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(12) **United States Design Patent**  
**Shum et al.**

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(54) **HEAT SINK**

(71) Applicant: **SORAA, INC.**, Fremont, CA (US)

(72) Inventors: **Frank Shum**, Fremont, CA (US);  
**Clifford Jue**, Fremont, CA (US); **Artem Mishin**, Fremont, CA (US); **Zinovy Dolgonosov**, Fremont, CA (US); **George Xie**, Fremont, CA (US); **Michael Ragan Krames**, Fremont, CA (US)

(73) Assignee: **Soraa, Inc.**, Fremont, CA (US)

(\*\*) Term: **14 Years**

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**Related U.S. Application Data**

(63) Continuation-in-part of application No. 29/423,725, filed on Jun. 4, 2012, now Pat. No. Des. 694,722, which is a continuation-in-part of application No. 29/399,523, filed on Aug. 15, 2011, now Pat. No. Des. 662,899, and a continuation-in-part of application No. 29/399,524, filed on Aug. 15, 2011, now Pat. No. Des. 662,900.

(51) **LOC (10) Cl.** ..... **13-03**

(52) **U.S. Cl.**  
USPC ..... **D13/179**

(58) **Field of Classification Search**  
USPC ..... D13/179; D26/2, 113, 118; 165/80.3, 165/104.26, 104.33, 122, 151, 185; 257/706, 707, 718-722; 313/46; 315/52; 361/695, 697, 700, 702, 704, 361/709, 710, 711, 719

See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

6,204,602 B1 3/2001 Yang et al.  
D652,564 S \* 1/2012 Maxik ..... D26/118

D662,899 S \* 7/2012 Shum et al. .... D13/179  
D662,900 S \* 7/2012 Shum et al. .... D13/179  
8,227,962 B1 7/2012 Su  
8,272,762 B2 9/2012 Maxik et al.  
D674,960 S \* 1/2013 Chen et al. .... D26/113  
8,405,947 B1 3/2013 Green et al.  
8,414,151 B2 4/2013 Allen et al.  
8,525,396 B2 9/2013 Shum et al.  
D694,722 S \* 12/2013 Shum et al. .... D13/179

(Continued)

**FOREIGN PATENT DOCUMENTS**

WO WO 2011/054716 5/2011

**OTHER PUBLICATIONS**

International Preliminary Report & Written Opinion of PCT Application No. PCT/US2011/060030 dated Mar. 21, 2012, 11 pgs. total.

(Continued)

*Primary Examiner* — Selina Sikder

(74) *Attorney, Agent, or Firm* — Kilpatrick Townsend & Stockton LLP

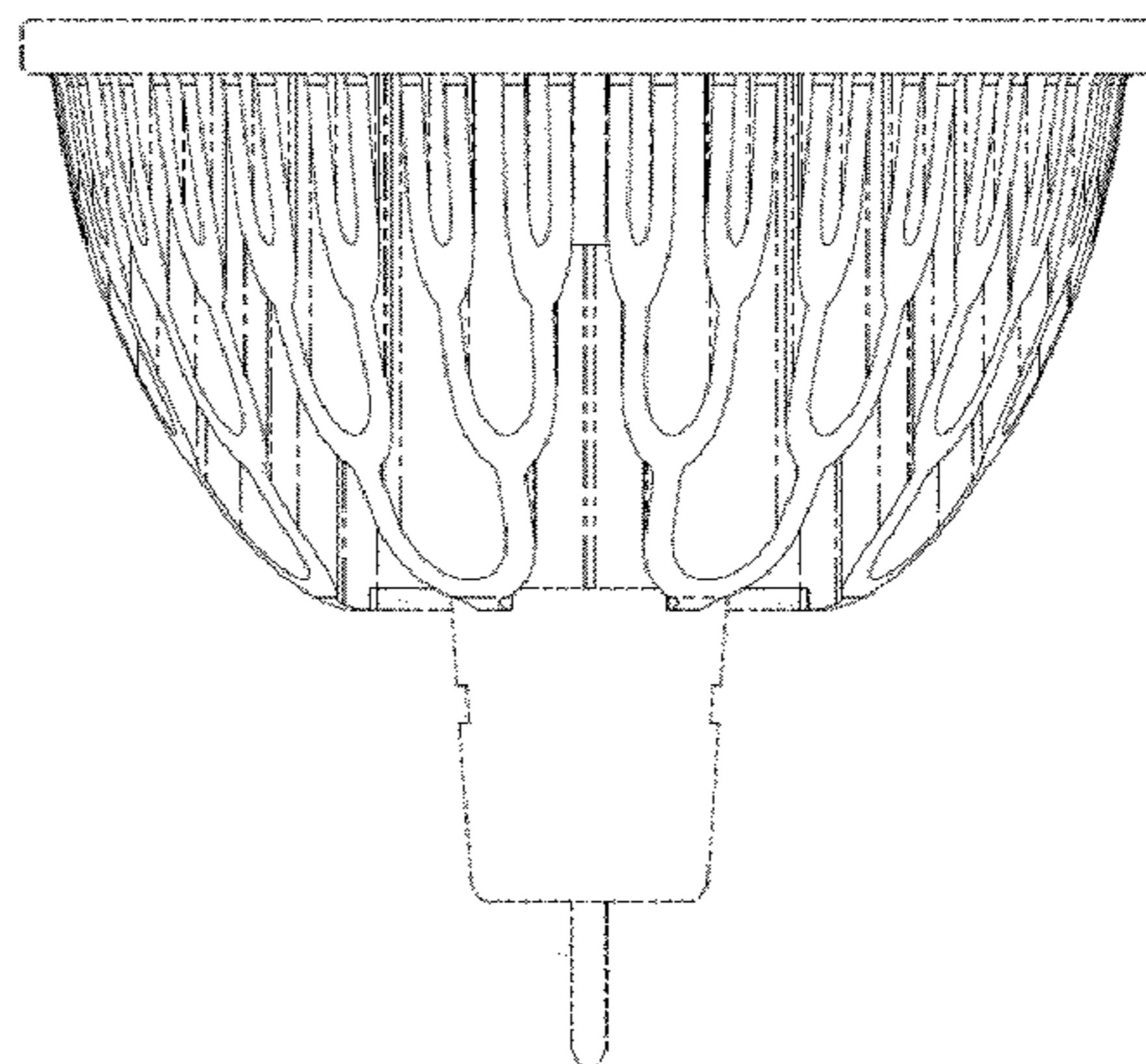
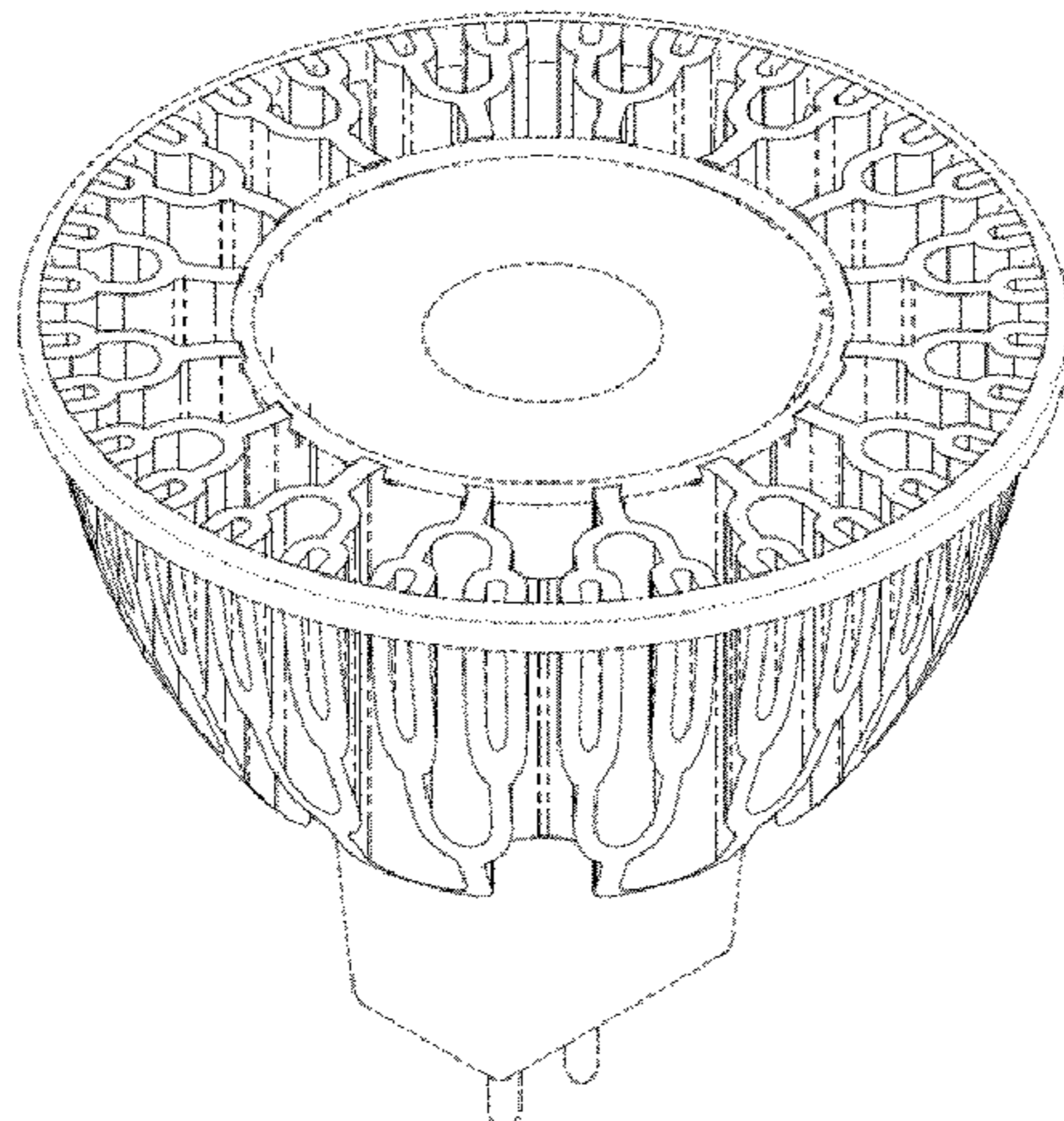
(57) **CLAIM**

The ornamental design for a heat sink, as shown and described.

**DESCRIPTION**

FIG. 1 is a perspective view of a heat sink showing a first embodiment our new design;  
FIG. 2 is a left side elevational view thereof, the right side elevational view being a mirror image thereof;  
FIG. 3 is a front elevational view thereof, the rear elevational view being a mirror image thereof;  
FIG. 4 is a top plan view thereof; and,  
FIG. 5 is a bottom plan view thereof.  
The broken lines in the figure descriptions represent unclaimed subject matter and form no part of the claimed design.

**1 Claim, 5 Drawing Sheets**



(56)

**References Cited**

U.S. PATENT DOCUMENTS

2003/0039122 A1 2/2003 Cao  
 2004/0264195 A1 12/2004 Chang et al.  
 2005/0214992 A1 9/2005 Chakraborty et al.  
 2007/0007898 A1 1/2007 Bruning  
 2007/0284564 A1 12/2007 Biwa et al.  
 2008/0049399 A1 2/2008 Lu et al.  
 2008/0080137 A1 4/2008 Otsuki et al.  
 2008/0142781 A1 6/2008 Lee  
 2008/0164489 A1 7/2008 Schmidt et al.  
 2008/0266866 A1 10/2008 Tsai  
 2009/0161356 A1 6/2009 Negley et al.  
 2009/0195186 A1 8/2009 Guest et al.  
 2009/0244899 A1 10/2009 Chyn  
 2010/0207502 A1 8/2010 Cao et al.  
 2010/0264799 A1 10/2010 Liu et al.  
 2011/0018418 A1\* 1/2011 Yoo ..... 313/46  
 2011/0095686 A1 4/2011 Falicoff et al.  
 2011/0169406 A1 7/2011 Weekamp et al.  
 2011/0175510 A1 7/2011 Rains, Jr. et al.  
 2011/0242823 A1 10/2011 Tracy et al.  
 2012/0161626 A1 6/2012 Van de Ven et al.  
 2013/0322089 A1\* 12/2013 Martis et al. .... 362/311.02

2013/0343062 A1\* 12/2013 Shum et al. .... 362/311.02  
 2014/0091697 A1\* 4/2014 Shum ..... 313/46  
 2014/0175966 A1\* 6/2014 Tan ..... 313/46

OTHER PUBLICATIONS

CFL Ballast IC Drive LED, www.placardshop.com, Blog, May 22, 2012, 3 pgs.  
 Rausch, 'Use a CFL ballast to drive LEDs', EDN Network, 2007, pp. 1-2.  
 USPTO Office Action for U.S. Appl. No. 12/785,953 dated Jan. 11, 2013, 15 pages.  
 USPTO Notice of Allowance for U.S. Appl. No. 13/025,791 dated Jun. 17, 2013, 8 pages.  
 USPTO Office Action for U.S. Appl. No. 13/025,833 dated Apr. 26, 2013, 23 pages.  
 USPTO Notice of Allowance for U.S. Appl. No. 13/025,849 dated Sep. 16, 2013, 10 pages.  
 USPTO Office Action for U.S. Appl. No. 13/274,489 dated Sep. 6, 2013, 13 pages.  
 USPTO Office Action for U.S. Appl. No. 13/535,142 dated Aug. 1, 2013, 14 pages.

\* cited by examiner

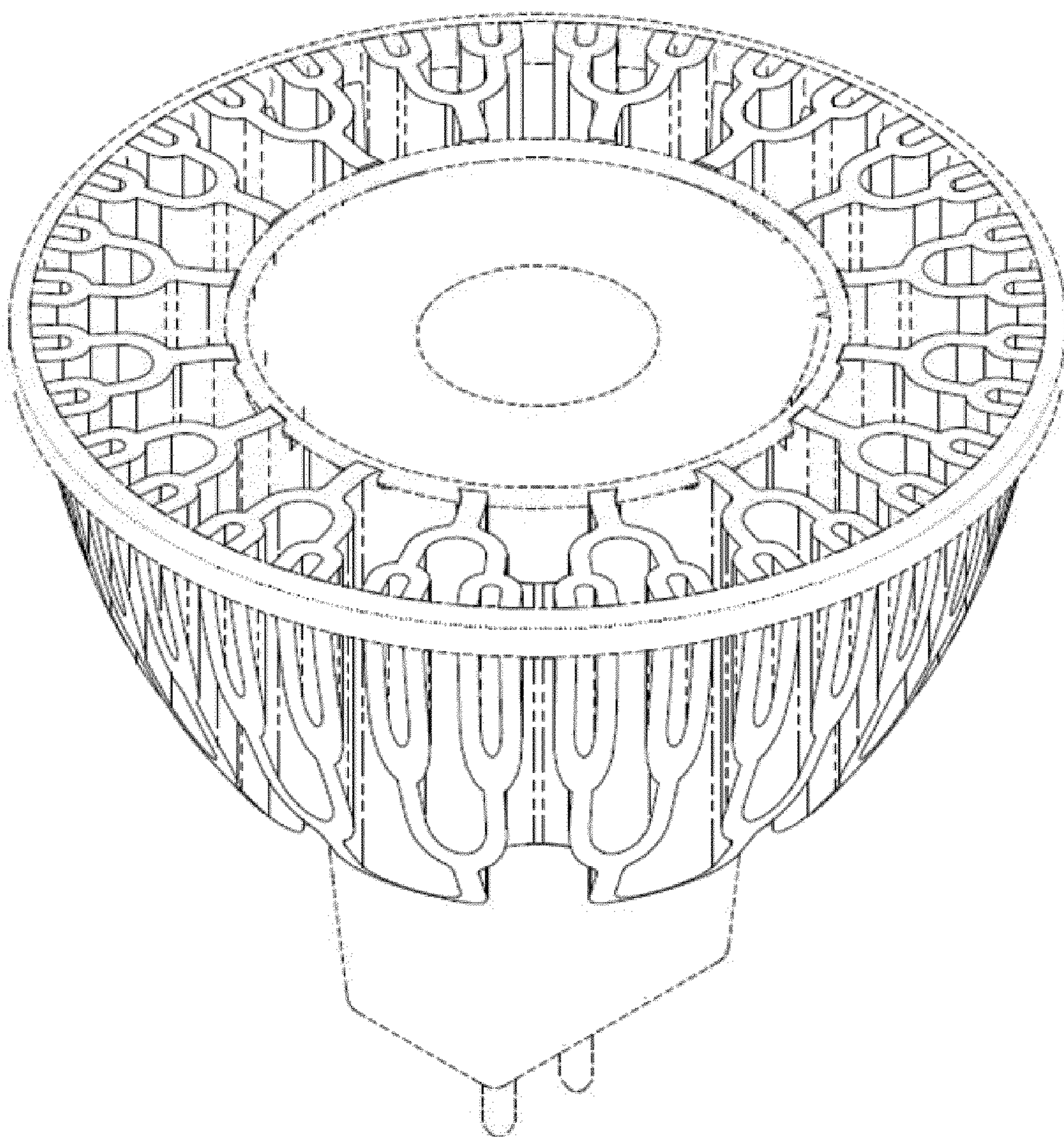


FIG. 1

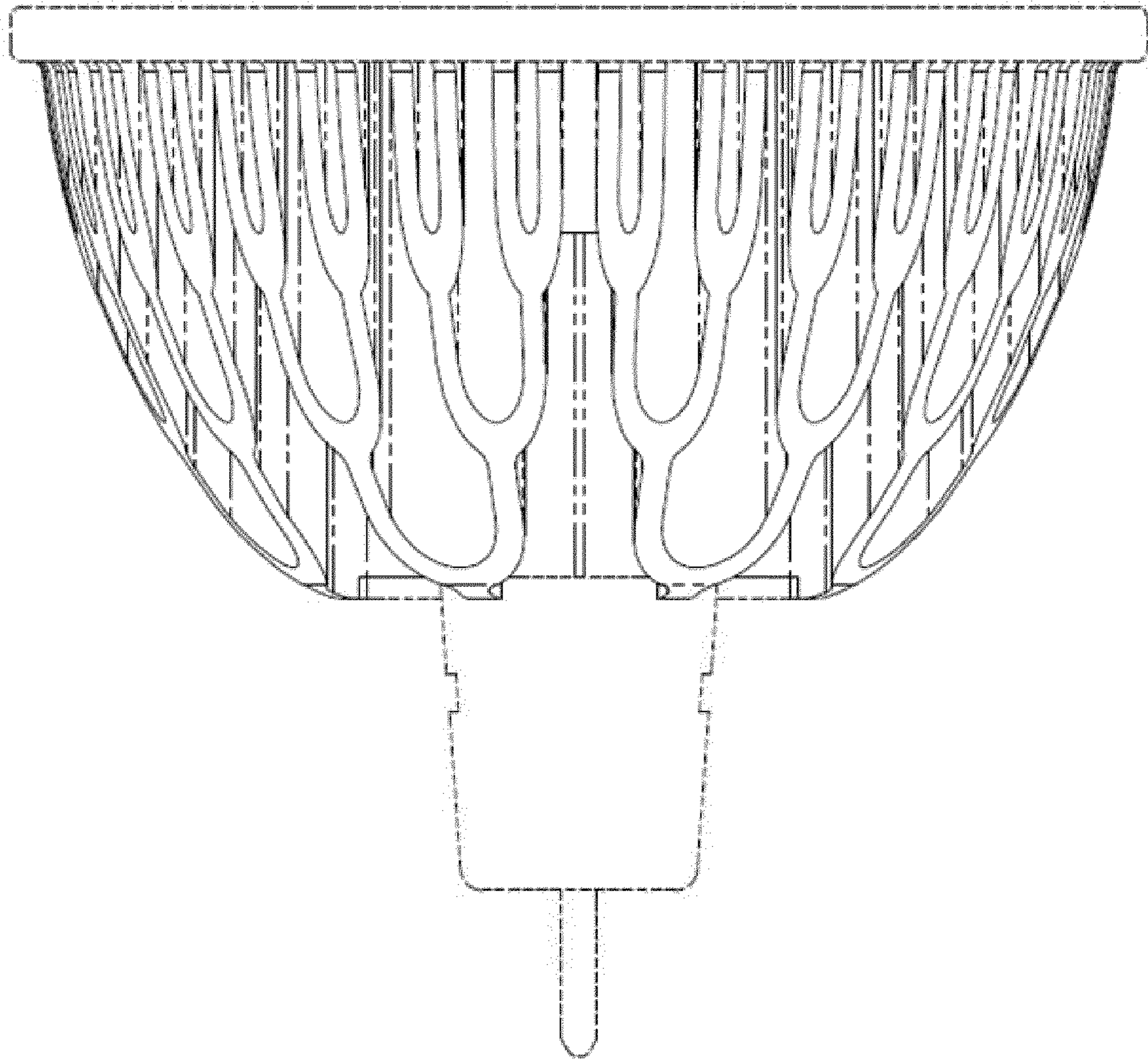


FIG. 2

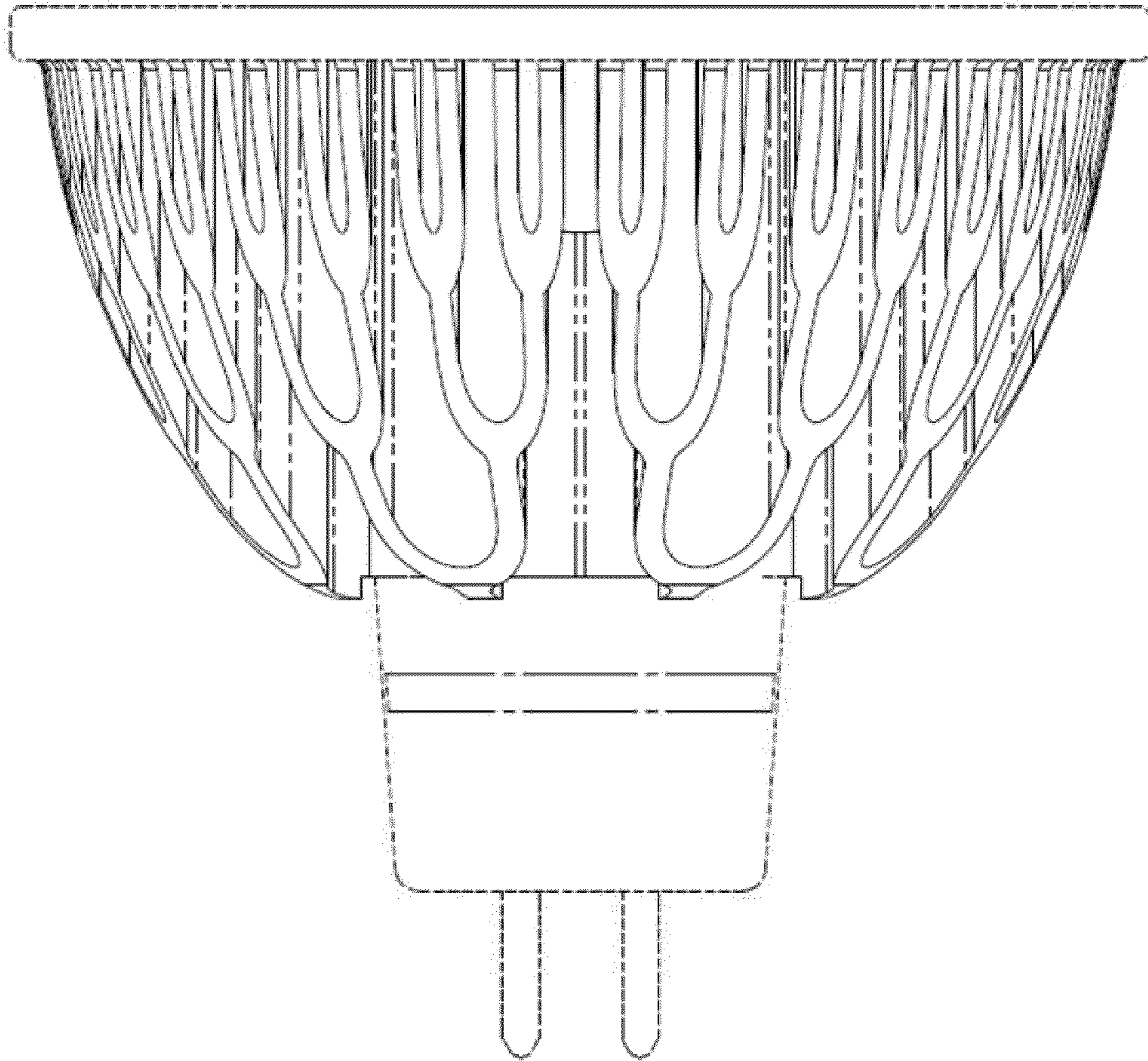


FIG. 3

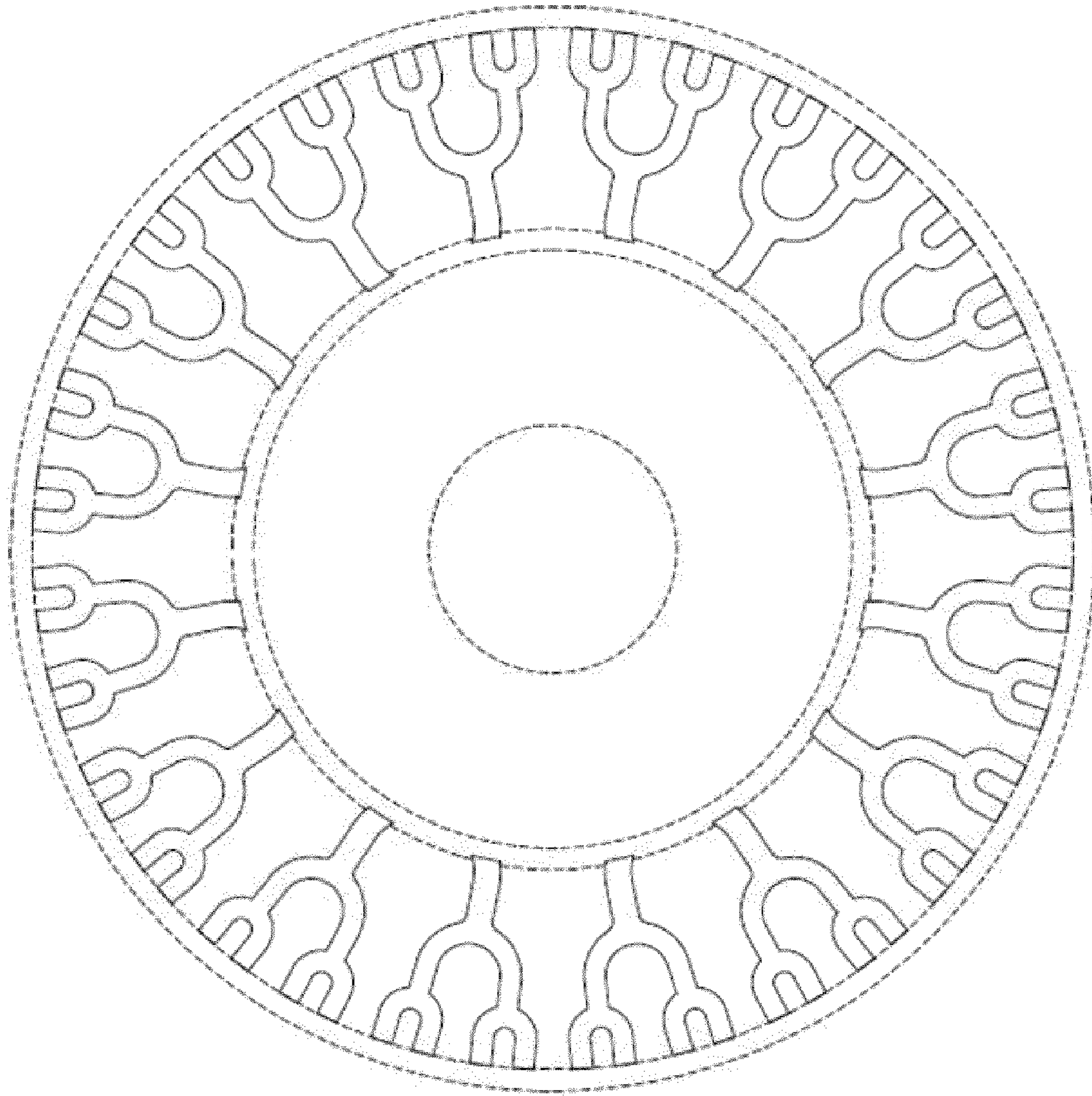


FIG. 4

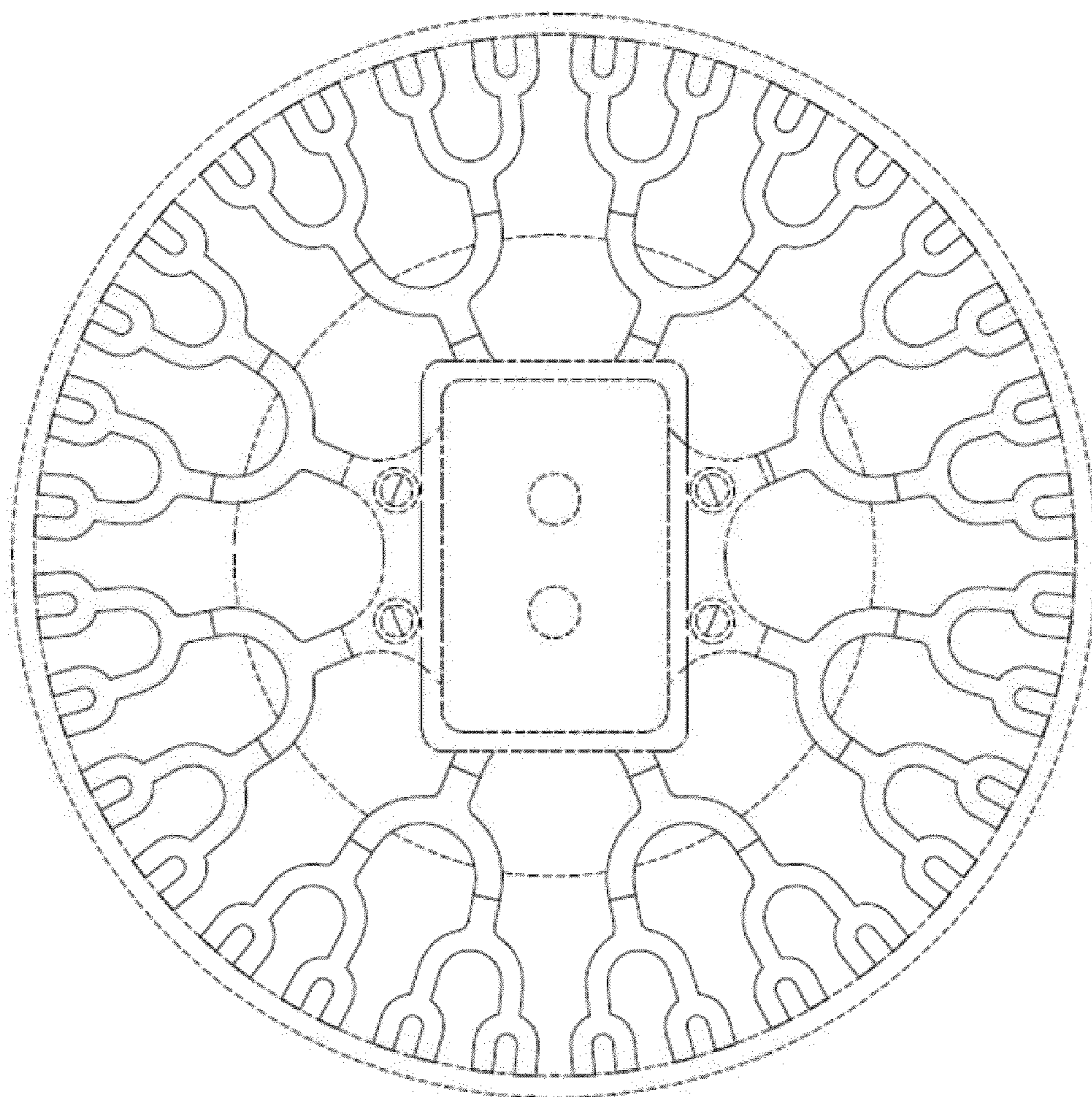


FIG. 5