US00D960086S

(12) United States Design Patent

Schwalbach et al.

(10) Patent No.: US D960,086 S
(45) Date of Patent: ** Aug. 9, 2022

(54) **BATTERY PACK**

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

(21) Appl. No.: **29/731,732**

(22) Filed: **Apr. 17, 2020**

Related U.S. Application Data

(63) Continuation of application No. 16/045,513, filed on Jul. 25, 2018.

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

(52) **U.S. Cl.**
USPC **D13/103**

(58) **Field of Classification Search**
USPC D13/102–106, 110, 118–119, 184
(Continued)

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,327,302 A 4/1982 Hershberger
4,434,546 A 3/1984 Hershberger
(Continued)

FOREIGN PATENT DOCUMENTS

CN 2715414 Y 8/2005
CN 1949628 A 4/2007
(Continued)

OTHER PUBLICATIONS

Australian Patent Office Examination Report No. 1 for Application No. 2018306290 dated Jul. 22, 2020 (6 pages).
(Continued)

Primary Examiner — Rosemary K Tarcza
(74) *Attorney, Agent, or Firm* — Michael Best & Friedrich LLP

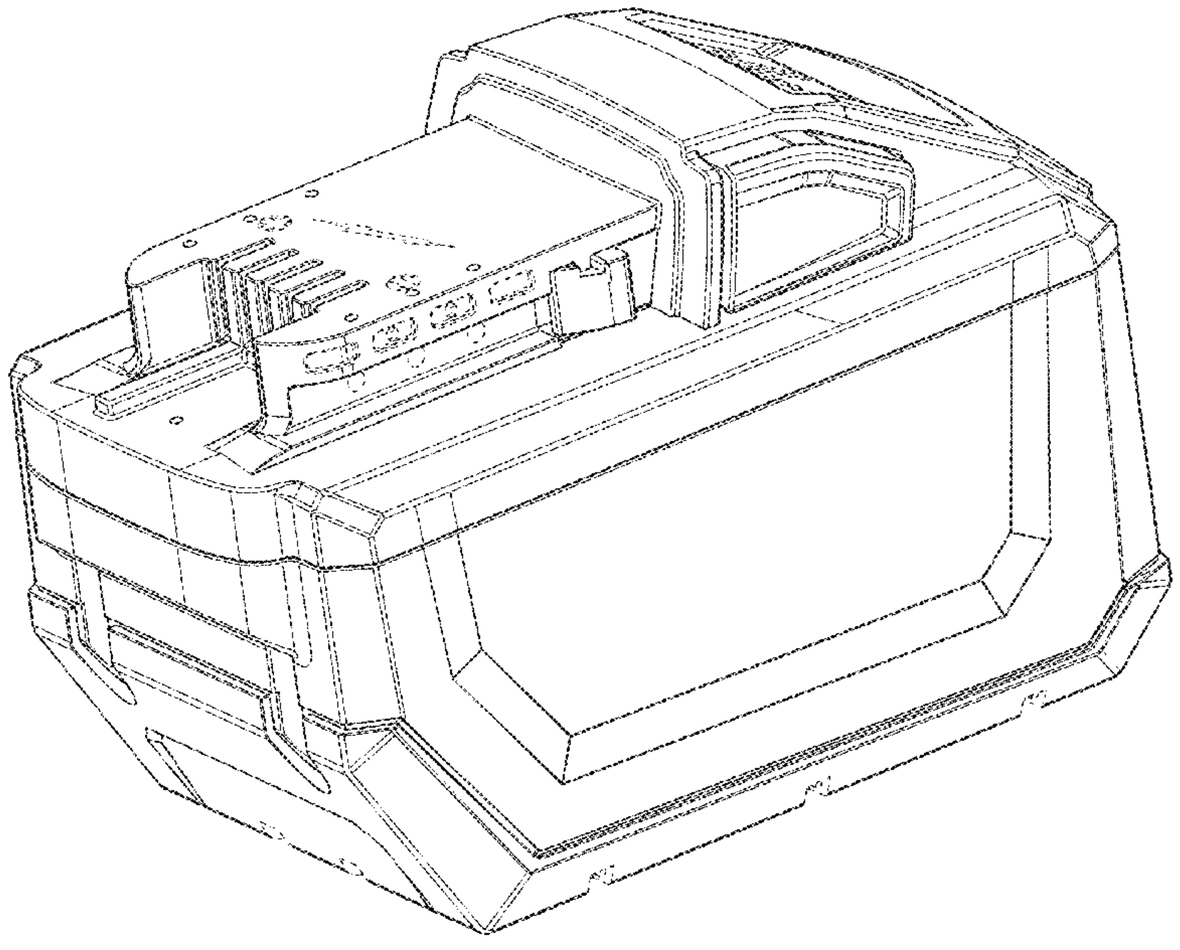
(57) **CLAIM**

We claim the ornamental design for a battery pack, as shown and described.

DESCRIPTION

FIG. **1** is a rear perspective view of a battery pack in accordance with an embodiment of the present invention.
FIG. **2** is another rear perspective view of the battery pack shown in FIG. **1**.
FIG. **3** is a top view of the battery pack shown in FIG. **1**.
FIG. **4** is a bottom view the battery pack shown in FIG. **1**.
FIG. **5** is a rear view of the battery pack shown in FIG. **1**.
FIG. **6** is a front view of the battery pack shown in FIG. **1**.
FIG. **7** is one side view of the battery pack shown in FIG. **1**; and,
FIG. **8** is another side view of the battery pack shown in FIG. **1**.
The portions of the battery pack shown in broken lines are included for the purpose of illustrating environment and form no part of the claimed design.

1 Claim, 8 Drawing Sheets



(58) **Field of Classification Search**
CPC Y02E 60/10; H01M 6/00; H01M 6/14; H01M 6/05; H01M 6/10; H01M 10/52
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,437,325	A	3/1984	Hershberger	
4,476,736	A	10/1984	Hershberger	
4,689,973	A	9/1987	Hershberger	
4,806,717	A	2/1989	Hershberger	
4,905,423	A	3/1990	van Laere	
RE33,655	E	8/1991	Hershberger	
5,510,725	A	4/1996	Schantz, Jr. et al.	
5,672,926	A	9/1997	Brandes et al.	
5,742,513	A	4/1998	Bouhenguel et al.	
5,945,760	A	8/1999	Honda et al.	
5,962,944	A	10/1999	Narita et al.	
6,008,559	A	12/1999	Asano et al.	
6,025,667	A	2/2000	Narita et al.	
6,031,311	A	2/2000	Lee	
6,049,153	A	4/2000	Nishiyama et al.	
6,087,751	A	7/2000	Sakai	
6,147,428	A	11/2000	Takazawa et al.	
6,177,745	B1	1/2001	Narita et al.	
6,274,960	B1	8/2001	Sakai et al.	
6,300,700	B1	10/2001	Nishiyama et al.	
6,329,734	B1	12/2001	Takahashi et al.	
6,340,857	B2	1/2002	Nishiyama et al.	
6,342,745	B1	1/2002	Sakai et al.	
6,356,001	B1	3/2002	Nishiyama et al.	
6,369,480	B1	4/2002	Nishiyama et al.	
6,437,473	B1	8/2002	Mobius et al.	
6,441,524	B2	8/2002	Kaneko et al.	
6,525,442	B2	2/2003	Koharagi et al.	
6,552,462	B2	4/2003	Sakai et al.	
6,555,940	B2	4/2003	Naito et al.	
6,630,762	B2	10/2003	Naito et al.	
6,664,688	B2	12/2003	Naito et al.	
6,717,315	B1	4/2004	Tajima et al.	
6,741,002	B2	5/2004	Nishiyama et al.	
6,741,003	B2	5/2004	Naito et al.	
6,759,778	B2	7/2004	Nishiyama et al.	
6,774,523	B2	8/2004	Ahn et al.	
6,826,824	B2	12/2004	Hiroyuki et al.	
6,867,526	B2	3/2005	Mori et al.	
6,885,125	B2	4/2005	Inayama et al.	
6,906,444	B2	6/2005	Hattori et al.	
6,917,133	B2	7/2005	Koharagi et al.	
6,927,519	B2	8/2005	Popov	
6,943,474	B2	9/2005	Inayama et al.	
6,956,312	B2	10/2005	Inayama et al.	
6,967,424	B2	11/2005	Popov	
6,979,924	B2	12/2005	Nishiyama et al.	
6,987,342	B2	1/2006	Hans	
D516,504	S *	3/2006	Okuda	D13/103
7,019,426	B2	3/2006	Mori et al.	
7,057,322	B2	6/2006	Araki et al.	
7,151,335	B2	12/2006	Tajima et al.	
7,170,209	B2	1/2007	Araki et al.	
7,176,598	B2	2/2007	Mori et al.	
7,196,446	B2	3/2007	Hans	
7,204,012	B2	4/2007	Kloepzig et al.	
D555,086	S *	11/2007	Zhang	D13/103
7,321,177	B2	1/2008	Uchida et al.	
7,385,328	B2	6/2008	Melfi	
7,432,624	B2	10/2008	Kolehmainen et al.	
7,436,095	B2	10/2008	Aydin et al.	
7,474,029	B2	1/2009	Rahman et al.	
7,479,723	B2	1/2009	Dawsey et al.	
D589,441	S *	3/2009	Van Wambeke	D13/103
7,504,754	B2	3/2009	Jahns et al.	
7,521,832	B2	4/2009	Tajima et al.	
7,550,889	B2	6/2009	Horst et al.	
7,560,842	B2	7/2009	Hattori	
D597,932	S *	8/2009	Aglassinger	D13/103
7,598,645	B2	10/2009	Ley et al.	
7,605,510	B2	10/2009	Okuma et al.	
D604,695	S *	11/2009	Aglassinger	D13/103
7,612,480	B2	11/2009	Fujii et al.	
D606,935	S *	12/2009	Murayama	D13/103
7,705,503	B2	4/2010	Takahashi et al.	
7,705,504	B2	4/2010	Nakayama et al.	
7,732,965	B2	6/2010	Nakayama et al.	
7,750,523	B2	7/2010	Nakayama et al.	
D622,661	S *	8/2010	Yamada	D13/103
7,791,236	B2	9/2010	Liang et al.	
7,800,272	B2	9/2010	Nakayama et al.	
7,804,216	B2	9/2010	Takahashi et al.	
7,808,143	B2	10/2010	Lee et al.	
7,843,101	B2	11/2010	Ito et al.	
7,851,958	B2	12/2010	Cai et al.	
7,868,503	B1	1/2011	Nakayama et al.	
7,902,710	B2	3/2011	Han et al.	
7,906,882	B2	3/2011	Okuma et al.	
7,932,658	B2	4/2011	Ionel	
7,952,249	B2	5/2011	Kori et al.	
D639,730	S *	6/2011	Kawase	D13/103
D640,628	S *	6/2011	Lopano	D13/103
D640,975	S *	7/2011	Okuda	D13/103
D643,809	S *	8/2011	Okuda	D13/103
8,008,825	B2	8/2011	Suzuki et al.	
8,018,109	B2	9/2011	Leonardi et al.	
8,044,546	B2	10/2011	Liang et al.	
8,058,767	B2	11/2011	Haruno et al.	
8,067,871	B2	11/2011	Tajima et al.	
8,080,915	B2	12/2011	Nakayama et al.	
8,120,223	B2	2/2012	Leonardi et al.	
8,138,651	B2	3/2012	Rahman et al.	
D657,307	S *	4/2012	Zhao	D13/103
8,174,158	B2	5/2012	Rahman et al.	
8,179,011	B2	5/2012	Takemoto et al.	
8,217,547	B2	7/2012	Kamiya et al.	
8,227,953	B2	7/2012	Suzuki et al.	
8,232,703	B2	7/2012	Nakayama et al.	
8,264,113	B2	9/2012	Takemoto et al.	
8,319,387	B2	11/2012	Maemura et al.	
8,350,431	B2	1/2013	Liang et al.	
RE44,037	E	3/2013	Tajima et al.	
D679,651	S *	4/2013	Stratford	D13/103
8,427,023	B2	4/2013	Maemura et al.	
D682,192	S *	5/2013	Corbin	D13/103
D682,193	S *	5/2013	Corbin	D13/103
8,461,737	B2	6/2013	Feng et al.	
8,536,748	B2	9/2013	Liang et al.	
8,546,990	B2	10/2013	Suzuki et al.	
8,564,168	B2	10/2013	Chamberlin et al.	
8,598,763	B2	12/2013	Aota et al.	
8,729,763	B2	5/2014	Kogure et al.	
D712,826	S *	9/2014	Marino	D13/103
8,866,359	B2	10/2014	Li et al.	
8,884,485	B2	11/2014	Jurkovic et al.	
8,928,197	B2	1/2015	Jurkovic et al.	
8,928,198	B2	1/2015	Lutz et al.	
8,957,560	B2	2/2015	Uchiyama et al.	
9,024,499	B2	5/2015	Nakada	
9,035,522	B2	5/2015	Liang et al.	
9,130,422	B2	9/2015	Rahman et al.	
9,130,424	B2	9/2015	Moon et al.	
9,300,175	B2	3/2016	Shibata	
9,369,012	B2	6/2016	Hattori et al.	
9,419,481	B2	8/2016	Yamaguchi et al.	
9,496,758	B2	11/2016	Kawanami	
9,502,930	B2	11/2016	Huang et al.	
9,502,934	B2	11/2016	Huang et al.	
9,515,526	B2	12/2016	Huang et al.	
D780,688	S *	3/2017	Elder	D13/103
D785,562	S *	5/2017	Cooper	D13/103
9,647,501	B2	5/2017	Nigo et al.	
9,680,341	B2	6/2017	Takeda et al.	
9,705,388	B2	7/2017	Melfi et al.	
9,748,806	B2	8/2017	Koka et al.	
D797,661	S *	9/2017	Elder	D13/103
9,755,489	B2	9/2017	Takemoto et al.	
9,755,490	B2	9/2017	Inuzuka	

(56) **References Cited**

U.S. PATENT DOCUMENTS

D800,650	S *	10/2017	Itoh	D13/103
D801,919	S *	11/2017	Elder	D13/103
9,831,729	B2	11/2017	Kim et al.	
D812,555	S *	3/2018	Schoch	D13/103
D818,948	S *	5/2018	Waldron	D13/103
D819,562	S *	6/2018	Waldron	D13/103
D826,150	S *	8/2018	Cayon	D13/103
D844,558	S *	4/2019	Taniguchi	D13/103
D849,681	S *	5/2019	Howell	D13/103
D884,600	S *	5/2020	Zhou	D13/103
D884,601	S *	5/2020	Zhou	D13/103
D887,969	S *	6/2020	Howell	D13/103
D890,692	S *	7/2020	Elder	D13/103
D894,120	S *	8/2020	Timm	D13/103
D898,662	S *	10/2020	Waldron	D13/103
D911,931	S *	3/2021	Li	D13/103
D912,615	S *	3/2021	Li	D13/103
D919,560	S *	5/2021	Taniguchi	D13/103
2002/0117923	A1	8/2002	Takei	
2002/0175583	A1	11/2002	Kikuchi et al.	
2004/0018419	A1	1/2004	Sugimoto et al.	
2005/0099155	A1	5/2005	Okuda et al.	
2005/0225192	A1	10/2005	Kloepzig et al.	
2005/0248320	A1	11/2005	Denning	
2006/0103335	A1	5/2006	Kolehmainen et al.	
2006/0279162	A1	12/2006	Achor et al.	
2007/0057589	A1	3/2007	Tatematsu et al.	
2007/0159021	A1	7/2007	Horst	
2007/0193761	A1	8/2007	Brotto	
2008/0258573	A1	10/2008	Kamiya	
2009/0140593	A1	6/2009	Kaiser et al.	
2010/0085020	A1 *	4/2010	Suzuki	H01M 10/4207 320/157
2010/0117475	A1	5/2010	Leonardi et al.	
2010/0218386	A1	9/2010	Ro kamp et al.	
2010/0218966	A1	9/2010	Liebhard et al.	
2011/0156521	A1	6/2011	Nagashima et al.	
2011/0163701	A1	7/2011	Carrier et al.	
2012/0038236	A1	2/2012	Tajima et al.	
2012/0200186	A1	8/2012	Sano et al.	
2013/0043757	A1	2/2013	Kagami et al.	
2013/0057294	A1	3/2013	Mizoguchi et al.	
2013/0106227	A1	5/2013	Aoyama	
2013/0119810	A1	5/2013	Aoyama	
2013/0187504	A1	7/2013	Tanaka	
2014/0028226	A1	1/2014	Mergener et al.	
2014/0062244	A1	3/2014	Sano et al.	
2014/0091664	A1	4/2014	Aoyama	
2014/0111050	A1	4/2014	Chamberlin et al.	
2014/0131059	A1	5/2014	Verbrugge et al.	
2014/0147718	A1	5/2014	Furui et al.	
2014/0152139	A1	6/2014	Huang et al.	
2014/0283373	A1	9/2014	Melfi et al.	
2014/0285050	A1	9/2014	Melfi et al.	
2014/0292132	A1	10/2014	Kazmin et al.	
2014/0361645	A1	12/2014	Beyerl	
2015/0091406	A1	4/2015	Tajima et al.	
2015/0130317	A1	5/2015	Hung et al.	
2015/0171684	A1	6/2015	McClelland et al.	
2015/0229172	A1	8/2015	Kashihara et al.	
2015/0256117	A1	9/2015	Suzuki et al.	
2016/0036089	A1	2/2016	Lutz et al.	
2016/0056672	A1	2/2016	Yuan et al.	
2016/0111984	A1	4/2016	Koizumi et al.	
2016/0149463	A1	5/2016	Smith et al.	
2016/0149467	A1	5/2016	Smith et al.	
2016/0172912	A1	6/2016	Nigo et al.	
2016/0231382	A1	8/2016	Hirose et al.	
2016/0248061	A1	8/2016	Brambrink et al.	
2016/0276886	A1	9/2016	Baba et al.	
2016/0285330	A1	9/2016	Mukai et al.	
2016/0344274	A1	11/2016	Jurkovic et al.	
2017/0040854	A1	2/2017	Saint-Michel	
2017/0063211	A1	3/2017	Mochida et al.	
2017/0070111	A1	3/2017	Kanda et al.	
2017/0104375	A1	4/2017	Kim et al.	
2017/0104376	A1	4/2017	Nakagawa et al.	
2017/0106521	A1	4/2017	Kelleher et al.	
2017/0144693	A1	5/2017	Okubo	
2017/0170696	A1	6/2017	Ogawa et al.	
2017/0302117	A1	10/2017	Fukumoto et al.	
2017/0366053	A1	12/2017	Ash	
2018/0076676	A1	3/2018	Chen et al.	
2019/0074682	A1	3/2019	Suda et al.	

FOREIGN PATENT DOCUMENTS

CN	200983519	Y	11/2007
CN	100392946	C	6/2008
CN	201130876	Y	10/2008
CN	100481678	C	4/2009
CN	101436793	A	5/2009
CN	101917076	A	12/2010
CN	101295891	B	2/2012
CN	202142925	U	2/2012
CN	202142926	U	2/2012
CN	202145610	U	2/2012
CN	102420475	A	4/2012
CN	202260714	U	5/2012
CN	101447705	B	11/2012
CN	103061944	A	4/2013
CN	103078465	A	5/2013
CN	202918085	U	5/2013
CN	101741199	B	6/2013
CN	103267053	A	8/2013
CN	203301332	U	11/2013
CN	203312944	U	11/2013
CN	103580327	A	2/2014
CN	102916512	B	11/2014
CN	104638864	A	5/2015
CN	104658748	A	5/2015
CN	104882978	A	9/2015
CN	105048671	A	11/2015
CN	103715799	B	3/2016
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CN	103780038	B	5/2016
CN	105811604	A	7/2016
CN	104104168	B	8/2016
CN	105846627	A	8/2016
CN	106026599	A	10/2016
CN	106451988	A	2/2017
CN	104767338	B	6/2017
CN	206542315	U	10/2017
CN	206759279	U	12/2017
DE	10345417	A1	5/2005
DE	102005047771	A1	4/2007
DE	102008044127	A1	6/2009
DE	102013205928	A1	10/2014
EP	26110022	A2	7/2013
JP	2005287240	A	10/2005
JP	2007135339		5/2007
WO	2012059258	A1	1/1997
WO	2006095887	A1	9/2006
WO	2012047118	A1	4/2012
WO	20131784362	A2	12/2013
WO	2014090050	A1	6/2014
WO	2014104824	A1	7/2014
WO	2015171486	A1	11/2015
WO	2015179318	A1	11/2015
WO	2017012765	A1	1/2017
WO	2017051522	A1	3/2017
WO	2017171037	A1	10/2017
WO	2017177740	A1	10/2017

OTHER PUBLICATIONS

International Search Report and Written Opinion for Application No. PCT/US2018/043749 dated Nov. 21, 2018, 26 pages.

(56) **References Cited**

OTHER PUBLICATIONS

Patent Cooperation Treaty Third Party Observation Report for Application No. PCT/US2018/043749 dated Nov. 14, 2019 (9 pages).
Extended European Search Report for Application No. 18837466.4 dated Jun. 15, 2021 (12 pages).
Chinese Patent Office for Application No. 201880062089.0 dated May 6, 2022 (23 pages including statement of relevance).

* cited by examiner

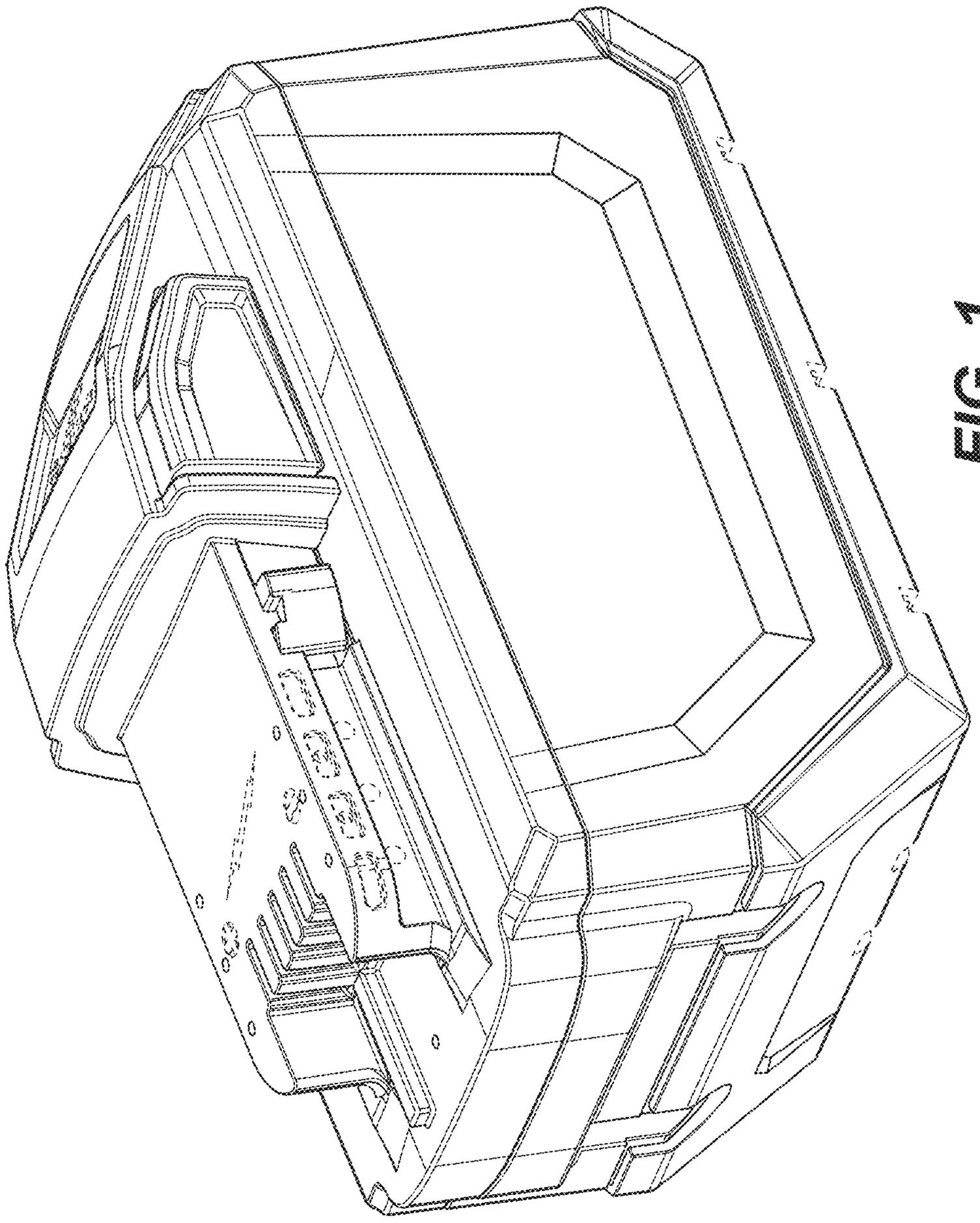

FIG. 1

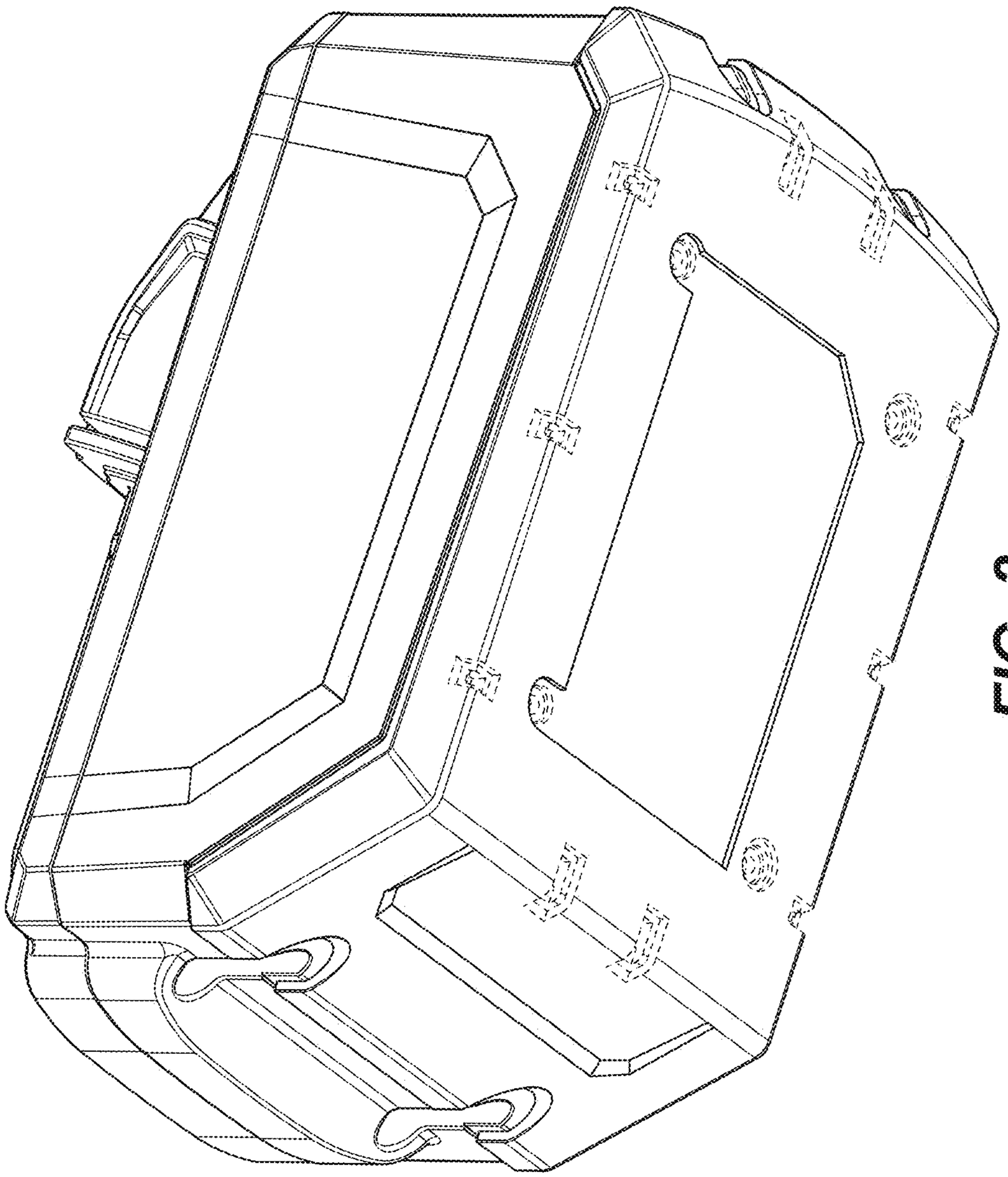

FIG. 2

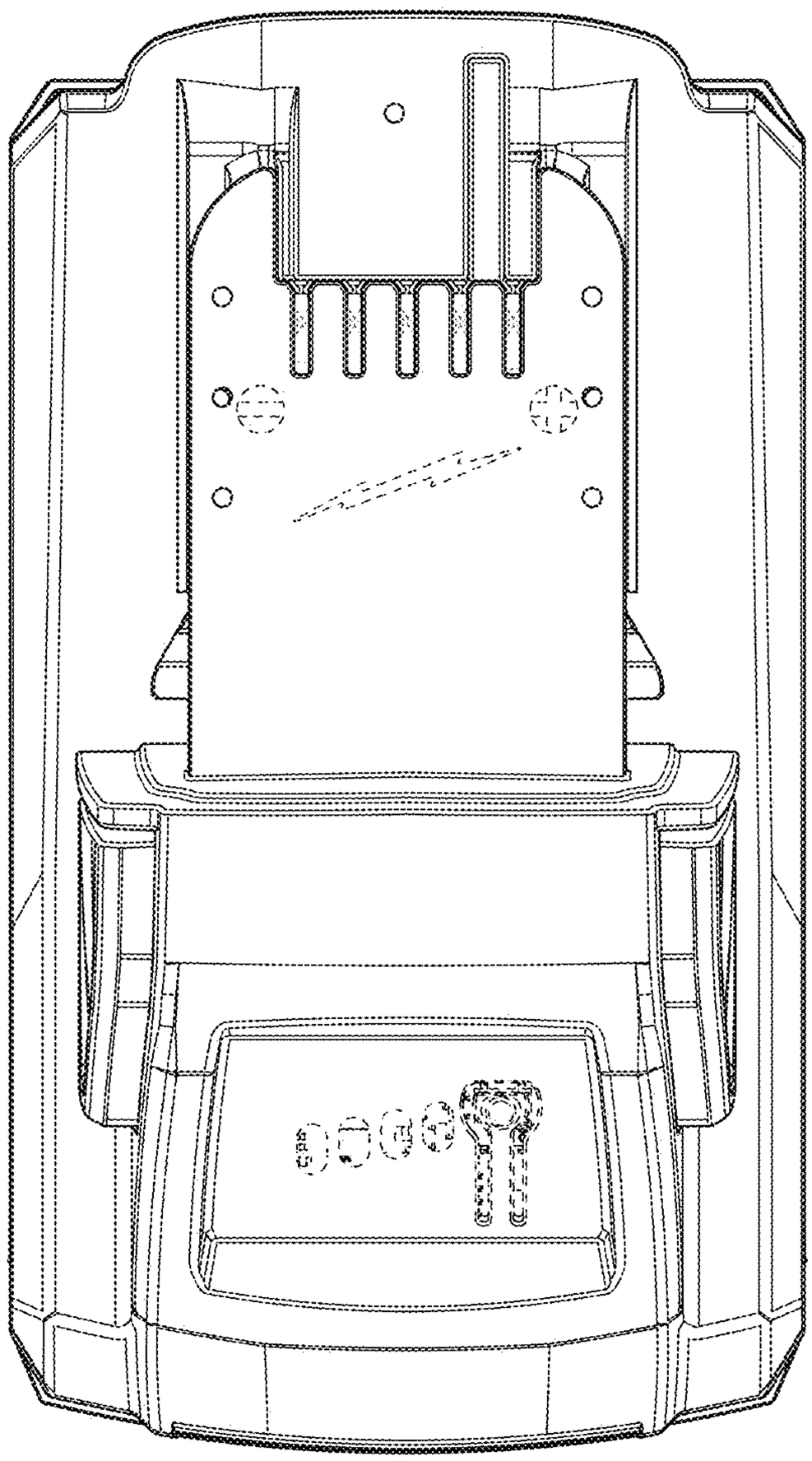

FIG. 3

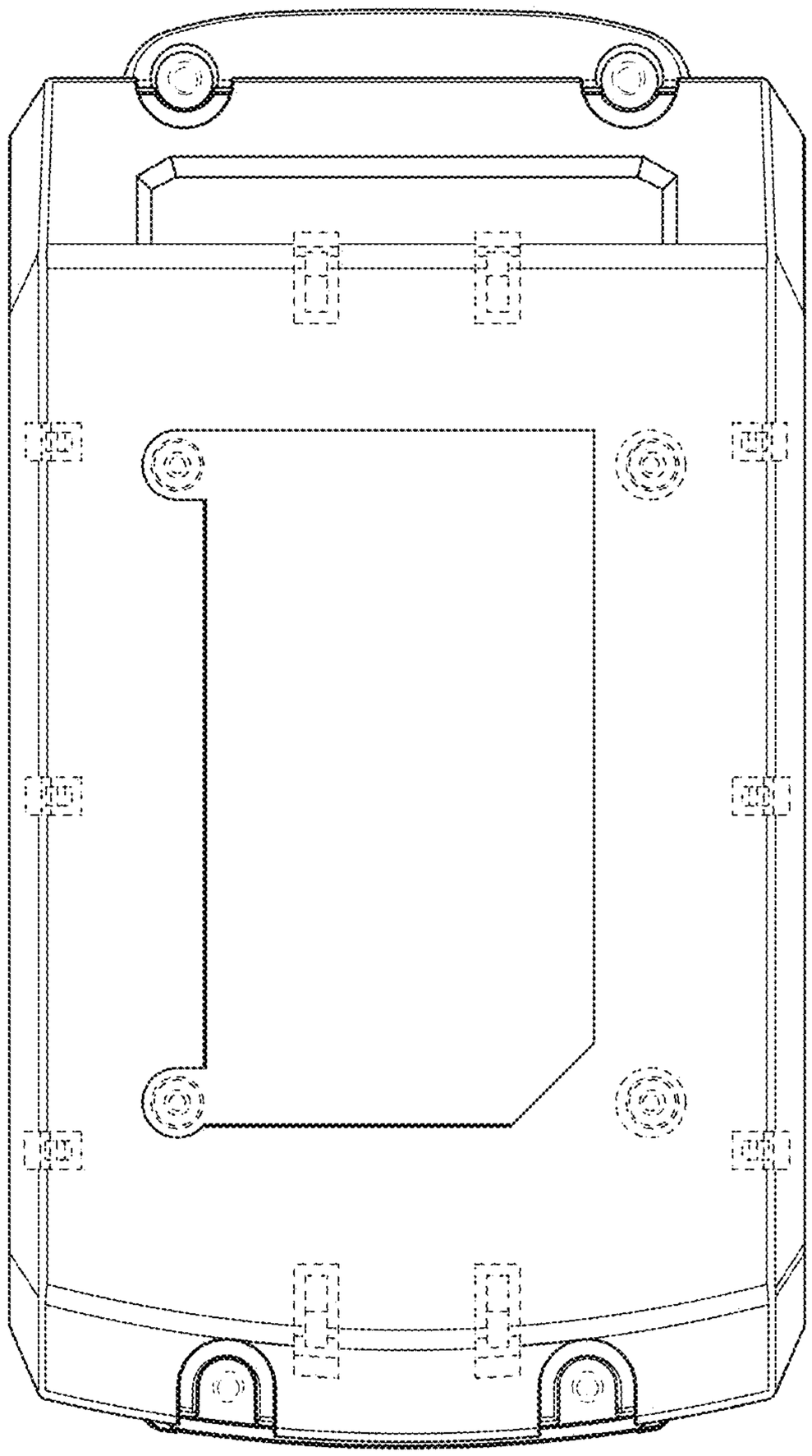

FIG. 4

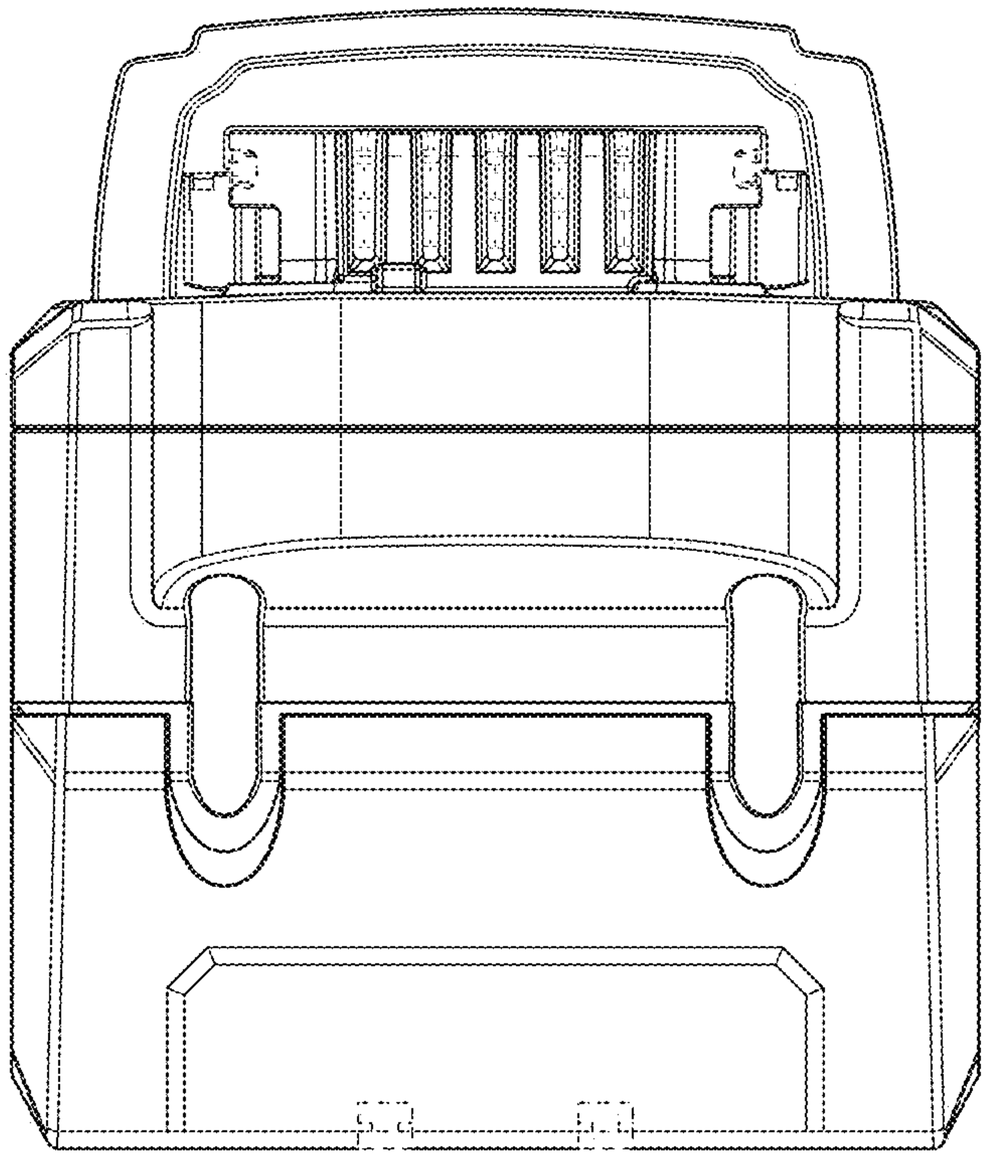

FIG. 5

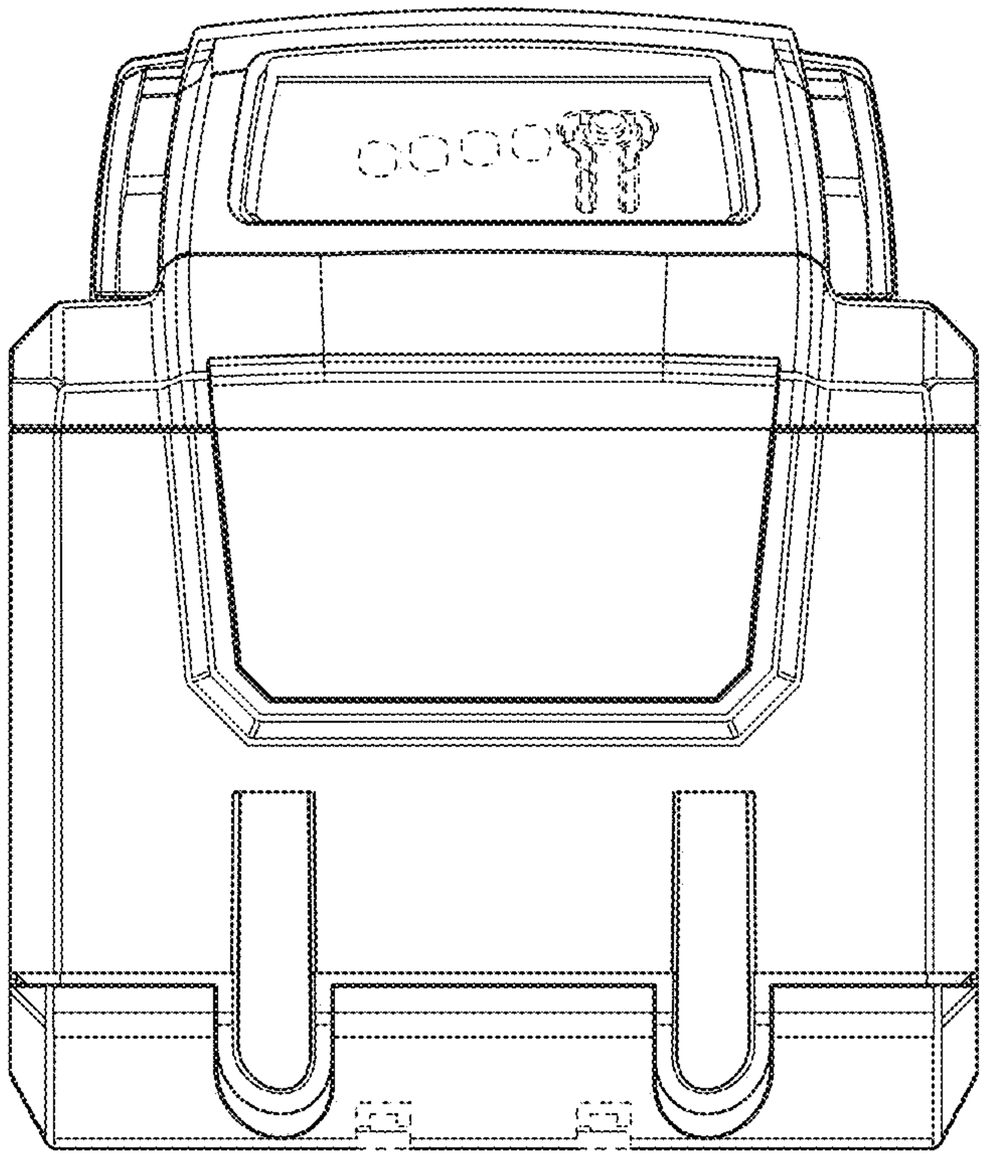

FIG. 6

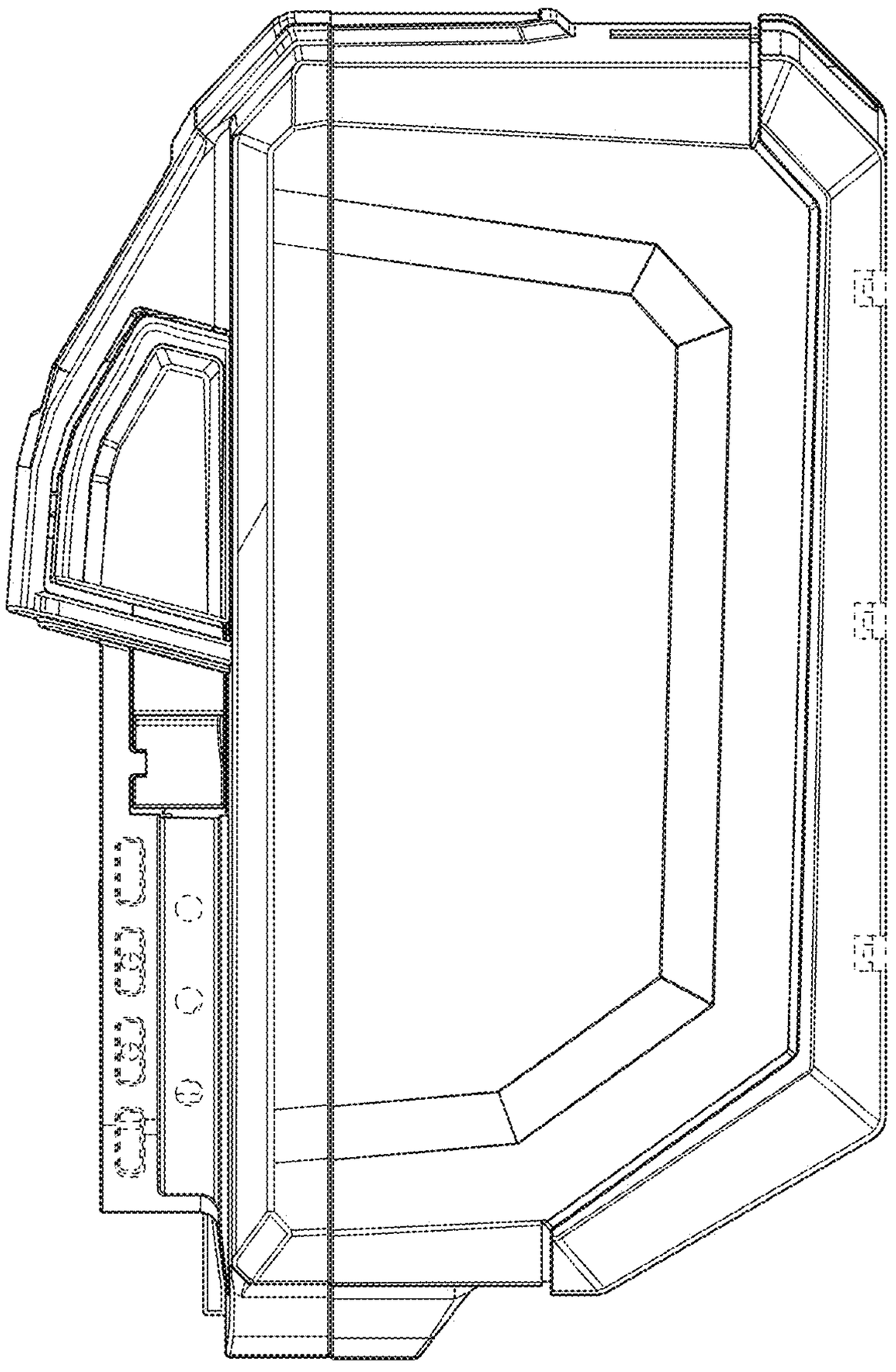

FIG. 7

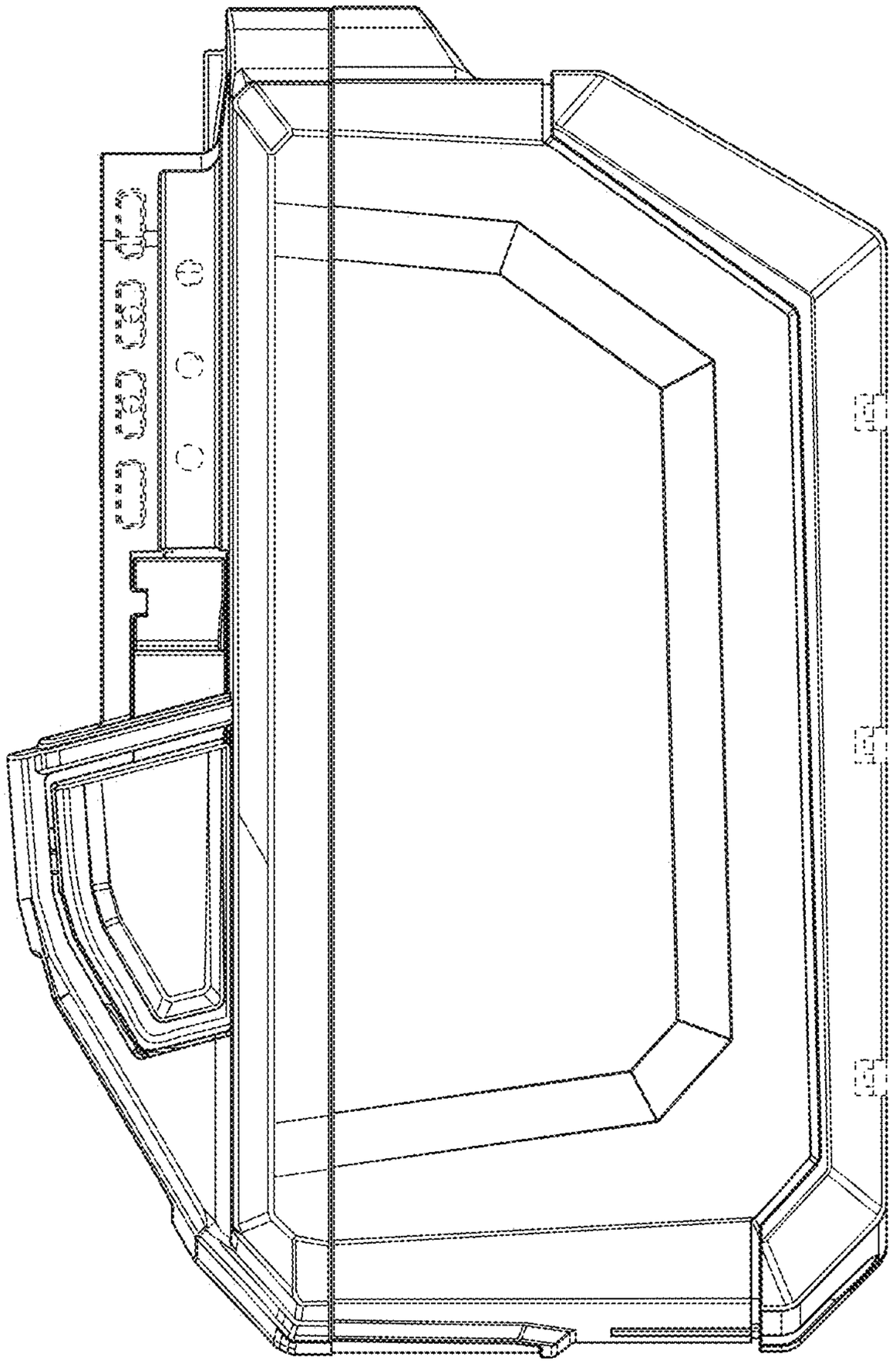

FIG. 8