US00D824518S

(12) United States Design Patent

Wilson et al.

(10) Patent No.: US D824,518 S
(45) Date of Patent: ** Jul. 31, 2018

(54) **SPINAL IMPLANT**

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

(21) Appl. No.: **29/609,254**

(22) Filed: **Jun. 29, 2017**

Related U.S. Application Data

(63) Continuation of application No. 15/007,678, filed on Jan. 27, 2016.

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

(52) **U.S. Cl.**
USPC **D24/155**

(58) **Field of Classification Search**
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
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.
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

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

(Continued)

OTHER PUBLICATIONS

Extended European Search Report for EP 16 15 2952 dated Jul. 1, 2016.

(Continued)

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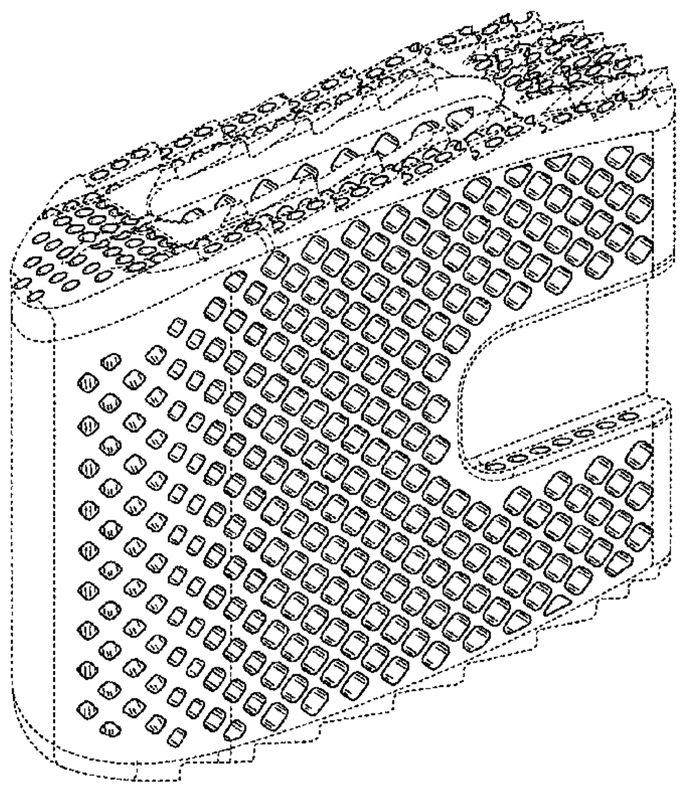
(57) **CLAIM**

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

DESCRIPTION

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.

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, Ttritanium 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

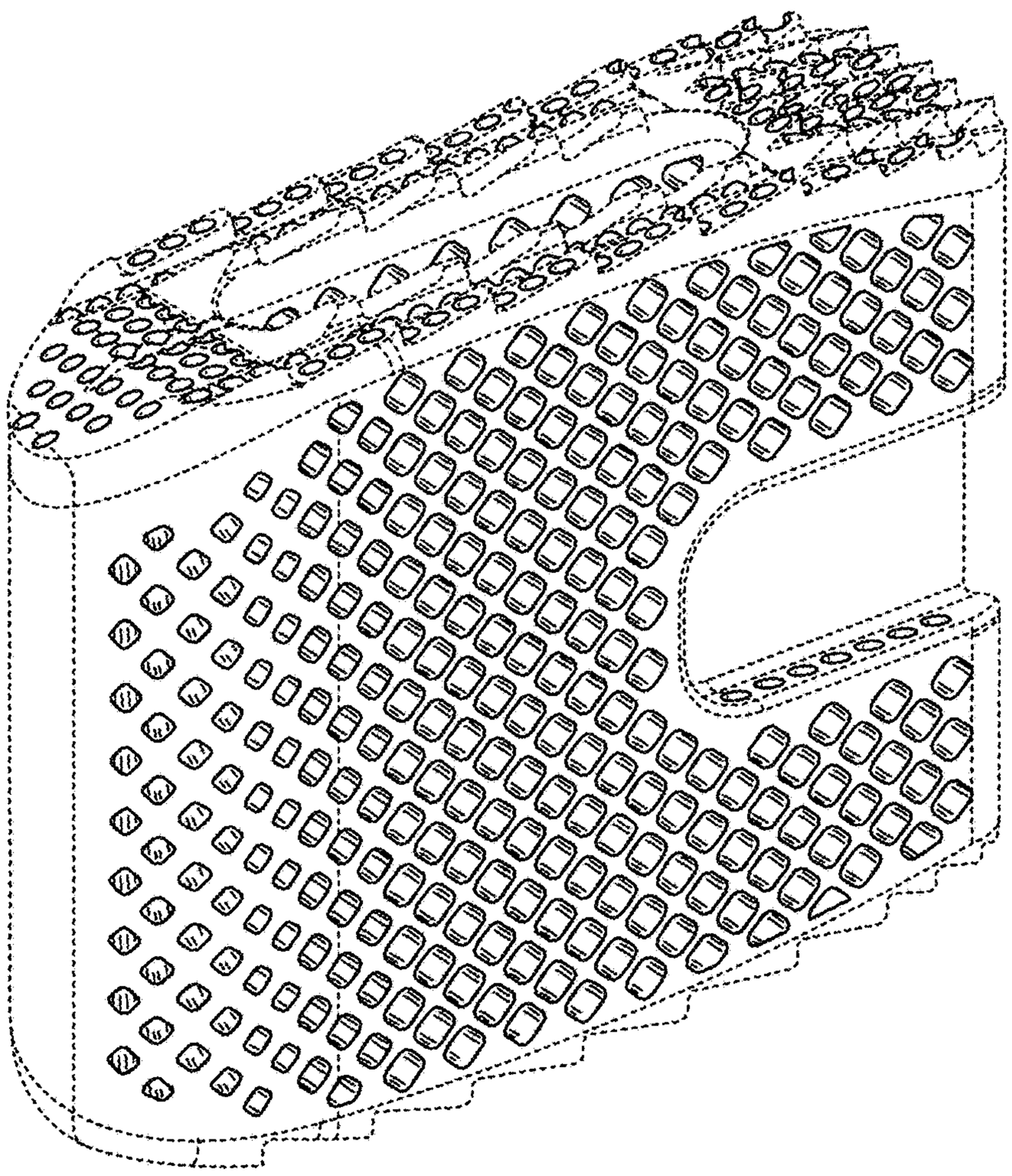


FIG. 1

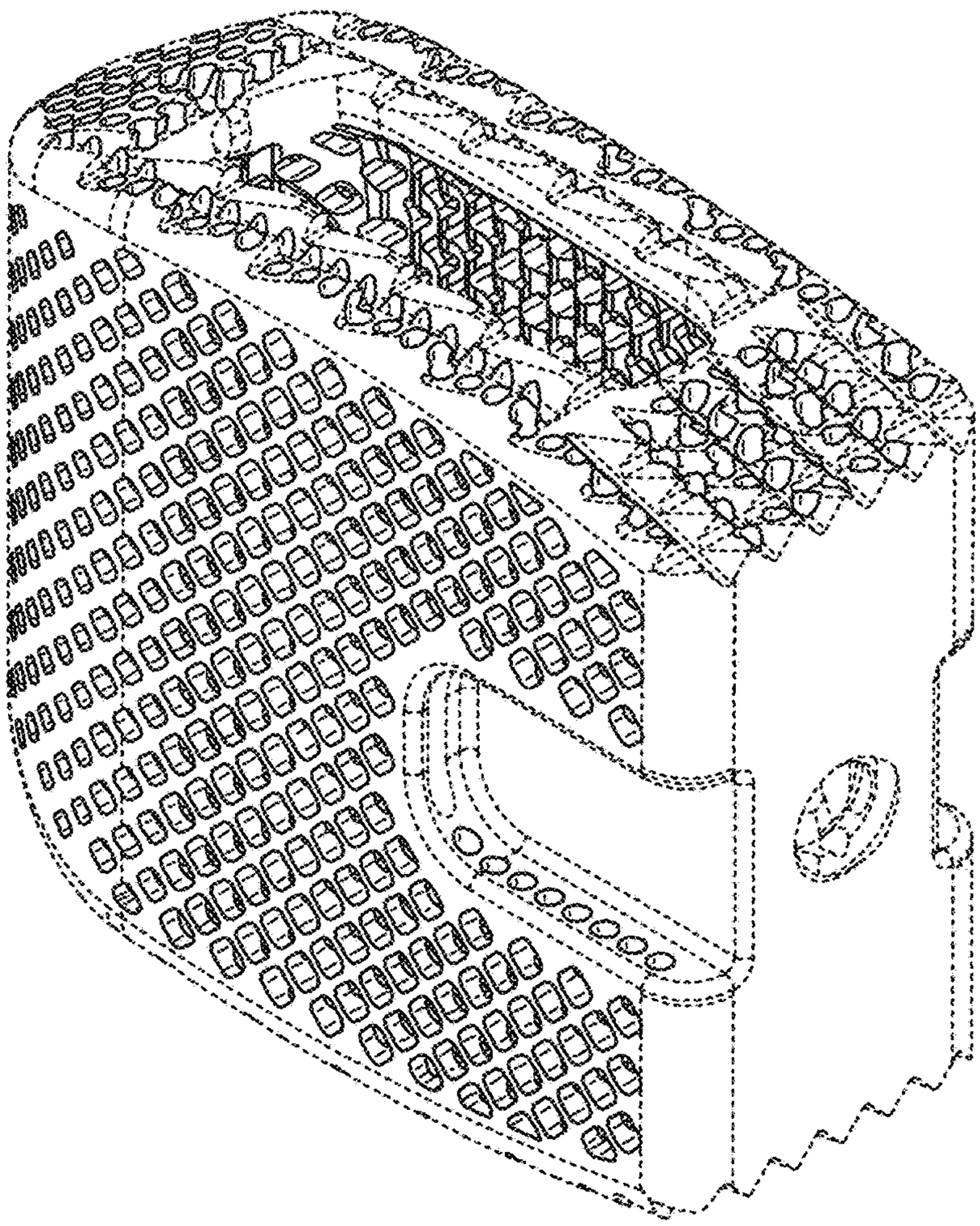


FIG. 2

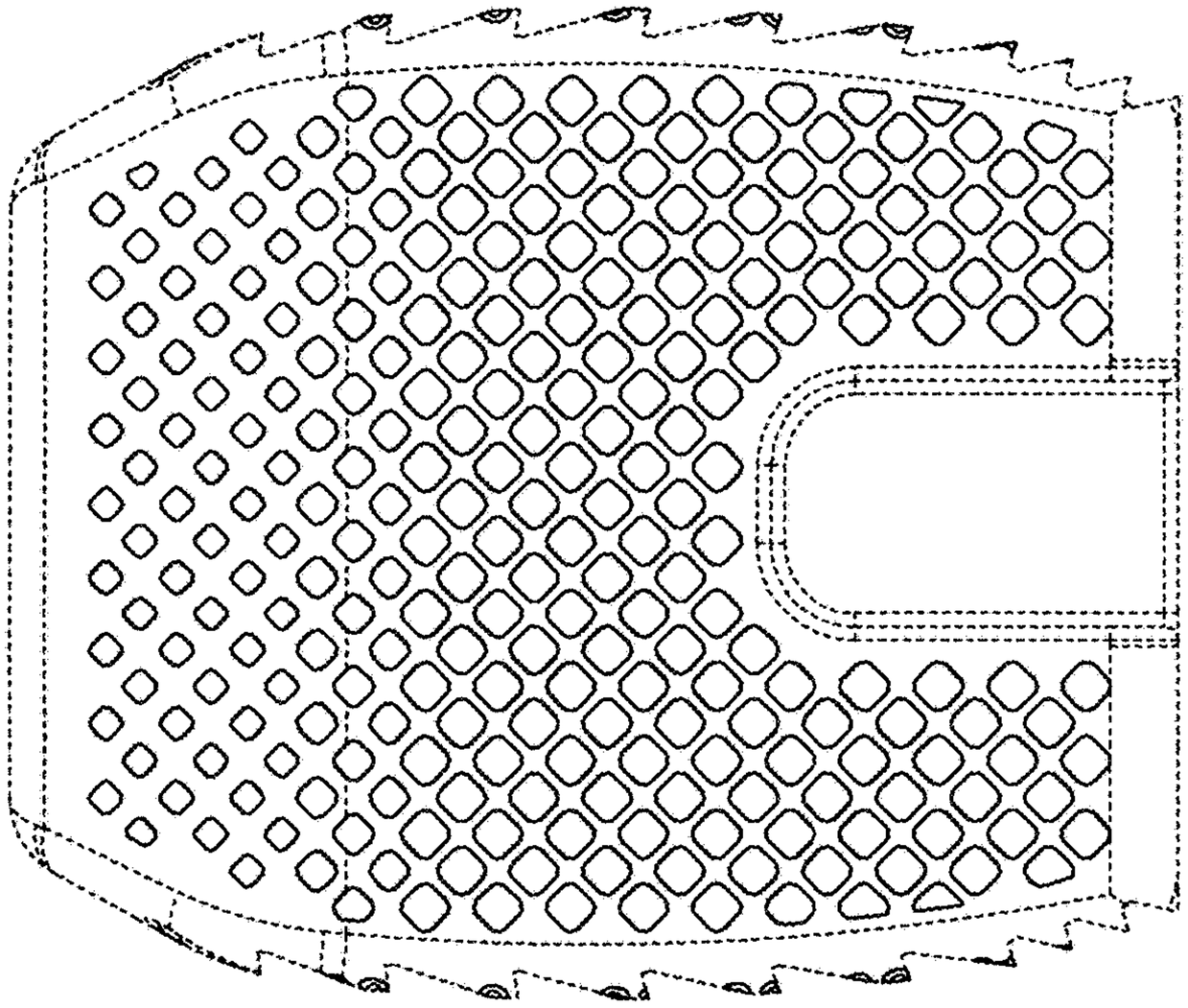


FIG. 3

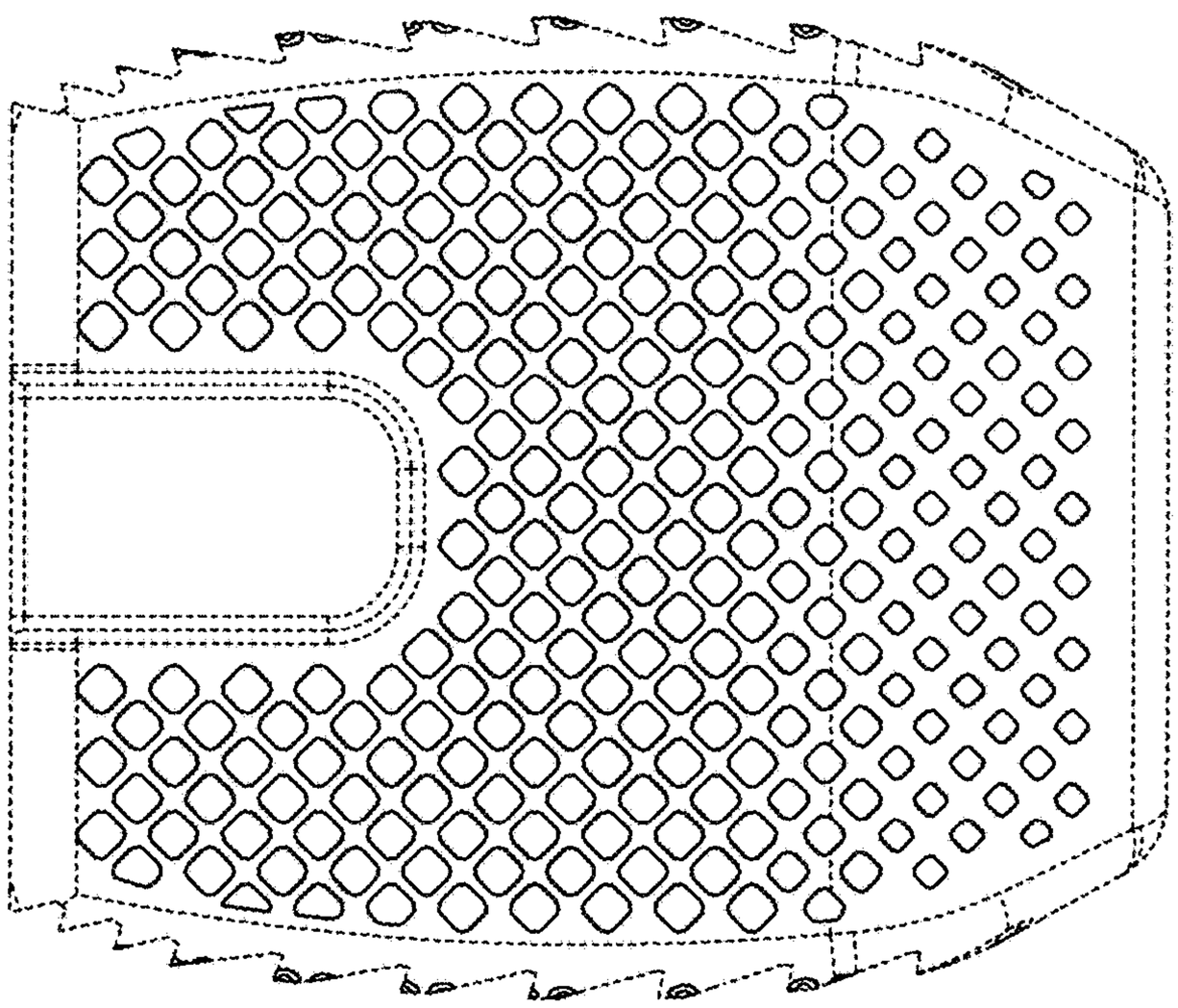


FIG. 4

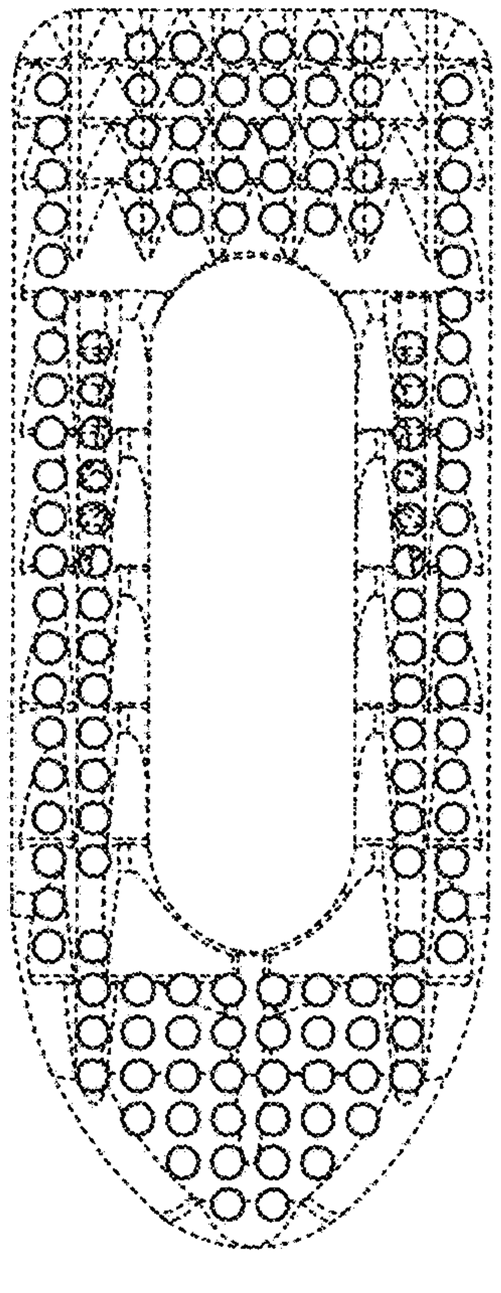


FIG. 5

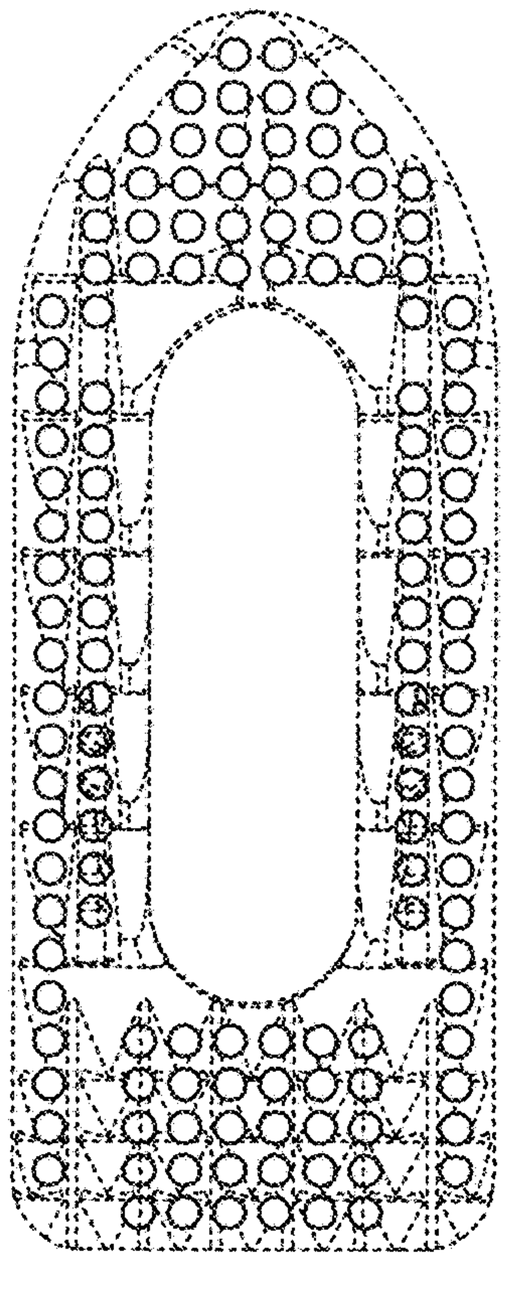


FIG. 6