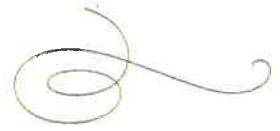
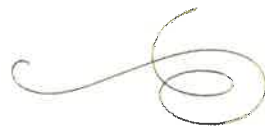


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The Director

of the United States Patent and Trademark Office has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this United States

Patent

grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America, and if the invention is a process, of the right to exclude others from using, offering for sale or selling throughout the United States of America, products made by that process, for the term set forth in 35 U.S.C. 154(a)(2) or (c)(1), subject to the payment of maintenance fees as provided by 35 U.S.C. 41(b). See the Maintenance Fee Notice on the inside of the cover.

Katherine Kelly Vidal

DIRECTOR OF THE UNITED STATES PATENT AND TRADEMARK OFFICE



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

(10) **Patent No.:** **US 11,844,156 B1**
(45) **Date of Patent:** **Dec. 12, 2023**

(54) **LED ILLUMINATION DEVICE AND COLOR TEMPERATURE SWITCHING METHOD THEREOF**

(58) **Field of Classification Search**
CPC H05B 45/20; H05B 45/325; H05B 45/37; H05B 45/54
See application file for complete search history.

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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 0 days.

(57) **ABSTRACT**

An LED illumination device and a color temperature switching method thereof are provided. The LED illumination device includes a bridge rectifier chip, a microcontroller module, a first semiconductor switch module, a second semiconductor switch module, a first current limiting module, a second current limiting module, and a first light-emitting module and a second light-emitting module. The microcontroller module includes a microcontroller chip. The first semiconductor switch module includes a first semiconductor switch chip for receiving a first pulse width modulation signal output from the microcontroller chip. The second semiconductor switch module includes a second semiconductor switch chip for receiving a second pulse width modulation signal output from the microcontroller chip. When the AC power is supplied to the LED illumination device, the first and the second semiconductor switch modules are turned on and maintained within a predetermined turn-on percentage range without being completely turned off.

(21) Appl. No.: **18/145,826**

(22) Filed: **Dec. 22, 2022**

(30) **Foreign Application Priority Data**

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(51) **Int. Cl.**
H05B 45/20 (2020.01)
H05B 45/54 (2020.01)
H05B 45/325 (2020.01)
H05B 45/37 (2020.01)

(52) **U.S. Cl.**
CPC **H05B 45/20** (2020.01); **H05B 45/325** (2020.01); **H05B 45/37** (2020.01); **H05B 45/54** (2020.01)

10 Claims, 10 Drawing Sheets

