US011825575B2

(12) **United States Patent**
Averyt et al.

(10) **Patent No.: US 11,825,575 B2**
(45) **Date of Patent: Nov. 21, 2023**

(54) **PULSE-WIDTH MODULATION AND ARBITRATION FOR CONTEXTUAL AND UNIFORM LED ILLUMINATION IN USB APPLICATIONS**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 449 days.

(21) Appl. No.: **17/013,978**

(22) Filed: **Sep. 8, 2020**

(65) **Prior Publication Data**

US 2021/0084726 A1 Mar. 18, 2021

Related U.S. Application Data

(60) Provisional application No. 62/899,193, filed on Sep. 12, 2019.

(51) **Int. Cl.**
H05B 45/18 (2020.01)
H05B 45/325 (2020.01)
(Continued)

(52) **U.S. Cl.**
CPC ***H05B 45/325*** (2020.01); ***B60K 37/02*** (2013.01); ***B60Q 3/18*** (2017.02); ***H05B 45/18*** (2020.01);
(Continued)

(58) **Field of Classification Search**
CPC H05B 45/18; H05B 45/325; B60Q 3/18; G06F 3/162; G06F 13/385
See application file for complete search history.

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(57) **ABSTRACT**

A PWM lighting bridge manages hardware PWM compensation components. One or more PWM outputs are driven based upon a master PWM input signal. The master PWM input signal is processed through a mapping function to produce a desired output signal(s) on the one or more PWM outputs. The mapping function comprises a set of compensation bins having a maxim input duty cycle, a minimum input duty cycle and an output duty cycle. The mapping process selects a bin based on determining whether the input duty cycle is within the minimum and maximum duty cycle ranges of the bins and then uses the specified output duty cycle for the one or more PWM outputs. The PWM lighting bridge provides configuration and runtime management of the hardware PWM compensation components. Read/write access to the PWM compensation bins provides customizable configurations of the input and output PWM characteristics.

21 Claims, 5 Drawing Sheets