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(12) **United States Design Patent** (10) **Patent No.:** **US D966,357 S**  
**Gunther et al.** (45) **Date of Patent:** **\*\* Oct. 11, 2022**

(54) **TARGET PROFILE FOR A PHYSICAL VAPOR DEPOSITION CHAMBER TARGET**

FOREIGN PATENT DOCUMENTS

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CN 206573738 U 10/2017  
JP D1420846 8/2011

(Continued)

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OTHER PUBLICATIONS

Search Report for Taiwan Design Application No. 106301373 dated Jun. 20, 2017.

(Continued)

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

(57) **CLAIM**

(21) Appl. No.: **29/821,669**

We claim the ornamental design for a target profile for a physical vapor deposition chamber target, as shown and described.

(22) Filed: **Dec. 31, 2021**

**DESCRIPTION**

**Related U.S. Application Data**

(62) Division of application No. 29/760,578, filed on Dec. 2, 2020, now Pat. No. Des. 940,765.

FIG. 1 is a top isometric view of a sputter target for a physical vapor deposition chamber, according to our novel design.

(51) **LOC (13) Cl.** ..... **15-09**

(52) **U.S. Cl.**  
USPC ..... **D15/138**; D13/182

FIG. 2 is a top plan view thereof.

FIG. 3 is a bottom plan view thereof.

FIG. 4 is a right side elevation view thereof.

FIG. 5 is a left side elevation view thereof.

FIG. 6 is a front elevation thereof.

FIG. 7 is a back elevation view thereof; and,

FIG. 8 is an enlarged partial right side elevation view showing portions of the design in greater detail.

The broken lines in the drawings represent unclaimed environment and form no part of the claimed design.

The long dash short dash broken lines in FIGS. 4 and 8 represent the region of enlargement taken from FIG. 4 as shown in FIG. 8 and form no part of the claimed design.

(58) **Field of Classification Search**  
USPC ..... D23/249, 259, 262, 269; D15/138, 139, D15/143, 144, 144.1, 144.2, 150, 199;  
(Continued)

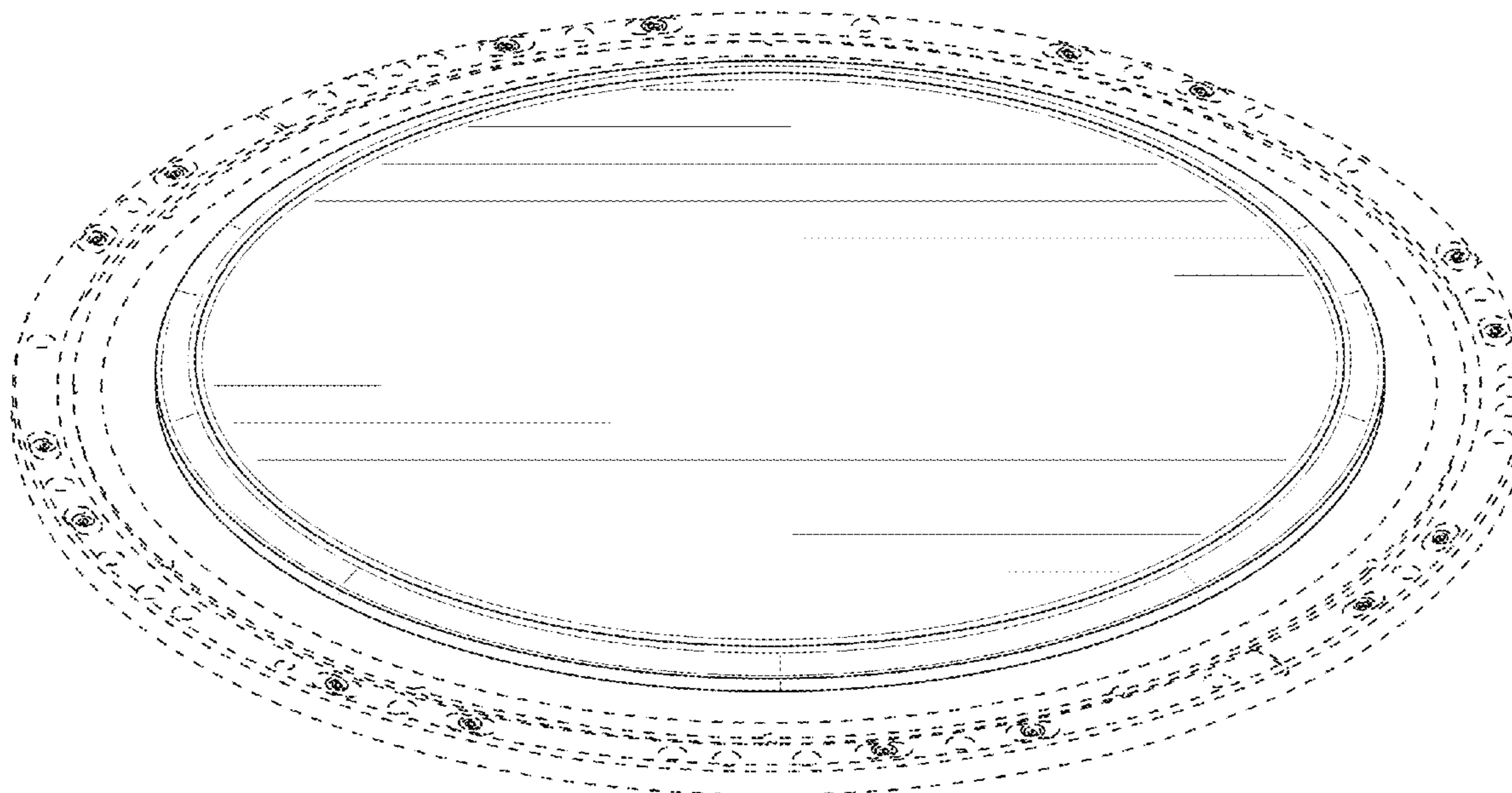
(56) **References Cited**

U.S. PATENT DOCUMENTS

5,320,728 A 6/1994 Tepman  
D351,450 S 10/1994 Maryska

(Continued)

**1 Claim, 6 Drawing Sheets**



## (58) Field of Classification Search

USPC ..... D13/118, 122, 133, 162, 182, 184, 199;  
D22/113, 119CPC ..... H01J 37/3414; H01J 37/3423; H01L  
21/02631; H01L 2221/68363; H01L  
2224/75186-75189; H01L 21/67742;  
H01L 21/0226; H01L 21/02263; H01L  
21/02266; H01L 21/02269; H01L  
21/02271; F16J 7/00; E04D 13/14; C23C  
14/3407; C23C 14/35

See application file for complete search history.

## (56) References Cited

## U.S. PATENT DOCUMENTS

D363,464 S 10/1995 Fukasawa et al.  
D376,744 S 12/1996 Eisenblatter  
D381,030 S \* 7/1997 Tepman ..... D15/144  
D395,483 S \* 6/1998 Maryska ..... D22/100  
D423,026 S 4/2000 Shimazu  
D425,919 S \* 5/2000 Burkhart ..... D15/140  
6,086,725 A 7/2000 Abburi et al.  
6,114,216 A 9/2000 Yieh et al.  
D446,231 S 8/2001 Kuraoka et al.  
6,390,905 B1 5/2002 Korovin et al.  
6,659,850 B2 12/2003 Korovin et al.  
D487,254 S 3/2004 Suenaga  
D496,951 S 10/2004 Brasseur et al.  
6,815,352 B1 11/2004 Tamura et al.  
D503,729 S 4/2005 Leeuw et al.  
D553,104 S 10/2007 Oohashi et al.  
D557,226 S 12/2007 Uchino  
D559,066 S 1/2008 Tano et al.  
D559,993 S 1/2008 Nagakubo et al.  
D559,994 S 1/2008 Nagakubo et al.  
D562,856 S 2/2008 Hawley et al.  
D570,310 S 6/2008 Sasaki et al.  
D571,383 S 6/2008 Ota et al.  
D571,831 S 6/2008 Ota et al.  
D571,833 S 6/2008 Ota et al.  
D572,733 S 7/2008 Ota et al.  
7,402,098 B2 7/2008 Severson et al.  
D582,949 S 12/2008 Yamashita  
D584,591 S 1/2009 Tano et al.  
D592,029 S 5/2009 Tano et al.  
D592,030 S 5/2009 Tano et al.  
D600,660 S 9/2009 Sato  
D600,989 S 9/2009 Tano et al.  
D614,593 S 4/2010 Lee et al.  
D616,389 S 5/2010 Takahashi  
D616,390 S 5/2010 Sato  
D633,452 S 3/2011 Namiki et al.  
D649,126 S 11/2011 Takahashi  
D669,509 S 10/2012 Krink et al.  
8,371,904 B2 2/2013 Jindal et al.  
D678,745 S 3/2013 Nguyen  
8,398,833 B2 3/2013 Lee et al.  
D683,806 S 6/2013 Dueck  
D687,790 S 8/2013 Krishnan et al.  
D687,791 S 8/2013 Krishnan et al.  
D691,974 S 10/2013 Osada  
D694,790 S 12/2013 Matsumoto et al.  
D703,162 S 4/2014 Tamaso  
D716,742 S 11/2014 Jang et al.  
D724,553 S 3/2015 Choi et al.  
D732,094 S 6/2015 Jussel et al.  
D741,823 S 10/2015 Tateno et al.  
D741,921 S 10/2015 Jarvius et al.  
D750,728 S 3/2016 Kremer  
D754,468 S \* 4/2016 Nason ..... D7/368  
D767,234 S 9/2016 Kirkland et al.  
D769,200 S 10/2016 Fukushima et al.  
9,475,996 B2 10/2016 Mandle  
D770,992 S 11/2016 Tauchi et al.  
D790,039 S 6/2017 Hawrylchak et al.  
D790,041 S \* 6/2017 Jang ..... D23/259

D793,572 S 8/2017 Kozuka et al.  
D794,753 S 8/2017 Miller  
D795,208 S 8/2017 Sasaki et al.  
D796,458 S 9/2017 Jang et al.  
D797,067 S 9/2017 Zhang et al.  
D797,691 S 9/2017 Joubert et al.  
D798,248 S 9/2017 Hanson et al.  
D801,942 S 11/2017 Riker et al.  
D804,230 S \* 12/2017 Allan ..... D6/716  
D808,349 S 1/2018 Fukushima et al.  
D810,705 S 2/2018 Krishnan et al.  
D813,181 S \* 3/2018 Okajima ..... D13/182  
D819,580 S \* 6/2018 Krishnan ..... D13/182  
D825,504 S 8/2018 Zhang et al.  
D825,505 S 8/2018 Hanson et al.  
D830,435 S 10/2018 Wakisaka et al.  
D830,981 S \* 10/2018 Jeong ..... D13/182  
D836,572 S 12/2018 Riker et al.  
D837,755 S 1/2019 Riker et al.  
D839,224 S 1/2019 Yamaki et al.  
D846,514 S 4/2019 Yoshida et al.  
D851,613 S 6/2019 Johanson et al.  
10,442,056 B2 10/2019 Namiki et al.  
D868,124 S \* 11/2019 Riker ..... D15/144  
D869,409 S \* 12/2019 Riker ..... D13/182  
D877,101 S 3/2020 Johanson et al.  
10,662,520 B2 5/2020 West  
D888,903 S 6/2020 Gunther et al.  
D891,382 S 7/2020 Koppa et al.  
D893,441 S 8/2020 Rao et al.  
D894,137 S \* 8/2020 Johanson ..... D13/184  
10,811,232 B2 10/2020 Srikantaiah et al.  
D902,165 S \* 11/2020 Johanson ..... D13/182  
D908,645 S \* 1/2021 Savandaiah ..... D13/182  
D913,979 S \* 3/2021 Babu ..... D13/182  
D913,980 S \* 3/2021 Lee ..... D13/182  
D933,725 S \* 10/2021 Koppa ..... D15/138  
D933,726 S \* 10/2021 Savandaiah ..... D15/138  
D937,329 S \* 11/2021 Riker ..... D15/138  
D940,765 S \* 1/2022 Gunther ..... D15/138  
D941,371 S \* 1/2022 Lavitsky ..... D15/138  
D946,638 S \* 3/2022 Riker ..... D15/138  
2004/0149567 A1 8/2004 Kosyachkov  
2005/0152089 A1 7/2005 Matsuda et al.  
2005/0193952 A1 9/2005 Goodman et al.  
2007/0076345 A1 4/2007 Bang  
2008/0173541 A1 7/2008 Lee et al.  
2008/0308416 A1 12/2008 Allen et al.  
2009/0260982 A1 10/2009 Riker et al.  
2010/0096261 A1 4/2010 Hoffman et al.  
2010/0108500 A1 5/2010 Hawrylchak et al.  
2010/0170786 A1 7/2010 Wang et al.  
2012/0033340 A1 2/2012 Roy et al.  
2012/0263569 A1 \* 10/2012 Priddy ..... C30B 23/02  
414/800  
2013/0316628 A1 11/2013 Jang et al.  
2014/0261180 A1 9/2014 Yoshidome et al.  
2015/0170888 A1 6/2015 Riker et al.  
2015/0357169 A1 \* 12/2015 Yuan ..... B23K 35/24  
204/298.13  
2016/0002776 A1 1/2016 Nal et al.  
2016/0002788 A1 1/2016 Nal et al.  
2016/0035547 A1 2/2016 Johanson et al.  
2017/0009367 A1 \* 1/2017 Harris ..... C25D 17/06

## FOREIGN PATENT DOCUMENTS

JP D1421157 8/2011  
JP D1422692 9/2014  
TW 223429 5/1994  
TW 223430 5/1994  
TW D146490 4/2012  
TW D 197321 5/2019  
TW D 197827 6/2019  
TW D 202101 1/2020

(56)

**References Cited**

OTHER PUBLICATIONS

Search Report for Taiwan Design Application No. 107305358 dated Feb. 21, 2019.

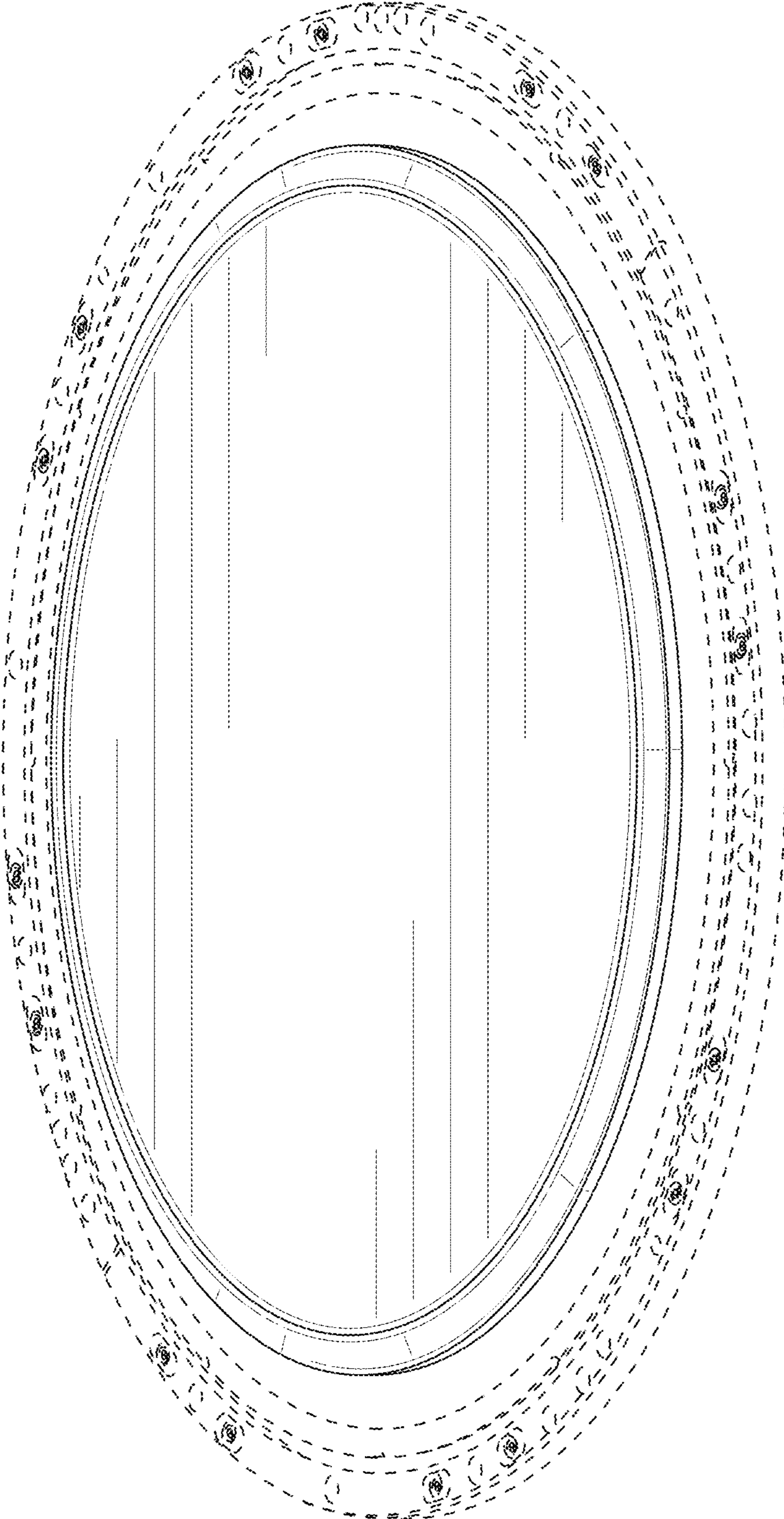
Search Report for Taiwan Design Application No. 1077303086 dated Jul. 6, 2018.

Sputtering Targets, posted at Angstrom Sciences, posting date May 5, 2016. Site visited Apr. 1, 2019. URL: <<https://web.archive.org/web/20160505015447/https://www.angstromsciences.com/sputtering-targets>> (Year: 2016).

Sputtering Targets for LSis, posted at JX Nippon Mining & Metals, posting date Mar. 22, 2016. Site visited Apr. 1, 2019. URL: <[https://web.archive.org/web/20160322055046/http://www.nmm.jx-group.co.jp/english/products/04\\_supa/target\\_adv.html](https://web.archive.org/web/20160322055046/http://www.nmm.jx-group.co.jp/english/products/04_supa/target_adv.html)> (Year: 2016).

Search Report for Taiwan Design Application No. 110302622 dated May 21, 2021.

\* cited by examiner



**FIG. 1**

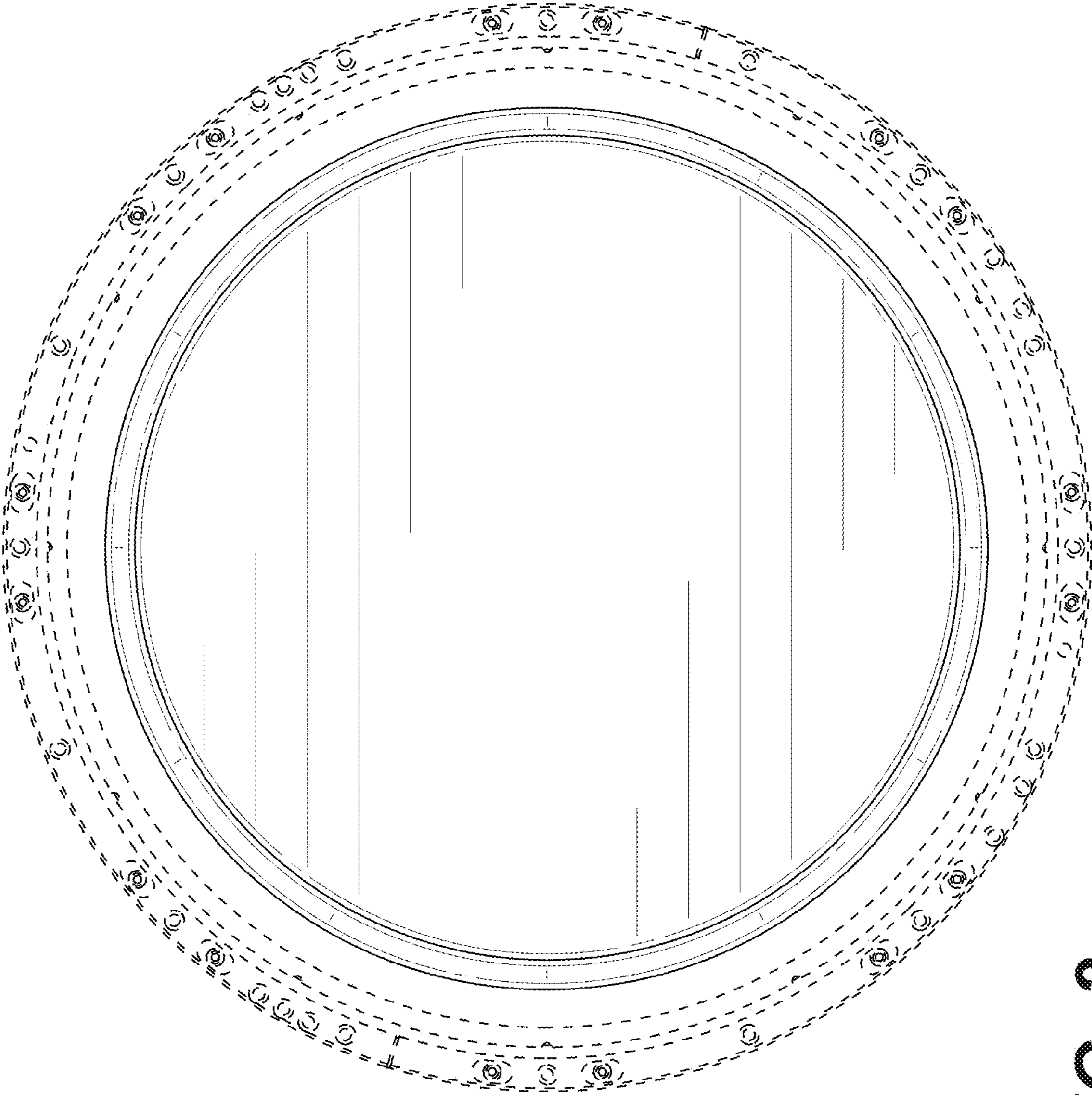
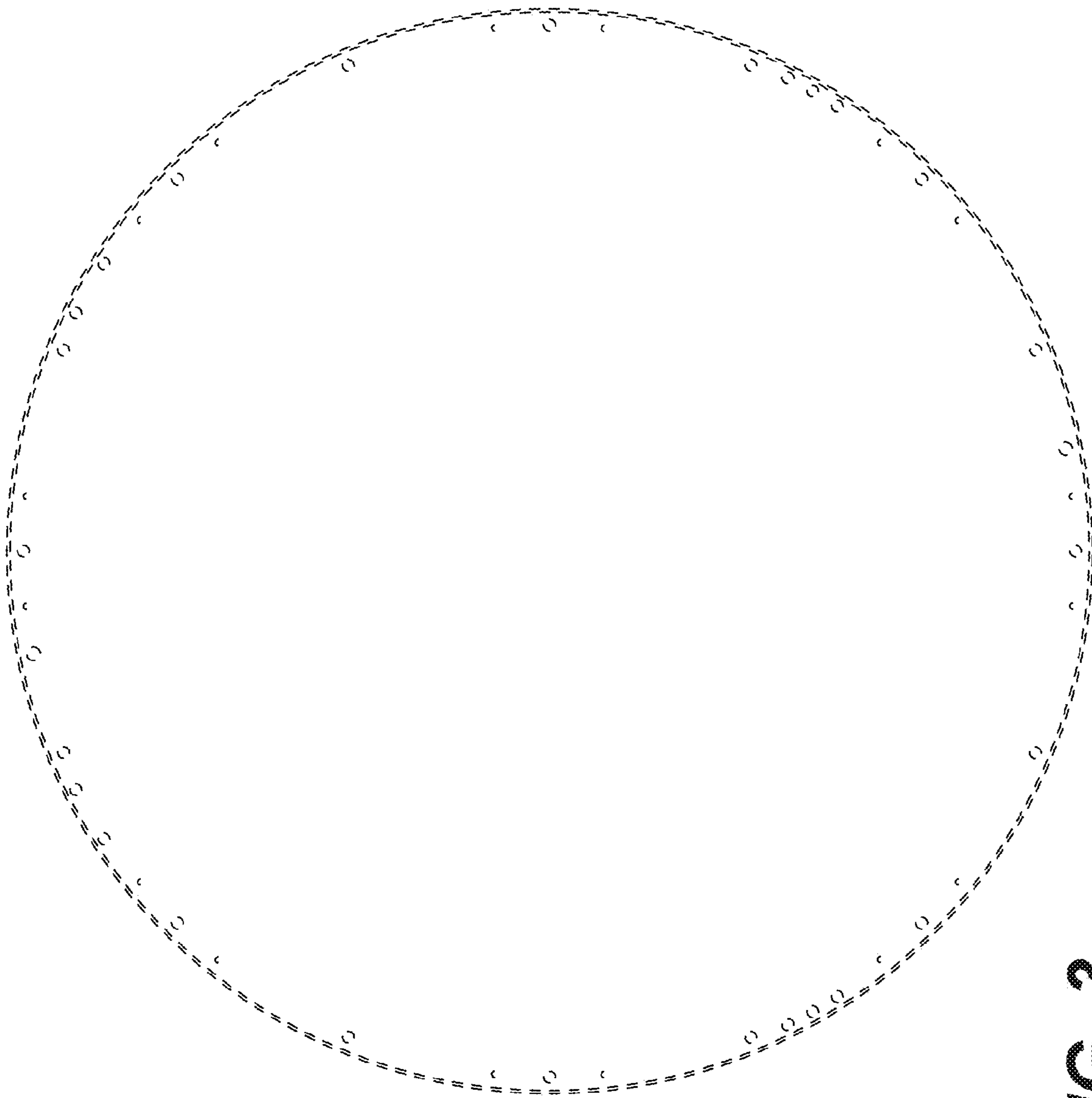
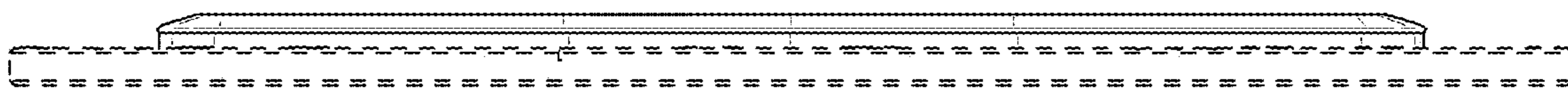
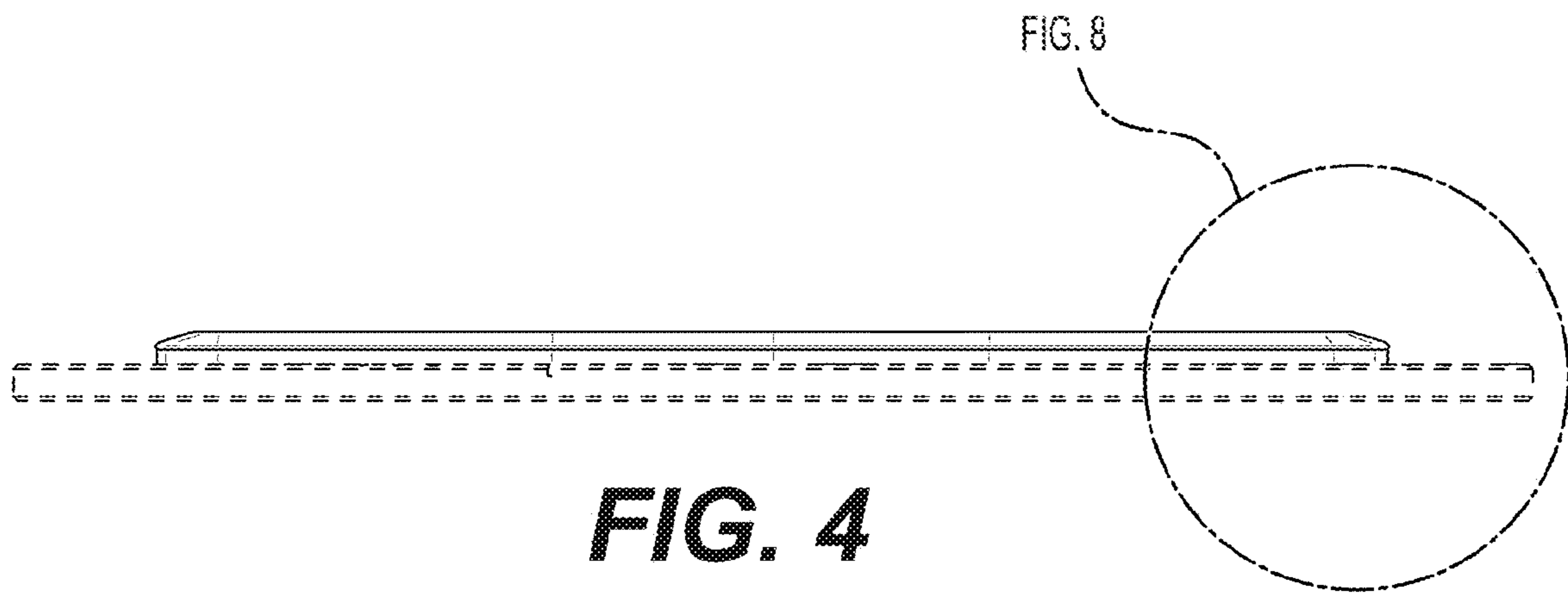


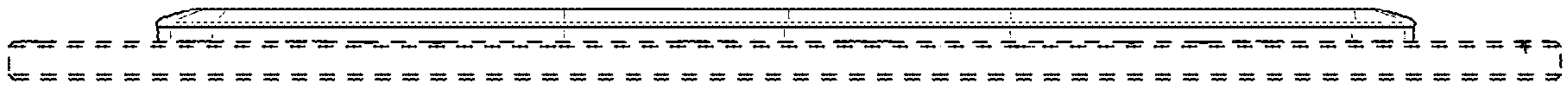
FIG. 2



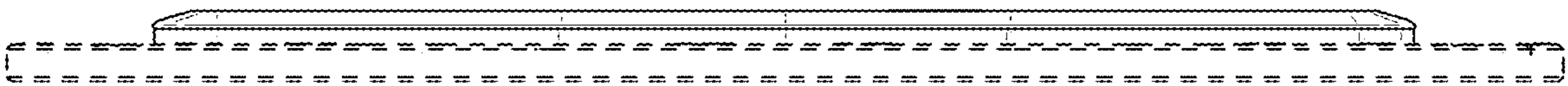
**FIG. 3**



**FIG. 5**

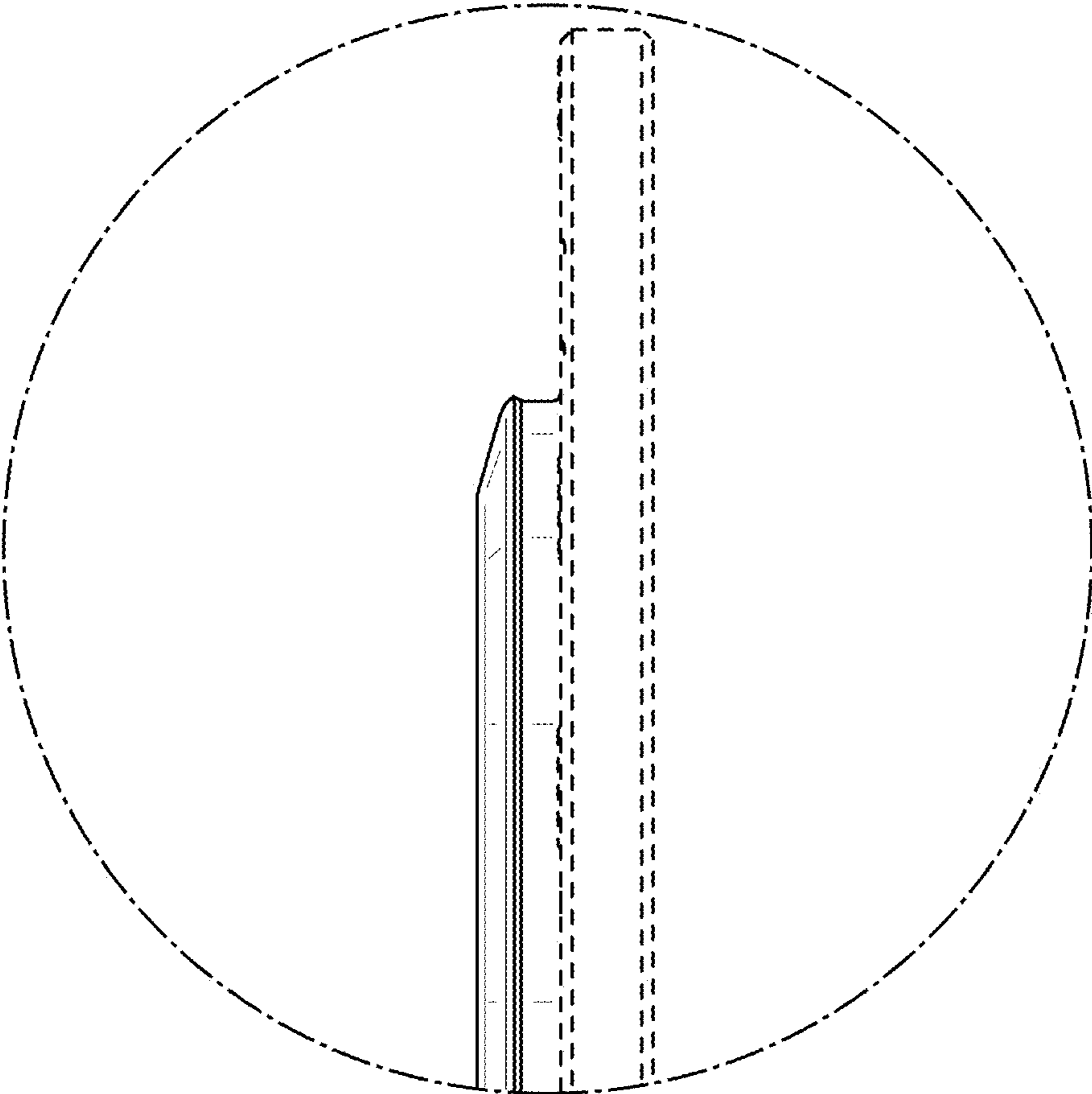


**FIG. 6**



**FIG. 7**





**FIG. 8**