



US00D828422S

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

(10) **Patent No.:** **US D828,422 S**

(45) **Date of Patent:** **** Sep. 11, 2018**

- (54) **HYDROCYCLONE INLET HEAD**
- (71) Applicant: **Superior Industries, Inc.**, Morris, MN (US)
- (72) Inventors: **Lafe Grimm**, Morris, MN (US); **Shane Hanson**, Columbus, NE (US); **Paul Ilott**, Tyler, TX (US)
- (73) Assignee: **Superior Industries, Inc.**, Morris, MN (US)

- D464,067 S * 10/2002 Rogers D15/147
 - 7,255,790 B2 * 8/2007 Rogers B04C 5/12
209/715
 - 7,347,332 B2 * 3/2008 Hakola B04C 5/085
209/159
 - 7,404,491 B2 * 7/2008 Hakola B01D 45/12
209/715
 - D612,878 S * 3/2010 Meter D15/147
 - 8,104,622 B2 * 1/2012 Soto B04C 5/13
209/732
 - D654,105 S * 2/2012 Schneider D15/147
 - D658,695 S * 5/2012 Schneider D15/147
- (Continued)

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

(21) Appl. No.: **29/591,837**

(22) Filed: **Jan. 24, 2017**

(51) **LOC (11) Cl.** **15-09**

(52) **U.S. Cl.**
USPC **D15/147**

(58) **Field of Classification Search**
USPC D15/138, 147; D32/1, 25
CPC B04C 5/00; B04C 5/04; B04C 5/12; B04C
5/13; B04C 5/26; B04C 5/28; B04C
11/00

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

- 3,385,437 A * 5/1968 Woodruff B04C 5/04
209/734
- 4,652,363 A * 3/1987 Miller B04C 5/02
209/734
- D294,363 S * 2/1988 Donhauser D15/147
- D303,672 S * 9/1989 Stienen D15/147
- 5,651,466 A * 7/1997 Satomi B04C 5/02
209/734
- D414,789 S * 10/1999 Rogers D15/147
- D415,181 S * 10/1999 Rogers D15/147
- D415,182 S * 10/1999 Rogers D15/147
- D415,507 S * 10/1999 Rogers D15/147
- 6,109,451 A * 8/2000 Grimes B04C 3/00
209/725
- D456,429 S * 4/2002 Rogers D15/147

OTHER PUBLICATIONS

Krebs gMax Hydrocyclones; brochure; 2016; pp. 1-4; FLSmidth Krebs; Arizona, USA.

(Continued)

Primary Examiner — Patricia A Palasik
(74) *Attorney, Agent, or Firm* — Todd R. Fronek; Larkin Hoffman Daly & Lindgren, Ltd.

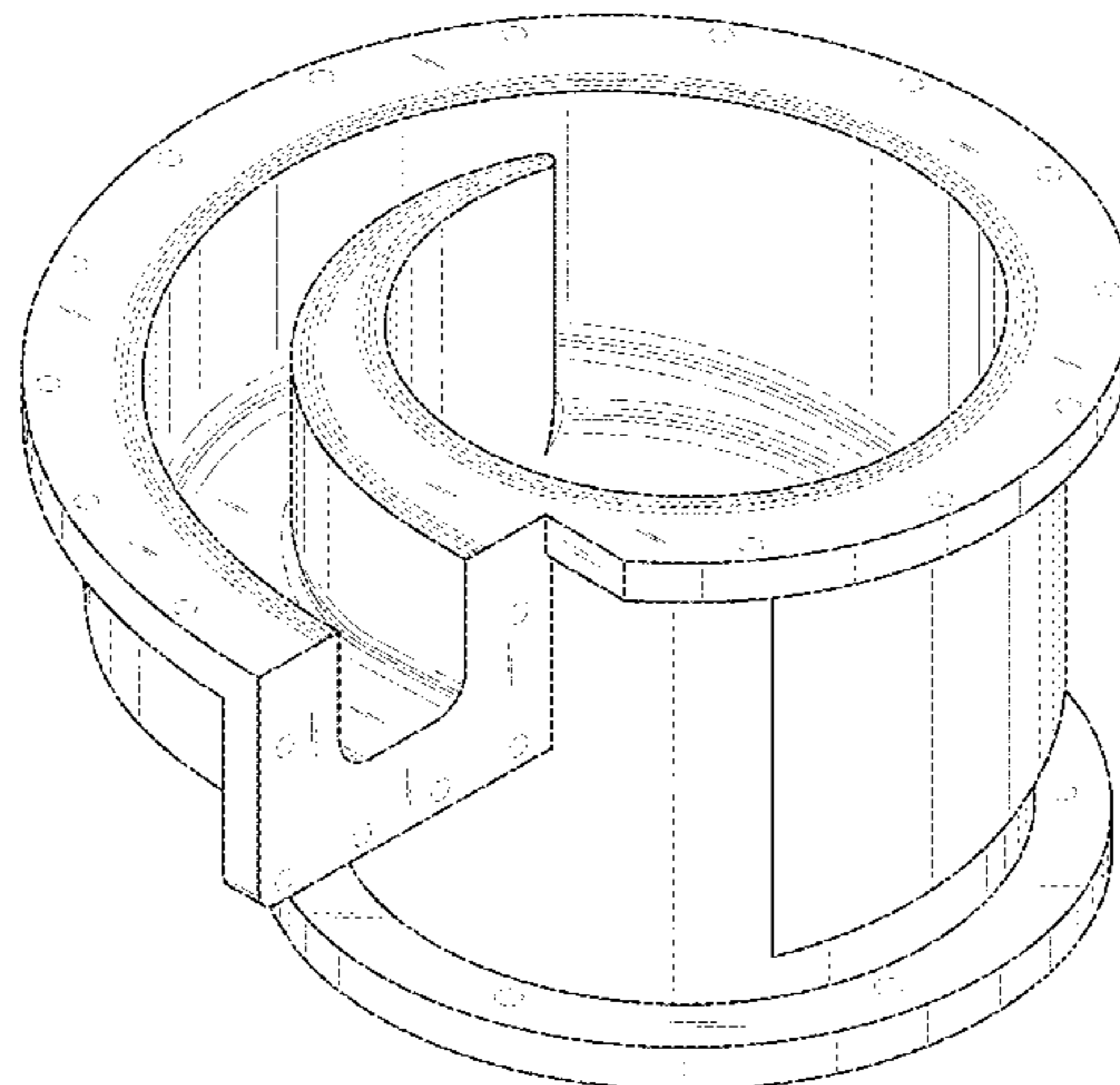
(57) **CLAIM**

The ornamental design for hydrocyclone inlet head, as shown and described.

DESCRIPTION

FIG. 1 is a perspective view of a hydrocyclone inlet head showing our new design;
FIG. 2 is a front elevation view thereof;
FIG. 3 is a rear elevation view thereof;
FIG. 4 is a left elevation view thereof;
FIG. 5 is a right elevation view thereof;
FIG. 6 is a plan view thereof; and,
FIG. 7 is a bottom view thereof.
The broken lines in the drawings depict unclaimed environmental subject matter.

1 Claim, 7 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

D663,082 S * 7/2012 Gabrielson D32/1
 D744,707 S * 12/2015 Becker D32/25
 D807,414 S * 1/2018 Maguire D15/135
 2003/0222003 A1 * 12/2003 Girdler B04C 5/28
 209/721
 2004/0108256 A1 * 6/2004 Hoffmann B04C 5/103
 209/715
 2005/0077234 A1 * 4/2005 Yoshida B04C 5/04
 210/512.1
 2009/0071880 A1 * 3/2009 Castro Soto B04C 5/04
 209/606
 2016/0353954 A1 * 12/2016 Kleine-Doepke A47L 9/1658
 2017/0173598 A1 * 6/2017 Sutherland B03B 5/34
 2017/0209875 A1 * 7/2017 MacLean A47L 9/1608
 2017/0232454 A1 * 8/2017 Irvin, Sr. B04C 5/081
 210/512.1
 2017/0312764 A1 * 11/2017 Robert B04C 5/04
 2017/0320070 A1 * 11/2017 Bovensiep B04C 5/103
 2017/0361338 A1 * 12/2017 Ni B04C 5/26
 2018/0085761 A1 * 3/2018 Dressler B04C 5/04

OTHER PUBLICATIONS

Krebs gMax Cyclones For Finer Separations With Larger Diameter Cyclones; paper; Aug. 2000, pp. 1-7; FLSmidth Krebs; Arizona, USA.
 Krebs Installation-Operation-Maintenance Manual; model D26B-1085 Krebs Cyclone manual; 1999; pp. 1-6; Krebs Engineers; Arizona, USA.
 Separators; brochure; Sep. 2014, pp. 1-4; McLanahan Corporation; Pennsylvania, USA.
 Cavex Hydrocyclones—CVXT Tile Lined Hydrocyclones, technical specifications brochure; 2016; pp. 1-2; Weir Minerals Australia Ltd.; Australia.
 Cavex Hydrocyclones—G4 Hydrocyclones; technical specifications brochure; 2016; pp. 1-2; Weir Minerals Australia Ltd.; Australia.

* cited by examiner

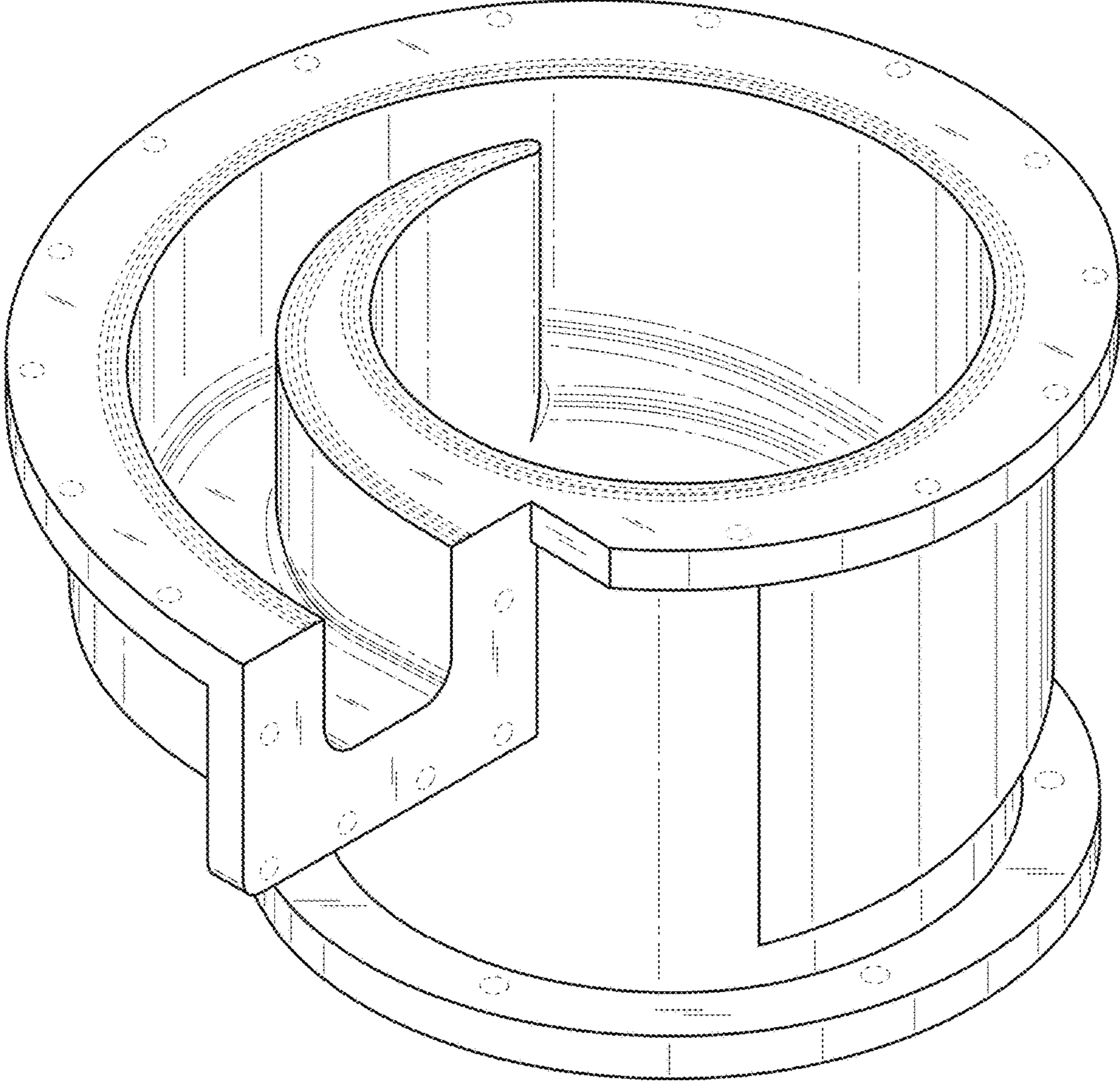


Fig. 1

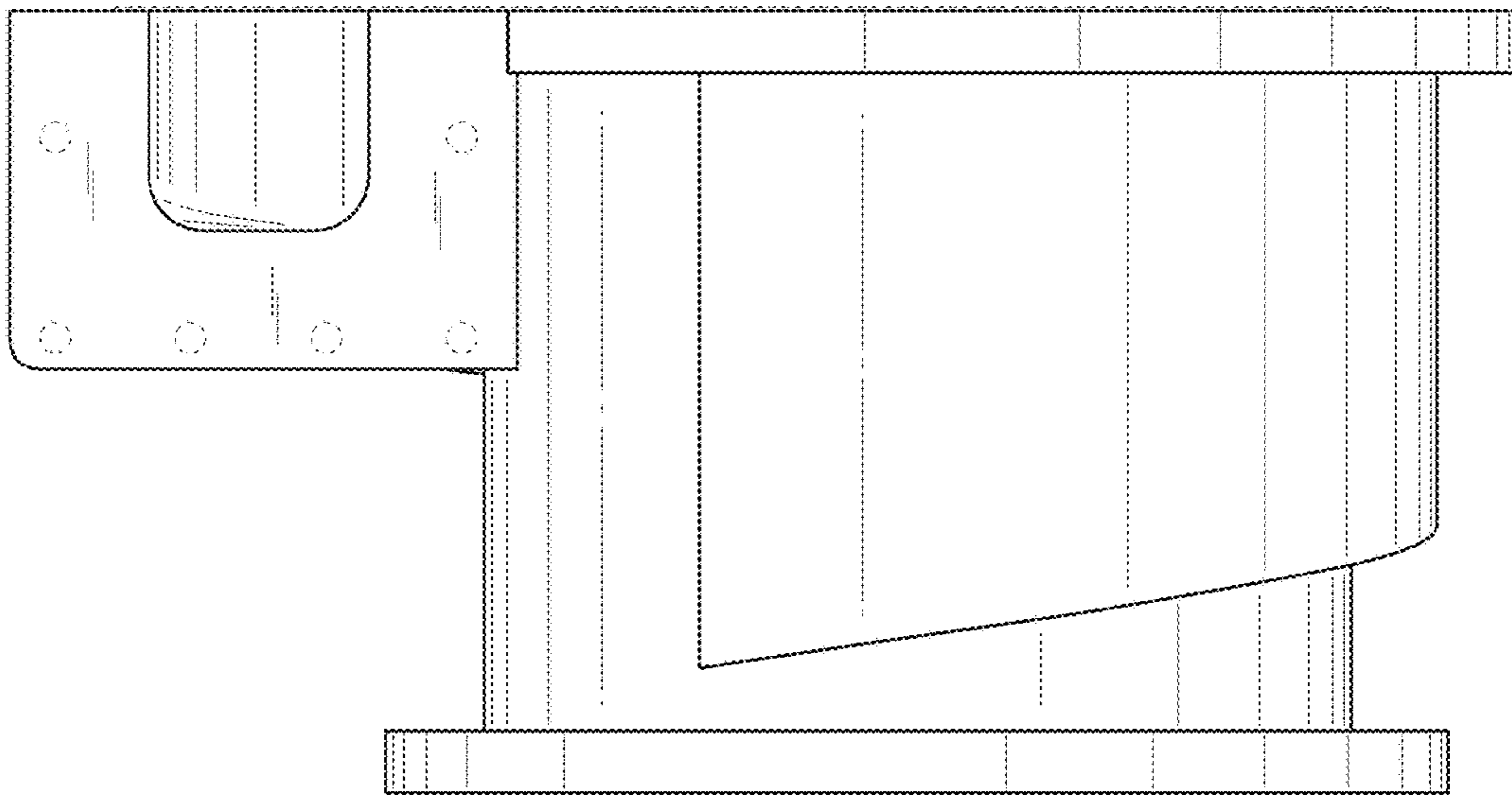


Fig. 2

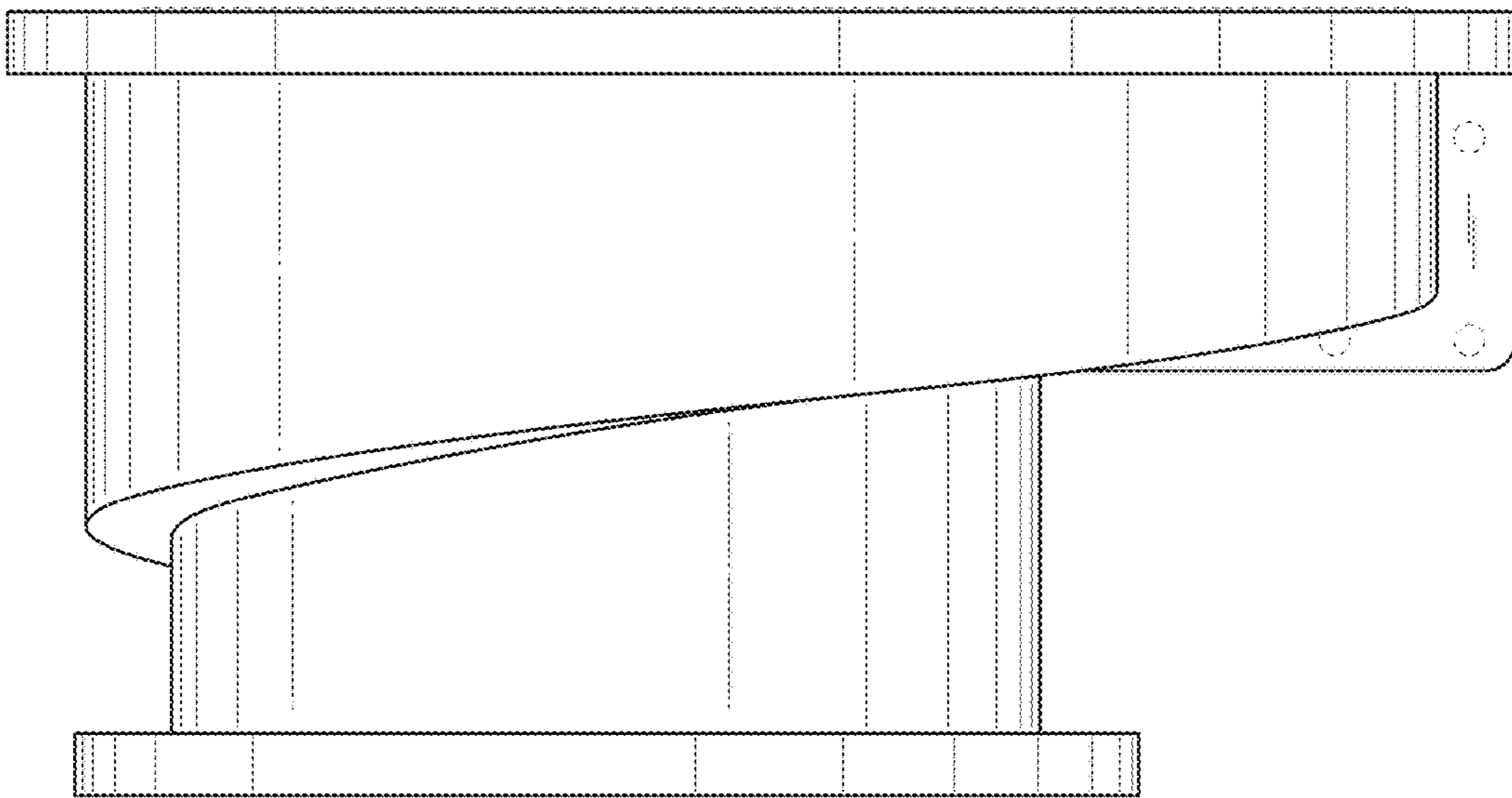


Fig. 3

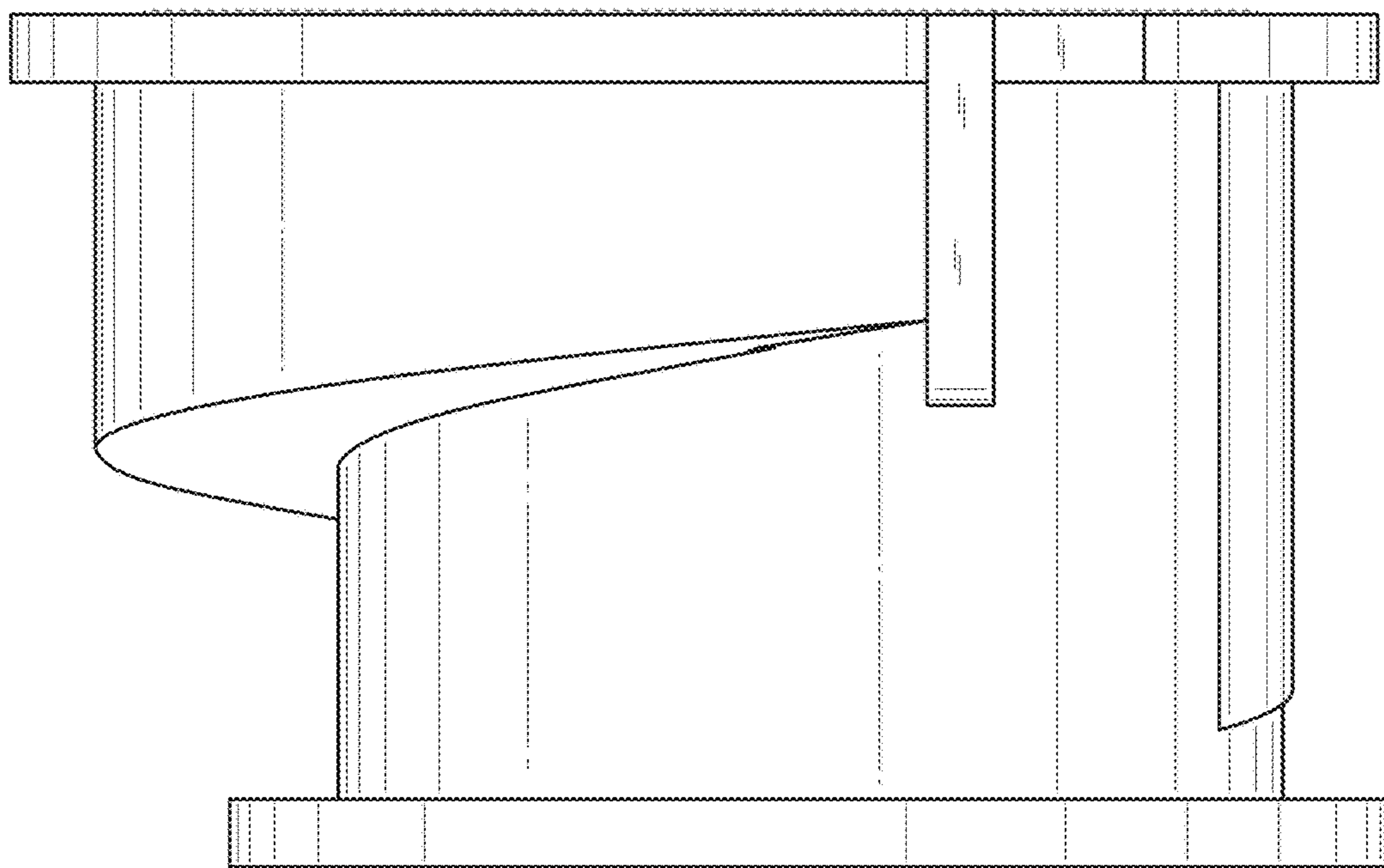


Fig. 4

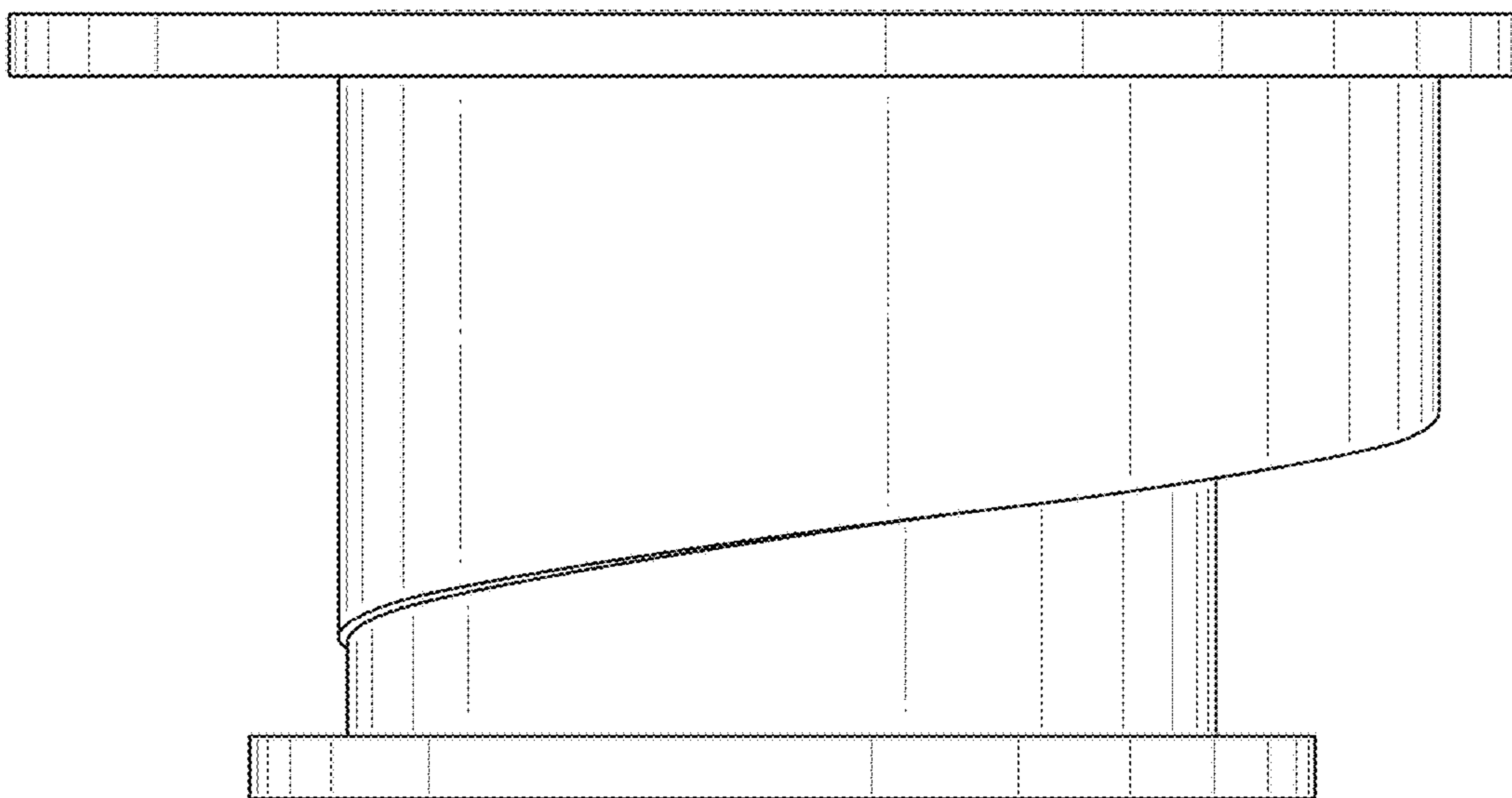


Fig. 5

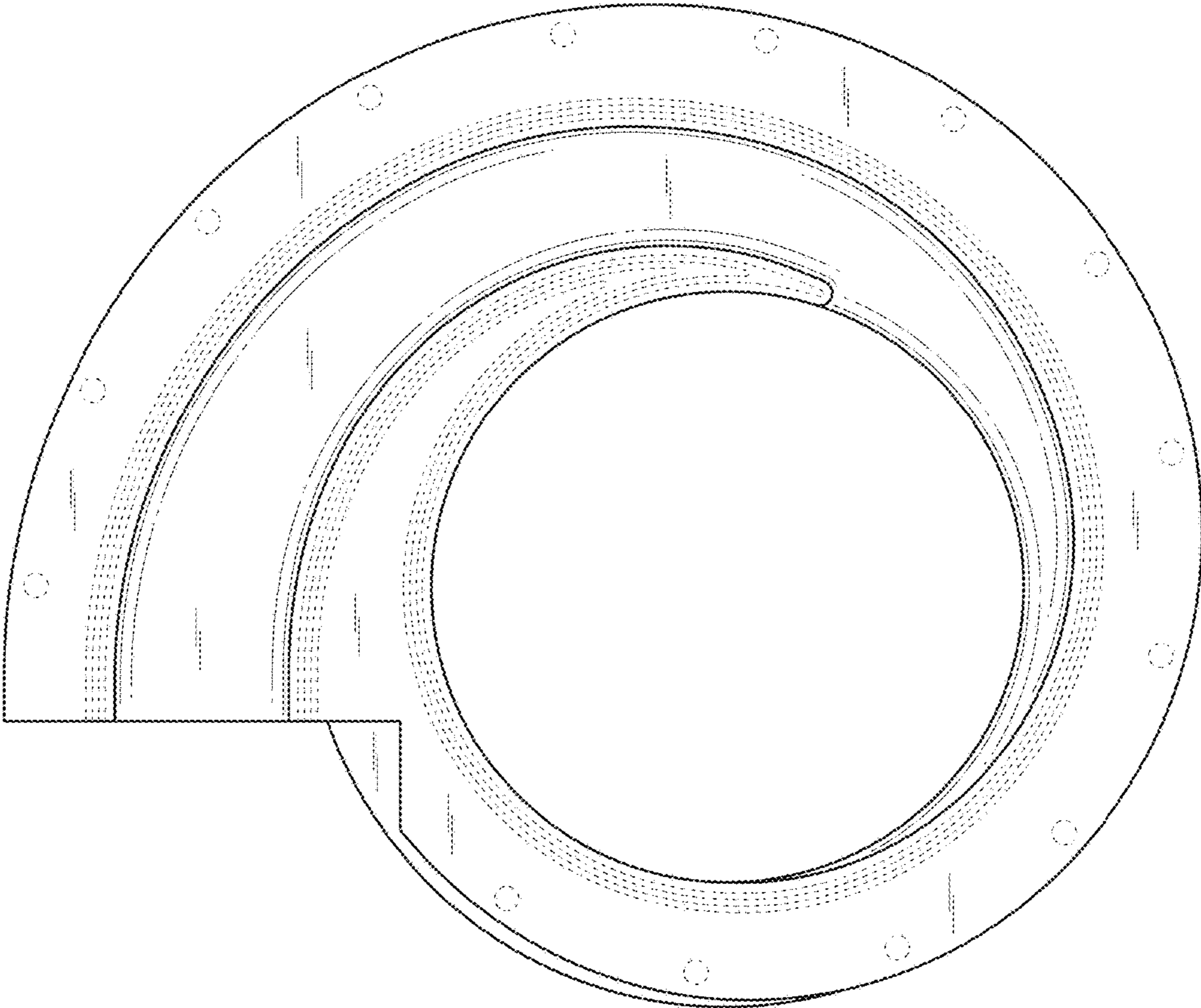


Fig. 6

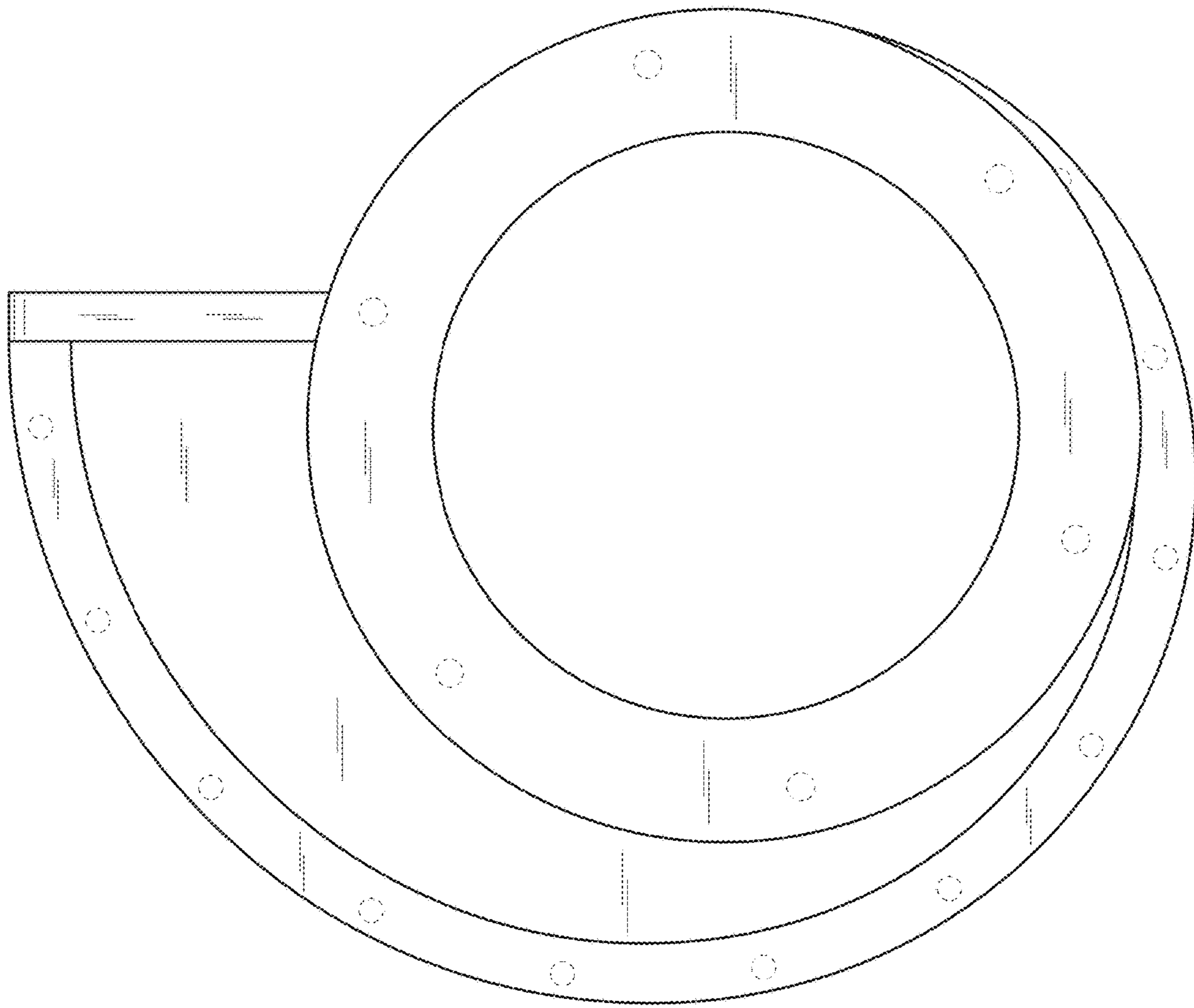


Fig. 7