



US00D820130S

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

(10) **Patent No.:** **US D820,130 S**  
(45) **Date of Patent:** **\*\* Jun. 12, 2018**

(54) **ANALYTE DETECTION SYSTEM**

FOREIGN PATENT DOCUMENTS

(71) Applicant: **CUE INC.**, San Diego, CA (US)

CN 104232622 A 12/2014  
EP 2 050 498 A1 4/2009

(72) Inventors: **Ayub Khattak**, San Diego, CA (US);  
**Clinton Sever**, San Diego, CA (US)

(Continued)

(73) Assignee: **CUE HEALTH INC.**, San Diego, CA (US)

OTHER PUBLICATIONS

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

International Search Report and Written Opinion, PCT/US2016/042688, CUE Inc, 16 pages (Jan. 10, 2017).

(21) Appl. No.: **29/584,715**

(Continued)

(22) Filed: **Nov. 16, 2016**

*Primary Examiner* — Antoine Duval Davis

(74) *Attorney, Agent, or Firm* — Foley & Lardner LLP;  
Antoinette F. Konski; Christopher C. Bolten

**Related U.S. Application Data**

(62) Division of application No. 29/545,014, filed on Nov. 9, 2015, now Pat. No. Des. 774,407, which is a division of application No. 29/490,660, filed on May 12, 2014, now Pat. No. Des. 745,423.

(51) **LOC (11) Cl.** ..... **10-04**

(52) **U.S. Cl.**  
USPC ..... **D10/81; D24/129**

(58) **Field of Classification Search**  
USPC ..... D10/81; D24/129  
CPC ..... G01N 35/08; G01N 33/542; G01N 21/64;  
G01N 33/48; G01N 1/00; G01N 21/00;  
G01N 33/543; B01L 3/00; C40B 30/04;  
C12M 1/34

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

D115,326 S 6/1939 Chott  
3,915,806 A 10/1975 Horlach  
D249,062 S 8/1978 Crafoord et al.  
D298,166 S 10/1988 Chennault  
D302,585 S 8/1989 Elliott  
D303,288 S 9/1989 Harboe et al.

(Continued)

(57) **CLAIM**

We claim the ornamental design for an analyte detection system, as shown and described.

**DESCRIPTION**

FIG. 1A is a top, front, and left side perspective view of an embodiment of a reader device of an analyte detection system;

FIG. 1B is an exploded view thereof;

FIG. 1C is a left side view thereof;

FIG. 1D is a right side view thereof;

FIG. 1E is a top view thereof;

FIG. 1F is a bottom view thereof;

FIG. 1G is a front view thereof;

FIG. 1H is a rear view thereof;

FIG. 2A is a top, front, and left side perspective view of a second embodiment of a reader device of an analyte detection system;

FIG. 2B is an exploded view thereof;

FIG. 2C is a left side view thereof;

FIG. 2D is a right side view thereof;

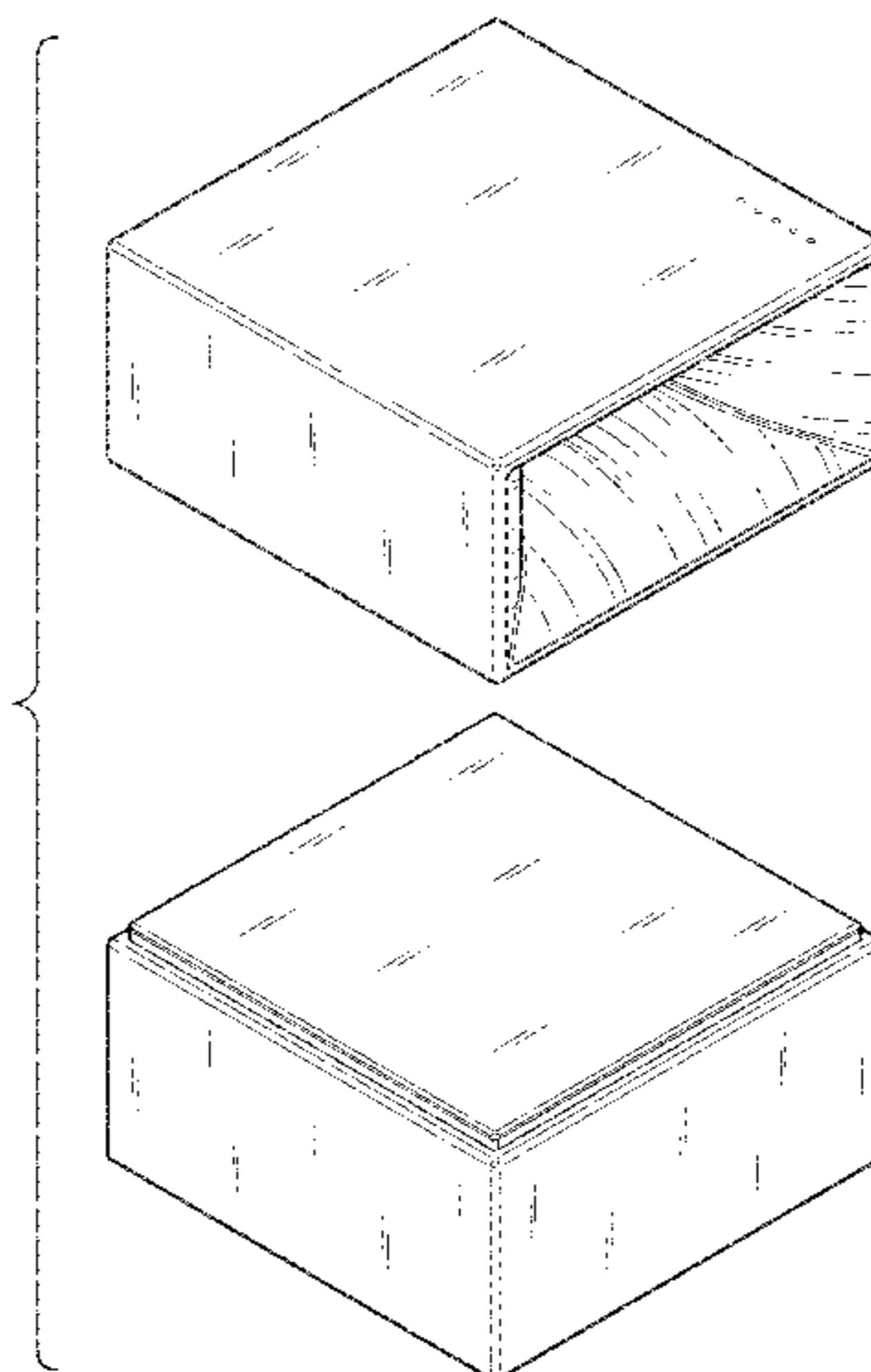
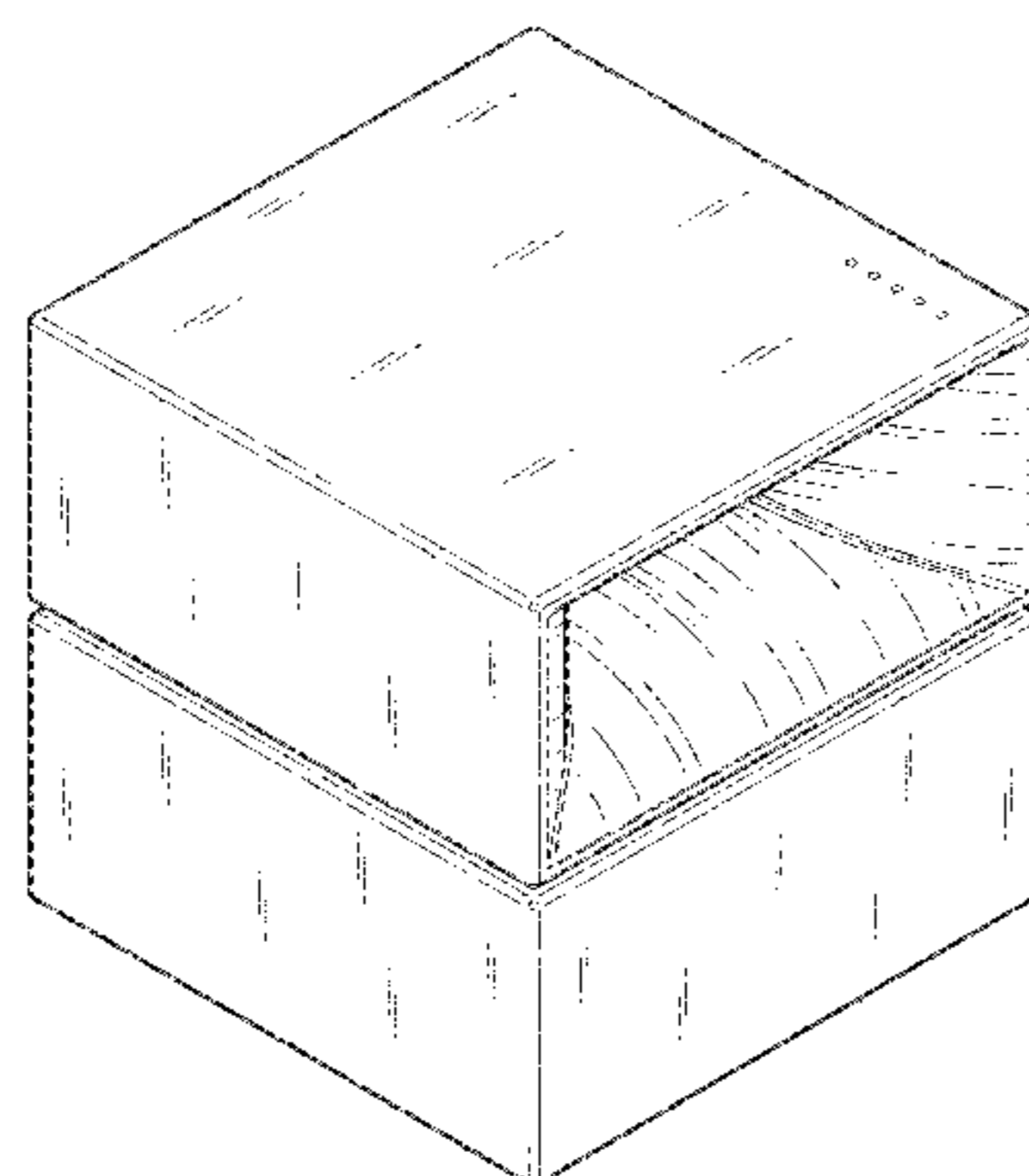
FIG. 2E is a top view thereof;

FIG. 2F is a bottom view thereof;

FIG. 2G is a front view thereof; and,

FIG. 2H is a rear view thereof.

**1 Claim, 10 Drawing Sheets**



(56)

## References Cited

## U.S. PATENT DOCUMENTS

D306,067 S	2/1990	Bogdanoff et al.	9,207,245 B2	12/2015	Khattak
5,223,414 A	6/1993	Zarling et al.	9,310,231 B2	4/2016	Bloss et al.
5,273,881 A	12/1993	Sena et al.	9,360,491 B2	6/2016	Sever et al.
D343,679 S	1/1994	Wong	9,636,676 B2	5/2017	Sever et al.
5,455,166 A	10/1995	Walker	9,718,058 B2	8/2017	Khattak et al.
5,470,723 A	11/1995	Walker et al.	9,724,691 B2	8/2017	Khattak et al.
D379,230 S	5/1997	Mark	2002/0002326 A1	1/2002	Causey et al.
5,708,247 A	1/1998	McAleer et al.	2002/0123048 A1	9/2002	Gau
5,714,320 A	2/1998	Kool	2002/0137234 A1	9/2002	Wohlstadter et al.
D402,753 S	12/1998	White	2003/0019522 A1	1/2003	Parunak
5,935,804 A	8/1999	Laine et al.	2004/0173456 A1	9/2004	Boos et al.
6,146,590 A	11/2000	Mazurek et al.	2004/0189311 A1	9/2004	Glezer et al.
6,235,502 B1	5/2001	Weissman et al.	2004/0214200 A1	10/2004	Brown et al.
D458,456 S	6/2002	Dragan et al.	2004/0219732 A1	11/2004	Burns et al.
6,410,278 B1	6/2002	Notomi et al.	2005/0136529 A1	6/2005	Yang et al.
6,523,560 B1	2/2003	Williams et al.	2005/0171528 A1	8/2005	Sartor et al.
D472,975 S	4/2003	Iori et al.	2005/0178700 A1	8/2005	Tyvoll et al.
6,686,195 B1	2/2004	Colin et al.	2005/0200643 A1	9/2005	Falcon
6,893,879 B2	5/2005	Petersen et al.	2006/0131994 A1	6/2006	D'Angelico et al.
6,929,915 B2	8/2005	Benkovic et al.	2006/0160205 A1	7/2006	Blackburn et al.
D518,597 S	4/2006	Sommers	2006/0207891 A1	9/2006	Althaus et al.
7,118,667 B2	10/2006	Lee	2006/0243591 A1	11/2006	Plotkin et al.
7,195,036 B2	3/2007	Burns et al.	2007/0031283 A1	2/2007	Davis et al.
D542,931 S	5/2007	Pukall et al.	2007/0060815 A1	3/2007	Martin et al.
7,282,328 B2	10/2007	Kong et al.	2007/0154922 A1	7/2007	Collier et al.
7,285,412 B2	10/2007	Casagrande et al.	2007/0184547 A1	8/2007	Handique et al.
7,291,497 B2	11/2007	Holmes et al.	2007/0299364 A1	12/2007	Sangha
7,399,590 B2	7/2008	Piepenburg et al.	2008/0124779 A1	5/2008	Oh et al.
7,432,106 B2	10/2008	Cox	2008/0160601 A1	7/2008	Handique
7,466,908 B1	12/2008	Lem et al.	2008/0160622 A1	7/2008	Su et al.
7,478,792 B2	1/2009	Oh et al.	2008/0160630 A1	7/2008	Liu et al.
D591,864 S	5/2009	Schmidt	2008/0182301 A1	7/2008	Handique et al.
D600,578 S	9/2009	Tsuji	2008/0275229 A1	11/2008	Lem et al.
7,635,594 B2	12/2009	Holmes et al.	2008/0302193 A1	12/2008	Bommarito et al.
7,723,099 B2	5/2010	Miller et al.	2009/0061450 A1	3/2009	Hunter
7,888,125 B2	2/2011	Gibbons et al.	2009/0130777 A1	5/2009	Arinaga et al.
7,981,696 B2	7/2011	Moreland et al.	2010/0236340 A1	9/2010	Lee et al.
8,007,999 B2	8/2011	Holmes et al.	2010/0280146 A1	11/2010	Vanderlaan et al.
8,008,034 B2	8/2011	Gibbons et al.	2010/0297708 A1	11/2010	Collier et al.
8,012,744 B2	9/2011	Gibbons et al.	2010/0331652 A1	12/2010	Groll et al.
D646,189 S	10/2011	Dinter et al.	2011/0008813 A1	1/2011	Dilleen et al.
8,071,054 B2	12/2011	Oh et al.	2011/0059468 A1	3/2011	Earhart et al.
8,071,308 B2	12/2011	Piepenburg et al.	2011/0129841 A1	6/2011	Heid et al.
8,101,402 B2	1/2012	Holmes	2011/0165562 A1	7/2011	Pourahmadi et al.
8,202,697 B2	6/2012	Holmes	2011/0171754 A1	7/2011	Redmond et al.
8,216,832 B2	7/2012	Battrell et al.	2011/0212440 A1	9/2011	Viovy et al.
8,265,955 B2	9/2012	Michelson et al.	2011/0233073 A1	9/2011	Laczka et al.
8,283,155 B2	10/2012	Holmes et al.	2011/0272294 A1	11/2011	Fujiwara
8,361,808 B2	1/2013	Wang	2012/0009588 A1	1/2012	Rajagopal et al.
D679,025 S	3/2013	Motadel et al.	2012/0071342 A1	3/2012	Lochhead et al.
8,435,738 B2	5/2013	Holmes	2012/0095316 A1	4/2012	Lewis et al.
8,449,842 B2	5/2013	Knopp et al.	2012/0164036 A1	6/2012	Stern et al.
8,470,524 B2	6/2013	Gibbons et al.	2012/0180580 A1	7/2012	Immink et al.
8,475,739 B2	7/2013	Holmes et al.	2012/0190589 A1	7/2012	Anderson et al.
8,528,777 B2	9/2013	Harder et al.	2012/0255660 A1	10/2012	Briman et al.
8,551,714 B2	10/2013	Jovanovich et al.	2012/0267258 A1	10/2012	Uraoka et al.
8,562,918 B2	10/2013	Jovanovich et al.	2012/0271127 A1	10/2012	Battrell et al.
D698,036 S	1/2014	Dickinson	2013/0011210 A1	1/2013	Toner et al.
8,637,253 B2	1/2014	Piepenburg et al.	2013/0029324 A1	1/2013	Rajagopal et al.
8,669,047 B2	3/2014	Holmes et al.	2013/0085680 A1	4/2013	Arlen et al.
8,679,407 B2	3/2014	Holmes et al.	2013/0137591 A1	5/2013	Clemens et al.
8,724,833 B1	5/2014	Shain et al.	2013/0145591 A1	6/2013	Chen
8,735,104 B2	5/2014	Harder et al.	2013/0244339 A1	9/2013	Ehrenkranz et al.
D707,847 S	6/2014	Motadel et al.	2013/0273528 A1	10/2013	Ehrenkranz
8,741,230 B2	6/2014	Holmes et al.	2013/0309778 A1	11/2013	Lowe et al.
8,778,665 B2	7/2014	Gibbons et al.	2014/0027286 A1	1/2014	Ikegami et al.
D718,462 S	11/2014	Cook et al.	2014/0030717 A1	1/2014	Zhong et al.
D719,666 S	12/2014	Manian	2014/0194305 A1	7/2014	Kayyem et al.
8,945,880 B2	2/2015	Cloake et al.	2014/0242622 A1	8/2014	Petrich et al.
9,034,168 B2	5/2015	Khattak et al.	2014/0335520 A1	11/2014	Jackson et al.
9,052,275 B2	6/2015	Khattak et al.	2014/0336083 A1	11/2014	Khattak et al.
9,086,417 B2	7/2015	Khattak et al.	2015/0129049 A1	5/2015	Khattak et al.
D745,185 S	12/2015	Kimura et al.	2015/0140556 A1	5/2015	Albert et al.
D745,423 S	12/2015	Khattak et al.	2016/0091518 A1	3/2016	Khattak et al.
9,207,244 B2	12/2015	Khattak et al.	2017/0043336 A1	2/2017	Khattak et al.
			2017/0045508 A1	2/2017	Khattak et al.
			2017/0241845 A1	8/2017	Hwang et al.

(56)

## References Cited

## U.S. PATENT DOCUMENTS

## FOREIGN PATENT DOCUMENTS

EP	2 179 294	A2	4/2010
GB	2 430 032	A	3/2007
JP	2007-505319		3/2007
JP	2009-531064		9/2009
JP	2009-226404	A	10/2009
JP	2011-013043	A	1/2011
JP	2012-504956		3/2012
JP	2012-127978	A	7/2012
JP	2012-173181	A	9/2012
JP	2012-521558		9/2012
JP	2012-528995		11/2012
WO	WO-2005/026689		3/2005
WO	WO-2006/121510	A1	11/2006
WO	WO-2007/112114	A2	10/2007
WO	WO-2009/018473	A1	2/2009
WO	WO-2010/003212	A1	1/2010
WO	WO-2010/036808	A1	4/2010
WO	WO-2010/041231		4/2010
WO	WO-2010/109392	A1	9/2010
WO	WO-2010/140128		12/2010
WO	WO-2012/025729	A1	3/2012
WO	WO-2012/032294	A1	3/2012
WO	WO-2012/147426		11/2012
WO	WO-2012/170703	A1	12/2012
WO	WO-2013/136115	A1	9/2013
WO	WO-2013/144643	A2	10/2013

## OTHER PUBLICATIONS

Int'l Preliminary Report on Patentability dated Sep. 24, 2015 in Int'l PCT Patent Appl Serial No. PCT/US2014/023821.

Notice of Allowance in U.S. Appl. No. 14/954,817, dated Nov. 3, 2016.

Notice of Allowance in U.S. Appl. No. 15/336,735, dated Jan. 5, 2017.

Notice of Allowance on U.S. Appl. No. 29/574,536 dated Feb. 17, 2017.

U.S. Non-Final Office Action dated Dec. 21, 2016 in U.S. Appl. No. 14/205,146.

U.S. Non-Final Office Action dated Feb. 9, 2017 in U.S. Appl. No. 15/336,715.

U.S. Non-Final Office Action dated Jan. 27, 2017 in U.S. Appl. No. 15/336,502.

U.S. Non-Final Office Action dated Jan. 30, 2017 in U.S. Appl. No. 15/336,487.

U.S. Notice of Allowability in U.S. Appl. No. 15/336,735, dated Feb. 13, 2017.

U.S. Notice of Allowance in U.S. Appl. No. 15/172,077, dated Feb. 10, 2017.

Advisory Action in U.S. Appl. No. 14/954,817, dated Sep. 19, 2016.

Anderson, J.C. et al. (2008) "Thermally-Actuated Microfluidic Systems," *JALA* 13:65-72.

Beyor, N. et al. (2008) "Immunomagnetic bead-based cell concentration microdevice for dilute pathogen detection," *Biomed Microdevices* 10:909-917.

U.S. Appl. No. 29/545,014, filed Nov. 9, 2015, CUE Inc.

Cecchet, F. et al. (2006) "Redox Mediation at 11-Mercaptoundecanoic Acid Self-Assembled Monolayers on Gold," *J. Phys. Chem. B* 110:2241-2248.

Chakrabarti, R. et al. (2001) "The enhancement of PCR amplification by low molecular weight amides," *Nucleic Acids Res.* 29(11):2377-2381.

Chen, Z. et al. (2005) "Thermally-actuated, phase change flow control for microfluidic systems," *Lab Chip* 5:1277-1285.

Cho, H. et al. (2007) "How the capillary burst microvalve works," *Journal of Colloid and Interface Science* 306:379-385.

Clinical IVD Products: Liat™ Analyzer; IQuum, Inc.: <http://www.iquum.com/products/analyzer.shtml>. Last accessed May 5, 2014.

Corrected Notice of Allowability in U.S. Appl. No. 14/599,369, dated May 11, 2016.

Extended European Search Report in European Patent Application No. 14779852.4, dated Jul. 20, 2016.

Fan, R. et al. (2008) "Integrated barcode chips for rapid, multiplexed analysis of proteins in microliter quantities of blood," *Nature Biotechnology* 26(12):1373-1378.

Ferguson, B.S. et al. (2009) "Integrated Microfluidic Electrochemical DNA Sensor," *Anal. Chem.* 81:6503-6508.

Final Office Action in U.S. Appl. No. 14/205,146, dated Apr. 3, 2015, 8 pages.

Final Office Action in U.S. Appl. No. 14/599,369, dated Jan. 4, 2016.

Final Office Action in U.S. Appl. No. 14/954,817, dated May 23, 2016.

Henares, T.G. et al. (2007) "Integration of Multianalyte Sensing Functions on a Capillary-Assembled Microchip: Simultaneous Determination of Ion Concentrations and Enzymatic Activities by a "Drop-and-Sip" Technique," *Anal. Chem.* 79:908-915.

International Search Report and Written Opinion (ISA/EP) for International Application No. PCT/US2015/049439, dated Dec. 7, 2015, 15 pages.

International Search Report and Written Opinion (ISA/KR) for International Application No. PCT/US2014/023821, dated Jul. 7, 2014, 12 pages.

Jagannathan, H. et al. (2001) "Micro-Fluidic Channels with Integrated Ultrasonic Transducers," *IEEE Ultrasonics Symposium*:859-862.

JP Office Action dated Aug. 4, 2016 in JP Patent Application U.S. Appl. No. 2016-501354.

Kaigala, G.V. et al. (2008) "Electrically controlled microvalves to integrate microchip polymerase chain reaction and capillary electrophoresis," *Lab Chip* 8:1071-1078.

Kim, D. et al. (2007) "A Bi-Polymer Micro One-Way Valve," *Sensors and Actuators A* 136:426-433.

Kinoshita, T. et al. (2007) "Functionalization of Magnetic Gold/Iron-Oxide Composite Nanoparticles with Oligonucleotides and Magnetic Separation of Specific Target," *J. of Magnetism and Magnetic Materials* 311:255-258.

Kwakye, S. et al. (2006) "Electrochemical Microfluidic Biosensor for Nucleic Acid Detection with Integrated Minipotentostat," *Biosensors and Bioelectronics* 21: 2217-2223.

Laschi, S. et al. (2010) "A New Gravity-Driven Microfluidic-Based Electrochemical Assay Coupled to Magnetic Beads for Nucleic Acid Detection," *Electrophoresis* 31: 3727-3736.

Lawi, W. et al. (2009) "A Microfluidic Cartridge System for Multiplexed Clinical Analysis," *J. Assoc. Laboratory Automation* 14(6):407-412.

Lee, C.S. et al. (2001) "Microelectromagnets for the Control of Magnetic Nanoparticles," *Applied Physics Letters* 79(20):3308-3310.

Lillehoj, P.B. et al. (2010) "A Self-Pumping Lab-on-a-Chip for Rapid Detection of Botulinum Toxin," *Lab Chip* 10: 2265-2270.

Liu, R.H. et al. (2004) "Self-Contained, Fully Integrated Biochip for Sample Preparation, Polymerase Chain Reaction Amplification, and DNA Microarray Detection," *Analytical Chemistry* 76(7):1824-1831.

Liu, R.H. et al. (2004) "Single-use, Thermally Actuated Paraffin Valves for Microfluidic Applications," *Sensors and Actuators B* 98:328-336.

Lomas, N. (2014) "Cue is a Connected Lab-In-A-Box for On-Demand Health Testing at Home," *TechCrunch*.

Marentis, T.C. et al. (2005) "Microfluidic Sonicator for Real-Time Disruption of Eukaryotic Cells and Bacterial Spores for DNA Analysis," *Ultrasound in Med. & Biol.* 31(9):1265-1277.

Mrksich, M. et al. (1997) "Using Self-Assembled Monolayers that Present Oligo(ethylene glycol) Groups to Control the Interactions of Proteins with Surfaces," *American Chemical Society Symposium Series* 680:361-373.

Non-Final Office Action dated Aug. 18, 2015 in U.S. Appl. No. 14/599,369.

Non-Final Office Action in U.S. Appl. No. 14/205,146, dated Apr. 6, 2016.

(56)

**References Cited**

## OTHER PUBLICATIONS

- Non-Final Office Action in U.S. Appl. No. 14/205,146, dated Sep. 26, 2014, 6 pages.
- Non-Final Office Action in U.S. Appl. No. 14/479,149, dated Jan. 13, 2015, 17 pages.
- Non-Final Office Action in U.S. Appl. No. 14/543,842, dated Feb. 12, 2015, 11 pages.
- Non-Final Office Action in U.S. Appl. No. 14/599,372, dated Mar. 27, 2015, 11 pages.
- Non-Final Office Action in U.S. Appl. No. 14/599,375, dated Jun. 19, 2015, 15 pages.
- Non-Final Office Action in U.S. Appl. No. 14/954,817, dated Feb. 2, 2016.
- Notice of Allowance dated Aug. 20, 2015 in Design U.S. Appl. No. 29/490,660.
- Notice of Allowance in U.S. Appl. No. 14/479,149, dated Mar. 6, 2015, 13 pages.
- Notice of Allowance in U.S. Appl. No. 14/543,842, dated Apr. 24, 2015, 8 pages.
- Notice of Allowance in U.S. Appl. No. 14/599,365, dated May 1, 2015, 8 pages.
- Notice of Allowance in U.S. Appl. No. 14/599,369, dated Apr. 22, 2016.
- Notice of Allowance in U.S. Appl. No. 14/599,375, dated Aug. 26, 2015, 9 pages.
- Notice of Allowance in U.S. Appl. No. 29/545,014, dated Sep. 2, 2016.
- Office Action in Design U.S. Appl. No. 29/490,660, dated Jun. 25, 2014, 6 pages.
- Prindle, D. (2014) "Sick? Need more vitamin D? Testosterone? Lick a stick and Cue fills you in," [www.digitaltrends.com](http://www.digitaltrends.com).
- Restriction Requirement in U.S. Appl. No. 14/599,369, dated May 7, 2015, 6 pages.
- Restriction Requirement in Design U.S. Appl. No. 29/490,660, dated Jun. 2, 2015, 8 pages.
- Restriction Requirement in Design U.S. Appl. No. 29/545,014, dated May 10, 2016.
- Rida, A. et al. (2004) "Manipulation of Self-Assembled Structures of Magnetic Beads for Microfluidic Mixing and Assaying," *Analytical Chemistry* 76(21):6239-6246.
- Roderee, K. et al. (2011) "DNA Hybridization Enhancement Using Piezoelectric Microagitation through a Liquid Coupling Medium," *Lab Chip*, doi:10.1039/C0LC00419G.
- Sharma, V. et al. (2007) "Surface Characterization of Plasma-Treated and PEG-Grafted PDMS for Micro Fluidic Applications," *Vacuum* 81:1094-1100.
- Shin, Y.S. et al. (2010) "Chemistries for Patterning Robust DNA MicroBarcodes Enable Multiplex Assays of Cytoplasm Proteins from Single Cancer Cells," *ChemPhysChem* 11:3063-3069.
- Simplexa™ Flu A/B & RSV Direct Kit; Focus Diagnostics, Inc.: <https://www.focusdx.com/product/MOL2650>. Last accessed May 5, 2014.
- Supplementary Partial European Search Report in European Application No. 14779852.4, dated Feb. 11, 2016.
- Taylor, M.T. et al. (2001) "Lysing Bacterial Spores by Sonication through a Flexible Interface in a Microfluidic System," *Analytical Chemistry* 73(3):492-496.
- The FilmArray System; Biofire Diagnostics, Inc.: <http://filmarray.com/the-panels/>. Last accessed May 5, 2014.
- U.S. Notice of Allowance dated Aug. 26, 2015 in U.S. Appl. No. 14/599,375.
- U.S. Notice of Allowance dated Sep. 14, 2015 in U.S. Appl. No. 14/599,372.
- U.S. Notice of Allowance dated Oct. 22, 2015 in U.S. Appl. No. 14/205,146.
- Wang, J. (2002) "Portable Electrochemical Systems," *Trends in Analytical Chemistry* 21(4):226-232.
- Wang, J. et al. (2005) "Self-Actuated, Thermo-Responsive Hydrogel Valves for Lab on a Chip," *Biomedical Microdevices* 7(4):313-322.
- Wang, J. et al. (2010) "A Self-Powered, One-Step Chip for Rapid, Quantitative and Multiplexed Detection of Proteins from Pinpricks of Whole Blood," *Lab Chip* 10:3157-3162.
- Wu, C. et al. (2011) "Ultrasonication on a Microfluidic Chip to Lyse Single and Multiple Pseudo-Nitzschia for Marine Biotxin Analysis," *Biotechnology Journal* 6:150-155.
- Xpert® Flu; Cepheid: <http://www.cepheid.com/us/cepheid-solutions/clinical-ivd-tests/critical-infectious-diseases/xpert-flu>. Last accessed May 5, 2014.
- Yoshioka, K. et al. (2010) "Suppression of Non-specific Adsorption Using Densified Tri(ethylene glycol) Alkanethiols: Monolayer Characteristics Evaluated by Electrochemical Measurements," *Analytical Sciences* 26:33-37.
- Ziegler, J. et al. (2008) "High-Performance Immunoassays Based on Through-Stencil Patterned Antibodies and Capillary Systems," *Analytical Chemistry* 80(5):1763-1769.
- US Notice of Allowance on U.S. Appl. No. 15/336,739 dated Feb. 26, 2018.
- US Notice of Allowance on U.S. Appl. No. 15/487,956 dated Jan. 31, 2018.
- US Notice of Allowance on U.S. Appl. No. 29/584,030 dated Feb. 22, 2018.
- US Office Action on U.S. Appl. No. 15/336,502 dated Feb. 21, 2018.
- US Office Action on U.S. Appl. No. 29/584,030 dated Nov. 29, 2017.
- US Office Action on U.S. Appl. No. 29/591,165 dated Nov. 29, 2017.
- PCT International Search Report and Written Opinion for Application No. PCT/US2018/015111 dated Apr. 13, 2018. (11 pages).
- US Notice of Allowance for U.S. Appl. No. 29/591,165 dated Apr. 11, 2018. (9 pages).
- US Office Action for U.S. Appl. No. 15/785,394 dated Apr. 13, 2018. (6 pages).

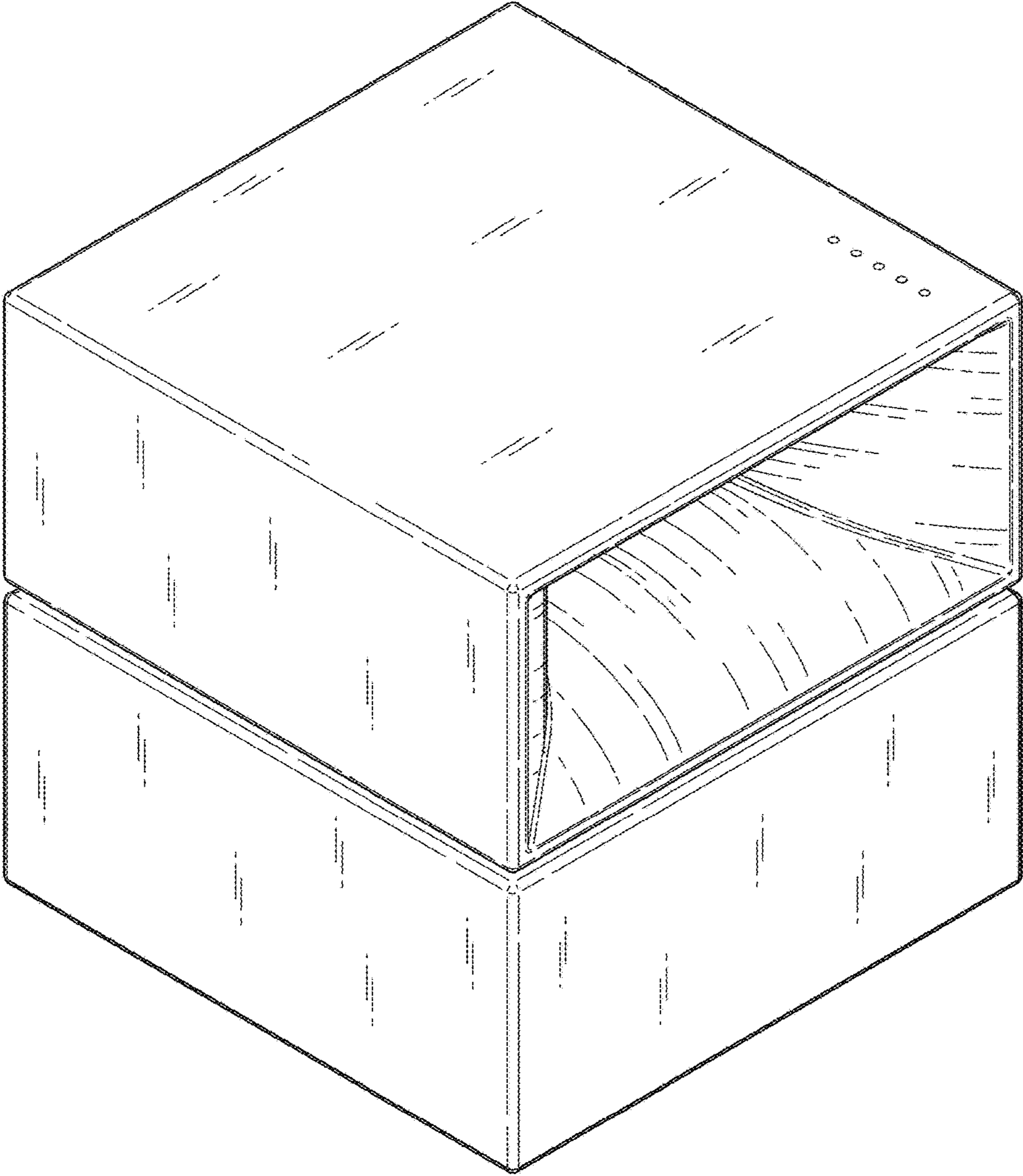


FIG. 1A

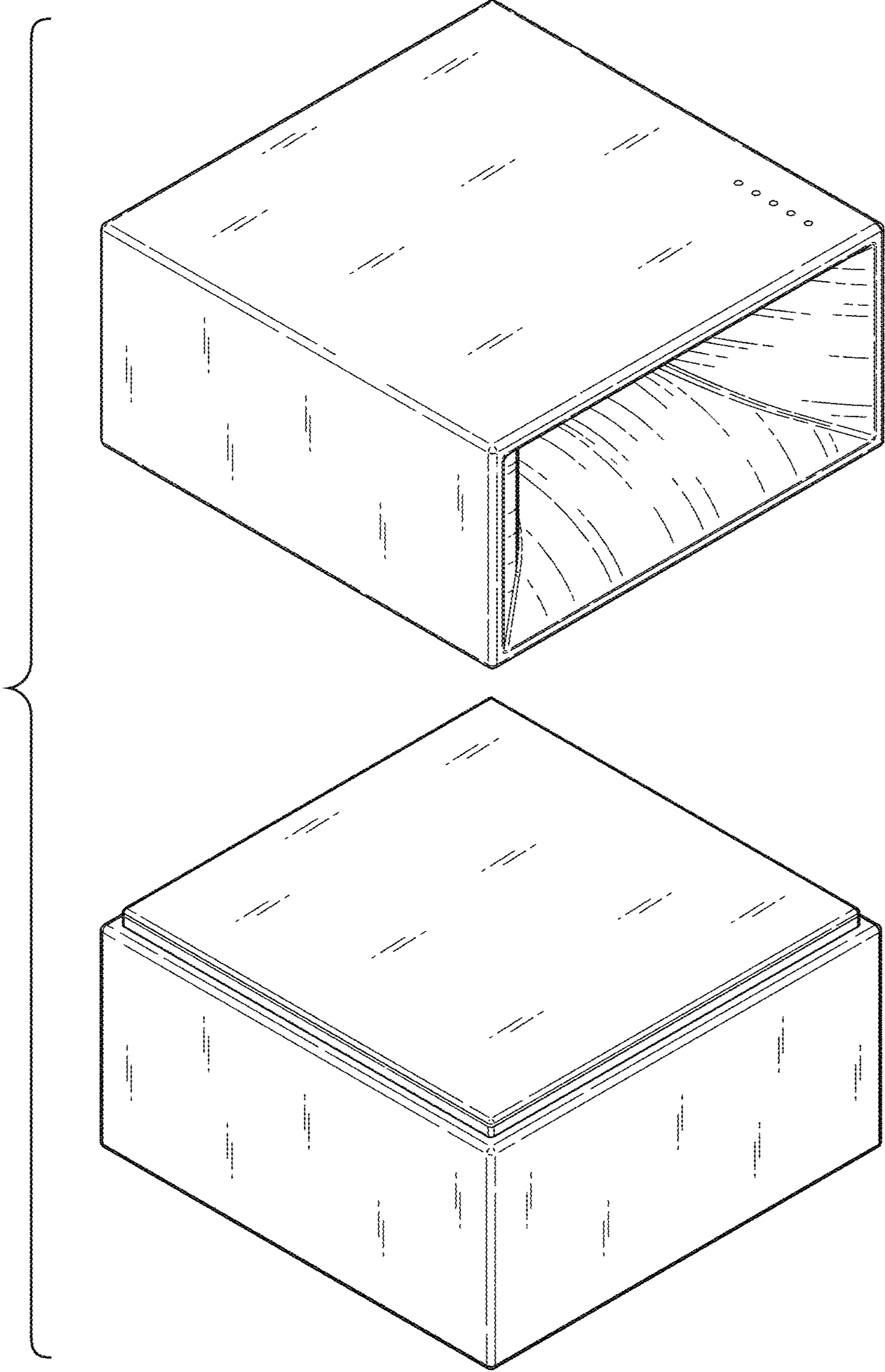


FIG. 1B

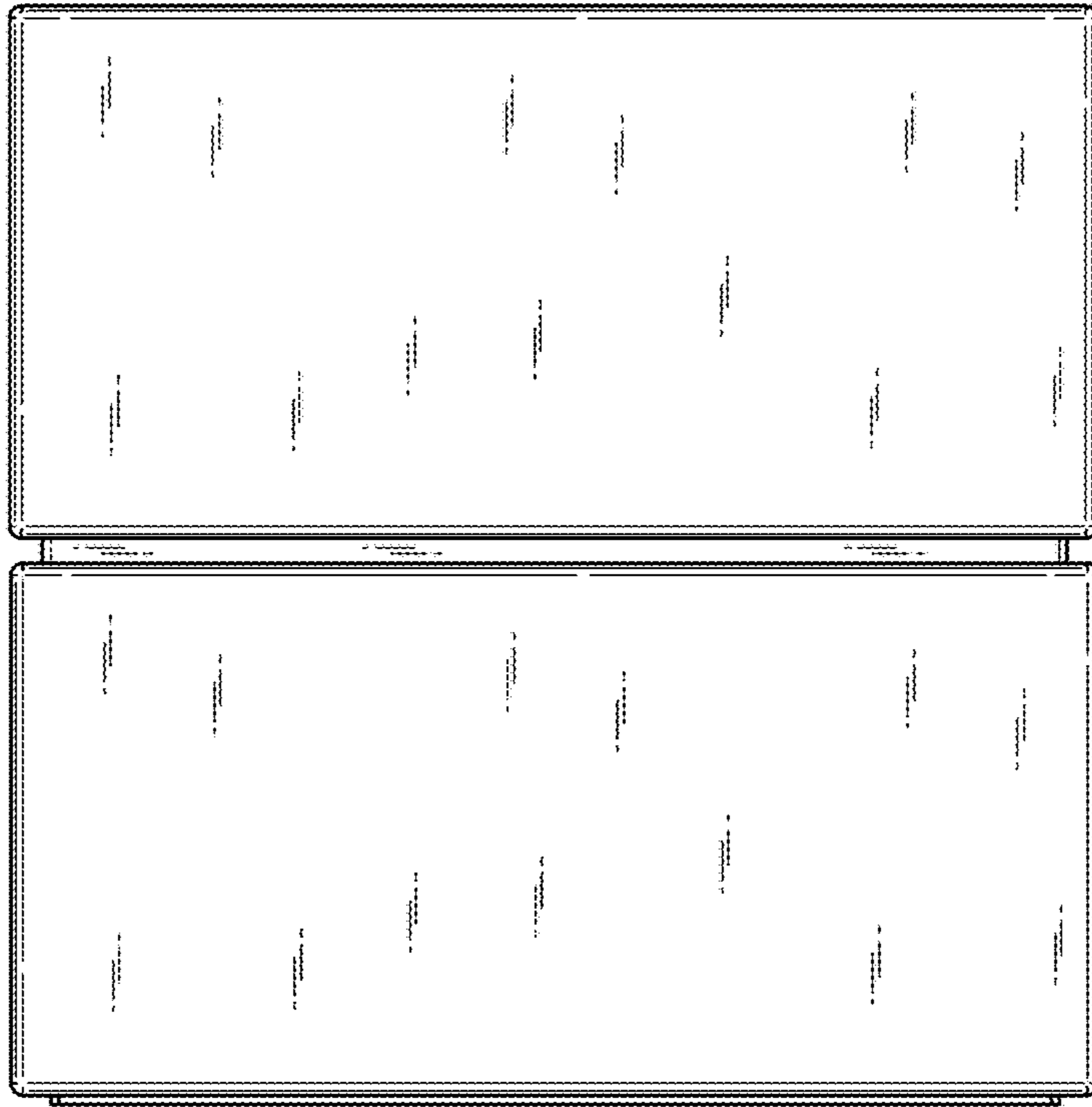


FIG. 1C

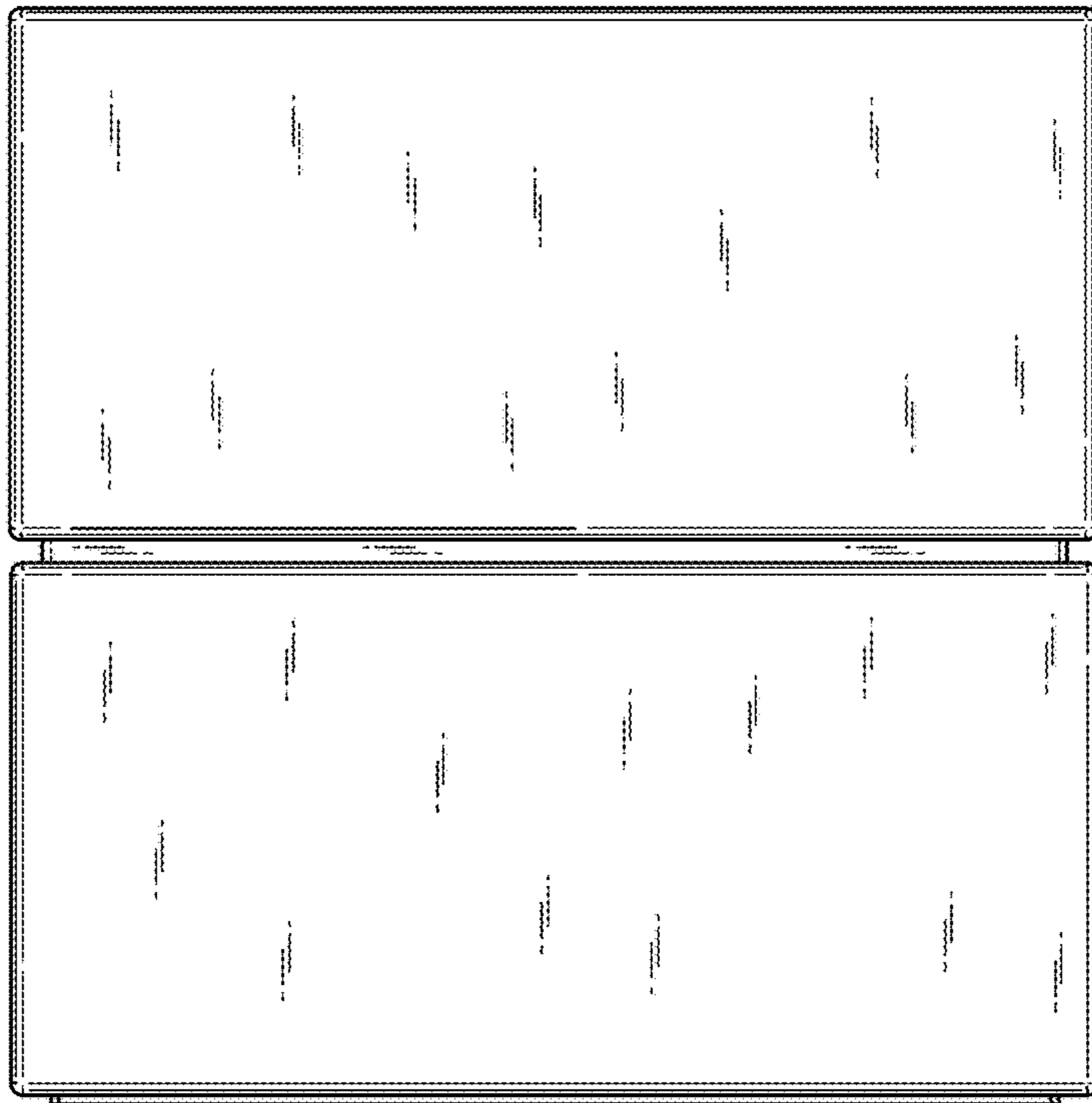


FIG. 1D

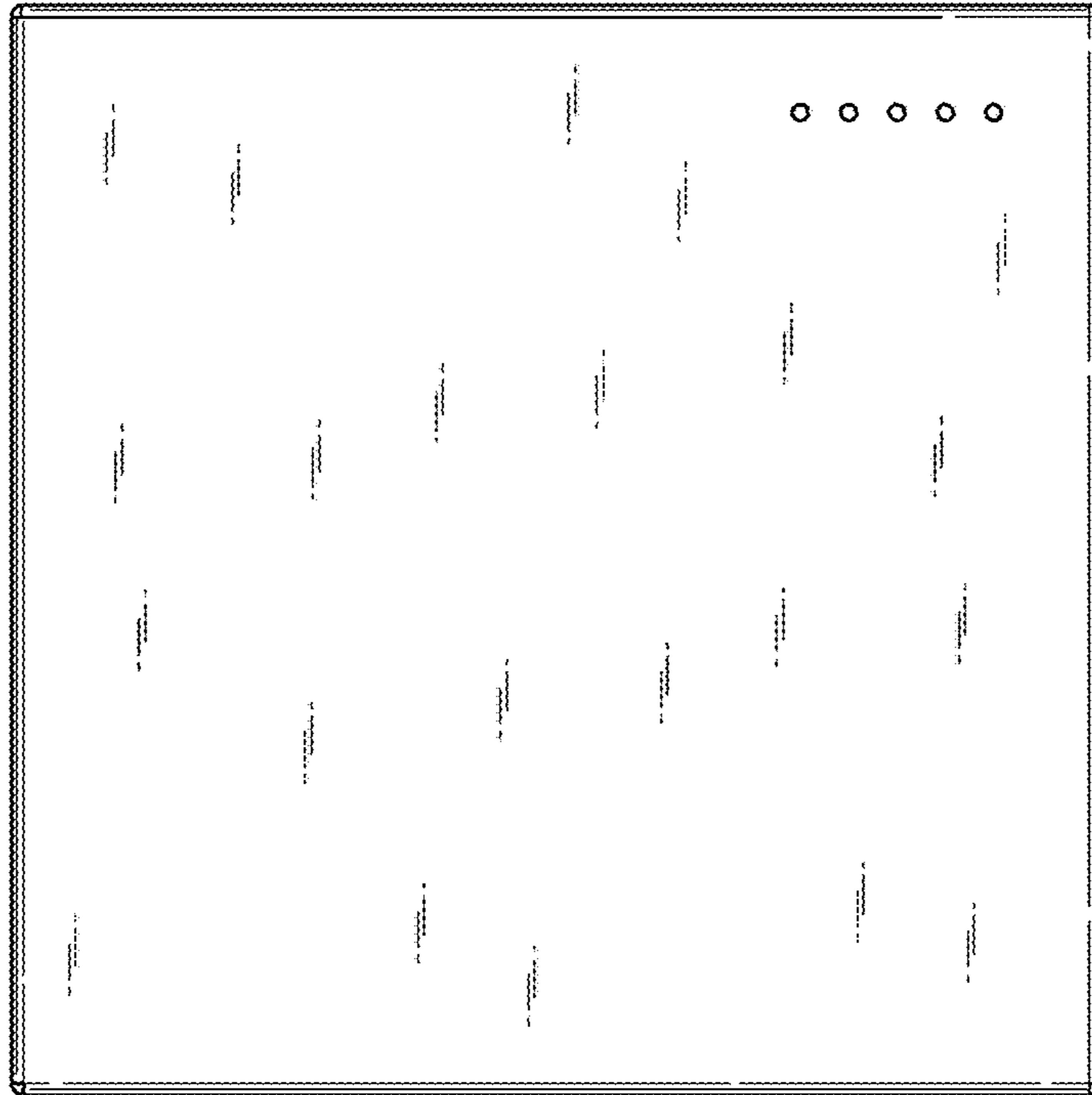


FIG. 1E

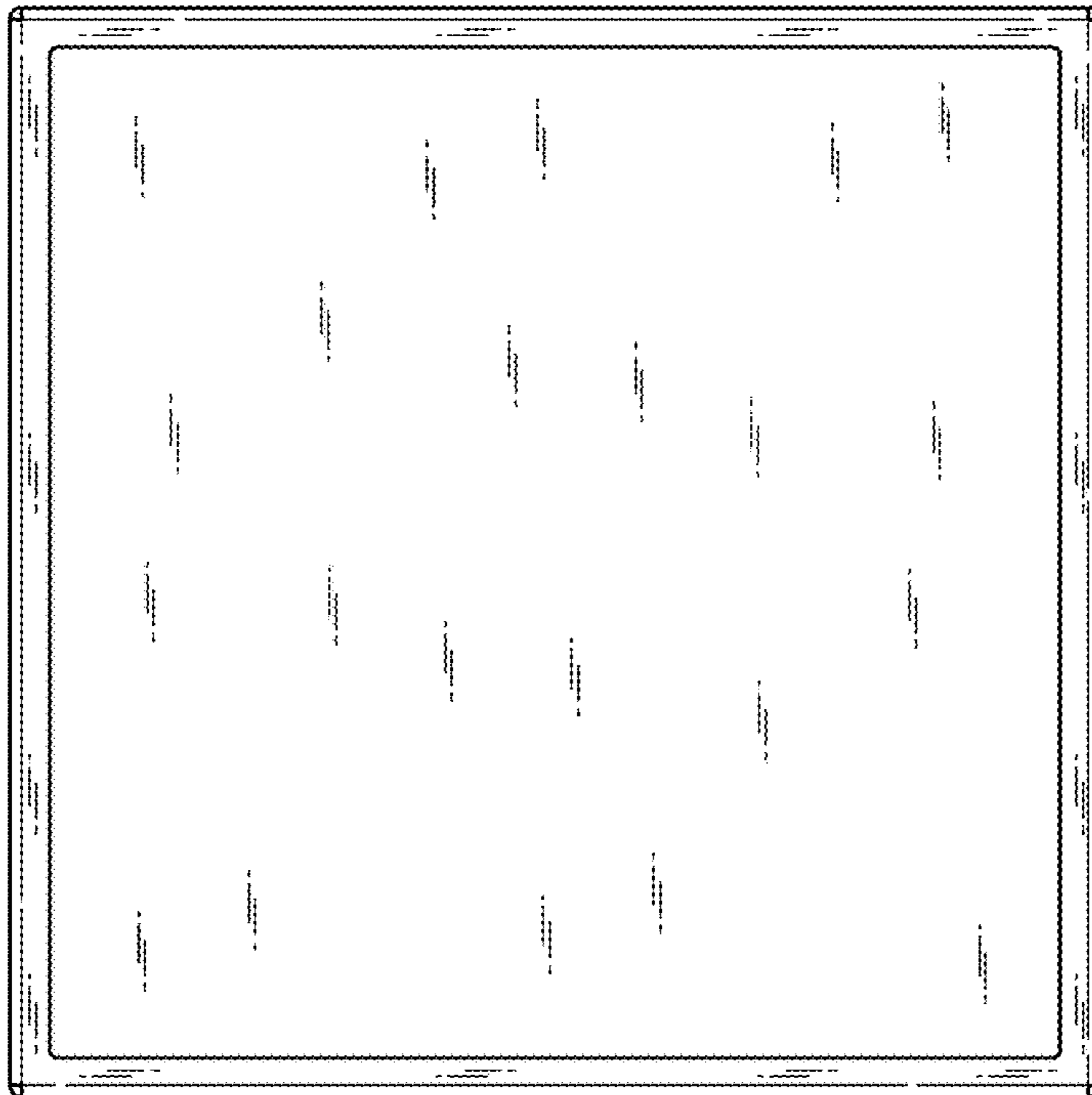


FIG. 1F



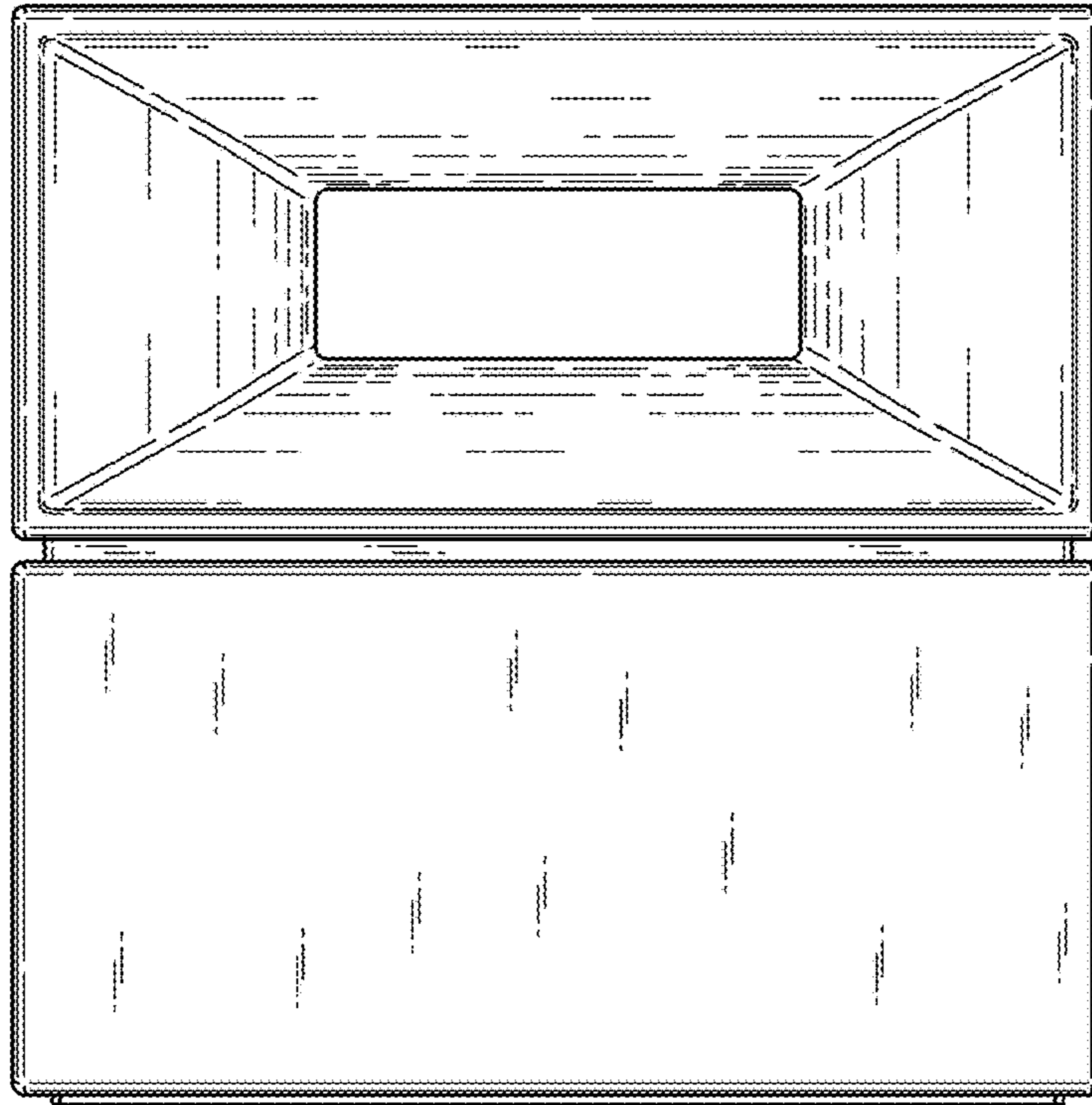


FIG. 1G

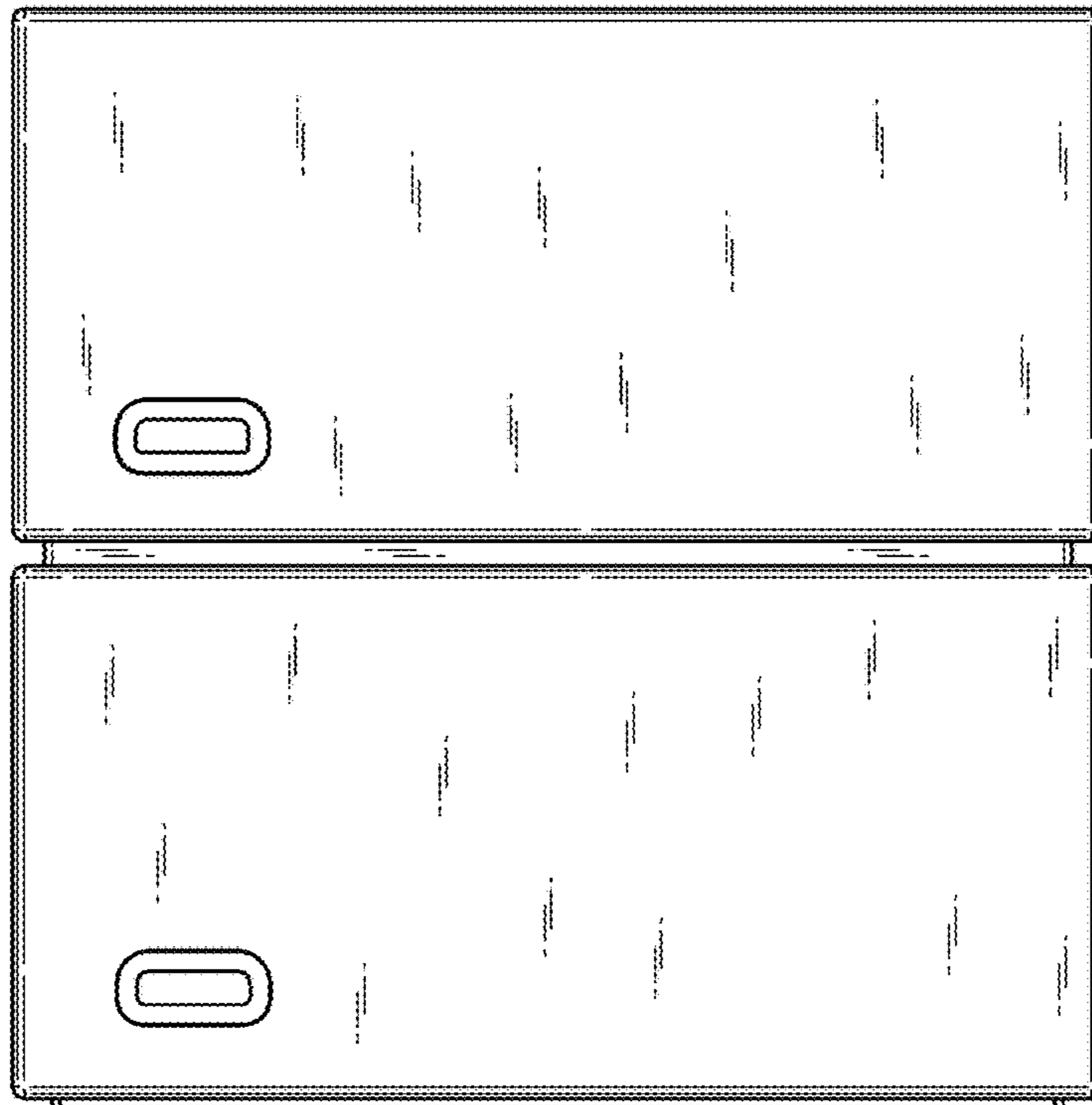


FIG. 1H

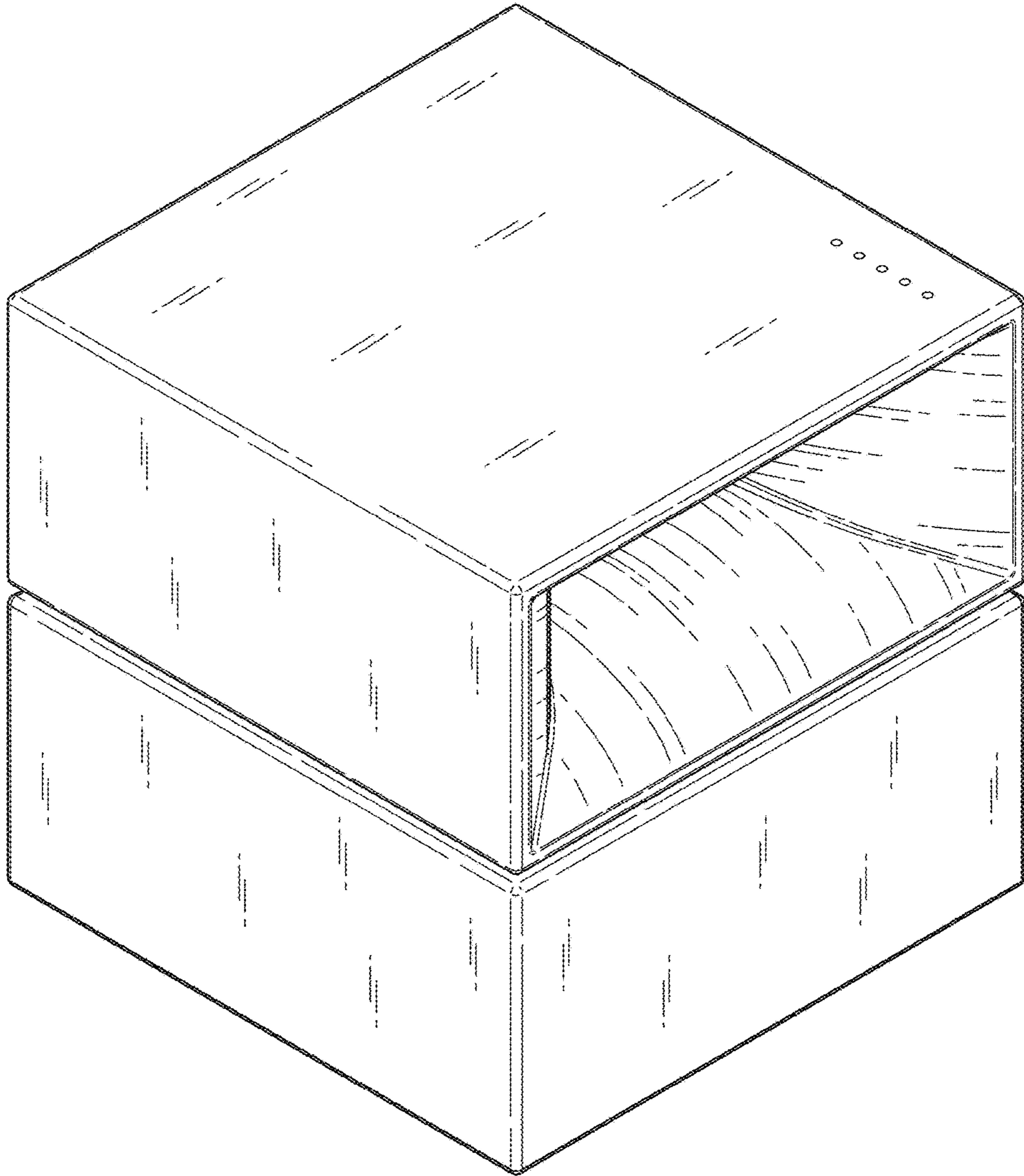


FIG. 2A

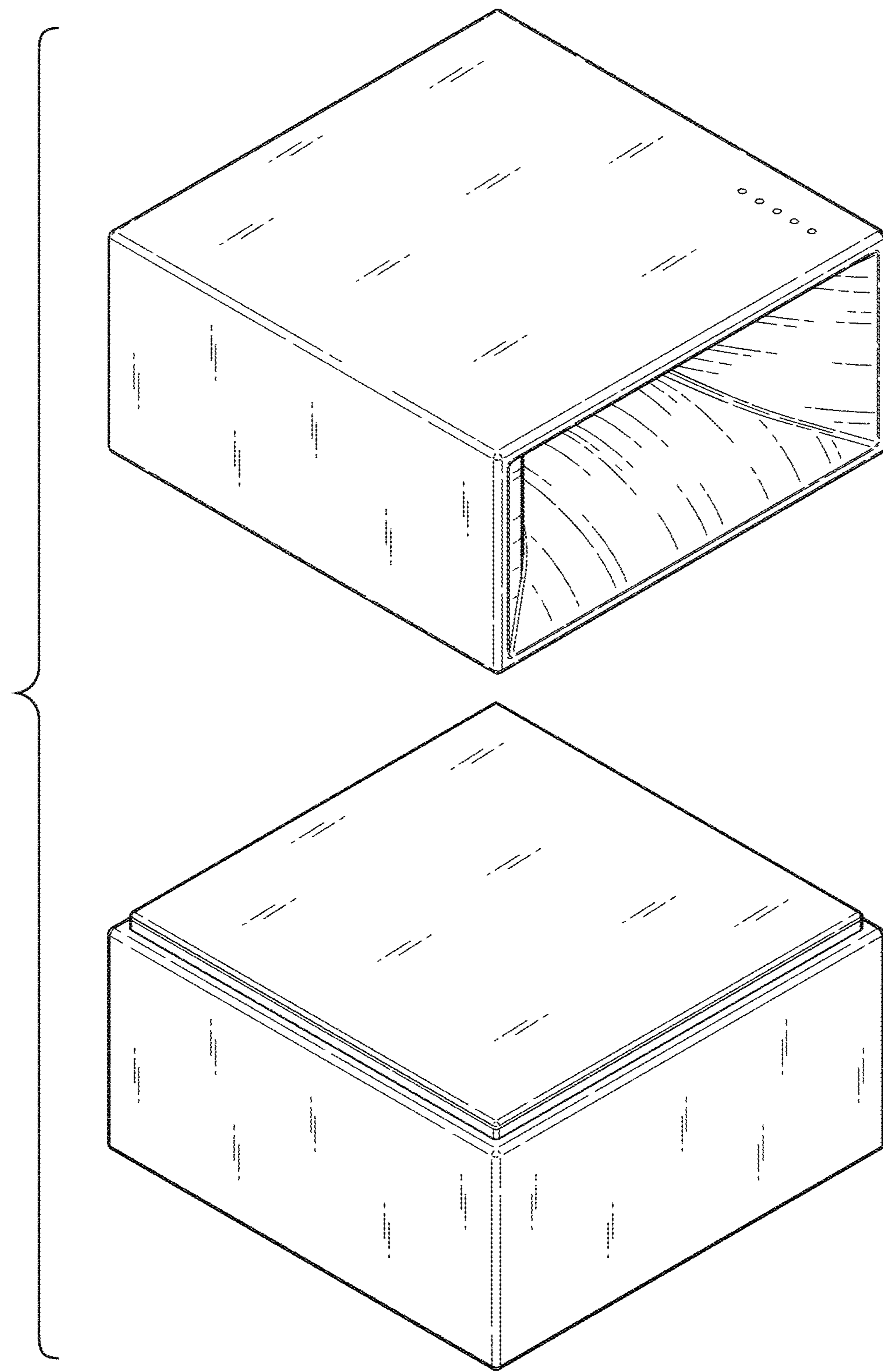


FIG. 2B

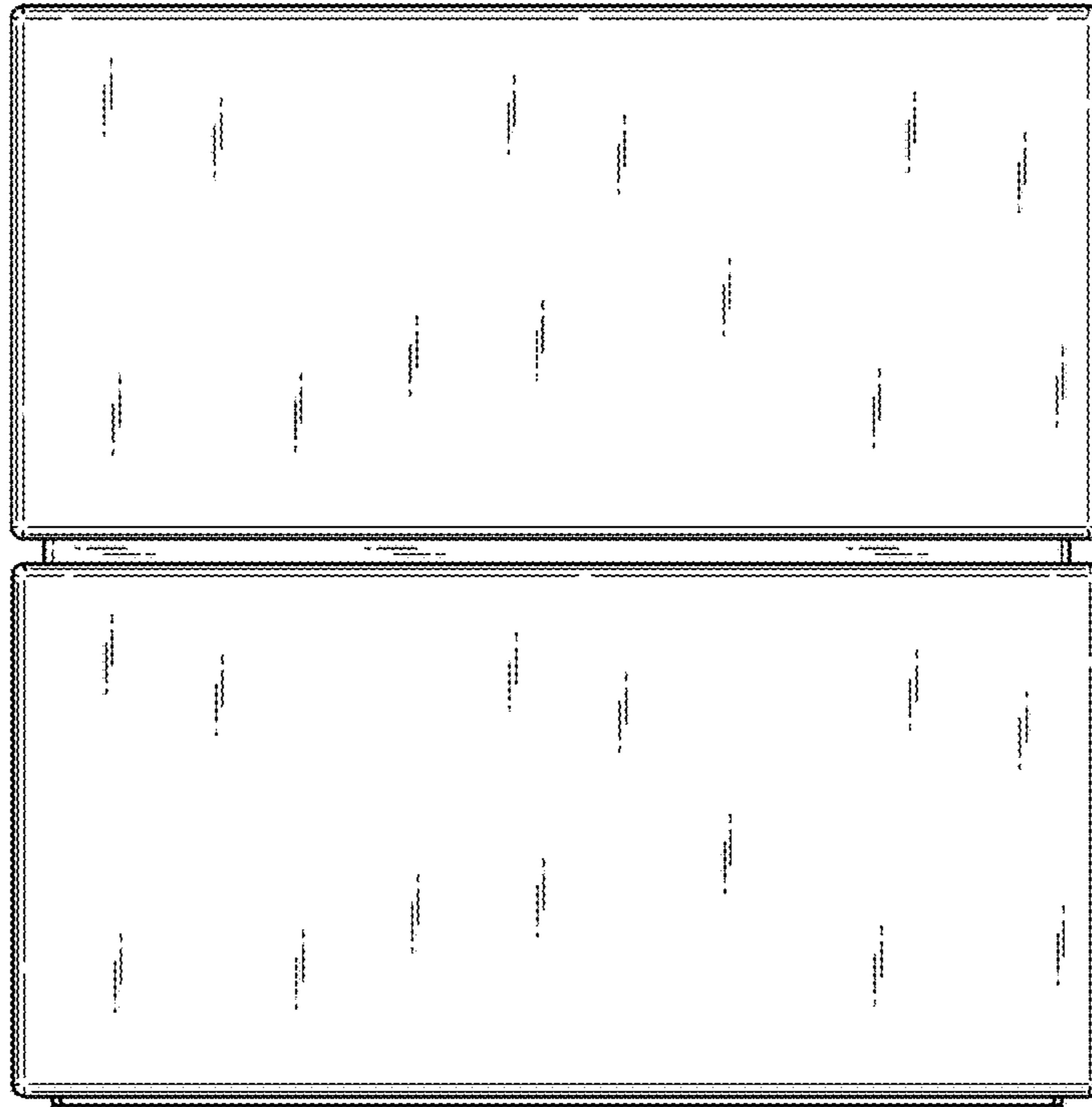


FIG. 2C

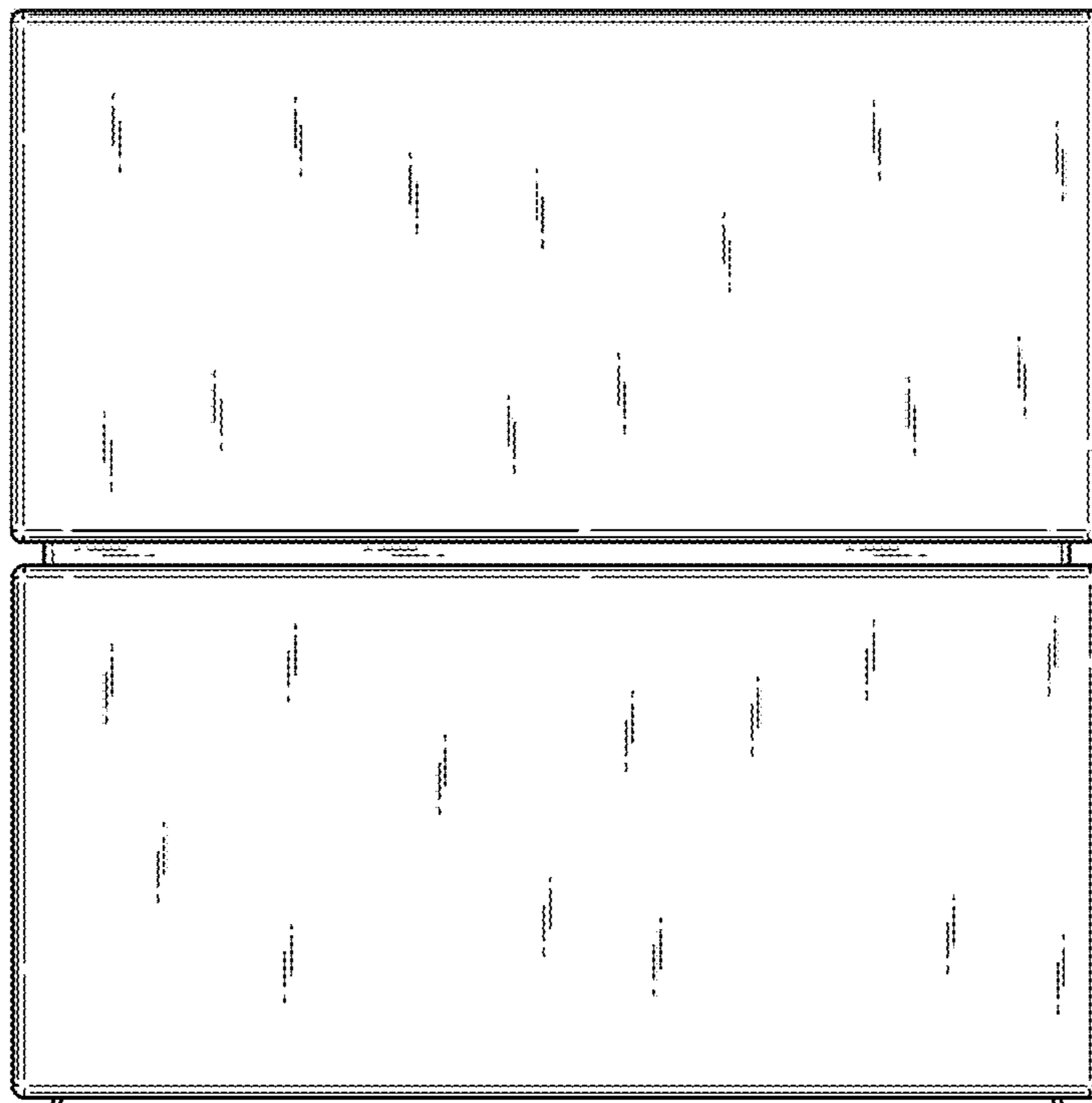


FIG. 2D

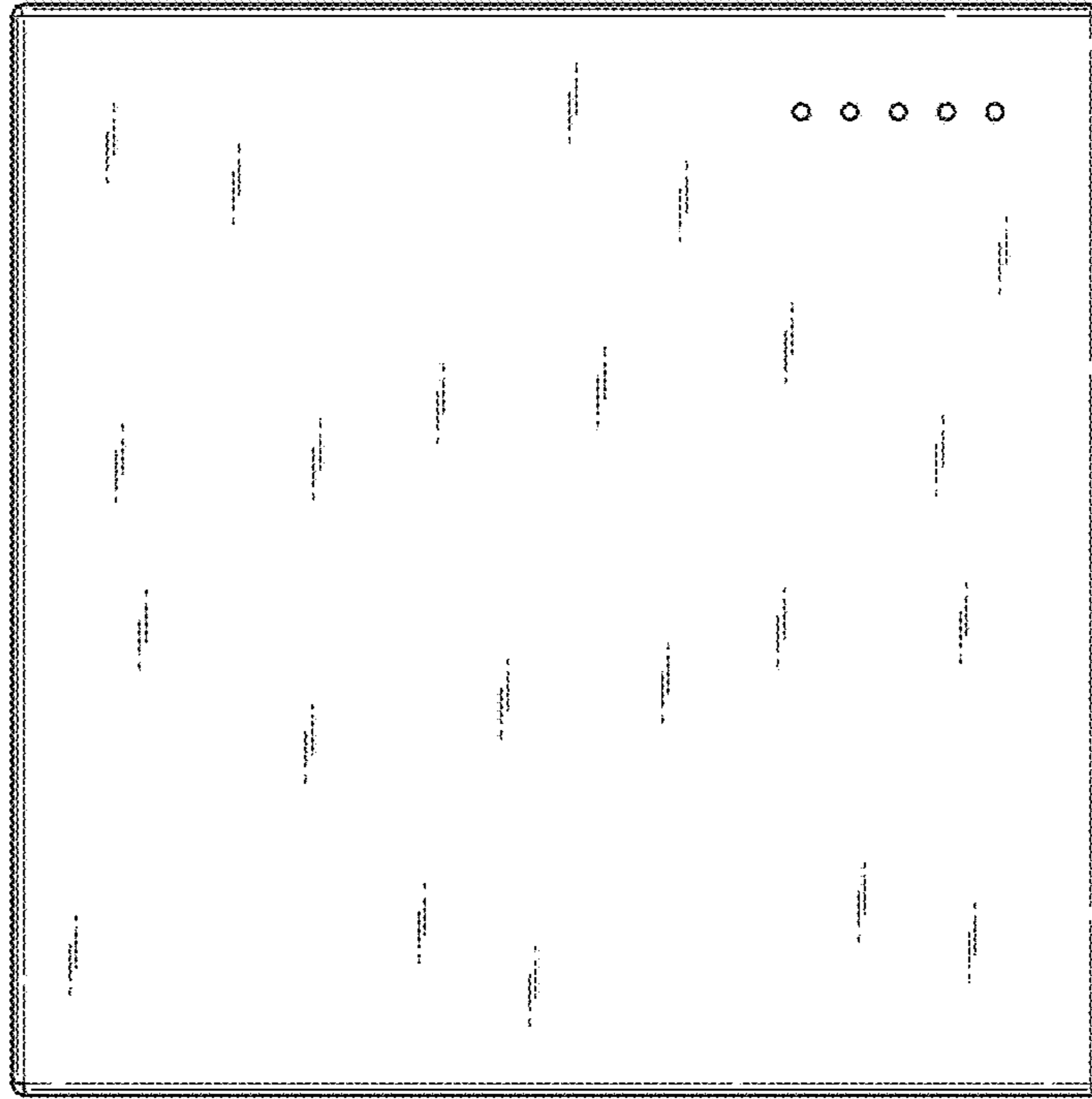


FIG. 2E

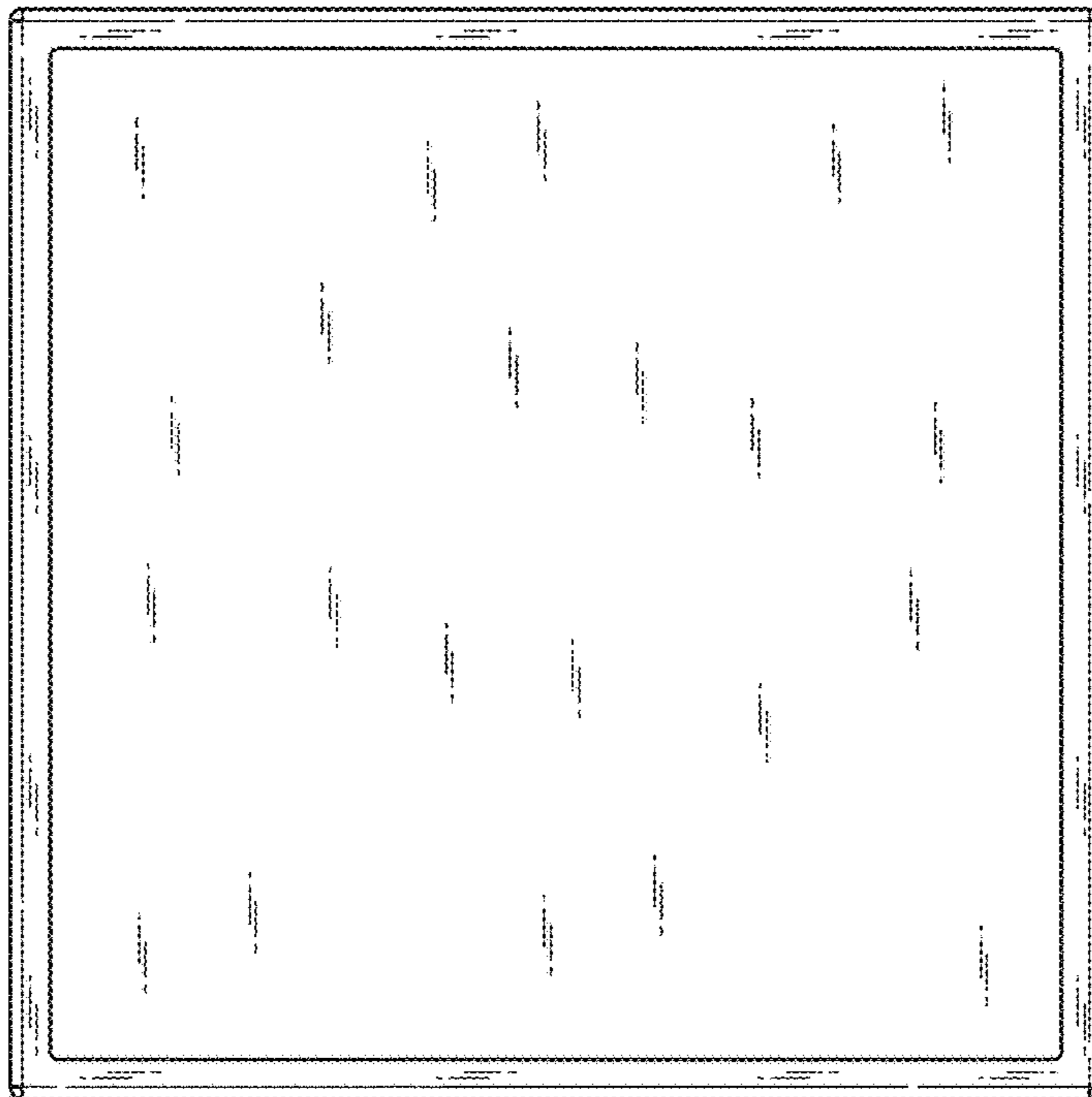


FIG. 2F

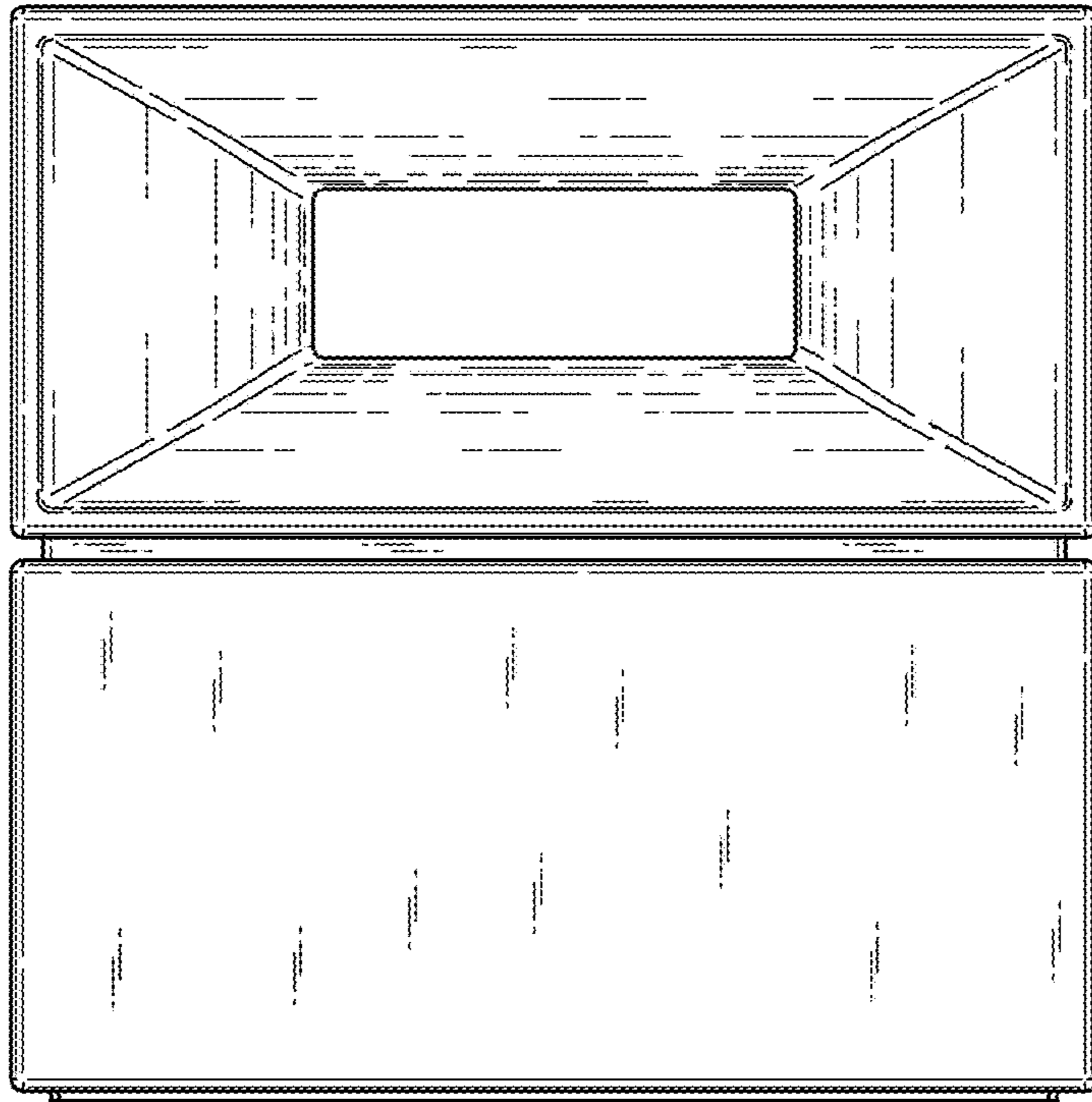


FIG. 2G

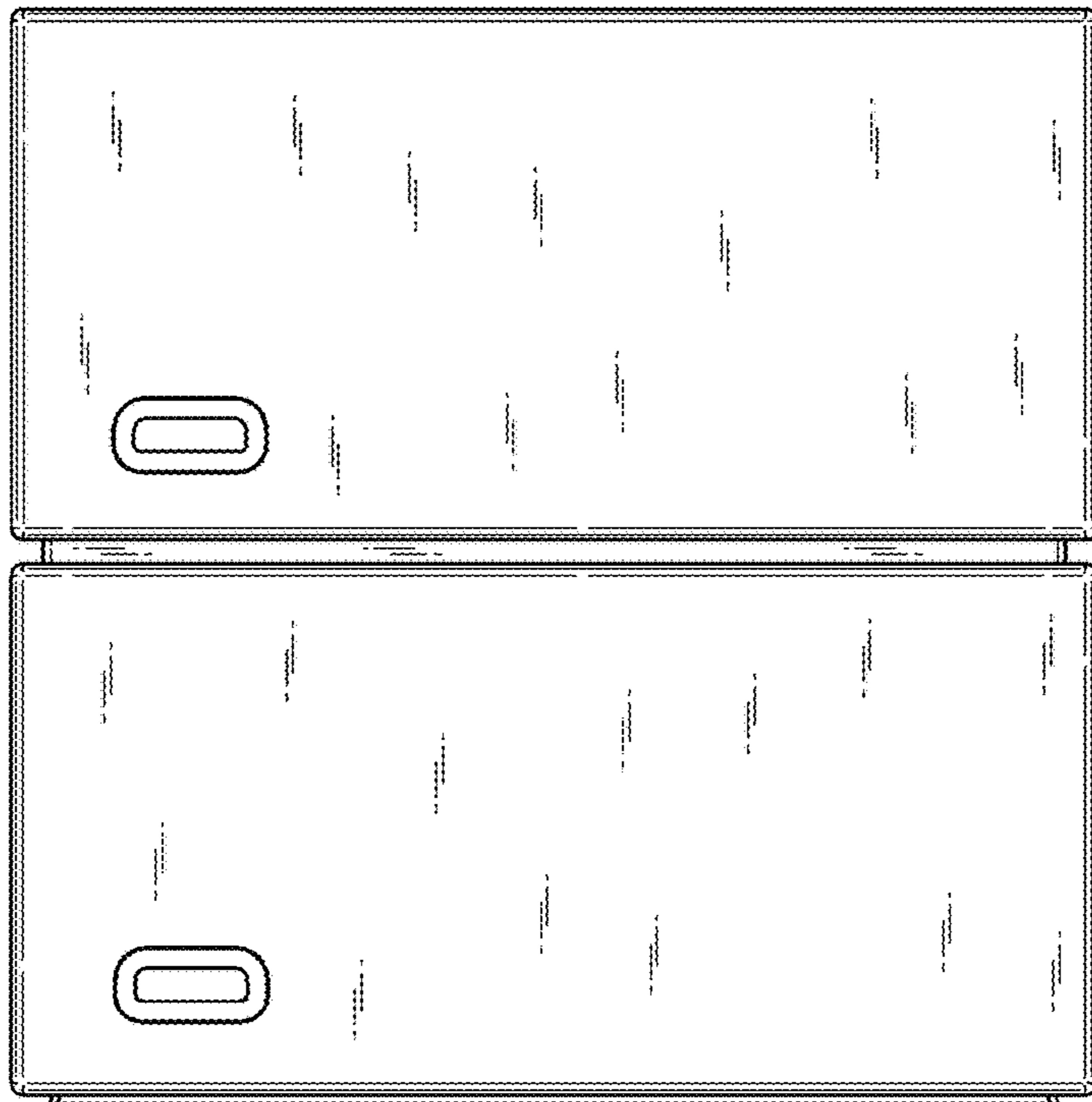


FIG. 2H