US009410686B2

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

(10) **Patent No.: US 9,410,686 B2**
(45) **Date of Patent: Aug. 9, 2016**

(54) **COOLING SYSTEM AND LED-BASED LIGHT COMPRISING SAME**

(75) Inventors: **Jens Burmeister**, Eberbach (DE); **Gerhard Schwarz**, Schönbrunn (DE)

(73) Assignee: **COOPER CROUSE-HINDS GMBH**, Soest (DE)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 112 days.

(21) Appl. No.: **14/124,557**

(22) PCT Filed: **Jun. 8, 2012**

(86) PCT No.: **PCT/EP2012/002445**

§ 371 (c)(1),
(2), (4) Date: **May 28, 2014**

(87) PCT Pub. No.: **WO2012/167945**

PCT Pub. Date: **Dec. 13, 2012**

(65) **Prior Publication Data**

US 2014/0268827 A1 Sep. 18, 2014

(30) **Foreign Application Priority Data**

Jun. 8, 2011 (DE) 10 2011 103 605

(51) **Int. Cl.**
F21V 29/00 (2015.01)
F21V 29/02 (2006.01)
(Continued)

(52) **U.S. Cl.**
CPC ***F21V 29/022*** (2013.01); ***F21K 9/10*** (2013.01); ***F21V 15/01*** (2013.01); ***F21V 25/12*** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC F21V 29/004; F21V 29/70; F21V 29/83; F21V 29/507; F21V 29/773; F21V 29/763; F21V 23/009; F21V 29/02; F21V 29/74; F21V 23/006; F21V 15/01; F21V 29/2212; F21V 29/677; F21V 29/75; F21V 29/77
USPC 362/373
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2004/0120152 A1* 6/2004 Bolta et al. 362/294
2010/0134017 A1* 6/2010 Yatsuda et al. 315/113
2010/0296285 A1* 11/2010 Chemel et al. 362/235

FOREIGN PATENT DOCUMENTS

AU 2009210391 A1 3/2010
CN 2641452 9/2004
(Continued)

OTHER PUBLICATIONS

Peter Huber, DE Application No. 102011103605.2 German Office Action, Mar. 12, 2012, 5 pages, Deutsches Patent- und Markenamt.
(Continued)

Primary Examiner — William Carter
(74) *Attorney, Agent, or Firm* — King & Spalding LLP

(57) **ABSTRACT**

A cooling system (**1**) of a light-emitting diode-based light (**2**) is proposed, wherein said light comprises a completely closed light fitting (**3**) with a flame-proof housing (**4**). In the housing, a cooling body (**5**) as part of the cooling system (**1**) is arranged. The cooling system (**1**) further comprises an electrically operated air circulation means (**6**).

By such a cooling system, it is possible to compensate reduction in light flux with minimal additional costs or minimal additional weight or size of the light, wherein the LED light is simultaneously usable in hazardous areas in a wide temperature range.

16 Claims, 2 Drawing Sheets