US00D873305S

(12) United States Design Patent

Thooft et al.

(10) Patent No.: US D873,305 S
(45) Date of Patent: ** Jan. 21, 2020

(54) **ATTRITION MILL PROPELLER**

(71) Applicant: **Superior Industries, Inc.**, Morris, MN (US)

(72) Inventors: **Travis Thooft**, Morris, MN (US); **Lafe Grimm**, Morris, MN (US)

(73) Assignee: **Superior Industries, Inc.**, Morris, MN (US)

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

(21) Appl. No.: **29/618,523**

(22) Filed: **Sep. 21, 2017**

Related U.S. Application Data

(63) Continuation-in-part of application No. 15/600,194, filed on May 19, 2017.

(51) **LOC (12) Cl.** **15-03**

(52) **U.S. Cl.**
USPC **D15/28**; D13/115

(58) **Field of Classification Search**
USPC D15/7, 28, 29, 139; D13/115, 118, 122, D13/199; D12/214; D23/370, 379, 411
CPC .. B01F 7/00; B01F 7/22; B01F 7/0015; B01F 7/0275; B01F 7/00366; B01F 7/633; B01F 15/00915; B01F 2003/1257; B01F 2215/0481; B01F 2215/0032; B01F 2215/0422; B01F 2215/0431
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,446,442	A	5/1969	Carter	
4,098,465	A	7/1978	Meller et al.	
4,108,385	A	8/1978	Funk	
4,434,942	A	3/1984	Cardini	
4,468,130	A	8/1984	Weetman	
4,533,464	A	8/1985	Smith et al.	
4,813,617	A	3/1989	Knox, Jr. et al.	
D344,487	S *	2/1994	Iwamoto	D12/214
5,328,105	A	7/1994	Sims et al.	
6,109,449	A	8/2000	Howk et al.	
D468,009	S *	12/2002	Hoenderkamp	D23/379
7,168,641	B2	1/2007	Filgueiras	
8,695,804	B2	4/2014	Bennington, II et al.	
D742,427	S *	11/2015	Langlais	D15/28

(Continued)

FOREIGN PATENT DOCUMENTS

KR	101700662	B1	1/2017
WO	9527563	A1	10/1995

OTHER PUBLICATIONS

AZ FAB; Vertical Durability Cell; brochure; pp. 1-2; Tucson, Arizona.

(Continued)

Primary Examiner — Derrick E Holland
(74) *Attorney, Agent, or Firm* — Todd R. Fronek; Larkin Hoffman Daly & Lindgren, Ltd.

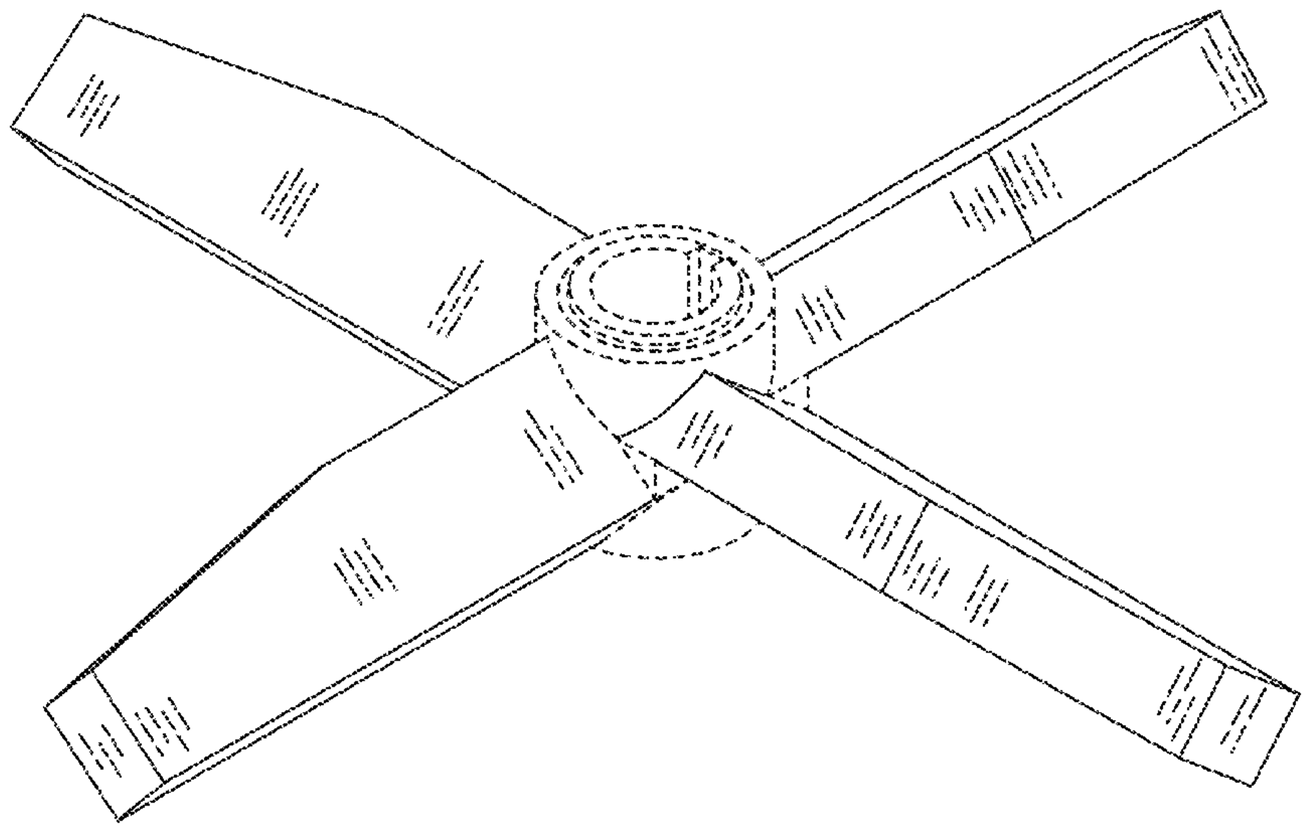
(57) **CLAIM**

The ornamental design for an attrition mill propeller, as shown and described.

DESCRIPTION

FIG. **1** is a perspective view of an attrition mill propeller 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 top plan view thereof; and,
FIG. **7** is a bottom plan view thereof.
The broken lines shown in the drawings illustrate portions of the attrition mill propeller that form no part of the claimed design.

1 Claim, 7 Drawing Sheets



(56) **References Cited**

U.S. PATENT DOCUMENTS

2005/0221246	A1	10/2005	Drinkwater et al.	
2005/0242218	A1	11/2005	Nakano et al.	
2006/0176771	A1	8/2006	Adams	
2006/0187750	A1*	8/2006	Aldrich	B01F 7/0015 366/270
2010/0086410	A1*	4/2010	Sykora	B01F 3/1221 416/223 R
2011/0026360	A1*	2/2011	Greller	B01F 7/00633 366/308
2011/0150583	A1*	6/2011	Engstrom	B23C 5/06 407/40
2011/0309174	A1	12/2011	Rubenstein et al.	
2013/0088934	A1*	4/2013	Gouin	B01F 7/22 366/282
2015/0044057	A1*	2/2015	Dinnison	B01F 7/00366 416/237

OTHER PUBLICATIONS

Julian B. Fasano and Mark Reeder; Viscous and Geometric Effects on Fluid Motion and Flow; AIChE 2002 Annual Meeting; Nov. 3-8, 2002; Indianapolis, Indiana; pp. 1-28.

Eagle Iron Works; Attrition Mill; brochure; 2005; pp. 1-3; Des Moines, Iowa.

Floatex Separations Ltd.; Attrition Scrubber; brochure; pp. 1-4; Northhamptonshire, United Kingdom.

FLSMIDTH Minerals; Wemco Attrition Machines; brochure; 2007; pp. 1-6; Salt Lake City, Utah.

James Steffe; Rheological Methods in Food Process Engineering; Chapter 10-Mixing and Agitation; book; Freeman Press; 1996; pp. 287-304; East Lansing, Michigan.

KPI-JCI Astec Companies; Attrition Cell Spec Sheet; May 2012; p. 1; Yankton, South Dakota.

Metso Corporation; Attrition Scrubbers; brochure; 2012; pp. 1-4; Helsinki, Finland.

Mike Preston and Jeremy Tatarzyn; Optimizing Plant Efficiency with Attrition Scrubbers; Mining Engineering magazine; Society for Mining, Metallurgy, and Exploration, Inc.; Oct. 2013; pp. 18-19; Englewood, Colorado.

MIP Process Corporation; Attrition Scrubbers; brochure; pp. 1-4; Sacramento, California.

Jim Sadowski; Processing for Proppants; Physical Separation Technology External Newsletter, Issue 1; Outotec Inc.; Jul. 2008; pp. 1-8; Jacksonville, Florida.

Pacific Minerals Processing; Turbine Attrition Scrubbers; brochure; pp. 1-2; Perth, Australia.

Philadelphia Mixing Solutions, Ltd.; The Raven 3800 Series Mixer Drive; brochure; 2010; pp. 1-2; Palmyra, Pennsylvania.

Linatex Limited; Modular Attrition Cells; brochure; 2011; pp. 1-2; Gallatin, Tennessee.

* cited by examiner

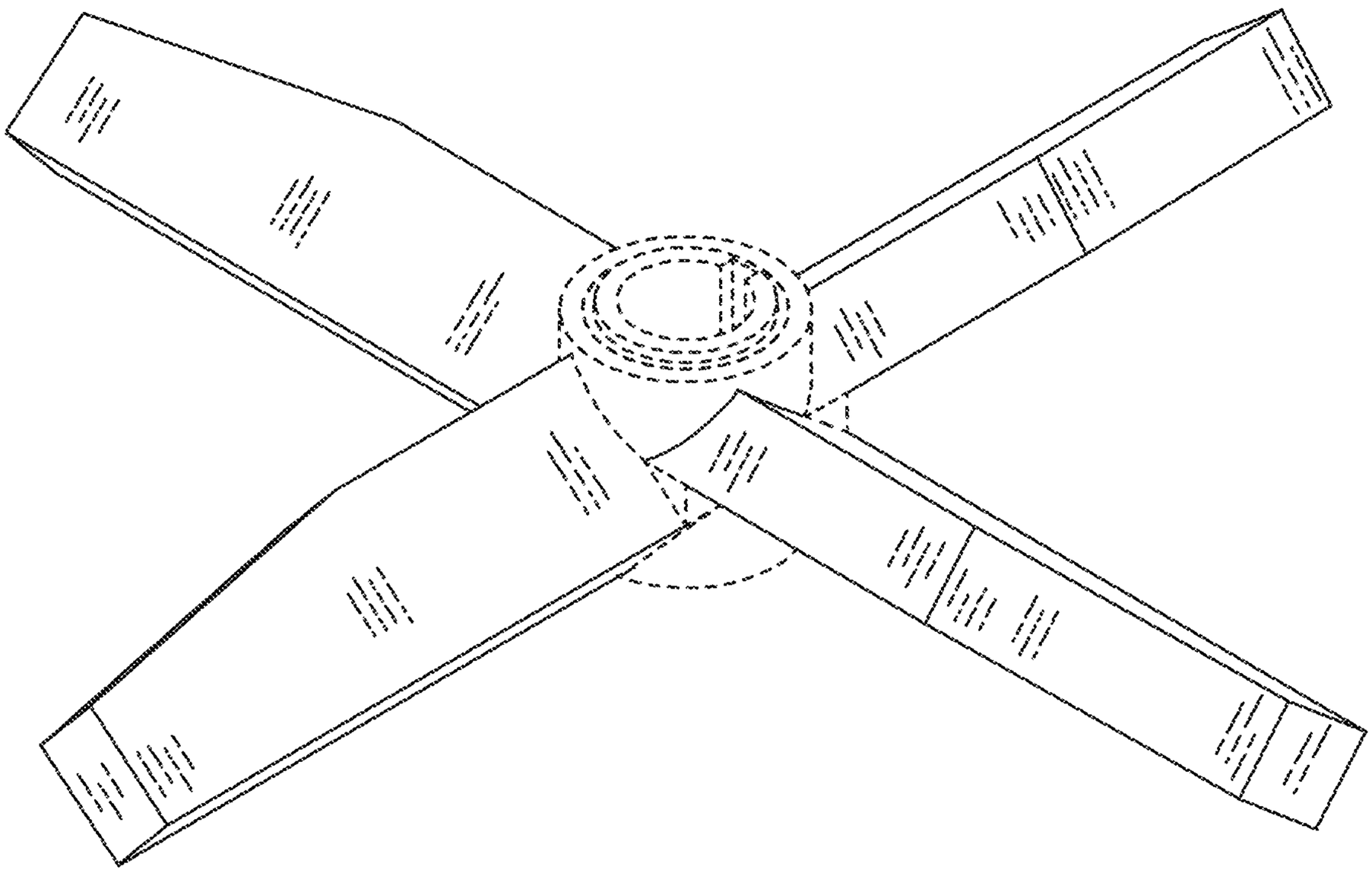


FIG. 1

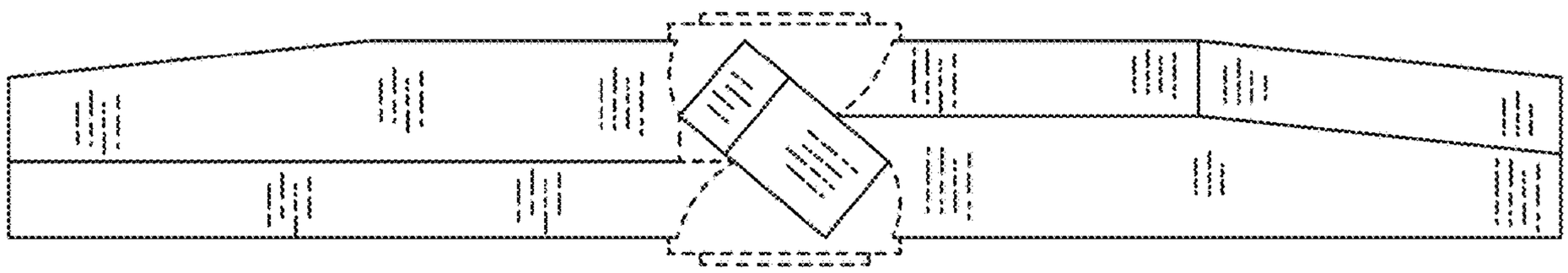


FIG. 2

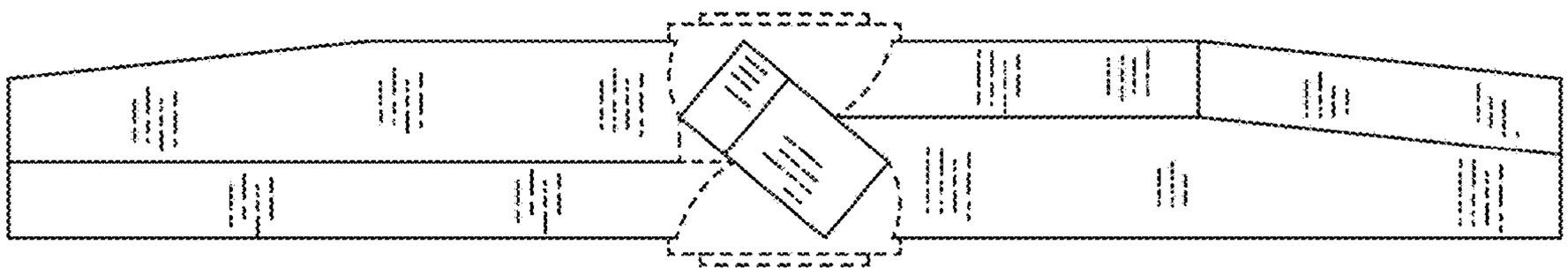


FIG. 3

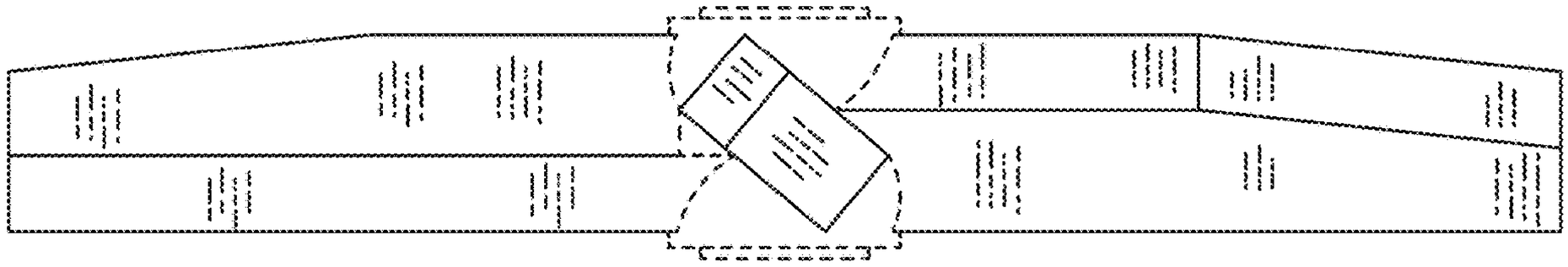


FIG. 4

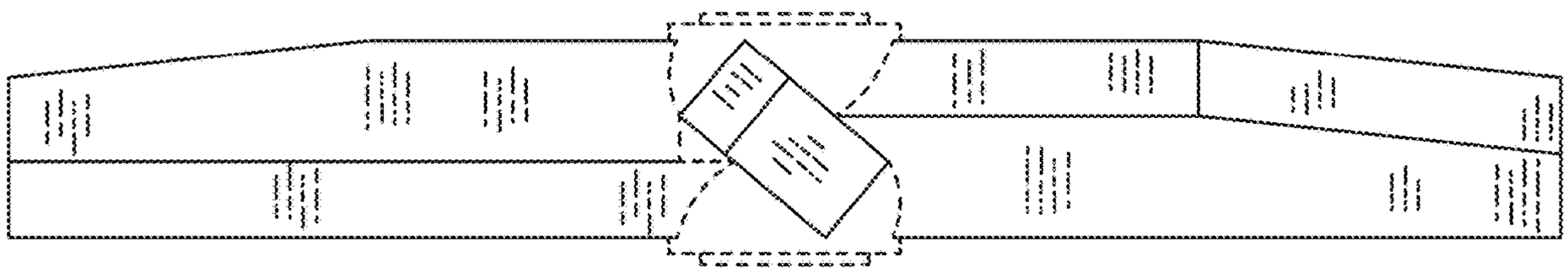


FIG. 5

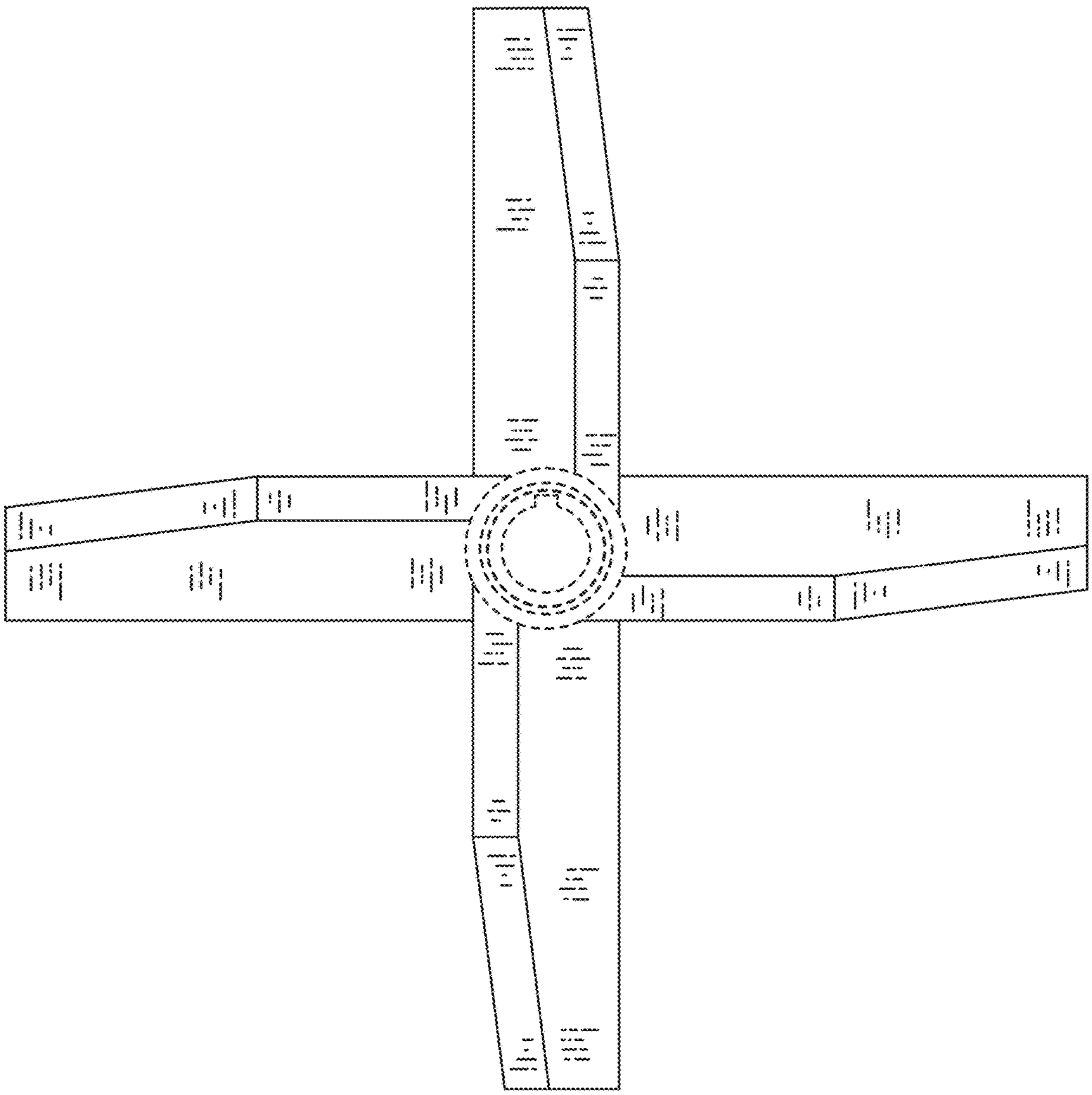


FIG. 6

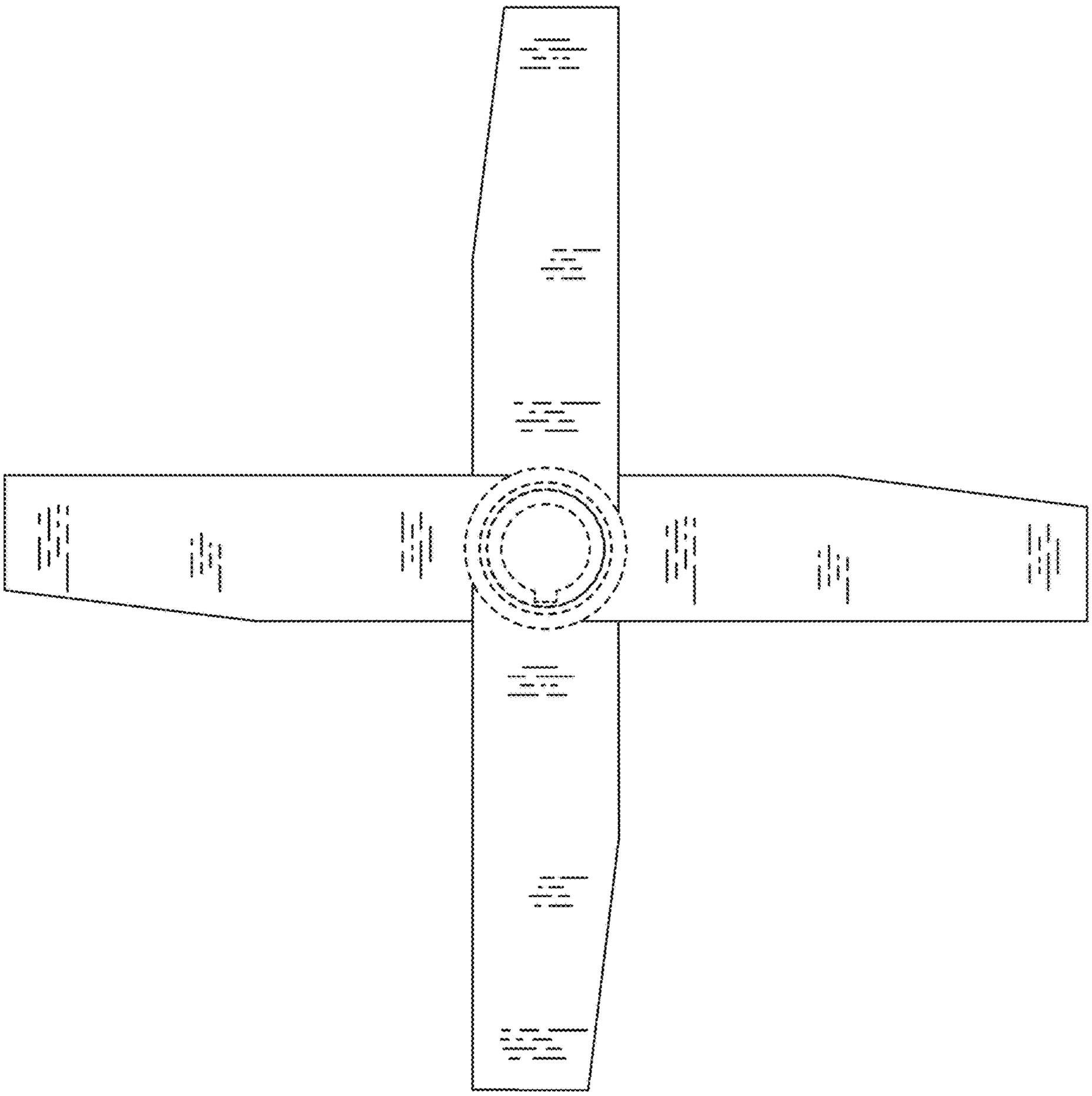


FIG. 7