



US00D920517S

(12) **United States Design Patent** (10) **Patent No.:** **US D920,517 S**
Miller et al. (45) **Date of Patent:** **** May 25, 2021**

(54) **OSTEOTOMY WEDGE**

2/38; A61F 2/42; A61F 2/4225; A61F 2/44; A61F 2/4405; A61F

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(Continued)

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(56) **References Cited**

U.S. PATENT DOCUMENTS

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4,440,835 A 4/1984 Vignaud
4,588,574 A 5/1986 Felder et al.
5,248,456 A 9/1993 Evans, Jr. et al.
7,001,672 B2 2/2006 Justin et al.
7,632,575 B2 12/2009 Justin et al.
7,666,522 B2 2/2010 Justin et al.
D653,756 S * 2/2012 Courtney D24/155

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

(Continued)

(21) Appl. No.: **29/719,883**

(22) Filed: **Jan. 8, 2020**

OTHER PUBLICATIONS

(51) **LOC (13) Cl.** **24-03**

Ortho Spine News, "SeaSpine Announces 25,000th NanoMetalene Implantation", first available Dec. 18, 2019. (<https://orthospinenews.com/2019/12/18/seaspine-announces-25000th-nanometalene-implantation/>) (Year: 2019).*

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

USPC **D24/155**

(Continued)

(58) **Field of Classification Search**

USPC D2/896, 902, 905, 906, 907, 908, 919, D2/920, 921, 922, 923, 946, 947, 948, D2/949, 950, 951, 952, 953, 954, 960, D2/968, 980, 983; D8/349, 382, 387, 47, D8/388, 391, 392, 393, 394, 395, 396, D8/397, 398, 399, 721; D24/107, 133, D24/141, 143, 155, 171, 188, 190, 192, D24/213, 215

CPC . A61B 17/151; A61B 17/154; A61B 17/8095; A61B 17/7058; A61B 17/58; A61B 2/60; A61B 2002/6614; A61B 2202/6657; A61B 2002/665; A61B 2/78; A61F 2/00; A61F 2/0009; A61F 2/0022; A61F 2/0063; A61F 2/0077; A61F 2002/0081; A61F 2002/0086; A61F 2002/009; A61F 2002/0091; A61F 2/28; A61F 2/30; A61F 2002/30108; A61F 2002/30112; A61F 2002/30125; A61F 2002/30151; A61F 2002/30153; A61F 2002/30154; A61F 2002/30158; A61F 2002/30199; A61F 2002/30224; A61F 2002/30263; A61F 2002/30266; A61F 2002/30281; A61F

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Assistant Examiner — Justin A Johnson
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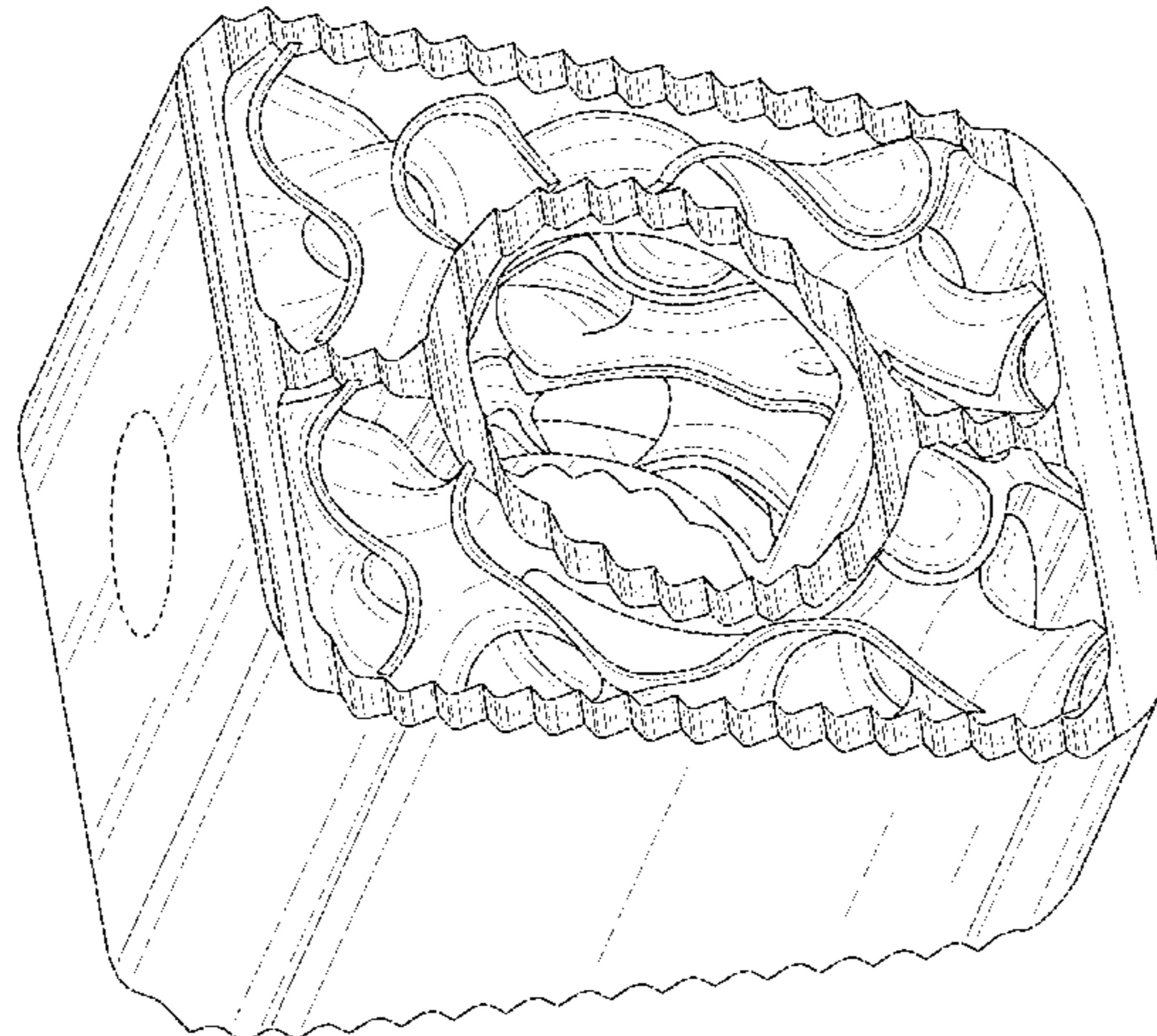
(57) **CLAIM**

The ornamental design for an osteotomy wedge, as shown and described.

DESCRIPTION

FIG. 1 is a perspective view of an exemplary osteotomy wedge;
FIG. 2 is a top view of an exemplary osteotomy wedge;
FIG. 3 is a bottom view of an exemplary osteotomy wedge;
FIG. 4 is a side view of an exemplary osteotomy wedge;
FIG. 5 is a side view of an exemplary osteotomy wedge;
FIG. 6 is a front view of an exemplary osteotomy wedge;
and,
FIG. 7 is a back view of an exemplary osteotomy wedge.
The broken lines illustrate portions of the osteotomy wedge and form no part of the claimed design.

1 Claim, 7 Drawing Sheets



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(58)	<p>Field of Classification Search</p> <p>CPC .. 2/441; A61F 2002/4415; A61F 2/442; A61F 2/4425; A61F 2002/443; A61F 2/446; A61F 2/447; A61F 2430/38; A61L 27/00; A61L 2430/38; G06T 2207/30052</p> <p>See application file for complete search history.</p>	<p>10,772,732 B1 *</p> <p>D899,900 S</p> <p>2004/0148032 A1</p> <p>2007/0118243 A1</p> <p>2008/0206297 A1</p> <p>2009/0093668 A1</p> <p>2009/0182430 A1 *</p>	<p>9/2020</p> <p>10/2020</p> <p>7/2004</p> <p>5/2007</p> <p>8/2008</p> <p>4/2009</p> <p>7/2009</p>	<p>Miller</p> <p>Blanco</p> <p>Rutter et al.</p> <p>Schroeder et al.</p> <p>Roeder et al.</p> <p>Marten et al.</p> <p>Tyber</p>	<p>A61F 2/4455</p> <p></p> <p></p> <p></p> <p></p> <p>A61F 2/4465</p> <p>623/17.16</p>
(56)	<p style="text-align: center;">References Cited</p> <p style="text-align: center;">U.S. PATENT DOCUMENTS</p>				
	<p>8,142,886 B2 3/2012 Noble et al.</p> <p>D675,320 S 1/2013 Oi</p> <p>8,430,930 B2 4/2013 Hunt</p> <p>8,457,930 B2 6/2013 Schroeder</p> <p>8,485,820 B1 7/2013 Ali</p> <p>8,551,173 B2 10/2013 Lechmann et al.</p> <p>D708,747 S 7/2014 Curran et al.</p> <p>8,775,133 B2 7/2014 Schroeder</p> <p>8,828,311 B2 9/2014 Medina et al.</p> <p>8,843,229 B2 9/2014 Vanasse et al.</p> <p>8,888,485 B2 11/2014 Ali</p> <p>D722,693 S * 2/2015 Kaufmann D24/155</p> <p>9,034,237 B2 5/2015 Sperry et al.</p> <p>9,180,029 B2 11/2015 Hollister et al.</p> <p>9,186,257 B2 11/2015 Geisler et al.</p> <p>D745,159 S * 12/2015 Lin D24/155</p> <p>D747,485 S * 1/2016 Oi D24/155</p> <p>9,271,845 B2 3/2016 Hunt et al.</p> <p>9,295,562 B2 3/2016 Lechmann et al.</p> <p>9,308,060 B2 4/2016 Ali</p> <p>9,339,279 B2 5/2016 Dubois et al.</p> <p>9,364,896 B2 6/2016 Christensen et al.</p> <p>9,370,426 B2 6/2016 Gabbrielli et al.</p> <p>9,421,108 B2 8/2016 Hunt</p> <p>D767,137 S * 9/2016 Lin D24/155</p> <p>9,433,510 B2 9/2016 Lechmann et al.</p> <p>9,433,707 B2 9/2016 Swords et al.</p> <p>9,545,317 B2 1/2017 Hunt</p> <p>9,549,823 B2 1/2017 Hunt et al.</p> <p>9,561,115 B2 2/2017 Elahinia et al.</p> <p>9,572,669 B2 2/2017 Hunt et al.</p> <p>9,597,197 B2 3/2017 Lechmann et al.</p> <p>9,636,226 B2 5/2017 Hunt</p> <p>9,649,178 B2 5/2017 Ali</p> <p>9,662,157 B2 5/2017 Schneider et al.</p> <p>9,662,226 B2 5/2017 Wickham</p> <p>9,668,863 B2 6/2017 Sharp et al.</p> <p>9,675,465 B2 6/2017 Padovani et al.</p> <p>9,688,026 B2 6/2017 Ho et al.</p> <p>9,694,541 B2 7/2017 Pruett et al.</p> <p>9,715,563 B1 7/2017 Schroeder</p> <p>9,757,235 B2 9/2017 Hunt et al.</p> <p>9,757,245 B2 9/2017 O'Neil et al.</p> <p>9,782,270 B2 10/2017 Wickham</p> <p>9,788,972 B2 10/2017 Flickinger et al.</p> <p>D809,661 S * 2/2018 Mueller D24/155</p> <p>9,907,670 B2 3/2018 Deridder et al.</p> <p>9,910,935 B2 3/2018 Golway et al.</p> <p>9,918,849 B2 3/2018 Morris et al.</p> <p>9,943,627 B2 4/2018 Zhou et al.</p> <p>D829,909 S * 10/2018 Horton A61B 17/8852</p> <p style="text-align: right;">D24/155</p> <p>D835,278 S 12/2018 Gottlieb</p> <p>10,183,442 B1 1/2019 Miller</p> <p>10,245,152 B2 4/2019 Kloss</p> <p>D849,944 S 5/2019 Dacosta</p> <p>D850,620 S 6/2019 Tyber</p> <p>D858,769 S * 9/2019 Barela A61F 2/4465</p> <p style="text-align: right;">D24/155</p> <p>D877,907 S 3/2020 Linder et al.</p> <p>D878,589 S * 3/2020 Linder A61F 2/4611</p> <p style="text-align: right;">D24/155</p> <p>D878,590 S 3/2020 Linder et al.</p> <p>D879,295 S 3/2020 Abbasi</p> <p>D879,961 S 3/2020 Linder et al.</p> <p>D881,665 S 4/2020 Zemel et al.</p> <p>10,624,746 B2 4/2020 Jones et al.</p>	<p>2010/0137990 A1</p> <p>2010/0168798 A1 *</p> <p>2010/0286791 A1</p> <p>2011/0144752 A1</p> <p>2011/0224796 A1</p> <p>2011/0230974 A1</p> <p>2012/0064288 A1</p> <p>2012/0215310 A1</p> <p>2013/0123935 A1</p> <p>2013/0158651 A1</p> <p>2013/0197657 A1</p> <p>2013/0218282 A1</p> <p>2014/0107786 A1</p> <p>2014/0236299 A1</p> <p>2014/0277443 A1</p> <p>2014/0288650 A1</p> <p>2014/0336680 A1</p> <p>2014/0371863 A1</p> <p>2015/0105858 A1</p> <p>2015/0282945 A1</p> <p>2015/0282946 A1</p> <p>2015/0320461 A1</p> <p>2015/0335434 A1</p> <p>2015/0343709 A1</p> <p>2015/0351915 A1</p> <p>2016/0051371 A1</p> <p>2016/0089138 A1</p> <p>2016/0151833 A1</p> <p>2016/0193055 A1</p> <p>2016/0199193 A1</p> <p>2016/0213485 A1</p> <p>2016/0213486 A1</p> <p>2016/0213487 A1</p> <p>2016/0213488 A1</p> <p>2016/0220288 A1</p> <p>2016/0256279 A1</p> <p>2016/0256610 A1</p> <p>2016/0270931 A1</p> <p>2016/0287388 A1</p> <p>2016/0303793 A1</p> <p>2016/0333152 A1</p> <p>2016/0374829 A1</p> <p>2017/0014169 A1</p> <p>2017/0020685 A1</p> <p>2017/0036403 A1</p> <p>2017/0042697 A1</p> <p>2017/0056178 A1</p> <p>2017/0056179 A1</p> <p>2017/0066873 A1</p> <p>2017/0105844 A1</p> <p>2017/0156880 A1</p> <p>2017/0165085 A1</p> <p>2017/0165790 A1</p> <p>2017/0172758 A1</p> <p>2017/0182222 A1</p> <p>2017/0209274 A1</p> <p>2017/0216035 A1</p> <p>2017/0216036 A1</p> <p>2017/0239054 A1</p> <p>2017/0239064 A1</p> <p>2017/0245998 A1</p> <p>2017/0252165 A1</p> <p>2017/0258606 A1</p> <p>2017/0282455 A1</p> <p>2017/0296244 A1</p> <p>2017/0319344 A1</p> <p>2017/0323037 A1</p> <p>2017/0333205 A1</p> <p>2017/0354510 A1</p> <p>2017/0354513 A1</p>	<p>6/2010</p> <p>7/2010</p> <p>11/2010</p> <p>6/2011</p> <p>9/2011</p> <p>9/2011</p> <p>3/2012</p> <p>8/2012</p> <p>5/2013</p> <p>6/2013</p> <p>8/2013</p> <p>8/2013</p> <p>4/2014</p> <p>8/2014</p> <p>9/2014</p> <p>9/2014</p> <p>11/2014</p> <p>12/2014</p> <p>4/2015</p> <p>10/2015</p> <p>10/2015</p> <p>11/2015</p> <p>11/2015</p> <p>12/2015</p> <p>12/2015</p> <p>2/2016</p> <p>3/2016</p> <p>6/2016</p> <p>7/2016</p> <p>7/2016</p> <p>7/2016</p> <p>7/2016</p> <p>7/2016</p> <p>7/2016</p> <p>8/2016</p> <p>9/2016</p> <p>9/2016</p> <p>9/2016</p> <p>10/2016</p> <p>10/2016</p> <p>11/2016</p> <p>12/2016</p> <p>1/2017</p> <p>1/2017</p> <p>2/2017</p> <p>2/2017</p> <p>3/2017</p> <p>3/2017</p> <p>3/2017</p> <p>4/2017</p> <p>6/2017</p> <p>6/2017</p> <p>6/2017</p> <p>6/2017</p> <p>6/2017</p> <p>6/2017</p> <p>7/2017</p> <p>8/2017</p> <p>8/2017</p> <p>8/2017</p> <p>8/2017</p> <p>8/2017</p> <p>9/2017</p> <p>9/2017</p> <p>10/2017</p> <p>10/2017</p> <p>11/2017</p> <p>11/2017</p> <p>11/2017</p> <p>12/2017</p> <p>12/2017</p>	<p>Apatsidis et al.</p> <p>Clineff</p> <p>Goldsmith</p> <p>Defelice et al.</p> <p>Weiland et al.</p> <p>Musani</p> <p>Nakano et al.</p> <p>Sharp et al.</p> <p>Hunt et al.</p> <p>Hollister et al.</p> <p>Anca et al.</p> <p>Hunt</p> <p>Geisler et al.</p> <p>Roeder et al.</p> <p>Fleury et al.</p> <p>Hunt</p> <p>Medina</p> <p>Vanasse et al.</p> <p>Papay et al.</p> <p>Hunt</p> <p>Hunt</p> <p>Ehmke</p> <p>Patterson et al.</p> <p>Gerstle et al.</p> <p>Defelice et al.</p> <p>Defelice et al.</p> <p>Early et al.</p> <p>Tsao</p> <p>Ries</p> <p>Willis et al.</p> <p>Schauffler et al.</p> <p>Nunley et al.</p> <p>Wilson et al.</p> <p>Moore et al.</p> <p>Dubois et al.</p> <p>Sanders et al.</p> <p>Zhou et al.</p> <p>Trieu</p> <p>Hunt et al.</p> <p>Ermoshkin et al.</p> <p>Cook et al.</p> <p>Vogt et al.</p> <p>Dean et al.</p> <p>Geisler et al.</p> <p>Ruff et al.</p> <p>McShane, III et al.</p> <p>Sharp et al.</p> <p>Lorio</p> <p>Gardet</p> <p>Kuyler et al.</p> <p>Halverson et al.</p> <p>Lechmann et al.</p> <p>McCarthy et al.</p> <p>Field et al.</p> <p>Paddock et al.</p> <p>Beerens et al.</p> <p>Hunt</p> <p>Cordaro</p> <p>Engstrand et al.</p> <p>Cordaro</p> <p>Padovani et al.</p> <p>Sharp et al.</p> <p>Afzal</p> <p>Defelice et al.</p> <p>Schneider et al.</p> <p>Hunt</p> <p>Schroeder</p> <p>Joly et al.</p> <p>O'Neil et al.</p> <p>Maglaras et al.</p>	<p>A61F 2/4611</p> <p>606/279</p>

(56)

References Cited

U.S. PATENT DOCUMENTS

2017/0355815 A1 12/2017 Becker et al.
 2017/0360488 A1 12/2017 Kowalczyk et al.
 2017/0360563 A1 12/2017 Hunt et al.
 2017/0360578 A1 12/2017 Shin et al.
 2017/0367843 A1 12/2017 Eisen et al.
 2017/0367844 A1 12/2017 Eisen et al.
 2017/0367845 A1 12/2017 Eisen et al.
 2018/0008419 A1* 1/2018 Tyber A61B 17/8852
 2018/0022017 A1 1/2018 Fukumoto et al.
 2018/0064540 A1 3/2018 Hunt
 2018/0085230 A1 3/2018 Hunt
 2018/0104063 A1 4/2018 Asaad
 2018/0110593 A1 4/2018 Khalil
 2018/0110626 A1 4/2018 McShane, III et al.
 2018/0110627 A1 4/2018 Sack
 2018/0117219 A1 5/2018 Yang et al.
 2018/0147319 A1 5/2018 Colucci-Mizenko et al.
 2018/0289515 A1 10/2018 Nemes et al.
 2019/0262101 A1 8/2019 Shanjani et al.
 2019/0343652 A1 11/2019 Petersheim et al.
 2020/0030102 A1 1/2020 Mullens et al.
 2020/0046512 A1 2/2020 Newman et al.

OTHER PUBLICATIONS

Restor3d, “Products”, first available Sep. 28, 2020. (<https://web.archive.org/web/20200928123335/https://restor3d.com/products>) (Year: 2020).*

Ortho Spine News, “Nvision Biomedical Technologies: First FDA Clearance for Osteotomy Wedge System”, first available Oct. 28, 2020. (<https://orthospinenews.com/2020/10/28/nvision-biomedical-technologies-first-fda-clearance-for-osteotomy-wedge-system-made-of-peek-optima-ha-enhanced/>) (Year: 2020).*

Sina, “Application logic of triple periodic minimum surface”, first available Oct. 24, 2020. (https://k.sina.com.cn/article_2422410454_90630cd600100t1bm.html?from=science) (Year: 2020).*

Larraona et al., “Radiopaque material for 3D printing scaffolds”, XXXV Confreso Anual de la Sociedad Espanola de Ingenieria Biomedica. Bilbao, Nov. 29-Dec. 1, 2017, p. 451-454 (Year 2017).

Rozema et al., The effects of different steam-sterilization programs on material properties of poly(1-lactide), Journal of Applied Biomaterials, vol. 2, 23-28 (1991) (Year: 1991).

Alt, Sami. “Design for Sterilization Part 1: Steam Sterillization.” Material, Material Technology Blog, Jun. 3, 2016, www.material-technology.com/single-post/2016/05/24/Design-for-Sterilization-part-1-Stream-Sterillization.

Ducheyne, Paul. “Comprehensive Biomaterials.” Comprehensive Biomaterials, vol. 1, Elsevier, 2011, pp. 135-135.

Anat Ratnovsky et al., Mechanical Properties of Different Airway Stents, Med. Eng’G. Physics, Mar. 2011, at 408., [http://www.medengphys.com/article/S1350-4533\(15\)00042-9/fulltext](http://www.medengphys.com/article/S1350-4533(15)00042-9/fulltext).

Andrew T. Miller et al., Fatigue of Injection Molded and 30 Printed Polycarbonate Urethane in Solution, 108 Polymer 121 (2017).

Andrew T. Miller et al., Deformation and Fatigue of Tough 30 Printed Elastomer Scaffolds Processed by Fused 3 Deposition Modeling and Continuous Liquid Interface Production, 75 J. Mechanical Behavior Biomedical. Materials 1 (2017).

* cited by examiner

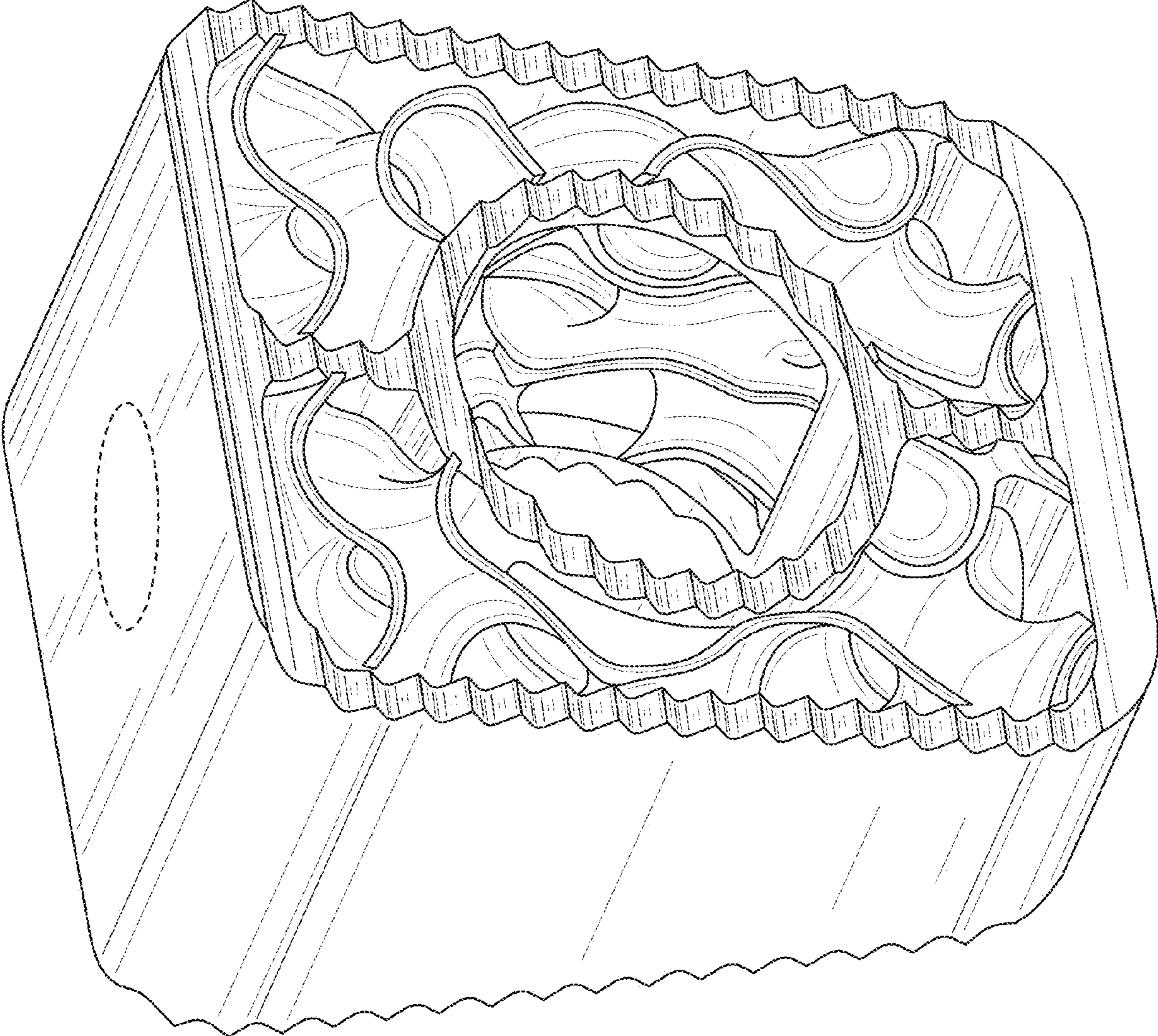


FIG. 1

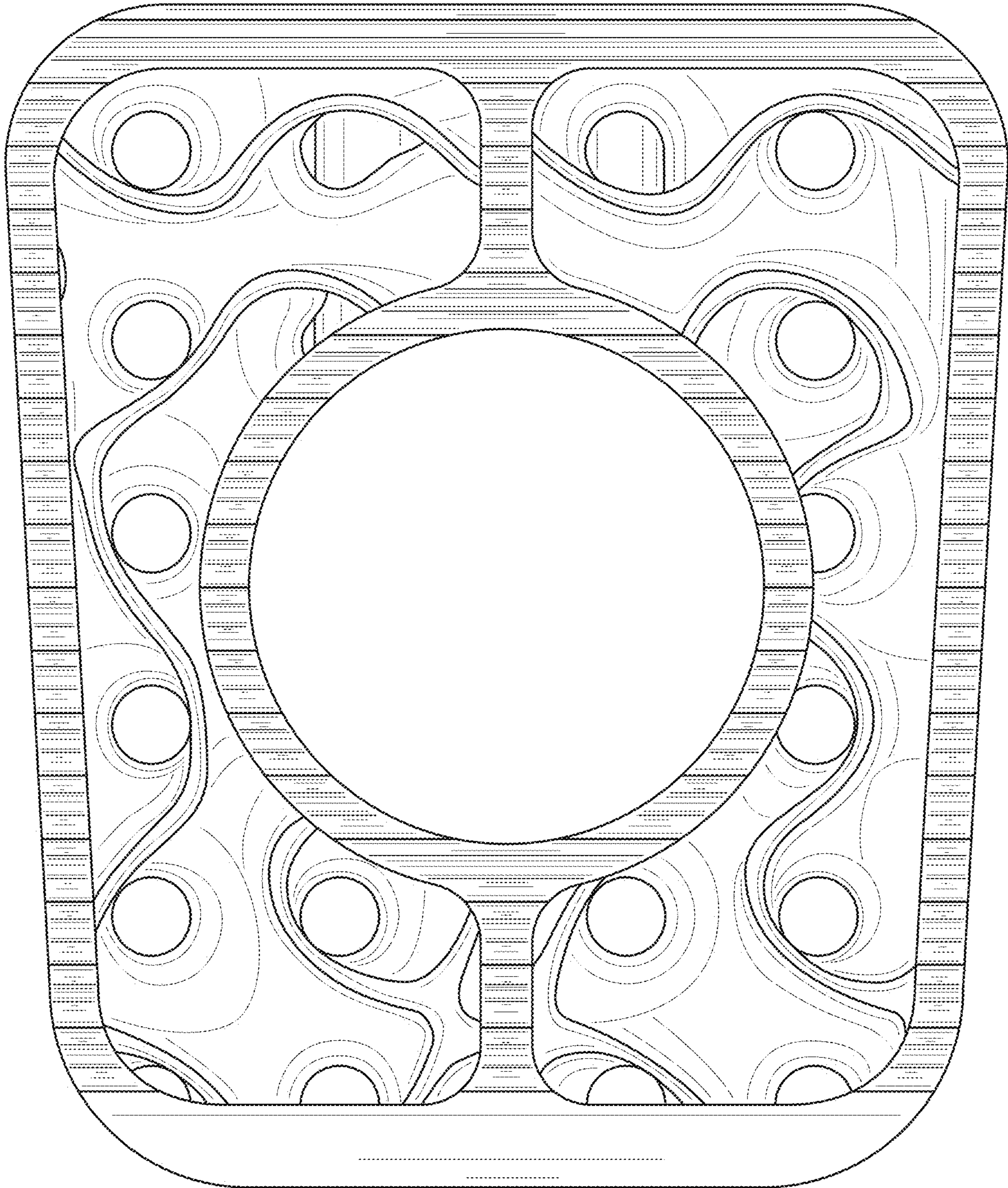


FIG. 2

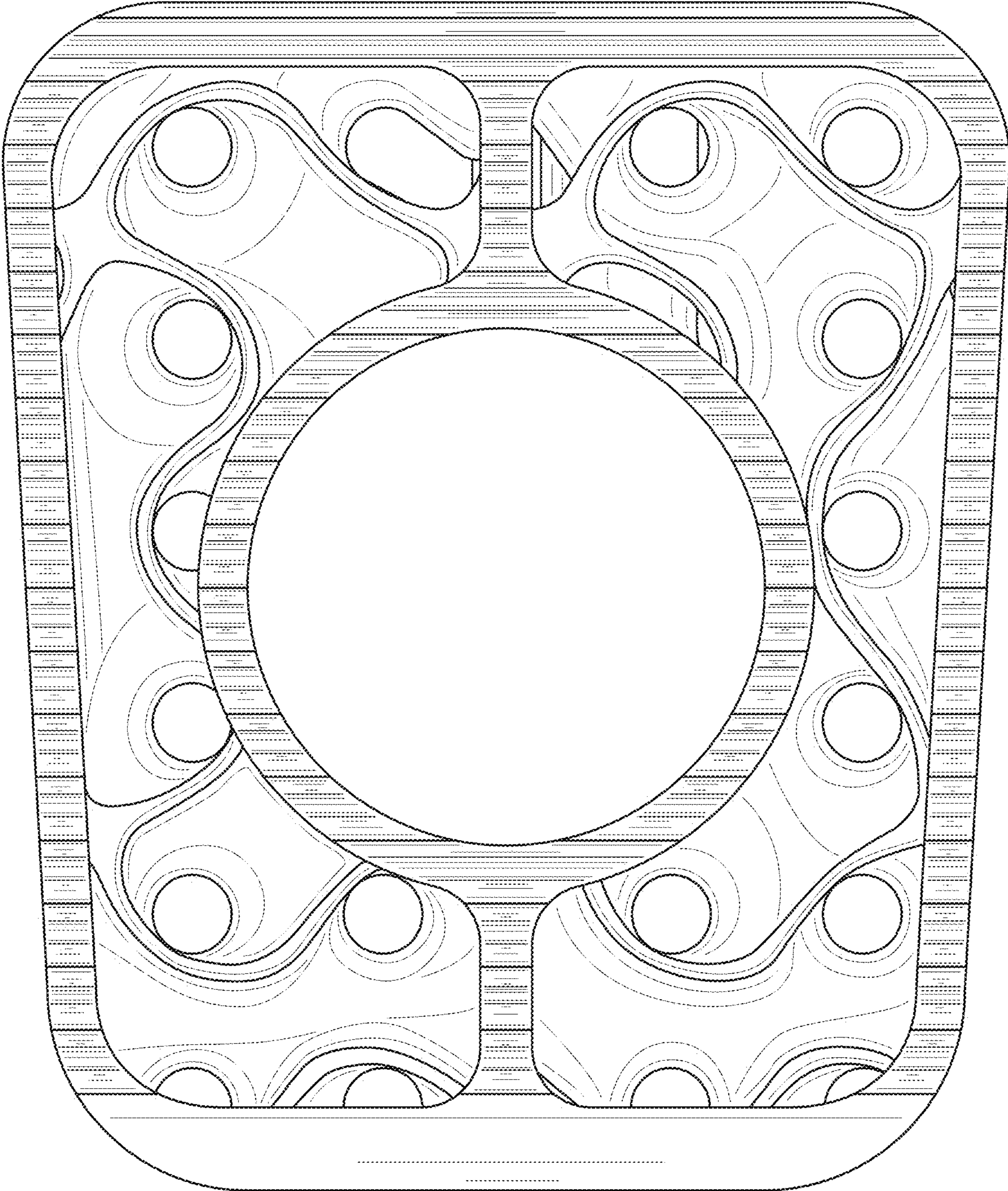


FIG. 3

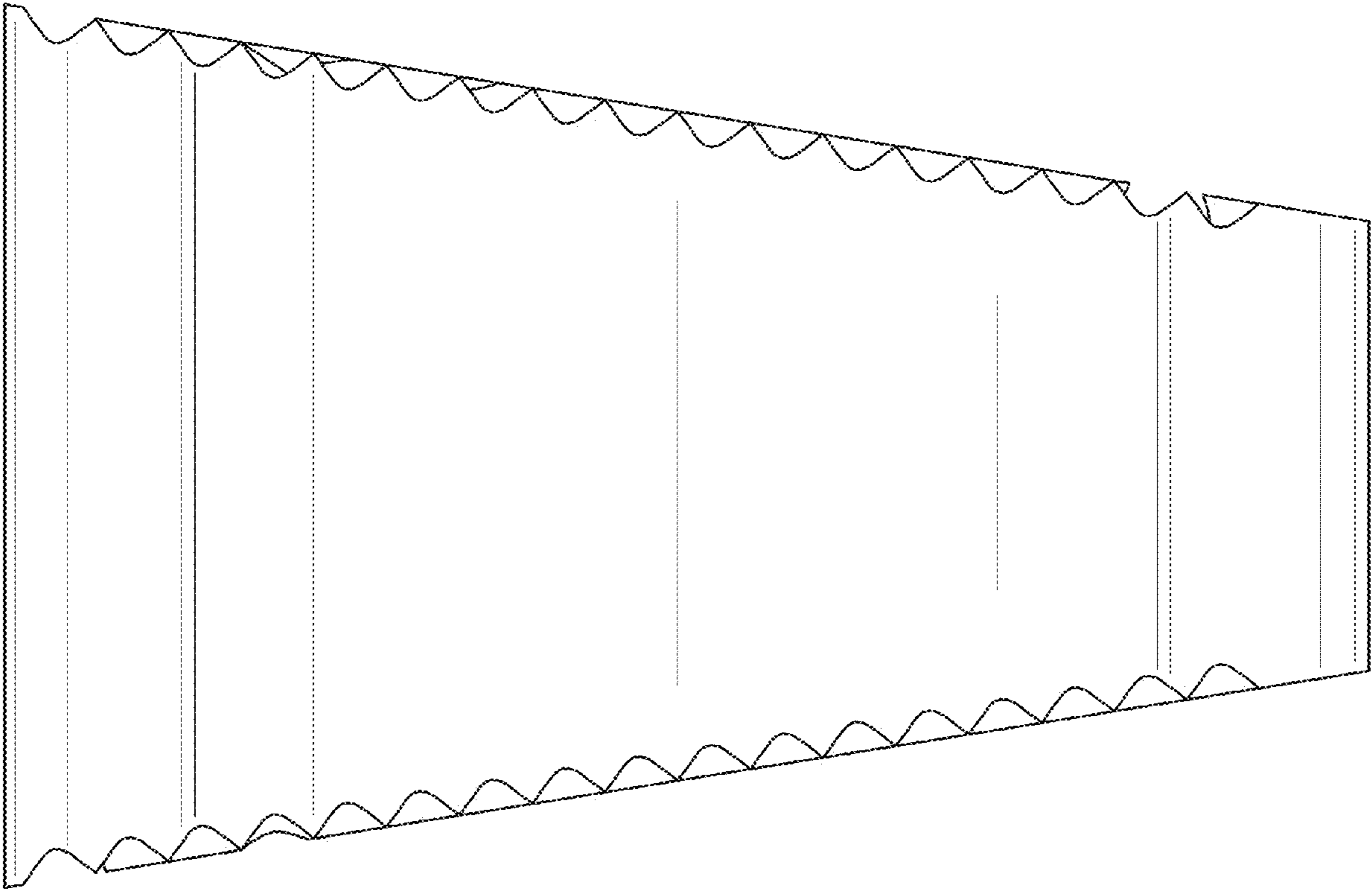


FIG. 4

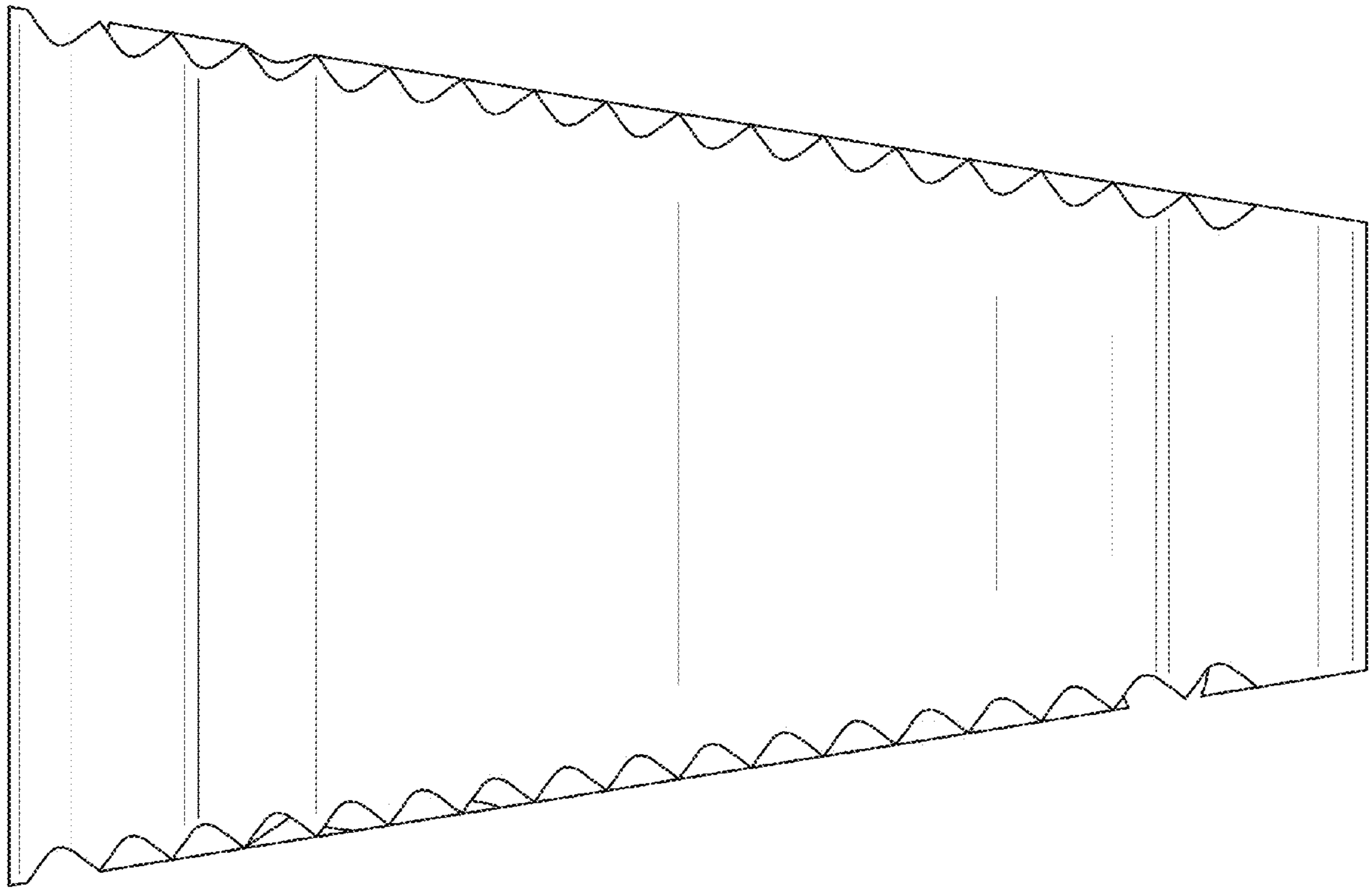


FIG. 5

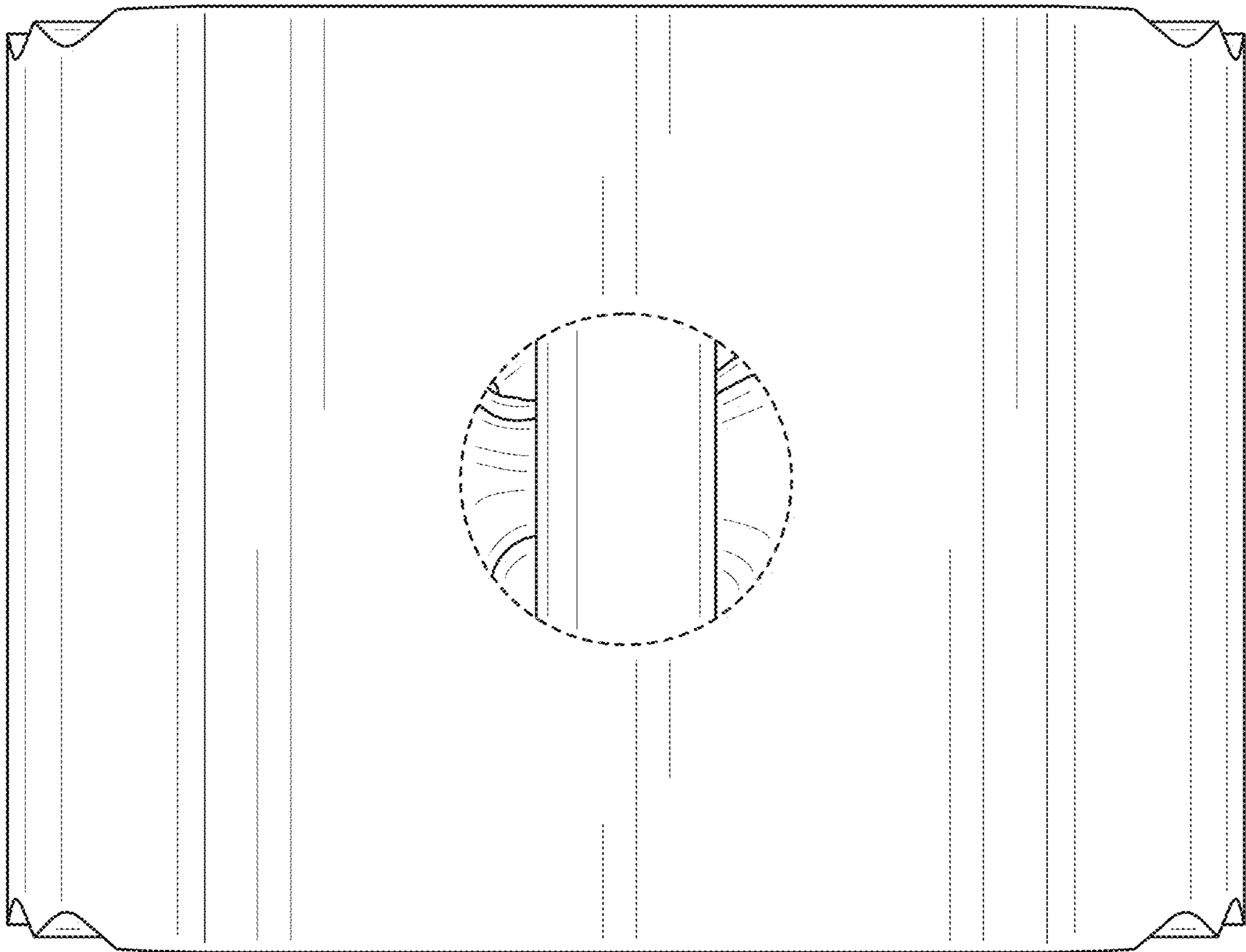


FIG. 6

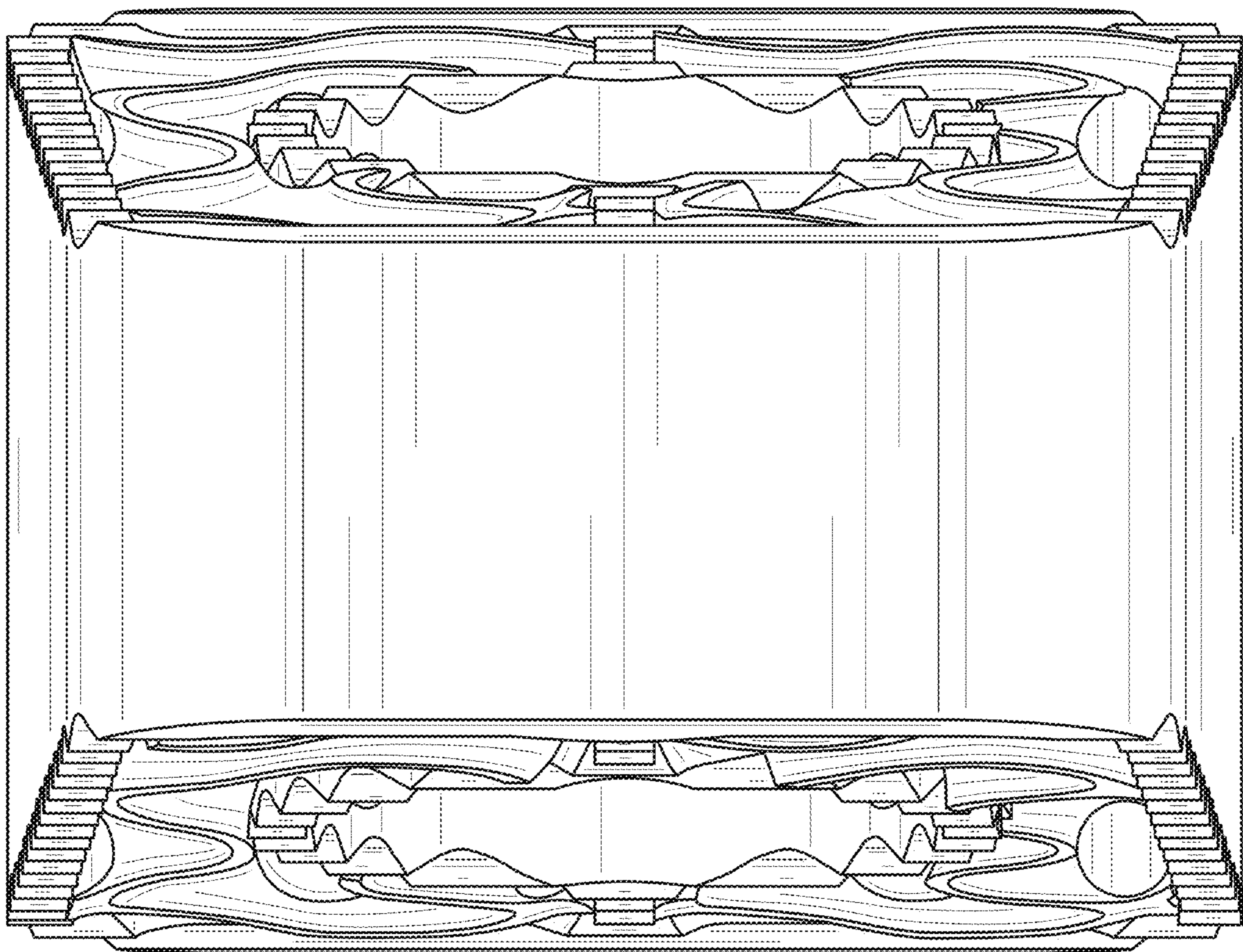


FIG. 7