



US00D926133S

(12) **United States Design Patent** (10) **Patent No.:** **US D926,133 S**
Schneider et al. (45) **Date of Patent:** **** Jul. 27, 2021**

(54) **TURBINE RUNNER**

FOREIGN PATENT DOCUMENTS

(71) Applicant: **Natel Energy, Inc.**, Alameda, CA (US)

EP 2295808 B1 3/2011
EP 2861863 B1 4/2015
EP 2861864 B1 4/2015

(72) Inventors: **Abraham D. Schneider**, San Francisco, CA (US); **Sterling Marina Watson**, San Francisco, CA (US)

OTHER PUBLICATIONS

(73) Assignee: **Natel Energy, Inc.**, Alameda, CA (US)

“Blansko Company Brochure,” ČKD Blansko Small Hydro, s.r.o., http://www.greentechsolution.co.th/PDF/CKD%20SH_Company%20Brochure_11-2013.pdf, dated 2013.

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

(Continued)

(21) Appl. No.: **29/727,935**

Primary Examiner — Derrick E Holland

(22) Filed: **Mar. 13, 2020**

(74) *Attorney, Agent, or Firm* — Sterne, Kessler, Goldstein & Fox P.L.L.C.

(51) **LOC (13) Cl.** **13-01**

(52) **U.S. Cl.**

(57) **CLAIM**

USPC **D13/115**

The ornamental design for a turbine runner, as shown and described.

(58) **Field of Classification Search**

DESCRIPTION

USPC D13/115, 101, 199; D15/1, 5, 199; D12/214; D21/458; D23/379, 413
CPC F03D 1/06; F03D 1/0608; F03D 1/0625; F03D 1/0633; F03D 1/0641; F03D 3/02; F03D 3/005; F03D 3/061; F03D 3/0409; F03D 7/0224; F03D 7/04; F03D 7/06; Y02E 10/20; Y02E 10/223; F03B 3/02; F03B 3/121; F03B 3/125; F05B 2240/30; F05B 2240/242; F05B 2220/32; F01D 5/141

See application file for complete search history.

FIG. 1 is a top perspective view of a first embodiment of a turbine runner showing the new design;
FIG. 2 is a bottom perspective view thereof;
FIG. 3 is a top view thereof;
FIG. 4 is a bottom view thereof;
FIG. 5 is a left side view thereof;
FIG. 6 is a right side view thereof;
FIG. 7 is a rear view thereof;
FIG. 8 is a front view thereof;
FIG. 9 is a top perspective view of a second embodiment of a turbine runner showing the new design;
FIG. 10 is a bottom perspective view thereof;
FIG. 11 is a top view thereof;
FIG. 12 is a bottom view thereof;
FIG. 13 is a left side view thereof;
FIG. 14 is a right side view thereof;
FIG. 15 is a rear view thereof; and,
FIG. 16 is a front view thereof.

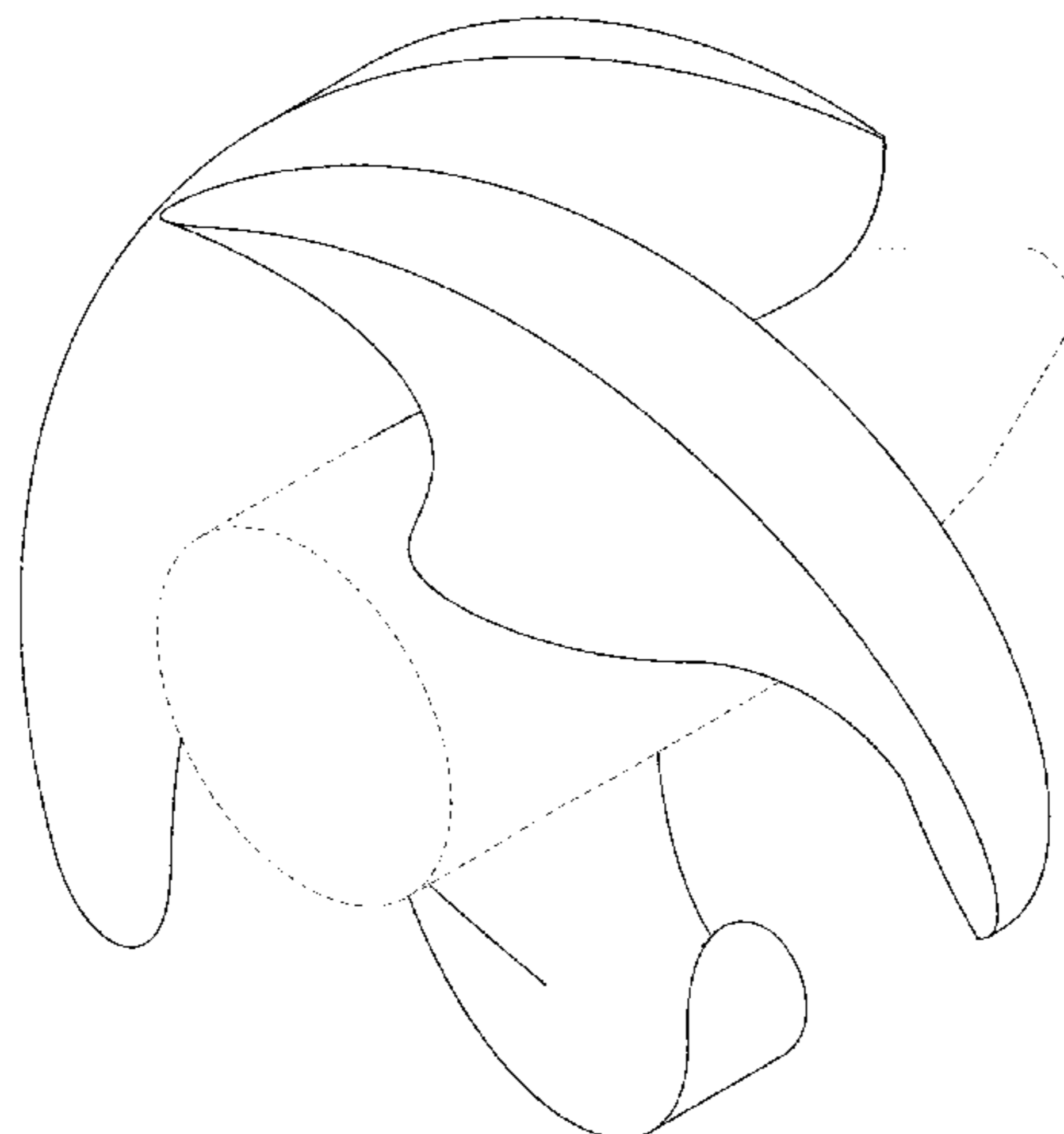
(56) **References Cited**

U.S. PATENT DOCUMENTS

1,607,773 A 11/1926 Moody
5,158,433 A * 10/1992 Cleary B63H 21/38
29/889.6
5,947,679 A 9/1999 Cybularz et al.
5,954,474 A 9/1999 Fisher et al.
5,997,242 A 12/1999 Hecker et al.

(Continued)

(Continued)



The broken lines in the figures show portions of the turbine runner that form no part of the claimed design.

1 Claim, 16 Drawing Sheets

(56)

References Cited

U.S. PATENT DOCUMENTS

| | | | | |
|--------------|------|---------|---|-------------------------|
| 6,007,297 | A | 12/1999 | Buchelt | |
| D610,542 | S * | 2/2010 | Raisanen | D13/115 |
| 7,972,108 | B2 | 7/2011 | Fonkenell | |
| D654,433 | S * | 2/2012 | Huang | D13/115 |
| D678,837 | S * | 3/2013 | Ruiz de Gordejuela Diaz de Tuesta | D13/115 |
| 8,426,990 | B2 | 4/2013 | Oswald et al. | |
| D722,965 | S * | 2/2015 | Perless | D13/115 |
| D805,474 | S * | 12/2017 | Bills | D13/115 |
| D842,211 | S * | 3/2019 | Xiao | D12/214 |
| 10,260,479 | B2 * | 4/2019 | Bills | F03D 3/061 |
| 2009/0257866 | A1 * | 10/2009 | Greim | F01D 5/141 415/208.1 |

| | | | | |
|--------------|------|---------|-------------------|-------------|
| 2014/0294590 | A1 | 10/2014 | Marier et al. | |
| 2017/0067486 | A1 * | 3/2017 | Cho | F04D 29/023 |
| 2018/0372059 | A1 | 12/2018 | Slachmuylders | |
| 2019/0170113 | A1 * | 6/2019 | Higinbotham | F03D 1/0633 |

OTHER PUBLICATIONS

“Gallery—Product and installation,” HydroErgia, <http://www.hydroergia.pl/indexEn.php?main=gallery&more=true&category=2>, dated Feb. 6, 2018.

“Global Hydro Production of a Kaplan runner,” Global Hydro Energy, YouTube.com, <https://www.youtube.com/watch?v=T8Gp4mCrz1g>, dated May 6, 2016.

“Weir American Hydro Company Brochure,” American Hydro Corporation, United States (dated 2012).

Abeykoon, C., & Hantsch, T., “Design and Analysis of a Kaplan Turbine Runner Wheel,” In The 3rd World Congress on Mechanical, Chemical, and Material Engineering, pp. 1-16 (dated 2017).

Amaral, S., et al., “Future Application of the Alden Fish-Friendly Hydro Turbine,” Alden Research Laboratory, <http://www.hydro.org/wp-content/uploads/2011/01/Alden-EPRI-and-Voith-Future-App-of-the-Alden-Fish-Friendly-Hydro-Turbine.pdf>, dated 2011.

* cited by examiner

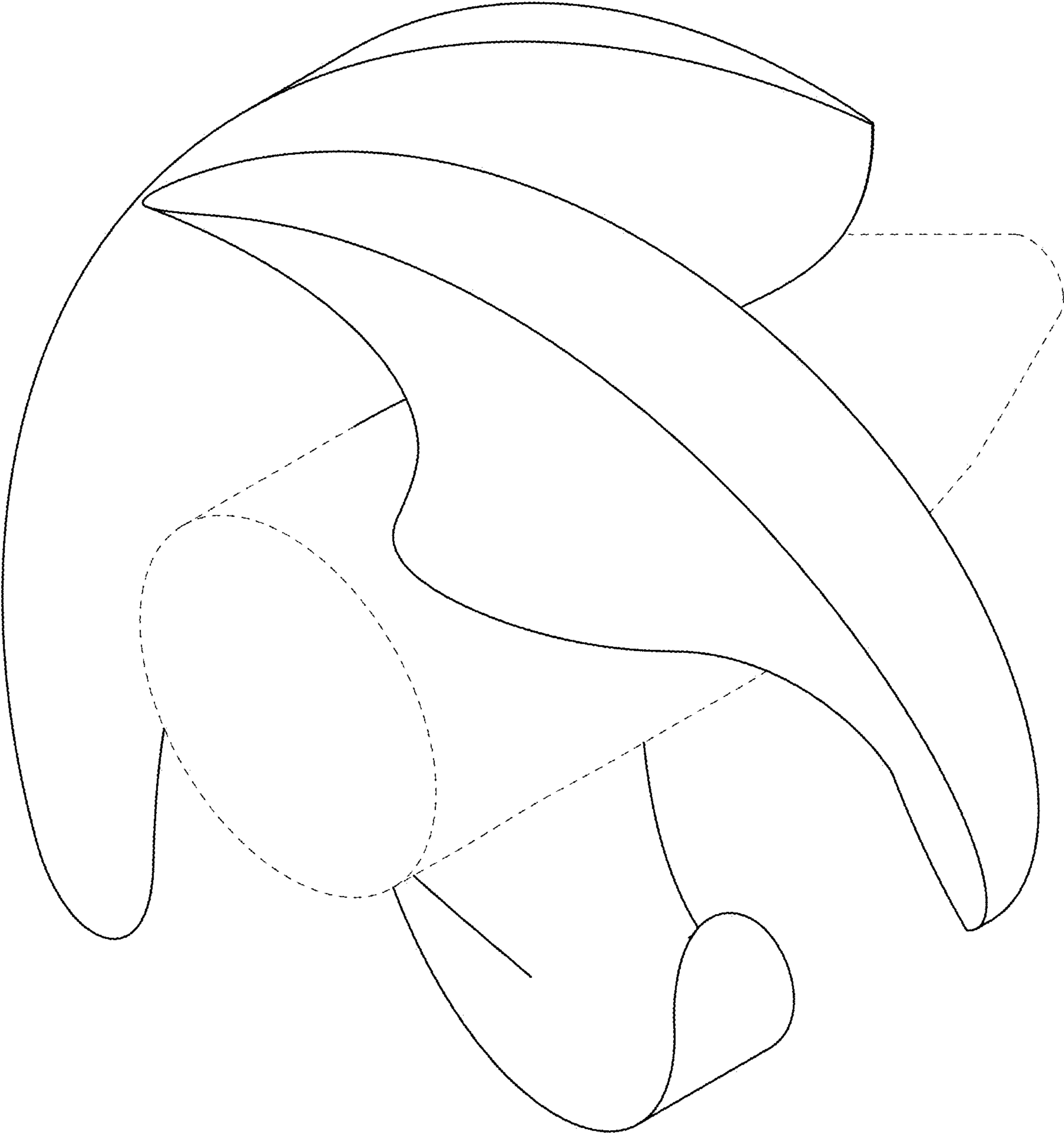


FIG. 1

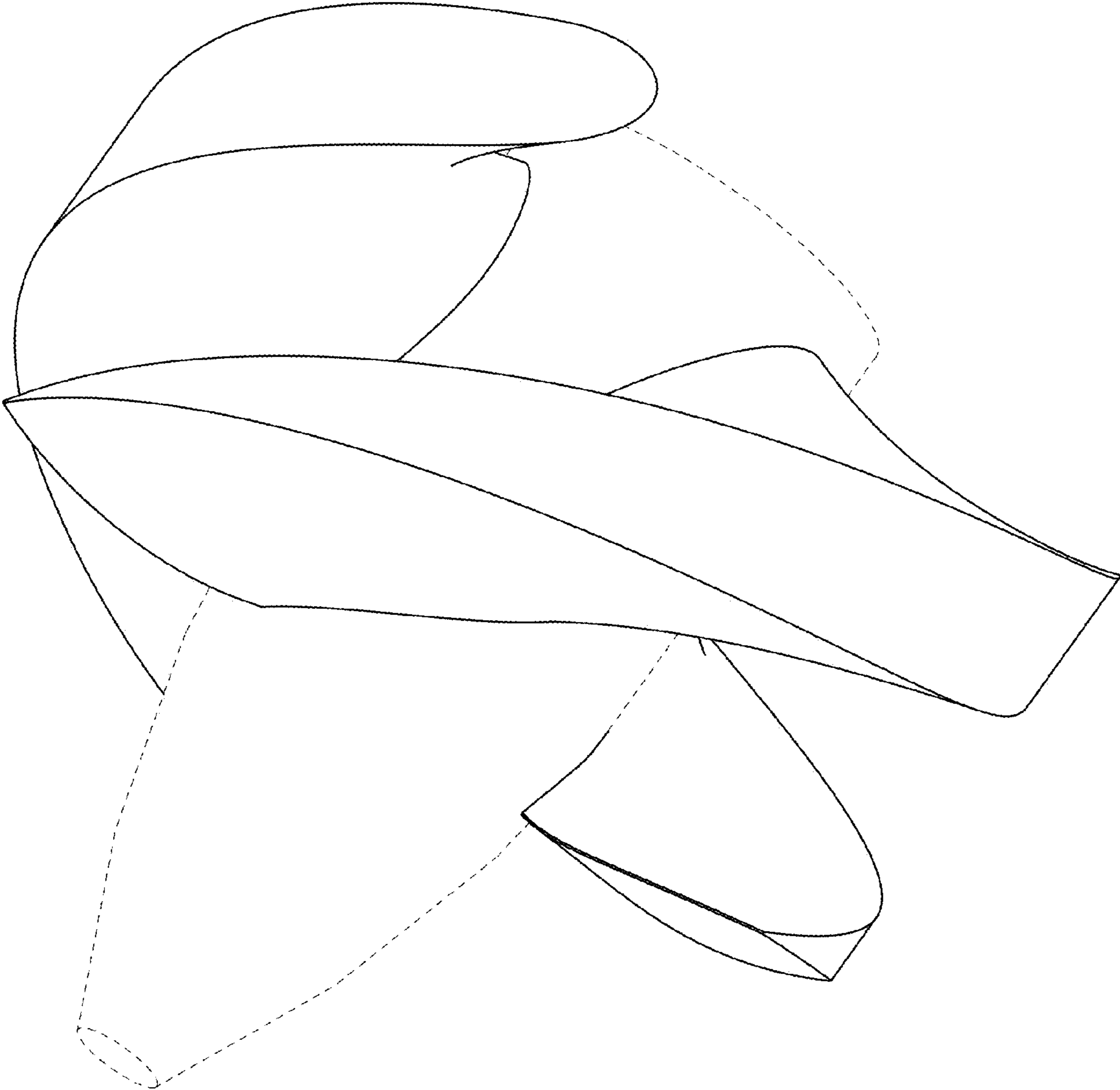


FIG. 2

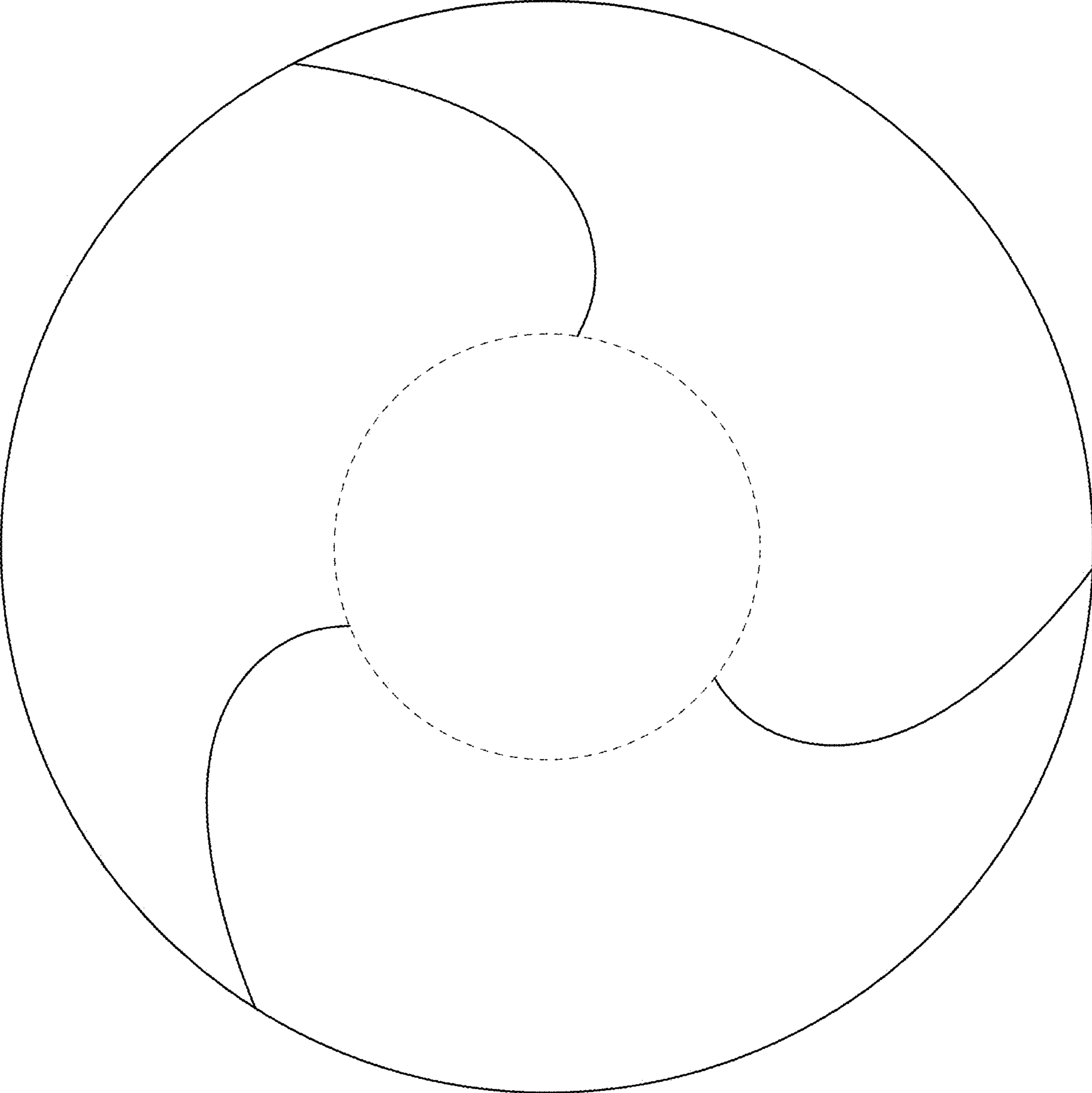


FIG. 3

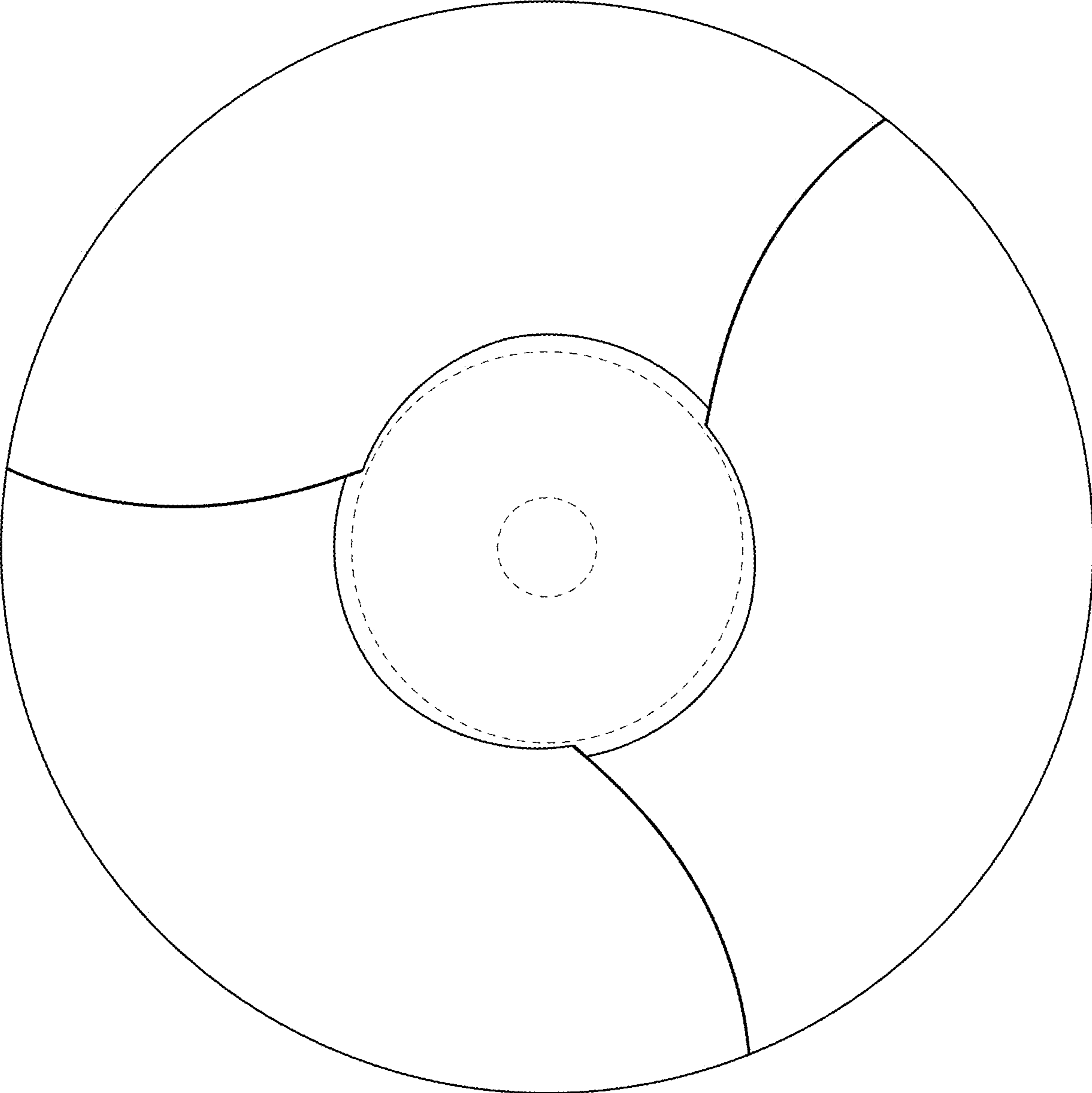


FIG. 4

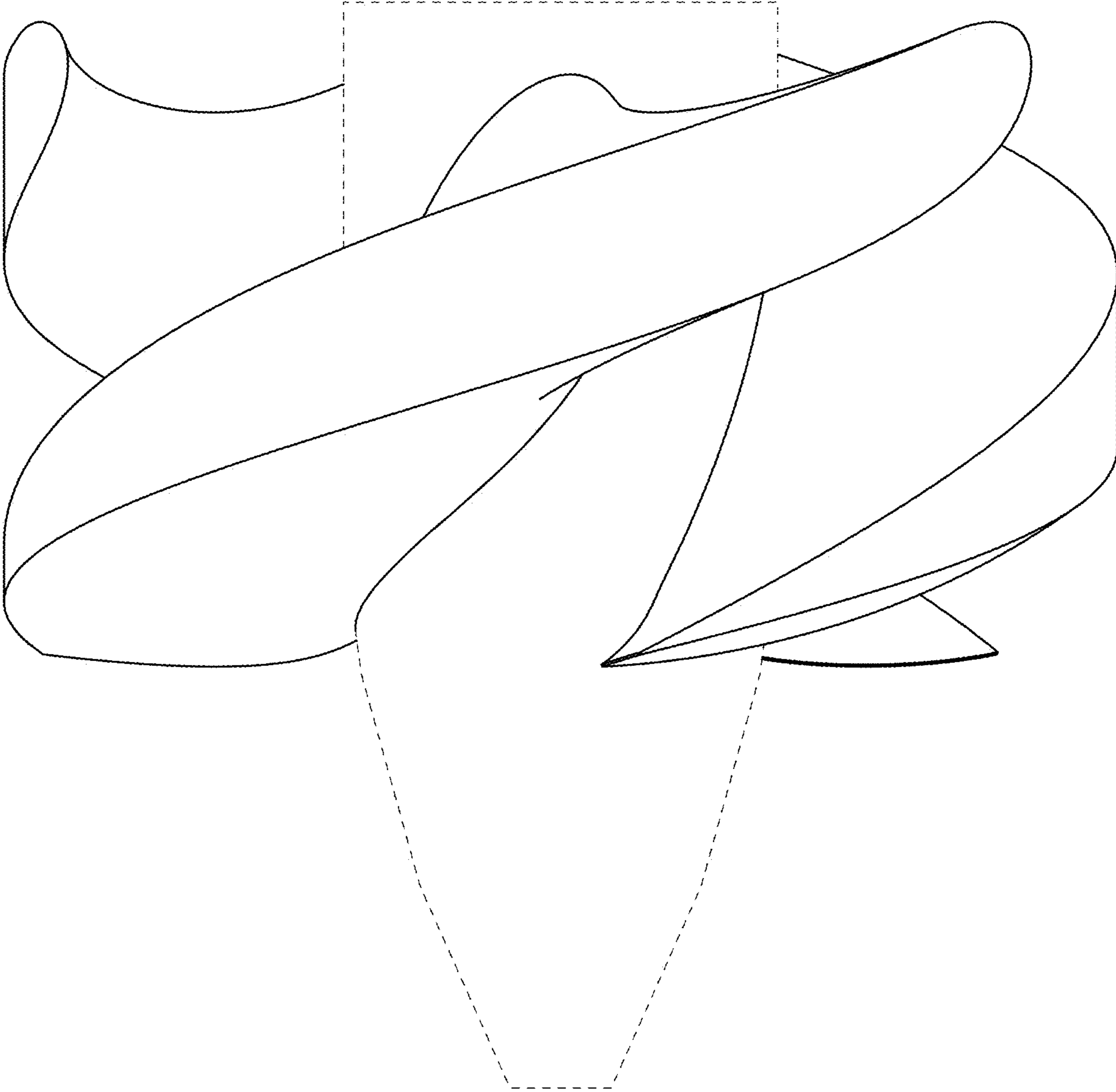


FIG. 5

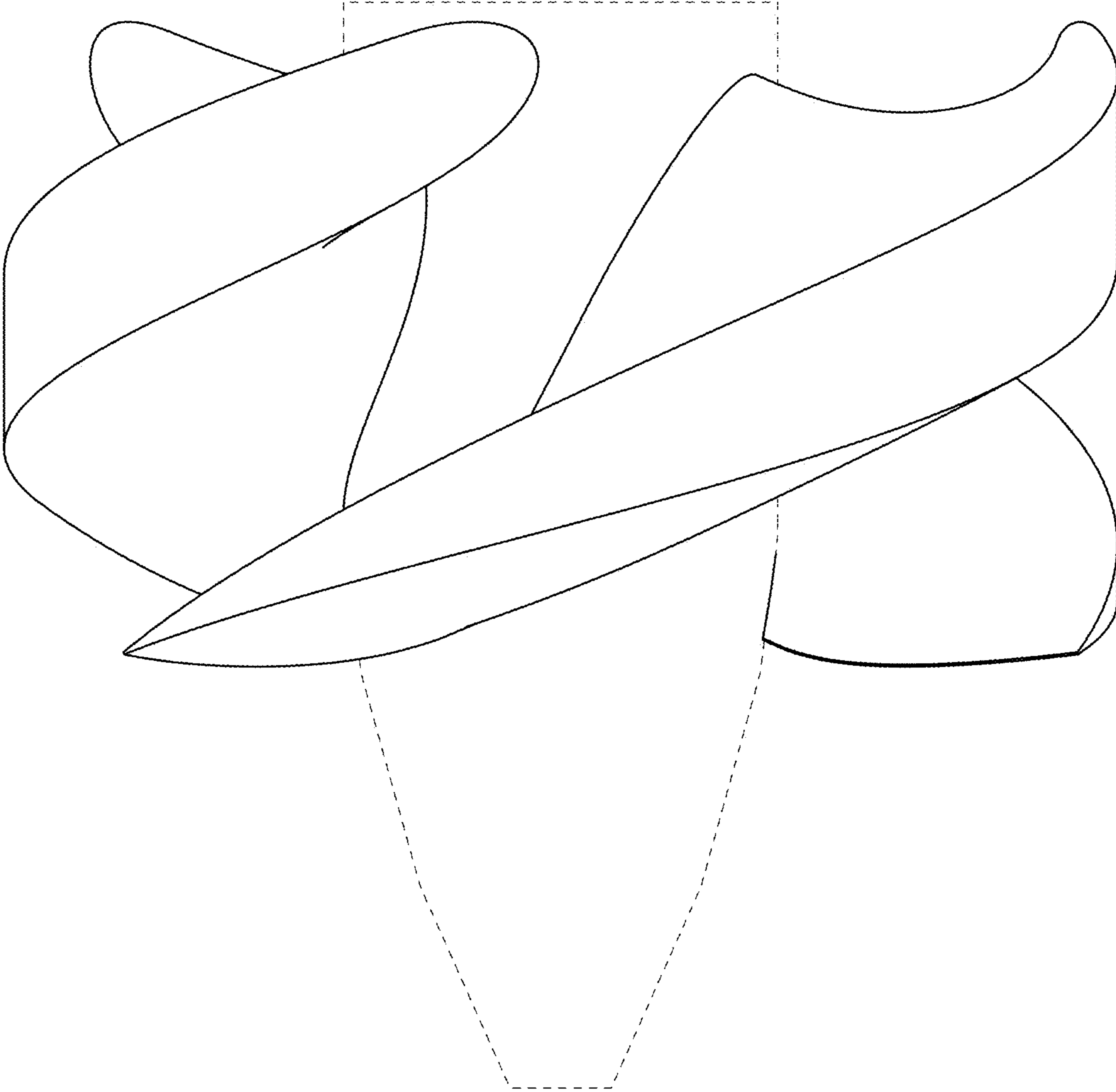


FIG. 6

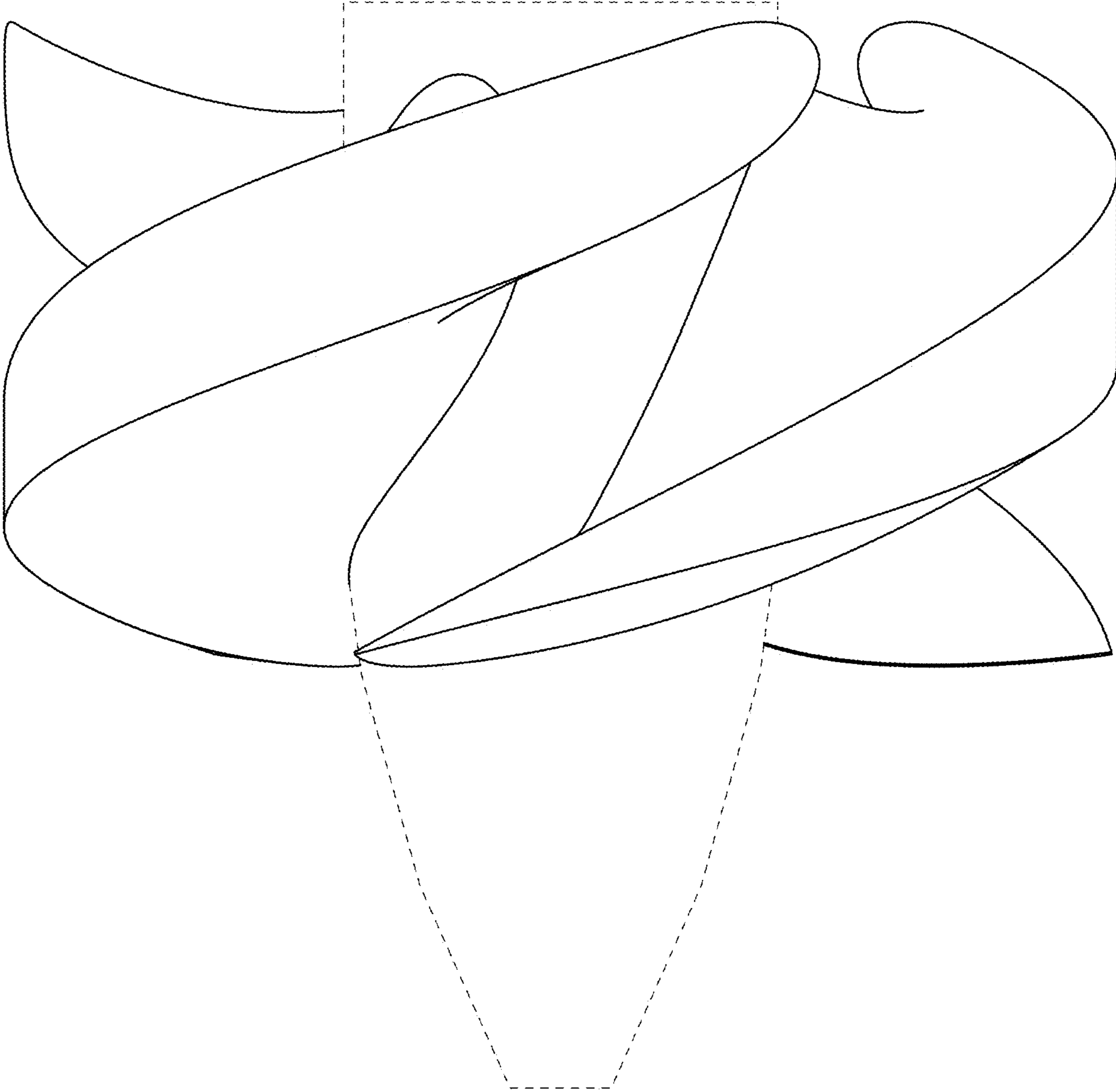


FIG. 7

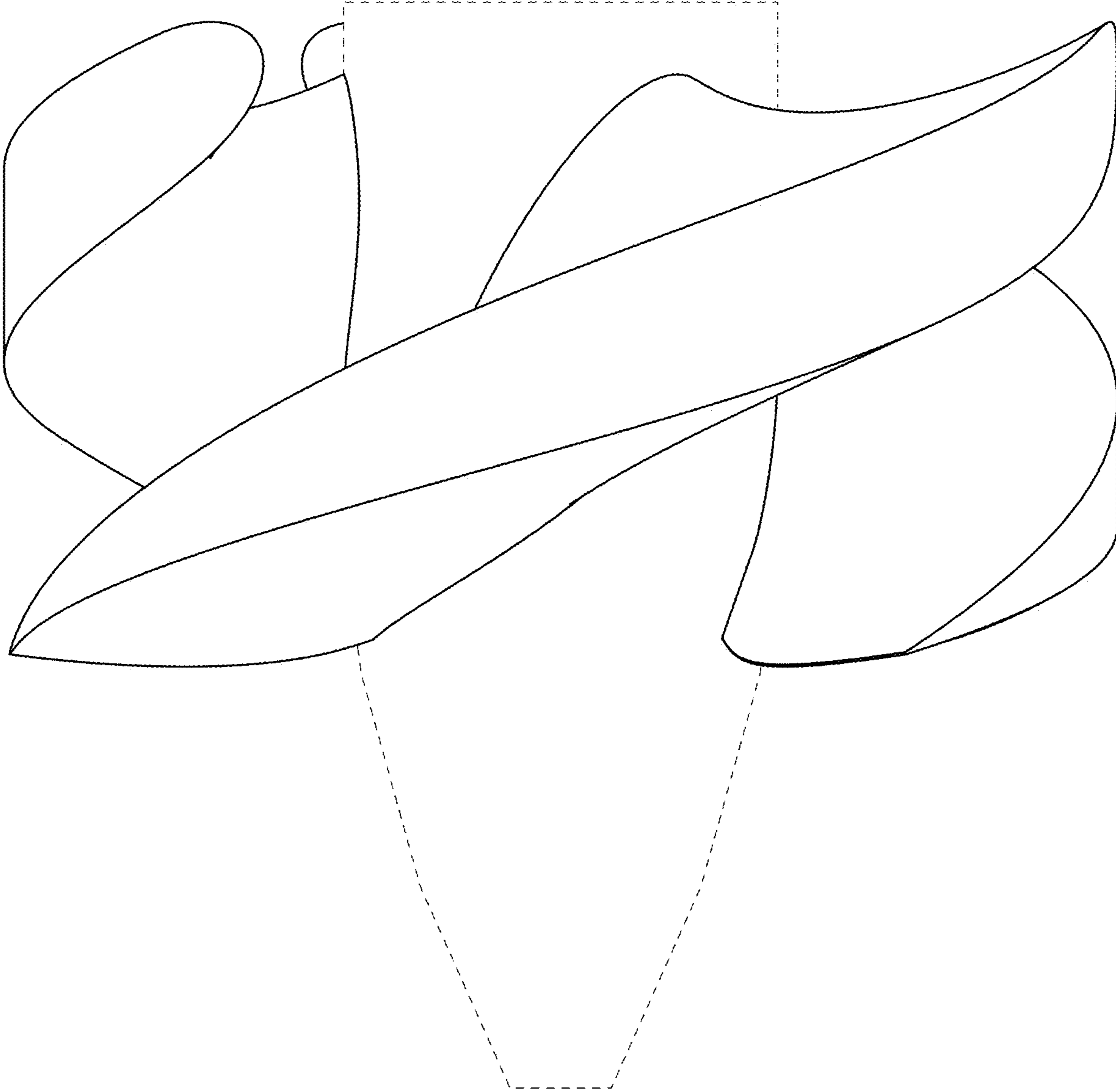


FIG. 8

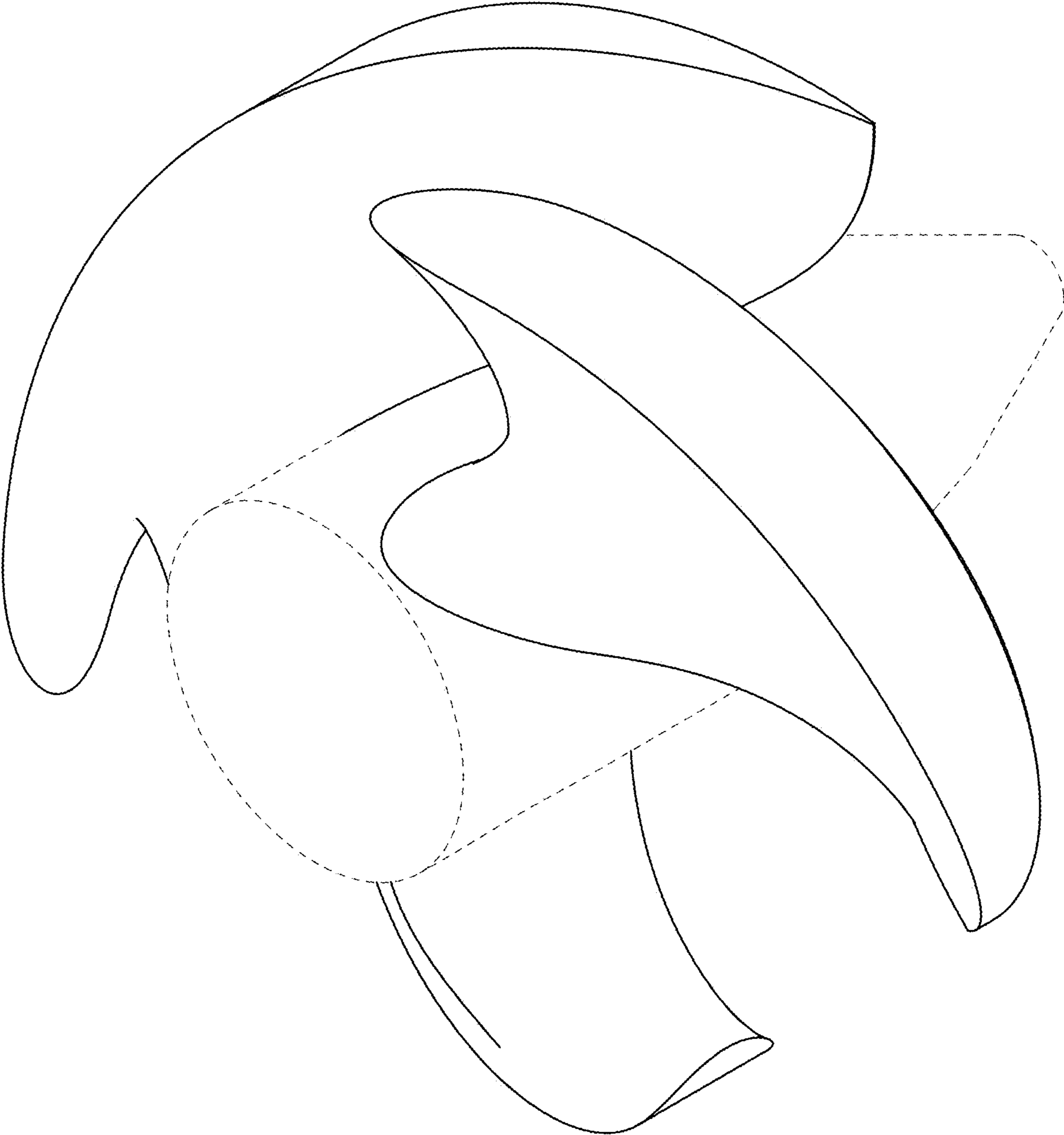


FIG. 9

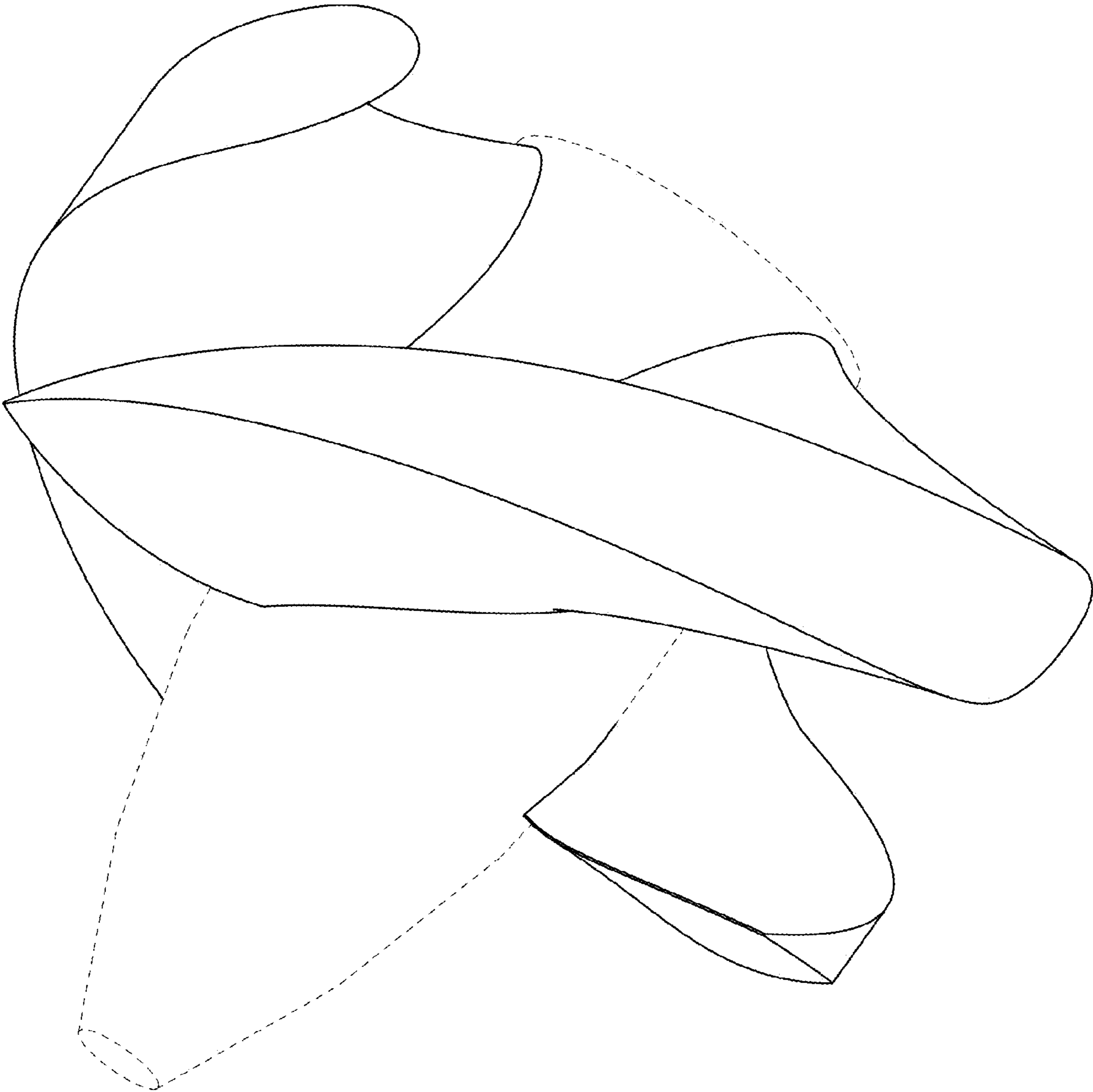


FIG. 10

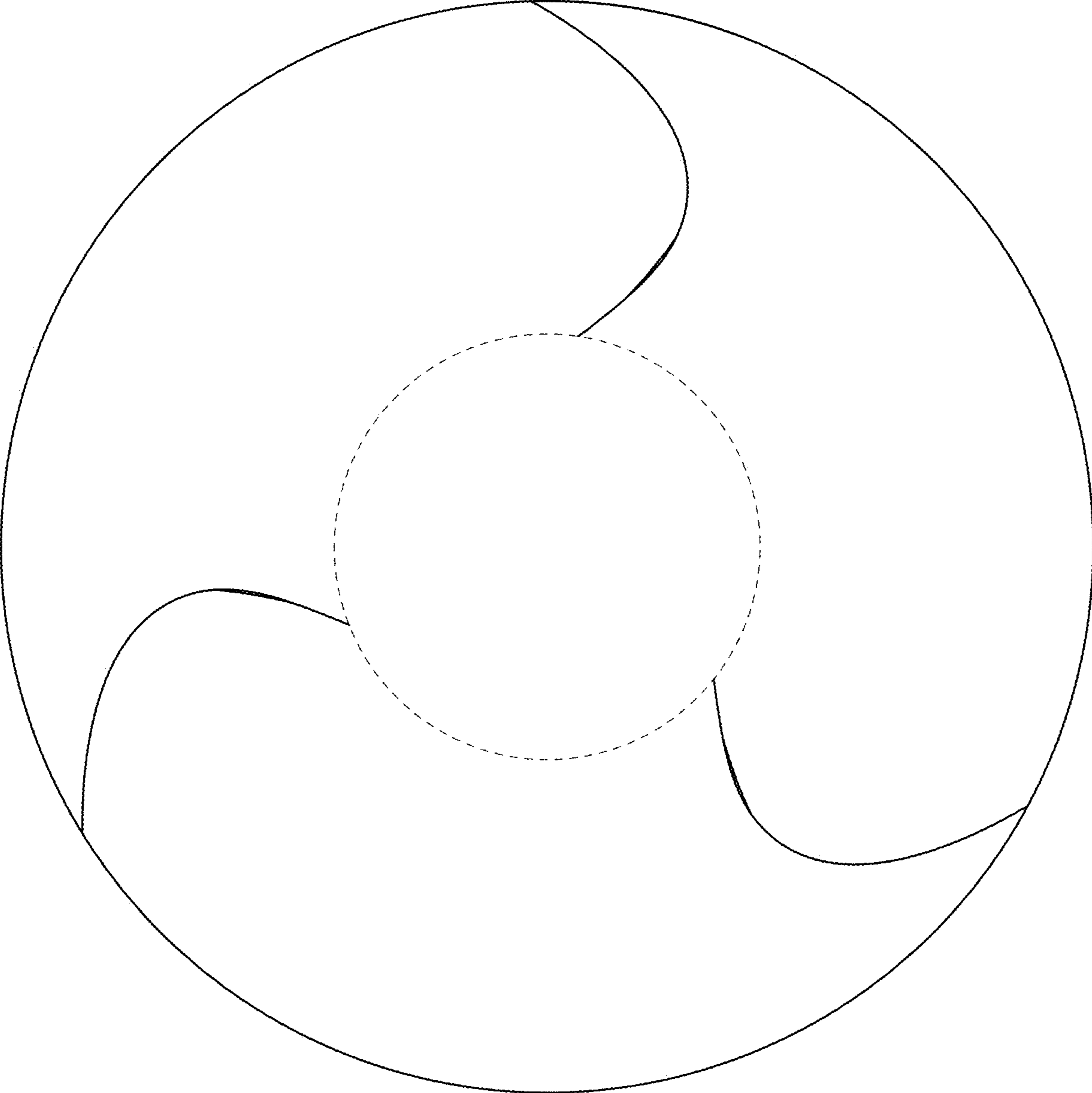


FIG. 11

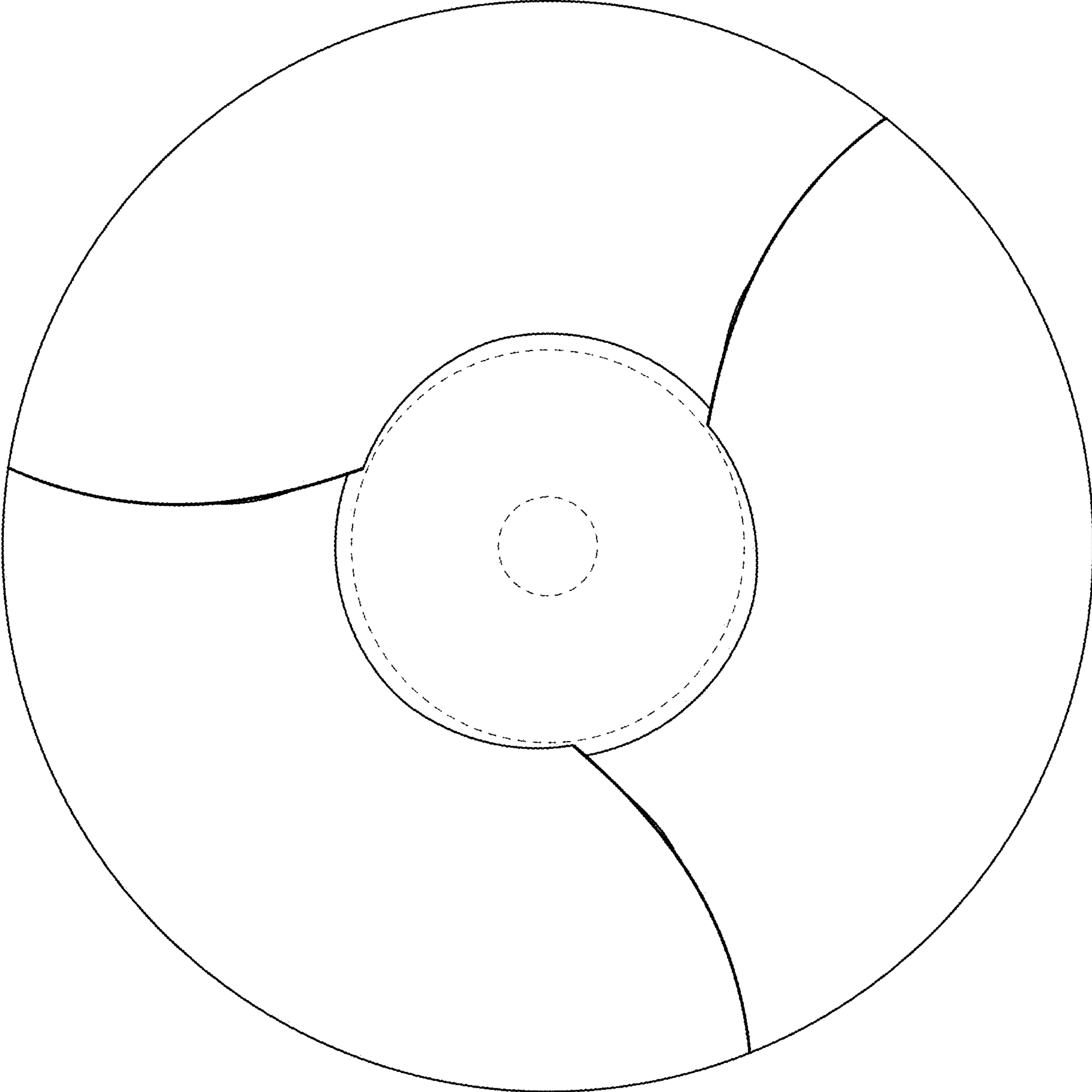


FIG. 12

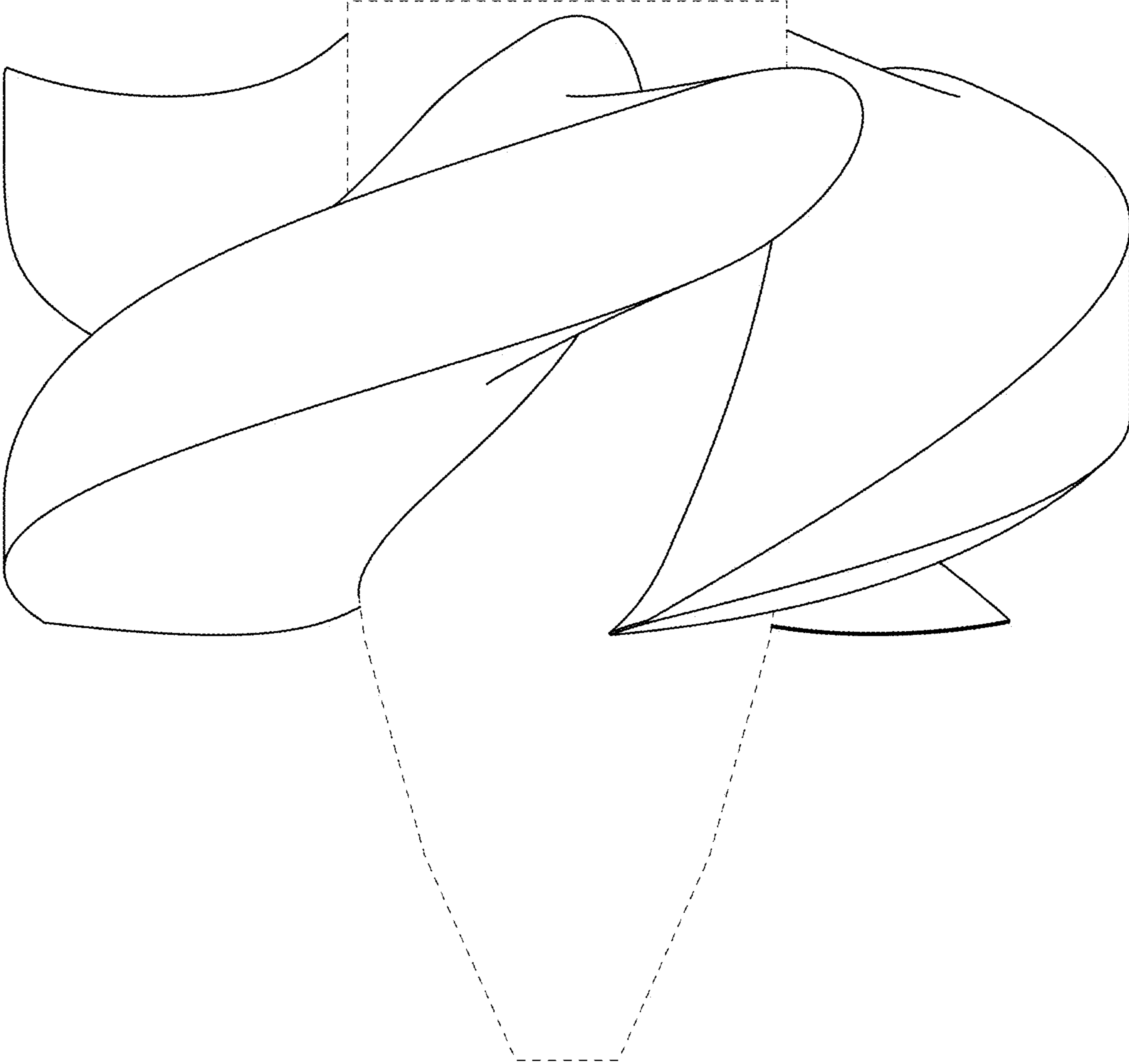


FIG. 13

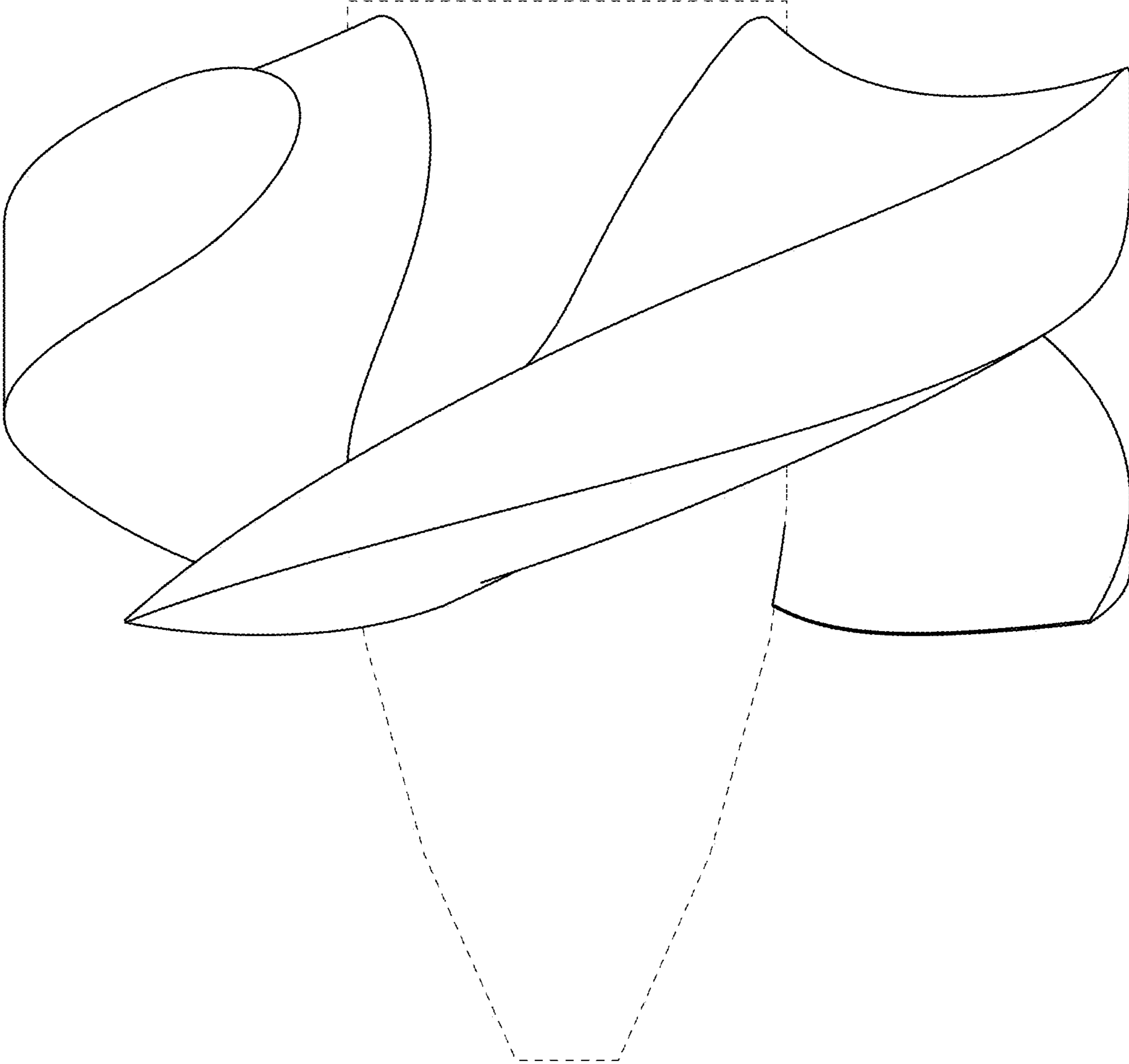


FIG. 14

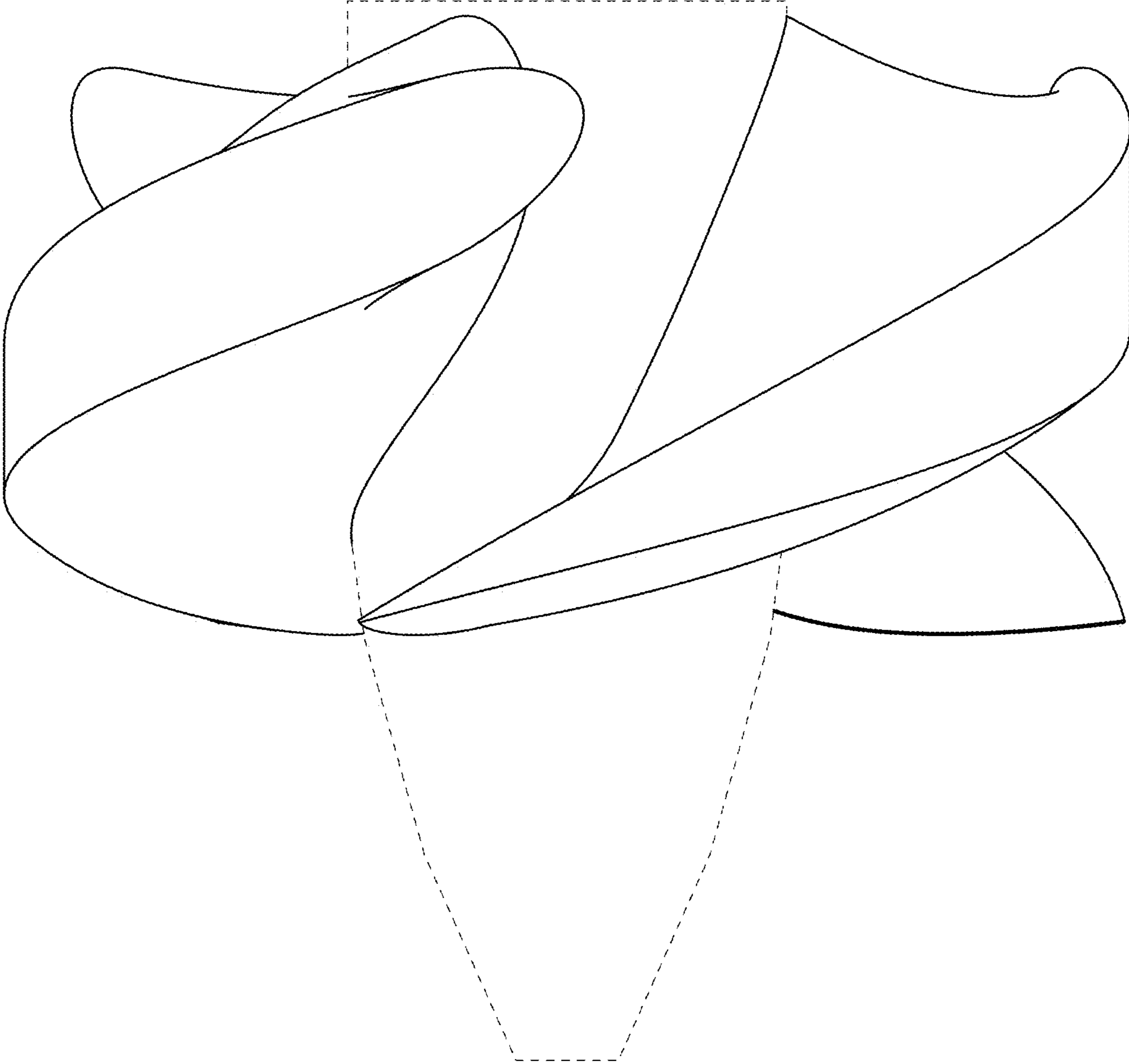


FIG. 15

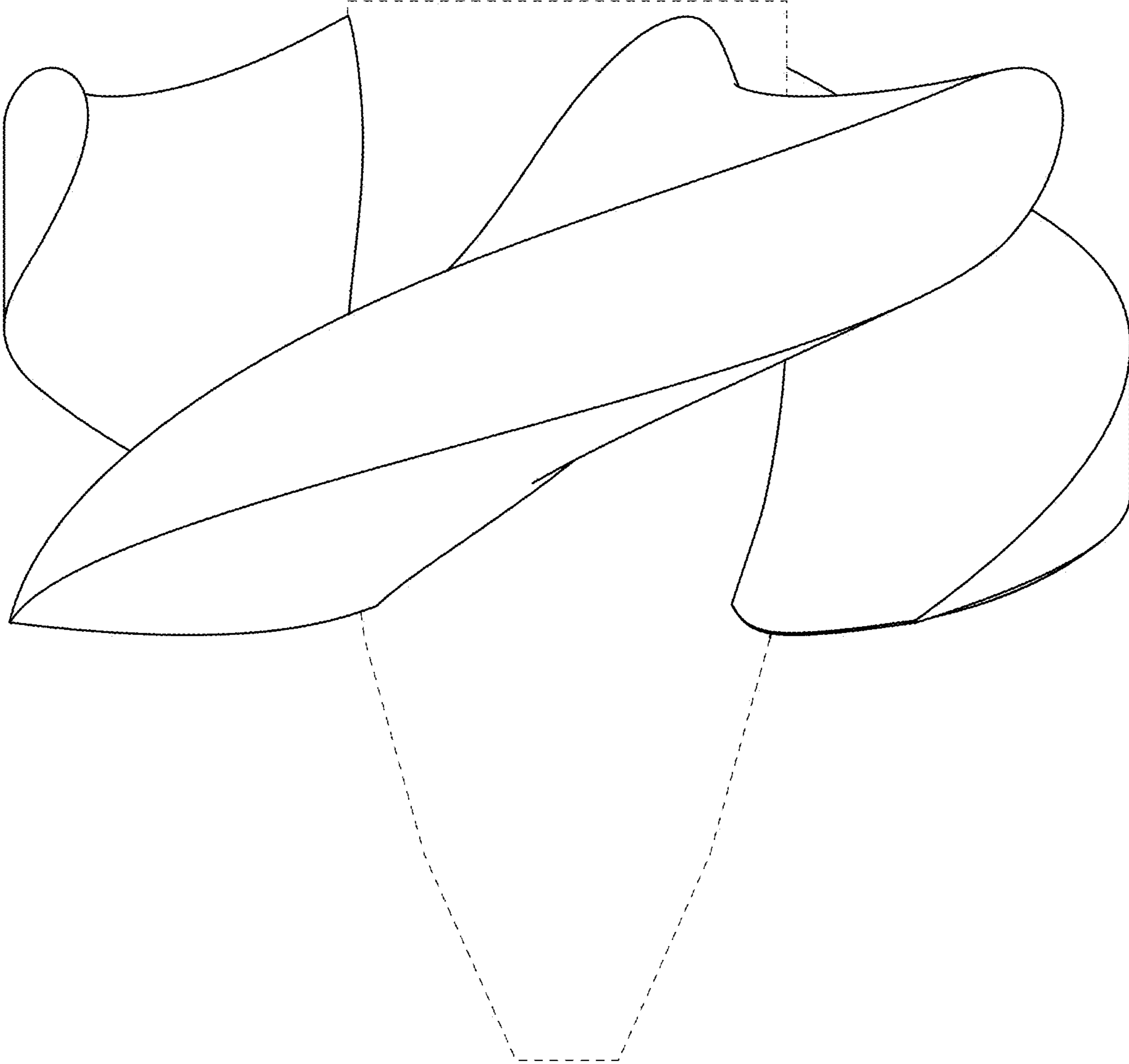


FIG. 16