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(12) **United States Design Patent** (10) **Patent No.:** **US D957,646 S**
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(54) **DENTAL MOUTHPIECE**

FOREIGN PATENT DOCUMENTS

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CA 2685161 A1 10/2007
EP 0603451 A1 6/1994
(Continued)

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OTHER PUBLICATIONS

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Harkins et al., "Chitosan-Cellulose Composite for Wound Dressing Material. Part 2. Antimicrobial Activity, Blood Absorption Ability, and Biocompatibility," *Journal of Biomedical Materials Research Part B, Applied biomaterials*, vol. 102, (2014), 1199-1206.
(Continued)

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

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(21) Appl. No.: **29/782,021**

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(57) **CLAIM**

Related U.S. Application Data

The ornamental design for a dental mouthpiece, as shown and described.

(63) Continuation-in-part of application No. 29/703,783, filed on Aug. 29, 2019, now abandoned.

(51) **LOC (13) Cl.** **24-02**

DESCRIPTION

(52) **U.S. Cl.**
USPC **D24/181**

FIG. 1 is a top perspective view of a dental mouthpiece showing our new design;
FIG. 2 is a top view of the dental mouthpiece shown in FIG. 1;
FIG. 3 is a bottom view of the dental mouthpiece shown in FIG. 1;
FIG. 4 is a right side view of the dental mouthpiece shown in FIG. 1;
FIG. 5 is a left side view of the dental mouthpiece shown in FIG. 1;
FIG. 6 is a back view of the dental mouthpiece; and,
FIG. 7 is a front view of the dental mouthpiece shown in FIG. 1.

(58) **Field of Classification Search**
USPC D24/178-182, 107; D29/108
CPC A61C 7/08; A61C 7/12; A61C 7/36; A61F 5/566

See application file for complete search history.

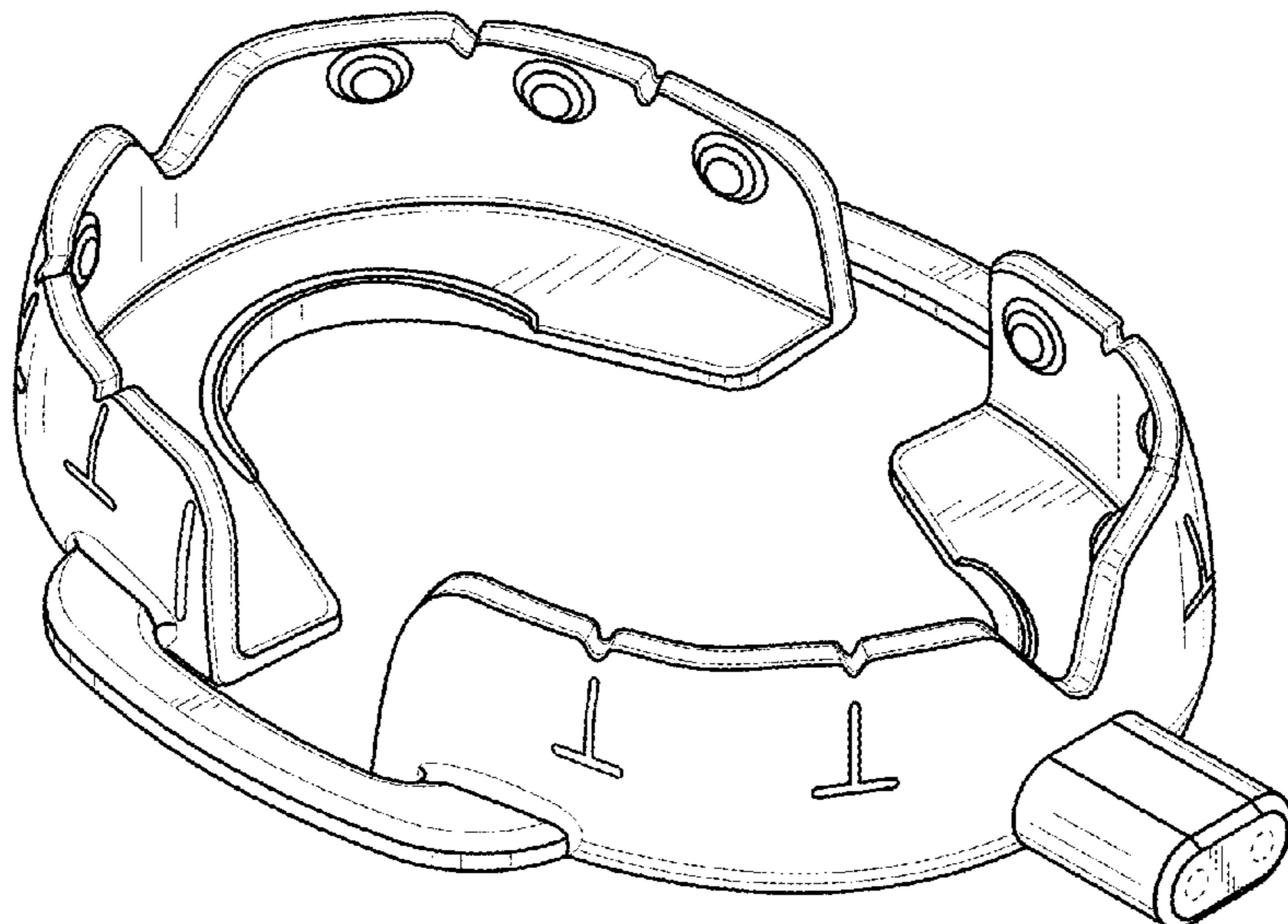
(56) **References Cited**

U.S. PATENT DOCUMENTS

D263,073 S *	2/1982	Jonkers	D24/181
D273,893 S	5/1984	Weitzman		
4,622,952 A	11/1986	Gordon		
4,976,733 A	12/1990	Girardot		
5,211,622 A	5/1993	Liboff et al.		
5,543,318 A	8/1996	Smith et al.		
5,693,029 A	12/1997	Leonhardt		

(Continued)

1 Claim, 5 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

5,713,917 A 2/1998 Leonhardt et al.
 5,725,377 A 3/1998 Lemler et al.
 5,817,139 A 10/1998 Kasano
 5,957,949 A 9/1999 Leonhardt et al.
 6,344,052 B1 2/2002 Greenan et al.
 6,618,625 B2 9/2003 Silverstone
 6,957,106 B2 10/2005 Schuler et al.
 6,988,004 B2 1/2006 Kanno et al.
 7,029,276 B2 4/2006 Mao
 7,136,699 B2 11/2006 Palti
 7,341,062 B2 3/2008 Chachques et al.
 7,483,749 B2 1/2009 Leonhardt et al.
 7,686,799 B2 3/2010 Leonhardt et al.
 7,881,784 B2 2/2011 Pasricha et al.
 8,133,267 B2 3/2012 Leonhardt et al.
 8,166,976 B2 5/2012 Webster et al.
 8,226,407 B2 7/2012 Hanewinkel et al.
 8,465,533 B2 6/2013 Palti
 8,534,289 B2* 9/2013 Hernandez A61F 5/566
 128/848
 8,639,361 B2 1/2014 Nathanson
 8,646,455 B2* 2/2014 Webster A61F 5/566
 128/859
 8,656,930 B2 2/2014 Schuler et al.
 8,660,669 B2 2/2014 Nemeh et al.
 8,738,144 B2 5/2014 Schneider
 8,909,346 B2 12/2014 Chalmers
 8,945,104 B2 2/2015 Boone et al.
 9,032,964 B2 5/2015 Schuler et al.
 9,533,170 B2 1/2017 Dye et al.
 9,545,331 B2 1/2017 Ingemarsson-Matzen
 D778,449 S 2/2017 Ingemarsson-Matzen
 9,656,096 B2 5/2017 Pilla
 9,662,184 B2 5/2017 Lowe
 9,687,383 B2 6/2017 Ingemarsson-Matzen
 D832,447 S 10/2018 Wiffen
 10,543,119 B2* 1/2020 Ingemarsson-Matzen
 A61F 5/566
 D881,399 S 4/2020 Ingemarsson-Matzen
 2002/0143373 A1 10/2002 Courtnage et al.
 2003/0032998 A1 2/2003 Altman
 2003/0220556 A1 11/2003 Porat et al.
 2004/0010231 A1 1/2004 Leonhardt et al.
 2004/0115587 A1 6/2004 Breining et al.
 2004/0147906 A1 7/2004 Voyiazis et al.
 2004/0236238 A1 11/2004 Schuler et al.
 2005/0171578 A1 8/2005 Leonhardt
 2006/0030908 A1 2/2006 Powell et al.
 2006/0100553 A1 5/2006 Lodin
 2007/0167984 A1 7/2007 Kieval et al.
 2007/0190028 A1 8/2007 Qu et al.
 2007/0265680 A1 11/2007 Liu et al.
 2008/0227046 A1 9/2008 Lowe et al.
 2008/0243060 A1 10/2008 Hartmann et al.
 2010/0082027 A1 4/2010 Chalmers
 2010/0184183 A1 7/2010 Schussler et al.
 2012/0156648 A1 6/2012 Kaufman et al.
 2013/0253413 A1 9/2013 Levine et al.
 2014/0023983 A1 1/2014 Lowe et al.
 2014/0214115 A1 7/2014 Greiner et al.
 2014/0214116 A1 7/2014 Peterson et al.
 2014/0214124 A1 7/2014 Greiner et al.
 2014/0214144 A1 7/2014 Peterson et al.
 2017/0028184 A1 2/2017 Godden et al.
 2017/0036032 A1 2/2017 Schuler et al.
 2017/0112983 A1 4/2017 Thorne et al.
 2017/0266371 A1 9/2017 Leonhardt et al.
 2017/0274206 A1 9/2017 Leonhardt
 2018/0064935 A1 3/2018 Leonhardt et al.
 2018/0071135 A1 3/2018 Ingemarsson-Matzen
 2019/0015661 A1 1/2019 Leonhardt et al.
 2019/0022389 A1 1/2019 Leonhardt
 2019/0022396 A1 1/2019 Leonhardt
 2020/0030136 A1 1/2020 Hernandez
 2020/0330753 A1 10/2020 Leonhardt et al.

FOREIGN PATENT DOCUMENTS

JP 2013-034881 A 2/2013
 KR 10-2007-0010908 A 1/2007
 KR 10-0726825 B1 6/2007
 WO 2006/116728 A2 11/2006
 WO 2007/146187 A2 12/2007
 WO 2008/145724 A1 12/2008
 WO 2009/021535 A1 2/2009
 WO 2011/016629 A2 2/2011

OTHER PUBLICATIONS

Hart, K. "Rankl and Osteoprotegerin Levels in Response to Orthodontic Forces" (2012). Theses and Dissertations (ETD). Paper 107. <http://dx.doi.org/10.21007/etd.cghs.2012.0127>.
 Healthcmi, "Acupuncture Combats Hypertension In University of California Research," Available online at <[https://www.healthcmi.com/Acupuncture-Continuing-Education-News/1688-acupuncture-c . . .](https://www.healthcmi.com/Acupuncture-Continuing-Education-News/1688-acupuncture-c...)>, (2016), 9 pages.
 Healthcmi, "Acupuncture Controls Hypertension In Groundbreaking Trial," Available online at <[https://www.healthcmi.com/Acupuncture-Continuing-Education-News/1804-acupuncture-c . . .](https://www.healthcmi.com/Acupuncture-Continuing-Education-News/1804-acupuncture-c...)>, (2017), 9 pages.
 Healthcmi, "UC Irvine—Acupuncture Reduces Hypertension Confirmed," Available Online at <[https://www.healthcmi.com/Acupuncture-Continuing-Education-News/1792-uc-irvine-acup . . .](https://www.healthcmi.com/Acupuncture-Continuing-Education-News/1792-uc-irvine-acup...)>, (2017), 6 pages.
 Heart Valve Calcifications-Focused Ultrasound Therapy Focused Ultrasound Therapy; Research Paper Last Updated: Jan. 28, 2020, The Focused Ultrasound Foundation Newsletter (5 pages).
 Hearts build new muscle with this simple protein patch, jacobsschool.ucsd.edu/news/news_releases/release.sfe?id=1813 (Sep. 16, 2015).
 Hoffmann, "Regeneration of the gastric mucosa and its glands from stem cells", *Curr Med Chem*, 15(29):3133-44 (2008).
 Holding et al. "The correlation of Rank, Rankl and TNFa expression with bone loss volume and polyethylene wear debris around hip implants" *Biomaterials* 27(30):5212-9—Nov. 2006.
 Holen et al. "Role of Osteoprotegerin (OPG) in Cancer" *Clin Sci (Lond)*. Mar. 2006; 110(3):279-91. doi: 10.1042/CS20050175.
 Hopkins Medicine "Overview of Pacemakers and Implantable Cardioverter Defibrillators (ICDs)," [hopkinsmedicine.org/healthlibrary/conditions/cardiovascular_diseases/ \)verview of pacemakers and implantable cardioverter defibrillators icds 85,P00234/](http://hopkinsmedicine.org/healthlibrary/conditions/cardiovascular_diseases/overview_of_pacemakers_and_implantable_cardioverter_defibrillators_icds_85,P00234/), last visited Sep. 12, 2018.
<https://www.dicardiology.com/content/bioleonhardt-unveils-stem-pump> Jan. 28, 2014.
 Hu et al. "Klotho Deficiency Causes Vascular Calcification in Chronic Kidney Disease" *J Am Soc Nephrol*. Jan. 2011; 22(1): 124-136.
 Hu et al. "Exosomes derived from human adipose mesenchymal stem cells accelerates cutaneous wound healing via optimizing the characteristics of fibroblasts", *Nature Scientific Reports*, vol. 6, Article No. 32993 (2016).
 Hu Klein, "Vagus Nerve Stimulation: A new approach to reduce heart failure" *Cardiology Journal* (2010).
 Huang et al. "Myocardial transfection of hypoxia-inducible factor-1a and co-transplantation of mesenchymal stem cells enhance cardiac repair in rats with experimental myocardial infarction", *Stem Cell Research & Therapy* 5:22 (2014) DOI: 10.1186/srct410.
 Hudson Et Al. "Local delivery of recombinant osteoprotegerin enhances postorthodontic tooth stability" *Calcif Tissue Int* Apr. 2012; 90(4):330-42. doi: 10.1007/S00223-012-9579-4.
 Hy et al., "Insulin-like growth factor 1 and hair growth," *Dermatol Online J*; 5(2):1 (Nov. 1999).
 Iglesias-Linares Et Al. "The use of gene therapy vs. corticotomy surgery in accelerating orthodontic tooth movement." *Orthod Craniofac Res*. Aug. 2011; 14(3):138-48. doi: 10.1111/j.1601-6343.2011.01519.x.
 Infante et al. "RANKL/RANK/OPG system beyond bone remodeling: involvement in breast cancer and clinical perspectives" *Journal of Experimental & Clinical Cancer Research* (2019) 38:12. <https://doi.org/10.1186/s13046-018-1001-2>.

(56)

References Cited

OTHER PUBLICATIONS

Interesting study about prolactin, VEGF and angiogenic inhibition, <http://www.regrowth.com/hair-loss-forums/topic/interesting-study-about-prolactin-vegf-and-angiogenic-inhibition/> (Nov. 2006).

Kaur et al. "Electrically conductive polymers and composites for biomedical applications", RSC Adv., 2015,5,37553-37567 DOI: 10.1039/C5RA01851J.

Keles et al. "Inhibition of tooth movement by osteoprotegerin vs. pamidronate under conditions of constant orthodontic force", Eur J Oral Sci. Apr. 2007;115(2):131-6.

Keunen et al. "Anti-VEGF treatment reduces blood supply and increases tumor cell invasion in glioblastoma," Proc. Natl. Acad. Sci. U. S. A. Mar. 1, 2011; 108(9): 3749-3754, published online Feb. 14, 2011; doi: 10.1073/pnas.1014480108.

Khan et al. "Accelerating Tooth Movement: What Options We Have?" J Dent Health Oral Disord Ther 2016, 5(7):00181.

Kido et al. "Hypoxia-Inducible Factor 1-Alpha Reduces Infarction and Attenuates Progression of Cardiac Dysfunction After Myocardial Infarction in the Mouse" JACC, vol. 46, Issue 11, Dec. 6, 2005, pp. 2116-2124. <https://doi.org/10.1016/j.jacc.2005.08.045>.

Kim Et Al., "Effect of Electrical Energy on the Efficacy of Biofilm Treatment Using the Bioelectric Effect," NPJ Biofilms and Microbiomes, vol. 1, (2015), Article 15016, 8 pages.

Kim et al., The effects of electrical current from a micro-electrical device on tooth movement, [http://e-kjo.org/search.php?where=aview&id=10.4041/kjod.2008.38.5.337& . . .](http://e-kjo.org/search.php?where=aview&id=10.4041/kjod.2008.38.5.337&...) visited Aug. 2, 2017.

King et al. "Mechanical Decalcification of the Aortic Valve" 272 The Annals of Thoracic Surgery vol. 42 No. 3 Sep. 1986 (pp. 269-272).

Kinney et al., "High Intensity Focused Electromagnetic Therapy Evaluated by Magnetic Resonance Imaging: Safety and Efficacy Study of a Dual Tissue Effect Based Non-Invasive Abdominal Body Shaping," Lasers in Surgery and Medicine, vol. 51, (2019), pp. 40-46.

Kondo et al. "Types of tooth movement, bodily or tipping, do not affect the displacement of the tooth's center of resistance but do affect the alveolar bone resorption" Angle Orthod Jul. 2017; 87(4):563-569.

Kose et al. "Citric acid as a decalcifying agent for the excised calcified human heart valves" Anadolu Kardiyol Derg 2008; 8: 94-8 (Eng Abstract).

Krishnan et al. (eds.), "Biological Mechanisms of Tooth Movement", John Wiley & Sons 2015 (10 pages).

Lamoureux et al. "Therapeutic Relevance of Osteoprotegerin Gene Therapy in Osteosarcoma: Blockade of the Vicious Cycle between Tumor Cell Proliferation and Bone Resorption" Cancer Res 1 2007 67(15):7308-7318; DOI: 10.1158/0008-5472.CAN-06-4130.

Alghatrif et al. "The Conundrum of Arterial Stiffness, Elevated blood pressure, and Aging" Curr Hypertens Rep. Feb. 2015; 17(2): 12. doi: 10.1007/s11906-014-0523-z.

Almpani et al., "Nonsurgical Methods for the Acceleration of the Orthodontic Tooth Movement", Tooth Movement. Front Oral Biol., vol. 18, pp. 80-91 (Karger, Basel, CH 2016) (DOI:10.1159/000382048), Published online: Nov. 24, 2015.

Andersson et al. "Drinking, antidiuresis and milk ejection from electrical stimulation within the hypothalamus of the goat," Acta Physiol Scand. Dec. 31, 1955; 35(2):191-201; DOI: 10.1111/j.1748-1716.1955.tb01277.x.

Ando et al. "RANKL/RANK/OPG: key therapeutic target in bone oncology" Curr Drug Discov Technol. Sep. 2008; 5(3): 263-268.

Aronowitz et al. "Mechanical versus enzymatic isolation of stromal vascular fraction cells from adipose tissue" SpringerPlus (2015) 4:713 DOI 10.1186/S40064-015-1509-2.

Atkinson et al. "Bioelectric Properties of the Tooth" 1969 vol. 48 issue: 5, pp. 789-794.

Aubert et al. "A new ultrasonic process for a renewal of aortic valve decalcification" Cardiovascular Ultrasound 2006, 4:2 doi:10.1186/1476-7120-4-2.

Aydin Et Al., "Focusing of Electromagnetic Waves by a Left-Handed Metamaterial Flat Lens," vol. 13, (2005), pp. 8753-8759.

Back et al. "Endogenous Calcification Inhibitors in the Prevention of Vascular Calcification: A Consensus Statement From the COST Action EuroSoftCalcNet" Frontiers in Cardiovascular Medicine | www.frontiersin.org, Jan. 2019 | vol. 5 | Article 196.

Banerjee, P. "Electrical muscle stimulation for chronic heart failure: an alternative tool for exercise training?" Curr Heart Fail Rep., 7(2):52-8. doi: 10.1007/s11897-010-0013-9 (Jun. 2010).

Bang et al., "Attenuation of Hypertension by C-Fiber Stimulation of the Human Median Nerve and the Concept-Based Novel Device," Scientific Reports, vol. 8, (2018), 12 pages.

Barbault et al., Amplitude-modulated electromagnetic fields for the treatment of cancer: Discovery of tumor-specific frequencies and assessment of a novel therapeutic approach, Journal of Experimental & Clinical Cancer Research, Apr. 14, 2009, vol. 28, No. 51, doi:10.1186/1756-9966-28-51, 10 pages.

Barker et al., "A Formidable Foe is Sabotaging Your Results: What You Should Know About Biofilms and Wound Healing," Plastic and Reconstructive Surgery, vol. 139, (2017), pp. 1184e-1194e.

Beebe et al. "Bioelectric Applications for Treatment of Melanoma," Cancers (Basel). Sep. 2010; 2(3): 1731-1770, published online Sep. 27, 2010; doi: 10.3390/cancers20317.

Berman "Suzanne Somers' Experimental Breast Reconstruction" Medpage Today, Feb. 7, 2012, www.medpagetoday.com > blogs > celebritydiagnosis.

Bl et al. "Key Triggers of Osteoclast-Related Diseases and Available Strategies for Targeted Therapies: A Review" Front Med (Lausanne). 2017; 4: 234. doi: 0.3389/fmed.2017.00234.

Borden et al., "Electric Current-Induced Detachment of *Staphylococcus epidermidis* Biofilms from Surgical Stainless Steel," Applied and Environmental Microbiology, vol. 70, (2004), pp. 6871-6874.

Boyle "Wound-Treating Jelly Regenerates Fresh, Scar-Free Skin", Popular Science, (Dec. 15, 2011), "New material developed for accelerated skin regeneration in major wounds", Science Highlight, (National Institute of Biomedical 11 Imaging and Bioengineering, Dec. 17, 2015).

Bradshaw et al. "Designer self-assembling hydrogel scaffolds can impact skin cell proliferation and migration" Nature Scientific Reports, vol. 4, Article No. 6903 (2014).

Brooks et al. "Bioelectric impedance predicts total body water, blood pressure, and heart rate during hemodialysis in children and adolescents" J. Ren Nutr., 18(3):304-311 (May 2008); doi: 10.1053/j.jrn.2007.11.008.

Buckle et al. "Soluble Rank Ligand Produced by Myeloma Cells Causes Generalised Bone Loss in Multiple Myeloma" PLoS One. 2012; 7(8): e41127. doi: 10.1371/journal.pone.0041127 PMID: PMC3430669.

Cai et al., "Intermedin Inhibits Vascular Calcification by Increasing the Level of Matrix (Gamma)-Carboxyglutamic Acid Protein," Cardiovascular Research, vol. 85, (2010), p. 864 873.

CalXStars Business Accelerator, Inc.—Website—Justia Patents—Mar. 15, 2017—US Patent Application for Stimulator, Pump & Composition Patent Application (Application #20170266371) <https://protect-us.mimecast.com/s/tSaBCxkVlwuDr61CvMWbF?domain=patents.justia.com>.

Campbell et al. "Electrical stimulation to optimize cardioprotective exosomes from cardiac stem cells" Med Hypotheses Mar. 2016; 88:6-9. doi: 10.1016/j.mehy.2015.12.022. Epub Jan. 11, 2016.

Canty et al., "Antibiotics Enhance Prevention and Eradication Efficacy of Cathodic-Voltage-Controlled Electrical Stimulation against Titanium-Associated Methicillin-Resistant *Staphylococcus aureus* and *Pseudomonas aeruginosa* Biofilms," mSphere, vol. 4, (May/Jun. 2019), e00178-19, 14 pages.

Caubet et al., "A Radio Frequency Electric Current Enhances Antibiotic Efficacy Against Bacterial Biofilms," Antimicrobial Agents and Chemotherapy, vol. 48, (2004), vol. 4662-4664.

Cerrada et al. "Hypoxia-Inducible Factor 1 Alpha Contributes to Cardiac Healing in Mesenchymal Stem Cells-Mediated Cardiac Repair," Stem Cells and Development, 22(3): 501-511 (2013).

Cervera "The interplay between genetic and bioelectrical signaling permits a spatial regionalisation of membrane potentials in model multicellular ensembles," Nature, Scientific Reports, Oct. 12, 2016 vol. 6, Article No. 35201 (2016).

(56)

References Cited

OTHER PUBLICATIONS

- Chang et al. "Pulsed electromagnetic fields stimulation affects osteoclast formation by modulation of osteoprotegerin, RANK ligand and macrophage colony-stimulating factor", *Journal of Orthopaedic Research*, 23 (2005) 1308-1314.
- Chang et al. Effect of Pulse-Burst Electromagnetic Field Stimulation on Osteoblast Cell Activities; *Bioelectromagnetics* 25:457-465 (2004).
- Chemet & Levin, "Transmembrane voltage potential is an essential cellular parameter for the detection and control of tumor development in a *Xenopus* model," *Dis. Models & Meeh.* 6, pp. 595-607 (2013); doi:10.1242/dmm.010835.
- Chen et al. "Secreted Klotho Attenuates Inflammation-Associated Aortic Valve Fibrosis in Senescence-Accelerated Mice P1" *Hypertension*. 2018;71:877-885. DOI: 10.1161/HYPERTENSIONAHA.117.10560. Downloaded from <http://ahajournals.org> by on Apr. 24, 2020 (9 pages).
- Chen et al., "Deficiency in the Anti-Aging Gene Klotho Promotes Aortic Valve Fibrosis Through AMPK(Alpha)-Mediated Activation of RUNX2," *Aging Cell*, vol. 15, (Oct. 2016), pp. 853-860.
- Chen et al., "Regenerative Hair Waves in Aging Mice and Extra-Follicular Modulators Follistatin, Dkk1, and Sfrp4," *Journal of Investigative Dermatology*, Aug. 2014, vol. 134, Issue 8, pp. 2086-2096.
- Chen et al., "The Role and Mechanism of (Alpha)-Klotho in the Calcification of Rat Aortic Vascular Smooth Muscle Cells," *BioMed Research International*, vol. 2015, (2015), 7 pages.
- Chen et al., "The Strategy to Prevent and Regress the Vascular Calcification in Dialysis Patients," *BioMed Research International*, vol. 2017, (2017), 11 pages.
- Chen et al., Efficacy and Safety of Acupuncture for Essential Hypertension: A Meta-Analysis, *Medical Science Monitor*, vol. 24, (2018), pp. 2946-2969.
- Chiang et al., "Silver-Palladium Surfaces Inhibit Biofilm Formation," *Applied and Environmental Microbiology*, vol. 75, (2009), pp. 1674-1678.
- Christouls et al. "Pathogenesis and Management of Myeloma Bone Disease" *Expert Rev Hematol.* 2009; 2(4):385-398.
- Ciria et al., Antitumor effectiveness of different amounts of electrical charge in Ehrlich and fibrosarcoma Sa-37 tumors, *BMC Cancer*, Nov. 26, 2004, 10 pages, vol. 4, No. 87.
- Collette et al., "Measurement of the local aortic stiffness by a non-invasive bioelectrical impedance technique," in *Medical & Biological Engineering*, vol. 49, No. 4, Feb. 2011, pp. 431-439, Available online at <<https://www.ncbi.nlm.nih.gov/pubmed/21286830>>, 1 page (Abstract Only).
- Collins "Bioelectric Signals Can Be Used to Detect Early Cancer," *Tufts News*, <http://now.tufts.edu/news-releases/bioelectric-signals-used-detect-early-cancer> (Feb. 1, 2013).
- Columbia "Implant Procedure Concepts—Pacemaker, ICD and CRT Overview," columbia.edu/itc/hs/medical/hickey/docs/Pacemaker,%20ICD%20and%20CRT%20overview%2022007.pdf, last visited Sep. 12, 2018.
- Stoodley et al., "Influence of Electric Fields and pH on Biofilm Structure as Related to the Bioelectric Effect," *Antimicrobial Agents and Chemotherapy*, vol. 41, (1997), pp. 1876-1879.
- Sultana et al., "Electrochemical Biofilm Control: A Review," *Biofouling*, vol. 31, (2015), pp. 745-758.
- Sutherland et al. "Prolonged electrical stimulation of the nipples evokes intermittent milk ejection in the anaesthetised lactating rat," *Exp Brain Res.* 1987;66(1):29-34.
- Szkotak et al., "Differential Gene Expression to Investigate the Effects of Low-Level Electrochemical Currents on *Bacillus subtilis*," *AMB Express*, vol. 1, (Nov. 2011), 12 pages.
- Tajima et al. "HIF-1alpha is necessary to support gluconeogenesis during liver regeneration" *Biochem Biophys Res Commun.* Oct. 2, 2009; 387(4):789-94. doi: 10.1016/j.bbrc.2009.07.115. Epub Jul. 28, 2009.
- Tamaki et al., "Cardiomyocyte Formation by Skeletal Muscle-Derived Multi-Myogenic Stem Cells after Transplantation into Infarcted Myocardium", *PLoS ONE* 3(3): e1789. doi:10.1371/journal.pone.0001789 (Mar. 2008).
- Tan et al. "Bioelectric Perturbations in Orthodontic tooth movement" *2010 Journal of Dental Sciences & Research* 1:1: pp. 41-49.
- Tan et al., "Acupuncture Therapy for Essential Hypertension: a Network Meta-Analysis," *Annals of Translational Medicine*, vol. 7, (2019), pp. 1-12.
- Tavlasoglu et al. "Is partial decalcification of posterior mitral annular bed logical in all mitral valve replacement procedures?" *European Journal of Cardio-Thoracic Surgery* 43 (2013) 449-450.
- Thattaliyath et al. "Modified Skeletal Myoblast Therapy For Cardiac Failure Using AAV SDF-1," *Proc. Inti. Soc. Mag. Reson. Med.* 16, p. 579 (2008).
- Tokyo Medical and Dental University "Rankl expressed by osteocytes has an important role in orthodontic tooth movement" *Science Daily* Oct. 20, 2017.
- Totsugawa, et al. "Ultrasonic annular debridement in minimally invasive aortic valve replacement" *Gen Thorac Cardiovasc Surg.* Jan. 2020;68(1):81-83 doi: 10.1007/s11748-019-01158-8. Epub Jun. 15, 2019 (Abstract Only).
- Trafton, Anne, "A Noninvasive Method for Deep Brain Stimulation," *MIT News Office*, (available at <http://news.mit.edu/2017/noninvasive-method-deep-brain-stimulation-0601>), (Jun. 1, 2017), 3 pages.
- Uc Irvine, "Electroacupuncture for Hypertension in Women: The Susan Samueli Center for Integrative Medicine at UC Irvine is Recruiting Patients for a Study", Principle Investigators: Dr. Stephanie Tjen-a-Looi and Dr. Shaista Malik, MOD# 20266, HS# 1999-2222, (2017), 1 page.
- Ueland et al. "Inflammatory cytokines as biomarkers in heart failure," *Clinica Chimica Acta*, vol. 443, Mar. 30, 2015, pp. 71-77; doi.org/10.1016/j.cca.2014.09.001.
- Valvublator Heart Valve Regeneration, accessed Apr. 24, 2020 <https://valvublator.com> (6 pages).
- Van Dam et al. "RANK/RANKL signaling inhibition may improve the effectiveness of checkpoint blockade in cancer treatment" *Critical Reviews in Oncology/Hematology* vol. 133, Jan. 2019, pp. 85-91.
- Verna et al. "The rate and the type of orthodontic tooth movement is influenced by bone turnover in a rat model" *European Journal of Orthodontics* 22 (2000) 343-352.
- Vilela-Martin et al., "Effects of Transcutaneous Electrical Nerve Stimulation (TENS) on Arterial Stiffness and Blood Pressure in Resistant Hypertensive Individuals: Study Protocol for a Randomized Controlled Trial," *Trials*, vol. 17, (2016), pp. 1-13.
- Vinod Krishnan, Ze'ev Davidovitch (eds.), *Biological Mechanisms of Tooth Movement*, (John Wiley & Sons 2015 (10 Pages).
- Wagenseil et al., "Elastin in large artery stiffness and hypertension," *Journal of Cardiovascular Translational Research*, vol. 5, No. 3, 2012, pp. 264-273, Available online at <<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3383658/>>, 21, pages.
- Walsh & Choi "Biology of the Rank* Ran* OPG System in Immunity, Bone, and Beyond", *Front Immunol.* 2014; 5:511.
- Wang et al. "Local and sustained miRNA delivery from an injectable hydrogel promotes cardiomyocyte proliferation and functional regeneration after ischemic injury", *Nat Biomed Eng.* 2017; 1: 983-992, doi: 10.1038/S41551-017-0157-y.
- Wang et al., "Controlling *Streptococcus Mutans* and *Staphylococcus aureus* Biofilms With Direct Current and Chlorhexidine," *AMB Express*, vol. 7, (Nov. 2017), 9 pages.
- Warner "Inflammation Adds to Blood Pressure Risks, High Blood Pressure and C-Reactive Protein May Trigger Heart Attack, Stroke" *Art. WebMD Health News* (2003) 2 pages.
- Wei et al., "Epicardial FSTL1 reconstitution regenerates the adult mammalian heart," *Nature* 525: 479-485 (Sep. 24, 2015).
- Welch "RGS2 Proteins Regulate Blood Pressure" *JASN* Nov. 2010, 21 (11) 1809-1810.
- Wellman et al., "Bacterial Biofilms and the Bioelectric Effect," *Antimicrobial Agents and Chemotherapy*, vol. 40, (1996), pp. 2012-2014.
- Wong et al., "Dual Functional Polyelectrolyte Multilayer Coatings for Implants: Permanent Microbicidal Base With Controlled Release

(56)

References Cited

OTHER PUBLICATIONS

of Therapeutic Agents,” *Journal of the American Chemical Society*, vol. 132, (2010), p. 17840-17848.

Wu et al., “Vascular Calcification: an Update on Mechanisms and Challenges in Treatment,” *Calcified Tissue International*, vol. 93, (Oct. 2013), pp. 365-373.

Xiong Et Al. “Current understanding of neuroinflammation after traumatic brain injury and cell-based therapeutic opportunities” *Chin J Traumatol*. Jun. 2018; 21(3): 137-151. doi: 10.1016/j.cjtee.2018.02.003.

Yamaguchi, “RANK/RANKL/OPG during orthodontic tooth movement”, *Orthod Craniofac Res*. May 2009; 12(2):113-9. doi: 10.1111/j.1601-6343.2009.01444.x.

Yamakazi et al., “Hair cycle-dependent expression of hepatocyte growth factor (HGF) activator, other proteinases, and proteinase inhibitors correlates with the expression of HGF in rat hair follicles”, *J Invest Dermatol Symp Proc.*, 4 (3):312-5 (Dec. 1999).

Yang “Effect RANKL Produced by Periodontal Ligament Cells on Orthodontic Tooth Movement” (2016) *Dental Theses*. Paper 13.

Yang et al., “Acupuncture for hypertension,” *Cochrane Database of Systematic Reviews*, Available Online at <<https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD008821.pub2/full>>, (2018), 4 pages.

Yang Lei, “Mechanisms and Reversal of Elastin Specific Medial Arterial Calcification” (2014). All Dissertations, Paper 1307, (available at https://tigerprints.clemson.edu/all_dissertations/1307), 214 pages.

Yarbrough Et Al., “Specific Binding and Mineralization of Calcified Surfaces by Small Peptides,” *Calcified Tissue International*, vol. 86, (2010), pp. 58-66.

Yu et al. “Association between inflammation and systolic blood pressure in RA compared to patients without RA” *Arthritis Research & Therapy* vol. 20, Article No. 107 (2018).

Zalavras, Charalampos G. “CORR Insights(Registered): Cathodic Voltage-Controlled Electrical Stimulation Plus Prolonged Vancomycin Reduce Bacterial Burden of a Titanium Implant-associated Infection in a Rodent Model,” *Clinical Orthopaedics and Related Research*, vol. 474, (2016), pp. 1676-1678.

Zaniboni et al. “Do electrical current and laser therapies improve bone remodeling during an orthodontic treatment with corticotomy?” *Clin Oral Invest* 23, 4083-4097 (2019). <https://doi.org/10.1007/s00784-019-02845-9>.

Zdzisinska et al. “RANK/RANKL i OPG w szpiczaku plazmocytozym [The role of RANK/RANKL and OPG in multiple myeloma]” *Postepy Hig Med Dosw (Online)*. 2006; 60:471-482 (Abstract Only).

Zhang et al. “Exosomes derived from human embryonic mesenchymal stem cells promote osteochondral regeneration”, *Osteoarthritis and Cartilage*, vol. 24, Issue 12, Dec. 2016, pp. 2135-2140.

Zhang et al., “Comparison of arterial stiffness in non-hypertensive and hypertensive population of various age groups,” *Jan. 24, 2018*, 2 pages (Abstract Only).

Zhang et al., “Highly Stable and Reusable Imprinted Artificial Antibody Used for in Situ Detection and Disinfection of Pathogens,” *Chemical Science*, vol. 6, (2015), pp. 2822-2826.

Zhao et al. “Local osteoprotegerin gene transfer inhibits relapse of orthodontic tooth movement.” *Am J Orthod Dentofacial Orthop*. Jan. 2012; 141(1):30-40. doi: 10.1016/j.ajodo.2011.06.035.

Zupan et al. “The relationship between osteoclastogenic and anti-osteoclastogenic pro-inflammatory cytokines differs in human osteoporotic and osteoarthritic bone tissues,” *Journal of Biomedical Science*, 2012, 19:28 (DOI: 10.1186/1423-0127-19-28).

Landau et al. “Review: Proposed Methods to Improve the Survival of Adipose Tissue in Autologous Fat Grafting” *Plast Reconstr Surg Glob Open*. 2018;6(8):e1870. Published Aug. 3, 2018. doi:10.1097/GOX.0000000000001870.

Lanzetta et al. “Fundamental principles of an anti-VEGF treatment regimen: optimal application of intravitreal anti-vascular endothelial growth factor therapy of macular diseases,” *Graefes Arch. Clin.*

Exp. Ophthalmol. 2017;255(7): 1259-1273 (published online May 19, 2017); doi: 10.1007/s00417-017-3647-4.

Lasserre et al., “Influence of Low Direct Electric Currents and Chlorhexidine Upon Human Dental Biofilms,” *Clinical and Experimental Dental Research*, vol. 2, (Jul. 2016), pp. 146-154.

Lasserre et al., “Oral Microbes, Biofilms and Their Role in Periodontal and Peri-Implant Diseases,” *Materials*, vol. 11, (Sep. 2018), Article 1802, 17 pages.

Lee et al. “Hepatocyte growth factor (HGF) activator expressed in hair follicles is involved in in vitro HGF-dependent hair follicle elongation,” *J. Dermatol. Sci.*, 25(2):156-63 (Feb. 2001).

Lee et al., “Targeted Release of Tobramycin From a pH-Responsive Grafted Bilayer Challenged With *S. Aureus*,” *Biomacromolecules*, vol. 16, (2015), pp. 650-659.

Lei et al., “Efficacy of Reversal of Aortic Calcification by Chelating Agents,” *Calcified Tissue International*, vol. 93, (Nov. 2013), 15 pages.

Leibrock et al., “NH4CI Treatment Prevents Tissue Calcification in Klotho Deficiency,” *Journal of the American Society of Nephrology*, vol. 26, (2015), pp. 2423-2433.

Leonhardt “Leonhardt Adds HIF-1 Alpha To Estate of Bioelectric Controlled Release Regenerative Proteins” *Press Release*, Published Jun. 13, 2017.

Leonhardt, “Leonhardt Ventures Files Patent for Heart Valve Regeneration,” (available at <https://bioleonhardt.com/leonhardt-ventures-files-patent-for-heart-valve-regeneration/>), (Mar. 20, 2018), 6 pages.

Leonhardt, H.—Leonhardt Announces Vibrational Energy Device For Preventing Blood Clots Provisional Patent Application and License Agreements, (available at <https://leonhardtventures.com/leonhardt-announces-vibrational-energy-device-preventing-blood-clots-provisional-patent-application-license-agreements/>), (Jul. 5, 2017), 5 pages.

Leonhardt, Leonhardt Announces Vibrational Energy Device For Preventing Blood Clots Provisional Patent Application and License Agreements, (available at <https://leonhardtventures.com/leonhardt-announces-vibrational-energy-device-preventing-blood-clots-provisional-patent-application-license-agreements/>), (Jul. 5, 2017), 5 pages.

Leonhardt’s Launchpads Announces Filing of Patent for Bioelectric Stimulation Controlled Klotho Expression—Powerful Anti-aging and Regeneration Promoting Protein, by Api Podder, Published: Mar. 13, 2019, available online at <<https://mysocialgoodnews.com/leonhardts-launchpads-announces-filing-of-patent-for-bioelectric-stimulation-controlled-klotho-expression-powerful-anti-aging-and-regeneration-promoting-protein/>>.

Li et al., “Exogenous IGF-1 promotes hair growth by stimulating cell proliferation and down regulating TGF-(Beta)1 in C57BL/6 mice in vivo” *Growth Hormone & IGF Research*, vol. 24, Issues 2-3, pp. 89-94 (Apr.-Jun. 2014).

Li et al., “Long-Lasting Reduction of Blood Pressure by Electroacupuncture in Patients with Hypertension: Randomized Controlled Trial,” *Medical Acupuncture*, vol. 27, No. 4, (2015), pp. 253-266.

Li et al., “Repetitive Electroacupuncture Attenuates Cold-Induced Hypertension through Enkephalin in the Rostral Ventral Lateral Medulla,” *Scientific Reports*, vol. 6, (2016), 10 pages.

Li et al., “The Mechanism of Acupuncture in Treating Essential Hypertension: A Narrative Review,” *International Journal of Hypertension*, vol. 2019, (2019), Article ID 8676490, 10 pages.

Meadows et al. “Anti-VEGF Therapies in the Clinic,” *Cold Spring Harb. Perspect. Med.* Oct. 2012; 2(10): a006577; doi: 10.1101/cshperspect.a006577.

Miles et al. “Assessment of the changes in arch perimeter and irregularity in the mandibular arch during initial alignment with the AcceleDent Aura appliance vs no appliance in adolescents: A single-blind randomized clinical trial”, Dec. 2016, vol. 150, Issue 6 *American Journal of Orthodontics and Dentofacial Orthopedics* (9 pages).

Mishra “Angiogenic neovessels promote tissue hypoxia,” *Proc. Natl. Acad. Sci. U. S. A.* Sep. 20, 2016; 113(38): 10458-10460, published online Sep. 13, 2016; doi: 10.1073/pnas.1612427113.

Moe, “Klotho: A Master Regulator of Cardiovascular Disease?,” *Circulation*, vol. 125, (2012), pp. 2181-2183.

(56)

References Cited

OTHER PUBLICATIONS

- Mosteiro et al. "Tissue damage and senescence provide critical signals for cellular reprogramming in vivo." *Science*, 2016; 354 (6315): aaf4445 DOI: 10.1126/science.aaf4445.
- Niiranen et al., "Relative Contributions of Arterial Stiffness and Hypertension to Cardiovascular Disease: The Framingham Heart Study," *Journal of the American Heart Association*, vol. 5, No. 11, 2016, 8 pages.
- Nimeri et al. "Acceleration of tooth movement during orthodontic treatment—a frontier in Orthodontics", *Prog Orthod* 2013; 14:42; DOI: 10.1186/2196-1042-14-42.
- Nodzo et al., "Cathodic Electrical Stimulation Combined With Vancomycin Enhances Treatment of Methicillin-Resistant *Staphylococcus aureus* Implant-Associated Infections," *Clinical Orthopaedics and Related Research*, vol. 473, (2015), pp. 2856-2864.
- Nodzo et al., "Cathodic Voltage-Controlled Electrical Stimulation Plus Prolonged Vancomycin Reduce Bacterial Burden of a Titanium Implant-associated Infection in a Rodent Model," *Clinical Orthopaedics and Related Research*, vol. 474, (2016), 1668-1675.
- Nordstorm "Electrical Stimulation Blood Pressure Treatment Devices Market to Set Astonishing Growth by 2026" *Art. Apr. 4, 2019 Gator Ledger*.
- Norton et al. "Bioelectric Perturbations of Bone: Research Directions and Clinical Applications" *Angle Orthod* (1984) 54 (1): 73-87.
- Novack "Inflammatory osteoclasts, a different breed of bone eaters?" *Arthritis Rheumatol.* Dec. 2016; 68(12): 2834-2836. doi: 10.1002/art.39835.
- Novickij et al., "Induction of Different Sensitization Patterns of MRSA to Antibiotics Using Electroporation," *Molecules*, vol. 23,(2018), Article 1799, 10 pages.
- O'Neill et al., "Recent Progress in the Treatment of Vascular Calcification," *Kidney International*, vol. 78, (Dec. 2010), pp. 1232-1239.
- Oranger et al. "Cellular Mechanisms of Multiple Myeloma Bone Disease" *Clinical and Developmental Immunology* vol. 2013, Article ID 289458, 11 pages <http://dx.doi.org/10.1155/2013/289458>.
- Otero et al. "Expression and Presence of OPG and RANKL mRNA and Protein in Human Periodontal Ligament with Orthodontic Force", *Gene-Regulation-and-Systems-Biology*, 2016, 10, 15-20.
- Oyajobi "Multiple myeloma/hypercalcemia" *Arthritis Research & Therapy* vol. 9, Article No. S4 (2007).
- Palza et al., "Electroactive Smart Polymers for Biomedical Applications," *Materials*, vol. 12, (2019), 24 pages.
- Park et al. "Effects of SM-215 on Hair Growth by Hair Follicle Stimulation", *Indian Journal of Science and Technology*, vol. 8(25), DOI: 10.17485/ijst/2015/v8i25/80263, (Oct. 2015).
- Park, Alice "Shrinking Stem Cells Are the Real Reason for Hair Loss" *Time*, (Feb. 5, 2016).
- Paulus "Cytokines and heart failure," *Heart Fail. Monit.* 2000; 1(2):50-6.
- Pierce et al. "Collection and characterization of amniotic fluid from scheduled C-section deliveries," *Cell Tissue Bank*, DOI 10.1007/s10561-016-9572-7 (Springer, 2012) and is available from Irvine Scientific.
- Plumbingtoday, "How to Remove Hard, White Mineral Deposits from Faucets/Showerheads," (available at <https://plumbingtoday.biz/blog/how-to-remove-hard-white-mineral-deposits-from-faucets-showerheads>), (Jul. 11, 2016), 4 pages.
- Pozo et al., "Bioelectric Effect and Bacterial Biofilms. A Systematic Review," *The International Journal of Artificial Organs*, vol. 31, (2008), pp. 786-795.
- Pozo et al., "Effect of Electrical Current on the Activities of Antimicrobial Agents Against *Pseudomonas Aeruginosa*, *Staphylococcus aureus*, and *Staphylococcus epidermidis* Biofilms," *Antimicrobial Agents and Chemotherapy*, vol. 53, (2009), pp. 35-40.
- Pozo et al., "Prevention of *Staphylococcus epidermidis* Biofilm Formation Using Electrical Current," *Journal of Applied Biomaterials & Functional Materials*, vol. 12, (2014), pp. 81-83.
- Pozo et al., "The Electricidal Effect: Reduction of *Staphylococcus* and *Pseudomonas* Biofilms by Prolonged Exposure to Low-Intensity Electrical Current," *Antimicrobial Agents and Chemotherapy*, vol. 53, (2009), pp. 41-45.
- Price et al. "Mitral Valve Repair is Feasible Following Extensive Decalcification and Reconstruction of the Atrioventricular Groove" *J Heart Valve Dis.* Jan. 2015;24(1):46-52 (Abstract Only).
- Prochazka et al. "Therapeutic Potential of Adipose-Derived Therapeutic Factor Concentrate for Treating Critical Limb Ischemia," *Cell Transplantation*, 25(9), pp. 1623-1633(11) (2016).
- Prochazka et al., "Cocktail of Factors from Fat-derived Stem Cells Shows Promise for Critical Limb Ischemia" <http://www.sciencenewswatch.com/news/2016012204520017.html> (Jan. 21, 2016).
- Pupo et al., *Electrotherapy on Cancer: Experiment and Mathematical Modeling, Current Cancer Treatment—Novel Beyond Conventional Approaches*, Prof. Oner Ozdemir (Ed.) ISBN: 978-953-307-397-2, InTech, Available from: <http://www.intechopen.com/books/current-cancer-treatment-novel-beyond-conventional-approaches/electrotherapy-on-cancer-experiment-and-mathematical-modeling>, 2011.
- Puro et al "Bioelectric impact of pathological angiogenesis on vascular function," *PNAS* Aug. 30, 2016 113(35) 9934-9939; published ahead of print Aug. 22, 2016 <https://doi.org/10.1073/pnas.1604757113>.
- Rachner et al. "Prognostic Value of RANKL/OPG Serum Levels and Disseminated Tumor Cells in Nonmetastatic Breast Cancer" *Clin Cancer Res* Feb. 15, 2019 (25) (4) 1369-1378; DOI: 10.1158/1078-0432.CCR-18-2482.
- Raje et al. "Role of the RANK/RANKL Pathway in Multiple Myeloma" *Clin Cancer Res* 2019 25(1):12-20; DOI: 10.1158/1078-0432.CCR-18-1537.
- Ren et al., "Efficient Eradication of Mature *Pseudomonas Aeruginosa* Biofilm via Controlled Delivery of Nitric Oxide Combined with Antimicrobial Peptide and Antibiotics," *Frontiers in Microbiology*, vol. 7, Article 1260, (Aug. 2016), 8 pages.
- Reversing Age-Related Hair Loss and Restoring Healthy Hair Growth in Men and Women <https://nutritionreview.org/2015/08/reversing-age-related-hair-loss-and-restoring-healthy-hair-growth-in-men-and-women/> (Aug. 24, 2015).
- RFA (radiofrequency ablation), *Swedish Medical Imaging*, 2 pages, author unknown, undated.
- Sabbah "Electrical vagus nerve stimulation for the treatment of chronic heart failure", *Cleve Clin J Med*, 78 Suppl 1: S24-9. doi: 10.3949/ccjm.78.s1.04 (Aug. 2011).
- Sabino-Carvalho et al., "Non-invasive Vagus Nerve Stimulation Acutely Improves Blood Pressure Control in a Placebo Controlled Study," *The FASEB Journal*, vol. 31, 2017, available online at https://www.fasebj.org/doi/abs/10.1096/fasebj.31.1_supplement.848.8, 2 pages) Abstract Only.
- Sahmeddini et al., "Electro-Acupuncture Stimulation at Acupoints Reduced the Severity of Hypotension During Anesthesia in Patients Undergoing Liver Transplantation," *Journal of Acupuncture and Meridian Studies*, vol. 5, Issue 1, (2012), pp. 11-14.
- Sahoo and Losardo, "Exosomes and Cardiac Repair After Myocardial Infarction", *Circulation Research*, 114:333-344 (Jan. 16, 2014).
- Salcedo et al., "Low current electrical stimulation upregulates cytokine expression in the anal sphincter," *Int. J. Colorectal Dis.*, Feb. 2012;27(2):221-5. doi: 10.1007/s00384-011-1324-3. Epub (Oct. 2011).
- Sandvik et al., "Direct Electric Current Treatment under Physiologic Saline Conditions Kills *Staphylococcus epidermidis* Biofilms via Electrolytic Generation of Hypochlorous Acid," *PloS one*, vol. 8, (Feb. 2013), e55118, 14 pages.
- Schardong et al., "Intradialytic neuromuscular electrical stimulation reduces DNA damage in chronic kidney failure patients: a randomized controlled trial," *Biomarkers*, vol. 23, Issue 5, 2018, pp. 1-11.
- Schimmel et al. "Neuroinflammation in traumatic brain injury: A chronic response to an acute injury" *Brain Circ*, 2017, 3(3):135-142.
- Schmidt-Malan et al., "Activity of Fixed Direct Electrical Current in Experimental *Staphylococcus aureus* Foreign-Body Osteomyelitis," *Diagnostic Microbiology and Infectious Disease*, vol. 93, (2019), pp. 92-95.
- Seifi & Jeszri "Correlation of bone resorption induced by orthodontic tooth movement and expression of RANKL in rats", *Dental Journal*, vol. 26, No. 4 (2009).

(56)

References Cited

OTHER PUBLICATIONS

- Sethi et al. "Aortic stiffness: pathophysiology, clinical implications, and approach to treatment" *Integr Blood Press Control*. 2014; 7: 29-34.
- Shahid et al., "Rhinosinusitis in Children," *ISRN Otolaryngology*, vol. 2012, Article ID 851831, (Dec. 2012), 11 pages.
- Shirtliff et al., "Assessment of the Ability of the Bioelectric Effect to Eliminate Mixed-Species Biofilms," *Applied and Environmental Microbiology*, vol. 71, (2005), pp. 6379-6382.
- Shoji-Matsunaga et al. "Osteocyte regulation of orthodontic force-mediated tooth movement via RANKL expression." *Scientific Reports*, 7: 8753, published online Aug. 18, 2017, DOI:10.1038/s41598-017-09326-7.
- Showkatbakhsh et al. "Effect of Intra-Canal Direct Current Electric Stimulation on Orthodontic Tooth Movement: An Experimental Study in Canines" *Journal of Dental School* 2016; 34(3): 157-67.
- Showkatbakhsh et al. "The effect of pulsed electromagnetic fields on the acceleration of tooth movement." *World J Orthod*. 2010 Winter;11(4):e52-6.
- Signature Orthodontics "Accelerated Tooth Movement", <http://www.sigortho.com/accelerated-tooth-movement>, visited Mar. 15, 2017.
- Silvers et al. "The Bioelectric Code: Reprogramming Cancer and Aging from the Interface of Mechanical and Chemical Microenvironments," *Front. Cell Dev. Biol.*, Mar. 6, 2018; doi.org/10.3389/fcell.2018.00021.
- Sisay et al. "The RANK/RANKL/OPG system in tumorigenesis and metastasis of cancer stem cell: potential targets for anticancer therapy" *Onco Targets Ther*. 2017; 10: 3801-3810.
- Somayaji et al., "In Vitro Scanning Electron Microscopic Study on the Effect of Doxycycline and Vancomycin on Enterococcal Induced Biofilm," *Iranian Endodontic Journal*, vol. 5, (2010), pp. 53-58.
- Souli et al., "Effects of Slime Produced by Clinical Isolates of Coagulase-Negative *Staphylococci* on Activities of Various Antimicrobial Agents," *Antimicrobial Agents and Chemotherapy*, vol. 42, (Apr. 1998), pp. 939-941.
- Spadari et al.. Electrical stimulation enhances tissue reorganization during orthodontic tooth movement in rats; *Clinical Oral Investigations*, Jan. 2017, vol. 21, Issue 1, pp. 111-120, Abstract.
- Spiridonov et al. "Effect of Transcutaneous Electrical Stimulation of Nerves on Blood Pressure and Blood Content of Neuropeptide CGRP and Nitric Oxide in Hypertensive Rats with Metabolic Disturbances" *Bull Exp Biol Med* (Feb. 2019) 166: 436-437.
- Stein et al., "The effect of transcutaneous electrical nerve stimulation on blood pressure," *Blood Pressure*, vol. 22, Issue 3, 2013, available online at < <https://www.tandfonline.com/doi/full/10.3109/08037051.2012.722271> >, 5 pages.
- Stenn et al., "Bioengineering the Hair Follicle," *Organogenesis*, 3(1): 6-13 (Jan.-Mar. 2007).
- Stewart et al., "Electrolytic Generation of Oxygen Partially Explains Electrical Enhancement of Tobramycin Efficacy Against *Pseudomonas Aeruginosa* Biofilm," *Antimicrobial Agents and Chemotherapy*, vol. 43, (1999), pp. 292-296.
- Control of pelage hair follicle development and cycling by complex interactions between follistatin and activin, *FASEB J* (Jan. 2, 2003).
- Corrigan et al. "Neurogenic inflammation after traumatic brain injury and its potentiation of classical inflammation", *Journal of Neuroinflammation*, 2016, 13:264; doi://doi.org/10.1186/s12974-016-0738-9.
- Costerton et al., "Mechanism of Electrical Enhancement of Efficacy of Antibiotics in Killing Biofilm Bacteria," *Antimicrobial Agents and Chemotherapy*, vol. 38, (1994), pp. 2803-2809.
- Costerton et al., "The Application of Biofilm Science to the Study and Control of Chronic Bacterial Infections," *The Journal of Clinical Investigation*, vol. 112, (2003), pp. 1466-1477.
- Cowburn et al. "HIF isoforms in the skin differentially regulate systemic arterial pressure" *Proc Natl Acad Sci U S A*. Oct. 22, 2013; 110(43): 17570-17575.
- Cross et al. "Milk Ejection following Electrical Stimulation of the Pituitary Stalk in Rabbits," *Nature* 166, 994-995 (Dec. 9, 1950); doi:10.1038/166994b0 (Abstract Only).
- D'Apuzzo et al. "Biomarkers of Periodontal Tissue Remodeling during Orthodontic Tooth Movement in Mice and Men: Overview and Clinical Relevance", *The Scientific World Journal*, vol. 2013 (2013), Article ID 105873, 8 pages, <http://dx.doi.org/10.1155/2013/105873>.
- Dai et al. "Nanosecond Pulsed Electric Fields Enhance the Antitumor Effects of the mTOR Inhibitor Everolimus against Melanoma," *Scientific Reports* vol. 7, Article No. 39597 (2017).
- Delcaru et al., "Microbial Biofilms in Urinary Tract Infections and Prostatitis: Etiology, Pathogenicity, and Combating strategies," *Pathogens*, vol. 5, (2016), 12 pages.
- Deswal et al. "Cytokines and Cytokine Receptors in Advanced Heart Failure An Analysis of the Cytokine Database from the Vesnarinone Trial (VEST)," *Circulation*. 2001;103:2055-2059;://doi.org/10.1161/01.CIR.103.16.2055.
- Dibart et al. "Tissue response during Piezocision-assisted tooth movement: a histological study in rats", *Eur J Orthod* (2014) 36 (4): 457-464; DOI: <https://doi.org/10.1093/ejo/cjt079>.
- Dietrich et al. "Decalcification of the mitral annulus: surgical experience in 81 patients" *Thorac Cardiovasc Surg*. Oct. 2006;54(7):464-7 (Abstract Only).
- Dong-Hwan Kim et al., The effects of electrical current from a micro-electrical device on tooth movement, *Korean Orthod.*, Oct. 2008, 38(5):337-346.
- Ehrlich Et Al., "Engineering Approaches for the Detection and Control of Orthopaedic Biofilm Infections," *Clinical Orthopaedics and Related Research*, vol. 437, (2005), pp. 59-66.
- El-Bialy Et Al. "Effect of Low Intensity Pulsed Ultrasound (LIPUS) on Tooth Movement and Root Resorption: A Prospective Multi-Center Randomized Controlled Trial" *J. Clin. Med*. 2020, 9, 804; doi:10.3390/jcm9030804.
- Electric Tumor Treatment Fields, No. 0827 Policy, http://www.aetna.com/cpb/medical/data/800_899/0827.html (Nov. 18, 2016).
- Electrical brain stimulation could support stroke recovery <https://www.sciencedaily.com/releases/2016/03/160316151108.htm> (Mar. 16, 2016).
- Eurekalert, UCI Study Finds Acupuncture Lowers Hypertension by Activating Natural Opioids, Available Online at < https://www.eurekalert.org/pub_releases/2016-10/uoc-usf103116.php >, (2016), 2 pages.
- Fan et al., "A Review on the Nonpharmacological Therapy of Traditional Chinese Medicine with Antihypertensive Effects," *Evidence-Based Complementary and Alternative Medicine*, vol. 2019, (2019), Article ID 1317842, 7 pages.
- Fatemi et al. "Imaging elastic properties of biological tissues by low-frequency harmonic vibration" *Proceedings of the IEEE*, 91(10):1503-1519 (Oct. 2003).
- FDA Approves Algovita Spinal Cord Stimulation System from Greatbatch, http://www.odtmag.com/contents/view_breaking-news/2015-12-02/fda-approves-algovita-spinal-cord-stimulation-system-from-greatbatch (Dec. 2, 2015).
- Ferris, "Battle against baldness turns to stem cells" <http://www.cnn.com/2015/01/29/studies-indicate-its-possible-to-use-stem-cells-to-cure-baldness.html> (Jan. 29, 2015).
- Ferrucci, D. A. "Introduction to This is Watson," in *IBM Journal of Research and Development*, vol. 56, No. 3.4, pp. 1:1-1:15, May-Jun. 2012. DOI: 10.1147/JRD.2012.2184356.
- Fili et al. "Therapeutic implications of osteoprotegerin" *Cancer Cell International* vol. 9, Article No. 26 (2009).
- Flachskampf et al., "Randomized Trial of Acupuncture to Lower Blood Pressure," *Circulation*, vol. 115, (2007), pp. 3121-3129.
- Fonseca et al. "Electrical stimulation: Complementary therapy to improve the performance of grafts in bone defects?" *Journal of Biomedical Materials Research Part B: Applied Biomaterials* 2018 vol. 000b, Issue 0.
- Froughreyhani et al., "Effect of Electric Currents on Antibacterial Effect of Chlorhexidine Against *Enterococcus Faecalis* Biofilm: An in Vitro Study," *Journal of Clinical and Experimental Dentistry*, vol. 10, (Dec. 2018), pp. e1223-e1229.
- Fukuoka and Suga, "Hair Regeneration Treatment Using Adipose-Derived Stem Cell Conditioned Medium: Follow-up With Trichograms" *Eplasty*, 15:e10 (Mar. 2015).

(56)

References Cited

OTHER PUBLICATIONS

Fukuoka et al. "Hair Regeneration Treatment Using Adipose-Derived Stem Cell Conditioned Medium: Follow-up With Trichograms" *Eplasty*, 15:e10 (Mar. 2015).

Fukuoka et al., "The Latest Advance in Hair Regeneration Therapy Using Proteins Secreted by Adipose-Derived Stem Cells" *The American Journal of Cosmetic Surgery*, 29(4):273-282 (2012).

Gavira et al. "Repeated implantation of skeletal myoblast in a swine model of chronic myocardial infarction," *Eur. Heart J.*, 31(8): 1013-1021. doi: 10.1093/eurheartj/ehp342 (2010).

Giganti et al. "Changes in serum levels of TNF-alpha, IL-6, OPG, Rankl and their correlation with radiographic and clinical assessment in fragility fractures and high energy fractures", *J Biol Regul Homeost Agents*, Oct.-Dec. 2012;26(4):671-80.

Giladi et al., "Microbial Growth Inhibition by Alternating Electric Fields," *Antimicrobial Agents and Chemotherapy*, vol. 52, (2008), pp. 3517-3522.

Golberg et al., "Eradication of Multidrug-Resistant *A. Baumannii* in Burn Wounds by Antiseptic Pulsed Electric Field," *Technology*, vol. 2, (2014), pp. 153-160.

Golberg et al., "Eradication of Multidrug-Resistant *A. Baumannii* in Burn Wounds by Antiseptic Pulsed Electric Field," *Technology*, vol. 2, (2014), pp. 153-160.

Golberg et al., "Pulsed Electric Fields For Burn Wound Disinfection in a Murine Model," *Journal of Burn Care & Research*, vol. 36, (2015), pp. 7-13.

Goranov et al. "Bone Lesions in Multiple Myeloma—The OPG/RANK—ligand System" *Folia Med (Plovdiv)*. 2004; 46(3): 5-11 (Abstract Only).

Goswami et al. "Osteoprotegerin rich tumor microenvironment: implications in breast cancer" *Oncotarget*. Jul. 5, 2016; 7(27): 42777-42791.

Grad, D., "Electrical Scalp Device Can Slow Progression of Deadly Brain Tumors", *New York Times*, https://www.nytimes.com/2014/11/16/health/electrical-scalp-device-can-slow-progression-of-deadly-brain-tumors.html?_r=0 (Nov. 15, 2014).

Greenwald "Pulse pressure and arterial elasticity" *QJM: An International Journal of Medicine*, vol. 95, Issue 2, 2002, pp. 107-112.

Guimarães-Camboa et al. "Redox Paradox: Can Hypoxia Heal Ischemic Hearts?" *Cell*, 39(4):392-394, (Nov. 21, 2016) DOI: <http://dx.doi.org/10.1016/j.devcel.2016.11.007>.

Gullestad Et Al. "Inflammatory cytokines in heart failure: mediators and markers," *Cardiology*. 2012;122(1):23-35. doi: 10.1159/000338166. Epub Jun. 12, 2012.

Gurbax et al. "Accelerated Orthodontic Tooth Movement: A Review" *mod Res Dent*. 1(2). MRD.000508. 2017. DOI: 10.31031/MRD.2017.01.000508.

Hamman, R. "Modulation Of RANKL and Osteoprotegerin in Adolescents Using Orthodontic Forces", Masters Thesis, University of Tennessee (2010).

Hamzelou Et Al. "Cancer reversed in frogs by hacking cells' electricity with light," *New Scientist This Week*, Mar. 16, 2016.

Hari et al., "Application of Bioelectric Effect to Reduce the Antibiotic Resistance of Subgingival Plaque Biofilm: An in Vitro Study," *Journal of Indian Society of Periodontology*, vol. 22, (2018), pp. 133-139.

* cited by examiner

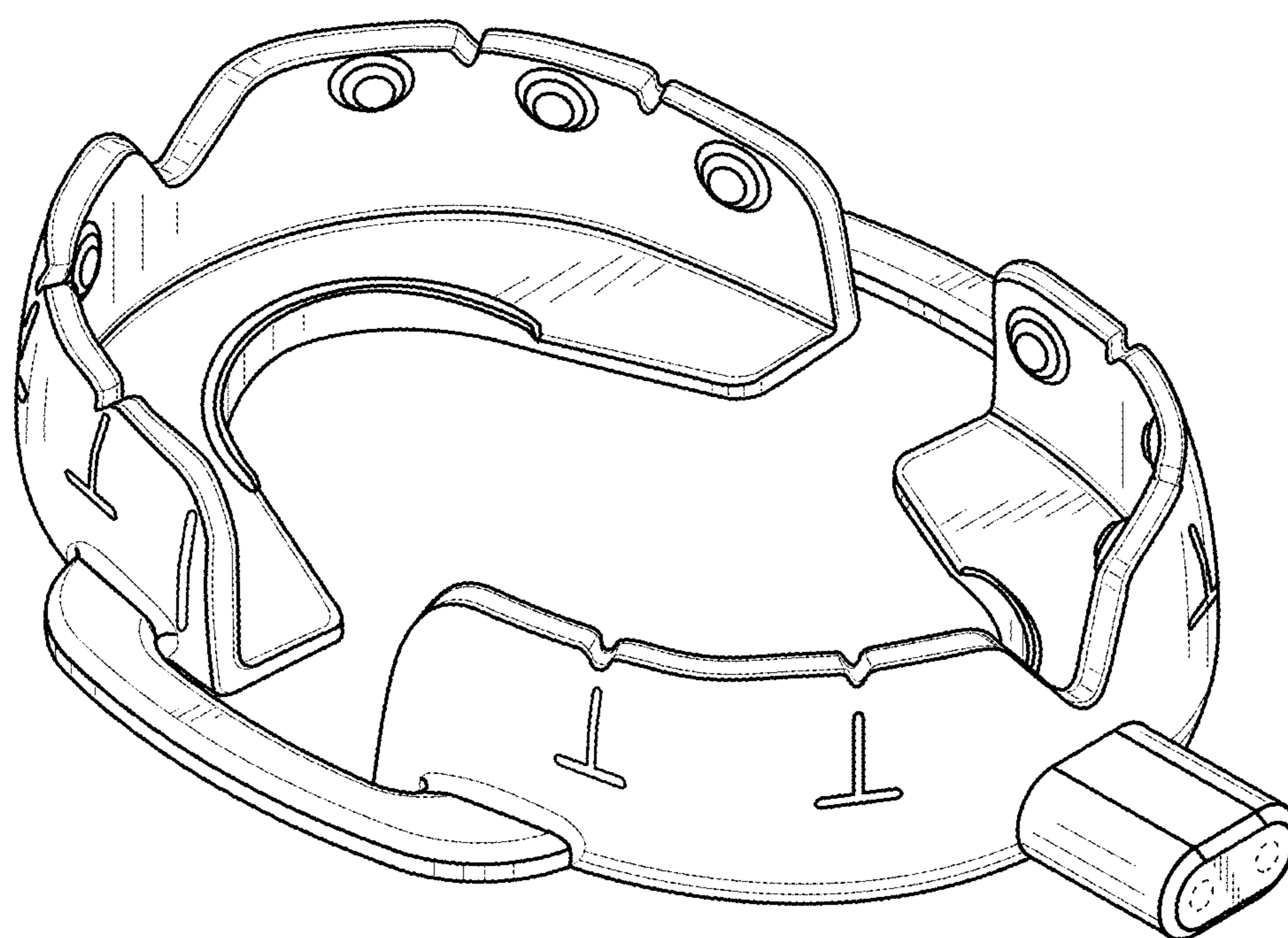


FIG. 1

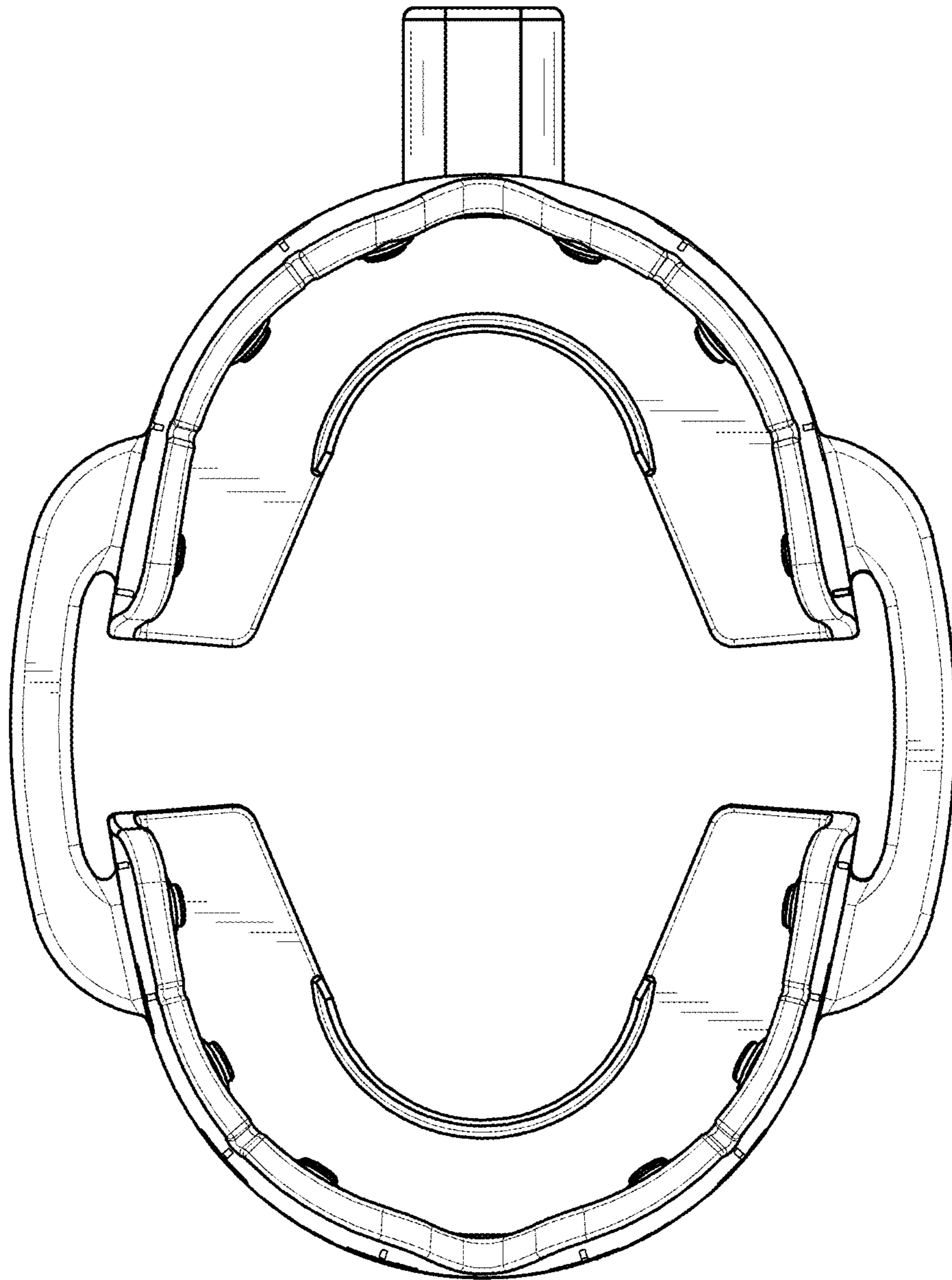


FIG. 2

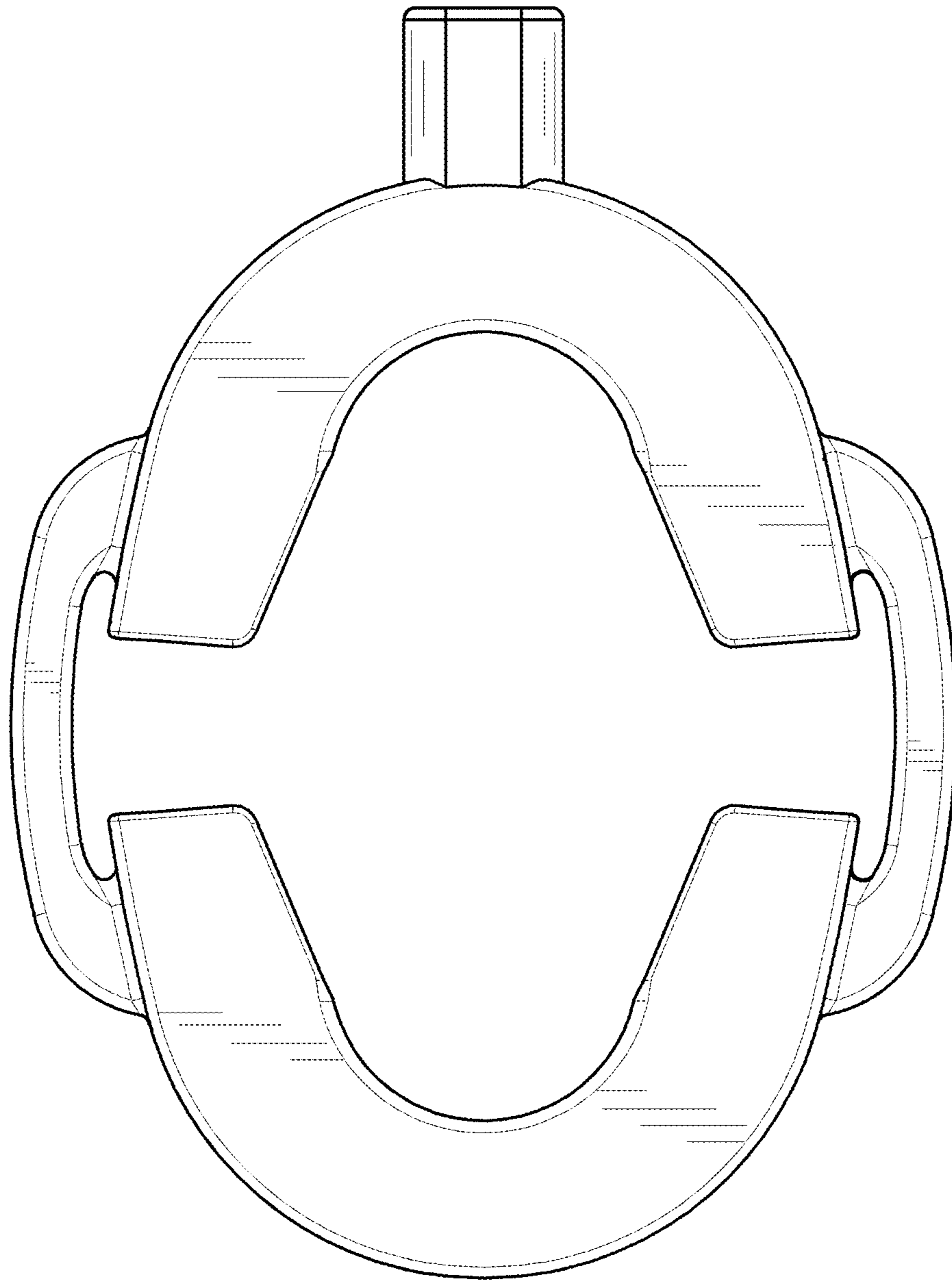


FIG. 3

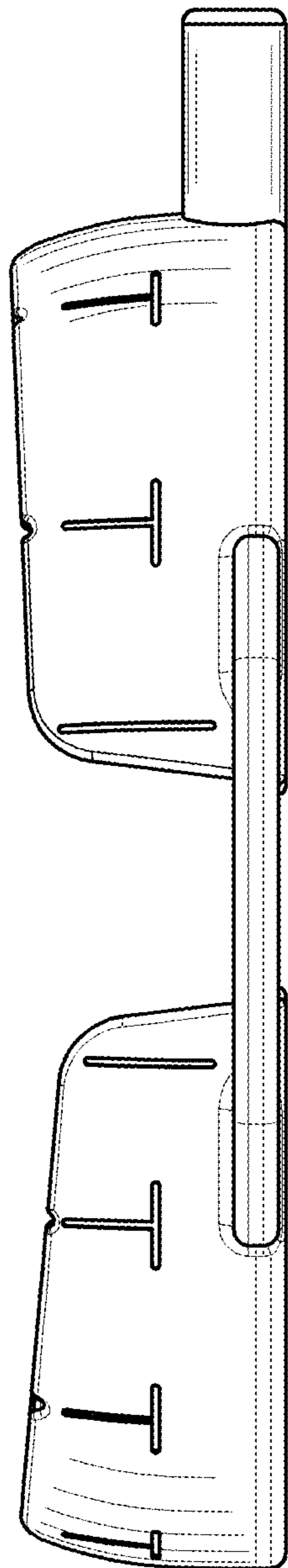


FIG. 4

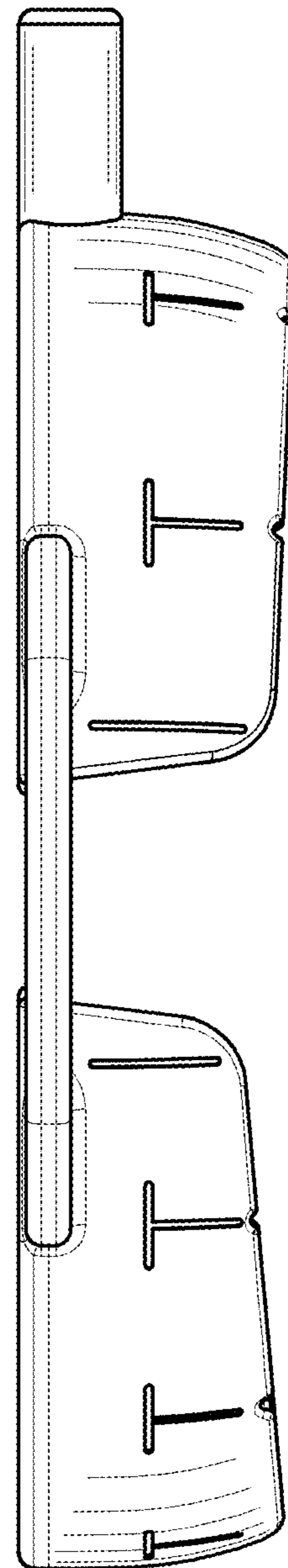


FIG. 5

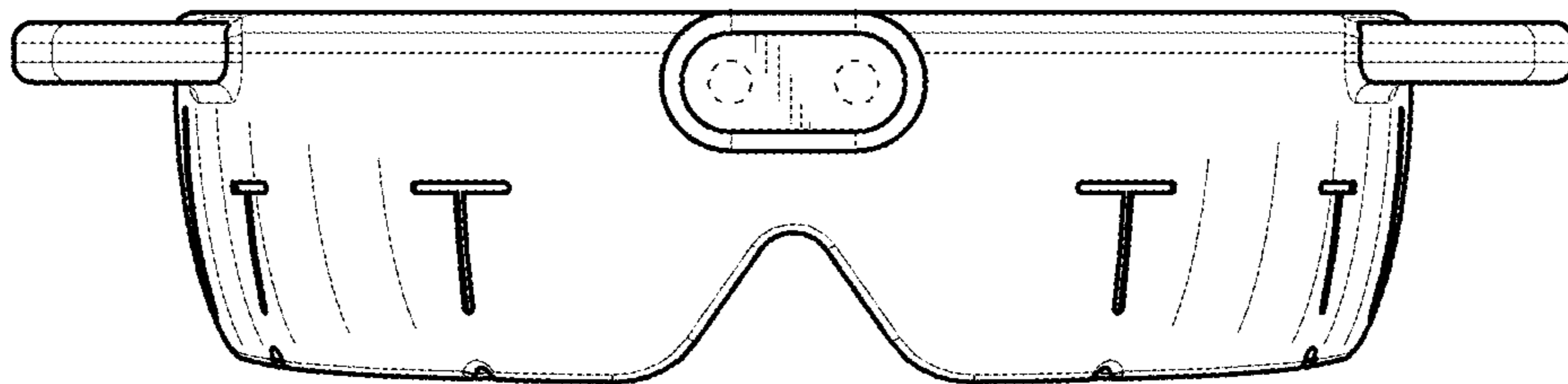


FIG. 6

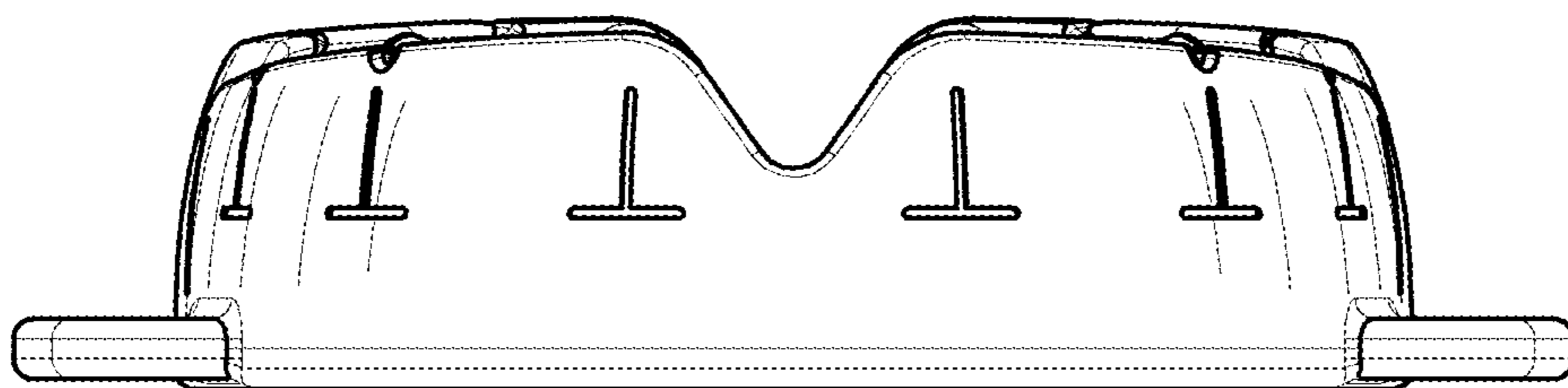


FIG. 7