



US00D821554S

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

(10) **Patent No.:** **US D821,554 S**
(45) **Date of Patent:** **** Jun. 26, 2018**

(54) **HEAT EXCHANGER INTERFACE SYSTEM**

D274,030 S * 5/1984 Daenen D7/391
4,534,281 A 8/1985 Parks et al.
4,718,478 A 1/1988 Huber
D296,761 S * 7/1988 Mockett 379/438
(Continued)

(71) Applicant: **The University of Kansas**, Lawrence, KS (US)

(72) Inventors: **George S. Wilson**, Lawrence, KS (US);
William Scott Jeffress, Baldwin City, KS (US); **Frank J. Schoenen**, Lawrence, KS (US)

(73) Assignee: **The University of Kansas**, Lawrence, KS (US)

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

(21) Appl. No.: **29/579,468**

(22) Filed: **Sep. 30, 2016**

Related U.S. Application Data

(63) Continuation-in-part of application No. 29/473,168, filed on Nov. 19, 2013, which is a continuation-in-part of application No. 13/966,496, filed on Aug. 14, 2013, now Pat. No. 9,463,495.

(51) **LOC (11) Cl.** **23-03**

(52) **U.S. Cl.**
USPC **D23/323**

(58) **Field of Classification Search**
USPC D23/314, 323, 330, 386, 499; 165/181, 165/121, 166, 167, 170, 150, 151, 182, 165/172, 140, 41; 454/57, 49
CPC B01L 1/50; B01L 2300/185; F28D 15/00; B08B 15/023
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,326,277 A 6/1967 Osborne
3,745,908 A 7/1973 Mayberry
D231,356 S * 4/1974 Kurz D23/393
4,415,847 A 11/1983 Galloway

OTHER PUBLICATIONS

International Search Report and Written Opinion dated Dec. 16, 2013 from PCT Application No. PCT/US2013/054886 filed Aug. 14, 2013.

(Continued)

Primary Examiner — T. Chase Nelson

Assistant Examiner — Ania Aman

(74) *Attorney, Agent, or Firm* — Valauskas Corder LLC

(57) **CLAIM**

The ornamental design for a heat exchanger interface system, as shown and described.

DESCRIPTION

FIG. 1 is a front view of a first embodiment of a heat exchanger interface system according to the present invention;

FIG. 2 is a rear view of the first embodiment of a heat exchanger interface system according to the present invention;

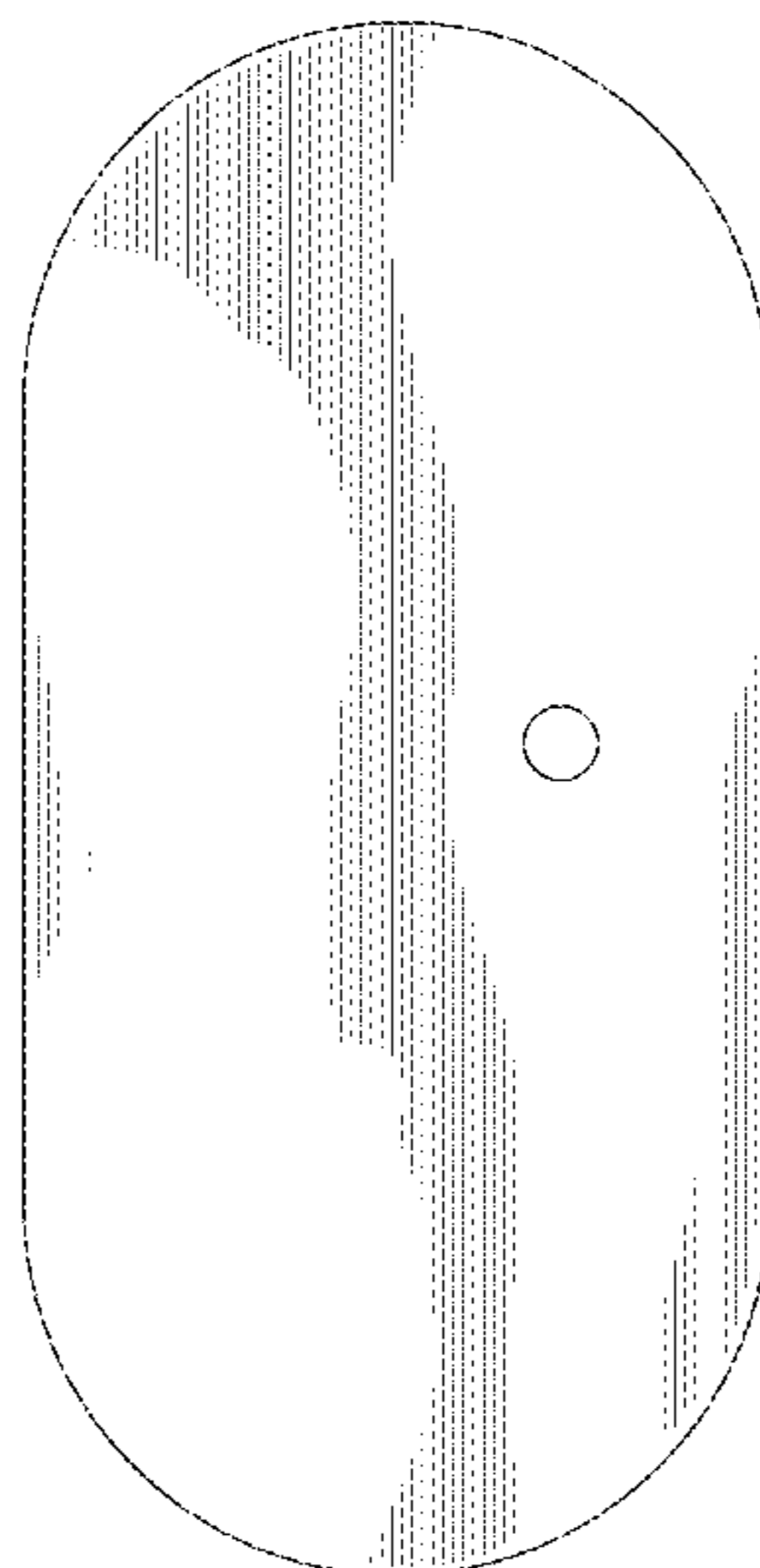
FIG. 3 is a side view of the first embodiment of a heat exchanger interface system according to the present invention;

FIG. 4 is a front view of a second embodiment of a heat exchanger interface system according to the present invention;

FIG. 5 is a rear view of the second embodiment of a heat exchanger interface system according to the present invention; and,

FIG. 6 is a side view of the second embodiment of a heat exchanger interface system according to the present invention.

1 Claim, 6 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

4,867,331 A 9/1989 Task
 5,058,391 A 10/1991 Periot
 5,113,927 A 5/1992 Kedar et al.
 5,251,377 A 10/1993 Ho
 D358,980 S * 6/1995 Mockett D8/356
 5,566,062 A 10/1996 Quisenberry et al.
 5,579,650 A 12/1996 Cleland et al.
 5,634,351 A 6/1997 Larson et al.
 5,687,707 A 11/1997 Prasser
 5,716,267 A 2/1998 Hambleton et al.
 6,062,203 A * 5/2000 Takahashi F02M 37/22
 123/509
 6,159,068 A 12/2000 Trotter
 7,051,797 B2 5/2006 de Leeuw
 D640,526 S * 6/2011 Cash D8/352
 D697,336 S 1/2014 Perry
 2002/0007932 A1 1/2002 Egara
 2004/0248077 A1 12/2004 Rodriguez et al.
 2006/0042289 A1 3/2006 Campbell et al.
 2010/0216382 A1 8/2010 Williams et al.
 2011/0258837 A1 10/2011 Scannon et al.
 2012/0100789 A1 4/2012 Liebsch
 2013/0331018 A1 * 12/2013 Wilson B01L 1/50
 454/56

OTHER PUBLICATIONS

Thermo Scientific NESLAB HX Series Recirculating Chiller, Thermo Scientific Manual P/N U00744, pp. 1-75 (Mar. 26, 2008).
 Thermo Scientific NESLAB System III Heat Exchanger, Thermo Scientific Manual P/N 000678, pp. 1-28 (Dec. 7, 2006).
 Thermo Scientific NESLAB ThermoFlex 2500, pp. 1-4 (2007).
 Thermo Electron Corporation LESLAB RTE and EX Series Bath Circulators, pp. 1-12 (undated).
 Thermo Electron Corporation LESLAB ULT Series Bath Circulators, pp. 10-12 (undated).
 Thermo Electron Corporation LESLAB RTE CB Series Cold Baths, pp. 14-15 (undated).
 Thermo Electron Corporation NESLAB CB Series Cryotrol, p. 16 (undated).
 Thermo Electron Corporation NESLAB Merlin Series Recirculating Chillers, pp. 17-20 (undated).
 Thermo Electron Corporation NESLAB CC Series Immersion Coolers, pp. 21-25 (undated).
 Thermo Electron Corporation NESLAB ThermoFlex 900 Recirculating Chiller, pp. 1-3 (undated).
 Thermo Electron Corporation NESLAB ThermoFlex 1400 Recirculating Chiller, pp. 1-4 (2006).
 Reflux Condensers, Jencon Laboratory Catalog, p. 794 created on Oct. 2005, modified Apr. 2006.

* cited by examiner

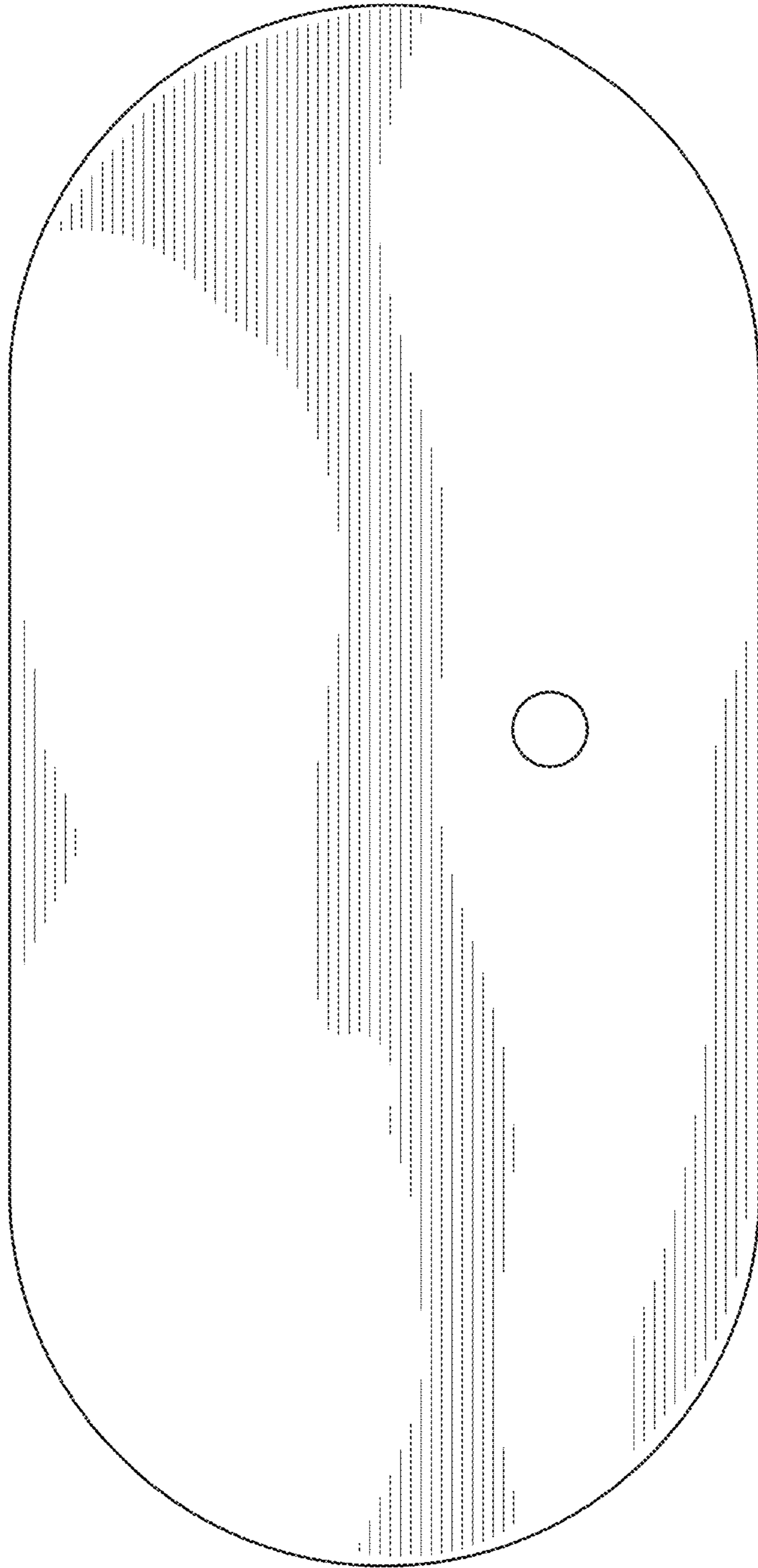


FIG. 1

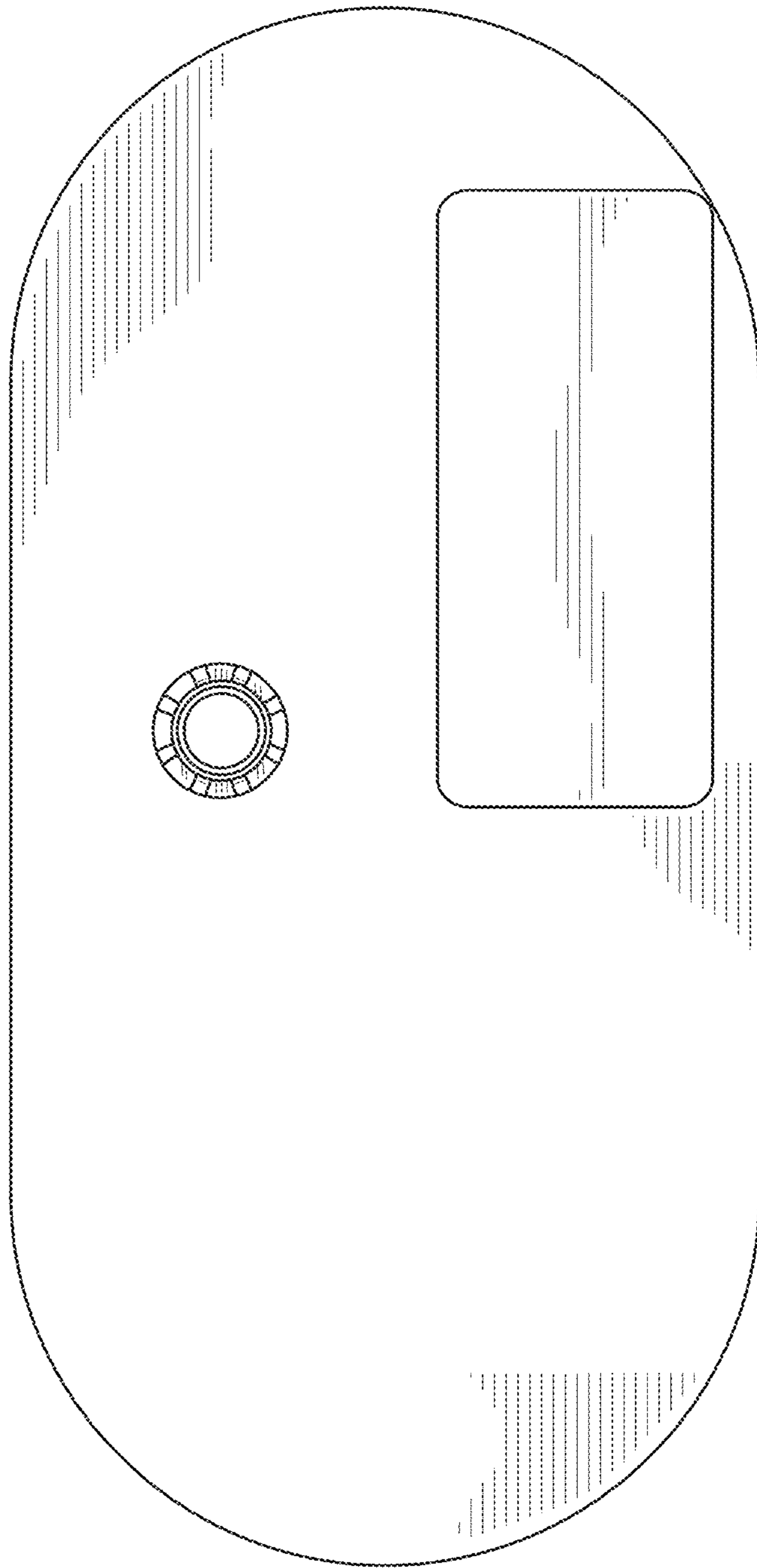


FIG. 2

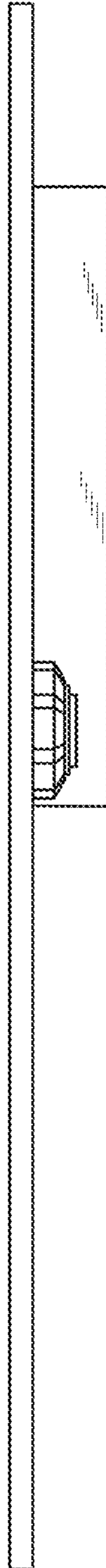


FIG. 3

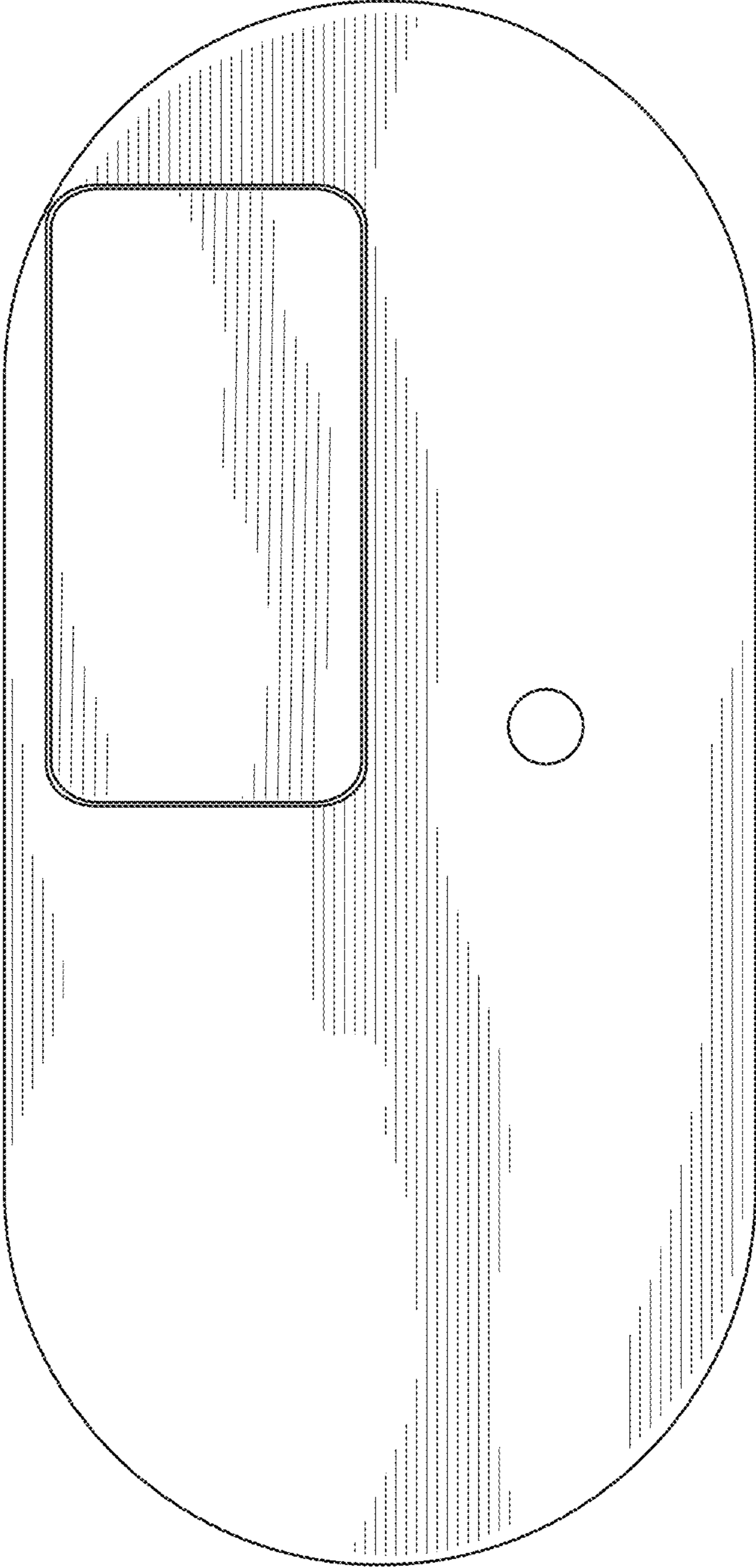


FIG. 4

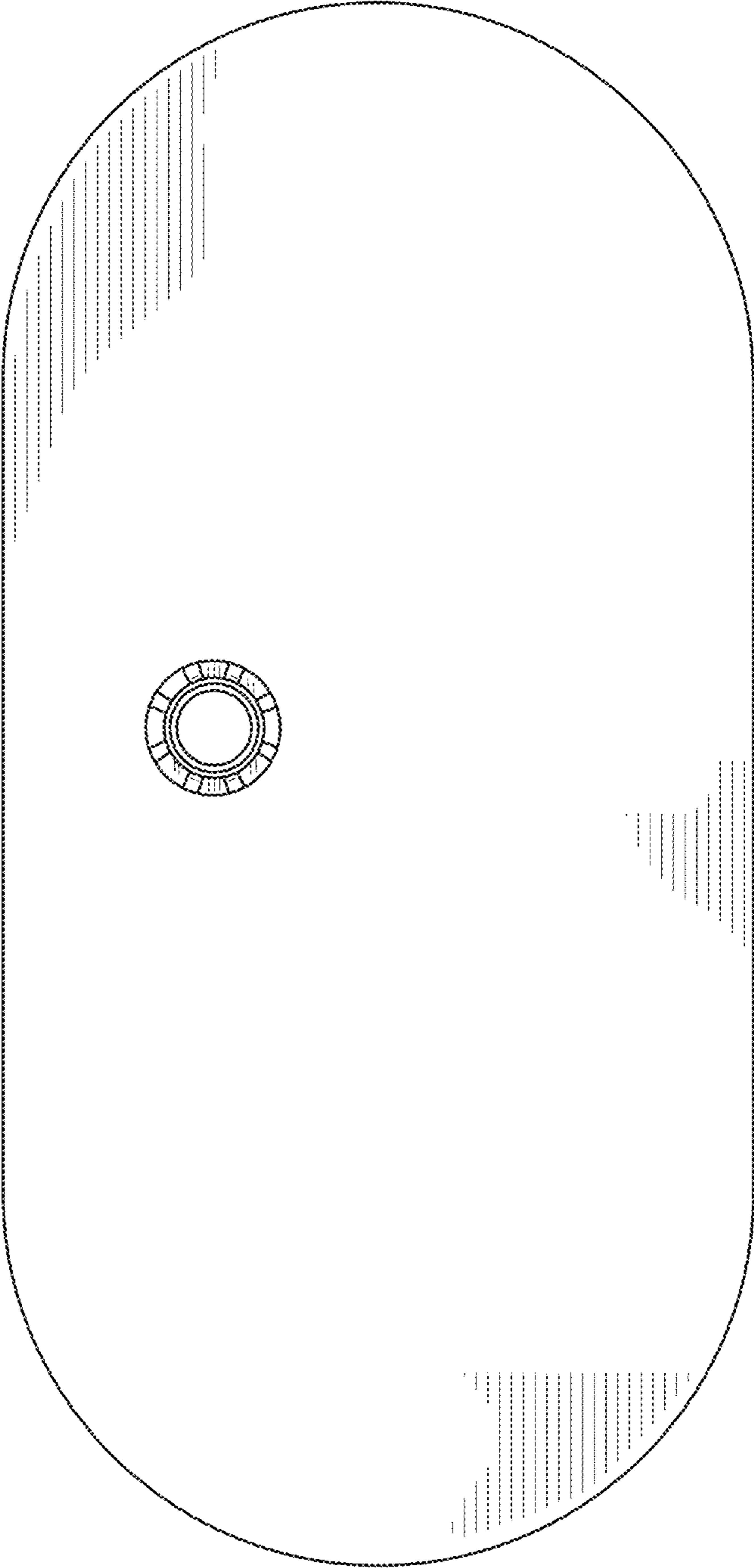


FIG. 5

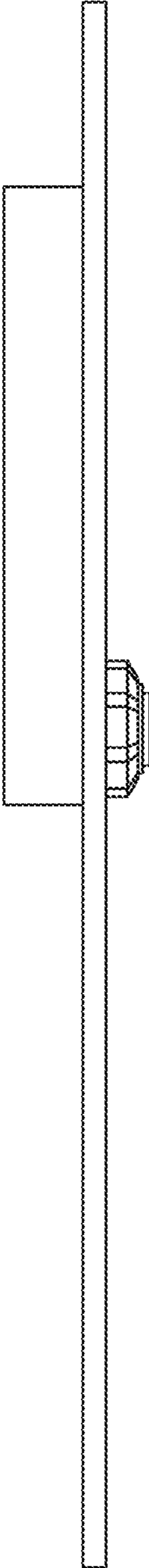


FIG. 6