



US00D766399S

(12) **United States Design Patent** (10) **Patent No.:** **US D766,399 S**  
**Bullock et al.** (45) **Date of Patent:** **\*\* Sep. 13, 2016**

(54) **HYBRID SPRAY NOZZLE TURRET**

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(\*\*) Term: **15 Years**  
(21) Appl. No.: **29/528,949**  
(22) Filed: **Jun. 2, 2015**

**Related U.S. Application Data**

(63) Continuation-in-part of application No. 14/506,057, filed on Oct. 3, 2014.  
(51) **LOC (10) Cl.** ..... **23-01**  
(52) **U.S. Cl.**  
USPC ..... **D23/213**  
(58) **Field of Classification Search**  
USPC ..... D23/213, 214-219; D15/13, 28;  
239/159, 77, 393  
CPC ..... A01M 7/0053  
See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

3,866,832 A 2/1975 Noguchi  
3,967,783 A 7/1976 Halsted et al.  
4,004,733 A 1/1977 Law  
4,058,260 A 11/1977 Lestradet

(Continued)

**FOREIGN PATENT DOCUMENTS**

CN 103096714 A 5/2013  
CN 203164717 U 8/2013

(Continued)

**OTHER PUBLICATIONS**

Combo-Rate [online product brochure]. Wilger Industries Ltd. [retrieved on Sep. 25, 2014]. Retrieved from the Internet: <http://www.heartlandag.com/assets/images/parts/wilger/nozzle/pdf\_83.pdf>.

(Continued)

*Primary Examiner* — Robin V Webster

(57) **CLAIM**

The ornamental design for a hybrid spray nozzle turret, as shown and described.

**DESCRIPTION**

FIG. 1 is a perspective view from above of an embodiment of a hybrid spray nozzle turret in accordance with the present design.

FIG. 2 is a side view of the hybrid spray nozzle turret of FIG. 1.

FIG. 3 is a top view of the hybrid spray nozzle turret of FIG. 1.

FIG. 4 is a bottom view of the hybrid spray nozzle turret of FIG. 1.

FIG. 5 is another side view of the hybrid spray nozzle turret of FIG. 1.

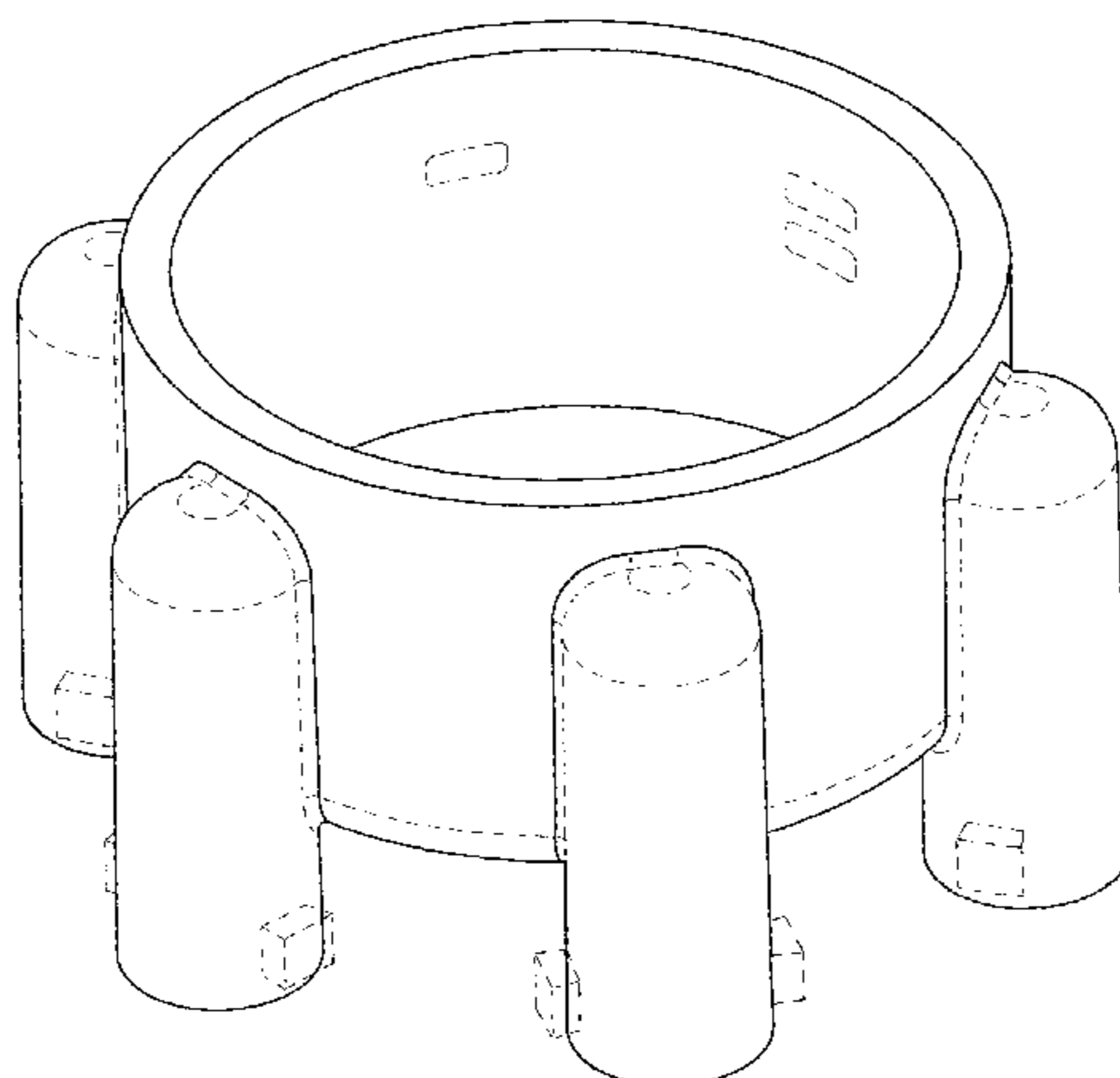
FIG. 6 is a top perspective view of the hybrid spray nozzle turret of FIG. 1 along with the rest of the nozzle body including a mount ring above the nozzle body, wherein the ring is mounted to a fluid distribution pipe; and,

FIG. 7 is another top perspective view of the hybrid spray nozzle turret of FIG. 1 along with the rest of the nozzle body including a mount ring above the nozzle body, wherein the ring is mounted to a fluid distribution pipe.

The ornamental design that is claimed is shown in solid lines in the drawings.

The broken line showing is included for the purpose of illustrating and forms no part of the claimed design.

**1 Claim, 6 Drawing Sheets**



(56)

References Cited

U.S. PATENT DOCUMENTS

4,613,080 A \* 9/1986 Benson ..... A01G 25/16  
138/45

4,649,818 A 3/1987 Switall et al.

4,749,126 A 6/1988 Kessener et al.

4,907,516 A 3/1990 Rogers

5,082,183 A \* 1/1992 Dahlin ..... B05B 1/1645  
239/393

5,134,961 A 8/1992 Giles et al.

D329,652 S \* 9/1992 Killian ..... D15/13

5,267,690 A 12/1993 Gazzoni

5,278,423 A 1/1994 Wangler et al.

5,296,702 A 3/1994 Beck et al.

5,356,077 A 10/1994 Shames et al.

5,441,203 A 8/1995 Swan et al.

5,475,614 A 12/1995 Tofte et al.

5,518,181 A 5/1996 Shames et al.

5,539,624 A 7/1996 Dougherty

5,653,389 A 8/1997 Henderson et al.

5,763,873 A 6/1998 Beck et al.

5,793,035 A 8/1998 Beck et al.

5,873,647 A 2/1999 Kurtz et al.

5,878,960 A 3/1999 McInerney, II et al.

5,938,123 A 8/1999 Heitzman

6,021,960 A 2/2000 Kehat

6,123,272 A \* 9/2000 Havican ..... B05B 1/1654  
239/390

6,193,166 B1 2/2001 Miller et al.

6,325,302 B1 12/2001 Guzowski et al.

6,435,427 B1 \* 8/2002 Conroy ..... B05B 1/1654  
239/392

6,444,090 B1 9/2002 Wolf et al.

6,596,996 B1 7/2003 Stone et al.

6,675,988 B2 1/2004 Cline et al.

6,749,134 B2 \* 6/2004 Arenson ..... A62C 31/03  
239/393

6,877,675 B2 4/2005 Benneweis

6,918,757 B2 7/2005 Nakamura et al.

D516,166 S \* 2/2006 Gregory ..... D23/214

7,066,402 B2 6/2006 Goebel et al.

7,280,047 B2 10/2007 Giles et al.

8,109,448 B2 2/2012 Giles

8,191,795 B2 6/2012 Grimm et al.

8,523,085 B2 9/2013 Grimm et al.

8,636,175 B2 1/2014 Smith

8,936,207 B2 \* 1/2015 Swan ..... B05B 7/0425  
239/589

2001/0000611 A1 5/2001 Cline et al.

2005/0000277 A1 1/2005 Giles

2006/0255176 A1 11/2006 Yeiser

2006/0273189 A1 12/2006 Grimm et al.

2009/0194604 A1 8/2009 Smith

2010/0032492 A1 2/2010 Grimm et al.

2010/0237165 A1 9/2010 Krueger

2012/0168532 A1 7/2012 Giles

2012/0228395 A1 9/2012 Needham et al.

2013/0161419 A1 6/2013 Funseth et al.

2013/0168473 A1 7/2013 Langkamp

2013/0284826 A1 10/2013 Funseth et al.

2013/0284827 A1 10/2013 Humpal et al.

FOREIGN PATENT DOCUMENTS

DE 19715136 A1 10/1998

DE 102007008787 A1 8/2008

DE 202007018966 U1 12/2009

DE 202011003270 U1 4/2011

EP 0362241 B1 6/1994

EP 2606722 A1 6/2010

EP 2227949 A1 9/2010

EP 1961300 B1 3/2011

EP 1961299 B1 6/2011

EP 2522432 A1 11/2012

EP 2522433 A1 11/2012

GB 2165469 A 4/1986

GB 2337984 A 8/1999

SU 1544333 A1 2/1990

WO 9857539 A1 12/1998

WO 0162399 A1 8/2001

WO 2013109272 A1 7/2013

WO 2014067785 A1 5/2014

OTHER PUBLICATIONS

Combo-Rate Nozzle Bodies [online product brochure]. Wilger Industries Ltd. [retrieved on Sep. 25, 2014]. Retrieved from the Internet: <[http://www.wilger.net/images/downloads/COMBO\\_RATE\\_Nozzle\\_Bodies.pdf](http://www.wilger.net/images/downloads/COMBO_RATE_Nozzle_Bodies.pdf)>.

Electronic Modules, Electronics Packaging [online]. Interplex Industries, Inc., 2014 [retrieved on Oct. 2, 2014]. Retrieved from the Internet: <<http://www.interplex.com/electronic-packaging>>.

Grisso, Robert; Alley, Mark; Thomason, Wade; Holshouser, David; Roberson, Gary T. Precision Farming Tools: Variable-Rate Application [online]. College of Agriculture and Life Sciences, Virginia Polytechnic Institute and State University, 2011 [retrieved on Sep. 25, 2014]. Retrieved from the Internet: <[http://pubs.ext.vt.edu/442/442-505/442-505\\_PDF.pdf](http://pubs.ext.vt.edu/442/442-505/442-505_PDF.pdf)>.

Hypro Duo React [online]. Pentair Ltd, 2014 [retrieved on Sep. 25, 2014]. Retrieved from the Internet: <<http://www.hypropumps.com/resources/images/27793.pdf>>.

Insert Molding [online]. Interplex Industries, Inc., 2014 [retrieved on Oct. 2, 2014]. Retrieved from the Internet: <<http://www.interplex.com/insert-molding>>.

Lebeau, Frédéric; Verstraete, Arnaud; Schiffers, Bruno; Destain, Marie-France. Evaluation of Real Time Spray Drift Using RTDrift Gaussian Advection-Diffusion Model. Communications in Agricultural and Applied Biological Sciences, vol. 74 (1), pp. 11-24. Gembloux Agricultural University, Belgium, 2009.

QJ360 Nozzle Body Series for Dry Boom [online]. TeeJet, 2014 [retrieved on Sep. 25, 2014]. Retrieved from Spraying Equipment Supply on the Internet: <<http://www.sprayingequipmentsupply.com/teejet/multiple-nozzle-bodies.html>>.

Sprayer Nozzles for Agriculture and Turf Spraying Systems [online]. Greenleaf Technologies, 2014 [retrieved on Sep. 25, 2014]. Retrieved from the Internet: <<http://www.greenleaftech.com/>>.

European Search Report issued in counterpart application No. 15172723.7, dated Nov. 13, 2015 (7 pages).

\* cited by examiner

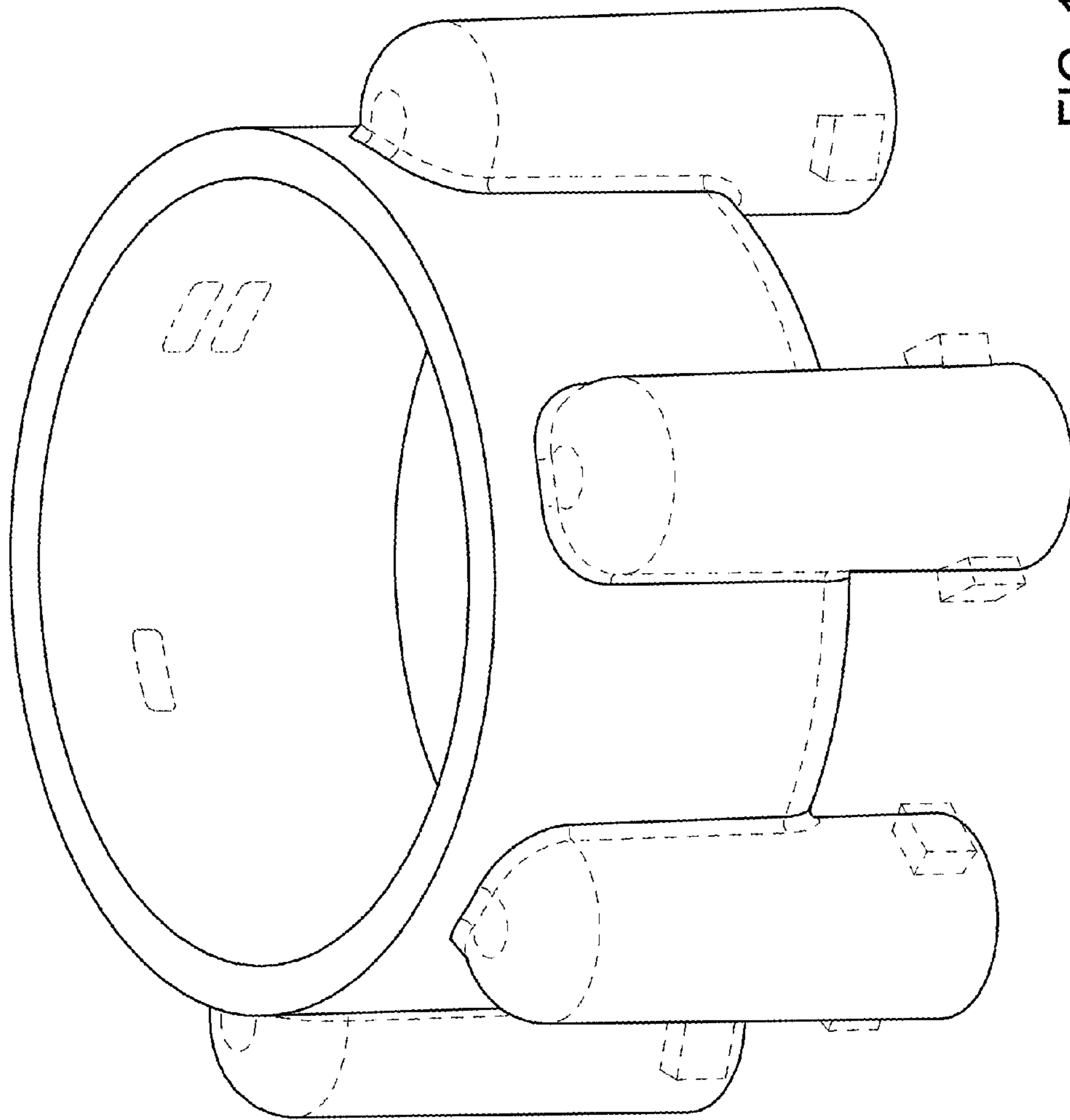


FIG. 1

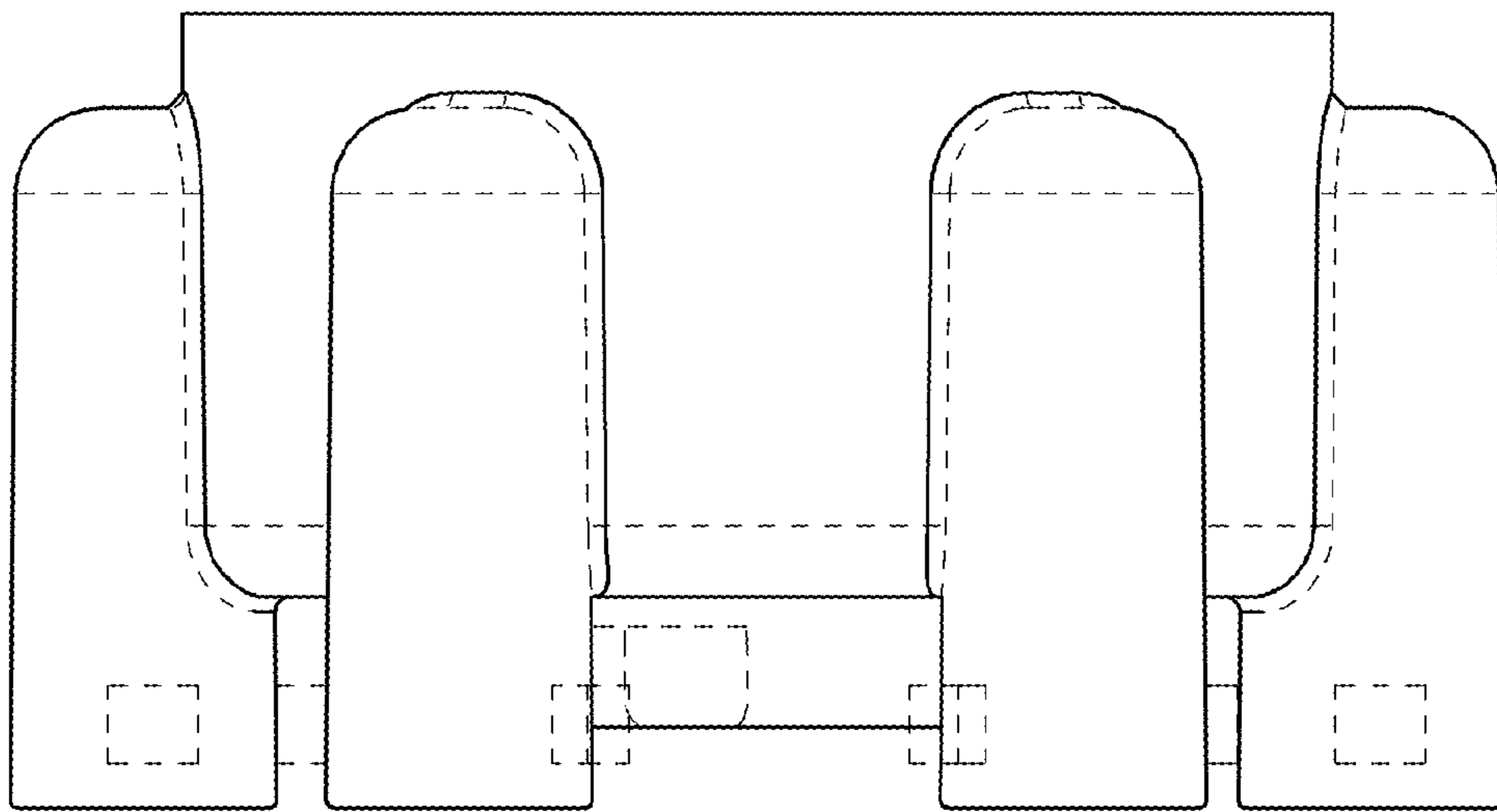


FIG. 2

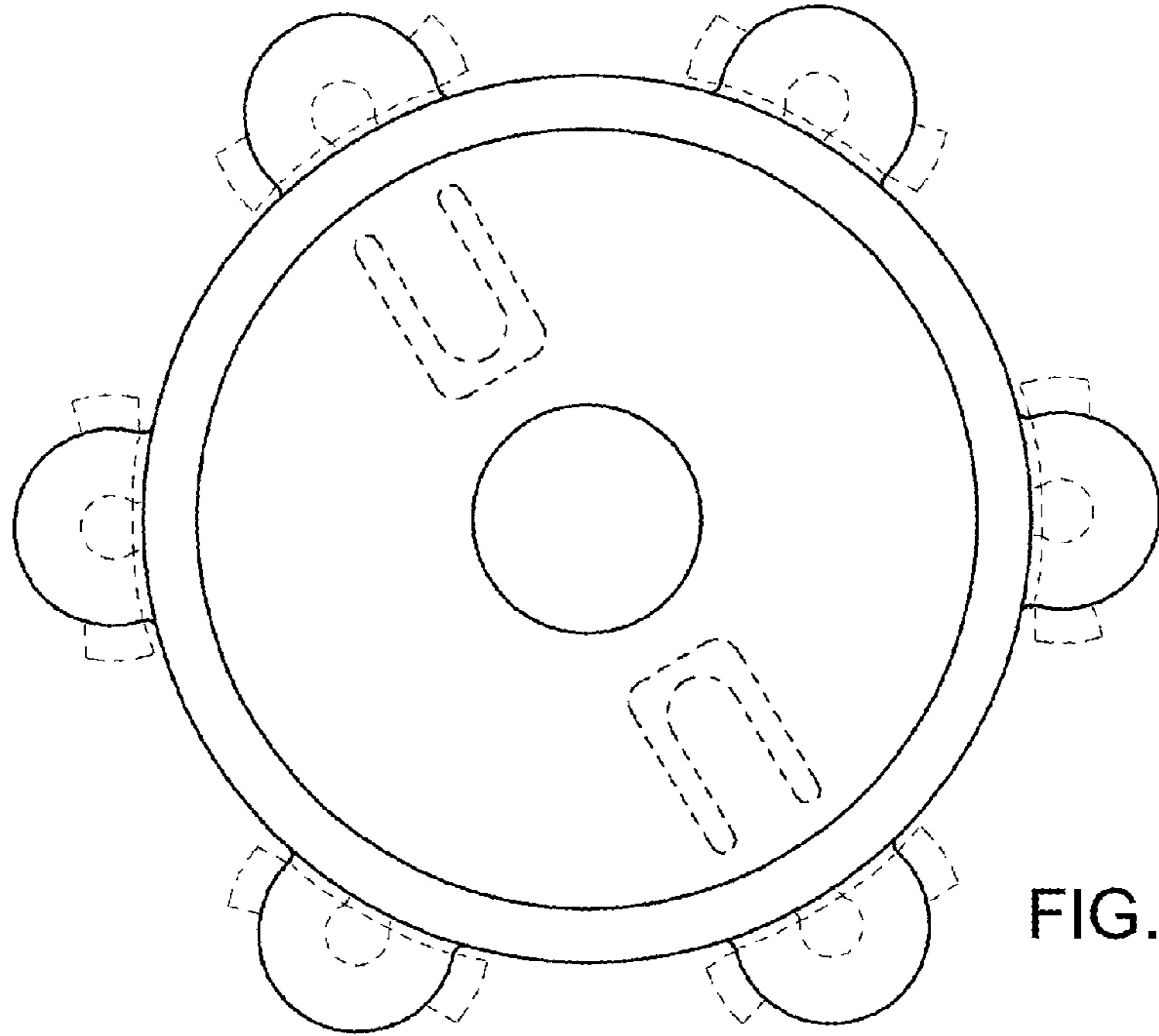


FIG. 3

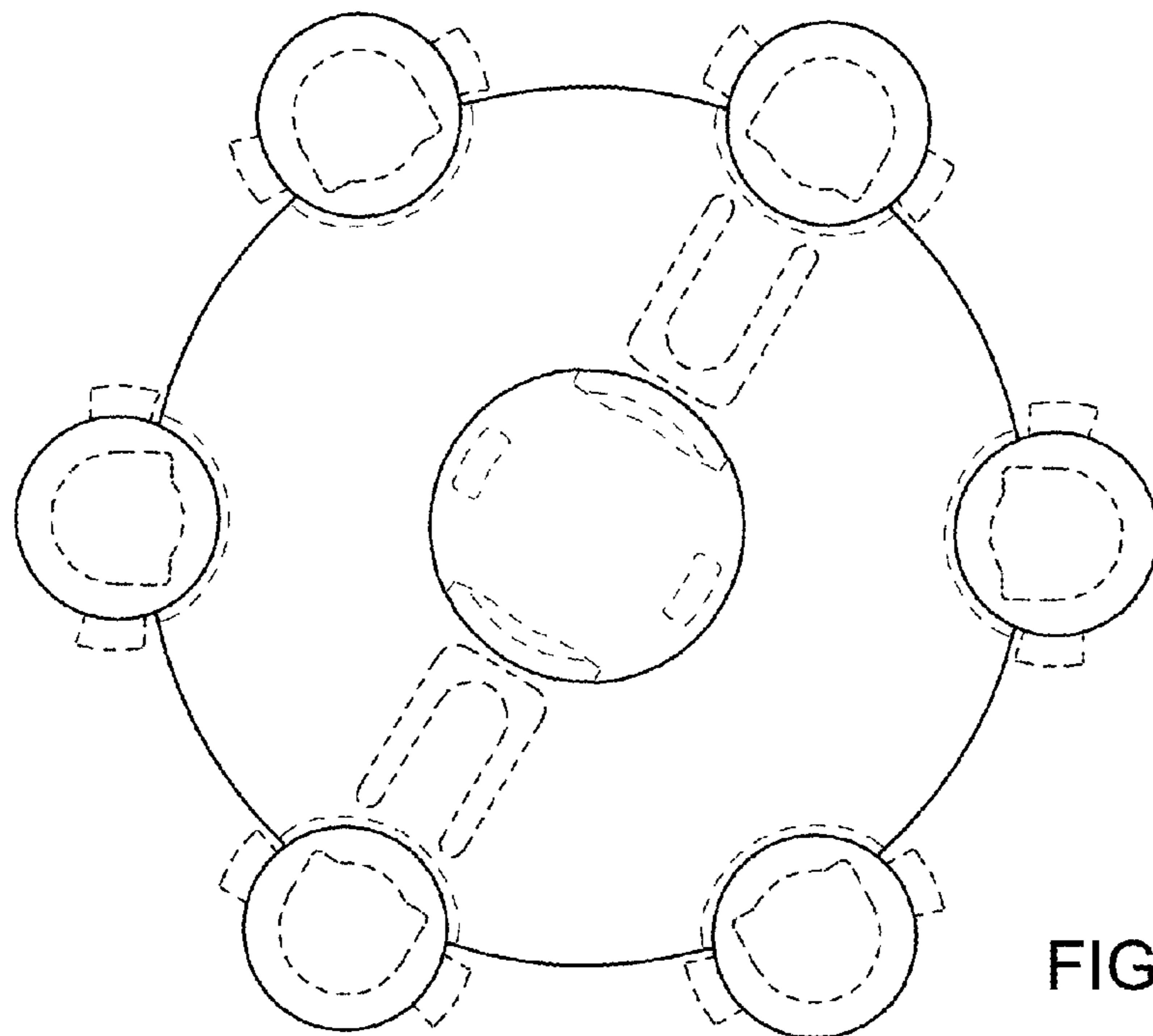


FIG. 4

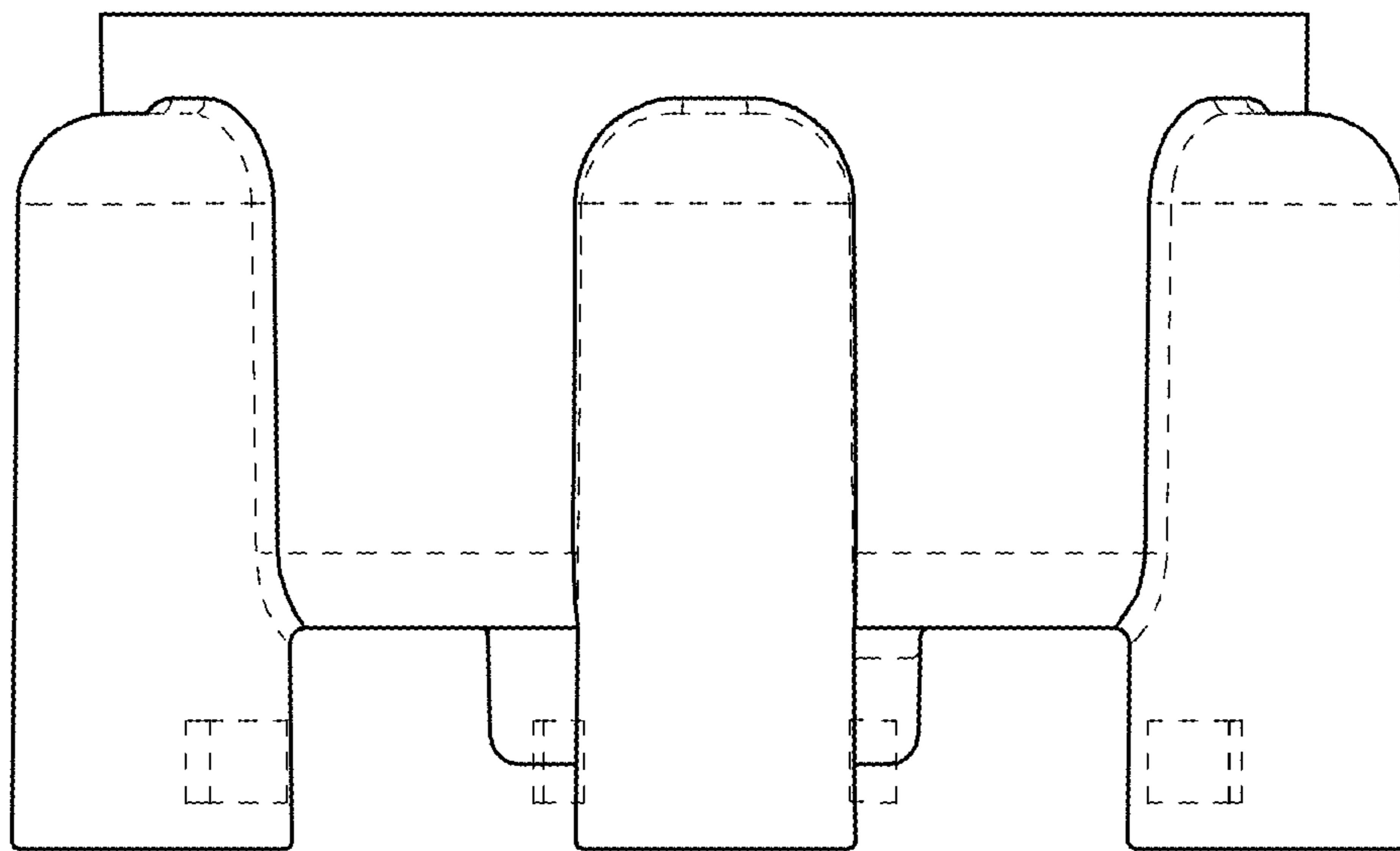


FIG. 5

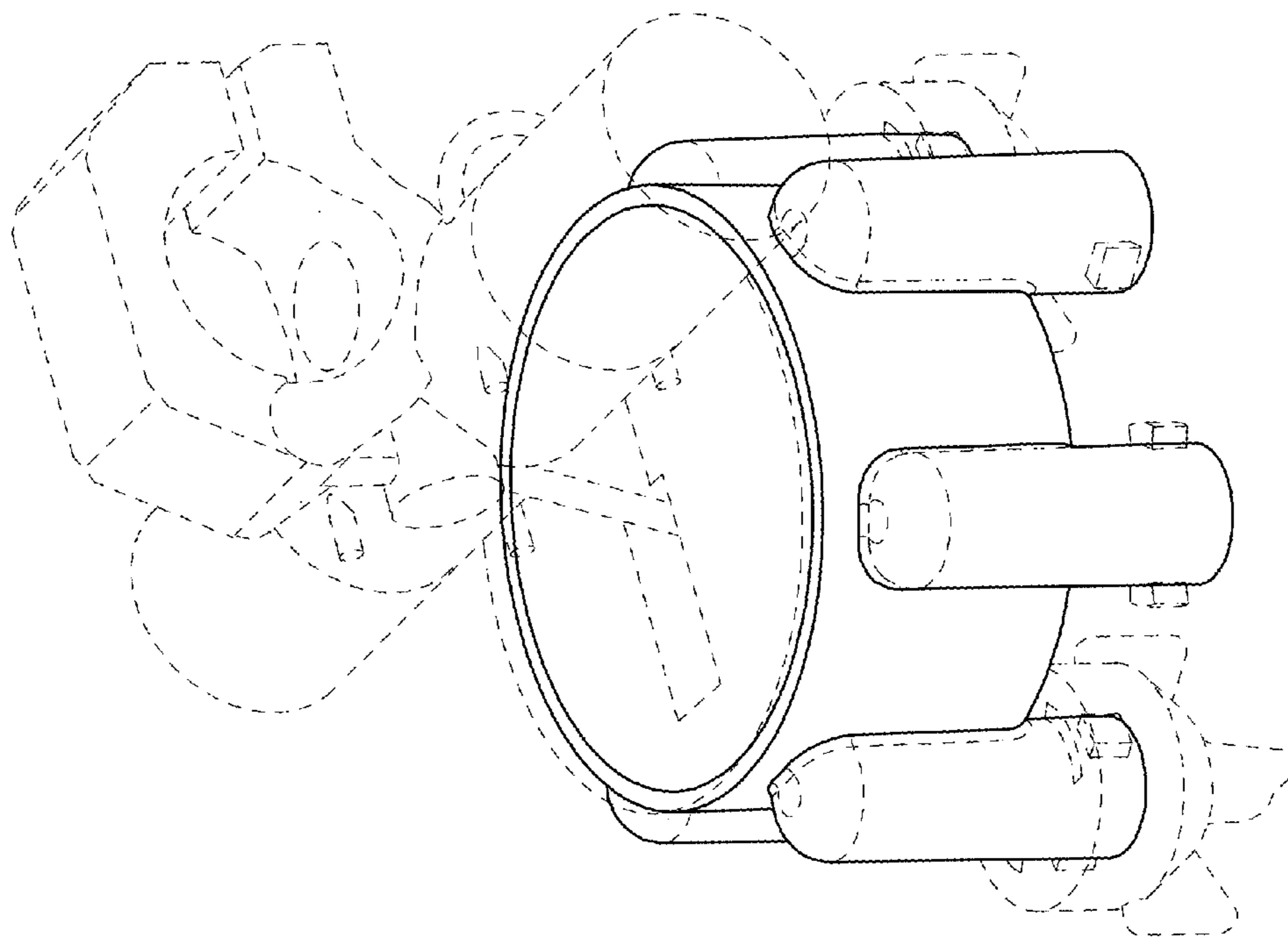


FIG. 6

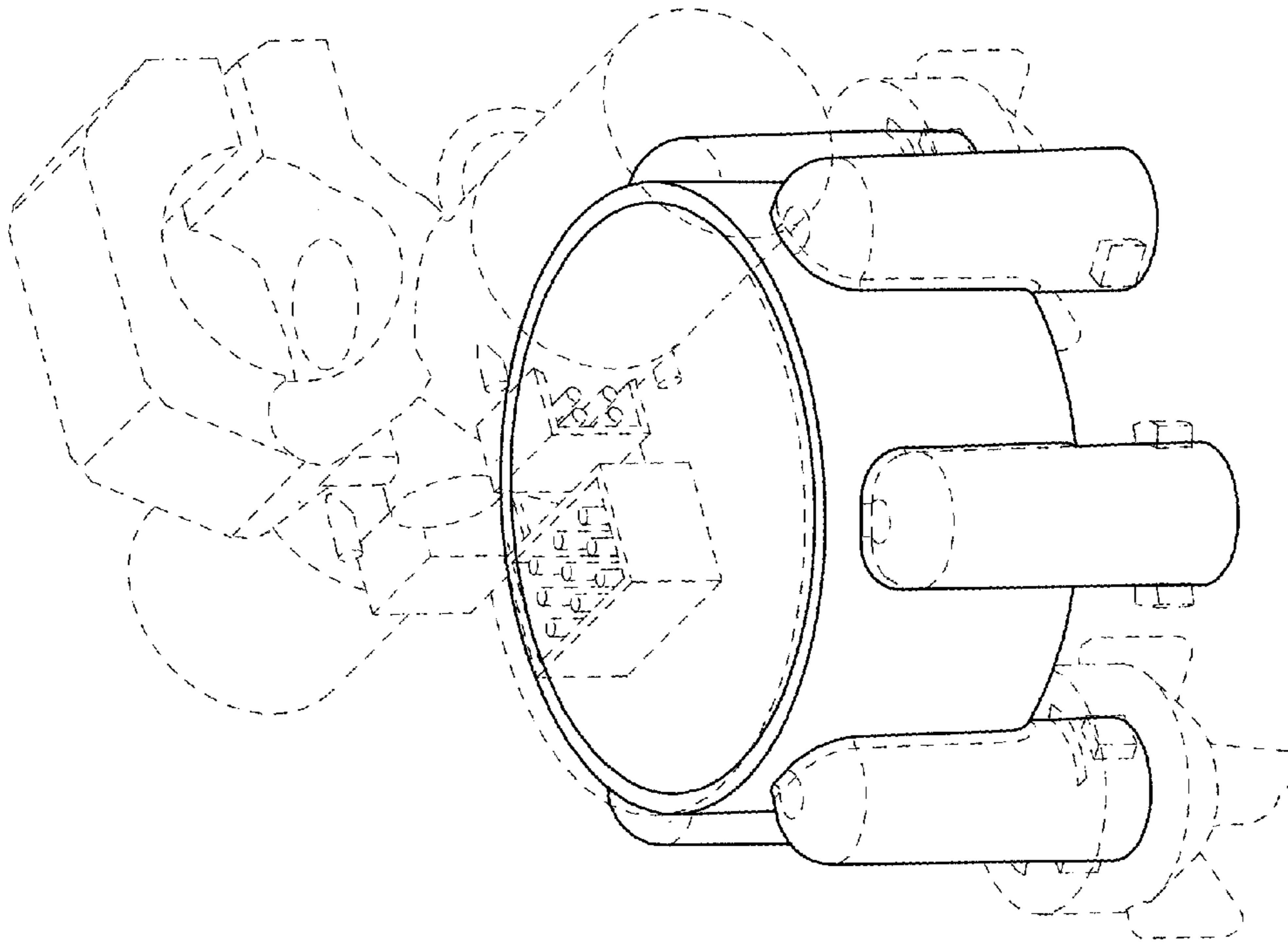


FIG. 7