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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

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

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- (54) **LED ILLUMINATION DEVICE FOR IMPROVING ANTI-SURGE CAPABILITY**
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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.
- (21) Appl. No.: **17/730,135**
- (22) Filed: **Apr. 26, 2022**
- (30) **Foreign Application Priority Data**
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- (51) **Int. Cl.**
H05B 45/50 (2022.01)
H05B 45/37 (2020.01)
- (52) **U.S. Cl.**
CPC **H05B 45/50** (2020.01); **H05B 45/37** (2020.01)
- (58) **Field of Classification Search**
None
See application file for complete search history.

- (56) **References Cited**
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(57) **ABSTRACT**
An LED illumination device for improving anti-surge capability includes a circuit substrate, a bridge rectifier chip, a surge absorber group, a first anti-surge current-limiting chip group, a second anti-surge current-limiting chip group, an LED illuminating group, and an LED current-limiting group. The surge absorber group is disposed on the circuit substrate and electrically connected to the bridge rectifier chip for absorbing a surge voltage. The first anti-surge current-limiting chip group is disposed on the circuit substrate for absorbing a first predetermined surge voltage. The second anti-surge current-limiting chip group is disposed on the circuit substrate for absorbing a second predetermined surge voltage. The LED illuminating group includes a plurality of LED chips disposed on the circuit substrate. The LED current-limiting group is disposed on the circuit substrate for controlling a total harmonic distortion of current (THDi) of the LED illuminating group.

10 Claims, 6 Drawing Sheets

