



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

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

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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](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**

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.

**DESCRIPTION**

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.

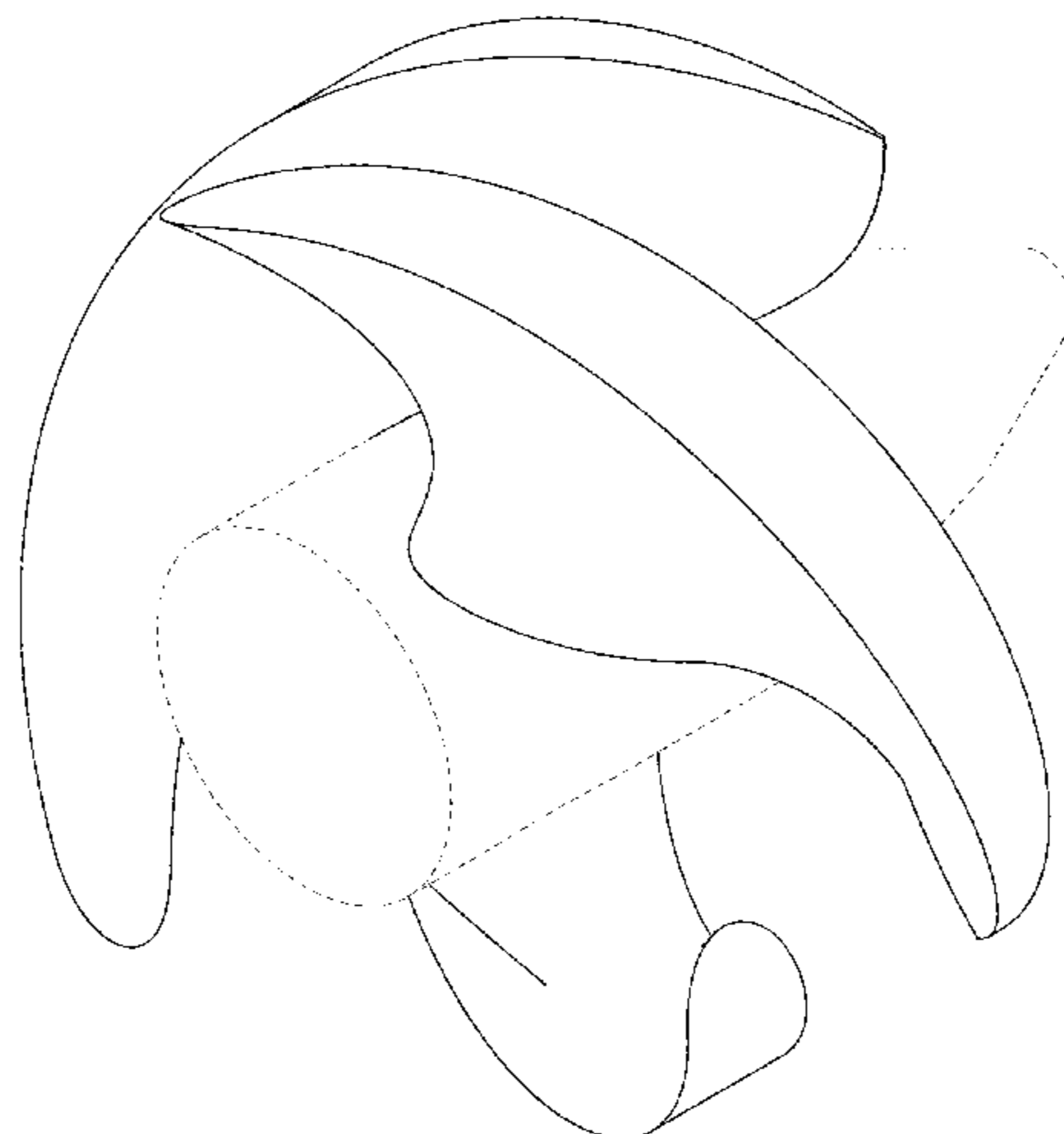
(56) **References Cited**

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)

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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.

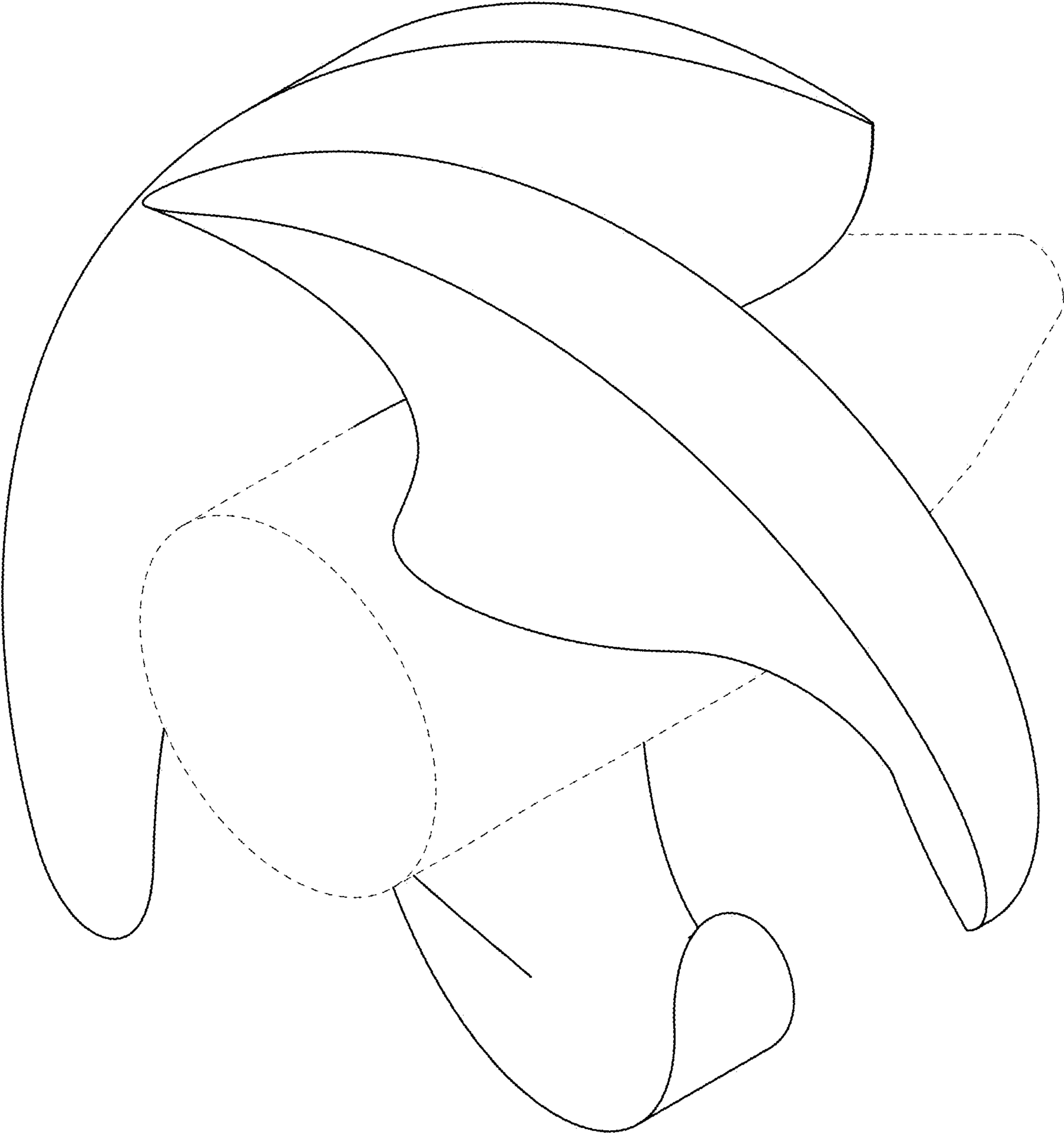
“Global Hydro Production of a Kaplan runner,” Global Hydro Energy, YouTube.com, <https://www.youtube.com/watch?v=T8Gp4mCrz1g>, dated May 6, 2016.

“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**

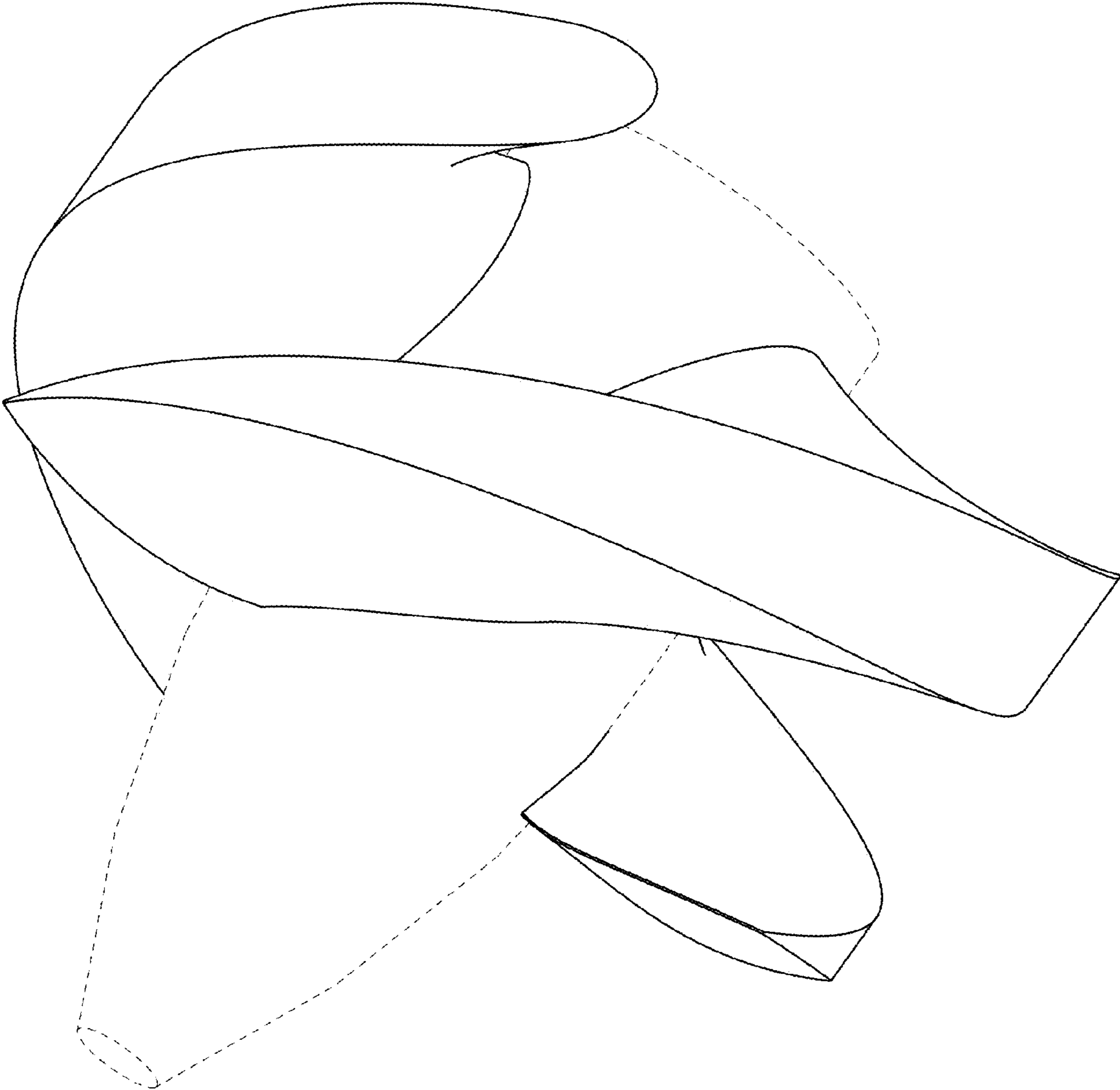
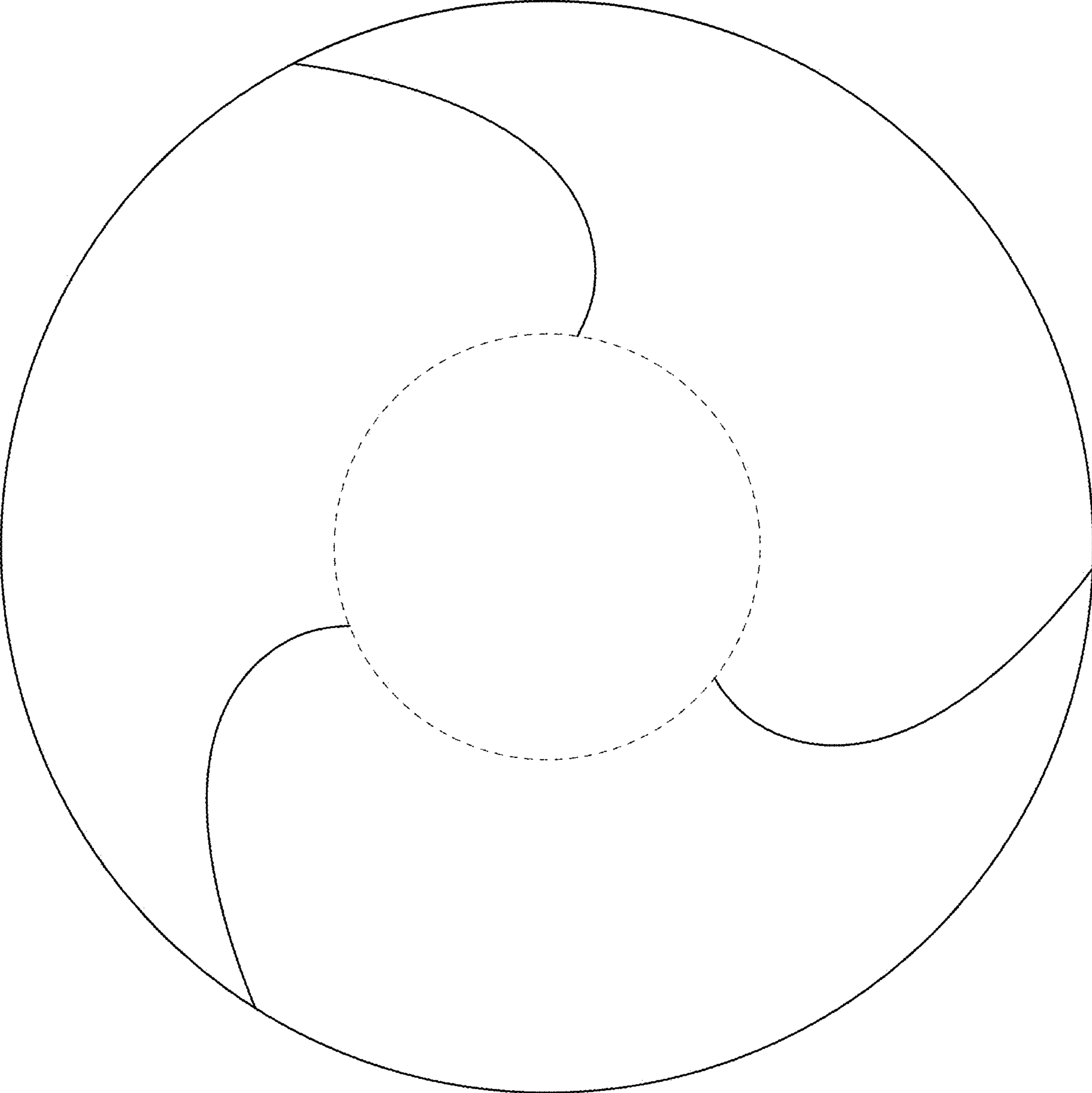


FIG. 2



**FIG. 3**

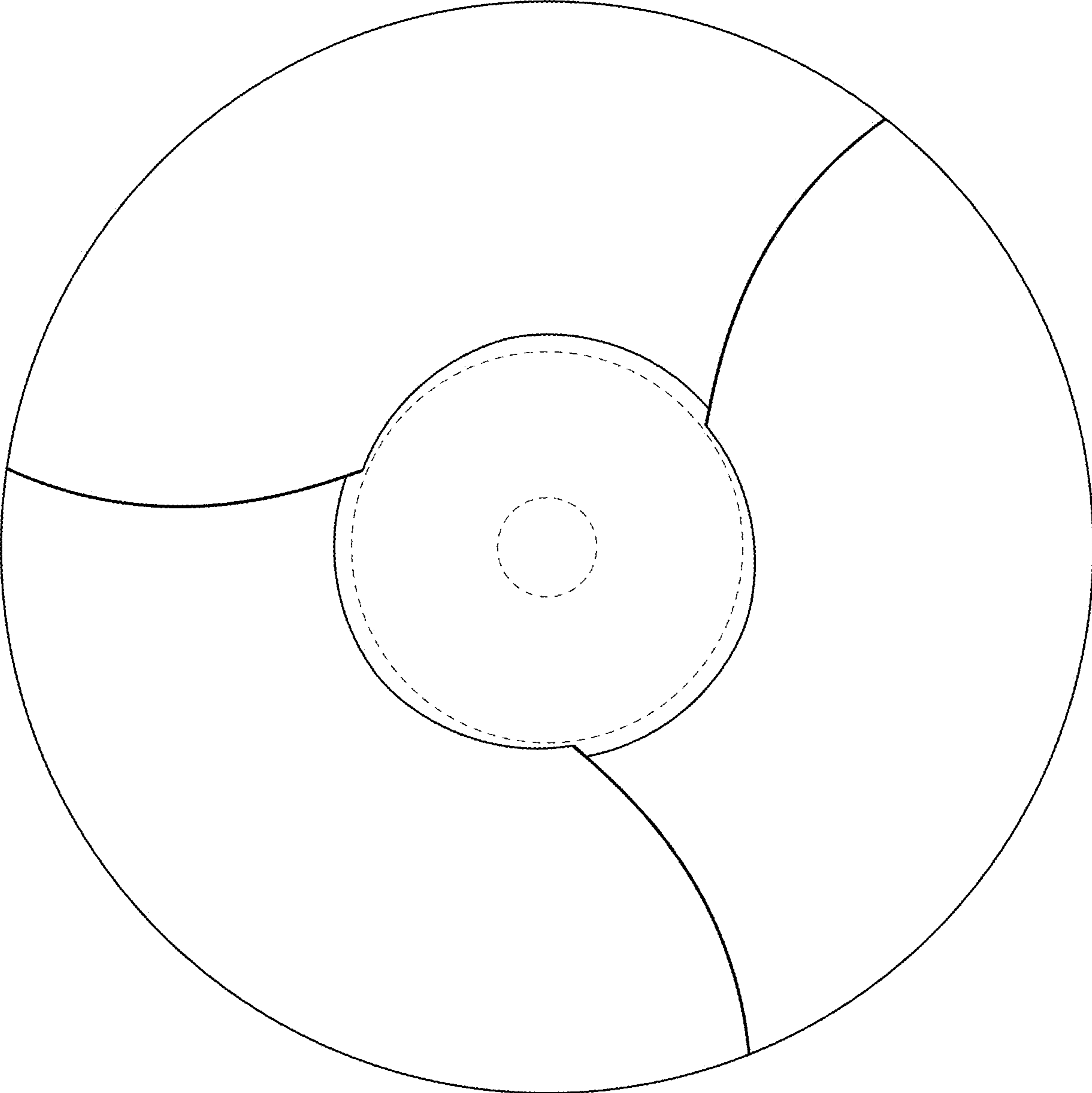
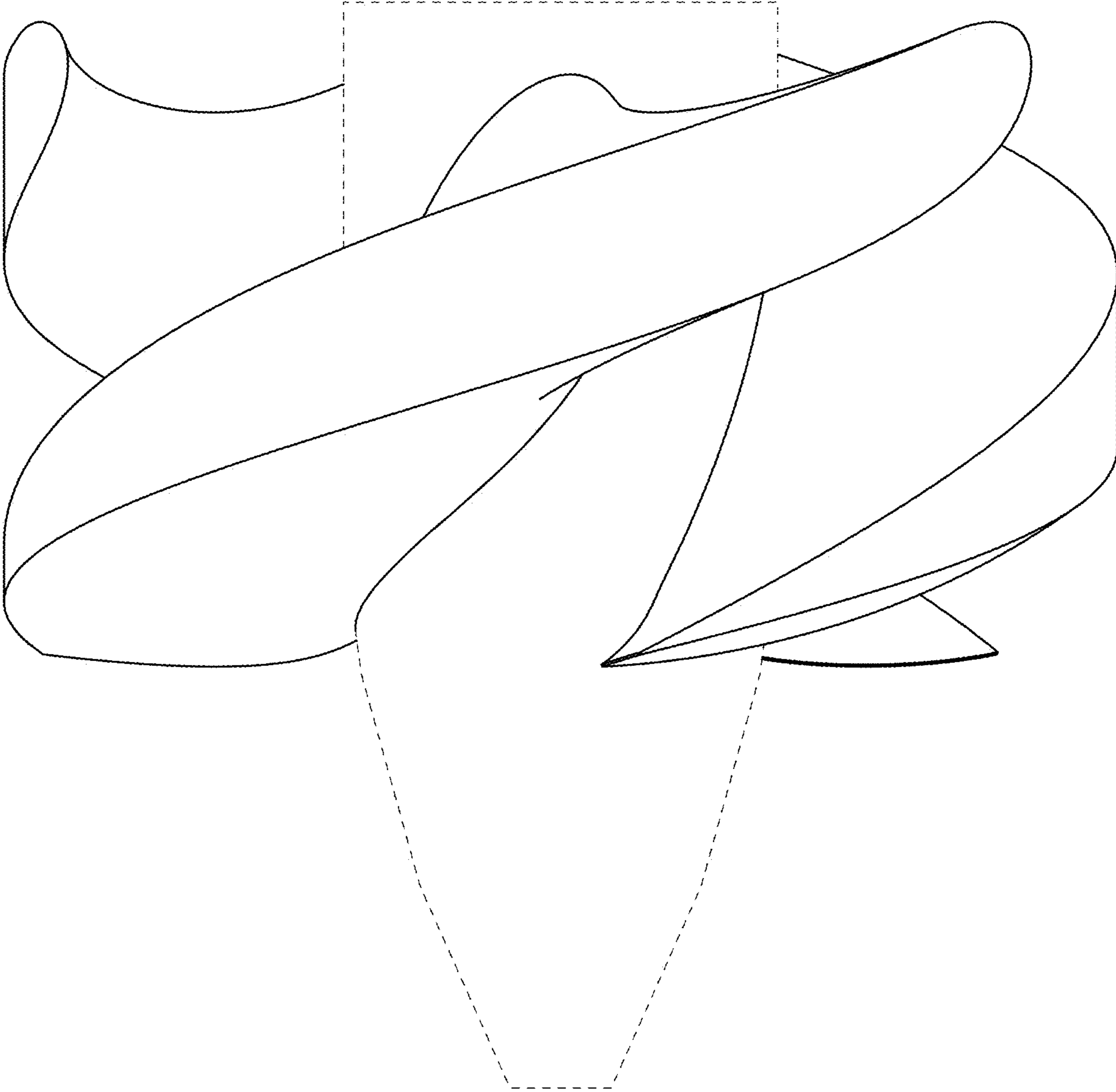
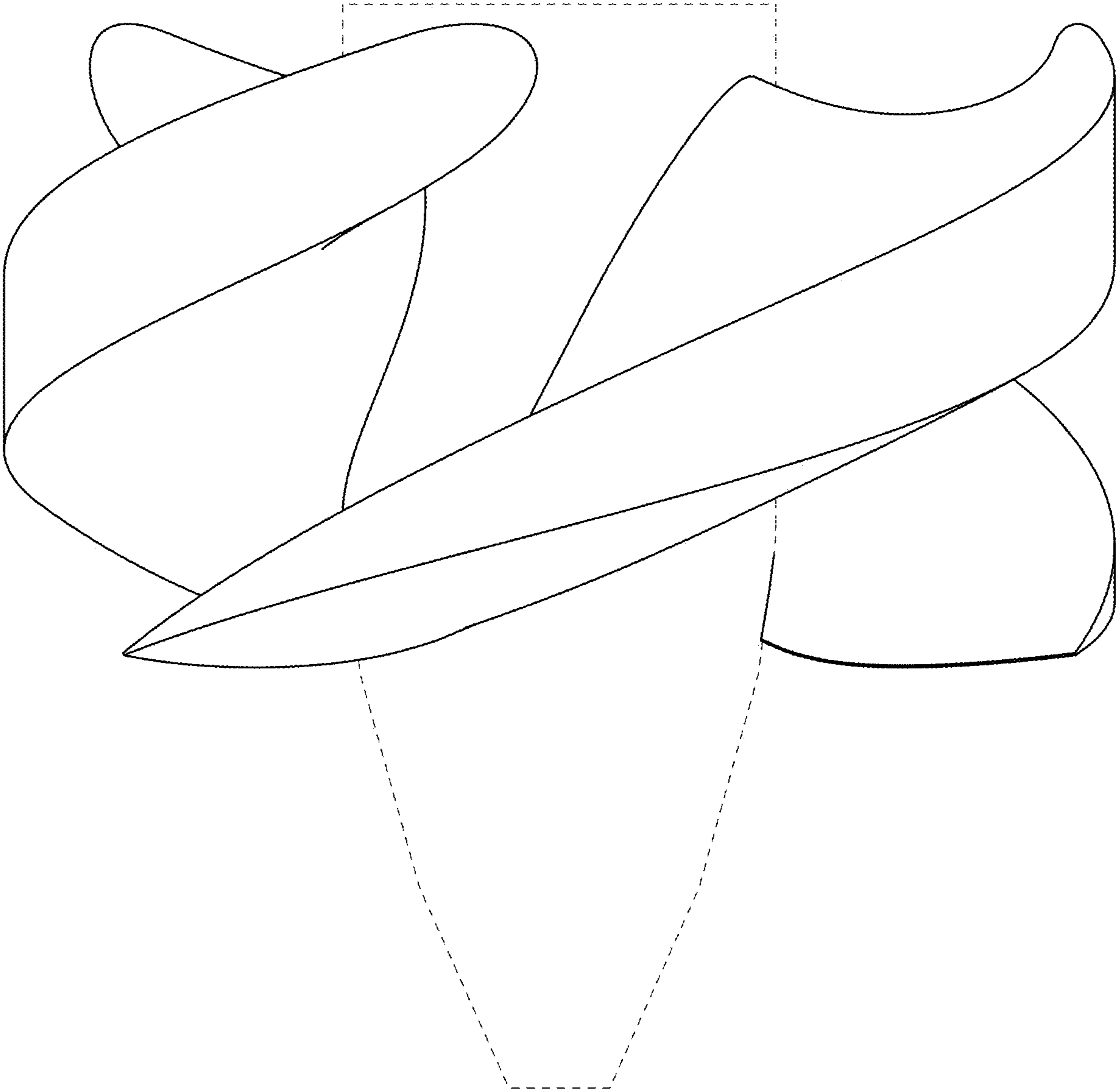


FIG. 4

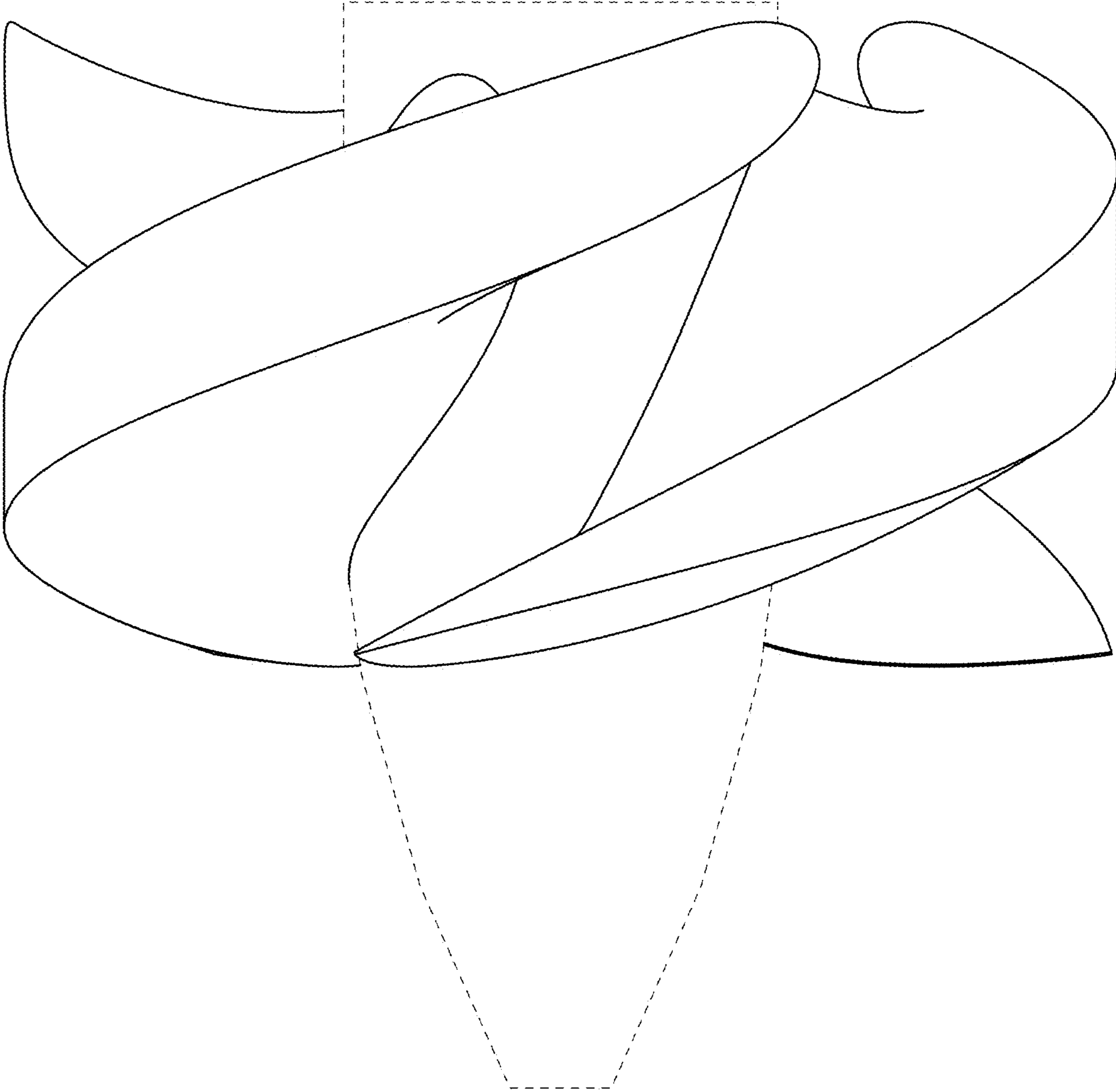


**FIG. 5**

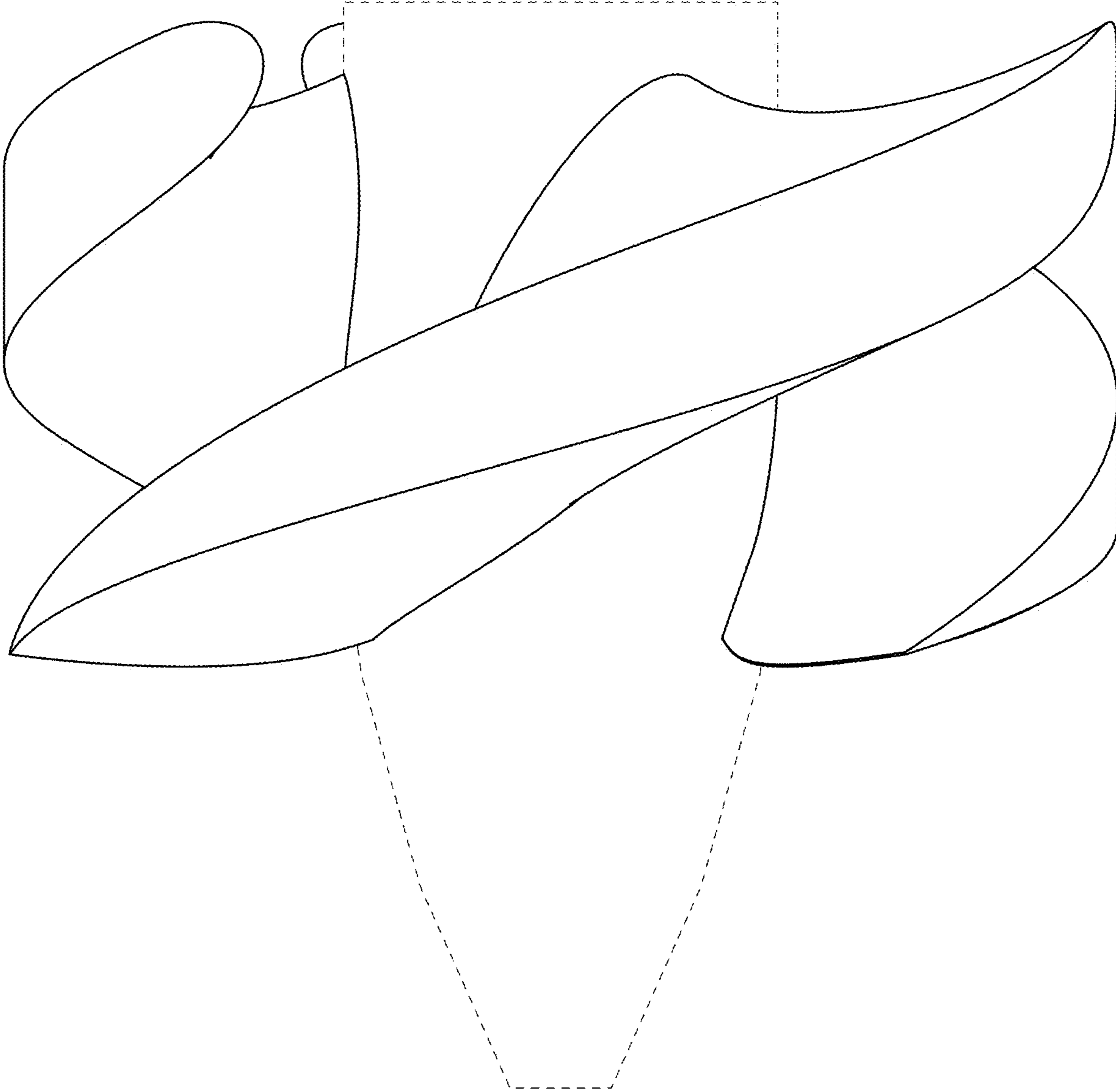


**FIG. 6**

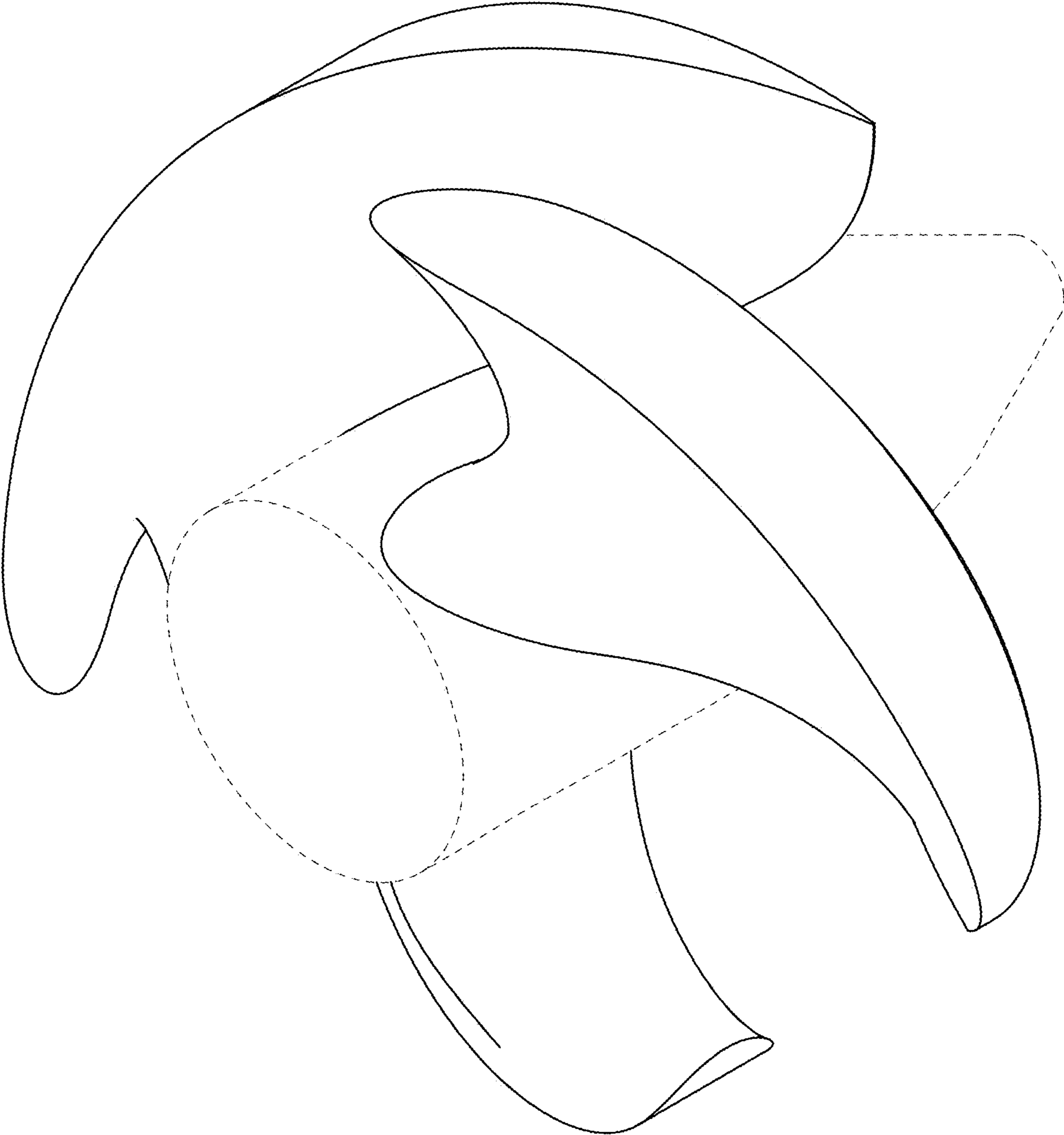




**FIG. 7**



**FIG. 8**



**FIG. 9**

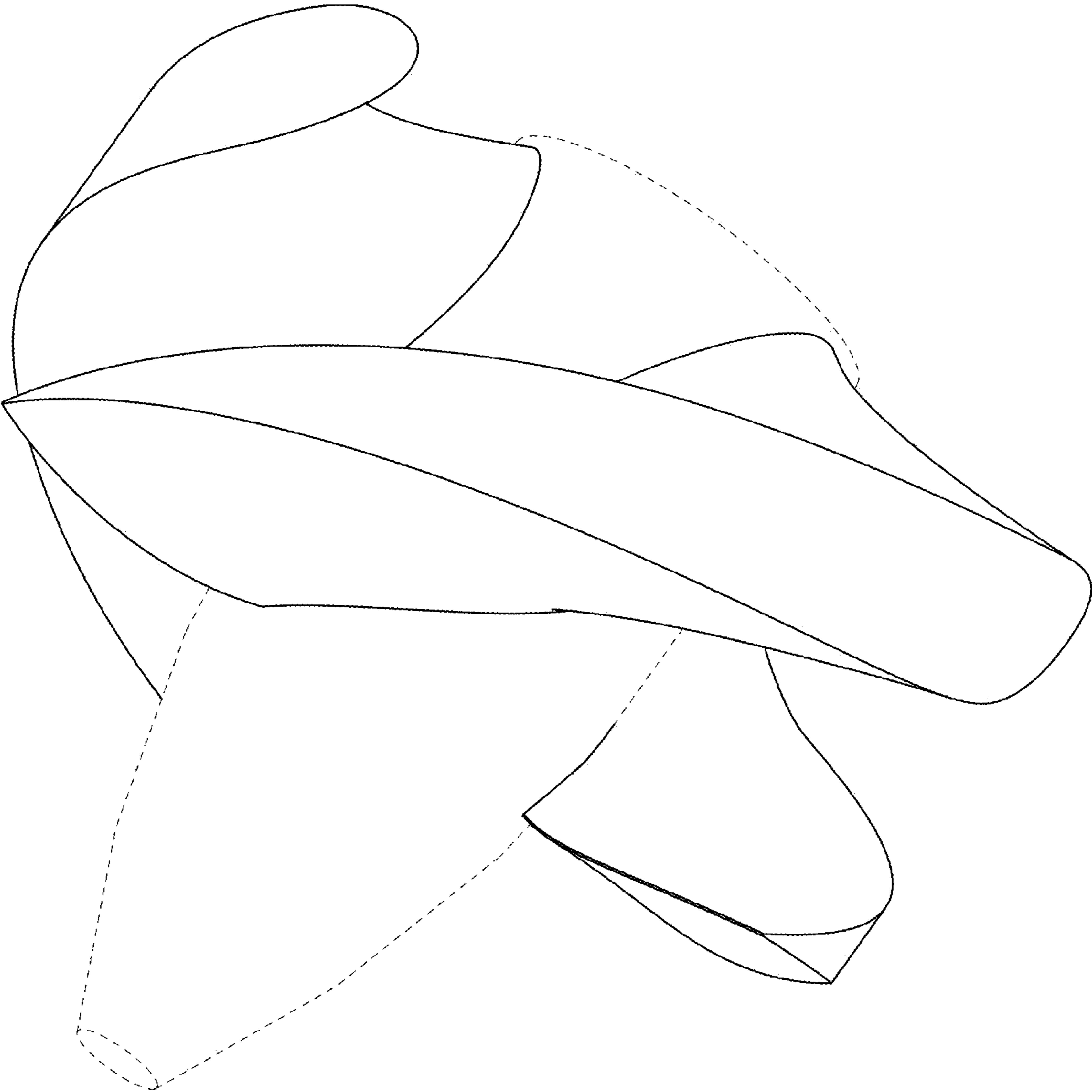
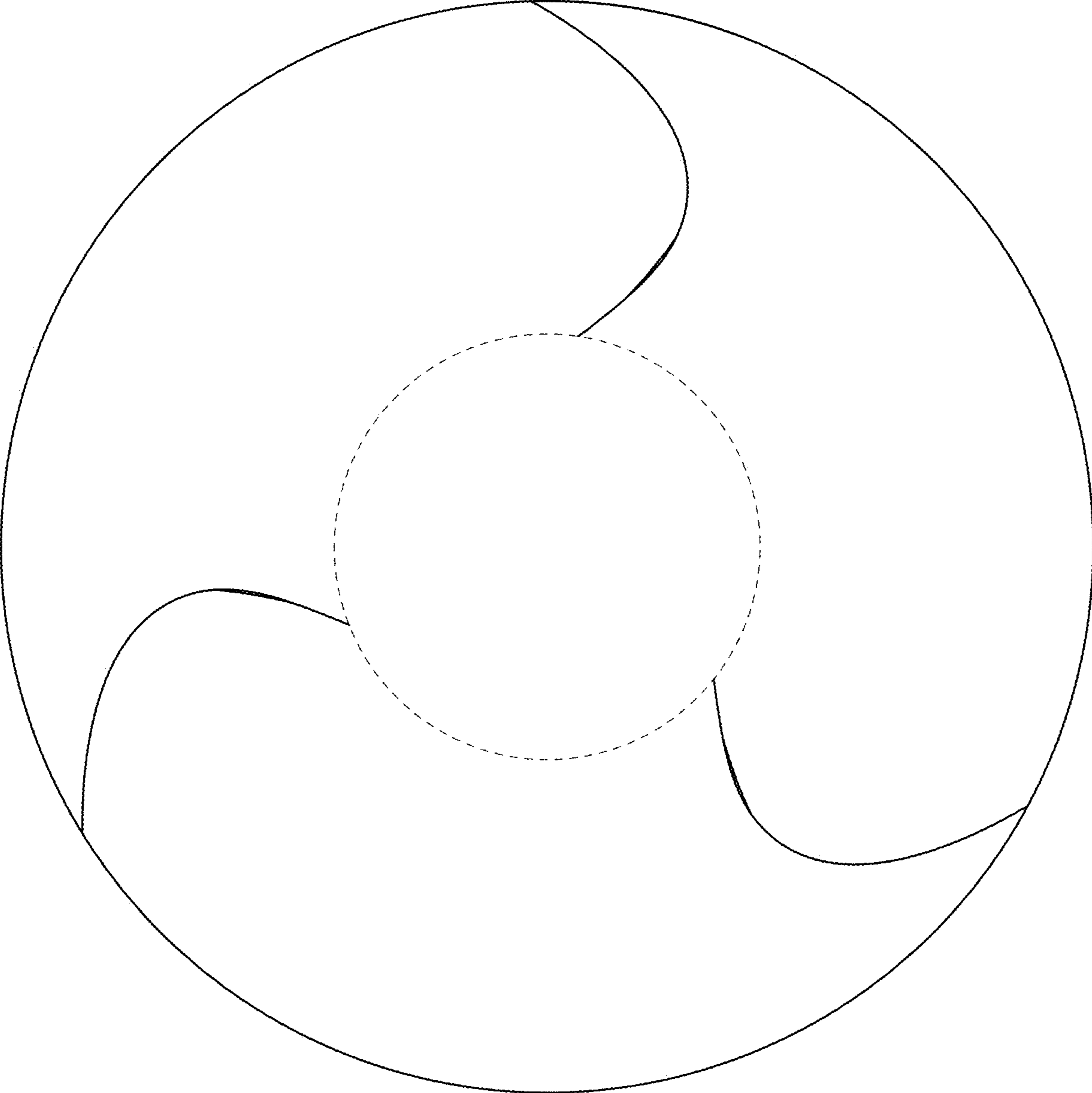
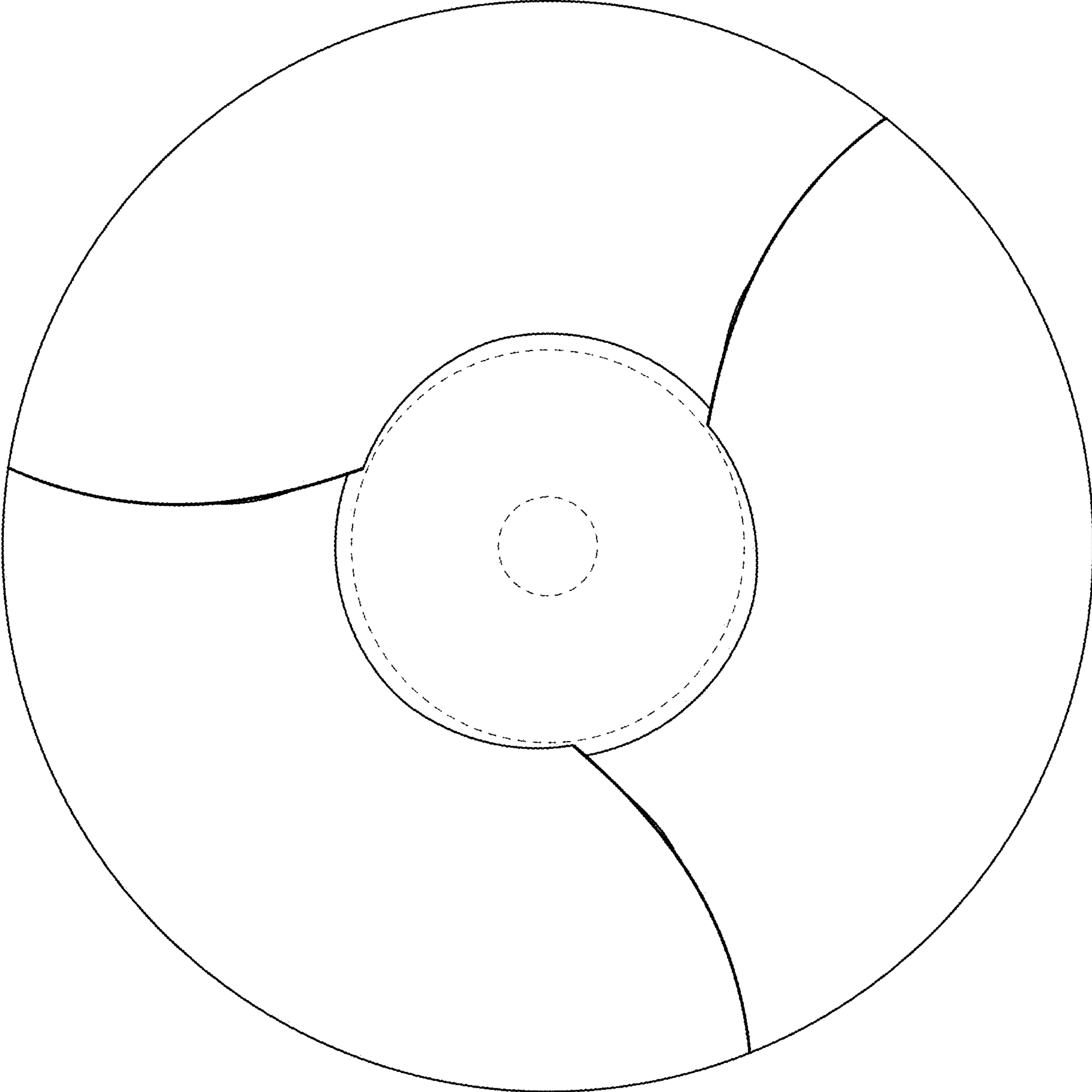


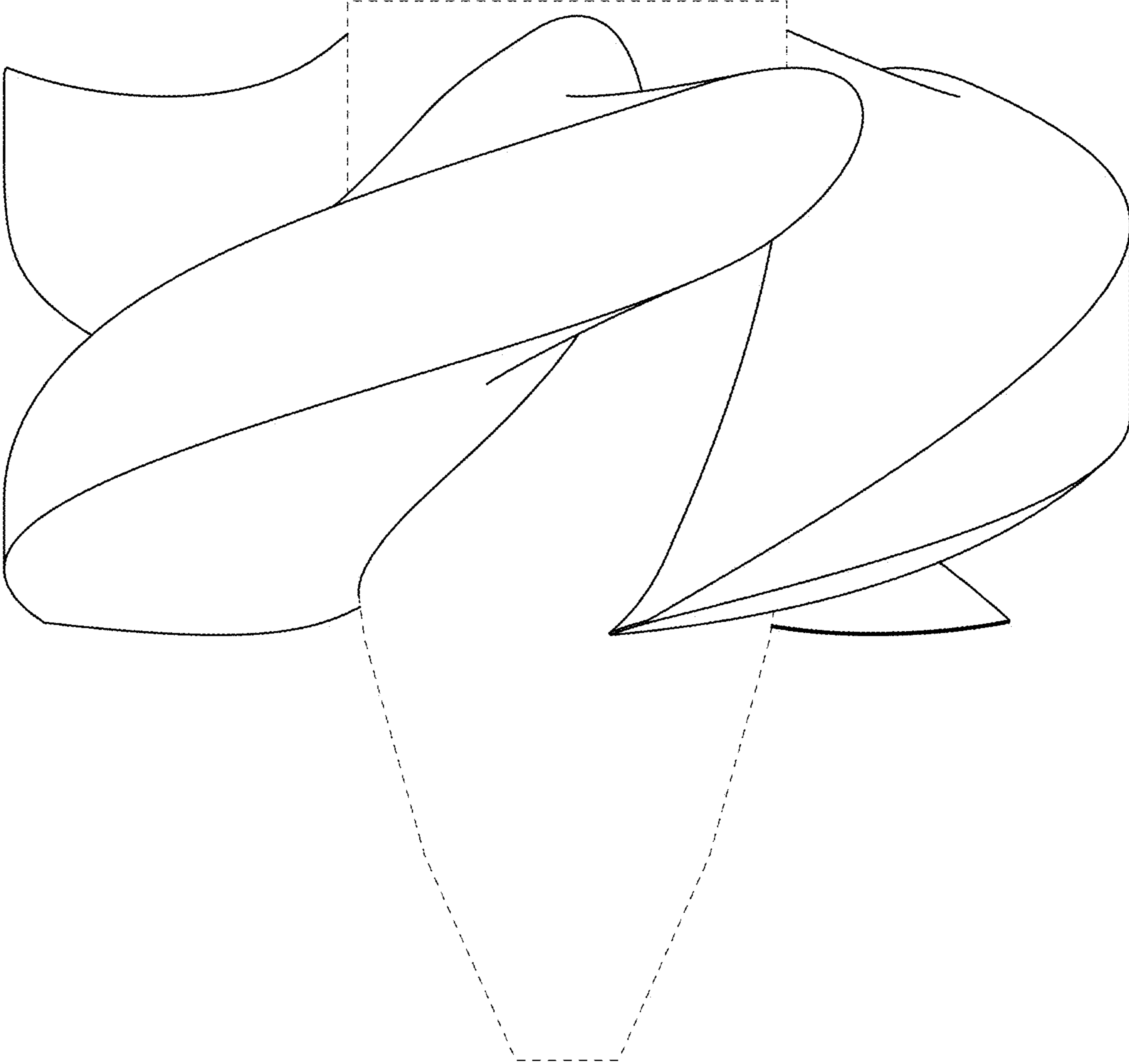
FIG. 10



**FIG. 11**



**FIG. 12**



**FIG. 13**

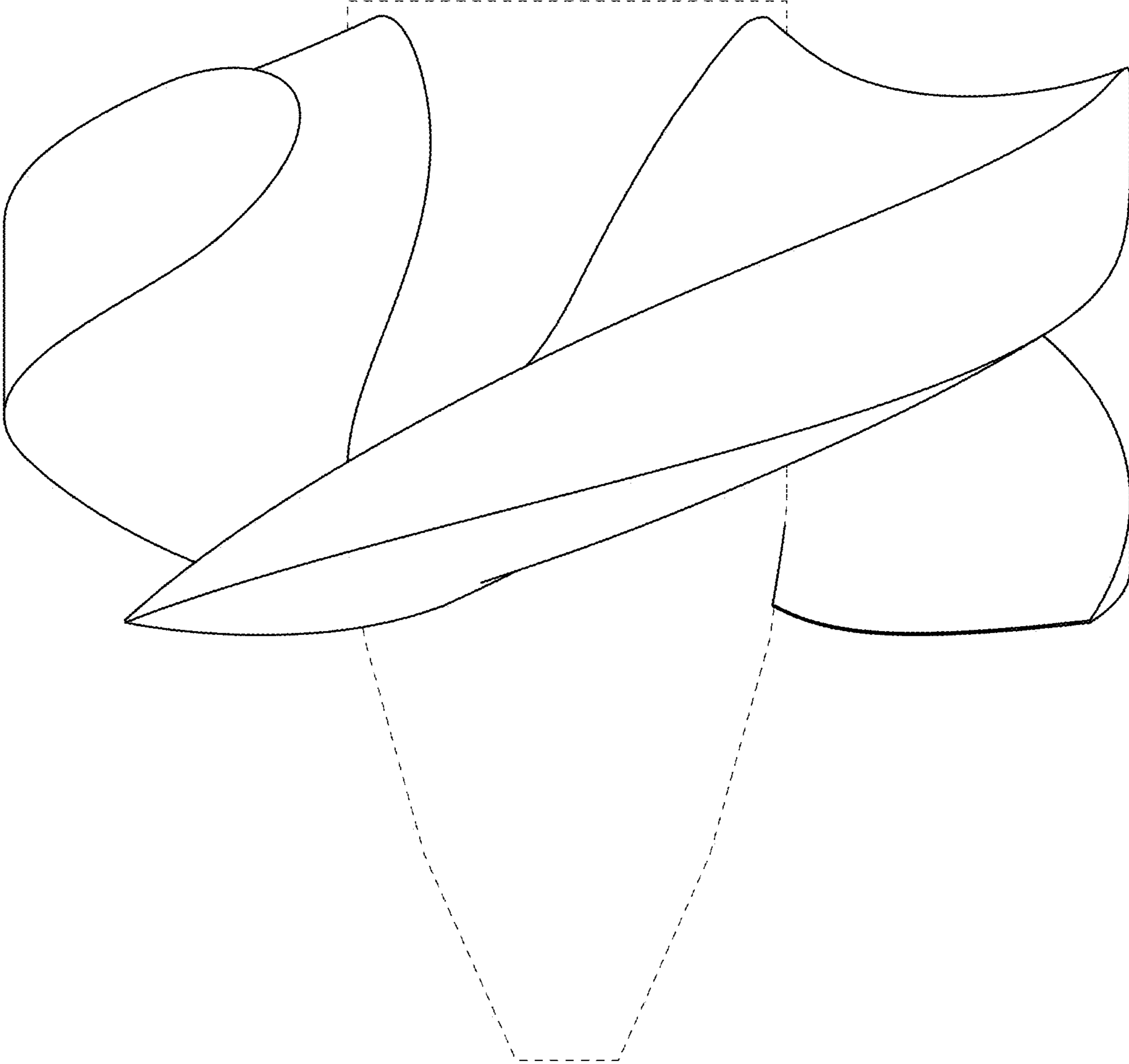


FIG. 14



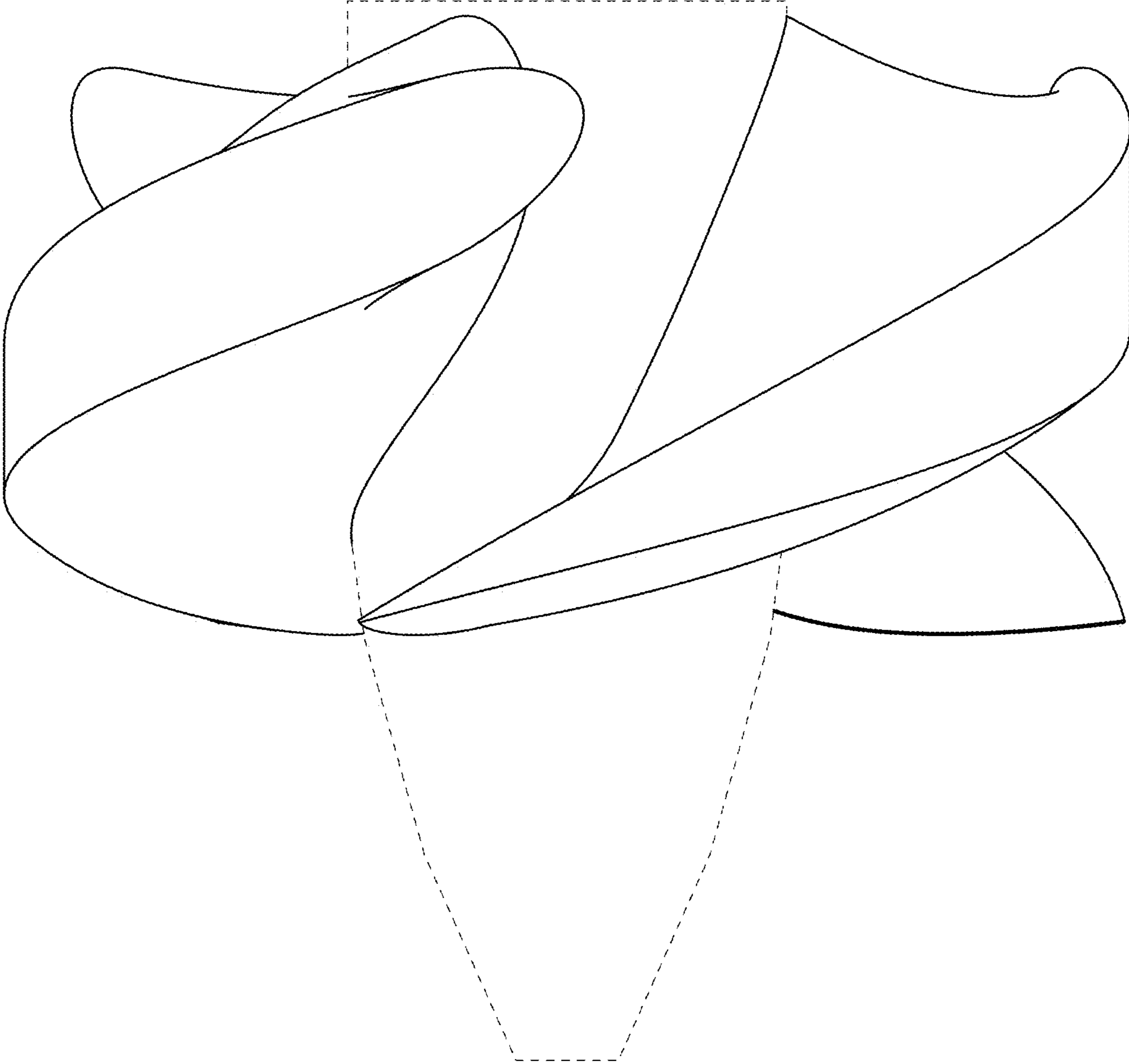


FIG. 15

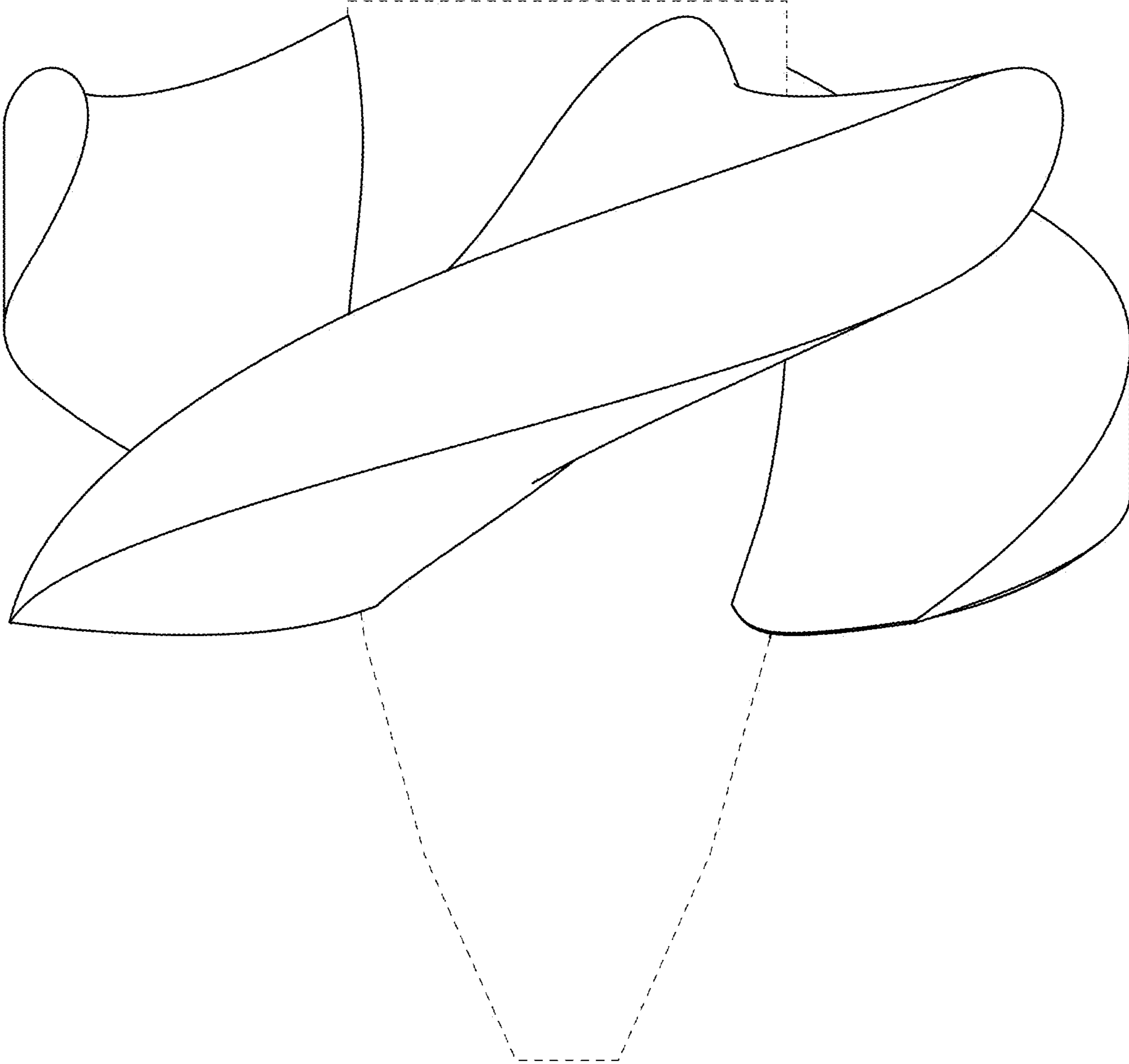


FIG. 16