



(12) **United States Design Patent**
Joye

(10) **Patent No.:** **US D863,607 S**
(45) **Date of Patent:** **** Oct. 15, 2019**

(54) **BALL AND SOCKET HEAT EXCHANGER FOR A LIGHT FIXTURE**

(74) *Attorney, Agent, or Firm* — Buche & Associates, P.C.; John K. Buche; Bryce A. Johnson

(71) Applicant: **Auroralight, Inc.**, La Jolla, CA (US)

(57) **CLAIM**

(72) Inventor: **Michael Joye**, Carlsbad, CA (US)

The ornamental design for a ball and socket heat exchanger for a light fixture, as shown and described.

(**) Term: **15 Years**

(21) Appl. No.: **29/532,520**

DESCRIPTION

(22) Filed: **Jul. 7, 2015**

(51) **LOC (12) Cl.** **26-04**

(52) **U.S. Cl.** **D26/2**

USPC **D26/2**

(58) **Field of Classification Search**
USPC D23/323; D26/1, 2, 74, 72, 75, 76, 77, D26/78, 58, 88, 89, 118, 138, 141, 24, D26/61, 63, 65, 85, 92, 60, 64, 66, 113, D26/119
CPC F21S 8/02; F21V 19/04; F21V 21/04
See application file for complete search history.

FIG. 1 is a perspective view of a ball and socket heat exchanger;
FIG. 2 is a front view of the ball and socket heat exchanger of FIG. 1;
FIG. 3 is a back view of the ball and socket heat exchanger of FIG. 1;
FIG. 4 is a side view of the ball and socket heat exchanger of FIG. 1;
FIG. 5 is a side view of the ball and socket heat exchanger of FIG. 1;
FIG. 6 is a top view of the ball and socket heat exchanger of FIG. 1;
FIG. 7 is bottom view of the ball and socket heat exchanger of FIG. 1;
FIG. 8 is a perspective view of another embodiment of ball and socket heat exchanger;
FIG. 9 is a front view of the ball and socket heat exchanger of FIG. 8;
FIG. 10 is a back view of the ball and socket heat exchanger of FIG. 8;
FIG. 11 is a side view of the ball and socket heat exchanger of FIG. 8;
FIG. 12 is a side view of the ball and socket heat exchanger of FIG. 8;
FIG. 13 is a top view of the ball and socket heat exchanger of FIG. 8; and,
FIG. 14 is bottom view of the ball and socket heat exchanger of FIG. 8.
In the figures, structures shown in broken lines form no part of the claimed design.

(56) **References Cited**

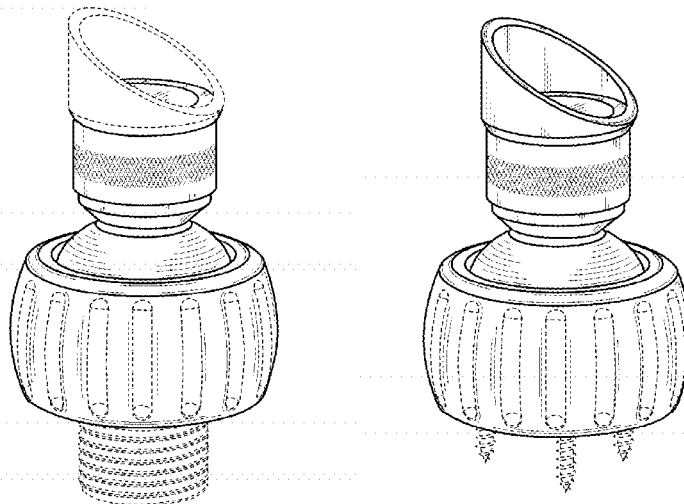
U.S. PATENT DOCUMENTS

3,912,918 A	10/1975	Feinbleom	
4,872,097 A *	10/1989	Miller	F21S 8/02
			362/365
5,452,193 A *	9/1995	Hinnefeld	F21S 8/02
			362/148
5,738,436 A *	4/1998	Cummings	F21S 8/026
			362/148
6,095,669 A *	8/2000	Cho	F21S 8/026
			362/147
6,390,653 B1	5/2002	Schrewe	
D528,673 S *	9/2006	Maxik	D26/2
D542,427 S *	5/2007	Takahashi	D26/2
D549,854 S *	8/2007	Takahashi	D26/2
D596,337 S *	7/2009	Sabernig	D26/88

(Continued)

Primary Examiner — T Chase Nelson
Assistant Examiner — Ania Aman

1 Claim, 6 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

D596,338 S * 7/2009 Sabernig D26/88
7,625,105 B1 * 12/2009 Johnson F21S 8/02
362/147
7,744,259 B2 6/2010 Walczak et al.
D625,876 S * 10/2010 Chen D26/74
D634,453 S * 3/2011 Kim D26/2
D666,336 S * 8/2012 Song D26/2
D685,519 S * 7/2013 Teranishi D26/118
D744,673 S * 12/2015 Boomgaarden D26/2
D769,501 S * 10/2016 Jeswani D26/74
9,488,324 B2 * 11/2016 Shum F21V 17/105
2003/0210554 A1 11/2003 Broelemann
2003/0214803 A1 11/2003 Ono et al.
2006/0098308 A1 * 5/2006 Angelini F21V 3/04
359/820
2011/0080741 A1 * 4/2011 Noh F21S 8/026
362/294
2012/0098424 A1 * 4/2012 Arik F21V 23/006
315/35
2012/0236575 A1 * 9/2012 Tsao F21S 8/02
362/373
2012/0236580 A1 * 9/2012 Cheng F21V 29/00
362/387
2013/0033868 A1 * 2/2013 Gattari F21V 29/02
362/249.02
2013/0322062 A1 * 12/2013 Danesh F21S 8/02
362/157
2014/0233233 A1 * 8/2014 Park F21V 29/004
362/249.02
2016/0319996 A1 * 11/2016 Moon F21S 8/02

* cited by examiner

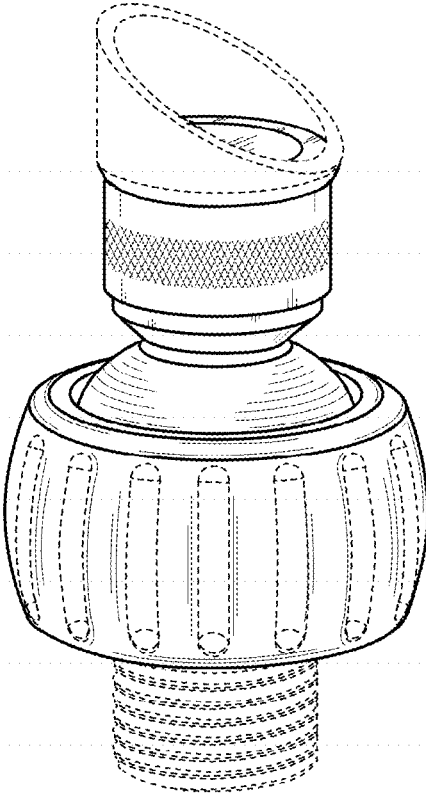


FIG. 1

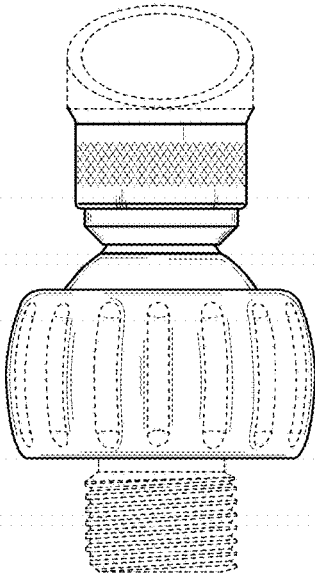


FIG. 2

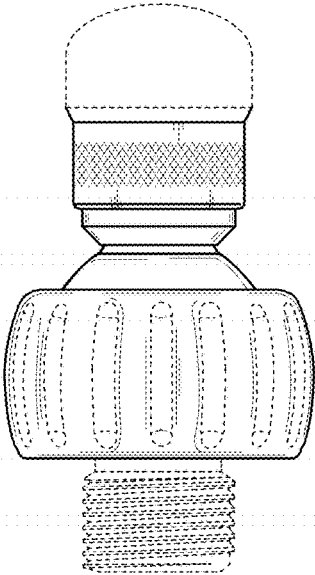


FIG. 3

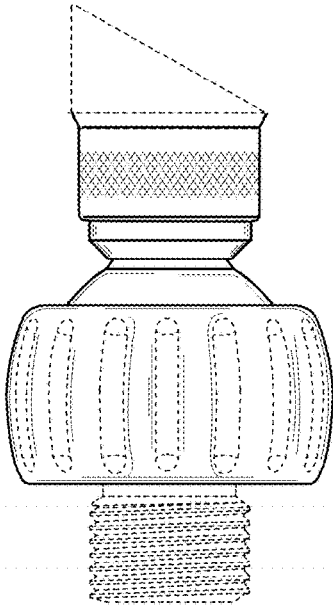


FIG. 4

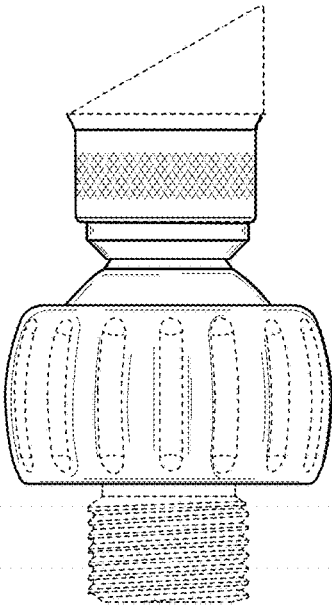


FIG. 5

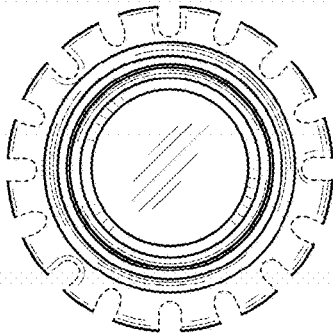


FIG. 6

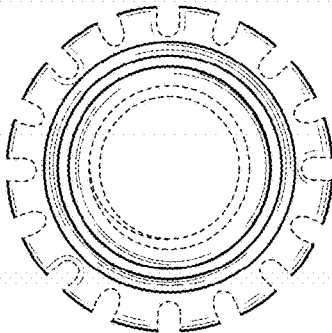


FIG. 7

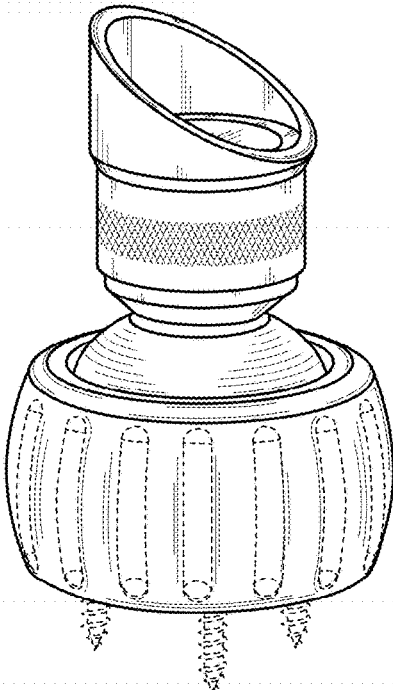


FIG. 8

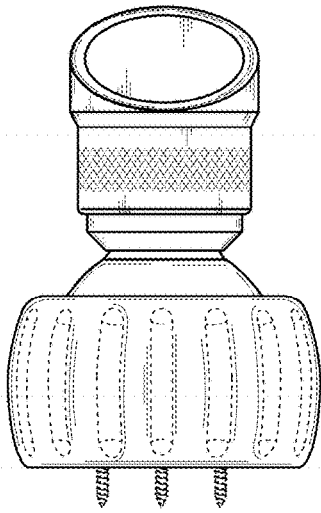


FIG. 9

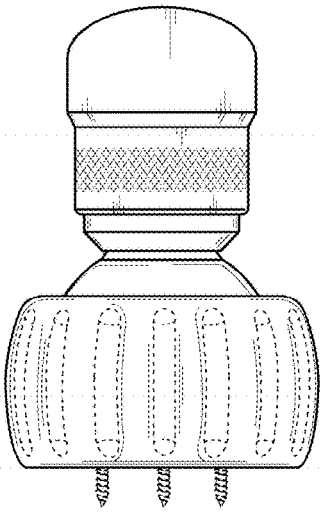


FIG. 10

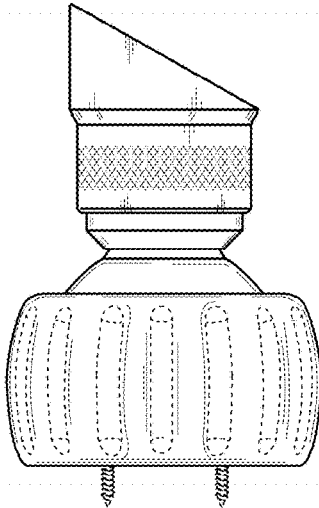


FIG. 11

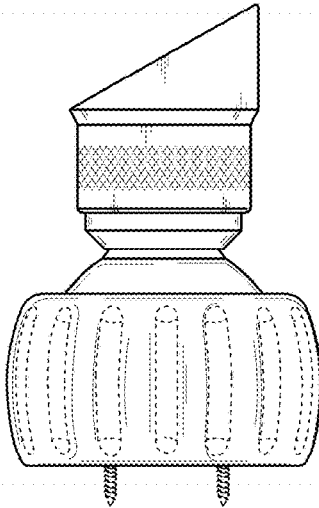


FIG. 12

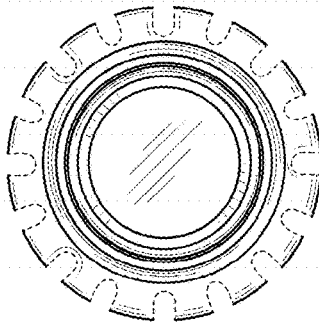


FIG. 13

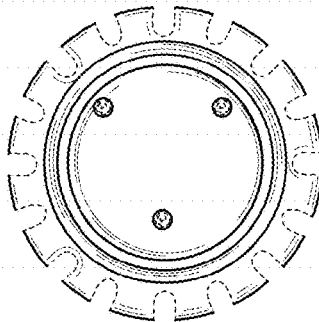


FIG. 14