

US009810405B2

# (12) United States Patent Yang et al.

# (10) Patent No.:

US 9,810,405 B2

## (45) Date of Patent:

Nov. 7, 2017

### (54) ELECTRONIC CANDLE

- (71) Applicant: Shenzhen Ningrui Electronical Technology Co., Ltd., Shenzhen, Guangdong (CN)
- (72) Inventors: Jiliang Yang, Chongqing (CN); Shihai Zou, Jiujiang (CN)
- (73) Assignee: SHENZHEN NINGRUI
  ELECTRONICAL TECHNOLOGY
  CO., LTD., Guangdong (CN)
- (\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 147 days.
- (21) Appl. No.: 15/001,990
- (22) Filed: Jan. 20, 2016
- (65) Prior Publication Data
  US 2017/0089548 A1 Mar. 30, 2017
- (30) Foreign Application Priority Data

(51)	Int. Cl.	
	F21V 14/02	(2006.01)
	F21V 14/08	(2006.01)
	F21V 33/00	(2006.01)
	F21L 4/02	(2006.01)
	F21V 7/00	(2006.01)
	F21V 13/08	(2006.01)
	F21V 14/04	(2006.01)
	F21V 23/00	(2015.01)
	F21V 23/04	(2006.01)
	F21Y 103/10	(2016.01)

(52) U.S. Cl.

F21V 23/004 (2013.01); F21V 23/0414 (2013.01); F21V 33/0028 (2013.01); F21Y 2103/10 (2016.08)

# (58) Field of Classification Search

None

See application file for complete search history.

### (56) References Cited

#### U.S. PATENT DOCUMENTS

2015/0109786	A1*	4/2015	Li	F21S 6/001
2016/0116127	A1*	4/2016	Patton	362/277 F21S 6/001
				362/284

\* cited by examiner

Primary Examiner — Britt D Hanley
(74) Attorney, Agent, or Firm — Schmeiser, Olsen &
Watts, LLP

### (57) ABSTRACT

The invention discloses an electronic candle, comprising a plastic shell, wherein a spring is arranged inside the plastic shell, an upright metal wire is arranged at the upper end of the spring, a metal ring is arranged at the lower end of the spring, the metal wire is sleeved with an included angle reflecting screen, a plurality of color flame projectors matched with the included angle reflecting screen are arranged on the plastic shell above the spring, a supporting rod with a concave point is arranged on the plastic shell below the spring, a metal hook is arranged at the metal ring bottom, and a driver for driving the soft iron sheet to swing and an overall power supply for supplying power to the driver and the color flame projectors are arranged below the soft iron sheet. The invention achieves a good effect in reasonable structural design and decorative lighting.

### 10 Claims, 9 Drawing Sheets

