



US00D711528S

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

(10) **Patent No.:** **US D711,528 S**
(45) **Date of Patent:** **** Aug. 19, 2014**

(54) **DRY POWDER INHALER**

D299,066 S 12/1988 Newell et al.
4,811,731 A 3/1989 Newell et al.
5,035,237 A 7/1991 Newell et al.

(71) Applicant: **Oriel Therapeutics Inc.**, Durham, NC
(US)

(Continued)

(72) Inventors: **Jerome A. Grunstad**, Inver Grove Heights, MN (US); **Charles Buckner**, Chapel Hill, NC (US); **Cyan Godfrey**, Chapel Hill, NC (US); **Daniel Deaton**, Apex, NC (US); **Andrew J. Valentine**, Raleigh, NC (US); **Margaret F. Butler**, Raleigh, NC (US); **Thomas W. Ruckdeschel**, Cary, NC (US)

FOREIGN PATENT DOCUMENTS

DE 19500764 7/1996
EP 1106196 3/2001

(Continued)

OTHER PUBLICATIONS

Hickey et al., A new millennium for inhaler technology, 21 Pharm. Tech., n. 6, pp. 116-125 (1997).

(Continued)

(73) Assignee: **Oriel Therapeutics, Inc.**, Durham, NC
(US)

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

Primary Examiner — Ian Simmons

Assistant Examiner — Richelle G Shelton

(21) Appl. No.: **29/454,143**

(74) *Attorney, Agent, or Firm* — Myers Bigel Sibley & Sajovec, P.A.

(22) Filed: **May 7, 2013**

Related U.S. Application Data

(63) Continuation of application No. 29/393,389, filed on Jun. 3, 2011, now Pat. No. Des. 684,684, which is a continuation of application No. 29/358,433, filed on Mar. 26, 2010, now Pat. No. Des. 641,076.

(51) **LOC (10) Cl.** **29-02**

(52) **U.S. Cl.**
USPC **D24/110**

(58) **Field of Classification Search**
USPC D24/110, 110.5; D23/366; D9/420;
128/200.14, 200.21, 200.23, 203.15,
128/203.21, 203.23

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,627,432 A 12/1986 Newell et al.
4,778,054 A 10/1988 Newell et al.

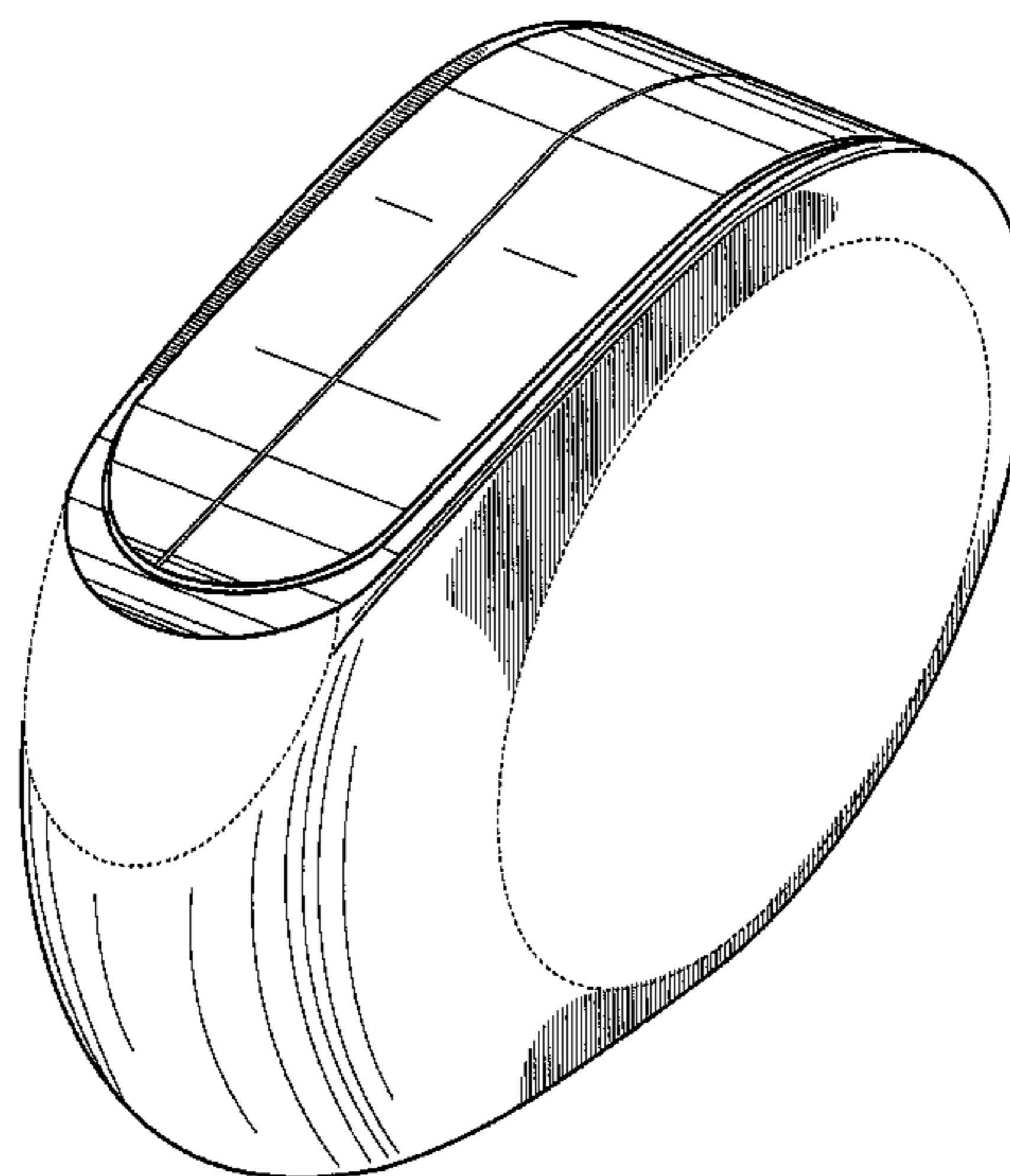
(57) **CLAIM**

The ornamental design for a dry powder inhaler, as shown and described.

DESCRIPTION

FIG. 1 is a front top side perspective view of a dry powder inhaler showing our design;
FIG. 2 is a front perspective view thereof;
FIG. 3 is a bottom view thereof;
FIG. 4 is a rear end view thereof;
FIG. 5 is a front end view thereof;
FIG. 6 is a top view thereof;
FIG. 7 is a side view thereof; and,
FIG. 8 is an opposing side view thereof.
The broken lines shown herein are included for the purpose of illustrating structural environment and form no part of the claimed design.

1 Claim, 4 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

5,138,138 A 8/1992 Theilacker et al.
 D342,994 S 1/1994 Rand et al.
 5,327,883 A 7/1994 Williams et al.
 5,337,740 A 8/1994 Armstrong et al.
 5,388,572 A 2/1995 Mulhauser et al.
 5,529,059 A 6/1996 Armstrong et al.
 5,533,502 A 7/1996 Piper
 D377,215 S 1/1997 Rand
 5,622,166 A 4/1997 Eisele et al.
 D379,506 S 5/1997 Maher
 D391,369 S 2/1998 Anderson
 5,715,810 A 2/1998 Armstrong et al.
 5,727,607 A 3/1998 Ichikawa et al.
 5,769,073 A 6/1998 Eason et al.
 5,909,829 A 6/1999 Wegman et al.
 5,921,237 A 7/1999 Eisele et al.
 5,947,169 A 9/1999 Wegman et al.
 6,029,663 A 2/2000 Eisele et al.
 6,082,356 A 7/2000 Stradella
 6,116,238 A 9/2000 Jackson et al.
 D433,126 S 10/2000 McCurry
 D437,931 S 2/2001 Anderson
 D445,496 S 7/2001 Anderson
 6,328,033 B1 12/2001 Avrahmi
 6,367,473 B1 4/2002 Käfer
 6,445,941 B1 9/2002 Hampton et al.
 6,543,448 B1 4/2003 Smith et al.
 6,550,477 B1 4/2003 Casper et al.
 6,591,832 B1 7/2003 DeJonge
 6,655,381 B2 12/2003 Keane et al.
 6,668,827 B2 12/2003 Schuler et al.
 6,679,254 B1 1/2004 Rand et al.
 D494,674 S 8/2004 King et al.
 6,792,945 B2 9/2004 Davies et al.
 D497,988 S 11/2004 King et al.
 6,810,872 B1 11/2004 Ohki et al.
 6,871,647 B2 3/2005 Allan et al.
 6,880,555 B1 4/2005 Brunnberg et al.
 D506,940 S * 7/2005 Cheng et al. D10/72
 6,923,178 B2 8/2005 Snow
 6,948,494 B1 9/2005 Snow
 D514,222 S 1/2006 Anderson et al.
 D518,171 S 3/2006 Anderson et al.
 7,089,935 B1 8/2006 Rand
 D527,815 S 9/2006 Nishibayashi et al.
 D527,816 S 9/2006 Nishibayashi et al.
 D527,817 S 9/2006 Ziegler et al.
 D528,654 S 9/2006 Nishibayashi et al.
 7,219,665 B1 5/2007 Braithwaite
 7,275,538 B2 10/2007 Nakamura
 7,318,436 B2 1/2008 Snow
 D565,715 S * 4/2008 Wu D23/366
 D569,968 S 5/2008 Kolb et al.
 D579,544 S 10/2008 Birath et al.
 7,503,324 B2 3/2009 Barney et al.
 7,571,723 B2 8/2009 Braithwaite

7,571,724 B2 8/2009 Braithwaite
 D600,124 S * 9/2009 Garcin D9/521
 D613,395 S 4/2010 Nakao et al.
 D613,396 S 4/2010 Nakao et al.
 D613,397 S 4/2010 Nakao et al.
 D613,848 S 4/2010 Harvey et al.
 D614,024 S 4/2010 Eason et al.
 D623,054 S 9/2010 Eason et al.
 D641,076 S * 7/2011 Grunstad et al. D24/110
 D654,805 S * 2/2012 Lua D9/686
 2001/0007853 A1 7/2001 Dimarchi et al.
 2001/0053761 A1 12/2001 Dimarchi et al.
 2002/0040713 A1 4/2002 Eisele et al.
 2005/0161041 A1 7/2005 Schuler et al.
 2005/0172963 A1 8/2005 Allan et al.
 2006/0102511 A1 5/2006 Pasbrig et al.
 2006/0157053 A1 7/2006 Barney et al.
 2007/0137643 A1 6/2007 Bonney et al.
 2007/0137645 A1 6/2007 Eason et al.
 2007/0181124 A1 8/2007 Casper et al.
 2007/0221218 A1 9/2007 Warden et al.
 2007/0235029 A1 10/2007 Zhu et al.
 2009/0114220 A1 5/2009 Wachtel et al.
 2010/0078021 A1 * 4/2010 Thoe et al. 128/203.15
 2010/0083962 A1 * 4/2010 Von Schuckmann 128/203.15
 2011/0271958 A1 * 11/2011 Sawant 128/203.21

FOREIGN PATENT DOCUMENTS

EP 1844805 10/2007
 GB 873410 7/1961
 GB 2340758 3/2000
 WO WO 94/20164 9/1994
 WO WO 98/41265 9/1998
 WO WO 99/36116 7/1999
 WO WO 00/45879 8/2000
 WO WO 01/28616 4/2001
 WO WO 01/34234 5/2001
 WO WO 02/053215 7/2002
 WO WO 02/053216 7/2002
 WO WO 03/011708 2/2003
 WO WO 2004/045487 6/2004
 WO WO 2005/002654 1/2005
 WO WO 2005/037353 4/2005
 WO WO 2005/044173 5/2005
 WO WO 2005/110519 11/2005
 WO WO 2006/031775 3/2006
 WO WO 2006/108877 10/2006
 WO WO 2007/007110 1/2007
 WO WO 2007/012871 2/2007

OTHER PUBLICATIONS

Prime et al., Review of Dry Powder Inhalers, 26 Adv. Drug Delivery Rev., pp. 51-58 (1997).
 Wolff et al., Generation of Aerosolized Drugs, J. Aerosol. Med., pp. 88-106 (1994).

* cited by examiner

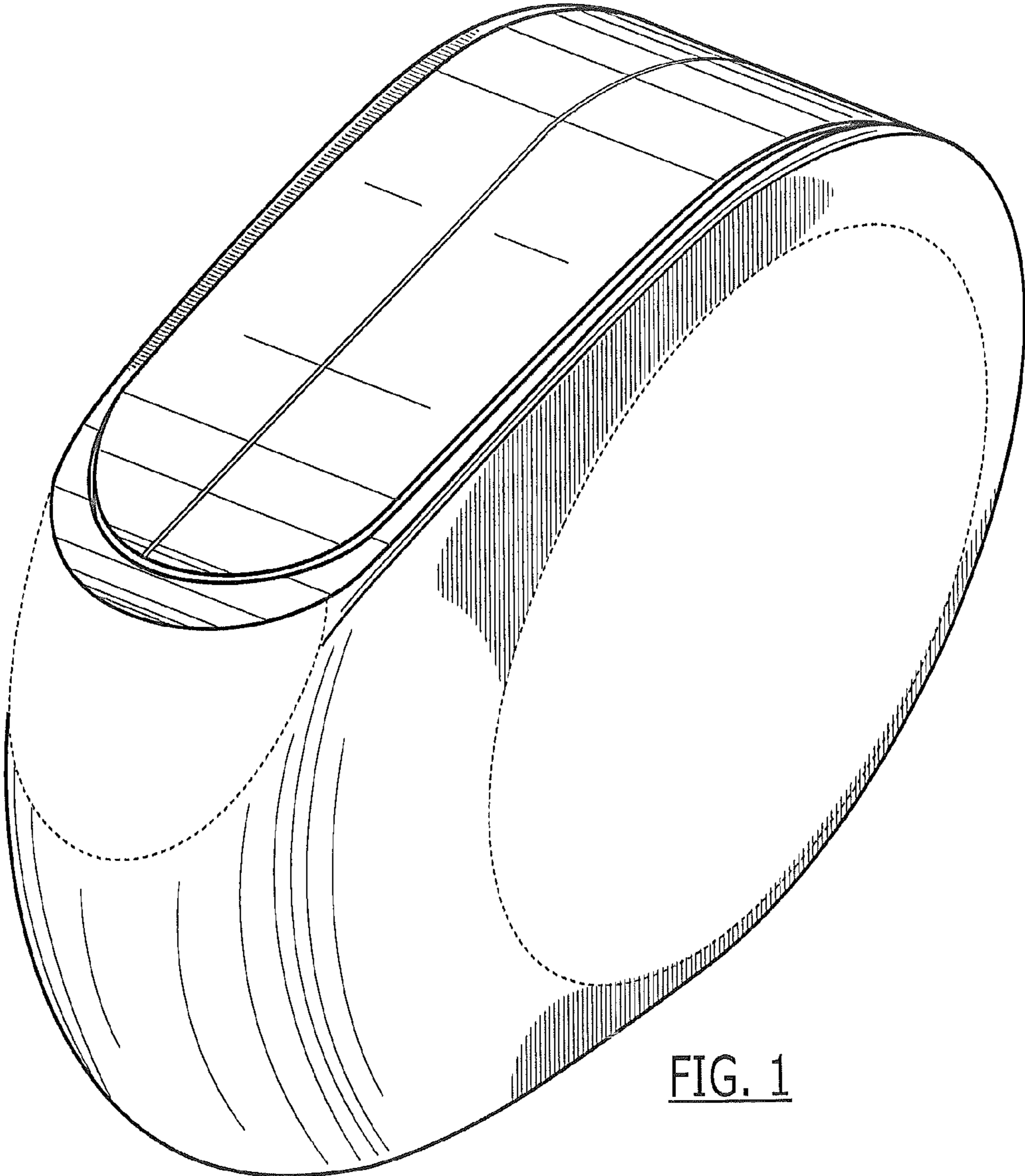


FIG. 1

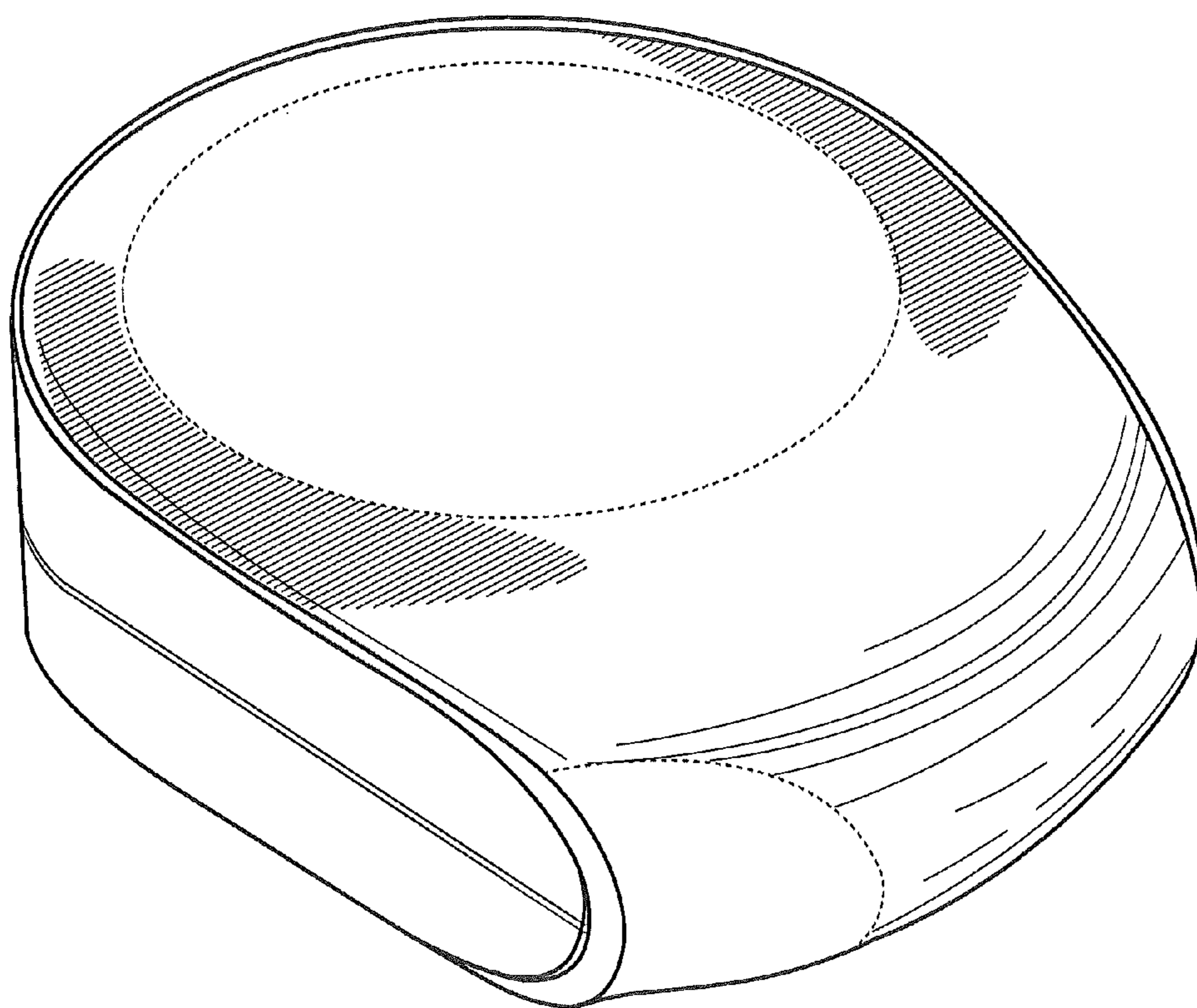


FIG. 2

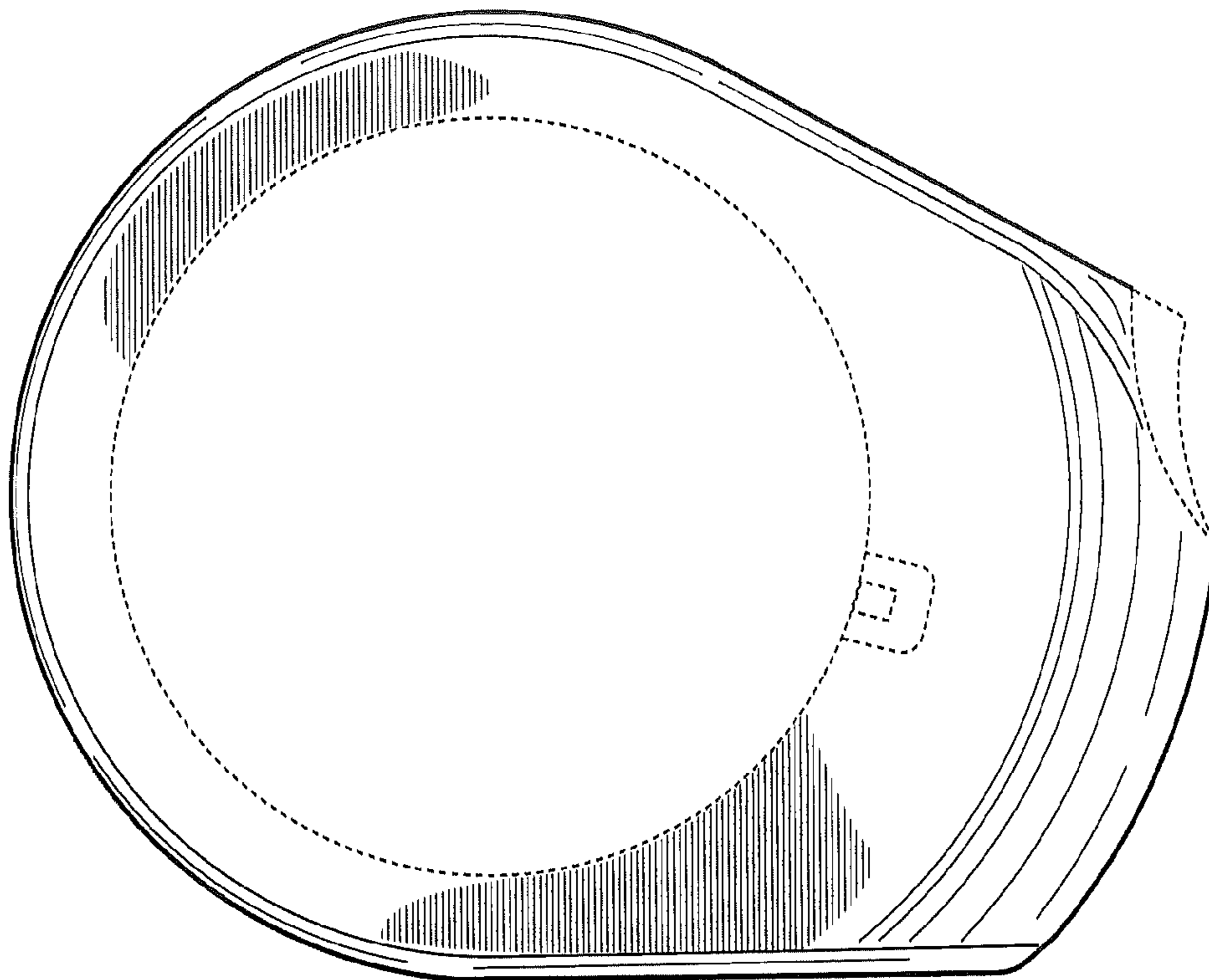


FIG. 3

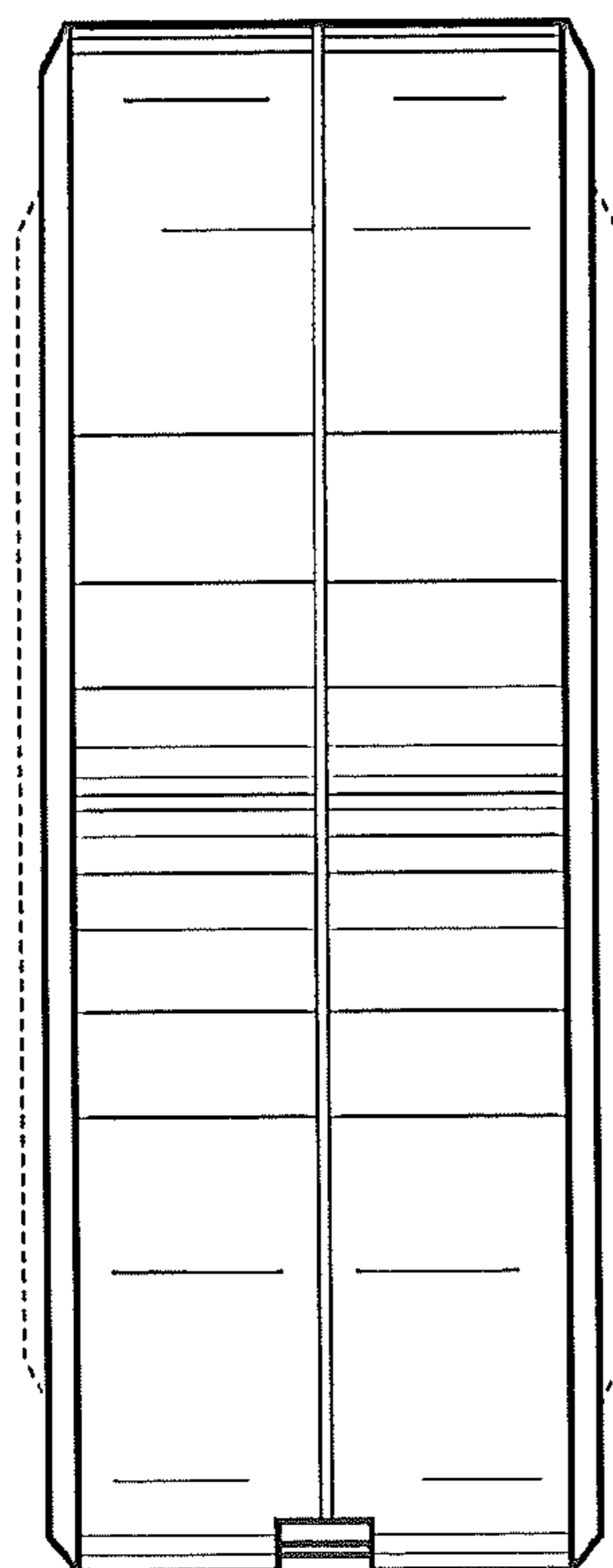


FIG. 4

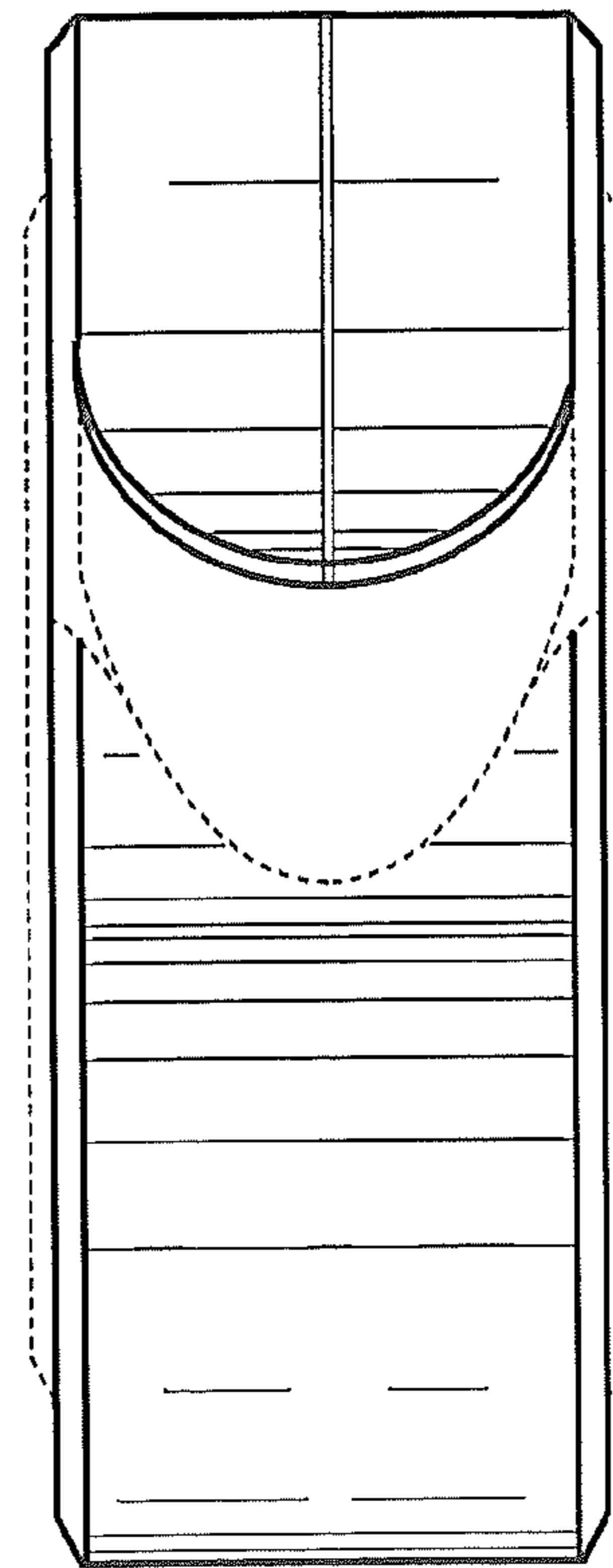


FIG. 5

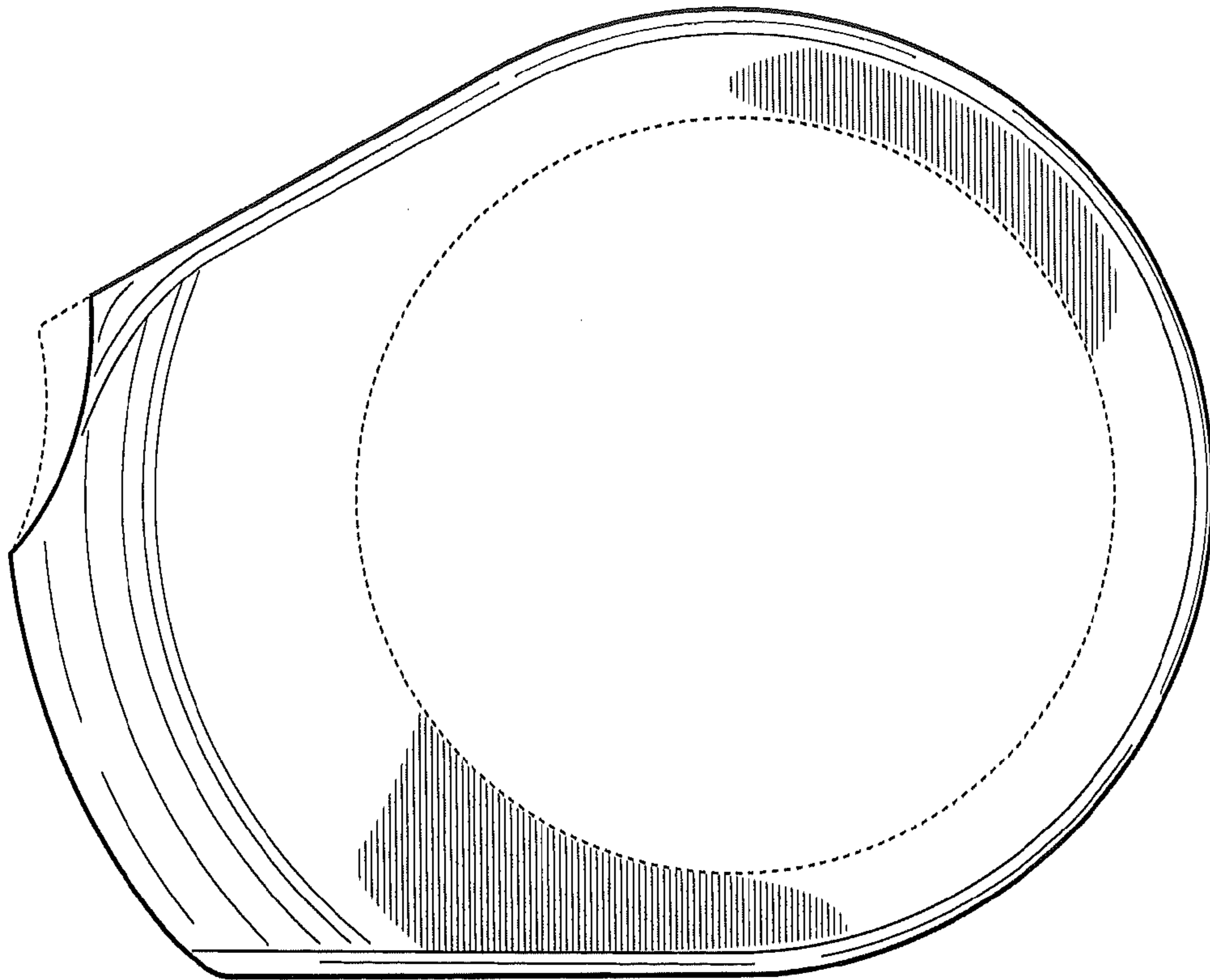


FIG. 6

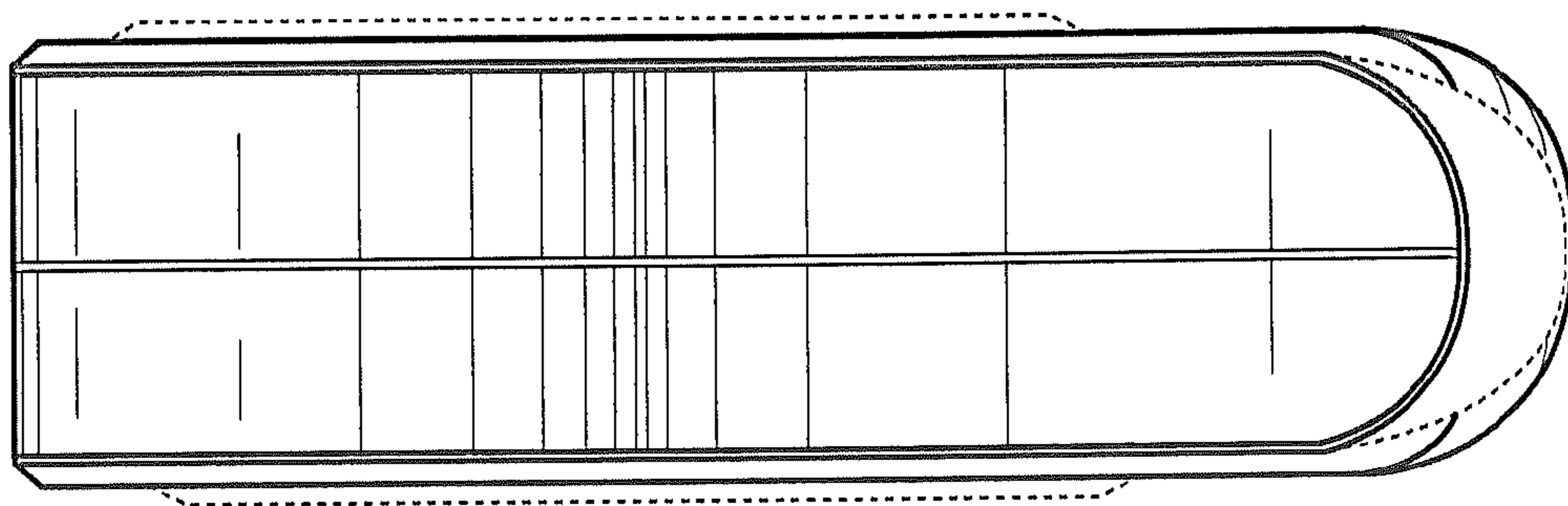


FIG. 7

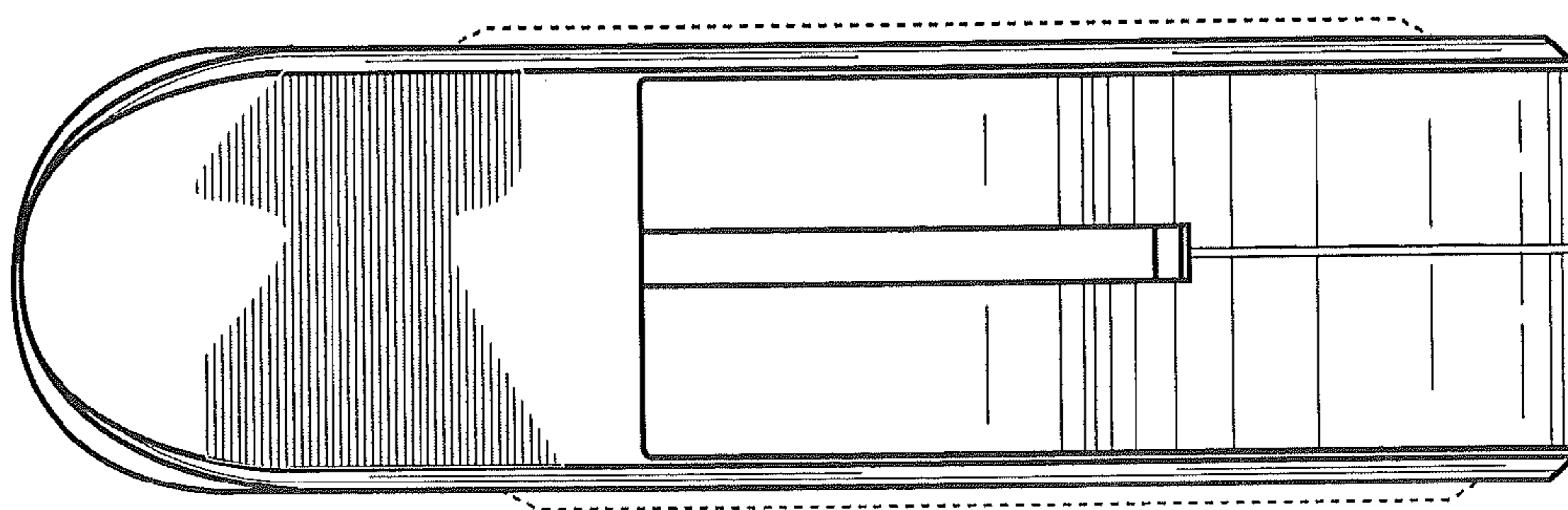


FIG. 8