



US00D638128S

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

(10) **Patent No.:** **US D638,128 S**

(45) **Date of Patent:** **** *May 17, 2011**

(54) **OCULAR DEVICE DESIGN**

D352,106 S * 11/1994 Fanney et al. D24/185
5,368,582 A 11/1994 Bertera
5,368,591 A 11/1994 Lennox et al.
5,425,380 A 6/1995 Hudson et al.

(75) Inventors: **Gary F. Prokop**, Wheaton, IL (US); **Don Lehman**, Chicago, IL (US); **David Chesley**, Duxbury, MA (US); **Joey Nakayama**, Chicago, IL (US); **Keith Gausmann**, Cary, NC (US); **Adam Ruggles**, Chicago, IL (US)

(Continued)

FOREIGN PATENT DOCUMENTS

CA 2679448 A1 9/2008

(Continued)

(73) Assignee: **TearScience, Inc.**, Morrisville, NC (US)

OTHER PUBLICATIONS

(**) Term: **14 Years**

Sullivan, David et al., "Do Sex Steroids Exert Sex-Specific and/or Opposite Effects on Gene Expression in Lacrimal and Meibomian Glands?" *Molecular Vision*, vol. 15, No. 166, Aug. 10, 2009, pp. 1553-1572.

(21) Appl. No.: **29/344,914**

(Continued)

(22) Filed: **Oct. 6, 2009**

(51) **LOC (9) Cl.** **24-01**

(52) **U.S. Cl.** **D24/172**

(58) **Field of Classification Search** D24/172,
D24/185, 186; D14/126, 371, 375, 376,
D14/382; 351/209 -212, 206

See application file for complete search history.

Primary Examiner — T. Chase Nelson

Assistant Examiner — Anhdao Doan

(74) *Attorney, Agent, or Firm* — Withrow & Terranova, PLLC

(56) **References Cited**

(57) **CLAIM**

The ornamental design for an ocular device design, as shown and described.

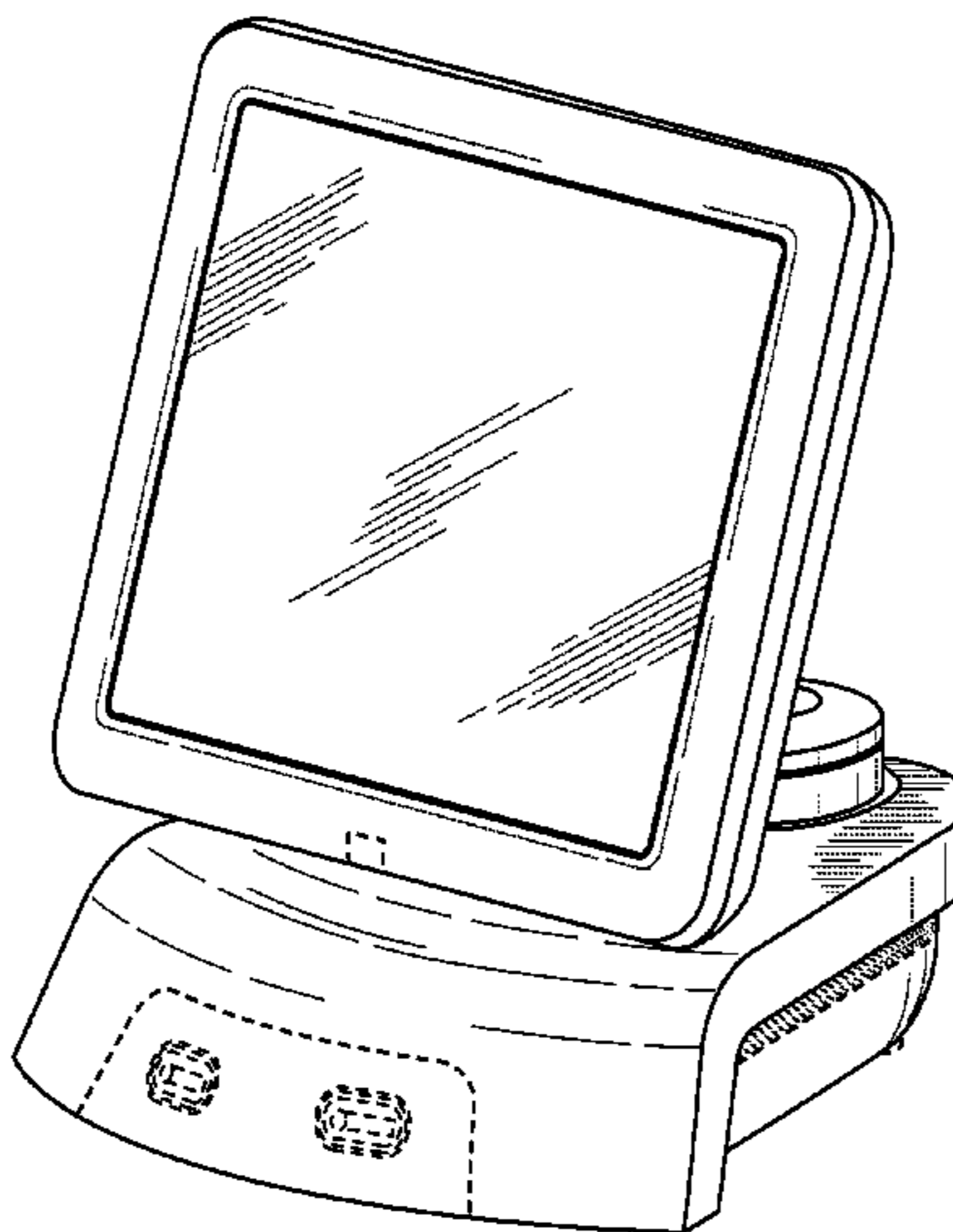
U.S. PATENT DOCUMENTS

DESCRIPTION

1,006,945 A 10/1911 Houston
1,924,315 A 8/1933 Hemphill et al.
2,891,252 A 6/1959 Lazo
3,333,586 A 8/1967 Bellis et al.
3,404,678 A 10/1968 Von Ardenne
3,667,476 A 6/1972 Muller
4,261,364 A 4/1981 Haddad et al.
4,778,457 A 10/1988 York
4,883,454 A 11/1989 Hamburg
4,914,088 A 4/1990 Glonek et al.
4,955,377 A 9/1990 Lennox et al.
4,958,632 A 9/1990 Duggan
5,030,214 A 7/1991 Spector
5,151,100 A 9/1992 Abele et al.
5,158,082 A 10/1992 Jones
5,213,097 A 5/1993 Zeindler
5,251,627 A 10/1993 Morris
5,283,063 A 2/1994 Freeman
5,343,561 A 9/1994 Adamo

FIG. 1 is a front perspective view of an ocular device design according to our design;
FIG. 2 is a rear perspective view thereof;
FIG. 3 is a front view thereof;
FIG. 4 is a rear view thereof;
FIG. 5 is a left side view thereof, the right side view being a mirror image;
FIG. 6 is a top view thereof; and,
FIG. 7 is a bottom side view thereof.
The broken lines in the drawing figures are included for the purpose of illustrating portions of the ocular device that form no part of the claimed design.

1 Claim, 7 Drawing Sheets



US D638,128 S

U.S. PATENT DOCUMENTS

5,496,311 A 3/1996 Abele et al.
5,601,548 A 2/1997 Smith et al.
5,643,336 A 7/1997 Lopez-Claros
5,700,238 A 12/1997 Hyson
5,720,773 A 2/1998 Lopez-Claros
5,807,357 A 9/1998 Kang
5,836,927 A 11/1998 Fried
5,958,912 A 9/1999 Sullivan
5,964,723 A 10/1999 Augustine
6,024,095 A 2/2000 Stanley, III
6,107,289 A 8/2000 Sullivan
6,110,292 A 8/2000 Jewett et al.
6,112,900 A 9/2000 Adkins, Jr.
6,113,561 A 9/2000 Augustine
6,153,607 A 11/2000 Pflugfelder et al.
6,155,995 A 12/2000 Lin
6,181,970 B1 1/2001 Kasevich
6,193,740 B1 2/2001 Rodriguez
6,206,842 B1 3/2001 Tu et al.
6,213,966 B1 4/2001 Augustine
6,273,886 B1 8/2001 Edwards et al.
D456,079 S * 4/2002 Fujii D24/172
6,423,018 B1 7/2002 Augustine
6,425,888 B1 7/2002 Embleton et al.
6,438,398 B1 8/2002 Pflugfelder et al.
6,455,583 B1 9/2002 Pflugfelder et al.
6,482,203 B2 11/2002 Paddock et al.
6,490,488 B1 12/2002 Rudie et al.
D472,637 S * 4/2003 Cooper et al. D24/172
6,544,257 B2 4/2003 Nagase et al.
D477,084 S * 7/2003 Menezes et al. D24/172
6,641,264 B1 11/2003 Schwebel
6,788,977 B2 9/2004 Fenn et al.
6,827,898 B1 12/2004 Fausset et al.
6,840,954 B2 1/2005 Dietz et al.
6,860,852 B2 3/2005 Schonenberger et al.
6,860,880 B2 3/2005 Treat et al.
6,874,884 B2 4/2005 Schwebel
6,882,885 B2 4/2005 Levy, Jr. et al.
6,886,933 B2 5/2005 Schwebel
6,908,195 B2 6/2005 Fuller
6,925,317 B1 8/2005 Samuels et al.
6,974,454 B2 12/2005 Hooven
7,001,379 B2 2/2006 Behl et al.
7,004,942 B2 2/2006 Laird et al.
7,036,928 B2 5/2006 Schwebel
7,069,084 B2 6/2006 Yee
7,108,694 B2 9/2006 Miura et al.
7,118,591 B2 10/2006 Frank et al.
7,123,968 B1 10/2006 Casscells, III et al.
7,211,070 B2 5/2007 Soroudi
7,231,922 B2 6/2007 Davison et al.
D546,459 S * 7/2007 Banryu D24/186
D552,736 S * 10/2007 Yamaoka D24/172
D553,750 S * 10/2007 Yamaoka D24/172
7,357,500 B2 4/2008 Schwebel
7,442,174 B2 10/2008 Butler
7,513,893 B2 4/2009 Soroudi
7,594,728 B2 * 9/2009 Seal et al. 351/210
D612,941 S * 3/2010 Youngquist et al. D24/172
D614,774 S * 4/2010 Gausmann et al. D24/172
7,712,899 B2 * 5/2010 Tanassi et al. 351/206
2001/0041886 A1 11/2001 Durkin et al.
2002/0035345 A1 3/2002 Beck
2002/0099094 A1 7/2002 Anderson
2002/0111608 A1 8/2002 Baerveldt et al.
2002/0128696 A1 9/2002 Pearl et al.
2003/0056281 A1 3/2003 Hasegawa
2003/0065277 A1 4/2003 Covington
2003/0114426 A1 6/2003 Pflugfelder et al.
2003/0139790 A1 7/2003 Ingle et al.
2003/0195438 A1 10/2003 Petillo
2003/0211043 A1 11/2003 Korb
2003/0233135 A1 12/2003 Yee
2004/0064169 A1 4/2004 Briscoe et al.
2004/0064171 A1 4/2004 Briscoe et al.
2004/0076695 A1 4/2004 Gilbard
2004/0111138 A1 6/2004 Bleam et al.

2004/0153093 A1 8/2004 Donovan
2004/0237969 A1 12/2004 Fuller
2004/0249427 A1 12/2004 Nabils
2005/0022823 A1 2/2005 Davison et al.
2005/0119629 A1 6/2005 Soroudi
2005/0143798 A1 6/2005 Bleam et al.
2005/0220742 A1 10/2005 Breen
2006/0018953 A1 1/2006 Guillon et al.
2006/0030604 A1 2/2006 Elsinger et al.
2006/0055878 A1 3/2006 Yee
2006/0104914 A1 5/2006 Soroudi
2006/0139569 A1 6/2006 Schwebel
2006/0154901 A1 7/2006 Pflugfelder et al.
2006/0157064 A1 7/2006 Davison et al.
2006/0183698 A1 8/2006 Abelson
2006/0233859 A1 10/2006 Whitcup et al.
2007/0016256 A1 1/2007 Korb et al.
2007/0049913 A1 3/2007 Grenon et al.
2007/0173799 A1 7/2007 Hsia
2007/0203462 A1 8/2007 Soroudi
2007/0280924 A1 12/2007 Daniels et al.
2008/0051741 A1 2/2008 Grenon et al.
2008/0075787 A1 3/2008 Hibino
2008/0132973 A1 6/2008 Lord et al.
2009/0043365 A1 2/2009 Friedland et al.
2009/0137533 A1 5/2009 Adkins, Jr.
2009/0306111 A1 12/2009 Nakamura et al.
2010/0100029 A1 4/2010 Maskin
2010/0292630 A1 11/2010 Maskin

FOREIGN PATENT DOCUMENTS

DE 202005011496 U1 7/2006
EP 2151438 A1 2/2010
EP 1587468 B1 1/2011
JP 06269473 A 9/1994
JP 11221247 8/1999
JP 2002078727 3/2002
JP 2006198249 8/2006
JP 2010155012 A 7/2010
WO 9958131 11/1999
WO 2004041134 A1 5/2004
WO 2008024100 A2 2/2008
WO 2008106228 A2 9/2008
WO 2009064834 A2 5/2009

OTHER PUBLICATIONS

Paugh, Jerry R. et al., "Precorneal Residence Time of Artificial Tears Measured in Dry Eye Subjects," *Optometry and Vision Science*, vol. 85, No. 8, Aug. 2008, pp. 725-731.
Lemp, Michael A. et al., "Blepharitis in the United States 2009: A Survey-Based Perspective on Prevalence and Treatment." *Ocul. Surf.*, vol. 7, No. 2 Suppl, Apr. 2009, pp. S1-S14.
Matsumoto, Yukihiko et al., "The Evaluation of the Treatment Response in Obstructive Meibomian Gland Disease by In Vivo Laser Confocal Microscopy," *Graefes Arch Clin Exp Ophthalmol*, vol. 247, No. 6, Jun. 2009, pp. 821-829.
Toyos, Rolando, "Intense Pulsed Light for Dry Eye Syndrome," *Cataract & Refractive Surgery Today*, Apr. 2009, pp. 1-3.
Donnenfeld, Eric et al., "Topical Ophthalmic Cyclosporine: Pharmacology and Clinical Uses," *Survey of Ophthalmology*, vol. 54, No. 3, May/Jun. 2009, pp. 321-338.
Suzuki, Tomo et al., "Estrogen and Progesterone Control of Gene Expression in the Mouse Meibomian Gland," *Invest. Ophthalmol. Vis. Sci.*, vol. 49, No. 5, Apr. 2008, pp. 1797-1818.
Vasta, Stephanie, "Aggressive Treatments Developed for Meibomian Gland Dysfunction," *Primary Care Optometry News*, Nov. 1, 2009, 3 pages.
"arGentis Licenses Third Treatment for Dry Eye Syndrome" *Business Wire* 5/12/2008.
"New Over-the-Counter Dry Eye Drop Now Available to Help Estimated 40 Percent of Americans Who Suffer from Occasional or Chronic Dry Eye" *Business Wire News Release* Mar. 31, 2008.
Aronowicz, JD et al. "Short Term Oral Minocycline Treatment of Meibomiantis," *Br. J. Ophthalmol*, vol. 90, No. 7, Jul. 2006.

- Blackie, Caroline A. et al., "Inner Eyelid Surface Temperature as a Function of Warm Compress Methodology," *Optometry and Vision Science*, vol. 85, No. 8, Aug. 2008, pp. 675-683.
- Blackie, Caroline A. et al., "Recovery Time of an Optimally Secreting Meibomian Gland," *Cornea*, vol. 28, No. 3, Apr. 2009, pp. 293-297.
- Goto, E., et al. "Treatment of Non-Inflamed Obstructive Meibomian Gland Dysfunction by an Infrared Warm Compression Device," *Br. J. Ophthalmology*, vol. 86, pp. 1403-1407, Dec. 2002.
- Goto, Eiki, et al., "Tear Evaporation Dynamics in Normal Subjects and Subjects with Obstructive Meibomian Gland Dysfunction," *Investigative Ophthalmology & Visual Science*, vol. 44, No. 2, pp. 533-539, Feb. 2003.
- Gupta, S. et al. "Docetaxel-Induced Meibomian Duct Inflammation and Blockage Leading to Chalazion Formation," *Prostate Cancer Prostatic Diseases*, vol. 10, No. 4, 2007.
- Kokke, K.H. et al., "Oral Omega-6 Essential Fatty Acid Treatment in Contact Lens Associated Dry Eye," *Contact Lens and Anterior Eye*, vol. 31, No. 3, 2008, pp. 141-146.
- Korb, Donald R. et al., "Increase in Tear Film Lipid Layer Thickness Following Treatment of Meibomian Gland Dysfunction", *Lacrimal Gland, Tear Film & Dry Eye Syndromes*, Plenum Press, 1994, pp. 293-298.
- Korb, Donald R. et al., Slide entitled "Inner Eyelid Surface Temperature as a Function of Warm Compress Methodology," from presentation entitled "The Greatest Anterior Segment Disease and Contact Lens Complications Course," AOA Meeting, Seattle, Washington, Jun. 27, 2008, 2 pages.
- Korb, Donald R., O.D., et al., "Meibomian Gland Dysfunction and Contact Lens Intolerance," *Journal of the American Optometric Association*, vol. 51, No. 3, Mar. 1980, pp. 243-251.
- Korb, Donald R., Slide entitled "Inner Eyelid Surface Temperature as a Function of Warm Compress Methodology," from presentation entitled "The Tear Film and Dry Eye States A Fertile Research Area," University of California at Berkeley, School of Optometry, Apr. 11, 2008. 2 pages.
- Kuscu, Naci Kemal, et al., "Tear Function Changes of Postmenopausal Women in Response to Hormone Replacement Therapy," *Maturitas*, vol. 44, pp. 63-68, 2003.
- Lemp, Michael A., et al., "The Therapeutic Role of Lipids—Managing Ocular Surface Disease," *Supplement to Refractive Eyecare of Ophthalmologists*, vol. 9, No. 6, Jun. 2005.
- Minco "Introducing: Thermofoil Heaters," *Bulletin HS-202*, 9 pages.
- Mitra, M. et al., "Tear Film Lipid Layer Thickness and Ocular Comfort after Meibomian Therapy via Latent Heat with a Novel Device in Normal Subjects," *Eye*, pp. 1-4, 2004.
- Mori, A., et al., "Efficacy of the Treatment by the Disposable Eyelid Warming Instrument for Meibomian Gland Dysfunction," *Poster Presentation, Hall A*, 1 page.
- Mori, Asako, et al., "Disposable Eyelid-Warming Device for the Treatment of Meibomian Gland Dysfunction", *Japan Journal of Ophthalmology*, vol. 47, pp. 578-586, 2003.
- Olson, Mary Catherine, B.A., et al., "Increase in Tear Film Lipid Layer Thickness Following Treatment with Warm Compresses in Patients with Meibomian Gland Dysfunction," *Eye & Contact Lens*, vol. 29, No. 2, pp. 96-99, 2003.
- Paugh, J.R. et al., "Meibomian Therapy in Problematic Contact Lens Wear," *Entrez PubMed, Optom Vis Sci*, vol. 68, No. 11, Nov. 1990, pp. 803-806 (abstract only).
- Romero, Juan M., et al., "Conservative Treatment of Meibomian Gland Dysfunction," *Contact Lens Association of Ophthalmology, Eye & Contact Lens*, vol. 30, pp. 14-19, 2004.
- Sullivan, Benjamin D., et al., "Impact of Antiandrogen Treatment on the Fatty Acid Profile of Neutral Lipids in Human Meibomian Gland Secretions," *Journal of Clinical Endocrinology & Metabolism*, Vol. 85, No. 12, pp. 4866-4873, 2000.
- Tobler, David et al., "Nanotech Silver Fights Microbes in Medical Devices," *ND & DI, devicelink.com*, 1 page.
- Unknown, "Anatomy of the Eye and Orbit," p. 170.
- Unknown, "IFU Manual for PNT Model 1000—Rev H," 24 pages.
- Korb, Donald et al., "The Effect of Two Novel Lubricant Eye Drops on Tear Film Lipid Layer Thickness in Subjects with Dry Eye Symptoms," *Optom. Vis. Sci.*, vol. 82, No. 7, 2005, pp. 594-601.
- Korb, Donald R. et al., "Tear Film Lipid Layer Thickness as a Function of Blinking," *Cornea*, vol. 13, No. 4, 1994, pp. 354-359.
- Knop, E. et al., "Meibomian Glands: Part III—Dysfunction—Argument for a Discrete Disease Entity and as an Important Cause of Dry Eye," *Ophthalmology*, vol. 106, No. 11, Nov. 2009, pp. 966-979. (Abstract Only).
- Knop, E. et al., "Meibomian Glands: Part IV—Functional Interactions in the Pathogenesis of Meibomian Gland Dysfunction (MGD)," *Ophthalmology*, vol. 106, No. 11, Nov. 2009, pp. 980-987. (Abstract Only).
- Foulks, Gary N. et al., "Topical Azithromycin Therapy for Meibomian Gland Dysfunction: Clinical Response and Lipid Alterations," *Cornea*, vol. 29, No. 7, Jul. 2010, pp. 781-788.
- Butovich, Igor et al., "Meibomian Lipid Glands and the Impact of Temperature," *Investigative Ophthalmology & Visual Science*, vol. 51, No. 11, Nov. 2010, pp. 5508-5518.
- Korb, Donald R. et al., "Restoration of Meibomian Gland Functionality with Novel Thermodynamic Treatment Device—A Case Report," *Cornea*, vol. 29, No. 8, Aug. 2010, pp. 930-933.
- Akyol-Salman, Ilknur et al., "Efficacy of Topical N-Acetylcysteine in the Treatment of Meibomian Gland Dysfunction," *Journal of Ocular Pharmacology and Therapeutics*, vol. 26, No. 4, Aug. 1, 2010, pp. 329-333.
- Wang, Y. et al., "Baseline Profiles of Ocular Surface and Tear Dynamics After Allogeneic Hematopoietic Stem Cell Transplantation in Patients With or Without Chronic GVHD-Related Dry Eye," *Bone Marrow Transplantation*, vol. 45, No. 6, Jun. 2010, pp. 1077-1083.
- Korb, Donald R. et al., "Lid Wiper Epitheliopathy and Dry Eye Symptoms," *Eye & Contact Lens*, vol. 31, No. 1, 2005, pp. 2-8.
- Foulks, Gary N., "Meibomian Gland Dysfunction: The Past, Present, and Future," *Eye and Contact Lens*, vol. 36, No. 5, Sep. 2010, pp. 249-253.
- Blackie, Caroline A. et al., "Nonobvious Obstructive Meibomian Gland Dysfunction" *Cornea*, vol. 29, No. 12, Dec. 2010, pp. 1333-1345.
- Haque, Reza M. et al., "Multicenter Open-label Study Evaluating the Efficacy of Azithromycin Ophthalmic Solution 1% on the Signs and Symptoms of Subjects with Blepharitis," *Cornea*, vol. 29, No. 8, Aug. 2010, pp. 871-877.
- Maskin, Steven L., "Intraductal Meibomian Gland Probing Relieves Symptoms of Obstructive Meibomian Gland Dysfunction," *Cornea*, vol. 29, No. 10, Oct. 2010, pp. 1145-1152.
- Dausch, Eva et al., "Dry Eye Syndrome in Women's Health and Gynecology: Etiology, Pathogenesis and Current Therapeutic Strategies," *Geburtshilfe und Frauenheilkunde*, vol. 70, No. 9, Jan. 1, 2010, pp. 707-711. (Abstract Only).

* cited by examiner

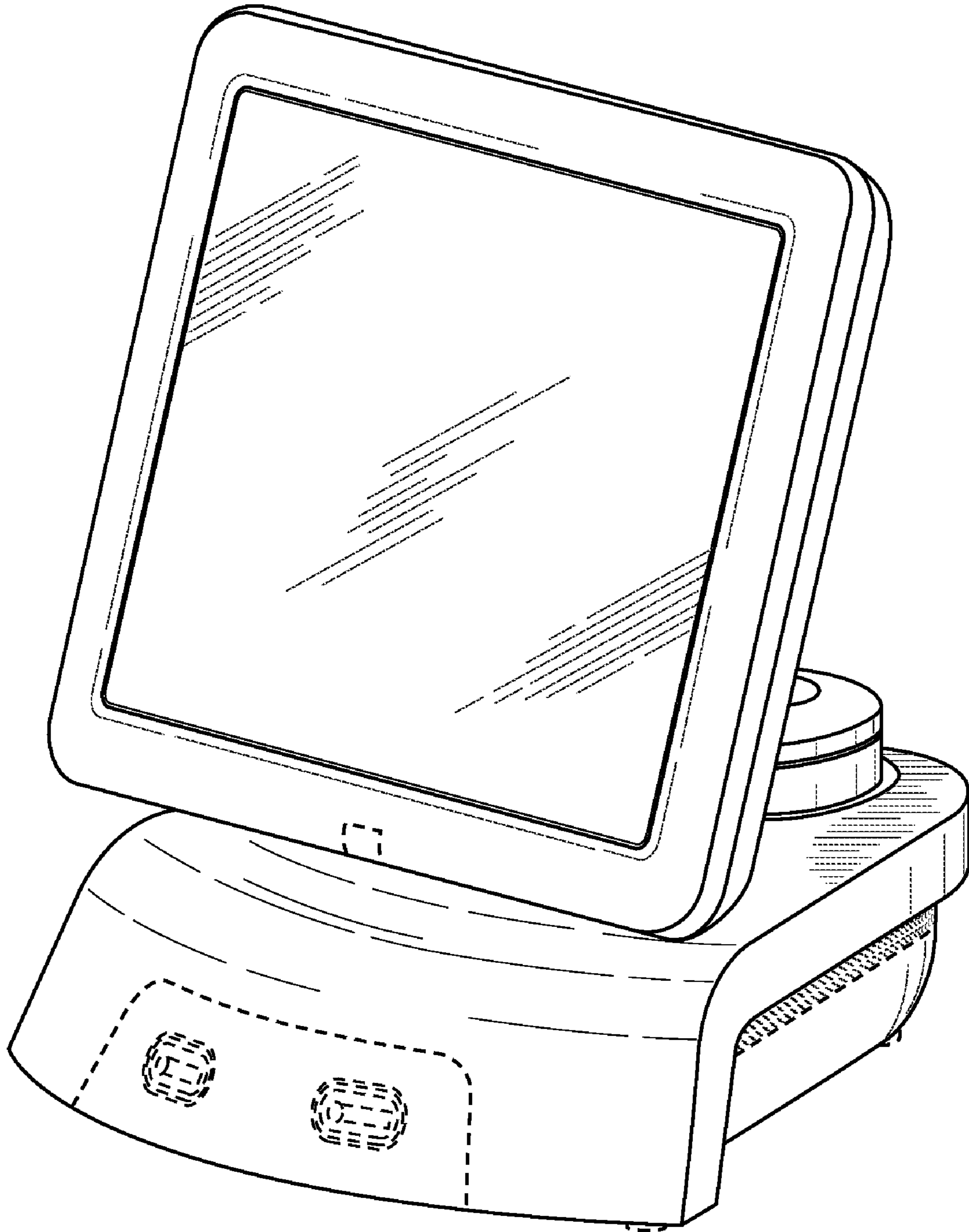


FIG. 1



FIG. 2

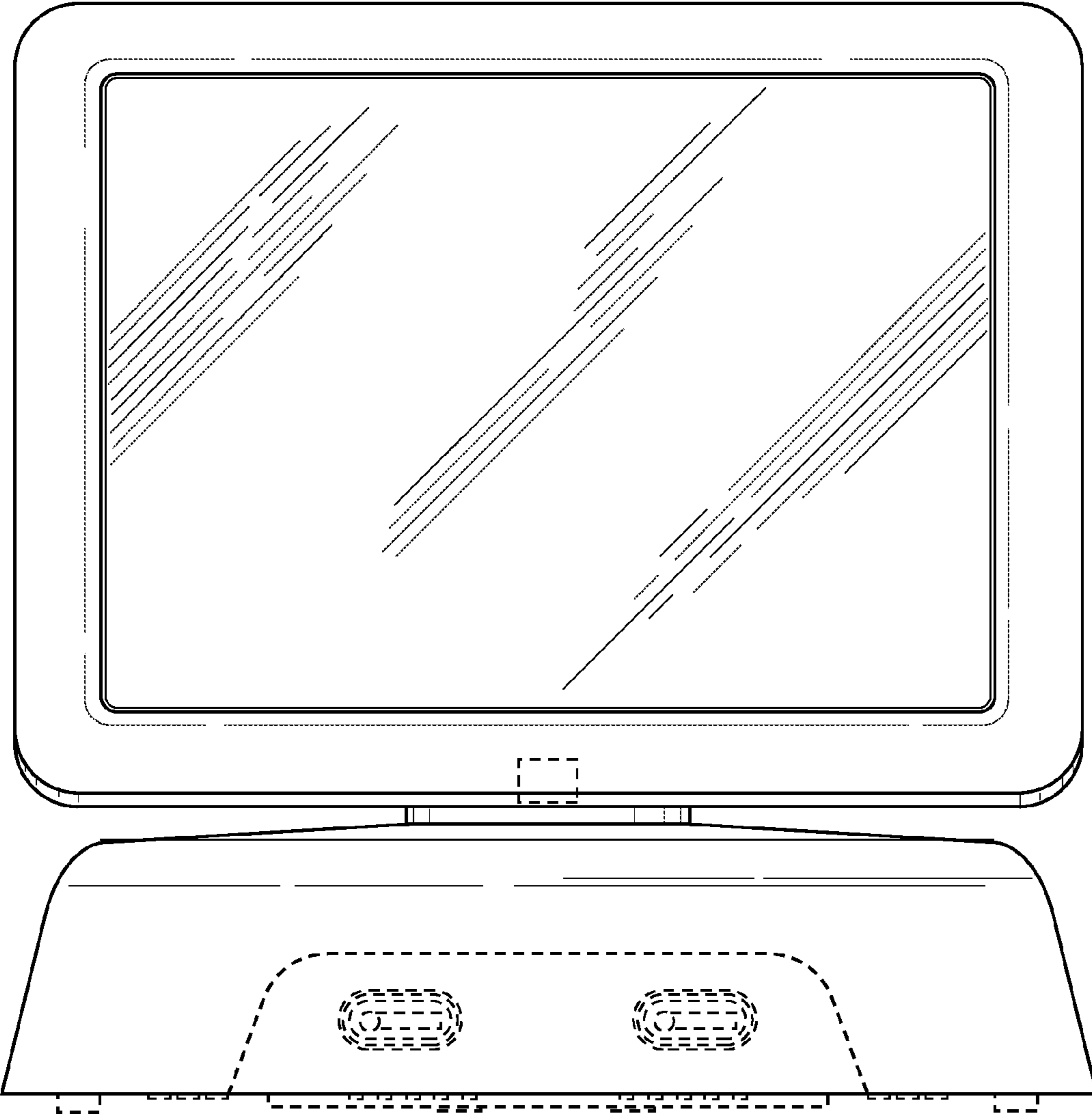


FIG. 3

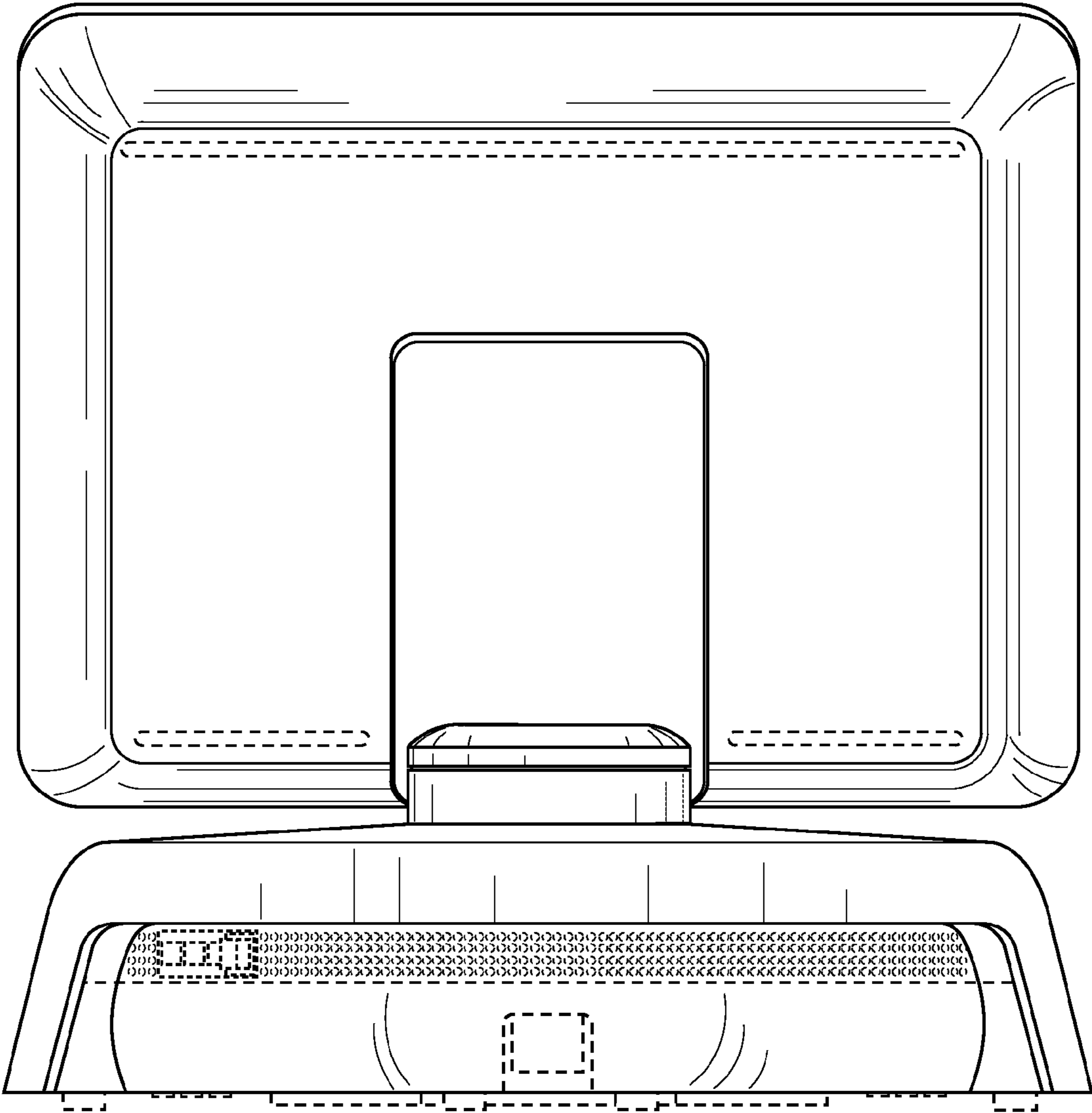


FIG. 4

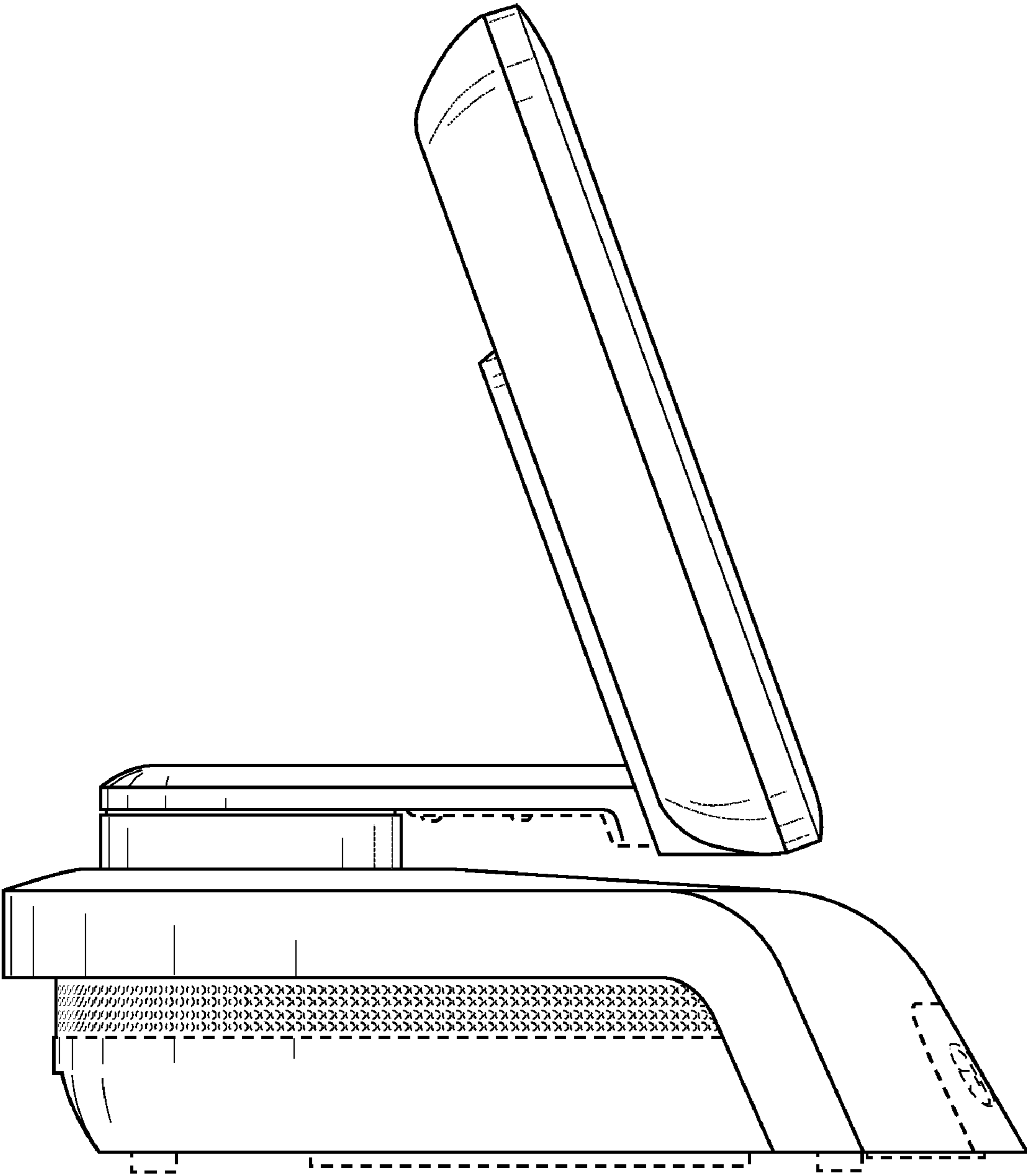


FIG. 5

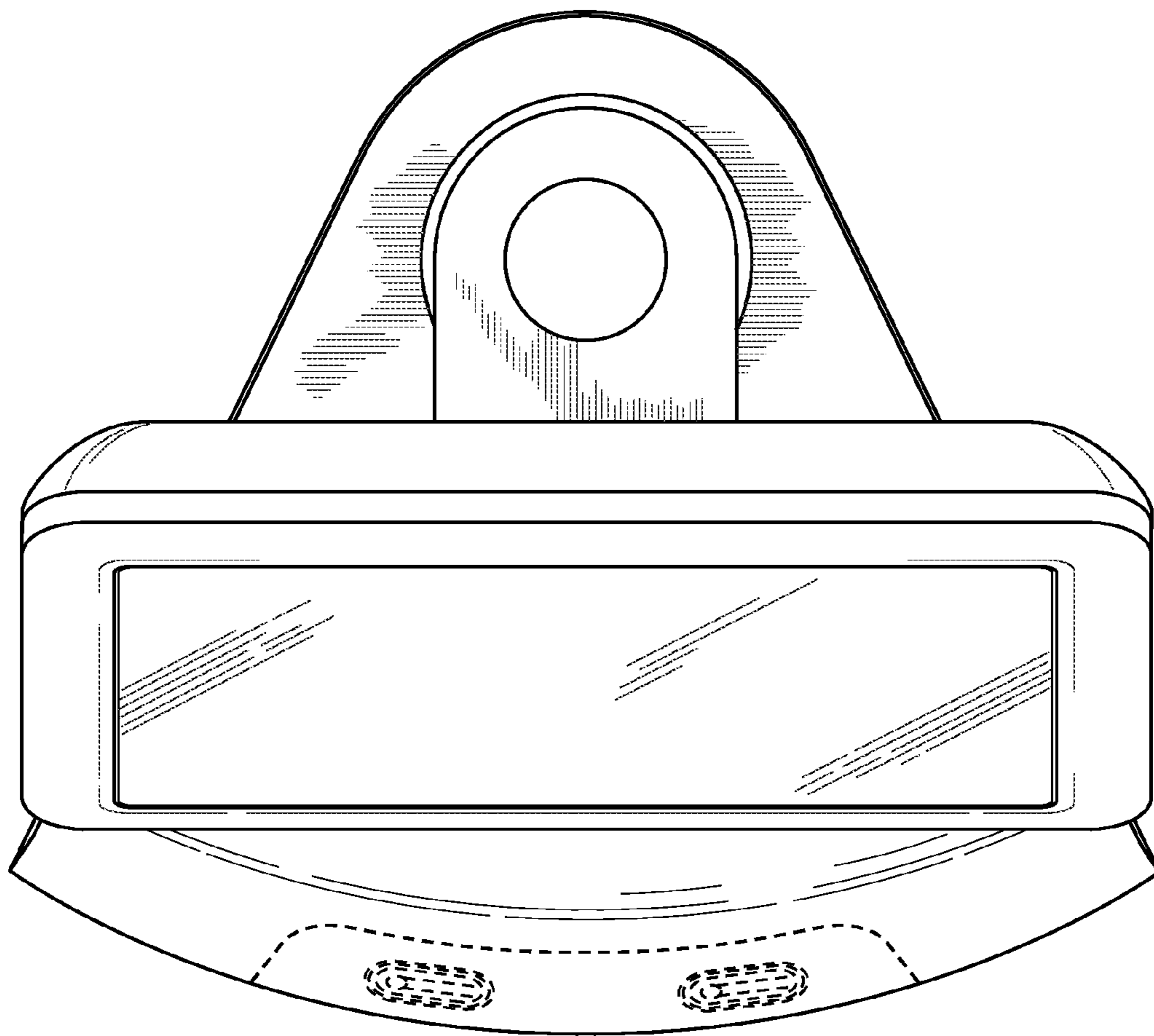


FIG. 6

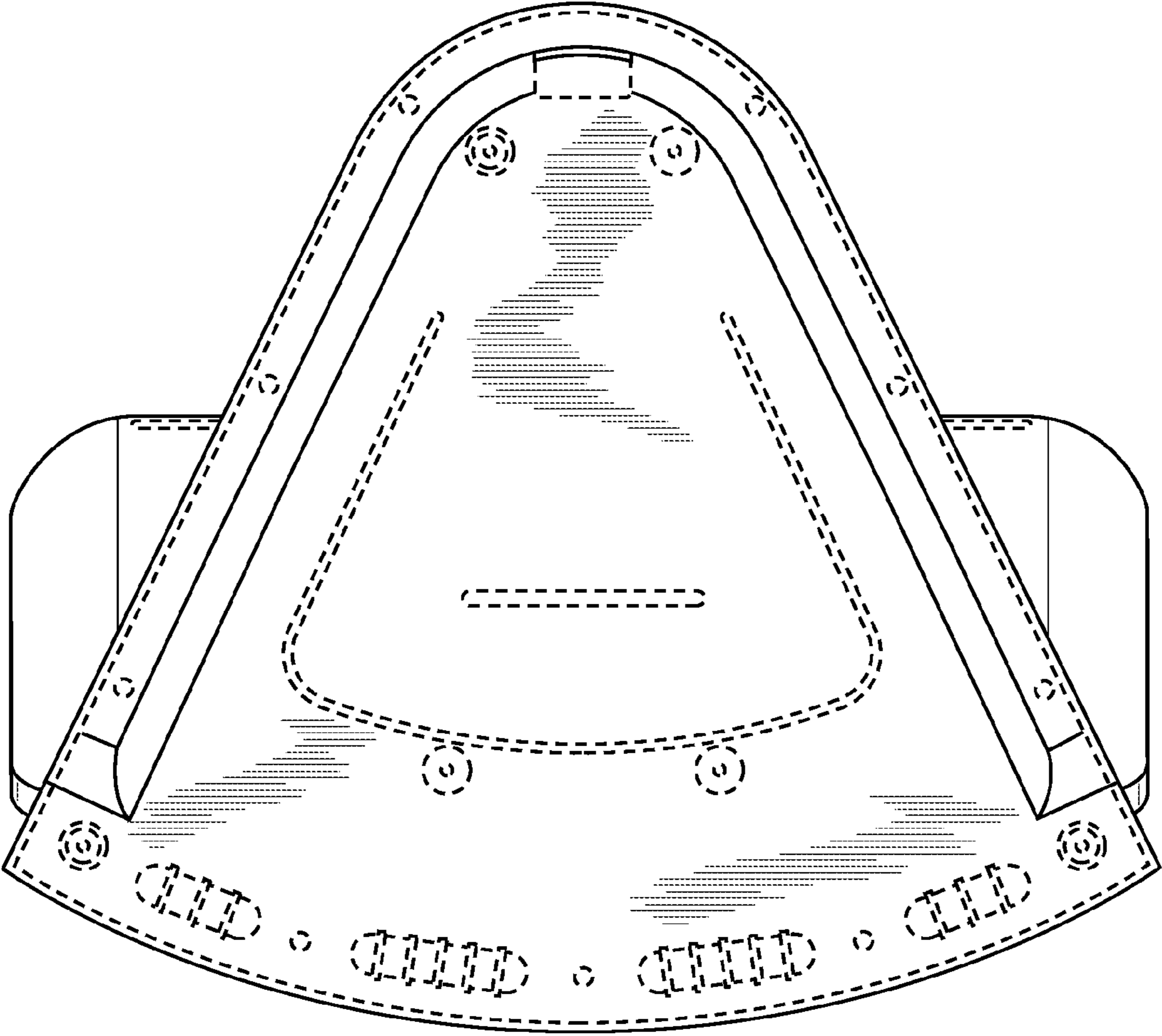


FIG. 7