



US00D902980S

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

(10) **Patent No.:** **US D902,980 S**

(45) **Date of Patent:** **** Nov. 24, 2020**

(54) **DRIVING UNIT FOR A CAMERA LENS**

(71) Applicant: **TDK TAIWAN CORP.**, Taoyuan (TW)

(72) Inventor: **Chen-Chi Kuo**, Taipei (TW)

(73) Assignee: **TDK TAIWAN CORP.**, Yangmei
Taoyuan (TW)

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

(21) Appl. No.: **29/633,347**

(22) Filed: **Jan. 12, 2018**

(51) **LOC (12) Cl.** **16-05**

(52) **U.S. Cl.**
USPC **D16/219**

(58) **Field of Classification Search**
USPC D16/200, 218, 219; D13/182, 184, 199
CPC G02B 27/646; G02B 7/08; G02B 7/09;
G02B 7/04; G03B 3/10; H02K 11/02;
H02K 11/215

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

- 7,817,358 B2 * 10/2010 Ke G02B 7/08
359/694
- 7,830,626 B2 * 11/2010 Ke H02K 41/0356
359/819
- 7,876,515 B2 * 1/2011 Liao H02K 41/0356
359/694
- 8,319,886 B1 * 11/2012 Wang G02B 7/08
348/202
- 8,736,988 B2 * 5/2014 Cheng G02B 6/4457
359/694
- 8,805,176 B1 * 8/2014 Chou G03B 3/10
396/133
- 8,981,603 B2 * 3/2015 Chou H02K 41/0356
310/12.16
- 9,250,413 B2 * 2/2016 Ku G02B 7/025
- 9,568,743 B2 * 2/2017 Hayashi G02B 27/646
- 9,766,476 B2 * 9/2017 Yeo G03B 5/00

- 9,778,481 B2 * 10/2017 Sato G02B 27/64
- 9,977,255 B2 * 5/2018 Park G02B 27/646
- 10,139,586 B2 * 11/2018 Chan G02B 7/026

(Continued)

FOREIGN PATENT DOCUMENTS

CN 304881672 * 11/2018

OTHER PUBLICATIONS

Bi-direction type autofocus actuator, published Jul. 8, 2015 [online], [retrieved Jul. 8, 2019], Available from Internet, URL: <https://www.eenewseurope.com/news/bi-direction-type-autofocus-actuator>.*

(Continued)

Primary Examiner — Dana K Weiland

Assistant Examiner — Mary Claire Ramirez

(74) *Attorney, Agent, or Firm* — Muncy, Geissler, Olds & Lowe, P.C.

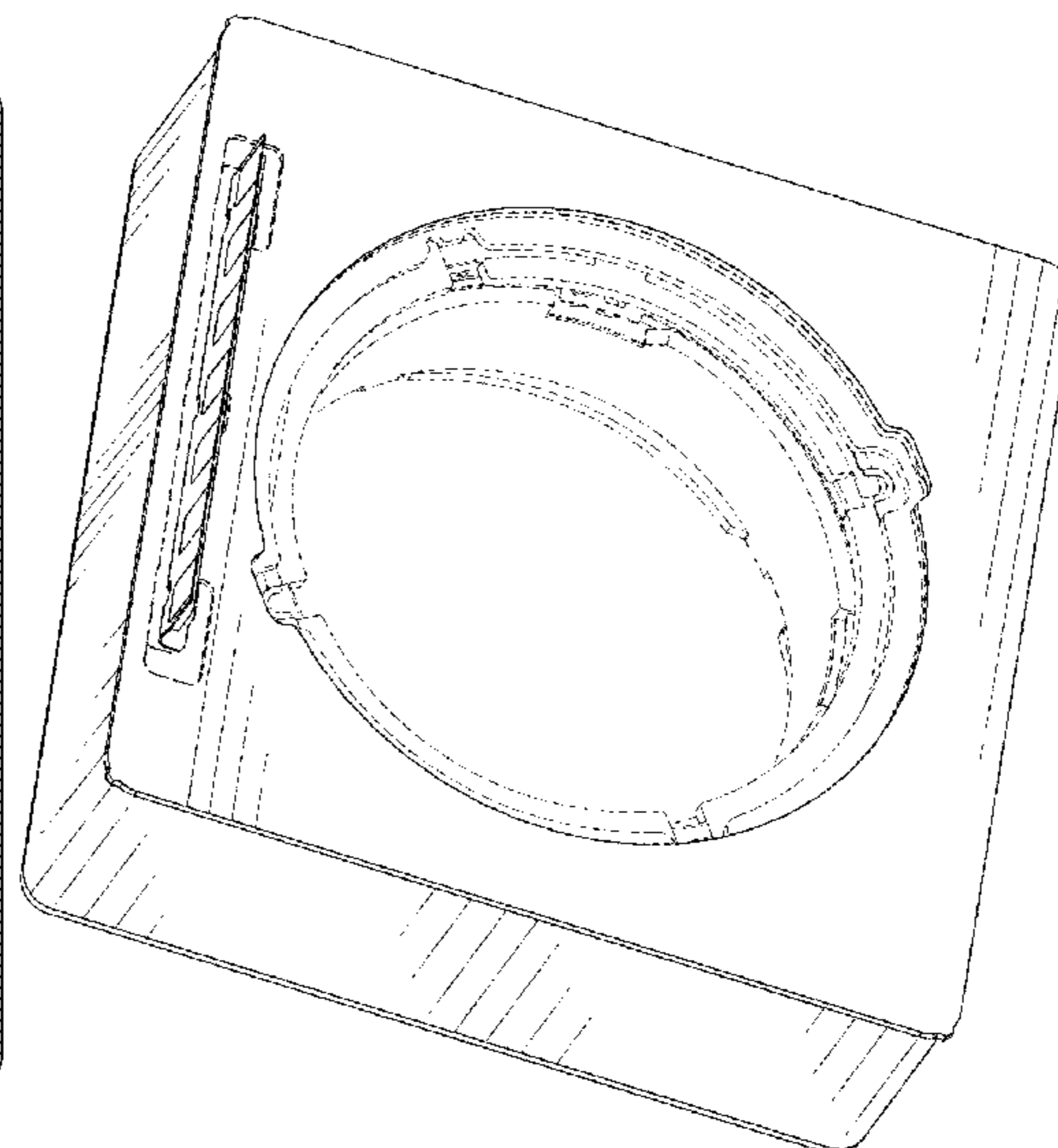
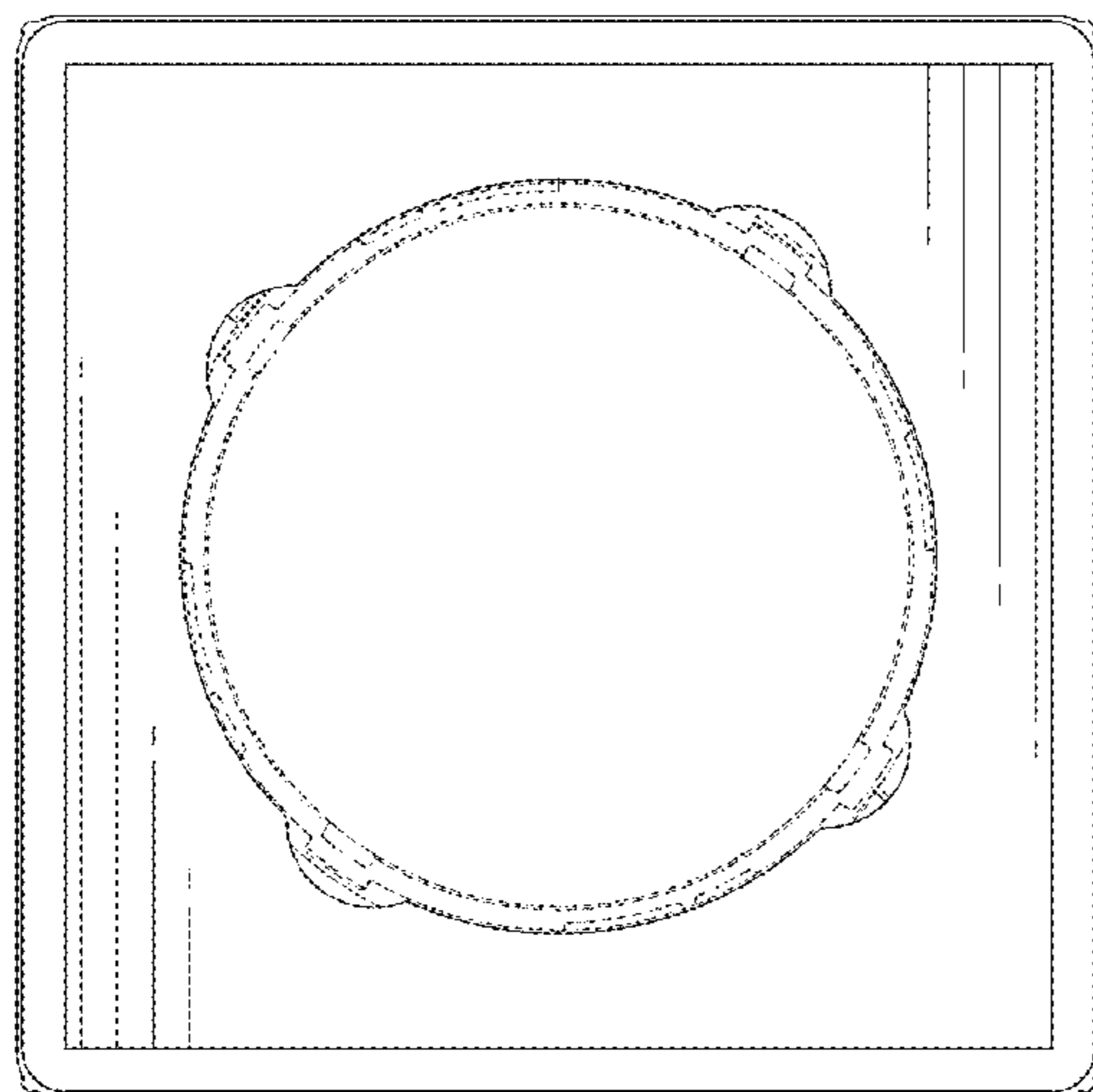
(57) **CLAIM**

The ornamental design for a driving unit for a camera lens, as shown and described.

DESCRIPTION

FIG. 1 is a top perspective view of a driving unit for a camera lens showing my new design; FIG. 2 is a front elevation view thereof; FIG. 3 is a rear elevation view thereof; FIG. 4 is a left side elevation view thereof; FIG. 5 is a right side elevation view thereof; FIG. 6 is a top plan view thereof; FIG. 7 is a bottom plan view thereof; and, FIG. 8 is another perspective view thereof. The broken lines shown in the drawings depict portions of the driving unit for a camera lens that form no part of the claimed design.

1 Claim, 8 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

10,168,506 B2 * 1/2019 Chen G02B 27/646
 10,367,982 B2 * 7/2019 Cho H04N 5/2257
 10,386,596 B2 * 8/2019 Shin H04N 5/2253
 10,468,959 B2 * 11/2019 Park H02K 41/0356
 10,649,172 B2 * 5/2020 Liu G02B 7/08
 10,690,880 B2 * 6/2020 Huang G02B 7/09
 D891,504 S * 7/2020 Wu D16/219
 2008/0266681 A1 * 10/2008 Shyu G02B 7/08
 359/824
 2009/0244356 A1 * 10/2009 Cheng H02K 41/0356
 348/345
 2009/0290233 A1 * 11/2009 Chou G02B 7/026
 359/696
 2010/0033852 A1 * 2/2010 Ke G02B 7/08
 359/824
 2011/0000207 A1 * 1/2011 Kume G02B 7/08
 60/528
 2011/0051265 A1 * 3/2011 Lee G02B 7/08
 359/824
 2011/0157462 A1 * 6/2011 Huang H04N 5/2253
 348/374
 2011/0199694 A1 * 8/2011 Kimoto G02B 7/08
 359/822
 2011/0204746 A1 * 8/2011 Kume G02B 7/08
 310/306
 2011/0205648 A1 * 8/2011 Takei G02B 7/08
 359/824
 2011/0222174 A1 * 9/2011 Nobe G02B 7/08
 359/822
 2011/0235194 A1 * 9/2011 Nobe G02B 7/08
 359/823
 2011/0235196 A1 * 9/2011 Ke G02B 7/023
 359/824
 2011/0235197 A1 * 9/2011 Miyazaki G02B 7/08
 359/824
 2011/0252782 A1 * 10/2011 Nobe G02B 7/08
 60/527
 2011/0317287 A1 * 12/2011 Aoki G02B 7/08
 359/813
 2012/0082442 A1 * 4/2012 Kwon G02B 27/646
 396/55
 2012/0120506 A1 * 5/2012 Yamauchi G02B 7/08
 359/811
 2012/0120512 A1 * 5/2012 Wade G02B 7/026
 359/824
 2012/0154614 A1 * 6/2012 Moriya G03B 3/10
 348/208.5
 2012/0218450 A1 * 8/2012 Pavithran H04N 5/2254
 348/296
 2012/0229926 A1 * 9/2012 Wade G02B 7/08
 359/824
 2013/0045000 A1 * 2/2013 Wu G02B 7/08
 396/85
 2013/0222685 A1 * 8/2013 Topliss G02B 27/646
 348/373
 2013/0286283 A1 * 10/2013 Chou H02K 41/0356
 348/374
 2013/0293969 A1 * 11/2013 Wu G02B 7/08
 359/698
 2013/0293972 A1 * 11/2013 Oh H04N 5/2251
 359/811
 2014/0177056 A1 * 6/2014 Hayashi G02B 7/08
 359/557
 2014/0307319 A1 * 10/2014 Uno G03B 3/10
 359/557
 2014/0307341 A1 * 10/2014 Uno G02B 7/08
 359/824

2014/0333829 A1 * 11/2014 Lee H04N 5/2251
 348/373
 2014/0355120 A1 * 12/2014 Yeo G03B 3/10
 359/557
 2015/0130990 A1 * 5/2015 Cho G03B 13/36
 348/357
 2015/0153539 A1 * 6/2015 Yoo G02B 7/04
 348/373
 2015/0153540 A1 * 6/2015 Lee H02K 41/0356
 348/357
 2015/0160471 A1 * 6/2015 Dong G02B 7/08
 359/557
 2015/0198817 A1 * 7/2015 Zhou G02B 27/646
 359/557
 2015/0212291 A1 * 7/2015 Lee G02B 7/08
 348/360
 2015/0253583 A1 * 9/2015 Cho G02B 7/09
 348/360
 2015/0256727 A1 * 9/2015 Kim G02B 7/09
 348/208.12
 2015/0331251 A1 * 11/2015 Hu G02B 27/646
 359/824
 2015/0362696 A1 * 12/2015 Han G02B 27/646
 359/824
 2016/0011394 A1 * 1/2016 Cho G02B 7/09
 359/822
 2016/0018624 A1 * 1/2016 Yeo G03B 5/00
 359/557
 2016/0018667 A1 * 1/2016 Yeo G02B 7/04
 359/557
 2016/0048033 A1 * 2/2016 Kim G02B 27/646
 348/357
 2016/0103331 A1 * 4/2016 Lee G02B 7/08
 359/557
 2016/0109719 A1 * 4/2016 Cho G03B 3/10
 359/557
 2016/0139425 A1 * 5/2016 Park G02B 27/646
 359/557
 2016/0139426 A1 * 5/2016 Park G02B 27/646
 359/557
 2016/0154249 A1 * 6/2016 Yeo G03B 5/00
 359/557
 2016/0178925 A1 * 6/2016 Park G02B 7/09
 359/557
 2016/0187670 A1 * 6/2016 Kim G02B 27/646
 359/557
 2016/0191754 A1 * 6/2016 Cho H04N 5/2257
 348/357
 2016/0216476 A1 * 7/2016 Lee G02B 7/08
 2016/0274328 A1 * 9/2016 Shin G02B 7/09
 2016/0277684 A1 * 9/2016 Park H04N 5/2257
 2016/0320585 A1 * 11/2016 Park G02B 27/646
 2016/0377881 A1 * 12/2016 Jung H02K 41/0356
 359/824
 2017/0229950 A1 * 8/2017 Moto G02B 7/023
 2017/0285362 A1 * 10/2017 Hu G02B 27/646
 2017/0285363 A1 * 10/2017 Hu G02B 7/09
 2017/0285443 A1 * 10/2017 Hu F03G 7/065
 2018/0321460 A1 * 11/2018 Lee G02B 7/09
 2018/0329173 A1 * 11/2018 Hu G02B 7/102
 2019/0181726 A1 * 6/2019 Kuo H02K 11/02
 2019/0204616 A1 * 7/2019 Yeo G02B 27/646
 2019/0227337 A1 * 7/2019 Kuo G02B 13/0065

OTHER PUBLICATIONS

Apple Camera Autofocus, published Jan. 15, 2014 [online], [retrieved Jul. 8, 2019], Available from Internet, URL: <https://ipadhelp.com/iphone/apple-camera-patent-published-prepares-for-improved-autofocus-and-ois-in-iphone-6/>.*

* cited by examiner

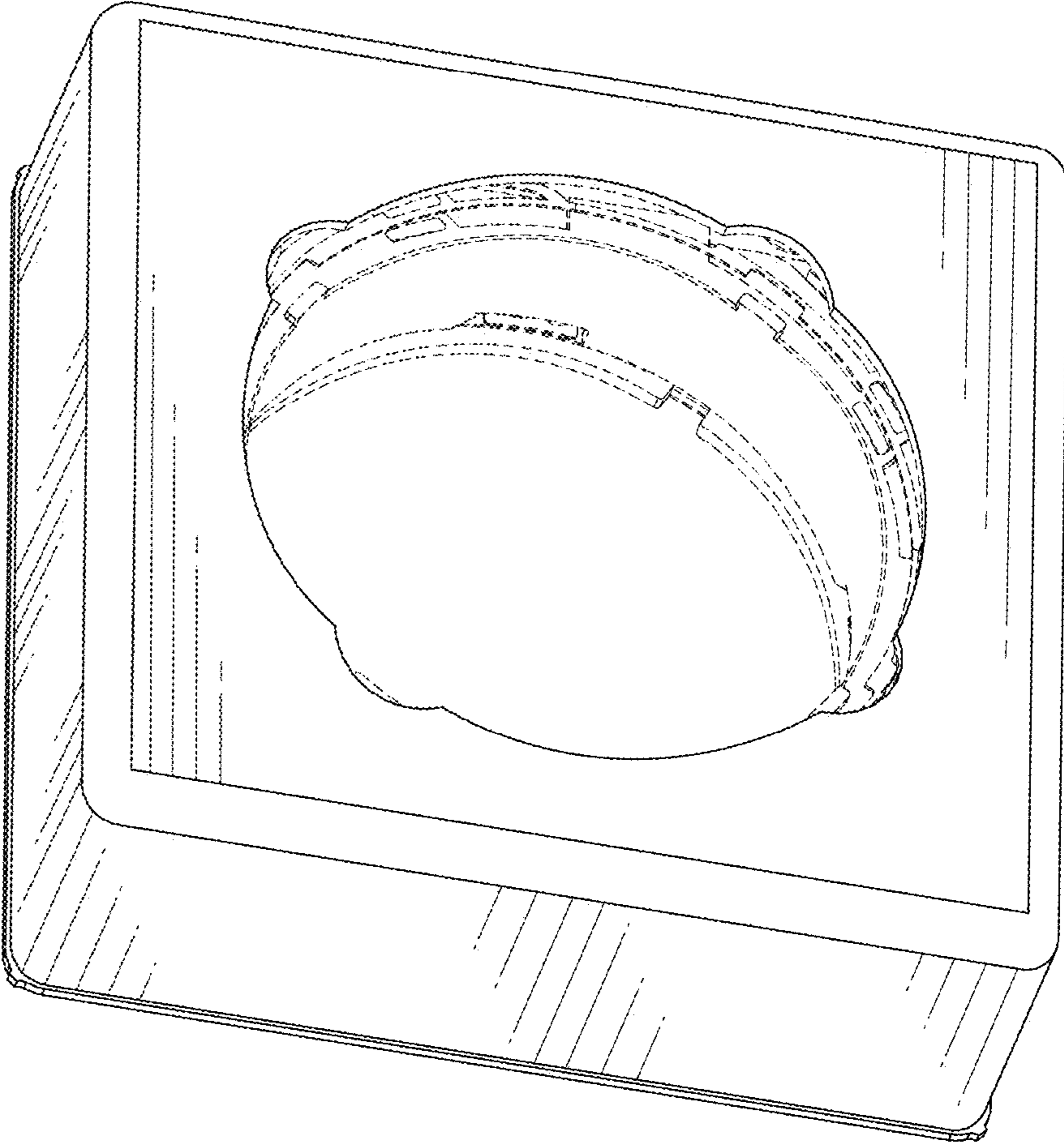


FIG. 1

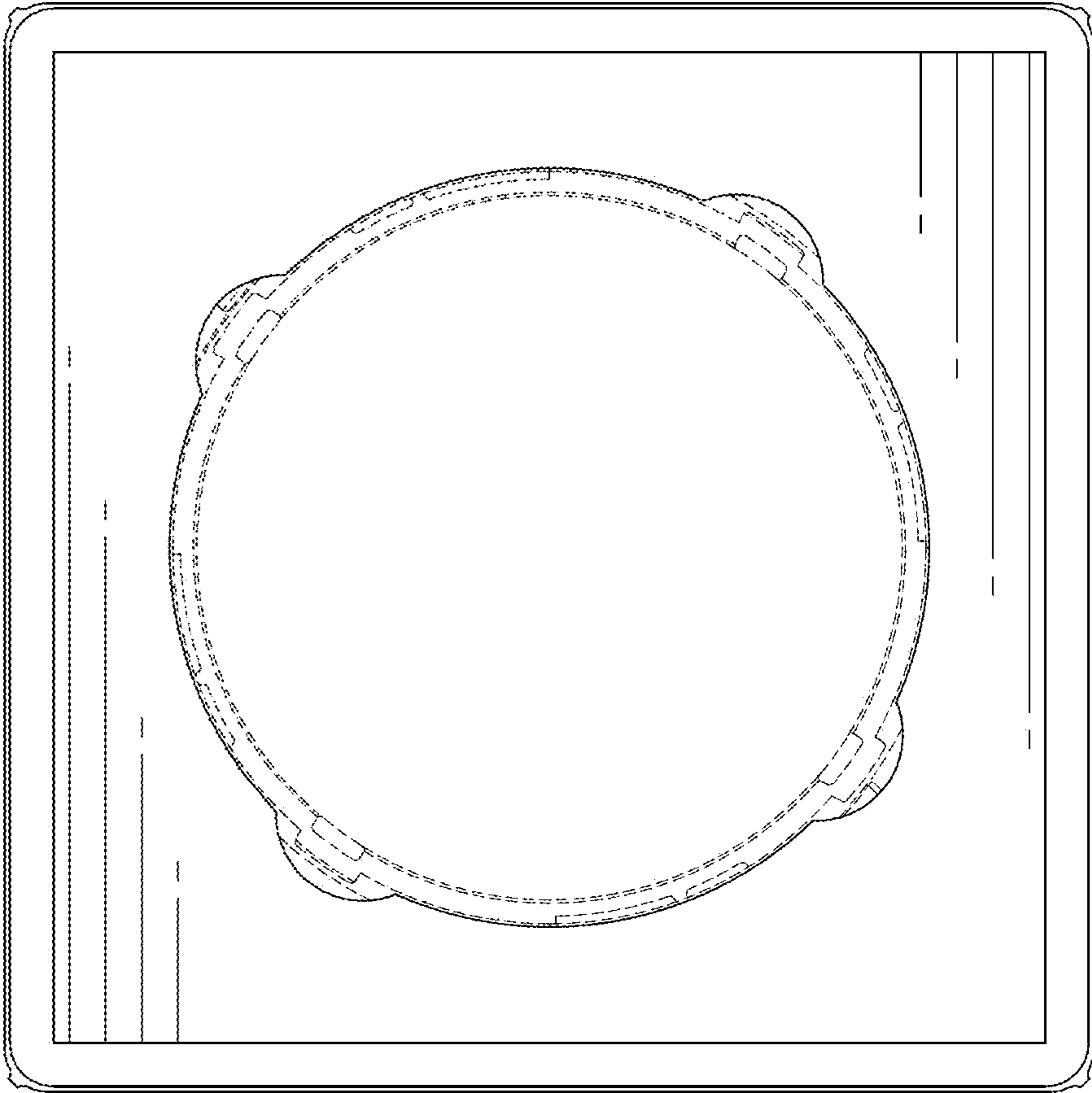


FIG. 2

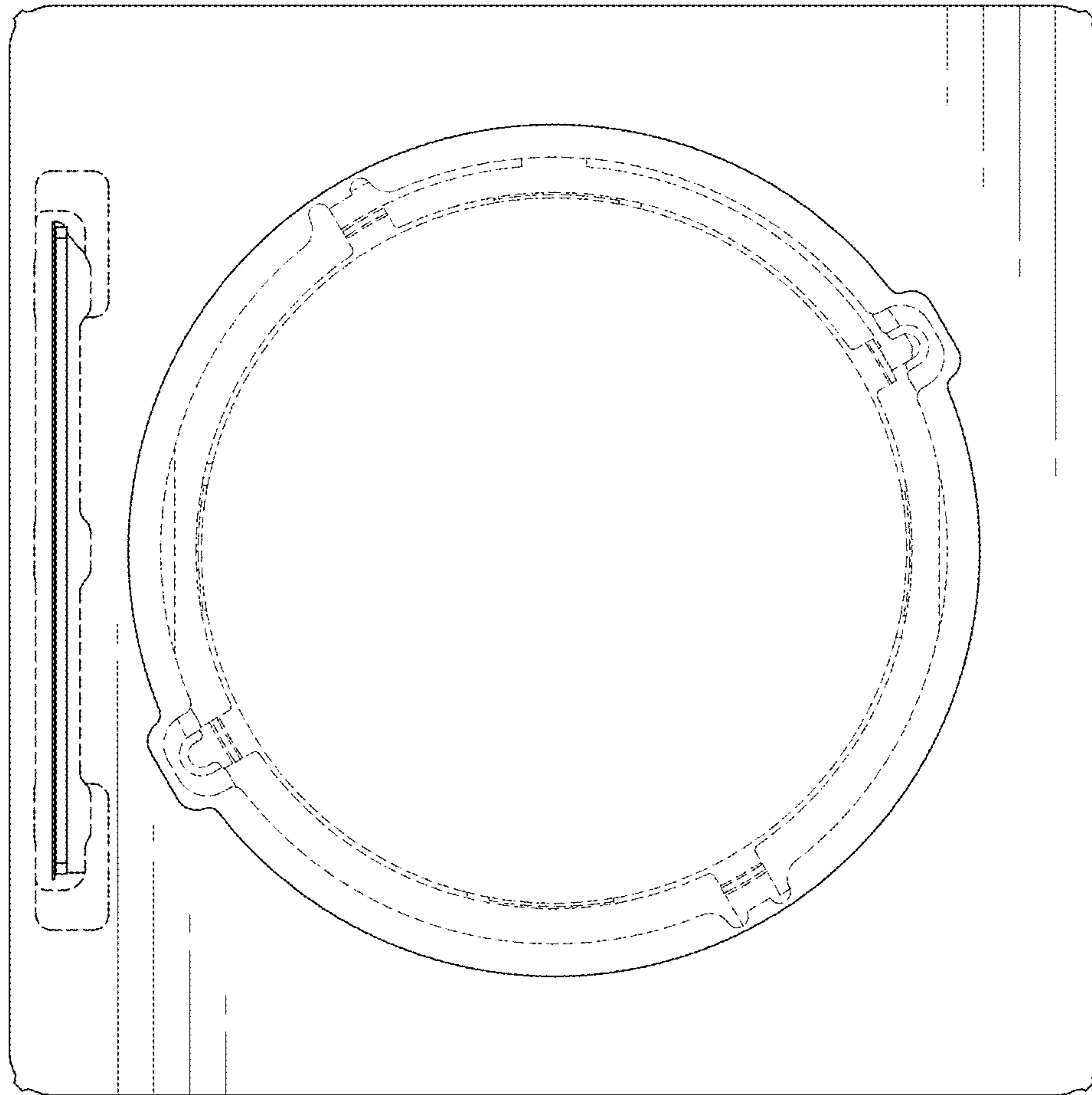


FIG. 3

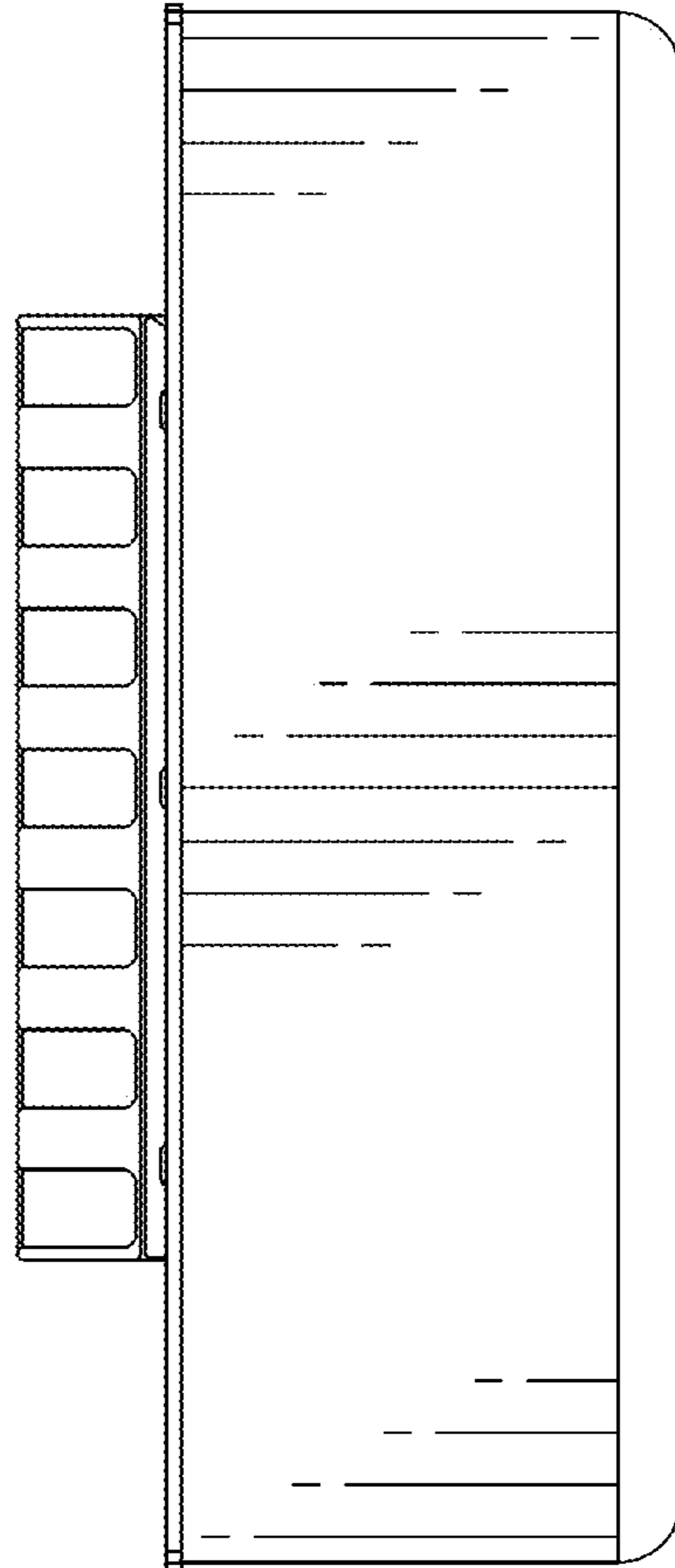


FIG. 4

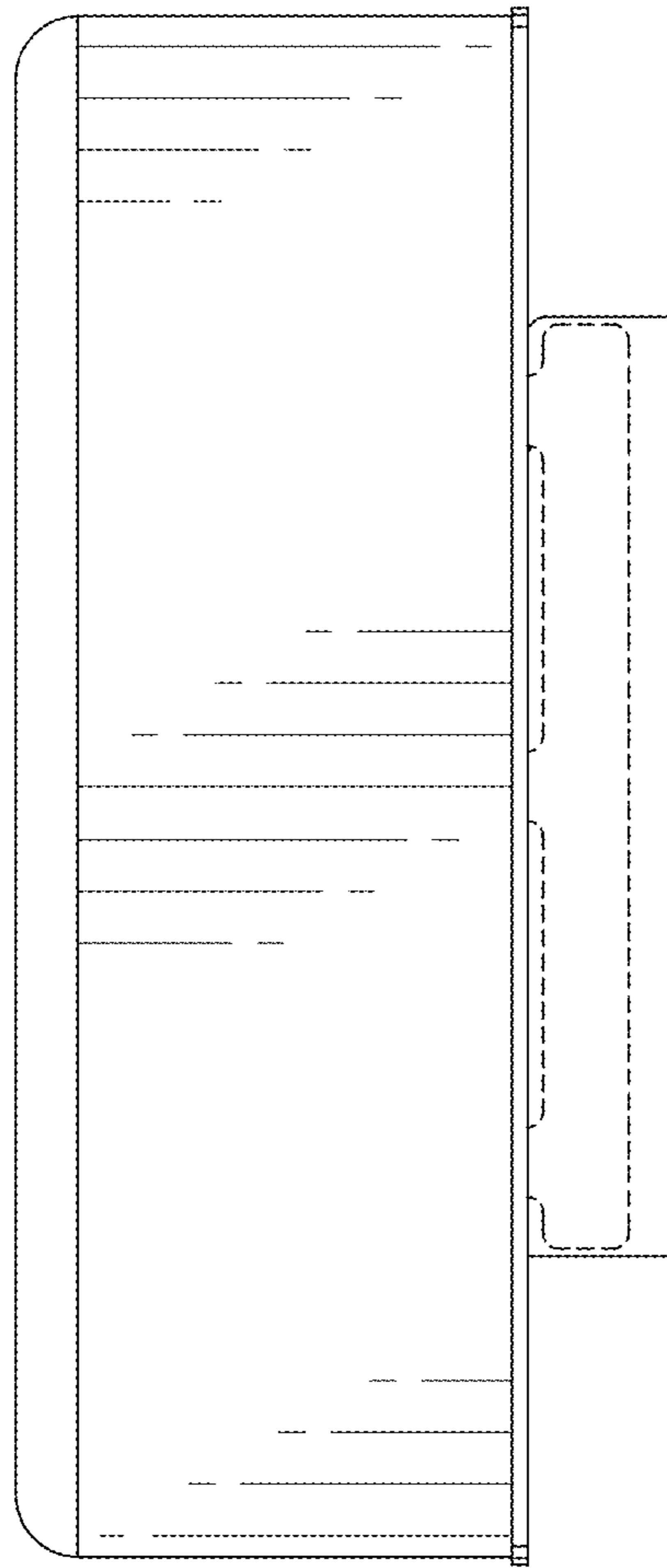


FIG. 5

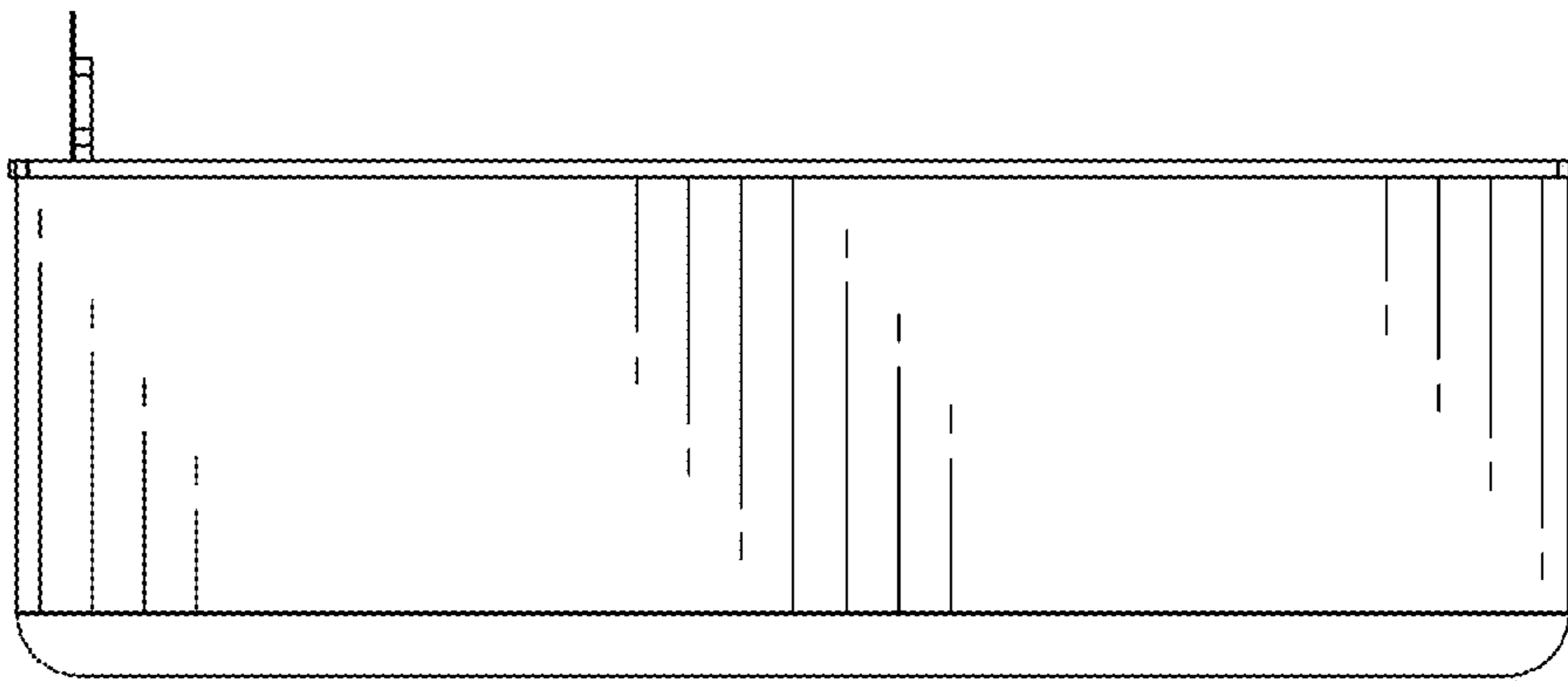


FIG. 6

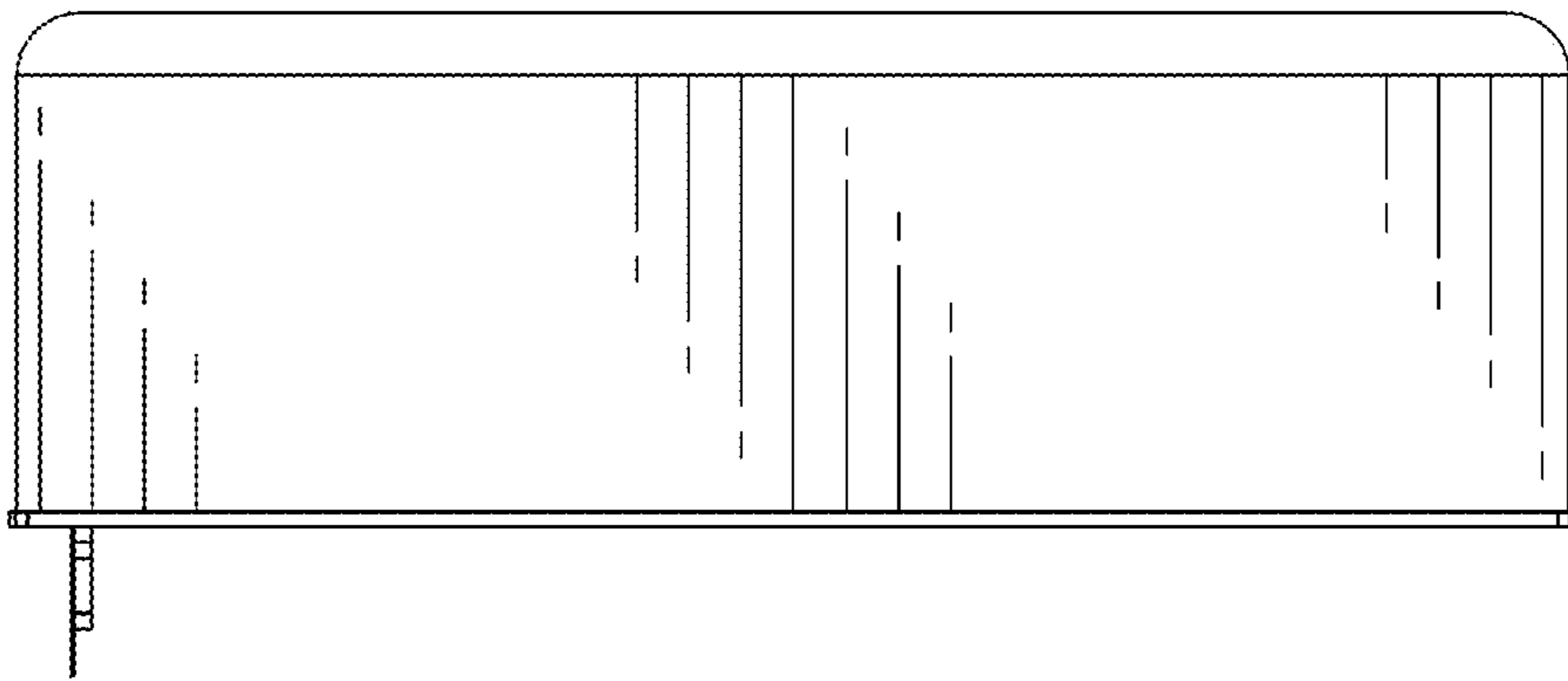


FIG. 7

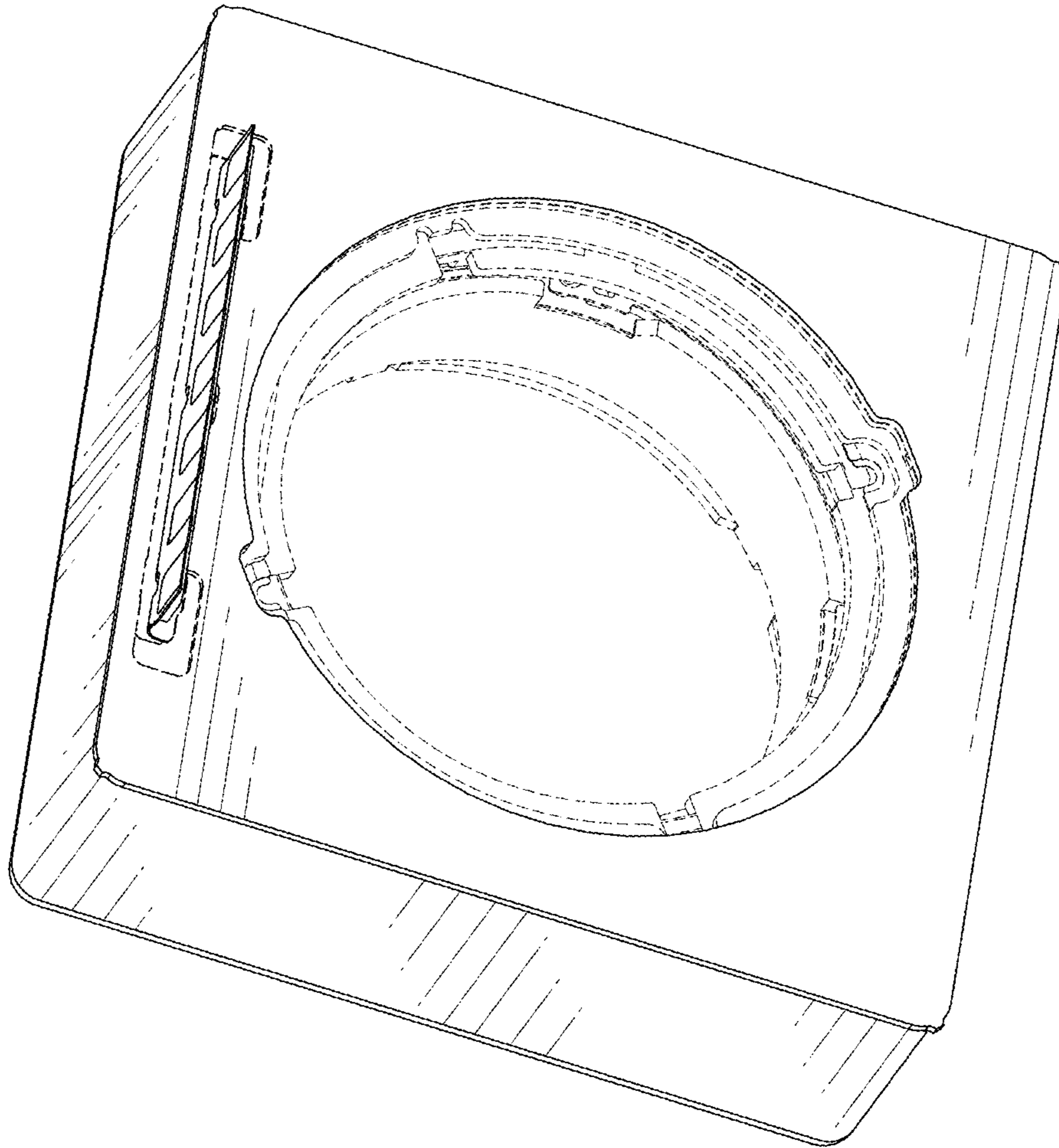


FIG. 8