



US00D652262S

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

(10) **Patent No.:** **US D652,262 S**
(45) **Date of Patent:** **** Jan. 17, 2012**

(54) **PIN STRIPED THIN FILM SOLAR MODULE FOR COOLER**
(75) Inventors: **Frank Yang**, San Jose, CA (US); **Robert Wieting**, San Jose, CA (US)
(73) Assignee: **Stion Corporation**, San Jose, CA (US)
(**) Term: **14 Years**
(21) Appl. No.: **29/339,066**

4,661,370 A 4/1987 Tarrant
4,663,495 A 5/1987 Berman et al.
4,724,011 A 2/1988 Turner et al.
4,751,149 A 6/1988 Vijayakumar et al.
4,775,425 A 10/1988 Guha et al.
4,798,660 A 1/1989 Ermer et al.
4,816,082 A 3/1989 Guha et al.
4,915,745 A 4/1990 Pollock et al.
4,950,615 A 8/1990 Basol et al.
5,008,062 A 4/1991 Anderson et al.
5,028,274 A 7/1991 Basol et al.
5,039,353 A 8/1991 Schmitt
5,045,409 A 9/1991 Eberspacher et al.

(Continued)

(22) Filed: **Jun. 23, 2009**
(51) **LOC (9) Cl.** **07-02**
(52) **U.S. Cl.** **D7/605**
(58) **Field of Classification Search** D15/79,
D15/81, 83; D7/601, 602, 605, 619.1; 62/3.6,
62/125-126; 312/116, 138.1, 236, 405, 406,
312/457.1-457.9

See application file for complete search history.

FOREIGN PATENT DOCUMENTS
AU 7865198 2/1999
(Continued)

OTHER PUBLICATIONS
Huang et al., Photoluminescence and Electroluminescence of ZnS:Cu Nanocrystals in Polymeric Networks, Applied Physics, Lett. 70 (18), May 5, 1997, pp. 2335-2337.

(Continued)

(56) **References Cited**

U.S. PATENT DOCUMENTS

D232,798 S * 9/1974 Roche D7/605
D235,195 S * 5/1975 Sauey, Jr. D3/294
D259,232 S * 5/1981 Tarozzi D7/313
4,335,266 A 6/1982 Mickelsen et al.
4,441,113 A 4/1984 Madan
4,461,922 A 7/1984 Gay et al.
4,465,575 A 8/1984 Love et al.
4,471,155 A 9/1984 Mohr et al.
4,499,658 A 2/1985 Lewis
4,507,181 A 3/1985 Nath et al.
4,517,403 A 5/1985 Morel et al.
4,532,372 A 7/1985 Nath et al.
4,542,255 A 9/1985 Tanner et al.
4,581,108 A 4/1986 Kapur et al.
4,589,194 A 5/1986 Roy
4,598,306 A 7/1986 Nath et al.
4,599,154 A 7/1986 Bender et al.
4,611,091 A 9/1986 Choudary et al.
4,623,601 A 11/1986 Lewis et al.
4,625,070 A 11/1986 Berman et al.
4,638,111 A 1/1987 Gay

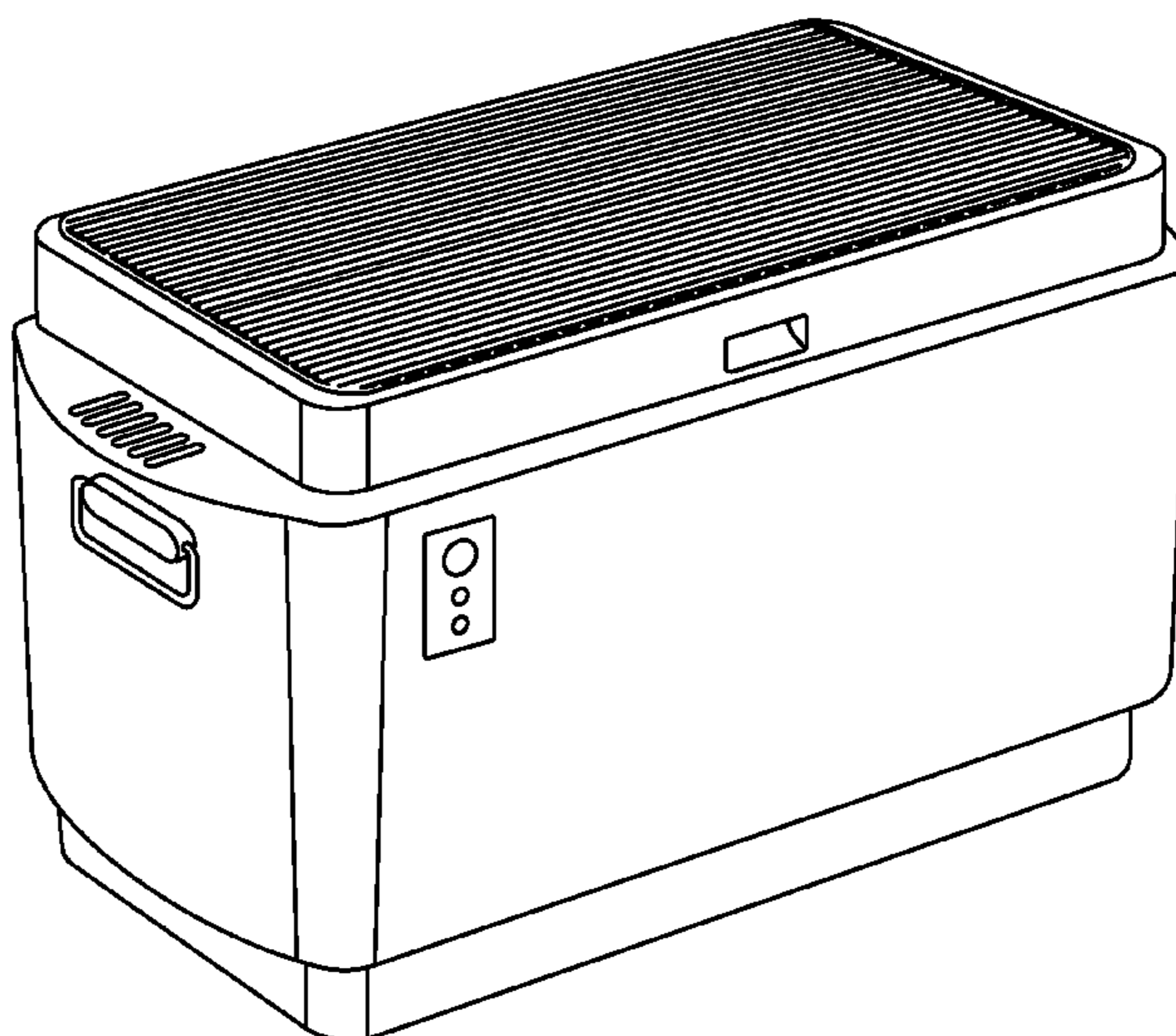
Primary Examiner — Mitchell Siegel

(57) **CLAIM**
The ornamental design for pin striped thin film solar module for cooler, as shown and described.

DESCRIPTION

FIG. 1 is a perspective view of a pin striped thin film solar module for a cooler showing our new design;
FIG. 2 is a top plan view thereof;
FIG. 3 is a left side elevational view thereof;
FIG. 4 is a right side elevational view thereof;
FIG. 5 is a front elevational view thereof; and,
FIG. 6 is a rear elevational view thereof.

1 Claim, 4 Drawing Sheets



U.S. PATENT DOCUMENTS

5,078,803	A	1/1992	Pier et al.	
5,133,809	A	7/1992	Sichanugrist et al.	
5,137,835	A	8/1992	Karg	
5,180,686	A	1/1993	Banerjee et al.	
5,211,824	A	5/1993	Knapp	
5,231,047	A	7/1993	Ovshinsky et al.	
5,248,345	A	9/1993	Sichanugrist et al.	
5,298,086	A	3/1994	Guha et al.	
5,336,623	A	8/1994	Sichanugrist et al.	
5,346,853	A	9/1994	Guha et al.	
D357,161	S *	4/1995	Booten	D7/605
5,474,939	A	12/1995	Pollock et al.	
5,512,107	A	4/1996	Van den Berg	
5,578,503	A	11/1996	Karg et al.	
5,676,766	A	10/1997	Probst et al.	
5,977,476	A	11/1999	Guha et al.	
5,981,868	A	11/1999	Kushiya et al.	
5,985,691	A	11/1999	Basol et al.	
6,040,521	A	3/2000	Kushiya et al.	
6,048,442	A	4/2000	Kushiya et al.	
6,092,669	A	7/2000	Kushiya et al.	
6,127,202	A	10/2000	Kapur et al.	
6,166,319	A	12/2000	Matsuyama	
6,310,281	B1	10/2001	Wendt et al.	
6,372,538	B1	4/2002	Wendt et al.	
6,690,041	B2	2/2004	Armstrong et al.	
6,852,920	B2	2/2005	Sager et al.	
6,878,871	B2	4/2005	Scher et al.	
7,194,197	B1	3/2007	Wendt et al.	
7,319,190	B2	1/2008	Tuttle	
D634,982	S *	3/2011	Melchert et al.	D7/605
2002/0063065	A1	5/2002	Sonoda et al.	
2003/0075717	A1	4/2003	Kondo et al.	
2004/0095658	A1	5/2004	Buretea et al.	
2004/0110393	A1	6/2004	Munzer et al.	
2004/0245912	A1	12/2004	Thurk et al.	
2004/0252488	A1	12/2004	Thurk	
2005/0287717	A1	12/2005	Heald et al.	
2006/0034065	A1	2/2006	Thurk	
2006/0051505	A1	3/2006	Kortshagen et al.	
2006/0096536	A1	5/2006	Tuttle	
2006/0096537	A1	5/2006	Tuttle	
2006/0096635	A1	5/2006	Tuttle	
2006/0102230	A1	5/2006	Tuttle	
2006/0219288	A1	10/2006	Tuttle	
2006/0219547	A1	10/2006	Tuttle	
2007/0116892	A1	5/2007	Zwaap	
2007/0116893	A1	5/2007	Zwaap	
2007/0283998	A1	12/2007	Kuriyagawa et al.	
2007/0289624	A1	12/2007	Kuriyagawa et al.	
2008/0032044	A1	2/2008	Kuriyagawa et al.	
2008/0105294	A1	5/2008	Kushiya et al.	
2008/0110495	A1	5/2008	Onodera et al.	

FOREIGN PATENT DOCUMENTS

AU	2001/40599	A1	8/2001
DE	3314197	A1	11/1983
DE	10104726	A1	8/2002
DE	102005062977	B3	9/2007
FR	2646560		11/1990

GB	2124826	A	2/1984
JP	2000/173969		6/2000
JP	2000/219512		8/2000
JP	2002/167695		6/2002
JP	2002/270871		9/2002
JP	2002/299670		10/2002
JP	2004/332043		11/2004
JP	2005/311292		11/2005
WO	WO 01/57932	A1	8/2001
WO	WO 2005011002		2/2005
WO	WO 2007/077171	A2	7/2007
WO	WO 2008/025326	A2	3/2008

OTHER PUBLICATIONS

Huang et al., Preparation of ZnxCd1-xS Nanocomposites in Polymer Matrices and their Photophysical Properties, Langmuir 1998, 14, pp. 4342-4344.

International Solar Electric Technology, Inc. (ISET) "Thin Film CIGS", <http://www.isetinc.com/cigs.html>, Oct. 1, 2008.

Kapur et al., "Fabrication of Light Weight Flexible CIGS Solar Cells for Space Power Applications", Mat. Res. Soc. Proc. vol. 668, (2001) ppH3.5.1-H3.5.6, Materials Research Society, Warrendale, PA 15086.

Kapur et al., Non-Vacuum Printing Process for CIGS Solar Cells on Rigid and Flexible Substrates 29th IEEE Photovoltaic Specialists Conf., New Orleans, LA, IEEE, (2002) p. 688-691.

Kapur et al., "Non-Vacuum Processing of CIGS Solar Cells on Flexible Polymer Substrates", Proceedings of the Third World Conference on Photovoltaic Energy Conversion, Osaka, Japan, 2P-D3-43 (2003).

Kapur et al., "Non-Vacuum Processing of CuIn_{1-x}Ga_xSe₂ Solar Cells on Rigid and Flexible Substrates using Nanoparticle Inks", Thin Solid Films, vol. 431-432 (2003) pp. 53-57 Proceedings of Symposium B, European Materials Research Society, Strasbourg, France.

Kapur et al., "Fabrication of CIGS Solar Cells via Printing of Nanoparticle Precursor Inks", DOE Solar Program Review Meeting 2004, DOE/GO-102005-2067, p. 135-136.

Kapur et al., "Nanoparticle Oxides Precursor Inks for Thin Film Copper Indium Gallium Selenide (CIGS) Solar Cells", Mat. Res. Soc. Proc. vol. 668, (2001) ppH2.6.1-H2.6.7, Materials Research Society, Warrendale, PA 15086.

Yang et al., Fabrication and Characteristics of ZnS Nanocrystals/Polymer Composite Doped with Tetraphenylbenzidine Single Layer Structure Light-emitting Diode, Applied Physics Lett. vol. 69 (3), Jul. 15, 1996, pp. 377-379.

Yang et al., Preparation, Characterization and Electroluminescence of ZnS Nanocrystals in a Polymer Matrix, J. Mater. Chem., 1997, 7(1), pp. 131-133.

Yang et al., Electroluminescence from ZnS/CdS Nanocrystals/Polymer Composite, Synthetic Metals 91, (1997) 347-349.

* cited by examiner

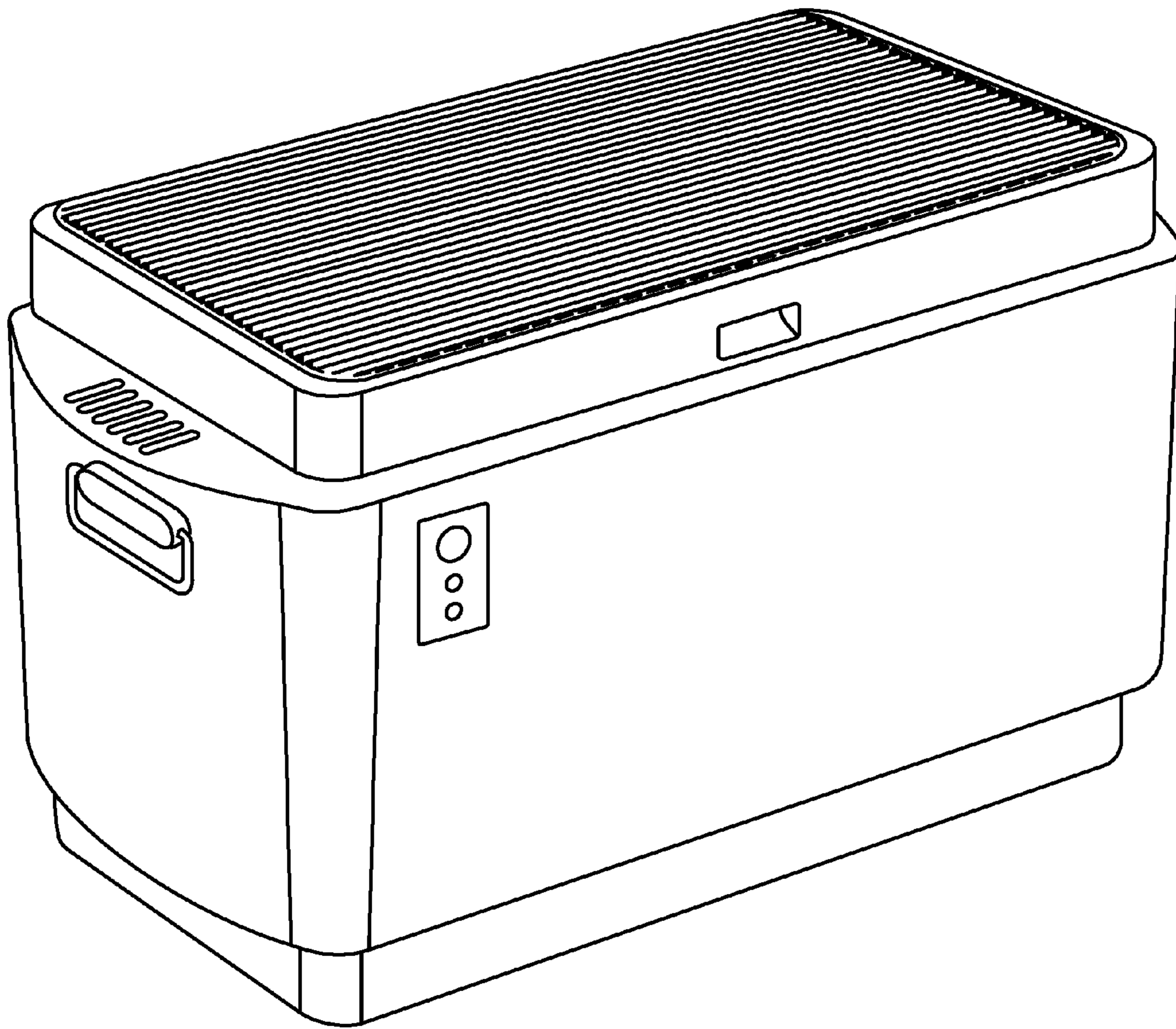


FIGURE 1

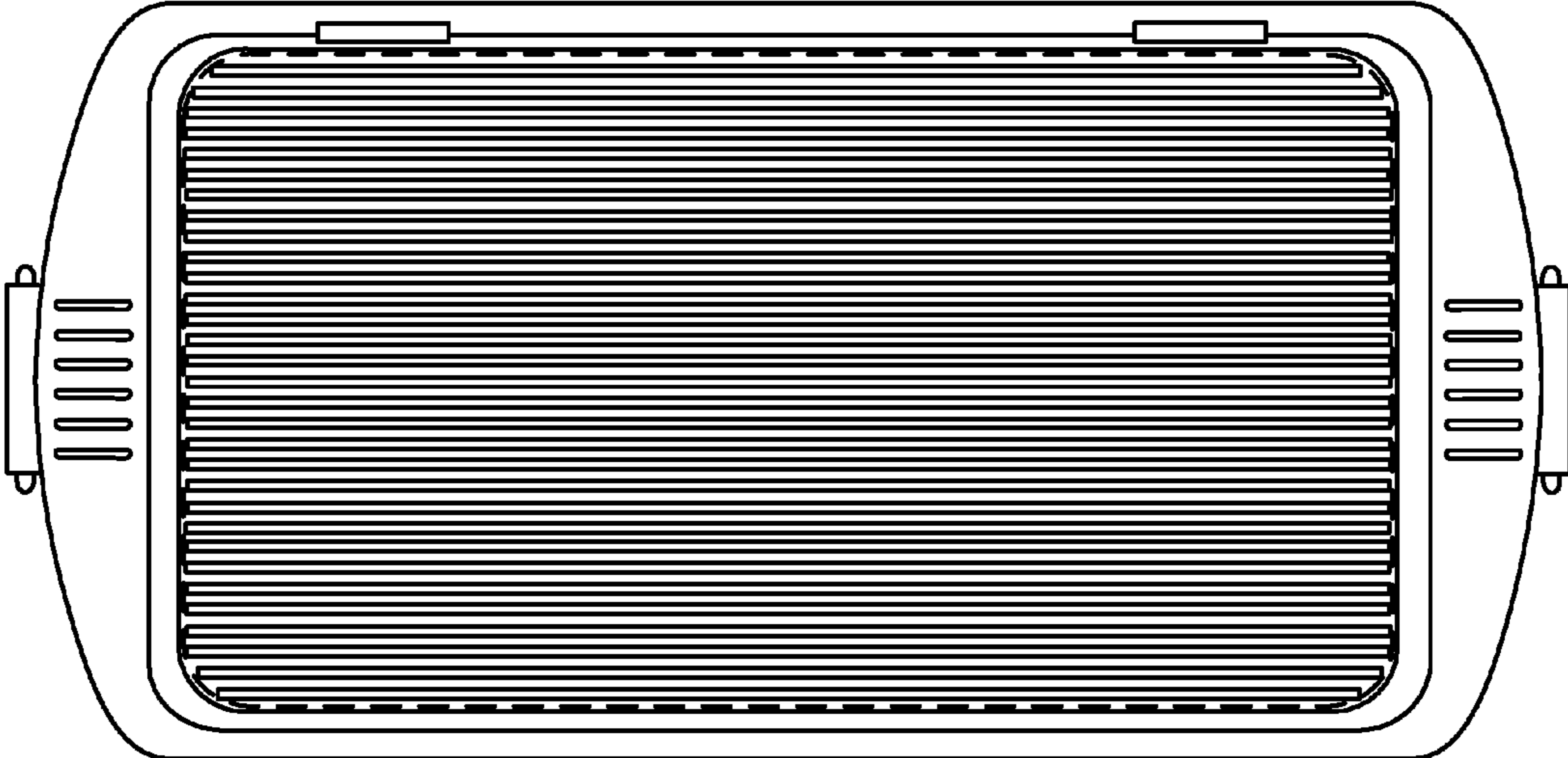


FIGURE 2

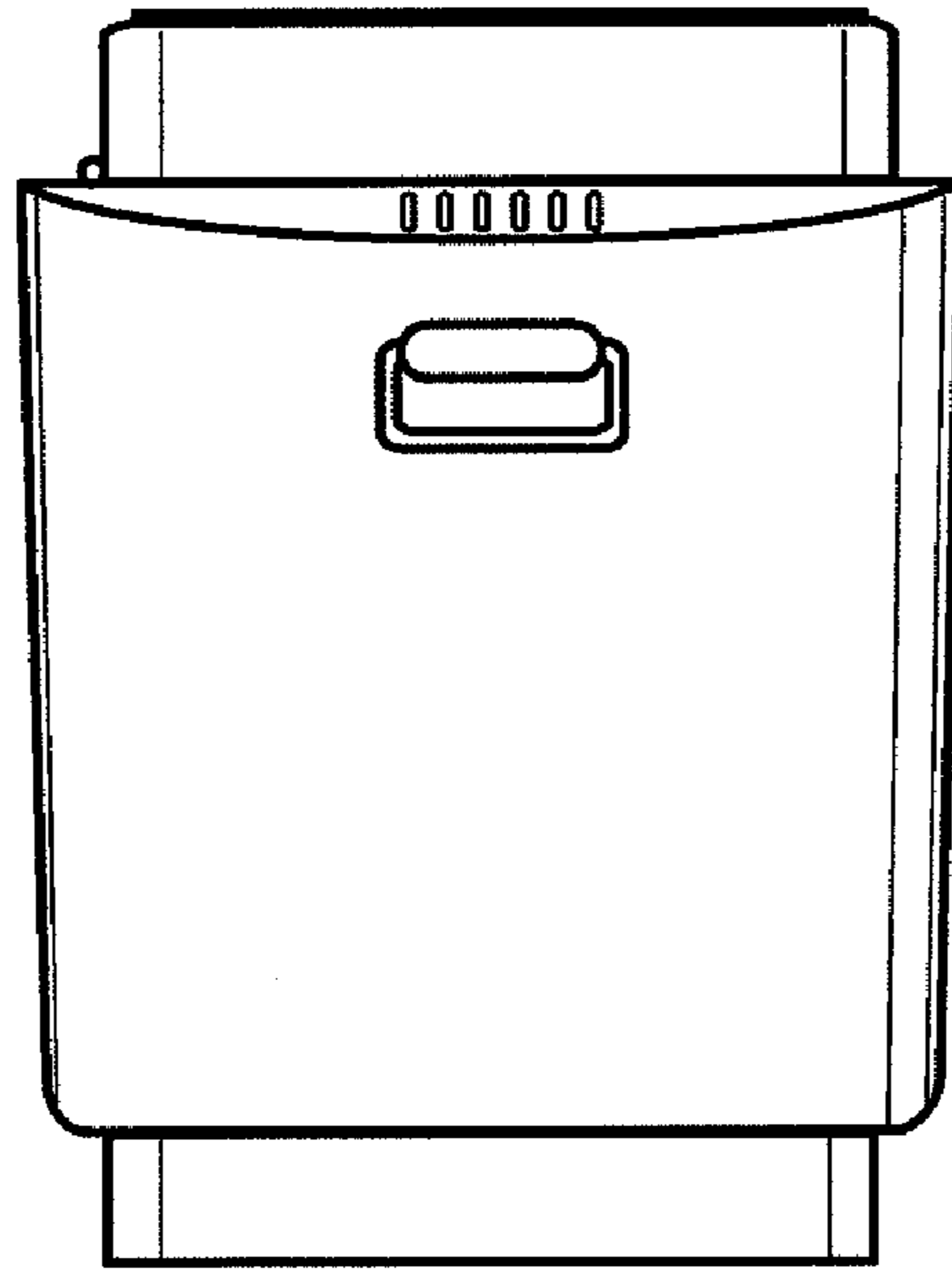


FIGURE 3

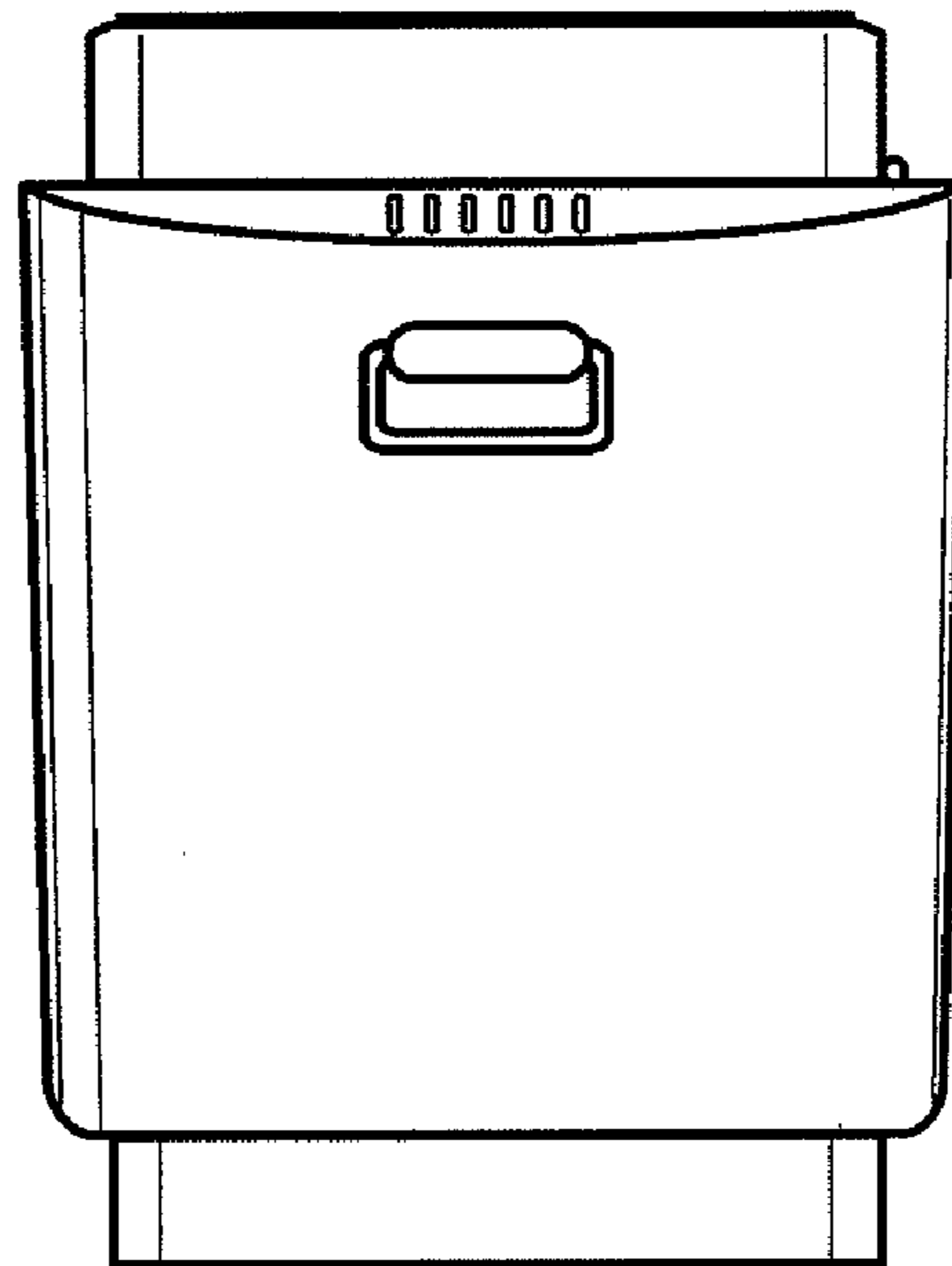


FIGURE 4

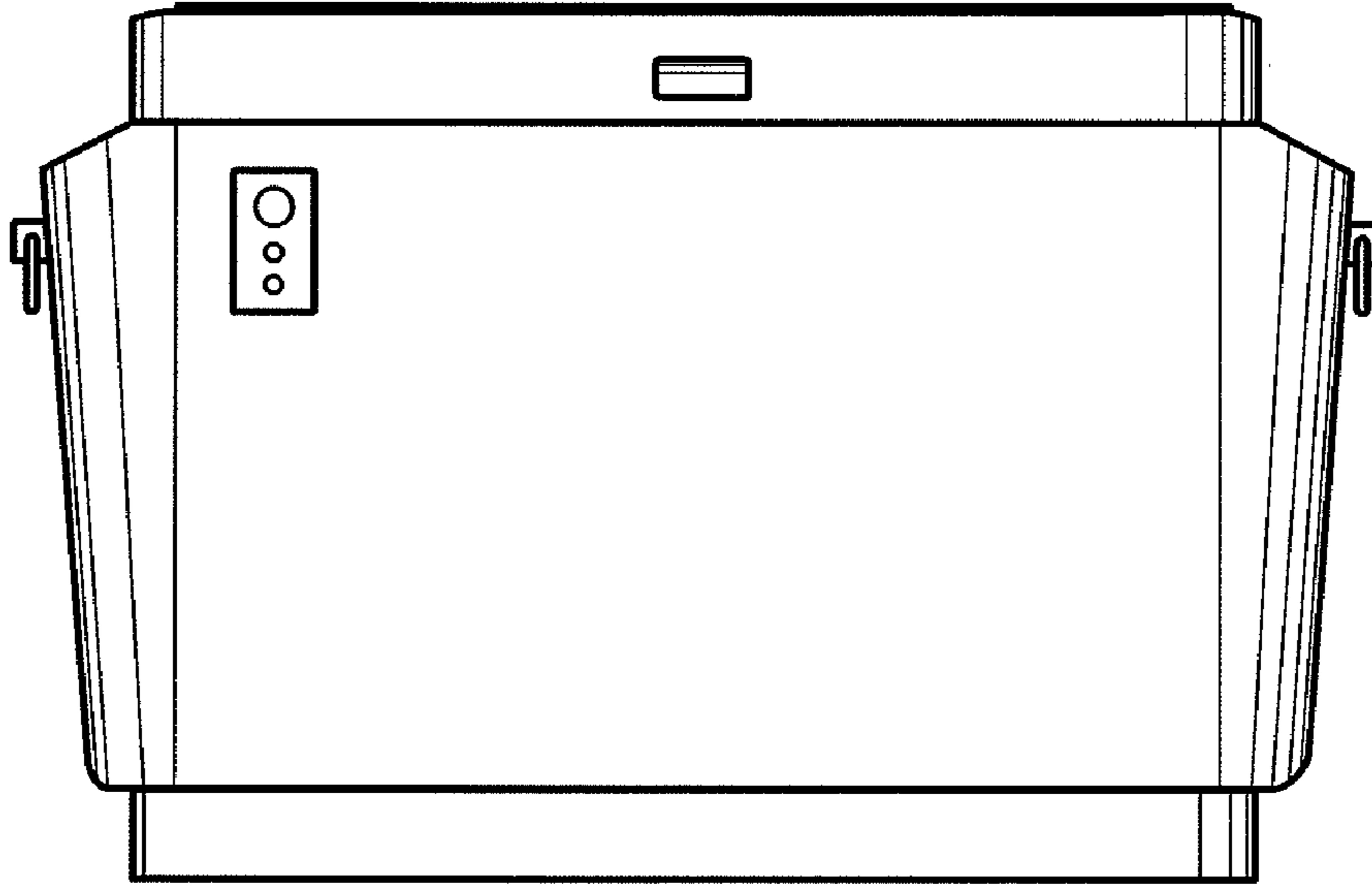


FIGURE 5

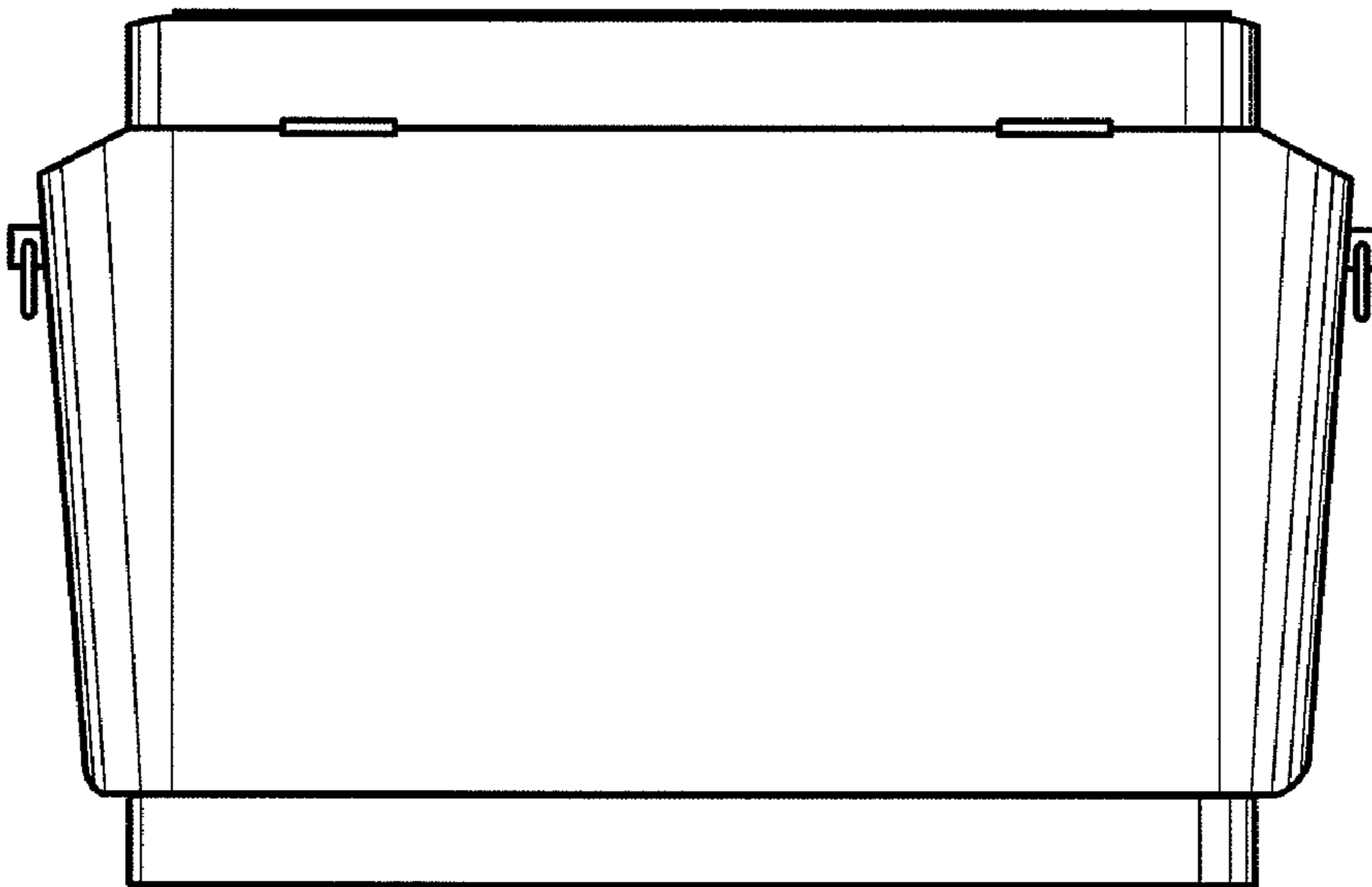


FIGURE 6