



US00D870278S

(12) **United States Design Patent** (10) **Patent No.:** **US D870,278 S**
Lilly et al. (45) **Date of Patent:** **** Dec. 17, 2019**

(54) **SYRINGE PLUNGER ASSEMBLY**
(71) Applicant: **SiO2 Medical Products, Inc.**, Auburn, AL (US)
(72) Inventors: **Brian Russell Lilly**, Auburn, AL (US); **Dalton Roe**, Auburn, AL (US); **Zachary Dean Freeman**, Auburn, AL (US); **Benjamin Hunt**, Auburn, AL (US); **Kenneth Wade Kelly**, Auburn, AL (US); **Robert S. Abrams**, Albany, NY (US)
(73) Assignee: **SIO2 MEDICAL PRODUCTS, INC.**, Auburn, AL (US)

6,129,712 A 10/2000 Sudo et al.
6,190,363 B1 2/2001 Gabbard et al.
D447,799 S * 9/2001 Jun D24/130
6,749,590 B2 6/2004 Niedoşpial, Jr.
7,547,297 B2 6/2009 Brinkhues
D612,493 S * 3/2010 Claessens D24/130
7,691,308 B2 4/2010 Brinkhues
7,766,882 B2 8/2010 Sudo et al.

(Continued)

FOREIGN PATENT DOCUMENTS

CA 1324545 C 11/1993
DE 202007005394 U1 9/2007

(Continued)

OTHER PUBLICATIONS

International Search Report issued in PCT/US2014/059531, dated Jun. 29, 2015.

(Continued)

Primary Examiner — David G Muller
(74) *Attorney, Agent, or Firm* — Mark T. Vogelbacker; Eckert Seamans Cherin & Mellott, LLC

(**) Term: **15 Years**
(21) Appl. No.: **29/590,783**
(22) Filed: **Jan. 13, 2017**
(51) **LOC (12) Cl.** **24-02**
(52) **U.S. Cl.**
USPC **D24/130**
(58) **Field of Classification Search**
USPC D24/112–114, 108, 133, 130, 127, 186;
606/181, 185; 604/264, 272, 187, 181,
604/184, 227
CPC A61M 5/178; A61M 3/00; A61M 5/20;
A61M 5/31; A61M 5/3146; A61M
5/3129; A61M 5/3148; A61M 5/315
See application file for complete search history.

(57) **CLAIM**

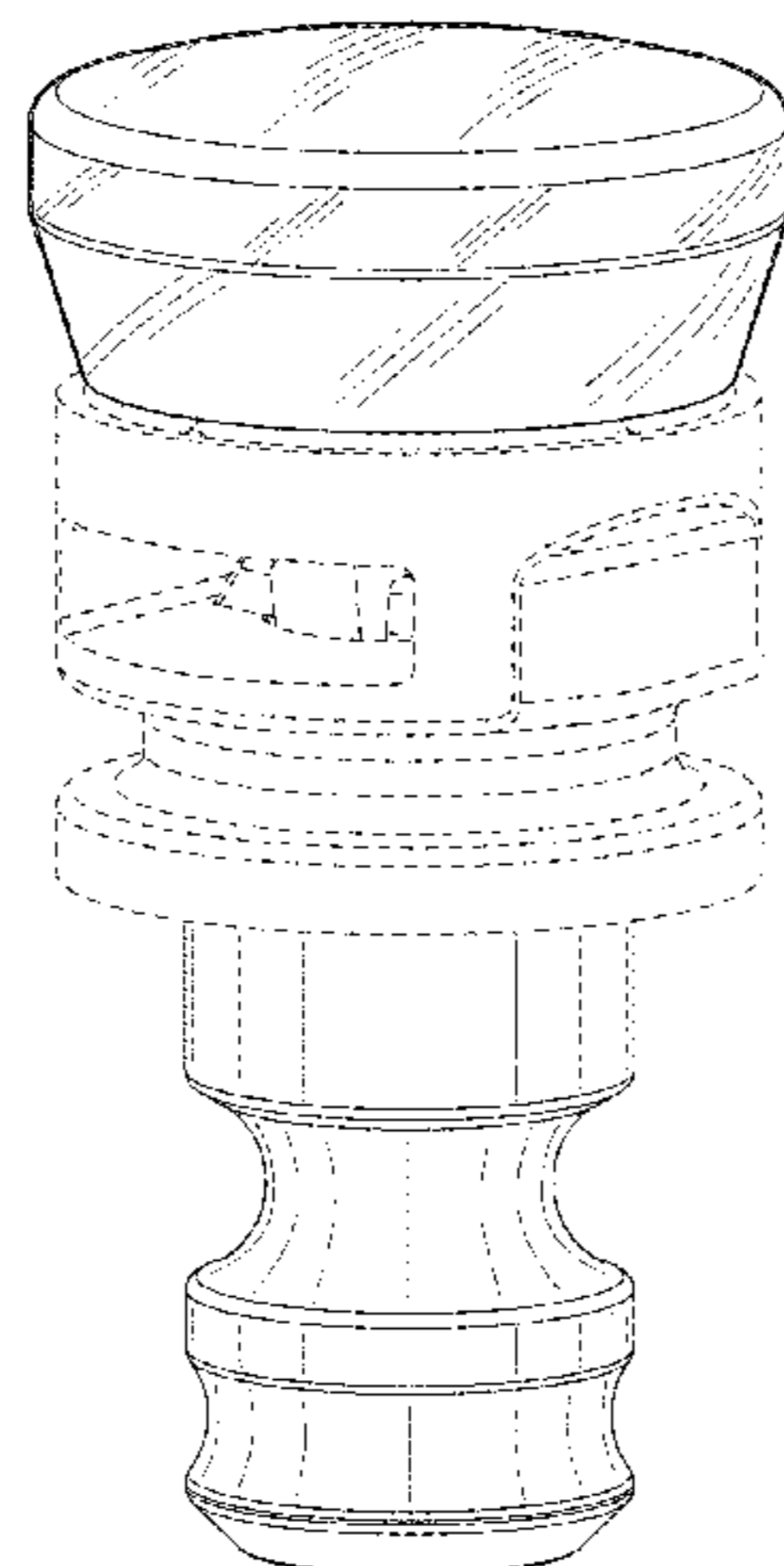
The ornamental design for a syringe plunger assembly, as shown and described.

DESCRIPTION

FIG. 1 is a top perspective view of a syringe plunger assembly showing our new design; FIG. 2 is a front elevation thereof; FIG. 3 is a side elevation thereof; FIG. 4 is a top plan view thereof; and, FIG. 5 is a bottom plan view thereof. The features shown in broken lines in the drawings depict unclaimed subject matter only and form no part of the claimed design.

1 Claim, 4 Drawing Sheets

(56) **References Cited**
U.S. PATENT DOCUMENTS
2,895,773 A 7/1959 McConnaughey
3,669,111 A 6/1972 Dubner
4,064,879 A 12/1977 Leibinsohn
5,314,416 A 5/1994 Lewis et al.
5,413,563 A 5/1995 Basile et al.
5,735,825 A 4/1998 Stevens et al.
5,951,527 A 9/1999 Sudo



(56)

References Cited

U.S. PATENT DOCUMENTS

7,927,315 B2 4/2011 Sudo et al.
 7,955,309 B2 6/2011 Cude
 7,985,188 B2 7/2011 Felts et al.
 8,460,250 B2 6/2013 Imai
 8,496,643 B2 7/2013 Chebator et al.
 8,574,201 B2 11/2013 Chattaraj et al.
 8,668,972 B2 3/2014 Lewis et al.
 8,722,178 B2 5/2014 Ashmead et al.
 8,960,685 B2 2/2015 Maeda et al.
 9,108,012 B2 8/2015 Pryce Lewis et al.
 9,192,725 B2 11/2015 Kawamura
 D746,448 S * 12/2015 Wu D24/129
 D747,471 S * 1/2016 Gulliver D24/129
 D751,699 S * 3/2016 Mills D24/127
 D771,247 S * 11/2016 Shinohara D24/130
 9,511,192 B2 12/2016 Kawamura
 9,522,237 B2 12/2016 Alheidt et al.
 D781,418 S * 3/2017 Winsor D24/129
 9,592,346 B2 3/2017 Quinn et al.
 D784,529 S * 4/2017 Steele D24/129
 D787,052 S * 5/2017 Heinz D24/130
 9,642,969 B2 5/2017 Ivosevic et al.
 9,649,444 B2 5/2017 Schiller et al.
 D789,528 S * 6/2017 Wohlfahrt D24/130
 9,717,857 B2 8/2017 Lanier
 D797,928 S * 9/2017 Davis D24/130
 D797,929 S * 9/2017 Davis D24/130
 D799,032 S * 10/2017 Becker D24/129
 9,827,376 B2 11/2017 Titus et al.
 10,159,796 B2 12/2018 Schiff et al.
 2009/0166978 A1 7/2009 Hoffmann et al.
 2010/0179487 A1 7/2010 Woehr
 2011/0196313 A1 8/2011 Mudd
 2011/0024611 A1 9/2011 Lum et al.
 2012/0253291 A1 10/2012 Ivosevic et al.
 2013/0041241 A1 2/2013 Felts et al.
 2013/0082057 A1 4/2013 Schiff et al.
 2013/0085452 A1 4/2013 Schiff et al.
 2013/0126559 A1 5/2013 Cowan et al.
 2013/0138050 A1 5/2013 Jugl et al.
 2013/0209766 A1 8/2013 Felts et al.
 2013/0291632 A1 11/2013 Felts et al.
 2014/0228774 A1 8/2014 Maeda et al.
 2014/0319778 A1 10/2014 Kawasaki et al.
 2014/0339776 A1 11/2014 Nakano et al.
 2014/0339777 A1 11/2014 Nakano et al.
 2015/0148751 A1 5/2015 Yotsutsuji
 2015/0231337 A1 8/2015 Nara et al.

2015/0273155 A1 10/2015 Kaneko et al.
 2015/0367076 A1 12/2015 Matsutani et al.
 2019/0009035 A1 1/2019 Lum et al.

FOREIGN PATENT DOCUMENTS

EP 1849490 A1 10/2007
 EP 2565006 A2 3/2013
 EP 2703025 A1 3/2014
 EP 2796159 A1 10/2014
 EP 2803378 A1 11/2014
 EP 2902060 A1 8/2015
 EP 2910265 A1 8/2015
 EP 2926851 A1 10/2015
 EP 2957310 A1 12/2015
 EP 1703930 B1 2/2018
 GB 578827 7/1946
 1168201 10/1969
 JP 06327770 A 11/1994
 JP 08182760 A 7/1996
 JP 2001025506 A 1/2001
 JP 2008154644 A 7/2008
 WO 2007118907 A1 10/2007
 WO 2011059823 A1 5/2011
 WO 2012076494 A1 6/2012
 WO 2013156524 A1 10/2013
 WO 2014050550 A1 4/2014
 WO 2014085348 A2 6/2014
 WO 2014164928 A1 10/2014
 WO 2015054282 A2 4/2015

OTHER PUBLICATIONS

Written Opinion issued in PCT/US2014/059531, dated Jun. 29, 2015.
 International Search Report issued in PCT/US2015/024558, dated Dec. 22, 2015.
 Written Opinion issued in PCT/US2015/024558, dated Dec. 22, 2015.
 International Search Report issued in PCT/US2016/042167, dated Oct. 25, 2016.
 Written Opinion issued in PCT/US2016/042167, dated Oct. 25, 2016.
 International Search Report issued in PCT/US2017/013337, dated May 11, 2017.
 Written Opinion issued in PCT/US2017/013337, dated May 11, 2017.

* cited by examiner

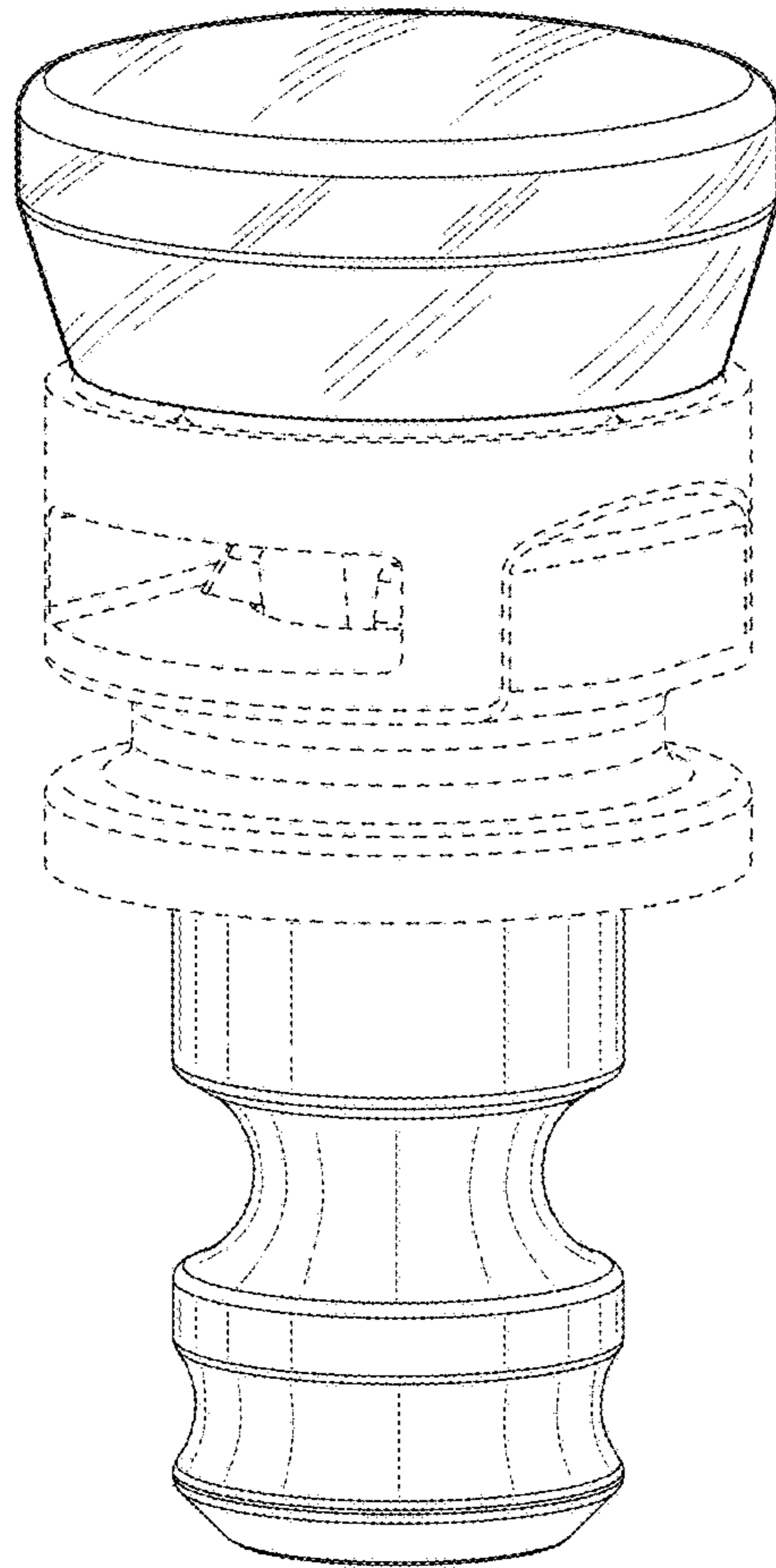


FIG. 1

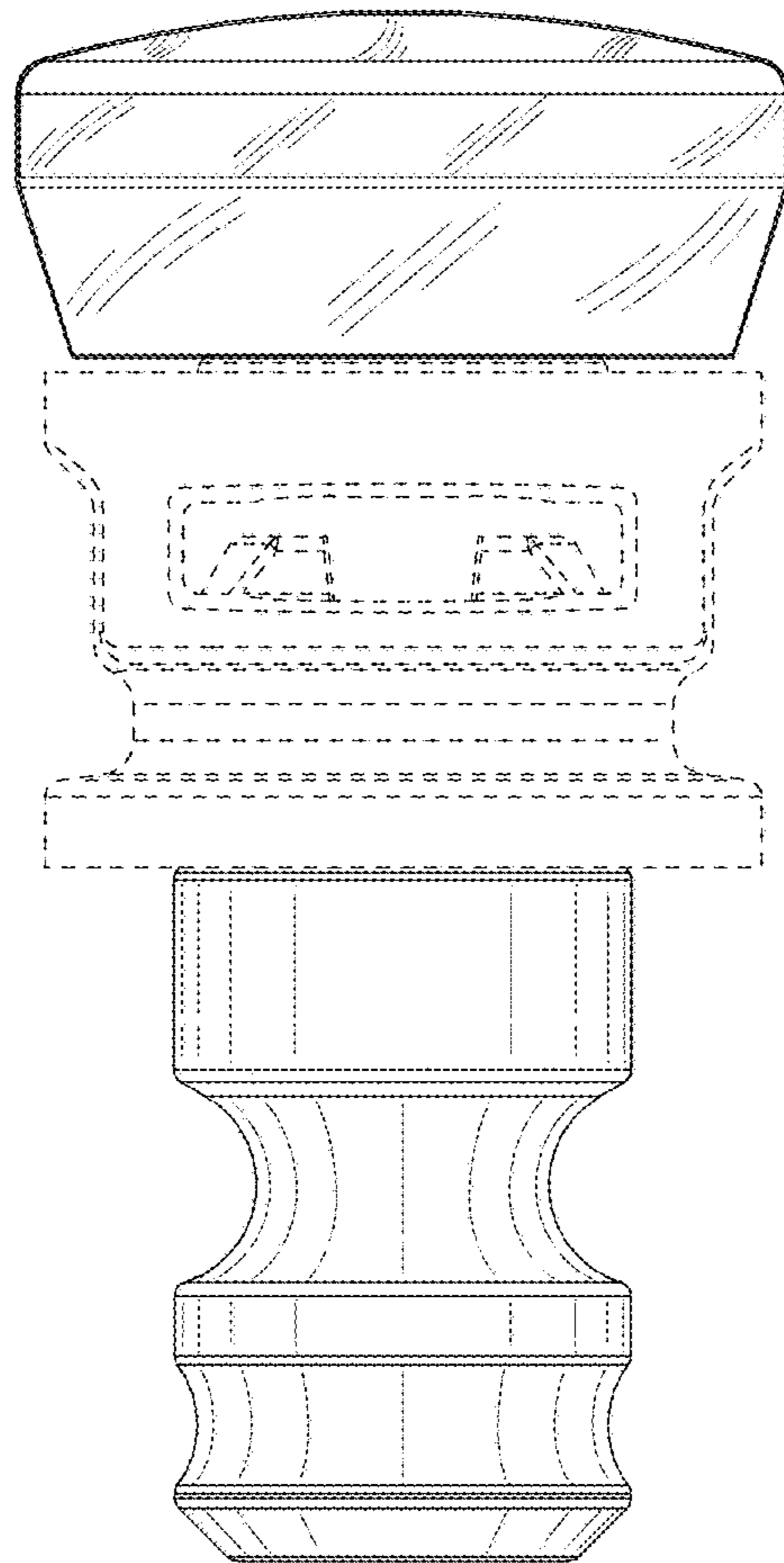


FIG. 2

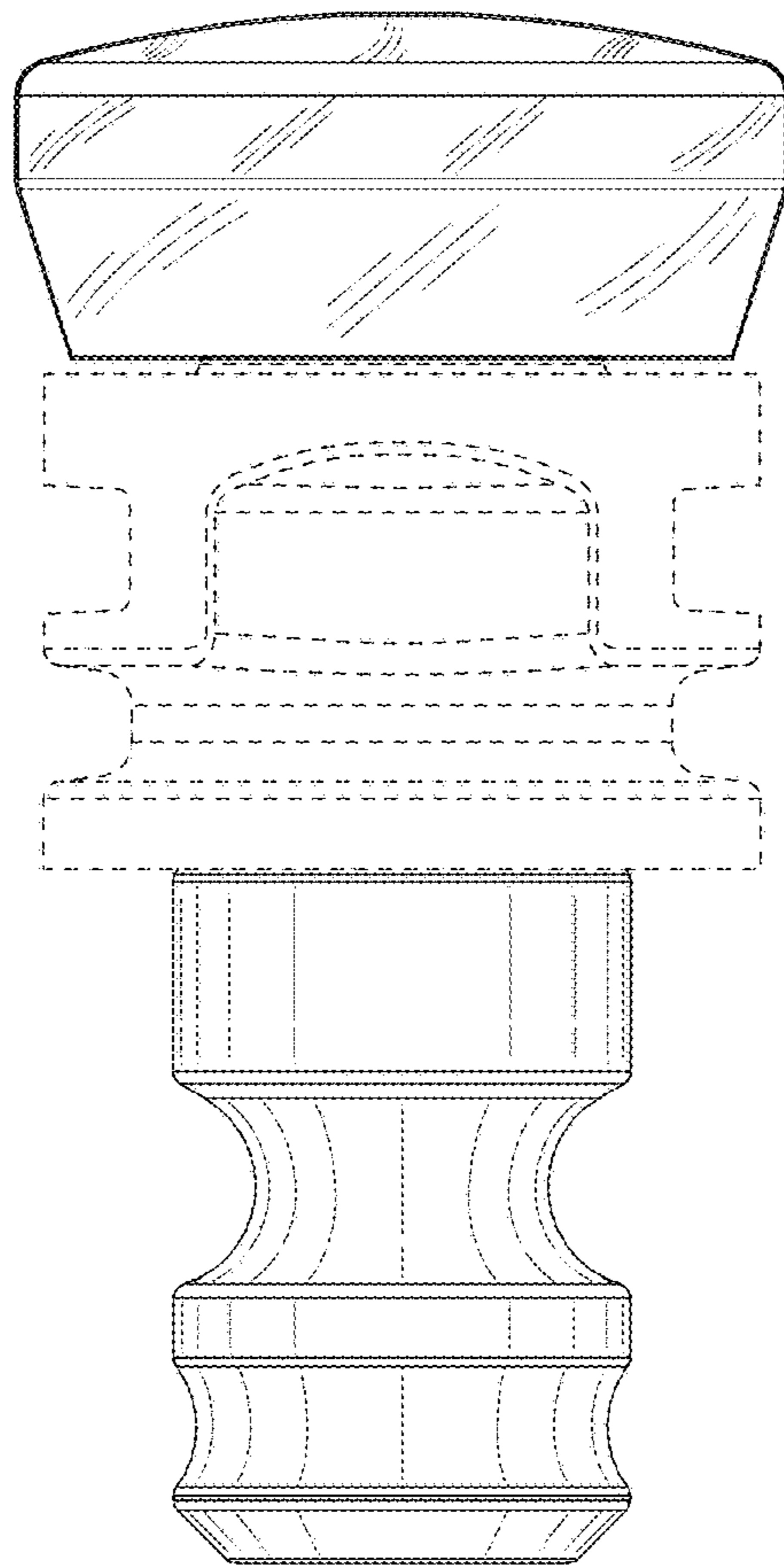


FIG. 3

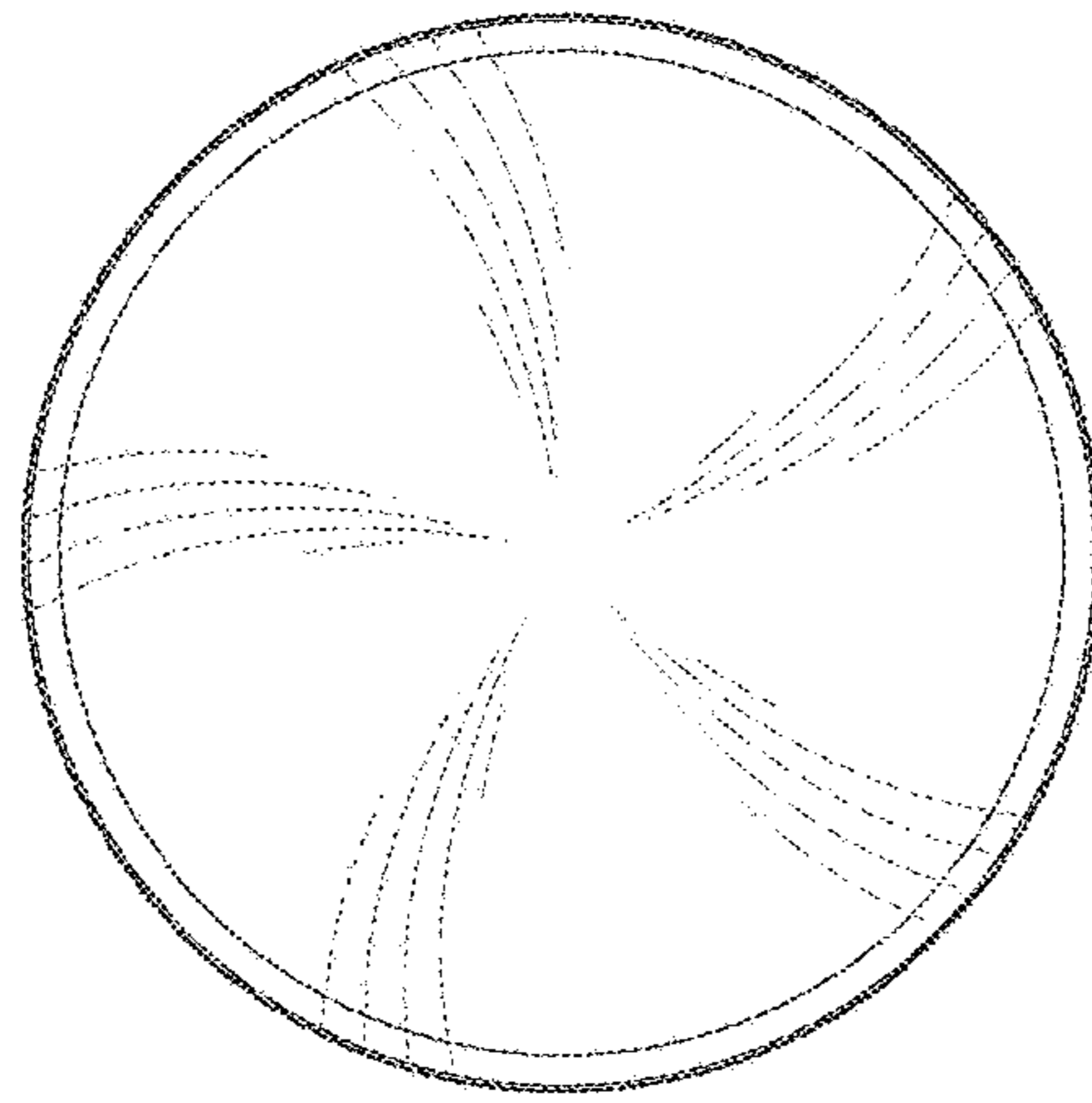


FIG. 4

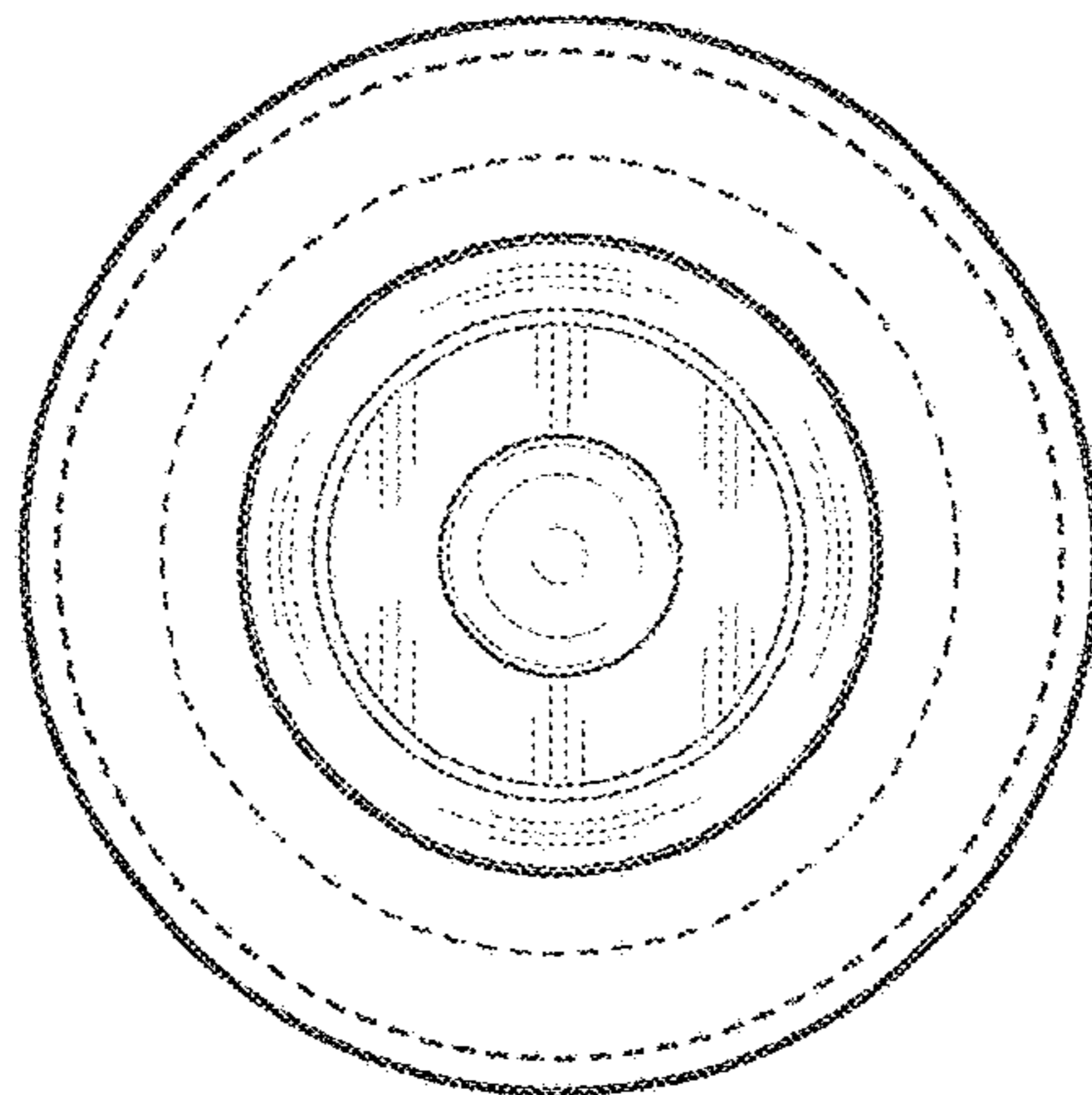


FIG. 5