US00D827593S

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

(10) **Patent No.: US D827,593 S**
(45) **Date of Patent: ** Sep. 4, 2018**

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(54) **SEMICONDUCTOR MODULE**

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

(21) Appl. No.: **29/632,135**

(22) Filed: **Jan. 5, 2018**

Related U.S. Application Data

(62) Division of application No. 29/580,736, filed on Oct. 12, 2016, now Pat. No. Des. 814,433, which is a (Continued)

(30) **Foreign Application Priority Data**

Nov. 28, 2014	(JP)	D2014-026634
Nov. 28, 2014	(JP)	D2014-026635
Nov. 28, 2014	(JP)	D2014-026636

(51) **LOC (11) Cl.** **13-03**
(52) **U.S. Cl.**
USPC **D13/182**
(58) **Field of Classification Search**
USPC D13/182; 257/678, 684, 690, 691; 361/679.01, 713, 728, 736, 760, 761, 772, 361/775, 783, 820; 174/250, 253; 438/15, 25, 26, 51, 55, 63, 64, 106; D8/349, 364, 381; D23/265, 259, 262
CPC . H01L 21/00; H01L 2224/42; H01L 2224/43; H01L 2021/00; H01L 2021/02; H01L 2021/04; H01L 21/4814; H01L
(Continued)

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,517,585 A *	5/1985	Ridout	....	H01L 23/4006 174/16.3
D339,277 S *	9/1993	Snider	....	D8/71

(Continued)

OTHER PUBLICATIONS

U.S. Appl. No. 29/580,738, filed Oct. 12, 2016.

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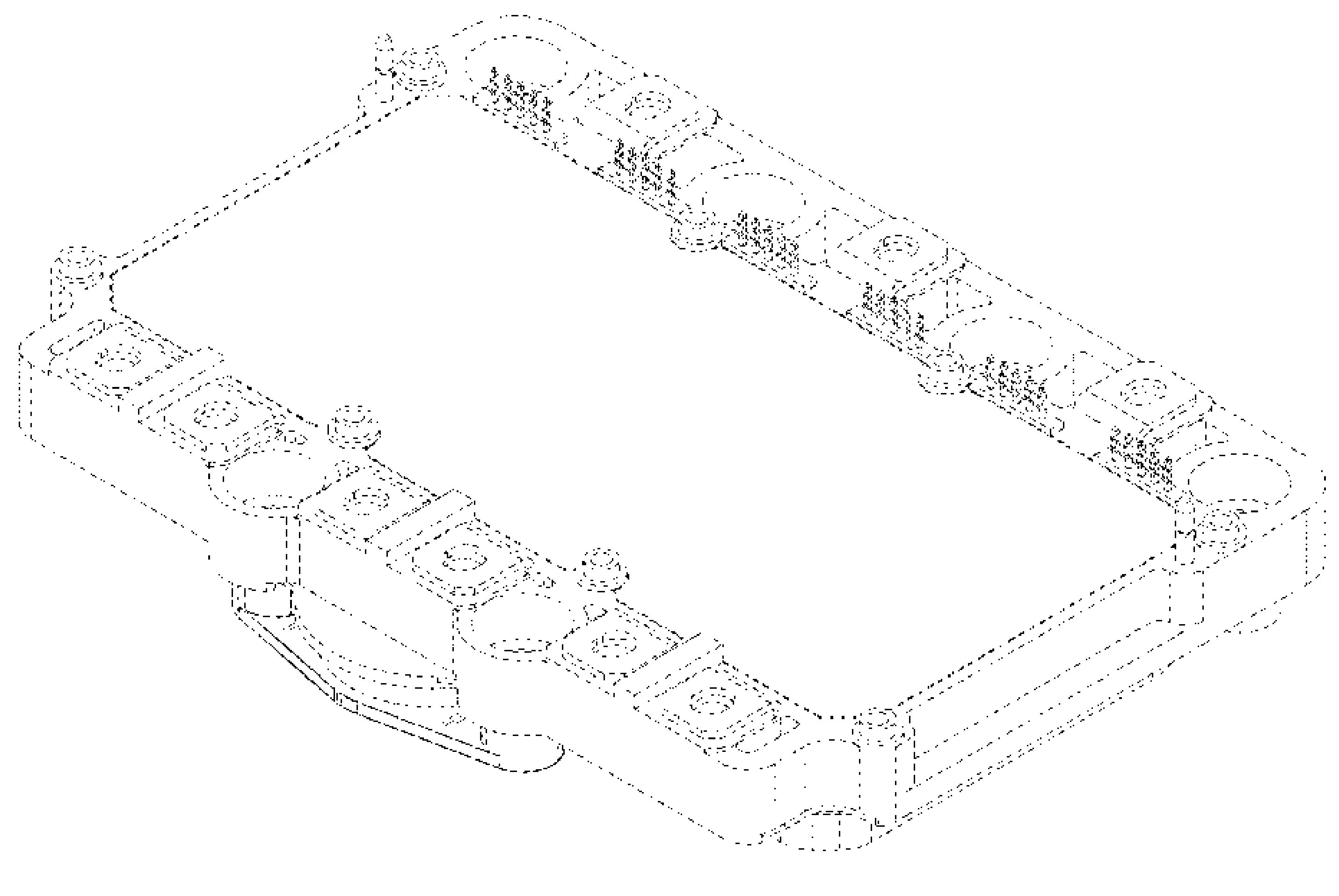
(57) **CLAIM**

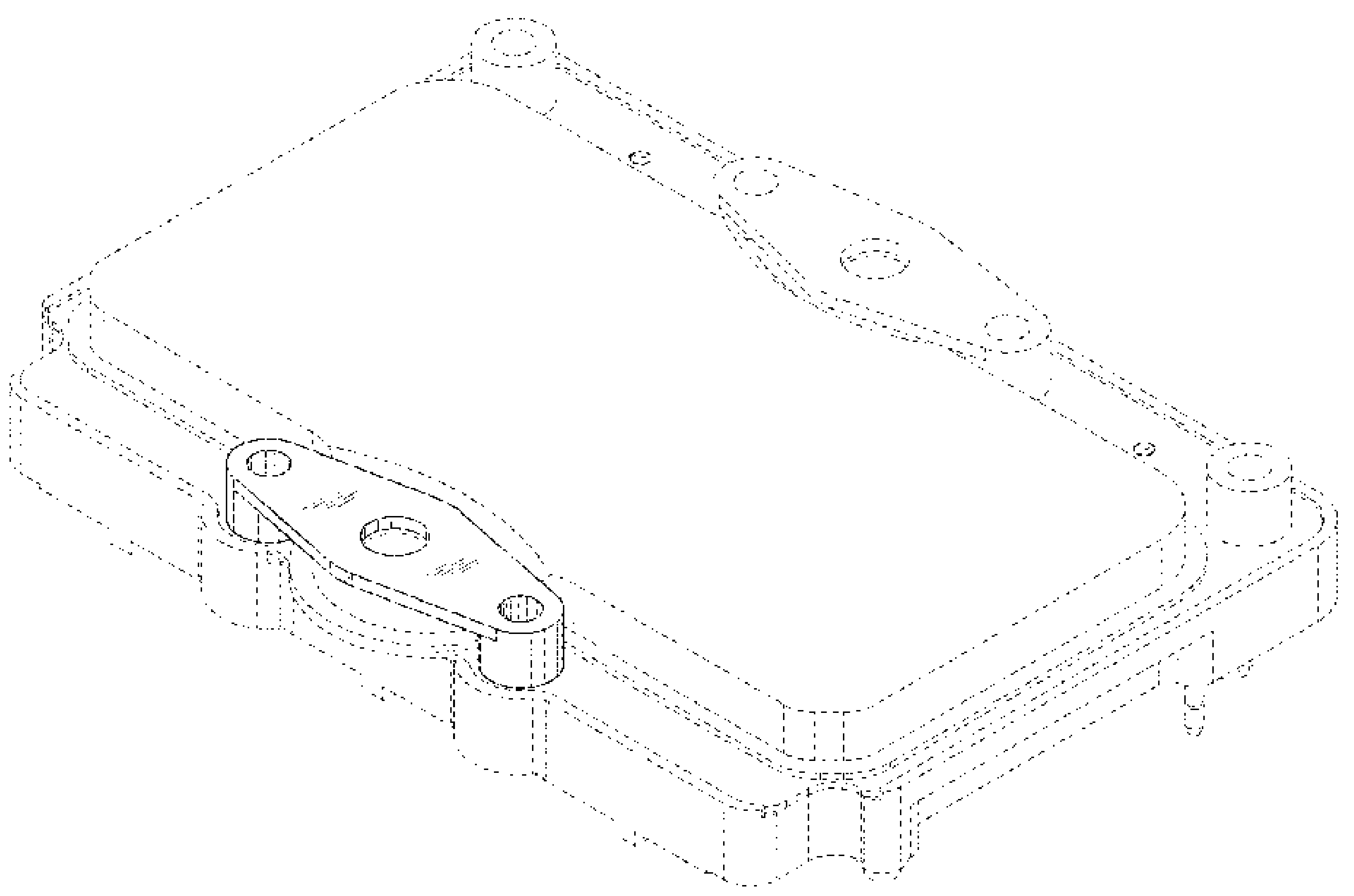
The ornamental design for a semiconductor module, as shown and described.

DESCRIPTION

FIG. **1** is a front view of a semiconductor module showing our new design.
FIG. **2** is a rear view of the semiconductor module of FIG. **1**.
FIG. **3** is a left side view of the semiconductor module of FIG. **1**.
FIG. **4** is a right side view of the semiconductor module of FIG. **1**.
FIG. **5** is a top view of the semiconductor module of FIG. **1**.
FIG. **6** is a bottom view of the semiconductor module of FIG. **1**.
FIG. **7** is a front, right, and bottom perspective view of the semiconductor module of FIG. **1**; and,
FIG. **8** is a rear, left, and top perspective view of the semiconductor module of FIG. **1**.
The broken lines shown in the drawing views of FIGS. **1-8** form no part of the claimed design.

1 Claim, 8 Drawing Sheets





Related U.S. Application Data

division of application No. 29/528,214, filed on May 27, 2015, now Pat. No. Des. 774,479.

(58) **Field of Classification Search**

CPC 21/4846; H01L 21/4871; H01L 21/67144; H01L 23/13; H01L 23/14; H01L 23/147; H01L 2924/171; H01L 2924/1711; H01L 2924/1715; H01L 2924/17151; H01L 2924/181; H01L 2924/1811; H01L 2924/1815; H01L 2924/19042; H01L 2924/1905; H01L 2224/08054; H01L 23/58; H05B 41/14; H02B 6/4201; G02B 6/4256; G02B 6/4257; G02B 6/4261; G02B 6/4262; G02B 6/428; G02B 6/4281; H05K 1/14; H05K 1/141; H05K 1/142; H05K 1/144; H05K 1/18; H05K 1/181; H05K 1/182; H05K 1/026

See application file for complete search history.

(56) References Cited

U.S. PATENT DOCUMENTS

5,347,160	A		9/1994	Sutrina	
D357,671	S		4/1995	Terasawa et al.	
D357,672	S		4/1995	Terasawa et al.	
D360,619	S		7/1995	Terasawa et al.	
D367,249	S	*	2/1996	Ott	D12/114
5,505,546	A	*	4/1996	Okude	F16C 33/20 384/276
D371,139	S	*	6/1996	Waskiewicz	384/428
D389,808	S		1/1998	Yamada et al.	
D396,450	S		7/1998	Nishiura et al.	
D420,688	S	*	2/2000	Ichihara	D15/143
D441,726	S		5/2001	Sofue et al.	
6,521,983	B1		2/2003	Yoshimatsu et al.	
D476,959	S		7/2003	Yamada et al.	
D587,662	S		3/2009	Soutome et al.	
D589,012	S		3/2009	Soyano et al.	
D606,951	S		12/2009	Soyano et al.	
7,768,118	B2	*	8/2010	Yoshida	H01L 23/3107 257/690
D653,633	S		2/2012	Soyano	
D653,634	S		2/2012	Soyano	
D686,174	S		7/2013	Soyano	
D689,446	S		9/2013	Soyano	
D704,670	S		5/2014	Chen et al.	
D704,671	S		5/2014	Chen et al.	
D705,184	S		5/2014	Takahashi et al.	
D706,232	S		6/2014	Nakamura	
D710,317	S		8/2014	Chen et al.	
D710,318	S		8/2014	Chen et al.	
D710,319	S		8/2014	Chen et al.	
D712,853	S		9/2014	Nakamura	
D721,048	S		1/2015	Nakamura	
D721,340	S		1/2015	Nakamura	
D724,554	S		3/2015	Motohashi et al.	
D748,595	S		2/2016	Bertalan et al.	
D754,084	S		4/2016	Kawase	
D759,604	S		6/2016	Yoneyama et al.	
D762,185	S		7/2016	Muehlensiep et al.	
D762,597	S		8/2016	Bertalan et al.	
D766,851	S		9/2016	Yoneyama et al.	
D767,516	S		9/2016	Yoneyama et al.	
D772,184	S		11/2016	Soyano et al.	
D773,412	S		12/2016	Yoneyama et al.	
D773,413	S		12/2016	Yoneyama et al.	
D774,479	S		12/2016	Soyano et al.	
D775,091	S		12/2016	Edenharter et al.	
D775,593	S		1/2017	Edenharter et al.	
D776,071	S		1/2017	Edenharter et al.	
D779,921	S	*	2/2017	Del Rossa	D12/223
D779,922	S	*	2/2017	Del Rossa	D12/223
D779,923	S	*	2/2017	Del Rossa	D12/223
D785,577	S		5/2017	Kawase	
D799,439	S	*	10/2017	Hayashiguchi	D13/182
D805,485	S	*	12/2017	Kawase	D13/182
D810,036	S	*	2/2018	Sawayanagi	D13/182
D810,706	S	*	2/2018	Soyano	D13/182
D814,431	S	*	4/2018	Matsumoto	D13/182
D814,433	S	*	4/2018	Soyano	D13/182
2001/0038143	A1		11/2001	Sonobe et al.	
2010/0149774	A1		6/2010	Matsumoto et al.	
2011/0044012	A1		2/2011	Matsumoto	
2011/0047997	A1	*	3/2011	Goplen	F01N 3/34 60/317
2016/0273440	A1	*	9/2016	Eadie	F01N 13/1805

* cited by examiner

FIG. 1

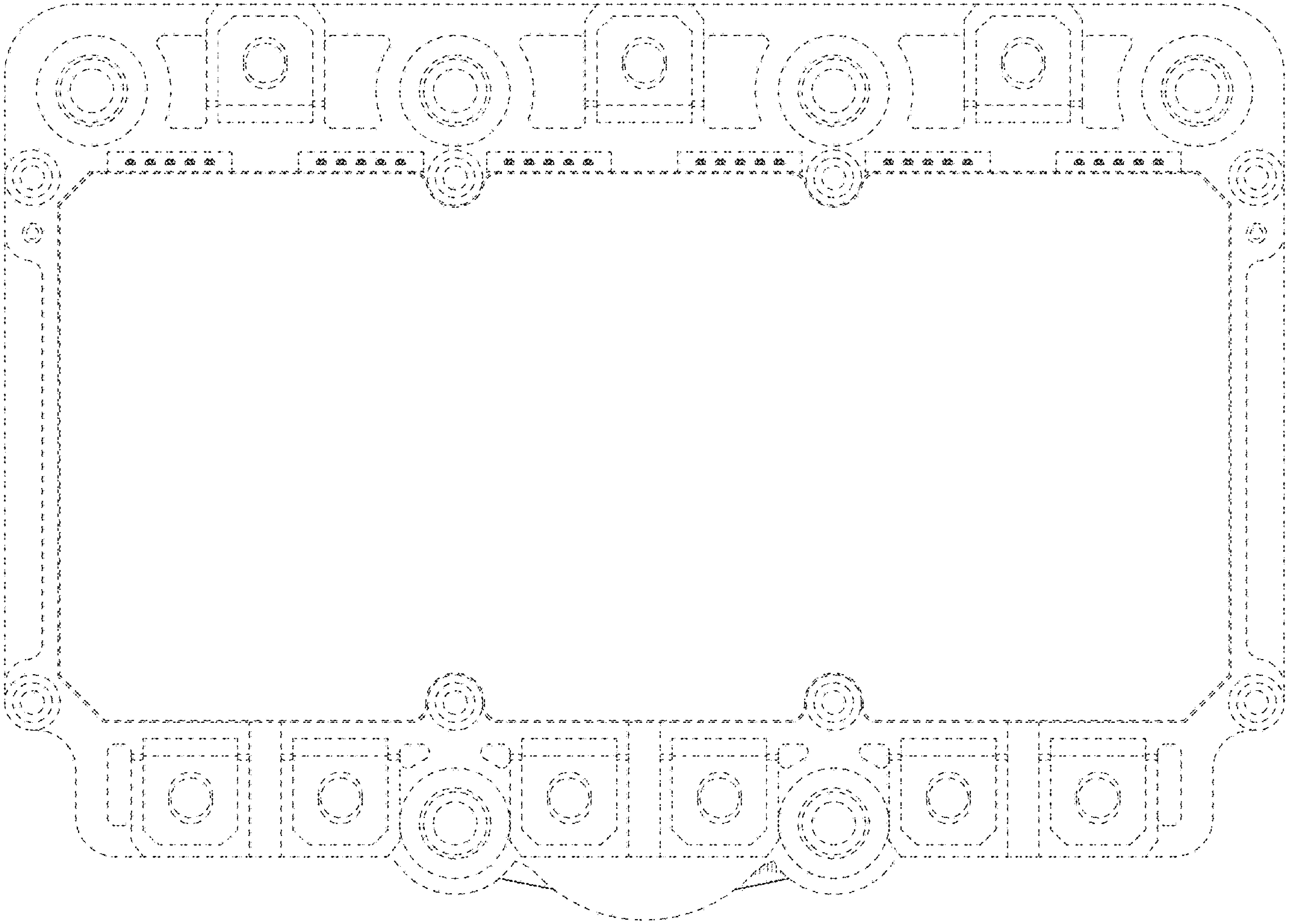


FIG. 2

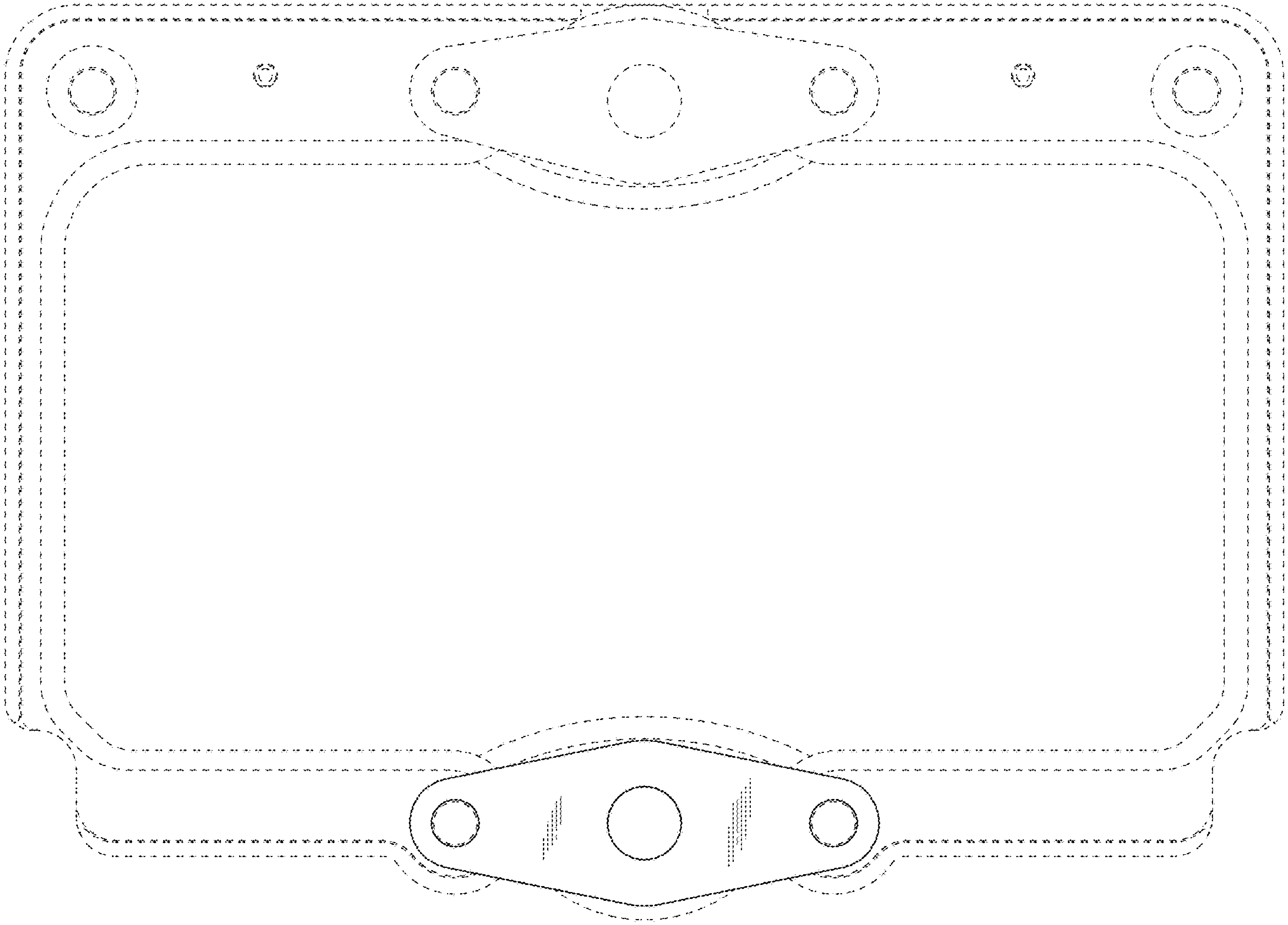


FIG. 3

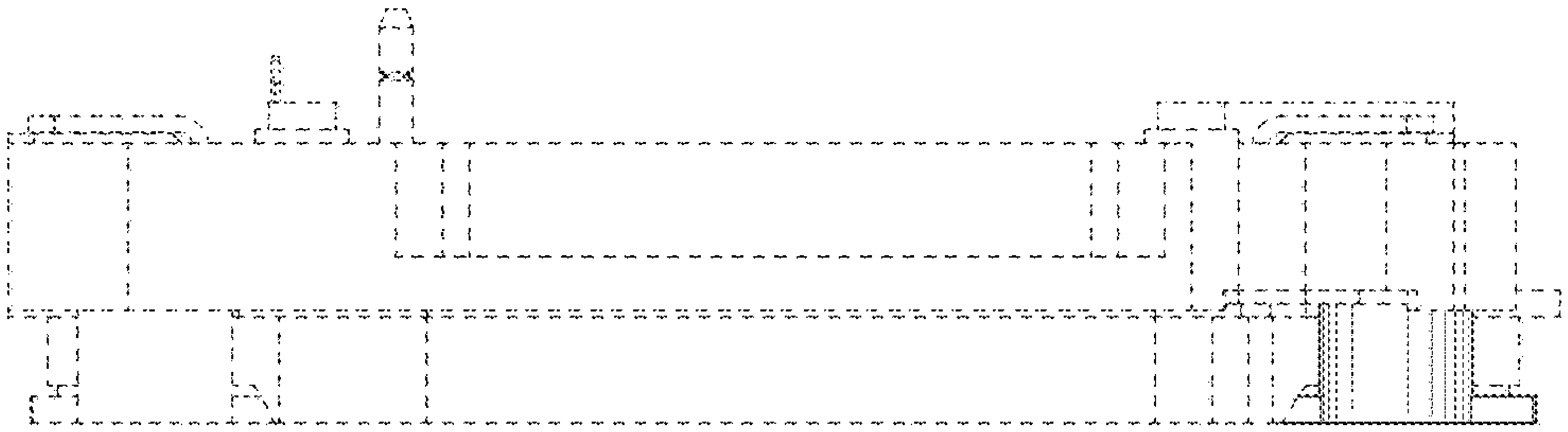


FIG. 4

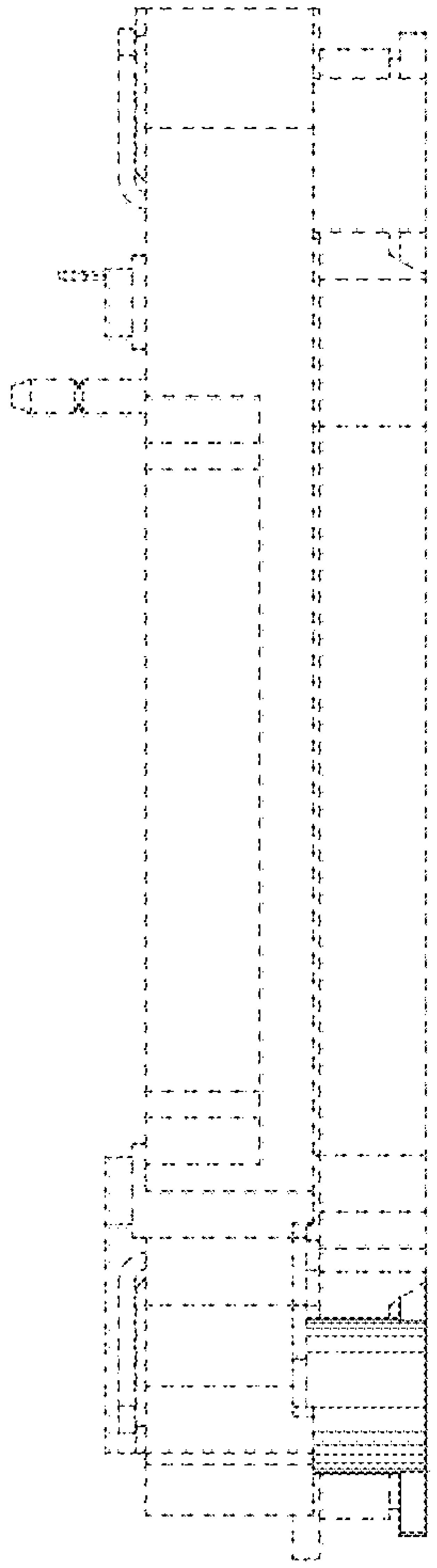


FIG. 5

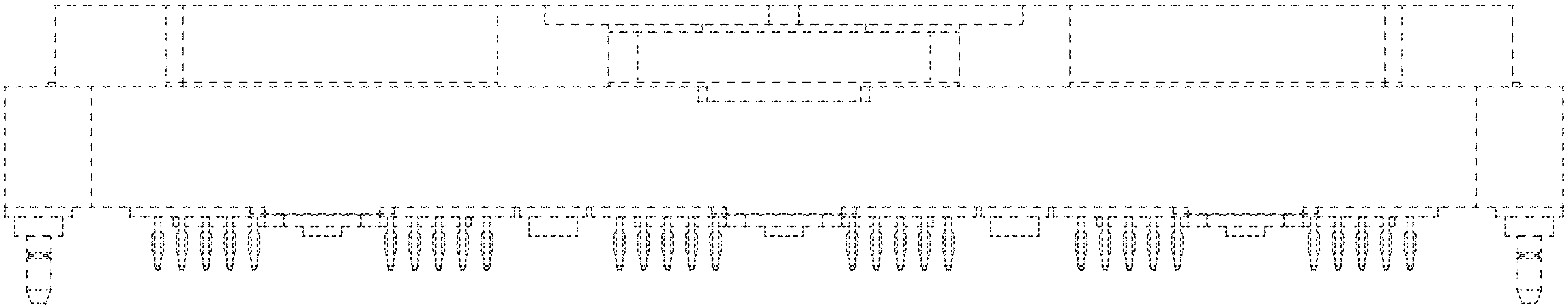


FIG. 6

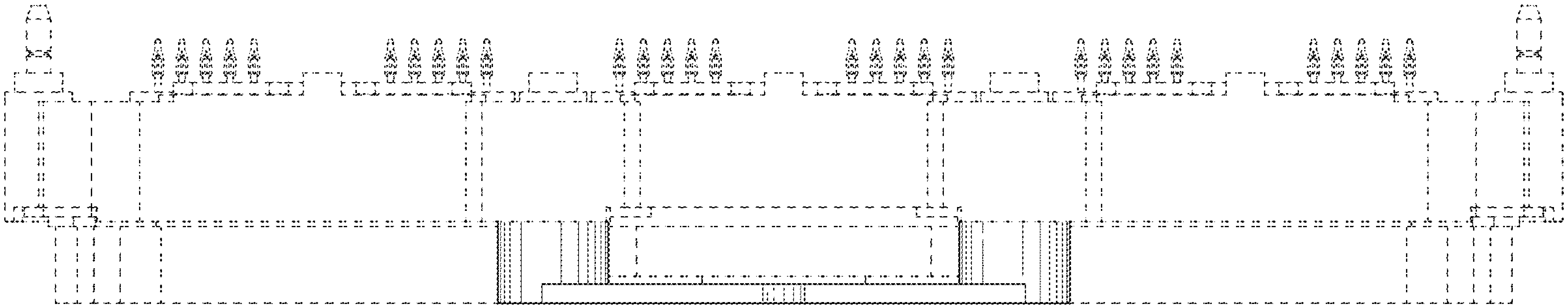


FIG. 7

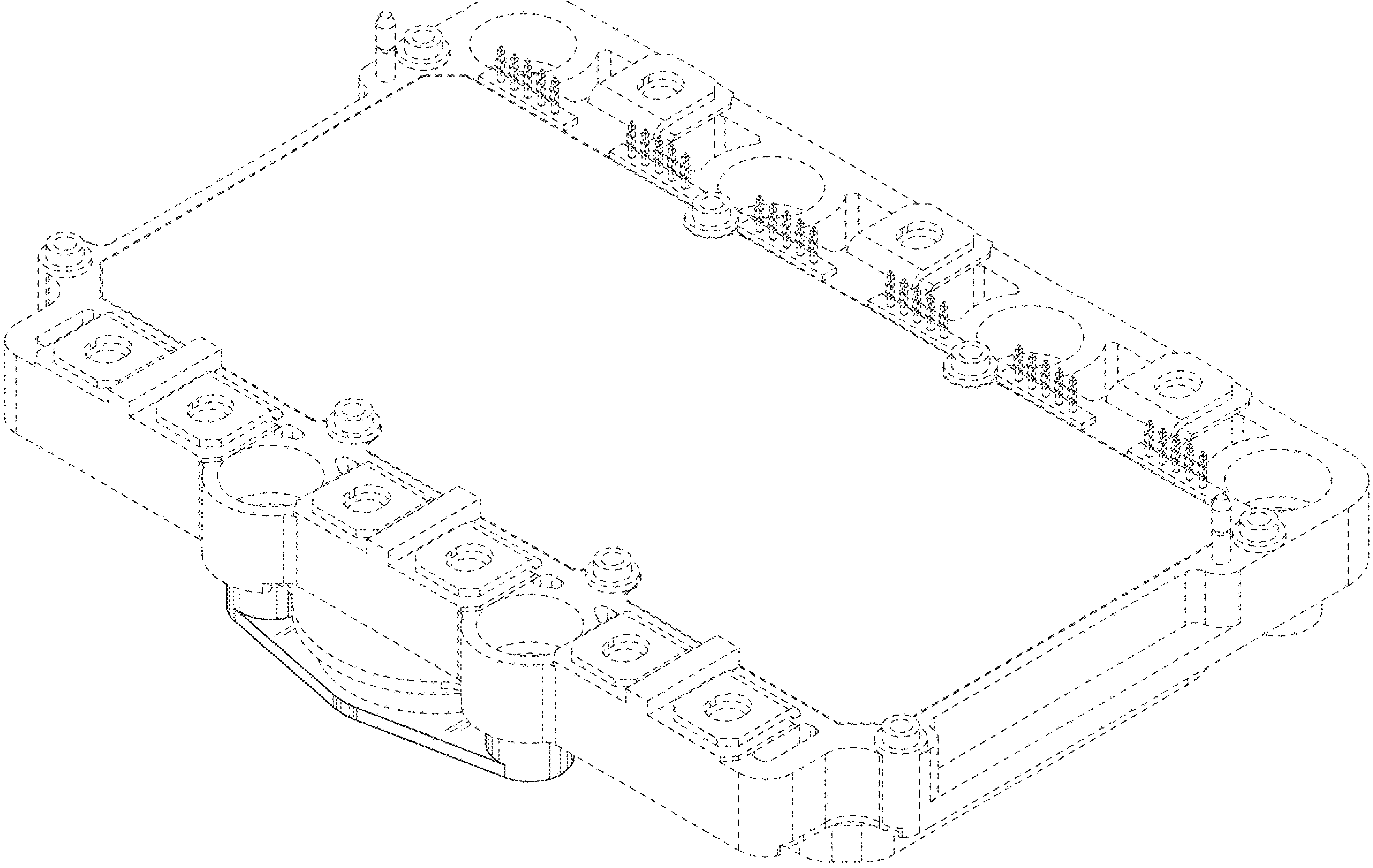


FIG. 8