or replaces (rather than mathematically

adjusts) the calculated brightness signal. Whitted, 8:9-25; Stevenson Decl., ¶69. In a prior IPR, the PTAB rejected this same argument that a “minimum” brightness is a “dark level bias.”

However, the *claim limitation recites more than merely maintaining screen brightness above a minimum level; it recites maintaining the screen brightness above a minimum level in a particular way* that is not sufficiently addressed by Petitioner or Dr. Hobbs. Even assuming maintaining screen brightness above a minimum level to adapt for dark conditions was a well-known solution, Petitioner has not sufficiently established that one of ordinary skill in the art would apply the solution in the manner claimed by Patent Owner. Specifically, Petitioner has not established that the combination of Thayer and Godwin teaches the dark level bias adjustment of the combined signal as claimed, or that performing the dark level bias adjustment of the combined signal (as opposed to, for example, performing the adjustment in some other manner) would have been obvious to one of ordinary skill in the art.

Ex. B, *Samsung*, IPR2018-01262, Paper 14 at 14-15 (emphasis added). Rather, as the PTAB recognized, the claims require more than a “minimum” brightness level. They require a “dark level bias” that adjusts the “combined signal” to generate a “brightness control signal.”

Neither Whitted nor Ottenstein disclose or suggest adjusting any signals; and thus the combination fails to teach “*adjusting* the combined signal . . . to generate a brightness control signal.” Stevenson Decl., ¶¶79-80. With regard to the alleged “dark level bias,” Whitted does not disclose or suggest the “pre-programmed” “minimum power level” (i.e., the alleged “dark level bias”) as mathematically “adjusting” any signals. Whitted, 7:53-8:35; Stevenson Decl., ¶¶69. For example, if the brightness result of the undisclosed “function” in Whitted is higher than the pre-programmed “minimum power level,” then the brightness result of the undisclosed “function” sets the brightness and the “minimum power level” plays no role determining the brightness. Stevenson Decl., ¶¶69. On the other hand, if the brightness result of the undisclosed “function” in Whitted is lower than the pre-programmed “minimum power level,” then the pre-programmed

“minimum power level” sets the brightness of the screen, ignoring the result of the “function.”

Stevenson Decl., ¶¶69. The “minimum power level” thus substitutes or replaces the signal from the brightness “function” at low ambient light levels rather than mathematically “adjusting” the signal from the brightness “function.” Stevenson Decl., ¶¶69. Ottenstein similarly contains no disclosure of the adjustment of any brightness signals with a bias. Stevenson Decl., ¶¶80.

Therefore, the combination of Ottenstein and Whitted fails to disclose or suggest a “dark level bias.”

Second, Whitted’s “minimum power level” cannot be a “dark level bias” because it cannot perform the act of “adjusting the combined signal . . . to generate a brightness control signal . . . such that the brightness control signal is maintained above a predetermined level when the ambient light level decreases to approximately zero” as required by claim 15. Claim 15 recites “multiplying the input signal with a sense signal to generate a combined signal.” Because Ottenstein uses night mode and does not perform any multiplication of any signals at low ambient light levels, there is no “combined signal” when the ambient light level is low (i.e., “when the ambient light level decreases to approximately zero”) as required by claim 15. Ottenstein, 3:65-68, 4:19-31; Stevenson Decl., ¶¶69, 79. Therefore, Whitted’s “minimum power level” cannot be a “dark level bias” that “adjust[s] the combined signal to generate a brightness control signal . . . such that the brightness control signal is maintained above a predetermined level *when the ambient light level decreases to approximately zero*” because the alleged “combined signal” does not even exist “when the ambient light level decreases to approximately zero” because there is no multiplication of signals. Stevenson Decl., ¶79.

Third, the combination of Whitted and Ottenstein fails to disclose or suggest “adjusting the combined signal . . . *to generate a brightness control signal.*” Stevenson Decl., ¶¶79-80. The Office Action fails to identify a “brightness control signal” in the combination of Whitted and

Ottenstein. Office Action, 22-24. Per the claim language, the “combined signal” and the “brightness control” signal are two separate and distinct signals in claims 15 and 16. ’117 patent, claims 15, 16; *HTC*, 701 Fed.Appx. at 982 (“The separate naming of two structures in the claim strongly implies that the named entities are not one and the same structure.”); *Becton Dickinson*, 616 F.3d at 1254 (“Where a claim lists elements separately, the clear implication of the claim language is that those elements are distinct component[s] of the patented invention.”); *see also* Ex. B, *Samsung*, IPR2018-01262, Paper 14 at 13 (“We agree with Patent Owner that the ‘combined signal’ and ‘brightness control signal’ are different, in that the ‘brightness control signal’ is the ‘adjusted’ combined signal and is used to ‘control a brightness level of a visible display.’”). However, because the “minimum power level” of Whitted replaces any other signal rather than mathematically adjusting it, there is no generation of a new adjusted signal corresponding to the claimed “brightness control signal.” Therefore, the combination of Whitted and Ottenstein fails to disclose or suggest the “brightness control signal” of claims 15 and 16.

* * *

Therefore, for the reasons enumerated above, the combination of Whitted and Ottenstein would not have rendered claims 15 and 16 obvious.

VII. THE OFFICE ACTION IMPROPERLY CONSTRUES THE “FIRST INPUT” AND “SECOND INPUT” TERMS AS INVOKING 35 U.S.C. § 112, ¶6.

The Office Action construed the “first input configured to receive a user signal ...” limitation of claim 1 under 35 U.S.C. § 112 ¶6, finding that “‘First input’ is not sufficient structure for executing the claimed function, nor is it modified by sufficient structure for executing the function. Instead, it is a generic term that does not implicate any particular structure.” Office Action, 6. The Office Action also construed the “second input configured to receive a user signal ...” limitation of claim 9 under 35 U.S.C. § 112 ¶6. Office Action, 7.

Patent Owner respectfully disagrees. As discussed in more detail below, the term “input” denotes sufficient structure such that § 112 ¶6 does not apply. Patent Owner respectfully submits that construing these terms under § 112 ¶6 as means-plus-function terms is contrary to the plain language of the claims, as well as inconsistent with legal authority and the prior construction of these terms both by the district court and the PTAB.

A. There is a Legal Presumption That § 112 ¶6 Does Not Apply to the “First Input” and “Second Input” Limitations

In determining whether 35 U.S.C. § 112 ¶6 applies to a claim limitation, the Federal Circuit has stated that use of the word “means” creates a presumption that § 112 ¶6 applies. *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1348 (Fed. Cir. 2015) (en banc). “The failure to use the word ‘means’ creates a rebuttable presumption that § 112, ¶6 does not apply.” *Zeroclick, LLC v. Apple Inc.*, 891 F.3d 1003, 1007 (Fed. Cir. 2018). However, “the presumption can be overcome, and § 112, ¶6 will apply, ‘if the challenger demonstrates that the claim term fails to recite sufficiently definite structure or else recites function without reciting sufficient structure for performing that function.’” *Id.* “[O]ther language in the claim ‘might inform the structural character of the limitation-in-question or otherwise impart structure’ to the claim term.” *MTD Prods. Inc. v. Iancu*, 933 F.3d 1336, 1342 (Fed. Cir. 2019). “In assessing whether the claim limitation is in means-plus-function format, we do not merely consider the introductory phrase [] in isolation, but look to the entire passage including functions performed by the introductory phrase.” *Id.* “The ultimate question is whether ‘the claim language, read in light of the specification, recites sufficiently definite structure to avoid § 112, ¶6.’” *Id.* Because the limitations “a first input configured to receive a user signal . . .” in claim 1 and “a second input configured to receive a selection signal . . .” in claim 9 do not use the word “means,” there is a legal presumption that § 112 ¶6 does not apply.

B. The Legal Presumption That § 112 ¶6 Does Not Apply to the “First Input” and “Second Input” Terms Cannot Be Overcome Because “Input” Connotes Sufficient Structure

The Office Action’s determination that “a first input configured to receive a user signal . . .” in claim 1 and “a second input configured to receive a selection signal . . .” in claim 9 should be construed as means-plus-function terms under § 112, ¶6 is contrary to well established legal precedent, the prior claim constructions of those same terms, and the claim language itself. The legal presumption that § 112, ¶6 does not apply to the “first input” and “second input” limitations cannot be overcome because “input” in the context of a “brightness control circuit” connotes sufficiently definite structure.

“The standard is whether the words of the claim are understood by persons of ordinary skill in the art to have a sufficiently definite meaning as the name for structure.” *Williamson*, 792 F.3d at 1349. In electrical engineering and electronics, it is well-known and commonplace that signals enter a circuit through an input to that circuit. Stevenson Decl., ¶39. This is a fundamental concept in the designing of hardware and software circuits. Stevenson Decl., ¶38.

Accordingly, one of ordinary skill in the art would understand the class of structures of hardware or software that could be used as an input (i.e., the “first input” and “second input”) to receive a signal into a circuit. Stevenson Decl., ¶¶38-39. Technical dictionaries confirm that “input” connotes commonly understood structure. For example, the IEEE Standard Dictionary of Electrical and Electronic Terms defines “input” as “the device or collective set of devices used for bringing data into another device.” Ex. H, IEEE Standard Dictionary of Electrical and Electronic Terms, 556. As a result, the word “input” in the context of circuits connotes specific hardware or software structures that can receive a signal (e.g., a voltage signal or a software signal) into a circuit. Stevenson Decl., ¶39.

C. The Office Action’s Application of § 112 ¶6 to “First Input” and “Second Input” Is Contrary to Legal Precedent

The Office Action’s finding that “input” lacks sufficient structure to avoid the application of § 112 ¶6 is contrary to legal precedent. As an initial matter, the word “input” is *not* a recognized nonce word like “device,” “mechanism,” or “element.” *Williamson*, 792 F.3d at 1358. To the contrary, courts have repeatedly found the word “input” to connote sufficient structure such that § 112 ¶6 does not apply. *Apple Computer v. Burst.com, Inc.*, No. C 06-00019 MHP, 2007 WL 1342504, at *19–20 (N.D. Cal. May 8, 2007) (holding that “input means”—which even included the term “means” —was *not* a means-plus-function term under § 112 ¶6 because “input” provides sufficient structure); *Maxell Ltd. v. Apple Inc.*, No. 5:19-CV-00036-RWS, 2020 WL 10456875, at *15 (E.D. Tex. Mar. 18, 2020) (holding that “an input unit for receiving an input entered by a user” is *not* a means-plus-function term under § 112 ¶6 because “input” provides sufficient structure).

The *Apple* case is instructive. In that case, the court was construing the phrase “*input means* for receiving audio/visual source information.” *Apple*, 2007 WL 1342504, at *19. Even though there was a presumption that § 112 ¶6 applied given the use of the word “means,” the court determined that “input” provided sufficient structure to *rebut* that presumption and held that “input means” was not a means-plus-function limitation. *Id.* at *19-20.

Here, the claim limitations “a first input configured to receive a user signal . . .” in claim 1 and “a second input configured to receive a selection signal . . .” in claim 9 are analogous to the limitation in *Apple* in that they involve an “input” that receives a signal/information. However, unlike in *Apple*, the presumption here is that § 112 ¶6 does *not* apply. Therefore, if “input means” is sufficient structure to *rebut* the presumption that § 112 ¶6 applies in *Apple*, then

“first input” and “second input” in a brightness control circuit is sufficient structure to confirm the presumption that § 112 ¶6 does *not* apply in this case.

Similarly, in *Maxell*, another district court held that § 112 ¶6 does *not* apply to the limitation “an input unit for receiving an input entered by a user” *Maxell Ltd*, 2020 WL 10456875, at *15. The court reasoned that, even though “unit” is a nonce term, “[t]he ‘input’ modifier imparts structural significance to the term, and, as such, ‘input unit’ is structural.” *Id.* The court further stated that “[t]he fact that an ‘input unit’ may refer to a ‘wide variety of structures’ does not render the term nonstructural, nor does the fact that term is defined by its structure.” *Id.* at 16 (citing *Personalized Media Comms., L.L.C. v. Int’l Trade Commission*, 161 F.3d 696, 704-705 (Fed. Cir. 1998)).

As in *Apple*, the claim element “an input unit for receiving an input entered by a user” at issue in *Maxell* is analogous to the limitations “a first input configured to receive a user signal . . .” and “a second input configured to receive a selection signal . . .” in the ’117 patent. The same reasoning from *Maxell* applies here, as the word “input” in both cases connotes sufficient structure even if it can refer to a wide variety of structures implemented in hardware or software. *Maxell Ltd*, 2020 WL 10456875, at *15.

Like the district courts, the PTAB also has held that “input” connotes sufficiently definite structure such that § 112 ¶6 does not apply. *Creston Elecs., Inc. v. Intuitive Building Controls, Inc.*, IPR2015-01460, Paper 14, 9 (P.T.A.B. Jan. 14, 2016). In *Creston*, the PTAB declined to apply § 112 ¶6 to the term “input device” because “‘input device’ connotes sufficiently detailed structure—specifically a device (in an electronics apparatus) that receives an input.” *Id.*

The Office Action’s construction of the limitations “a first input configured to receive a user signal . . .” and “a second input configured to receive a selection signal . . .” is thus contrary to precedent from district courts and the PTAB holding that “input” connotes sufficient structure

to one of ordinary skill in the art to avoid application of 35 U.S.C. § 112 ¶6. Patent Owner respectfully requests that the Office withdraw its constructions under 35 U.S.C. § 112 ¶6.

D. The Office Action’s Application of § 112 ¶6 to “First Input” and “Second Input” Is Contrary to Prior District Court Constructions

Furthermore, in construing claims during litigation, the Central District of California did not find the “first input” and “second input” limitations to require construction under § 112 ¶6. Rather, the claim construction order in that case held that these terms should be construed as follows:

Limitation	District Court Construction
“a first input configured to receive a user signal indicative of a user selectable brightness setting”	“first input actually programmed or implemented with hardware or software to receive a user signal indicative of a user selectable brightness setting”
“second input configured to receive a selection signal to selectively operate the brightness control circuit in an auto mode or a manual mode”	“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. P, 7-8.

The district court construed the “first input” of the “brightness control circuit” of claim 1 of the ’117 patent to be “actually programmed or implemented with hardware or software to receive the user signal indicative of a user selectable brightness setting.” The Court similarly construed the “second input” limitation. Consistent with the understanding of one of ordinary skill in the art, the court recognized that the structure of an “input” in the context of a “circuit” is the hardware or software that receives signals into the circuit. Stevenson Decl., ¶¶38-39; Ex. P, 7-8. Consistent with the case law, the district court did not construe “first input” and “second input” under § 112, ¶6. *Apple*, 2007 WL 1342504, at *19–20 (holding that “input means” was

not a means-plus-function term under § 112 ¶6 because “input” provides sufficient structure);

Maxell, 2020 WL 10456875, at *15 (holding that “an input unit for receiving an input entered by a user” is **not** a means-plus-function term under § 112 ¶6 because “input” provides sufficient structure).

Finally, the PTAB has denied institution in four prior *inter partes* reviews involving the ’117 patent. Ex. B, *Samsung*, IPR2018-01262, Paper 14; Ex. C, *VIZIO, Inc.*, IPR2020-00043, Paper 32; Ex. D, *LG Elec., Inc.*, IPR2020-01283, Paper 9; Ex. E, *Hisense Co. Ltd.*, IPR2020-01337, Paper 11⁸. The PTAB did not construe the “first input” and “second input” limitations under § 112 ¶6 in any of the decisions denying institution. Ex. B, *Samsung*, IPR2018-01262, Paper 14 at 6-8; Ex. C, *VIZIO*, IPR2020-00043, Paper 32 at 10-15; Ex. D, *LG*, IPR2020-01283, Paper 9 at 9-11; Ex. E, *Hisense*, IPR2020-01337, Paper 11 at 10-13. Furthermore, no party in the district court or any of the *inter partes* reviews has ever even argued that the “first input” and “second input” limitations in claims 1 and 9 are subject to § 112 ¶6. Exs. F-G (Claim Construction Orders); Ex. L (*Samsung*, IPR2018-01262, Paper 4 at 15-20 (P.T.A.B. June 15, 2018)); Ex. M (*VIZIO*, IPR2020-00043, Paper 2 at 16-20 (P.T.A.B. Oct. 15, 2019)); Ex. N, *LG*, IPR2020-01283, Paper 3 at 17-19; Ex. O (*Hisense*, IPR2020-01337, Paper 1 at 22-24 (P.T.A.B. July 21, 2020)).

Therefore, the Office Action’s application of § 112 ¶6 to the “first input” and “second input” limitations is contrary to the understanding of one of ordinary skill in the art, legal precedent, the prior district court constructions of these same limitations, and the positions of the

⁸ Also pending is *Nintendo Co., Ltd., v. Polaris PowerLED Technologies, LLC*, IPR2023-00778. While the PTAB has not yet ruled, neither party has proposed such a construction.

previous parties and panels in prior PTAB proceedings. Therefore, for these additional reasons, Patent Owner respectfully requests that the Office withdraw the claim constructions for “first input” and “second input” under § 112 ¶6.

E. The Requester, Patent Owner, and Their Experts All Agree That The “First Input” and “Second Input” Limitations Are Not Subject to § 112 ¶6

The Requester, Microsoft Corporation, and its expert, Dr. Hobbs, agree with Patent Owner and its expert, Dr. Stevenson, that the “first input” and “second input” limitations should not be construed under § 112 ¶6. None of the parties or their experts proposed means-plus-function constructions for the “first input” and “second input” terms. Request, 24-25; Request, Ex. 17 (Hobbs Decl.), ¶¶6-7; Stevenson Decl., ¶¶36-40. Instead, the Requester acknowledged the construction from the Central District of California in the *VIZIO* litigation. Request, 24-25; Request, Ex. 17 (Hobbs Decl.), ¶¶6-7.

VIII. “A DARK LEVEL BIAS” IS NOT A MEANS-PLUS-FUNCTION TERM AND THE PROPOSED CONSTRUCTION ADDS ADDITIONAL LIMITATIONS THAT ARE NOT RECITED IN THE CLAIM

The Office Action construed the “dark level bias” limitation of claim 1 under 35 U.S.C. § 112 ¶6 as follows:

Accordingly, the “dark level bias” is construed to correspond to a predetermined input value (“dark level bias” in FIG. 2) that is added (104) to the combined signal (output of 106) in order to adjust the combined signal so that the resulting brightness control signal is maintained above a predetermined level when the “light sensor” value is zero.

Office Action, 8.

The Office’s claim construction is not correct for three primary reasons. First, the Office Action improperly construed “dark level bias” as a means-plus-function term when there is not sufficient evidence to support such a construction under prevailing law. Second, the Office

Action is inconsistent with multiple prior district court and PTAB constructions, as well as the claims and specification of the '117 patent. All courts and PTAB panels evaluating the claims have failed to find, or even suggest, a means-plus-function construction is appropriate for the “dark level bias” limitations of claims 1 and 15. These issues are addressed in turn below. Third, the Office Action’s specific construction of the “dark level bias” limitation of claim 1 reads several limitations into claim 1 that are contrary to, and unsupported by, the intrinsic evidence.

A. The Office Action Improperly Construed “Dark Level Bias” Under § 112 ¶6

“The failure to use the word ‘means’ creates a rebuttable presumption that § 112, ¶6 does not apply.” *Zeroclick*, 891 F.3d at 1007. Therefore, there is a legal presumption that § 112, ¶6 does not apply to the limitation “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.”

To the best of Patent Owner’s knowledge, “bias” in the context of circuits has not been recognized by any court as a nonce word. This is because “bias” in the context of circuits provides a well-known and sufficient structure such that the presumption against means-plus function cannot be overcome in this case. As Dr. Stevenson testifies, a “bias” is a common and standard component of many electrical circuits. Stevenson Decl., ¶43. One of ordinary skill in the art would understand that, in the context of circuits and the '117 patent, a “bias” is a signal, such as a voltage signal or a software signal, that provides an adjustment to another value or signal in the system. Stevenson Decl., ¶¶43-44. Examples of “bias” are routinely found in engineering textbooks and are a universally recognized structure in the field with regard to circuits. *Id.* As a result, the term “bias” connotes sufficient structure such that the presumption against § 112 ¶6 is maintained.

Moreover, the Office Action's construction of "dark level bias" under § 112 ¶6 is inconsistent with two district courts' constructions and prior PTAB decisions. Two different district courts have construed one or more portions of the "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" limitation in claim 1 as shown in the table below. Importantly, neither of the district courts construed the "dark level bias" limitation under § 112 ¶6.

Limitation	Eastern District of Texas Constructions	Central District of California Constructions
"a dark level bias configured to adjust the combined signal"	Plain and ordinary meaning. Ex. F, 30.	
"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"		"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. G, 34.
"dark level bias"		"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. G, 34.

Furthermore, the Central District of California already *rejected* a defendant's argument that the "dark level bias" limitation of claim 1 should be construed under § 112 ¶6. Ex. Q, 1-3. In that case, the court construed "dark level bias" 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. G, 34. The court further found that an electrical signal and software are sufficient structure for the "dark level bias" and that § 112 ¶6 does not apply. Ex. Q, 2-3. The Office's

construction under § 112 ¶6 is inconsistent with the district court's decision not to construe the "dark level bias" limitation of claim 1 as a means-plus-function term.

Additionally, in the four prior *inter partes* reviews⁹ involving the '117 patent, the PTAB has never held that the limitation "a dark level bias configured to adjust the combined signal to generate a brightness control signal" is a means-plus-function terms requiring construction under § 112 ¶6. Ex. B, *Samsung*, IPR2018-01262, Paper 14 at 6-8; Ex. C, *VIZIO*, IPR2020-00043, Paper 32 at 10-15; Ex. D, *LG*, IPR2020-01283, Paper 9 at 9-11; Ex. E, *Hisense*, IPR2020-01337, Paper 11 at 10-13. Moreover, no party in any *inter partes* review has ever even argued that the "dark level bias" limitation is subject to § 112 ¶6. Ex. L, *Samsung*, IPR2018-01262, Paper 4 at 15-20; Ex. M, *VIZIO*, IPR2020-00043, Paper 2 at 16-20; Ex. N, *LG*, IPR2020-01283, Paper 3 at 17-19; Ex. O *Hisense, LLC*, IPR2020-01337, Paper 1 at 22-24.

B. The Office's Construction Requires a "Predetermined" Value, Which Is Contrary to the Intrinsic Evidence and Inconsistent with the Prior District Court Order Rejecting That Construction

The Office's construction that the "dark level bias" in claim 1 is "predetermined" is contrary to the intrinsic evidence. Whereas the "dark level bias" limitation of claim 1 (shown below) is clear that the "brightness control signal is maintained above a predetermined level," there is no claim language limiting a "dark level bias" value to being "predetermined."

...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.

⁹ Additionally, in *Nintendo Co. v. Polaris PowerLED Technologies, LLC*, IPR2023-00778, neither party has proposed such a construction.

'117 patent, claim 1. Therefore, there is no basis in the claim language to require the "dark level bias" to be "predetermined."

Furthermore, the use of "dark level bias" in other claims sheds light on its meaning. For example, the Office's construction is inconsistent with claims 2 and 17, which demonstrate that the "dark level bias" can vary and thus cannot be "predetermined."

2. 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*.

17. The method of claim 15, wherein the *dark level bias* is added to the sense signal before selective multiplication such that *the amount of adjustment to the combined signal is dependent on the input signal*.

'117 patent, claims 2, 17 (emphasis added).

Since the "dark level bias" adjusts the combined signal, the limitations "the amount of adjustment to the combined signal is dependent on the user selectable brightness setting" in claim 2 and "the amount of adjustment to the combined signal is dependent on the input signal" in claim 17 demonstrate that the value of the "dark level bias" is necessarily variable with the "user selectable brightness setting" and "input signal," respectively. Because claim 2 depends on claim 1 and requires varying values for the "dark level bias," independent claim 1 encompasses having a variable (i.e., not predetermined) "dark level bias." Similarly, because claim 17 depends on claim 15 and requires varying values for the "dark level bias," independent claim 15 also encompasses a variable (i.e., not predetermined) "dark level bias." Thus, the "dark level bias" cannot be limited to "predetermined" values.

In addition to conflicting with the dependent claims, the Office Action's construction has no support in the intrinsic evidence. The specification and file history never state that the "dark level bias" must be "predetermined." The equation accompanying Figure 8, for example, shows

how the “dark level bias” can vary and is not “predetermined.” ’117 patent, 10:8-12. In the equation of Figure 8, R3 is “a user adjustable potentiometer” that provides the “user signal” that is variable in magnitude. *Id.*, 9:38-41. Because the user adjustable potentiometer R3 comprises one component of the “dark level bias,” the “dark level bias” is necessarily variable and not “predetermined.” *Id.*, 10:8-12. The Office Action’s construction would exclude preferred embodiments like the one in Figure 8.

$$BCS3 = \left[\overset{\text{Dark Level Bias}}{VCC \times \frac{R3}{(R1 + R3)}} \right] + \left[\overset{\text{Sensing Signal}}{ISRC} \times \overset{\text{User Signal}}{\frac{(R1 \times R3)}{(R1 + R3)}} \right]$$

’117 patent, 10:8-12 (annotations added).

Furthermore, when considering the intrinsic evidence, the district court explicitly rejected “predetermined” from the construction of the “dark level bias” limitations in claims 1 and 15. The district court reasoned as follows:

The “dark level bias” is not necessarily predetermined. The Court agrees with Plaintiff that “bias,” as it is customarily used, is not necessarily predetermined, or constant. One dictionary of record provides that “bias” is a “systemic deviation of a value from a reference value” or “[t]he amount by which the average of a set of values departs from a reference value.” Harry Newton, *Newton’s Telecom Dictionary* 95 (2002), ECF No. 121-10 at 4. Defendants inexplicably equate “systemic” from this definition with “constant.” The Court does not understand it this way. Rather, a systemic deviation is one defined by the system, as opposed to being random. The Newton’s definitions allow that a bias may vary with the values or system state defining the bias.

Some claims may require the bias to be variable or determinable but not necessarily predetermined. For example, Claim 1 requires the “dark level bias” is “configured to adjust the combined signal to generate a brightness control signal” in a way that maintains the brightness control signal “above a predetermined level.”

Claim 2, which depends from Claim 1, requires the dark-level-bias adjustment “is dependent on the user selectable brightness setting.” The Patent is clear that the user brightness setting may vary. See, e.g., ’117 Patent col. 3 ll.21–22. Thus, a predetermined level is a function of a value that expressly may vary and the dark level bias. This suggests that, in order to maintain the brightness control signal above a predetermined level, the bias may vary if the user setting varies.

Ex. F, 24 (emphasis added). The district court thus explicitly and correctly rejected “predetermined” from the construction of “dark level bias” as contrary to the intrinsic evidence.

Therefore, the Office’s insertion of “predetermined” in the construction of the “dark level bias” limitation of claim 1 is contrary to the intrinsic evidence and inconsistent with a prior district court claim construction order.¹⁰

C. The Office Action’s Construction Requiring the “Dark Level Bias” To Be “Added” to the Combined Signal Is Contrary to the Intrinsic Evidence And Has Been Rejected By the District Court

The Office Action’s construction requiring the “dark level bias” to be “added” to the “combined signal” is contrary to the intrinsic evidence. The Office construed “dark level bias” to

¹⁰ Patent Owner also objects to the Office Action’s requirement that the “dark level bias” is an “input” to the extent that the construction is requiring that, under all circumstances, the “dark level bias” has to be input by a user. Office Action, 8. Such a construction is contrary to the intrinsic evidence and would read out preferred embodiments where the “dark level bias” is a property of the circuit and not input by the user. See, e.g., ’117 patent, FIGs. 4, 9, 6:22-7:35, 10:33-11:15. Such a construction reading out preferred embodiments is improper. *CUPP Computing*, 53 F.4th at 1381 (“[A] claim interpretation that excludes a preferred embodiment from the scope of the claim is rarely, if ever, correct.”).

“correspond to a predetermined input value (‘dark level bias’ in Figure 2) that is added (104) to the combined signal (output of 106) . . .” Office Action, 8. This construction improperly reads the limitation “added” into the claims from a single preferred embodiment of Figure 2. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1323 (Fed. Cir. 2005) (holding that courts must be careful to not to “import[] limitations from the specification into the claim”); *Kara Tech., Inc. v. Stamps.com, Inc.*, 582 F.3d 1341, 1348 (Fed. Cir. 2009) (“[W]e will not limit him to his preferred embodiment or import a limitation from the specification into the claims.”). Further, the Office admits that its construction purports to exclude all other preferred embodiments, which is improper. *CUPP Computing*, 53 F.4th at 1381 (“[A] claim interpretation that excludes a preferred embodiment from the scope of the claim is rarely, if ever, correct.”); Office Action, 9-10.

To narrowly interpret the phrase “dark level bias configured to adjust the combined signal” to require that the dark level bias be “added” to the combined signal is improper and is contrary to the plain language of the claims. There should be no dispute that the plain meaning of “adjust” is not “added.” By interpreting “configured to adjust” to mean “added,” the Office Action fails to give the claims their plain meaning, which is improper here as there has been no lexicography or disavowal. *Luminara Worldwide, LLC v. Liown Elecs. Co. Ltd.*, 814 F.3d 1343, 1353 (Fed. Cir. 2016) (“Absent lexicography or disavowal, we do not depart from the plain meaning of the claims.”).

The Office Action’s construction that the “dark level bias” must be “added (104) to the combined signal” is also contrary to the dependent claims. For example, claims 4 and 5 require that the “dark level bias” is added. ’117 patent, claims 4-5. These claims would be redundant and superfluous if claim 1 was construed to require that the “dark level bias” is “added” as the Office proposes.

Furthermore, the district court explicitly rejected the Office's same construction that the "dark level bias" must be "added (104) to the combined signal" based on the intrinsic evidence and claim language. Ex. F, 24-25. The court reasoned as follows:

"Adjust" (Claim 1) and "adjusting" (Claim 15) with the *dark level bias is not limited to adding the dark level bias to the combined signal. Claim 3 uses the product of the dark level bias and the sum of the user and sensing signals to generate the brightness control signal. This is different than just adding the dark level bias to the combined signal. Claim 4, in contrast, expressly requires the "dark level bias is added to the combined signal." If "adjust" meant "add," there would be no need to specify "added" in Claim 4.* Indeed, Claim 4 may be entirely superfluous under Defendants' claim construction. Similarly, Claim 18, which depends from Claim 15, requires "the dark level bias is added to the combined signal." Again, if "adjusting" meant "adding," there would be no need to separately specify that the dark level bias is "added." Finally, as described above in the section on "multiplier," *the dark level bias adjustments of the exemplary embodiments (other than Figure 2) are more complex than a simple addition.* Indeed, even the *Figure 2 embodiment includes scaling factors in the adjustment using the dark level bias* to generate the brightness control signal. *Id.* at col.5 ll.22-27. "Adjust" and "adjusting," specifically with respect to using the dark level bias to generate the brightness control signal from the combined signal, are broader than "add" and "adding."

Ex. F, 24-25 (emphasis added).

Therefore, the Office should withdraw its construction of "dark level bias" because its construction improperly reads in a limitation from the preferred embodiment, excludes other preferred embodiment, conflicts with the dependent claims, and fails to give the claims their plain and ordinary meaning.

D. The Phrase “When the ‘Light Sensor’ Value Is Zero” in Office’s Construction Is Contrary to the Claim Language And the Intrinsic Evidence

The portion of the Office Action’s construction that states “when the ‘light sensor’ value is zero” is contrary to the plain language of the claim 1. Office Action, 8. The dark level bias in claim 1 reads as follows:

...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.*

’117 patent, claim 1 (emphasis added).

The Office’s construction relating to “when the ‘light sensor’ value is zero” is inconsistent with the plain language of the claims and the specification. The claim language refers to when the “ambient light level” of the room or environment becomes “approximately zero” *not* when the “‘light sensor’ value” is zero. There is no mention of the light sensor or the sensing signal in the “dark level bias” limitation of claim 1. Further, the claim differentiates between the ambient light of the surrounding environment and the sensing signal, reciting “a light sensor configured to sense ambient light and to output a sensing signal indicative of the ambient light level.” This is supported by the specification, which refers to “ambient light” as the light of the environment of the display.

The ability to read the display is hampered under conditions of *high ambient room lighting.*

For example, a capacitor can be used to filter the initial current and to slow down the response time of the visible light sensor such that the sensor current signal remain [sic] substantially unchanged during *transient variations in the ambient light (e.g., when objects pass in front of the display).*

'117 patent, 1:25-27, 3:15-20 (emphasis added). The phrase “when the ambient light level decreases to approximately zero” thus refers to the ambient light level of the environment of the display.

Therefore, the Office Action’s use of “when the ‘light sensor’ value is zero” is contrary to the plain language of the claims and the specification of the '117 patent, which describes “ambient light” as referring to the environment of the display.

E. The Office Action’s Construction of “Dark Level Bias” Excludes Almost All Preferred Embodiments And Is Thus Contrary to Federal Circuit Precedent

The Federal Circuit has warned that “a claim interpretation that excludes a preferred embodiment from the scope of the claim is rarely, if ever, correct.” *CUPP Computing*, 53 F.4th at 1381 (citation omitted). Contrary to this Federal Circuit precedent, the Office Action admits that the “dark level bias” construction for claim 1 excludes every preferred embodiment except for Figure 2.

Note that the embodiment of *FIG. 1 is not applicable* to Functional Phrase #2 because in FIG. 1 the dark level bias is not configured to adjust the combined signal as claimed. The *dark level bias of FIG. 1 is used for generating the combined signal at multiplier 106, rather than for adjusting the combined signal after the combined signal has been generated.*

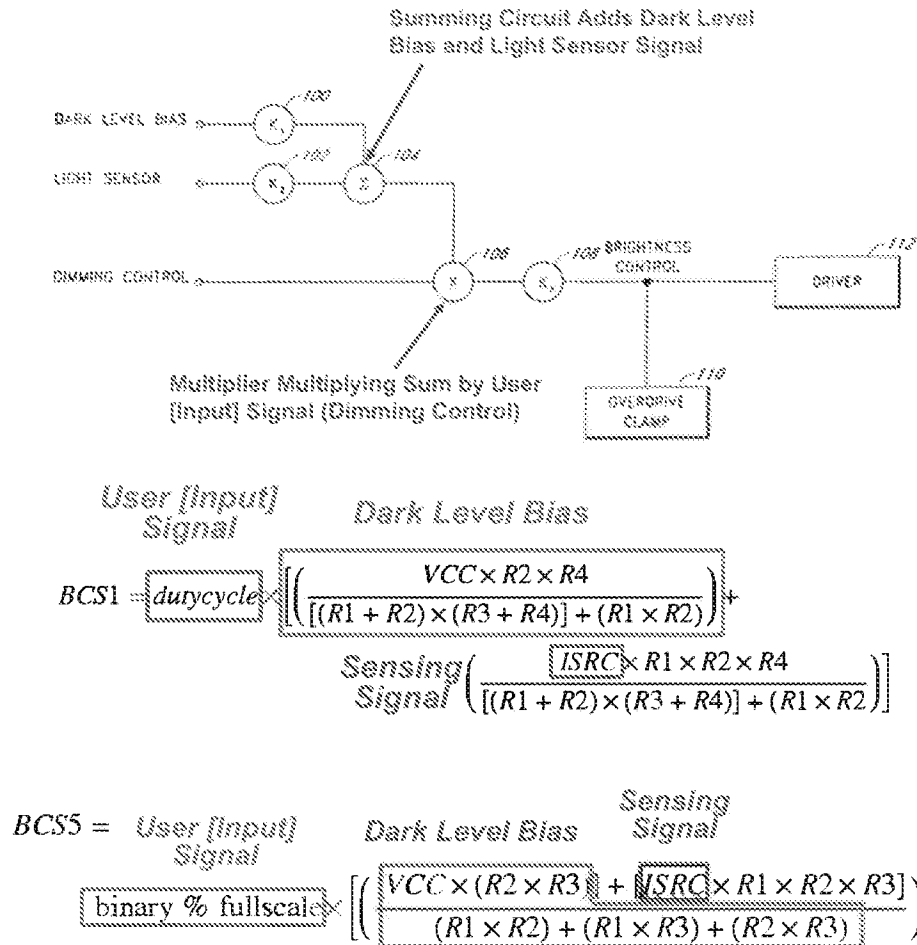
Likewise, *the embodiments of FIGS. 4 and 8-10 are not applicable* to Functional Phrase #2.

Office Action, 9 (emphasis added).

The Office Action appears to exclude the embodiment of Figure 1 by reading in a temporal restriction to the apparatus of claim 1 by requiring that the dark level bias to adjust the combined signal *after* multiplication regarding the combined signal. However, this temporal restriction is contrary to the intrinsic evidence and the language of the claims. For example,

preferred embodiment 1 shows the “dark level bias” being applied prior to multiplication of the user signal and sensing signals.

FIG. 1



'117 Patent, FIG. 1, 7:17-23, 11:10-15 (annotations added).

Therefore, the Office Action’s construction is contrary to the disclosure and preferred embodiments of the '117 patent.

Furthermore, the Office Action’s temporal restriction is also contrary to the dependent claims and therefore incorrect. For example, the dependent claims of the '117 patent are clear

that the claims cover adjustment of the combined signal by the dark level bias before, concurrently, and after multiplication. Stevenson Decl., ¶¶33-35.

17. The method of claim 15, wherein *the dark level bias is added to the sense signal before selective multiplication* such that the amount of adjustment to the combined signal is dependent on the input signal.

18. 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.

‘117 Patent, claims 17-18. Claim 17 specifically covers embodiments, like that in Figure 1, where “the dark level bias is added to the sense signal before selective multiplication.” Stevenson Decl., ¶¶33-35. Claim 18, in contrast, covers embodiments, like that in Figure 2, where “the dark level bias is added to the combined signal after selective multiplication.” Stevenson Decl., ¶¶34.

Similarly, the dependent claims 3, 5, and 10-12, which depend on claim 1, cover embodiments wherein the dark level bias adjusts the “output of the multiplier” (i.e., dark level bias adjusts after multiplication) and embodiments where the multiplier generates the “brightness control signal” (i.e., dark level bias adjustment occurs before multiplication such that the multiplier generates the “brightness control signal”). Stevenson Decl., ¶¶33-35.

3. The brightness control circuit of claim 2, wherein the *multiplier* multiplies a sum of the user signal and the sensing signal by the dark level bias *to generate an output signal corresponding to the brightness control signal*.

5. The brightness control circuit of claim 4, wherein the *dark level bias is added to an output of the multiplier*.

10. The brightness control circuit of claim 1, wherein the *multiplier* is implemented with a pair of current-steering diodes having commonly connected anodes coupled to the sensing signal and respective cathodes coupled to the user signal and a network of resistors *to generate the brightness control signal*.

11. The brightness control circuit of claim 1, wherein the user signal corresponds to a setting of a user adjustable potentiometer, and the ***multiplier is implemented*** with an isolation diode having an anode coupled to the sensing signal and a cathode coupled to the user adjustable potentiometer and a network of resistors ***to generate the brightness control signal***.

12. The brightness control circuit of claim 1, wherein the user signal corresponds to a digital word, and the ***multiplier is implemented*** with a digital-to-analog converter configured to receive the digital word and a reference signal determined by the sensing signal ***to generate the brightness control signal***.

Id. at claims 3, 5, 10-12 (emphasis added).

Therefore, claim 1, which is independent and thus necessarily broader than its dependent claims, must cover the adjustment by the dark level bias *both* before and after multiplication thereby encompassing all of the preferred embodiments. If claim 1 only covered adjustments by the dark level bias after multiplication as the Office Action contends, it would be narrow than, and contradict, dependent claims 3 and 10-12, which expressly state that the “multiplier” is implemented “to generate the brightness control signal” indicating that the dark level bias adjustment happens prior to multiplication as in preferred embodiment 1. ’117 patent, claims 3, 10-12, 4:46-61, 7:17-32, 10:33-11:15; Stevenson Decl., ¶¶33-35. The Office Action’s interpretation is thus incorrect. *Littlefuse*, 29 F.4th at 1380 (“By definition, an independent claim is broader than a claim that depends from it, so if a dependent claim reads on a particular embodiment of the claimed invention, the corresponding independent claim must cover that embodiment as well.”); *Columbia Univ.*, 811 F.3d at 1370 (“[C]onstruing the independent claim to exclude material covered by the dependent claim would be inconsistent.”). The Office Action’s interpretation would similarly exclude all preferred embodiments except Figure 2 by the Examiner’s own admission, which is improper. *CUPP Computing*, 53 F.4th at 1381 (“[A] claim

interpretation that excludes a preferred embodiment from the scope of the claim is rarely, if ever, correct.”); Office Action, 8-10.

The same temporal restriction proposed in the Office Action has been explicitly rejected by the district court as contrary to the intrinsic evidence and the plain language of the claims. The district court’s reasoning is shown below.

There is *no support in these embodiments for the temporal order of operations* proposed by Defendants. Specifically, *reading the claims to first generate a combined signal and then separately and subsequently adjust that combined signal by a dark level bias would exclude the Figure 4, Figure 8, and Figure 9 embodiments from the claims.* It would also *exclude the Figure 10 embodiment*, as that embodiment operates substantially the same as the Figure 4 embodiment. *Id.* at col.11 ll.39–48. This is in addition to *excluding the Figure 1 embodiment*, as expressly advocated by Defendants. To be clear, *Defendants are advocating, implicitly or explicitly, to construe the claims to exclude every exemplary embodiment of a “multiplier circuit” except that depicted as a functional block in the block diagram of Figure 2.* The Court declines to do so.

In addition to excluding most of the exemplary embodiments, *Defendants seek a construction that calls into question the validity of several claims* that depend from Claim 1 . . . Implicit in Defendants construction is that Claims 10 through 12 may also be invalid as indefinite. These claims, reproduced here and annotated by the Court, call for the multiplier to “generate the brightness control signal.” Claim 1 calls for the multiplier to “generate a combined signal.” Thus, the dependent claims expressly state that the purpose of the multiplier is not only to “generate a combined signal” but also to “generate the brightness control signal.” Yet Claim 1 also requires “a dark level bias configured to adjust the combined signal to generate a brightness control signal.” *Defendants’ construction, and its argument, are premised on the dark-level-bias adjustment to generate the brightness control signal being separate from and subsequent to the operation of the multiplier. Claims 10 through 12 require that the same multiplier that generates the combined signal also generates the brightness control signal. Defendants’*

construction and the express language of the claims are thus in conflict. The express language of the claims governs.

Ex. F at 19-20 (emphasis added). As the court noted, the Office’s proposed temporal restriction would exclude the embodiments of Figures 4, 8, 9, and 10. The district court’s analysis is strongly rooted in intrinsic evidence and legal precedent regarding claim construction. Patent Owner respectfully requests that the Office remove the temporal restriction from the “dark level bias” construction.

The Office Action’s construction of “dark level bias” excludes every preferred embodiment except for Figure 2 based on the following reasoning. Office Action, 8-10.

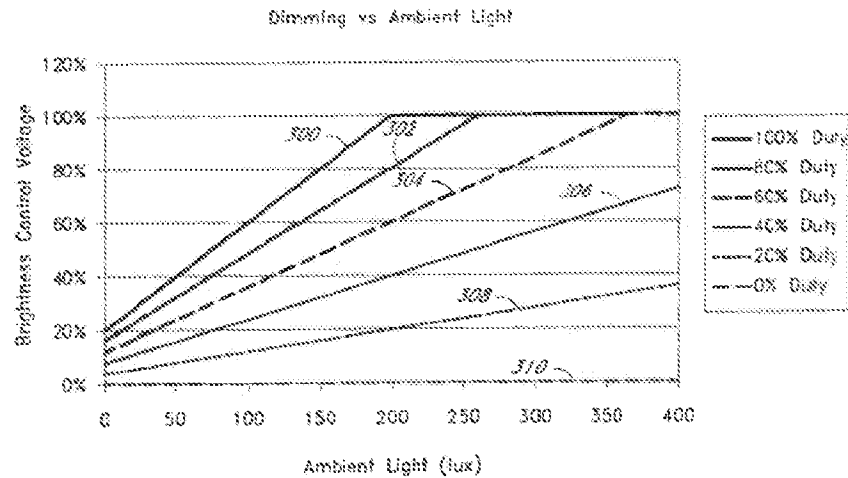
Instead, the ***brightness control signal is effectively zero in instances when both ambient light level and the user-selected brightness value are both zero.*** That is, ***when the user-selected brightness value*** (denoted by “duty cycle” in the equation at column 7 :20) ***is zero, then the brightness control signal is zero.***

Id. (emphasis added).

The Office Action’s reasoning improperly focuses on what happens when the “user-selected brightness value” is “zero.” *Id.* ***First***, the Office Action misinterprets the ’117 patent. Most of the embodiments of the ’117 patent allow the user to manually turn off the display device. Stevenson Decl., ¶22. The ’117 patent explains that, when the user setting is 0% duty, the display system is turned off. Stevenson Decl., ¶22; ’117 patent, FIG. 3, 6:1-6. Of course, when the display system is turned off, the display has no brightness because it is off. Stevenson Decl., ¶22.

Graph 310 lies substantially on top of the horizontal axis in accordance with the ***sixth user setting corresponding to turning off the visual information display system.*** For the other user settings (or user adjustable dimming levels), the brightness control signal increases (or decreases) with increasing (or decreasing) ambient light levels.

FIG. 3



'117 patent, FIG. 3, 6:1-6 (emphasis added).

Therefore, because a user may manually turn off the screen, it is not unexpected that in most embodiments the brightness will be zero when the user has chosen to turn off the display system. Stevenson Decl., ¶22. Turning off the display (i.e., 0% duty) will result in the display having no brightness. Stevenson Decl., ¶22.

The Office Action contends that only the embodiment of Figure 2 is within the scope of the claims. Office Action, 8-10. Noticeably, Figure 2 is an embodiment that is specifically designed “to prevent a user from using the brightness control circuit to turn off a visual information display system.” Stevenson Decl., ¶22; '117 patent, 5:38-43 (emphasis added).

Therefore, the Office Action’s interpretation of the claims would exclude any display system that can be turned off. This is contrary to the understanding of one of ordinary skill in the art and incorrect in light of the claim language. Stevenson Decl., ¶22. There is no claim language that would exclude devices that can be turned off.

Second, the Office Action's focus on what happens when the "user-selected brightness value" is zero is misplaced. While the claims relate to what happens when the display is on and "the ambient light level decreases to approximately zero," the question of what happens when the "user-selected brightness value" is zero (i.e., the display device is off) is wholly irrelevant to the claims. The claims have no requirement about what happens when the "user-selected brightness value" is zero (i.e., the display device is off). Stevenson Decl., ¶22.

1. A brightness control circuit with selective ambient light correction comprising:
a first input configured to receive a user signal indicative of a user selectable brightness setting;
a light sensor configured to sense ambient light and to output a sensing signal indicative of the ambient light level;
a multiplier configured to selectively generate a combined signal based on both the user signal and the sensing signal; and
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.

15. A method to selectively provide ambient light correction, said method comprising:
receiving a user input signal indicative of a user selectable brightness setting;
selectively multiplying the input signal with a sense signal to generate a combined signal, wherein the sense signal indicates an ambient light level; and
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.

'117 patent, claims 1, 15. Therefore, the Office Action's exclusion of all preferred embodiments wherein the "user-selected brightness value" can be set to zero (i.e., the display system can be manually turned off) is incorrect and unsupported by the actual language of the claims.

Patent Owner understands that there is no dispute that, if the display system is turned on (i.e., the user setting is not zero), then all preferred embodiments are within the scope of the claims because the dark level bias will maintain the brightness control signal above a predetermined level. Stevenson Decl., ¶22. For example, when the device is turned on (i.e., the user signal is non-zero), the dark level bias will maintain the brightness control signal above a predetermined level when the ambient light level decreases to approximately zero as shown in the equations for Figures 4 (BCS1), 8 (BCS3), and 9 (BCS5). Stevenson Decl., ¶22.

$$\begin{aligned}
 \text{BCS1} &= \boxed{\text{duty cycle}} \times \left[\left(\frac{VCC \times R2 \times R4}{[(R1 + R2) \times (R3 + R4)] + (R1 \times R2)} \right) + \right. \\
 &\quad \left. \boxed{\text{Sensing Signal}} \left(\frac{\boxed{ISRC} \times R1 \times R2 \times R4}{[(R1 + R2) \times (R3 + R4)] + (R1 \times R2)} \right) \right] \\
 \text{BCS3} &= \left[\boxed{\text{Dark Level Bias}} \left(VCC \times \frac{R3}{(R1 + R3)} \right) + \left[\boxed{\text{Sensing Signal}} \times \frac{\boxed{ISRC} \times (R1 \times R3)}{(R1 + R3)} \right] \right] \times \boxed{\text{User [Input] Signal}} \\
 \text{BCS5} &= \boxed{\text{User [Input] Signal}} \times \left[\left(\frac{VCC \times (R2 \times R3)}{(R1 \times R2) + (R1 \times R3) + (R2 \times R3)} \right) + \right. \\
 &\quad \left. \boxed{\text{Sensing Signal}} \left(\frac{\boxed{ISRC} \times R1 \times R2 \times R3}{(R1 \times R2) + (R1 \times R3) + (R2 \times R3)} \right) \right]
 \end{aligned}$$

'117 Patent, 7:17-32, 10:9-12, 11:10-15 (annotations added).

Therefore, the Office Action improperly interpreted the claims to exclude the preferred embodiments of Figures 1, 4, 8, and 9, based on the fact that the user could turn off the display system in these embodiments by turning the “user-selected brightness value” to zero duty. There

is no basis in the specification or claim language to exclude embodiments where the display device can be turned off.

F. The Requester, Patent Owner, and Their Experts All Agree That The “Dark Level Bias” Limitation Is Not Subject to § 112 ¶6

The Requester, Microsoft Corporation, and its expert, Dr. Hobbs, did not propose that any terms be construed under § 112 ¶6 and thus agree with Patent Owner and its expert, Dr. Stevenson, that the “dark level bias” limitation of claim 1 should *not* construed under § 112 ¶6. Request, 24-25; Request, Ex. 17 (Hobbs Decl.), 6-7; Stevenson Decl., ¶¶41-44. Instead, the Requester explicitly acknowledges the district court constructions and does propose any constructions under § 112 ¶6. *Id.*

IX. INTERVIEW SUMMARY PURSUANT TO 37 C.F.R. § 1.560(B)

Patent Owner would like to thank Examiner LaRose and his conferees, Supervisory Patent Examiner Patel and Examiner Corsaro, for the interview held on July 18, 2023. In attendance at the interview for Patent Owner were technical expert Dr. Robert Stevenson, and Patent Owner’s representatives Dr. Russell Tonkovich (Reg. No. 64,101), Jason A. Fitzsimmons (Reg. No. 65,367), and Aidan Brewster.

A slide presentation was provided by Patent Owner and discussed during the interview. A copy of presentation slides was given to Examiner LaRose for entry into the record. Patent Owner also acknowledges receipt of the Interview Summary dated July 21, 2023 and generally agrees that it represents topics that were discussed. However, while the fact that the Office Action’s constructions exclude all embodiments except the embodiment of Figure 2 from the scope of claim 1 was discussed, Patent Owner disputes the characterization of the issue in point (2) in the Examiner Interview Summary..

During the interview, Patent Owner and the Examiners discussed the scope and interpretation of independent claims 1 and 15, as well as differences between independent claims 1 and 15 and the applied references, including Pioneer and Whitted. In particular, Patent Owner explained that claim 1 is not limited only to the embodiment of Figure 2, but encompasses the other disclosed embodiment as well. Patent Owner explained that Pioneer's Equation 1 does not generate a "brightness control signal that is used to control a brightness," and, in fact, that Pioneer uses a quadratic equation based only on the ambient light detection value, and not Equation 1, to calculate the brightness of the display. Patent Owner also explained that the claimed "dark level bias" is not simply a preset minimum, such as that disclosed, for example, in Whitted. Finally, regarding claim construction, Patent Owner explained that the claims do not invoke § 112, sixth paragraph.

This Response addresses these issues in more detail and further supports the arguments presented at the July 18, 2023, interview. The Office is invited to contact the undersigned with any questions.

X. CONCLUSION

Patent Owner respectfully requests that the Office withdraw all rejections and claim constructions and confirm claims 1, 4-7, 9, 15, 16, and 18.

Respectfully submitted,

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