



US00D752222S

(12) **United States Design Patent**  
**Robichaud et al.**

(10) **Patent No.:** **US D752,222 S**  
(45) **Date of Patent:** **\*\* Mar. 22, 2016**

(54) **FEMORAL PROSTHESIS**

- (71) Applicant: **Laboratoires Bodycad Inc.**, Quebec (CA)
- (72) Inventors: **Jean Robichaud**, Quebec (CA); **Marc Bedard**, Pont-Rouge (CA); **Geoffroy Rivet-Sabourin**, Stoneham (CA); **Florent Miquel**, Quebec (CA)
- (73) Assignee: **LABORATOIRES BODYCAD INC.**, Quebec (CA)
- (\*\*) Term: **14 Years**
- (21) Appl. No.: **29/454,756**
- (22) Filed: **May 14, 2013**
- (51) **LOC (10) Cl.** ..... **24-02**
- (52) **U.S. Cl.**  
USPC ..... **D24/155**
- (58) **Field of Classification Search**  
USPC ..... D24/155–156, 176, 171; D15/21, 28;  
433/172–174; 623/17.16, 17.17, 11.11,  
623/23.26, 23.27; 606/266, 328, 54, 264,  
606/273, 250  
See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

D242,827	S	12/1976	Elliott	
4,659,331	A *	4/1987	Matthews et al.	623/20.21
D291,003	S *	7/1987	Huckstep	D24/155
D374,078	S *	9/1996	Johnson et al.	D24/155
5,878,170	A	3/1999	Kim	
6,249,594	B1	6/2001	Hibbard	
6,345,112	B1	2/2002	Summers et al.	
D473,307	S *	4/2003	Cooke	D24/155

(Continued)

**FOREIGN PATENT DOCUMENTS**

WO	2009052562	A1	4/2009
WO	2011150238	A1	12/2011

(Continued)

**OTHER PUBLICATIONS**

Kapur et al., Model Based Segmentation of Clinical Knee MRI, 1998, 9 pages, Massachusetts Institute of Technology, Artificial Intelligence Laboratory, Cambridge, Massachusetts, USA.  
(Continued)

*Primary Examiner* — Susan Bennett Hattan  
*Assistant Examiner* — Charles Hanson  
(74) *Attorney, Agent, or Firm* — Sutherland, Asbill & Brennan LLP

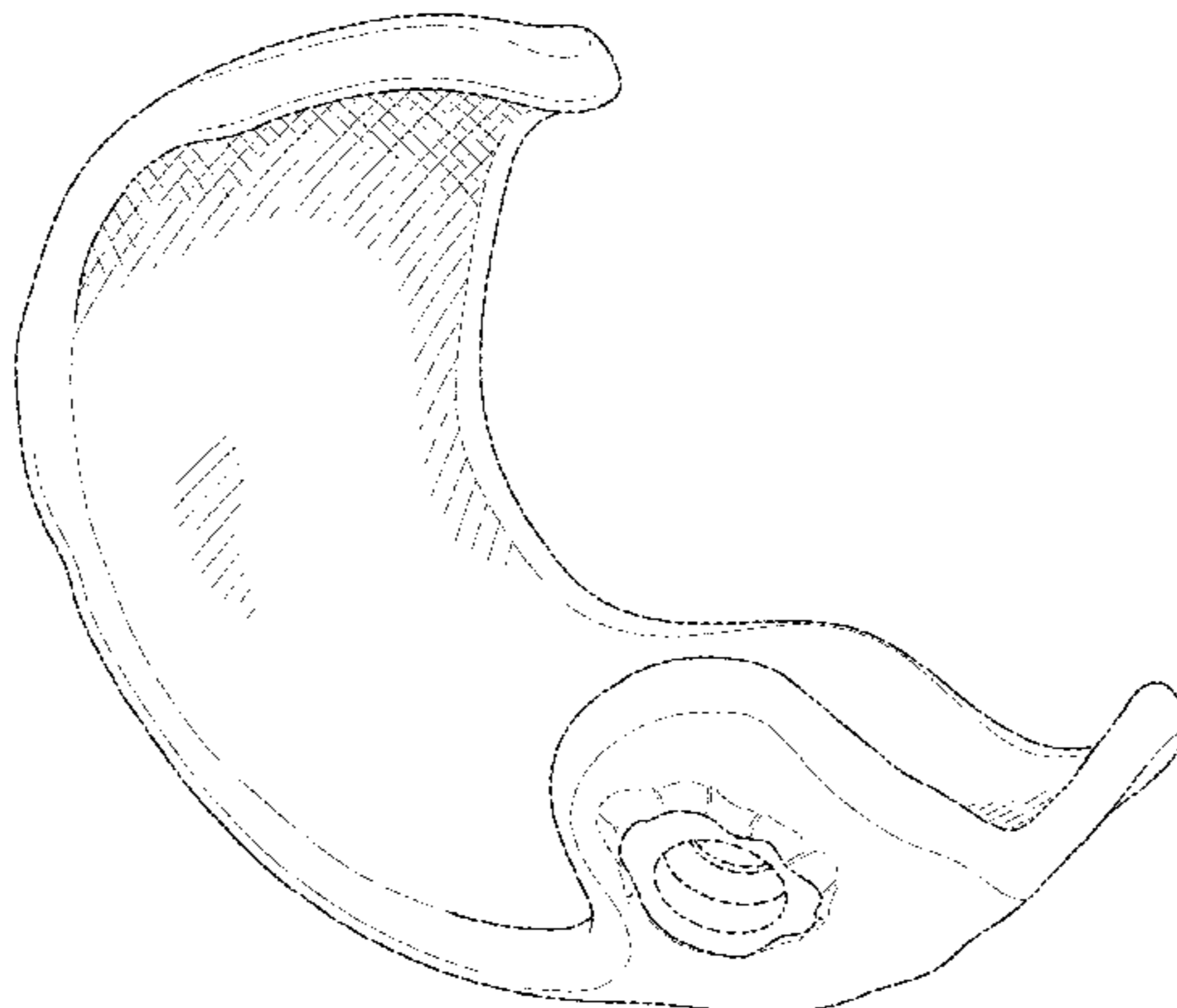
(57) **CLAIM**

The ornamental design for a femoral prosthesis, as shown and described.

**DESCRIPTION**

FIG. 1 is a perspective view of a femoral prosthesis showing our new design;  
FIG. 2 is a front elevation view of the femoral prosthesis shown in FIG. 1;  
FIG. 3 is a rear elevation view of the femoral prosthesis shown in FIG. 1;  
FIG. 4 is a left-side elevation view of the femoral prosthesis shown in FIG. 1;  
FIG. 5 is a right-side elevation view of the femoral prosthesis shown in FIG. 1;  
FIG. 6 is a top plan view of the femoral prosthesis shown in FIG. 1;  
FIG. 7 is a bottom plan view of the femoral prosthesis shown in FIG. 1;  
FIG. 8 is a front perspective view of the femoral prosthesis shown in FIG. 1 mounted on a femur; and,  
FIG. 9 is a rear perspective of the femoral prosthesis shown in FIG. 1 mounted on a femur.  
The portions shown in broken lines do not form part of the claimed design.

**1 Claim, 9 Drawing Sheets**



(56)

**References Cited**

U.S. PATENT DOCUMENTS

6,912,310	B1	6/2005	Park et al.	
D528,209	S	9/2006	Furlong et al.	
7,184,814	B2	2/2007	Lang et al.	
7,376,254	B2	5/2008	Barth	
7,773,786	B2	8/2010	Fidrich et al.	
7,799,077	B2	9/2010	Lang et al.	
D625,415	S *	10/2010	Otto et al.	D24/155
D638,541	S	5/2011	Claypool	
7,995,810	B2	8/2011	Li et al.	
8,036,729	B2	10/2011	Lang et al.	
D649,639	S *	11/2011	Bertoni et al.	D24/140
D651,317	S	12/2011	May et al.	
8,073,252	B2	12/2011	Florin et al.	
8,077,950	B2	12/2011	Tsougarakis et al.	
8,090,172	B2	1/2012	Shinagawa et al.	
8,098,909	B2	1/2012	Hibbard et al.	
8,112,142	B2	2/2012	Alexander et al.	
8,160,345	B2	4/2012	Pavlovskaja et al.	
D661,808	S *	6/2012	Kang	D24/155
8,715,359	B2 *	5/2014	Deffenbaugh et al.	623/20.29
2008/0030497	A1	2/2008	Hu et al.	
2008/0139922	A1	6/2008	Pelletier et al.	
2009/0076371	A1	3/2009	Lang et al.	
2009/0136103	A1	5/2009	Sonka et al.	
2009/0190815	A1	7/2009	Dam et al.	
2009/0226060	A1	9/2009	Gering et al.	
2009/0306496	A1	12/2009	Koo et al.	
2009/0319047	A1	12/2009	Walker	
2009/0324078	A1	12/2009	Wu et al.	
2010/0232671	A1	9/2010	Dam et al.	
2011/0066245	A1	3/2011	Lang et al.	
2011/0144760	A1	6/2011	Wong et al.	
2011/0295378	A1	12/2011	Bojarski et al.	
2011/0304332	A1	12/2011	Mahfouz	
2012/0004725	A1	1/2012	Shterling et al.	
2012/0197408	A1	8/2012	Lang et al.	
2012/0209394	A1	8/2012	Bojarski et al.	
2012/0316563	A1	12/2012	Metzger et al.	
2012/0323334	A1	12/2012	Jones et al.	
2012/0323337	A1	12/2012	Parisi et al.	

FOREIGN PATENT DOCUMENTS

WO	2012017375	A2	2/2012
WO	2012051178	A2	4/2012

OTHER PUBLICATIONS

Lynch et al., Cartilage Segmentation of 3D MRI Scans of the Osteoarthritic Knee Combining User Knowledge and Active Countours, Jun. 2000, 11 pages, Osteoporosis & Arthritis Research Group, Department of Radiology, UCSF, San Francisco, CA, USA.

Yezzi et al., A Variational Framework for Joint Segmentation and Registration, 2001, 8 pages, School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, GA, Artificial Intelligence Laboratory, Cambridge, MA, Visualization Technology Inc.; Lawrence, MA, USA.

Pakin et al., Segmentation, Surface Extraction and Thickness Computation of Articular Cartilage, 2002, 13 pages, University of Rochester, Electrical and Computer Engineering, Rochester NY, University of Rochester, Department of Radiology, Rochester NY, USA.

Ray et al., Merging Parametric Active Countours Within Homogeneous Image Regions for MRI-Based Lung Segmentation, Feb. 2003, 11 pages, IEEE Transactions on Medical Imaging, vol. 22, No. 2.

Tamez-Pena et al., Knee Cartilage Extraction and Bone-Cartilage Interface Analysis From 3D MRI Data Sets, 2004, 11 pages, Osteoporosis & Arthritis Research Group, Department of Radiology, UCSF, San Francisco, CA, USA.

Yushkevich et al., User-Guided 3D Active Contour Segmentation of Anatomical Structures: Significantly Improved Efficiency and Reliability, 2006, 13 pages, Penn Image Computing and Science Laboratory, Dept. of Radiology, University of Pennsylvania, PA, Depts. of Computer Science and Psychiatry, University of North Carolina, NC, Neurodevelopmental Disorders Research Center, University of North Carolina, NC, USA.

Folkesson et al. Segmenting Articular Cartilage Automatically Using a Voxel Classification Approach, Jan. 2007, 10 pages, IEEE Transactions on Medical Imaging, vol. 26, No. 1.

El Naqa et al, Concurrent Multimodality Image Segmentation by Active Contours for Radiotherapy Treatment Planning, Dec. 2007, 12 pages, Department of Radiation Oncology, School of Medicine, Washington University, St. Louis, Missouri, USA.

Sun et al., Active Contour Based Subthalamic Nucleus Segmentation on MRI Mippr 2009: Medical Imaging, Parallel Processing of Images, and Opimization Techniques, 2009, 12 pages, Dept. of Biomedical Engineering, Nanchang Hangkong University, Nanchang, China.

Williams et al., Anatomically Corresponded Regional Analysis of Cartilage in Asymptomatic and Osteoarthritic Knees by Statistical Shape Modelling of the Bone, Aug. 2010, 19 pages, IEEE Transactions on Medical Imaging, vol. 29, No. 8.

Yin et al., Logismos-Layered Optimal Graph Image Segmentation of Multiple Objects and Surfaces: Cartilage Segmentation in the Knee Joint, Dec. 2010, 15 pages, IEEE Transactions on Medical Imaging, vol. 29, No. 12.

Yin et al., Electric Field Theory Based Approach to Search-Direction Line Definition in Image Segmentation: Application to Optimal Femur-Tibia Cartilage Segmentation in Knee-Joint 3-D MR, 2010, 9 pages, Dept. of Electrical and Computer Engineering, The University of Iowa, Iowa City, Iowa, USA.

Tamez-Pena et al., Unsupervised Segmentation and Quantification of Anatomical Knee Features: Data From The Osteoarthritis Initiative, 19 pages, Apr. 2012, IEEE Transactions on Medical Imaging, vol. 29, No. 8.

\* cited by examiner



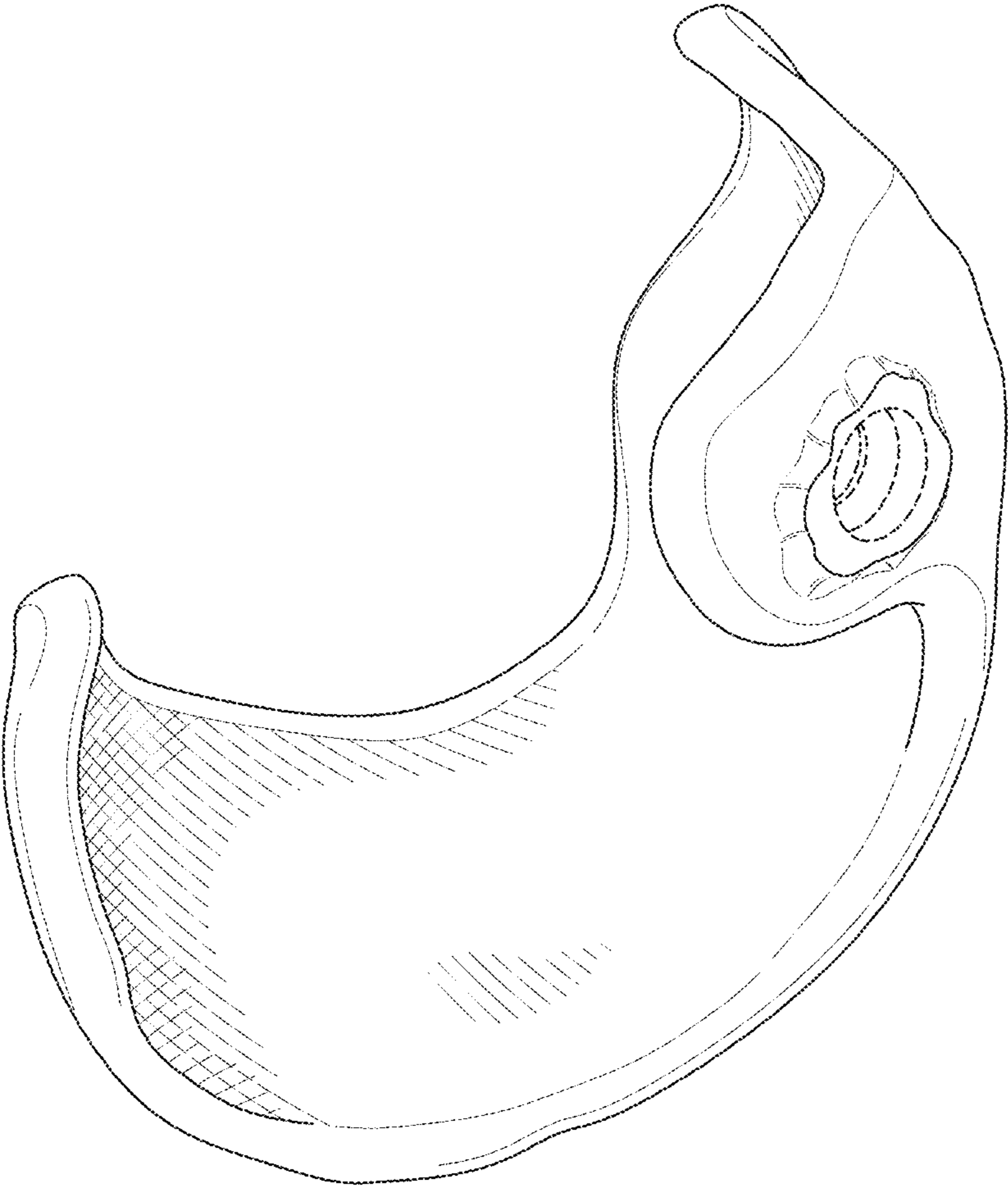


FIG. 1

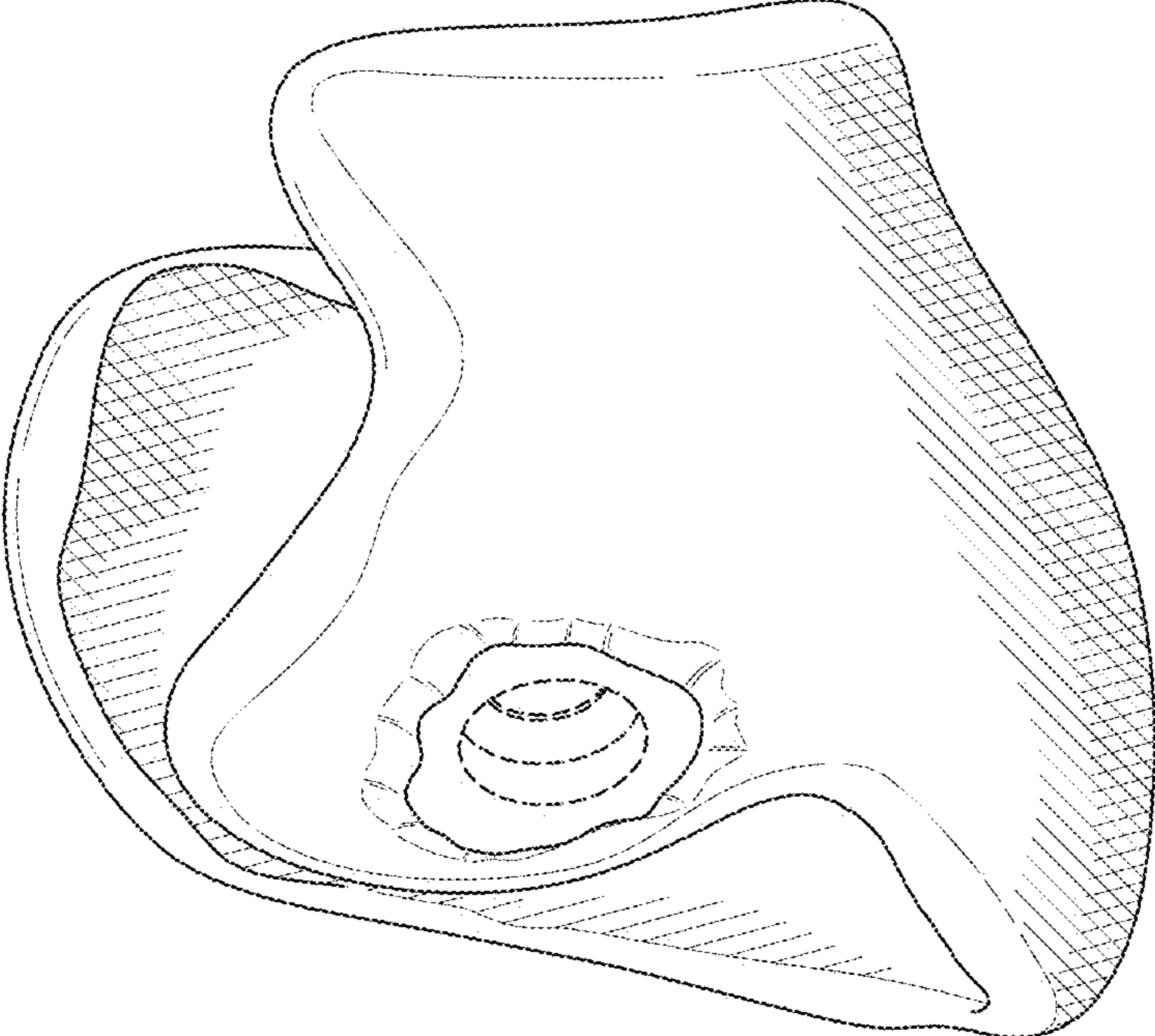


FIG. 2

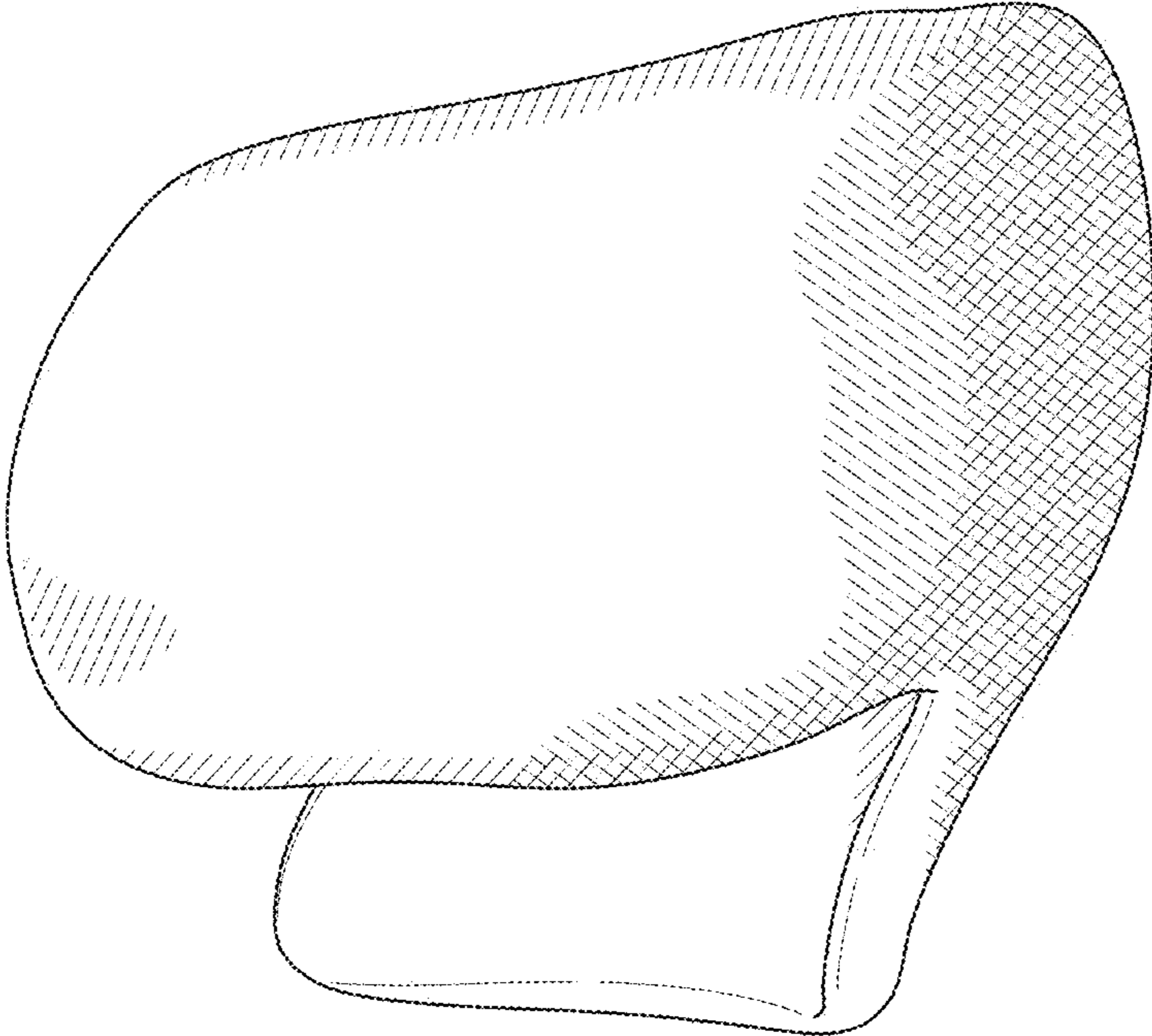


FIG. 3

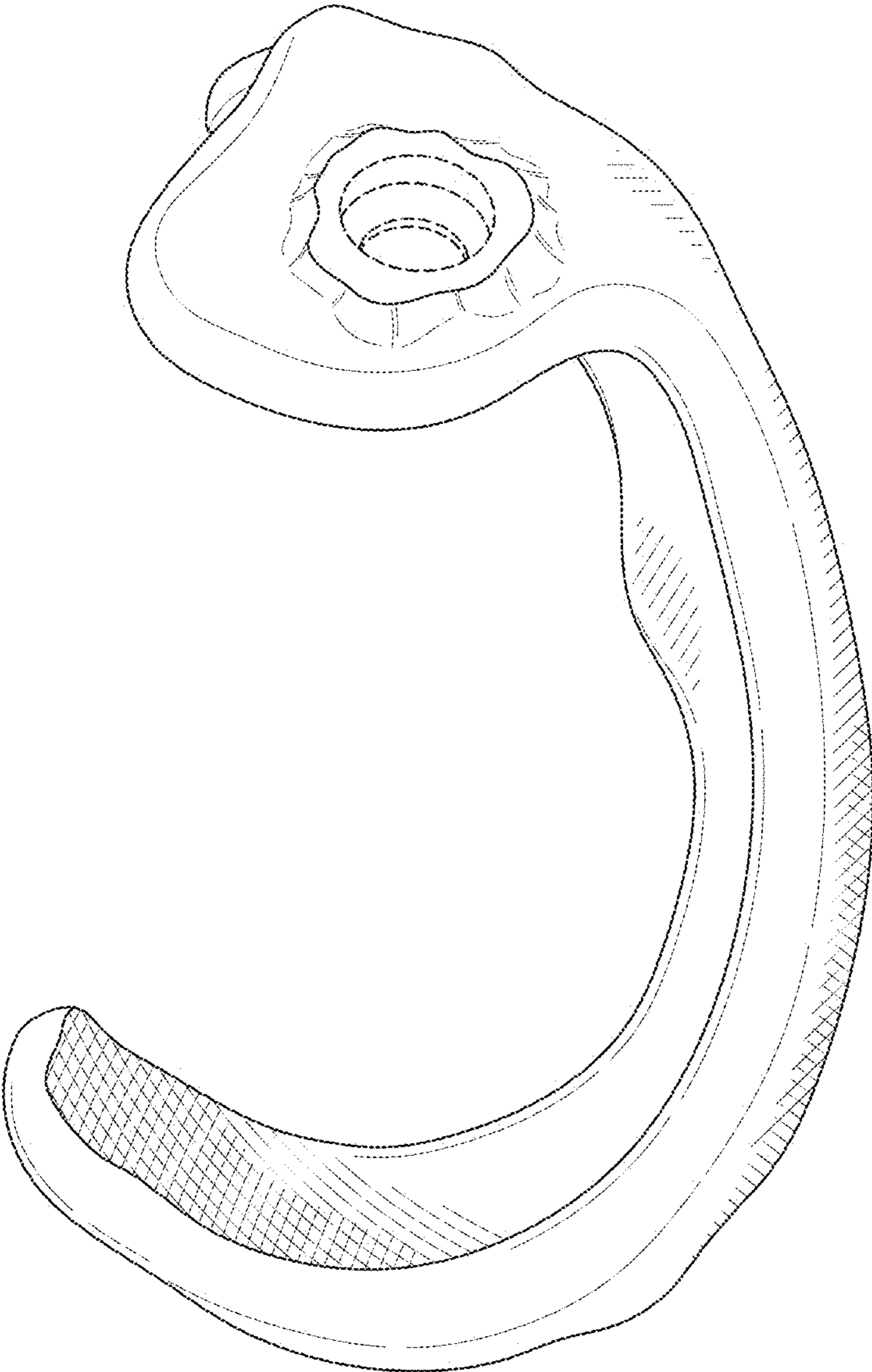


FIG. 4

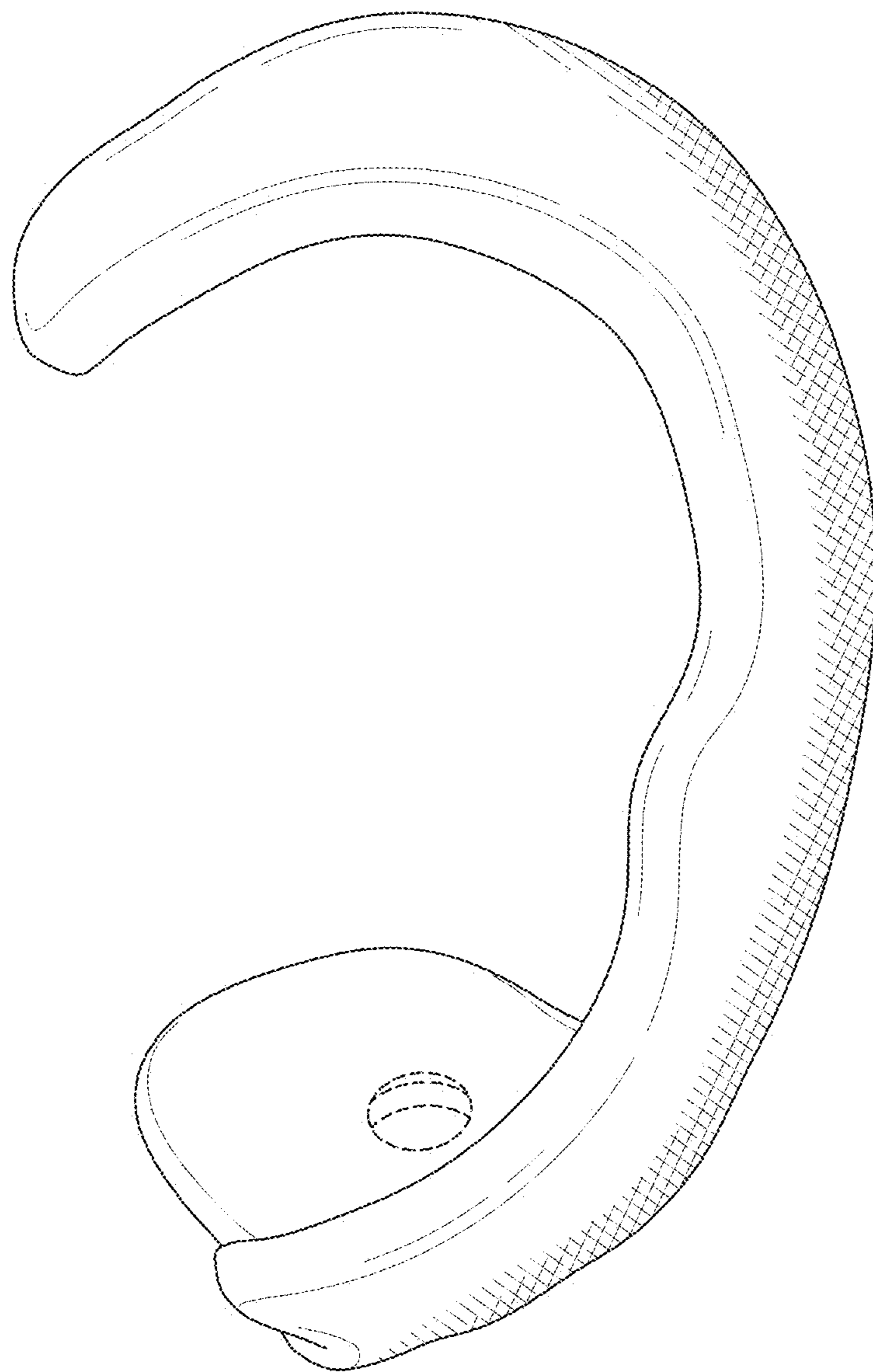


FIG. 5

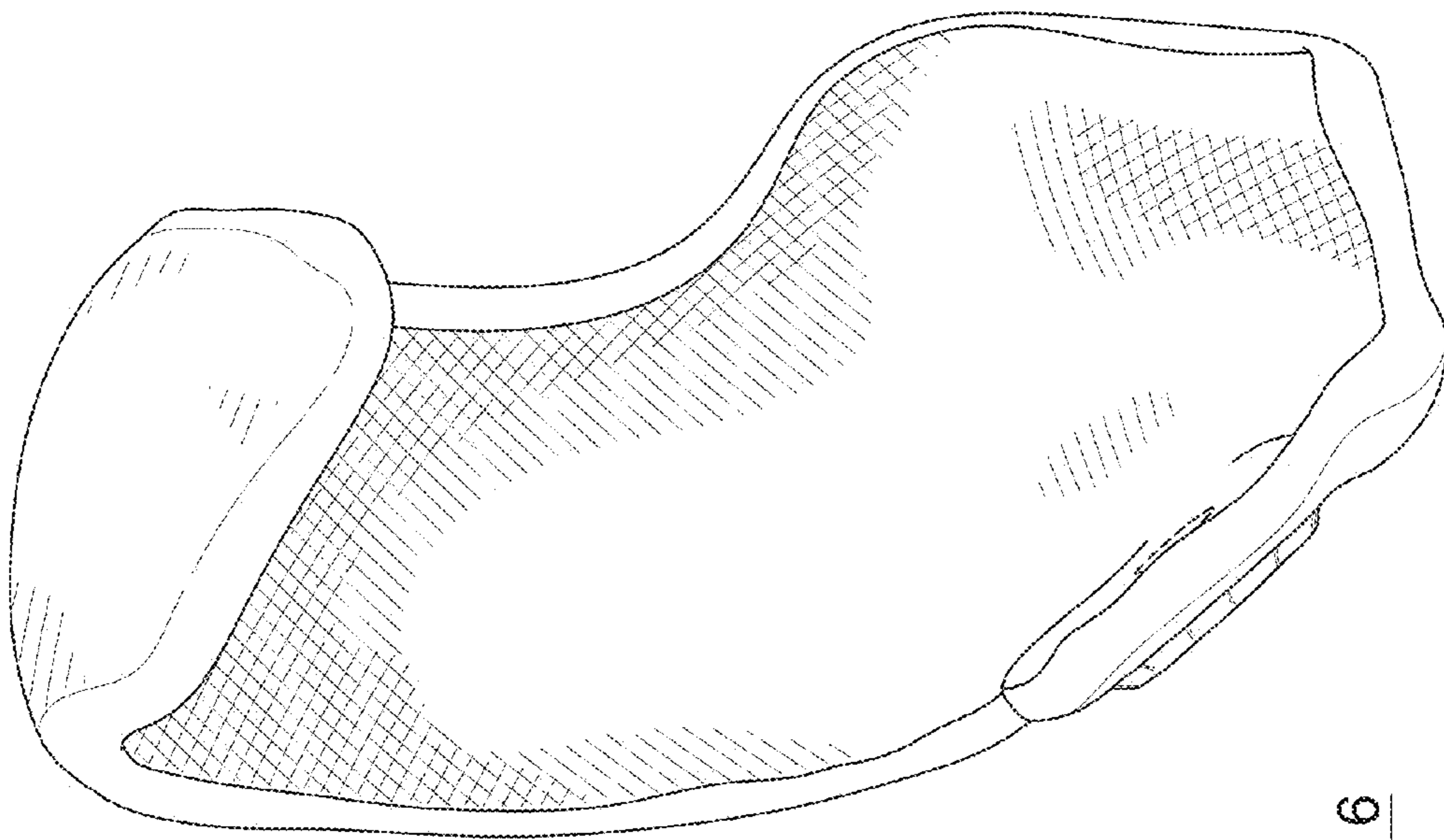


FIG. 6



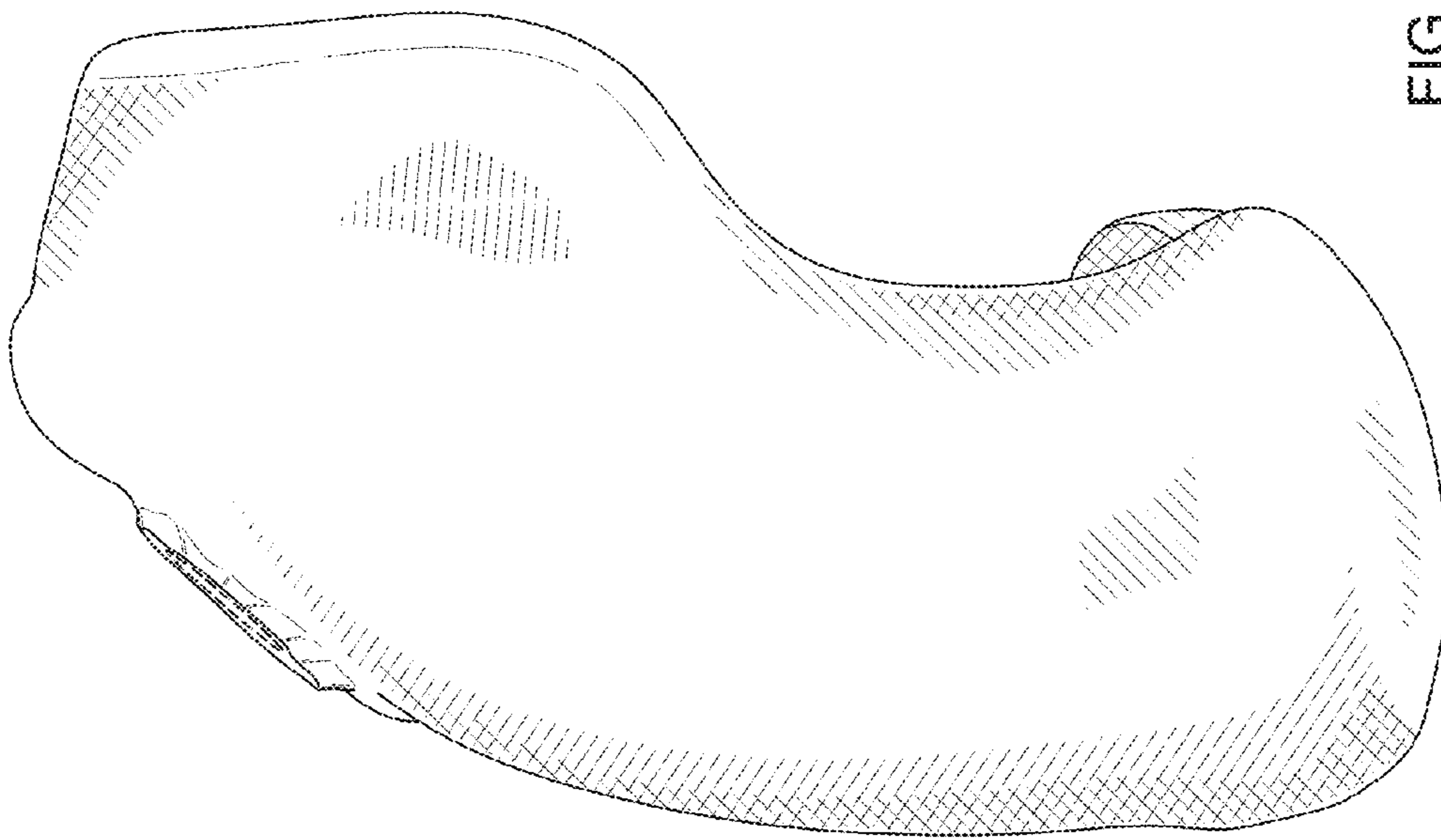


FIG. 7



FIG. 8

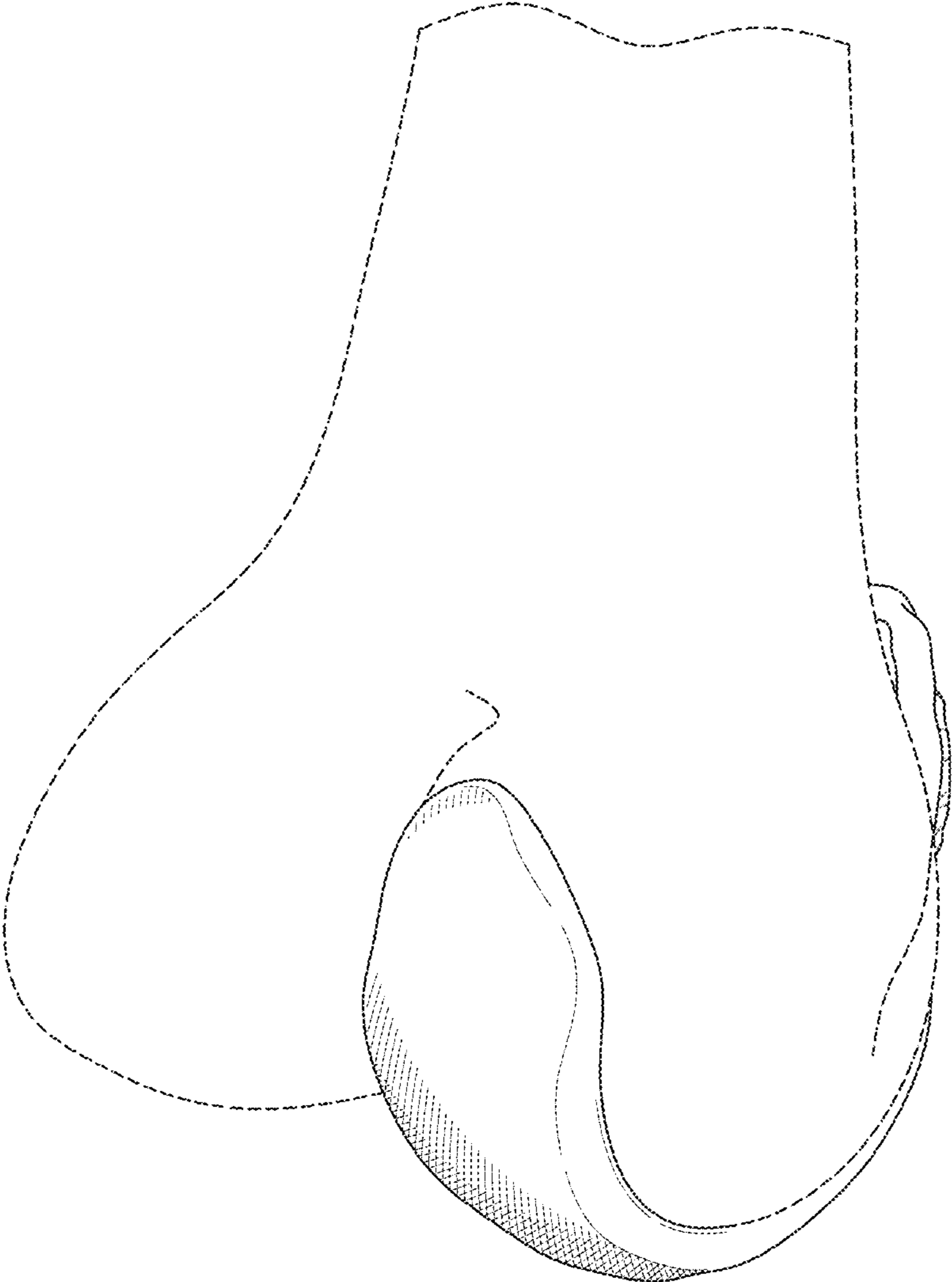


FIG. 9