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(12) **United States Design Patent** (10) **Patent No.:** **US D824,518 S**
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(54) **SPINAL IMPLANT**
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5,943,235 A 8/1999 Earl et al.
5,968,098 A 10/1999 Winslow
6,010,502 A 1/2000 Bagby
6,039,762 A 3/2000 McKay
6,391,058 B1 5/2002 Kuslich et al.
6,432,107 B1 8/2002 Ferree

(Continued)

FOREIGN PATENT DOCUMENTS

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DE 102008024281 A1 12/2009
DE 102008024288 A1 12/2009

(Continued)

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

OTHER PUBLICATIONS

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Related U.S. Application Data

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Primary Examiner — Charles D Hanson

(51) **LOC (11) Cl.** **24-02**

(74) *Attorney, Agent, or Firm* — Carter, DeLuca, Farrell & Schmidt, LLP

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

(57) **CLAIM**

USPC **D24/155**

The ornamental design for a spinal implant, as shown and described.

(58) **Field of Classification Search**

DESCRIPTION

USPC D24/155

CPC A61F 2/4611; A61F 2/442; A61F 2/447;
A61F 2220/0025; A61F 2310/00023;
A61F 2310/00017; A61F 2002/4475;
A61F 2002/30841; A61F 2002/2835;
A61F 2002/30904; A61F 2002/30785;
A61F 2002/443; A61F 2002/30578

FIG. 1 is a front, perspective view of a spinal implant in accordance with the principles of the present design;
FIG. 2 is a rear, perspective view of the spinal implant of FIG. 1;
FIG. 3 is a left side view of the spinal implant of FIG. 1;
FIG. 4 is a right side view of the spinal implant of FIG. 1;
FIG. 5 is a top view of the spinal implant of FIG. 1; and
FIG. 6 is a bottom view of the spinal implant of FIG. 1.
The broken line showing is included for the purpose of illustrating environment and forms no part of the claimed design.

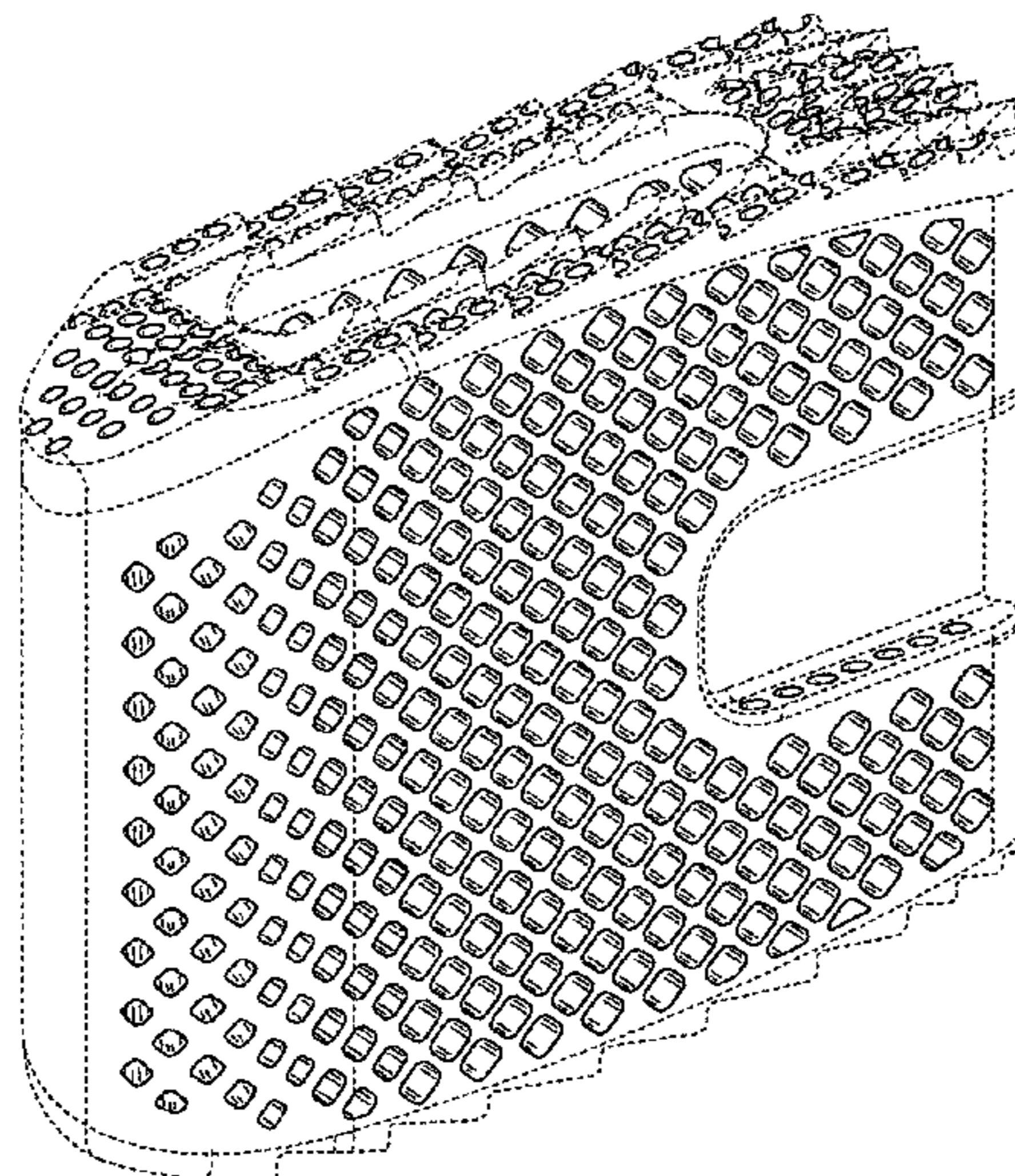
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,534,031 A 7/1996 Matsuzaki et al.
5,595,703 A 1/1997 Swaelens et al.
5,733,286 A 3/1998 Errico et al.
5,768,134 A 6/1998 Swaelens et al.

1 Claim, 5 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

6,520,996 B1 2/2003 Manasas et al.
 6,530,955 B2 3/2003 Boyle et al.
 6,530,956 B1 3/2003 Mansmann
 6,716,247 B2 4/2004 Michelson
 6,758,849 B1 7/2004 Michelson
 7,238,206 B2 7/2007 Lange et al.
 7,509,183 B2 3/2009 Lin et al.
 7,665,979 B2 2/2010 Heugel
 7,909,872 B2 3/2011 Zipnick et al.
 D664,252 S * 7/2012 Weiland D24/155
 8,275,594 B2 9/2012 Lin et al.
 8,403,986 B2 3/2013 Michelson
 8,439,977 B2 5/2013 Kostuik et al.
 8,449,585 B2 5/2013 Wallenstein et al.
 8,585,761 B2 11/2013 Theofilos
 8,590,157 B2 11/2013 Kruth et al.
 8,673,011 B2 3/2014 Theofilos et al.
 8,697,231 B2 4/2014 Longepied et al.
 8,784,721 B2 7/2014 Philippi et al.
 8,801,791 B2 8/2014 Soo et al.
 8,814,919 B2 8/2014 Barrus et al.
 8,843,229 B2 9/2014 Vanasse et al.
 8,870,957 B2 10/2014 Vraney et al.
 8,903,533 B2 12/2014 Eggers et al.
 8,932,356 B2 1/2015 Kraus
 8,967,990 B2 3/2015 Weidinger et al.
 8,999,711 B2 4/2015 Harlow et al.
 9,011,982 B2 4/2015 Muller et al.
 9,283,078 B2 3/2016 Roels et al.
 D786,434 S * 5/2017 Trautwein D24/155
 9,700,431 B2 * 7/2017 Nebosky A61F 2/447
 2001/0047207 A1 11/2001 Michelson
 2001/0047208 A1 11/2001 Michelson
 2002/0128714 A1 9/2002 Manasas et al.
 2003/0040798 A1 2/2003 Michelson
 2003/0135276 A1 7/2003 Eckman
 2004/0024400 A1 2/2004 Michelson
 2004/0243237 A1 12/2004 Unwin et al.
 2004/0249471 A1 12/2004 Bindseil et al.
 2005/0021151 A1 1/2005 Landis
 2005/0149192 A1 7/2005 Zucherman et al.
 2005/0177238 A1 8/2005 Khandkar et al.
 2007/0233272 A1 10/2007 Boyce et al.
 2009/0093881 A1 4/2009 Bandyopadhyay et al.
 2009/0270986 A1 * 10/2009 Christensen A61F 2/4425
 623/17.14
 2009/0291308 A1 11/2009 Pfister et al.
 2010/0100131 A1 4/2010 Wallenstein
 2010/0137990 A1 6/2010 Apatsidis et al.
 2010/0228369 A1 9/2010 Eggers et al.
 2010/0234966 A1 * 9/2010 Lo A61F 2/4455
 623/23.51
 2011/0144752 A1 6/2011 Defelice et al.
 2011/0165340 A1 7/2011 Baumann
 2011/0168091 A1 7/2011 Baumann et al.
 2011/0190888 A1 * 8/2011 Bertele A61F 2/446
 623/17.11
 2011/0190904 A1 8/2011 Lechmann et al.
 2011/0301709 A1 12/2011 Kraus et al.
 2012/0046750 A1 2/2012 Obrigkeit et al.
 2012/0143334 A1 6/2012 Boyce et al.
 2012/0158062 A1 6/2012 Nunley et al.
 2012/0179261 A1 7/2012 Soo
 2012/0191188 A1 7/2012 Huang
 2012/0191189 A1 7/2012 Huang
 2012/0303128 A1 * 11/2012 Ullrich, Jr. A61F 2/4465
 623/17.16
 2012/0310364 A1 12/2012 Li et al.
 2013/0046345 A1 2/2013 Jones et al.
 2013/0110243 A1 5/2013 Patterson et al.
 2013/0116793 A1 5/2013 Kloss
 2013/0171019 A1 7/2013 Gessler et al.
 2013/0273131 A1 10/2013 Frangov et al.
 2014/0088716 A1 3/2014 Zubok et al.
 2014/0107785 A1 4/2014 Geisler et al.

2014/0107786 A1 4/2014 Geisler et al.
 2014/0172111 A1 6/2014 Lang et al.
 2015/0018956 A1 1/2015 Steinmann et al.
 2015/0045924 A1 2/2015 Cluckers et al.
 2015/0134063 A1 5/2015 Steinmann et al.
 2015/0142158 A1 5/2015 Szwedka
 2015/0367575 A1 12/2015 Roels et al.
 2016/0058575 A1 3/2016 Sutterlin, III et al.

FOREIGN PATENT DOCUMENTS

EP 0425542 B1 3/1995
 EP 1464307 A1 10/2004
 EP 1905391 B1 1/2010
 EP 2145913 A1 1/2010
 EP 2457538 A1 5/2012
 EP 1772108 B1 11/2015
 WO 9000037 A1 1/1990
 WO 9405235 A1 3/1994
 WO 9419174 A1 9/1994
 WO 9510248 A1 4/1995
 WO 9532673 A1 12/1995
 WO 9608360 A1 3/1996
 WO 9628117 A1 9/1996
 WO 9640015 A1 12/1996
 WO 9640019 A1 12/1996
 WO 9734546 A1 9/1997
 WO 0025707 A1 5/2000
 WO 0040177 A1 7/2000
 WO 0066045 A1 11/2000
 WO 0202151 A2 1/2002
 WO 0230337 A2 4/2002
 WO 02080820 A1 10/2002
 WO 2006101837 A2 9/2006
 WO 2009068021 A1 6/2009
 WO 2011030017 A1 3/2011
 WO 201317647 A1 2/2013
 WO 2013155500 A1 10/2013
 WO 2013156545 A1 10/2013
 WO 201496294 A1 6/2014

OTHER PUBLICATIONS

Fukuda, et al., Bone Ingrowth into Pores of Lotus Stem—Type Bioactive Titanium Implants Fabricated Using Rapid Prototyping Technique, *Bioceramics Development and Applications*, vol. 1 (2011), Article ID D110125, 3 pages.
 Williams et al., CT Evaluation of Lumbar Interbody Fusion: Current Concepts, *AJNR Am J Neuroradiol* 26:2057-2066, Sep. 2005.
 Cunningham et al, Design of Interbody Fusion Cages: Historical Considerations and Current Perspectives in Cage Technology; *Surgical Techniques, Spinal Implants*, pp. 421-465, 2006.
 Akamaru et al., Healing of Autologous Bone in a Titanium Mesh Cage Used in Anterior Column Reconstruction After Total Spondylectomy; *SPINE* vol. 27, No. 13, pp. E329-E333, 2002.
 Lin et al., Interbody Fusion Cage Design Using Integrated Global Layout and Local Microstructure Topology Optimization; *SPINE*, vol. 29, No. 16, pp. 1747-1754, 2004.
 McAfee, Interbody Fusion Cages in Reconstructive Operations on the Spine, *The Journal of Bone and Joint Surgery Incorporated*, vol. 81A, No. 6, Jun. 1999, pp. 859-880.
 Zdeblick, et al., LT-CAGE Lumbar Tapered Fusion Device Surgical Technique, *Medtronic*, pp. 1-25, 2000.
 Kuslich, Lumbar Interbody Cage Fusion for Back Pain: An Update on the Bak (Bagby and Kuslich) System, *SPINE: State of the Art Reviews*; vol. 13, No. 2, May 1999, pp. 295-311.
 Cheung et al., Spinal Instrumentation Overview in Lumbar Degenerative Disorders: Cages, Lumbar Spine: Official Publication of the International Society for the Study of Lumbar Spine (3), pp. 286-291, 2004.
 Sasso, Screws, Cages or Both?, <<http://www.spineuniverse.com/professional/technology/surgical/thoracic/>>, pp. 1-11, Sep. 2012.
 Costa et al., Stand-alone cage for posterior lumbar interbody fusion in the treatment of high-degree degenerative disc disease: design of

(56)

References Cited

OTHER PUBLICATIONS

a new device for an “old” technique. A prospective study on a series of 116 patients, *Eur Spine J.* May 2011: 20 (Suppl 1), pp. 46-56.

Lin, et al. Structural and mechanical evaluations of a topology optimized titanium interbody fusion cage fabricated by selective laser melting process, *Journal of Biomedical Materials Research Part A* DOI 10.1002/jbm.A, pp. 272-279, Apr. 2007.

Chong et al., The design evolution of interbody cages in anterior cervical discectomy and fusion: a systematic review; *BMC Musculoskeletal Disorders* 2015 16:99, pp. 1-20.

Bridwell et al., Specialty Update, What’s New in Spine Surgery, *The Journal of Bone and Joint Surgery, Incorporated*, pp. 1022-1030, Core 1st page of article, 2015.

EBI Spine, Promotional flyer, 1 page 2005.

Synthes Contact Fusion Cage, Technique Guide, 2007, pp. 1-16.

Stryker, Tritanium basic science summary, technical monograph, pp. 1-2, 2016.

Sofamar Danek Interim Thread Fusion Device, pp. 32-45, 1999.

Kim et al. *Spinal Instrumentation Surgical Techniques*, Thieme Medical publishers, 2004, pp. 232-245, 518-524, 532-537, 736-743, 795-800.

* cited by examiner

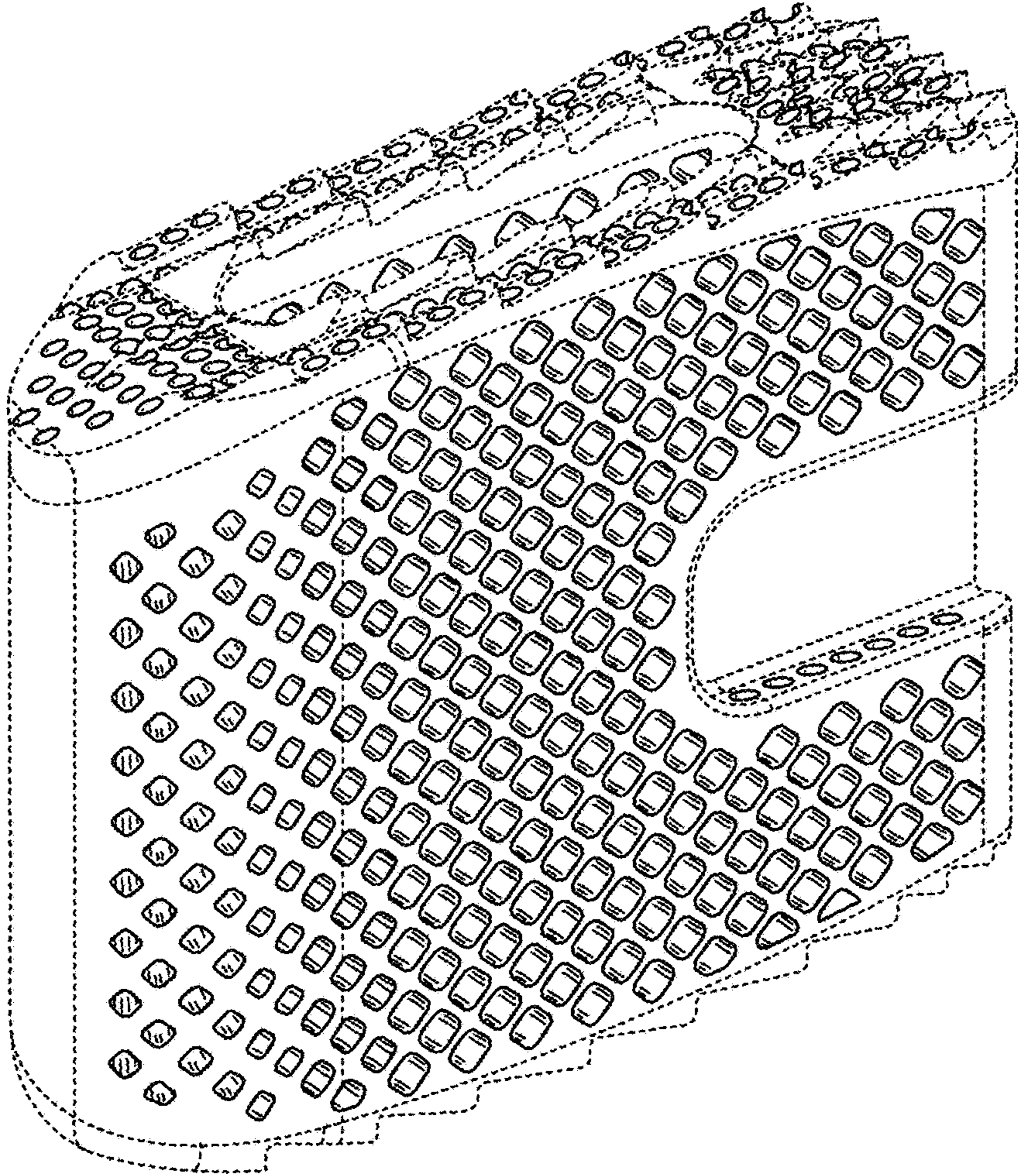


FIG. 1

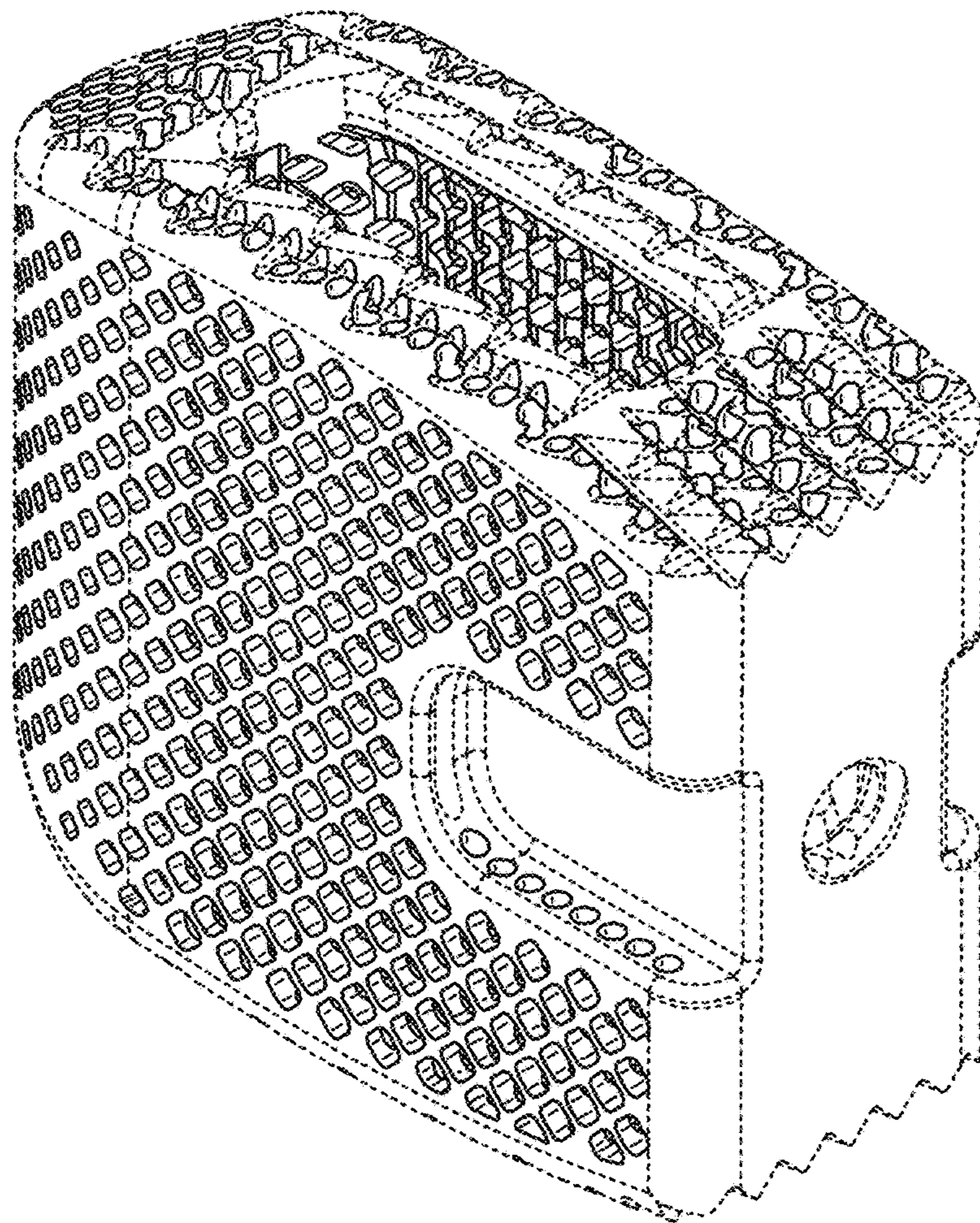


FIG. 2

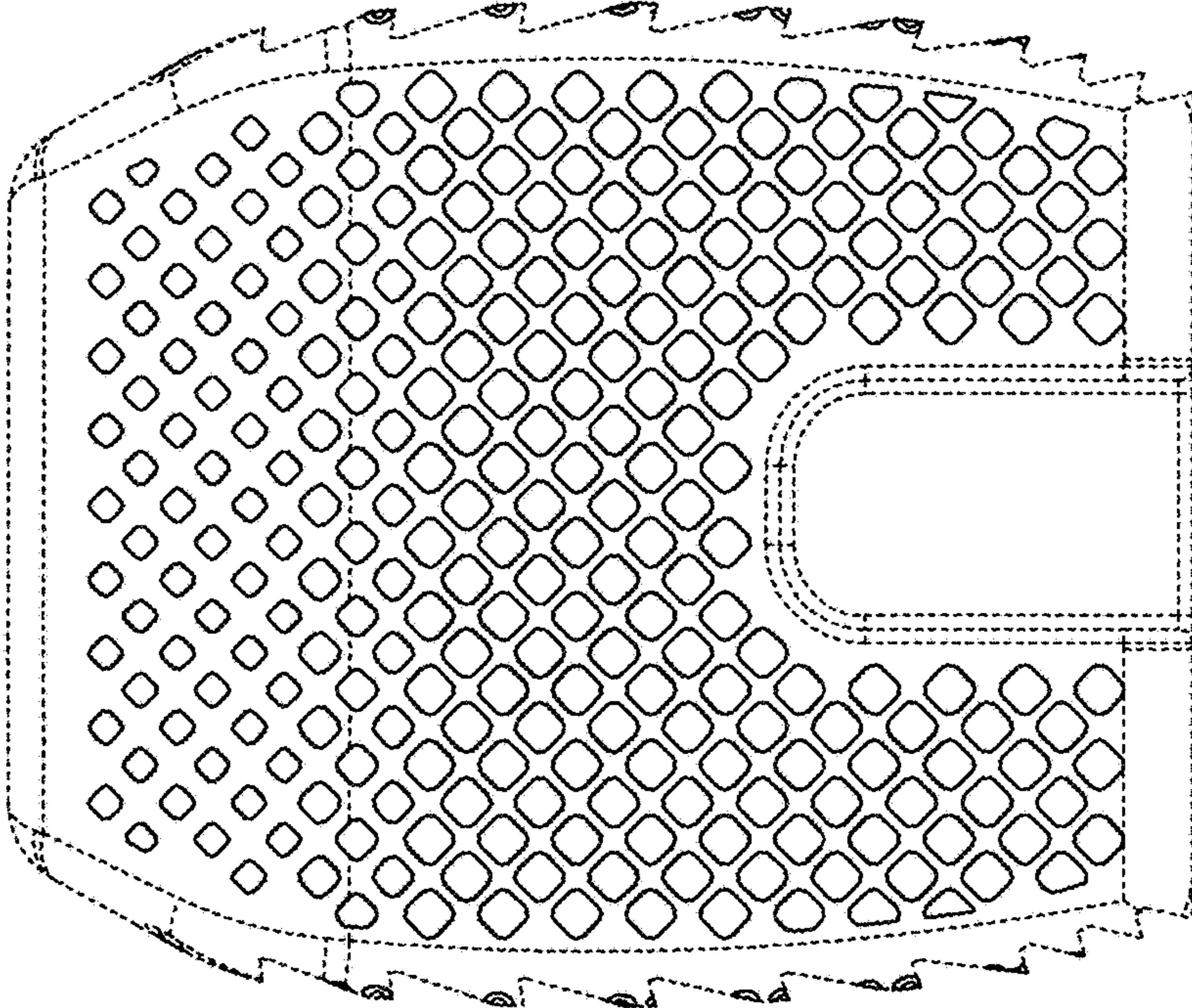


FIG. 3

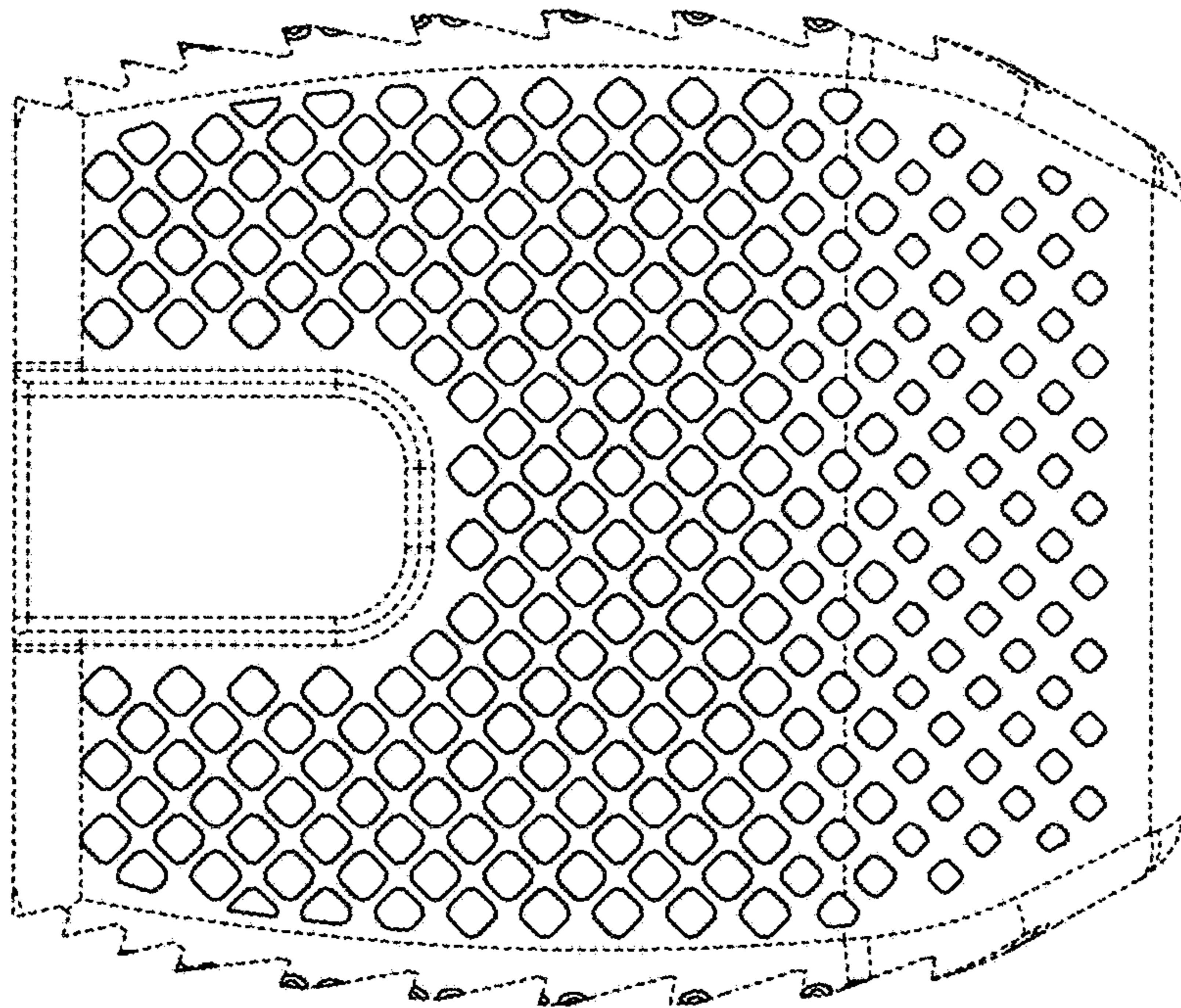


FIG. 4

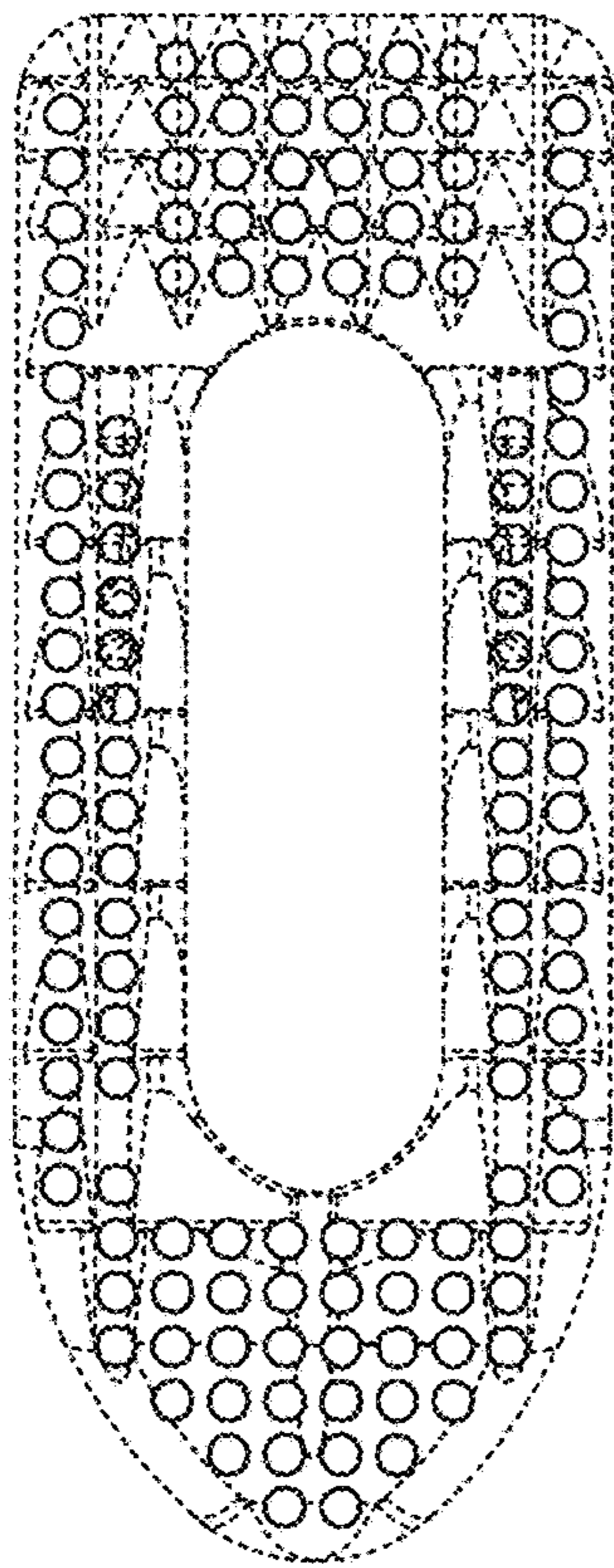


FIG. 5

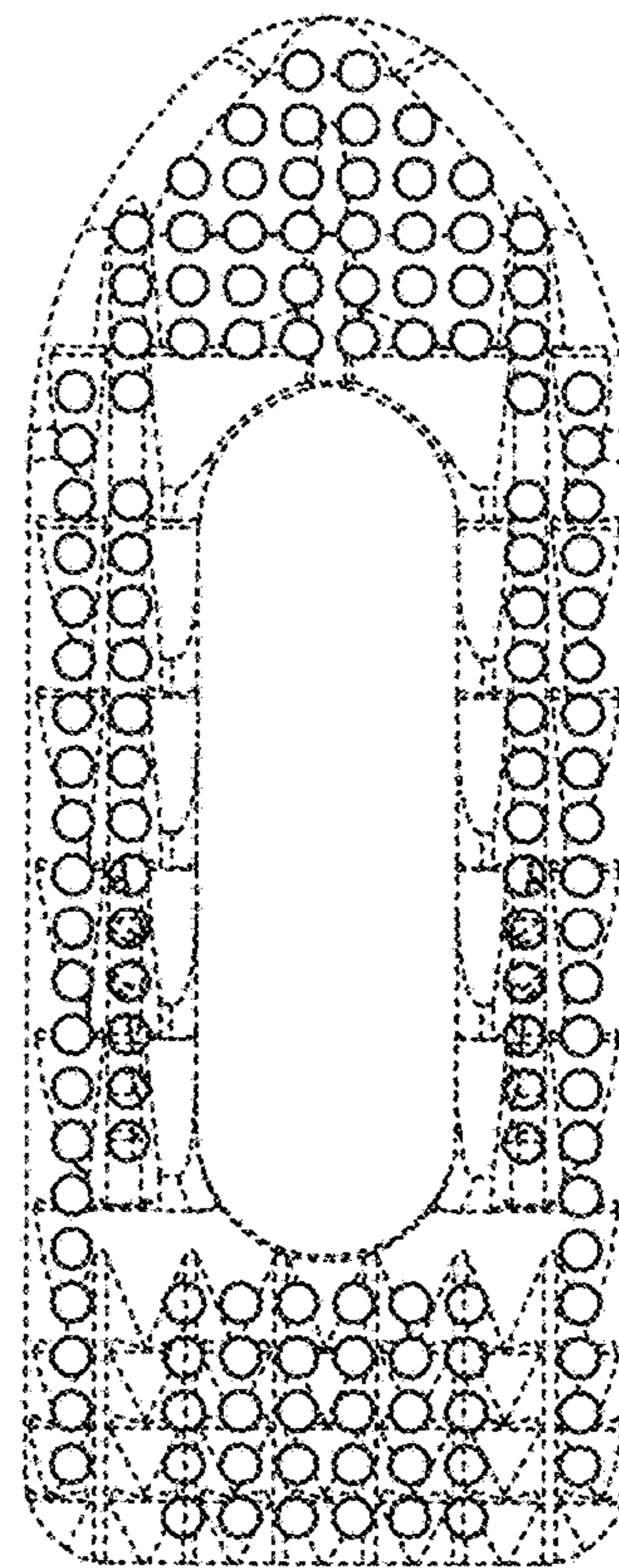


FIG. 6