US00D798832S

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

(10) **Patent No.:** **US D798,832 S**
(45) **Date of Patent:** ** **Oct. 3, 2017**

(54) **POWER SEMICONDUCTOR DEVICE**

(71) Applicant: **MITSUBISHI ELECTRIC CORPORATION**, Tokyo (JP)

(72) Inventors: **Yukimasa Hayashida**, Tokyo (JP); **Shinichi Iura**, Tokyo (JP); **Hitoshi Uemura**, Tokyo (JP); **Daisuke Oya**, Tokyo (JP); **Kenji Hatori**, Tokyo (JP); **Yasuhiro Sakai**, Tokyo (JP); **Ryo Tsuda**, Tokyo (JP); **Ryutaro Date**, Tokyo (JP)

(73) Assignee: **Mitsubishi Electric Corporation**, Tokyo (JP)

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

(21) Appl. No.: **29/558,572**

(22) Filed: **Mar. 18, 2016**

(30) **Foreign Application Priority Data**

Sep. 30, 2015 (JP) 2015-021416

(51) **LOC (10) 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
CPC . H01L 21/00; H01L 2224/42; H01L 2224/43; H01L 2021/00; H01L 2021/02; H01L 2021/04; H01L 21/4814; H01L 21/4846; H01L 21/4871; H01L 21/67144; H01L 23/02; 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 1/18; 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 H01L 24/72
257/678
D364,383 S * 11/1995 Yamada D13/146
D364,384 S * 11/1995 Shimizu D13/146
(Continued)

Primary Examiner — Elizabeth J Oswecki
(74) *Attorney, Agent, or Firm* — Studebaker & Brackett PC

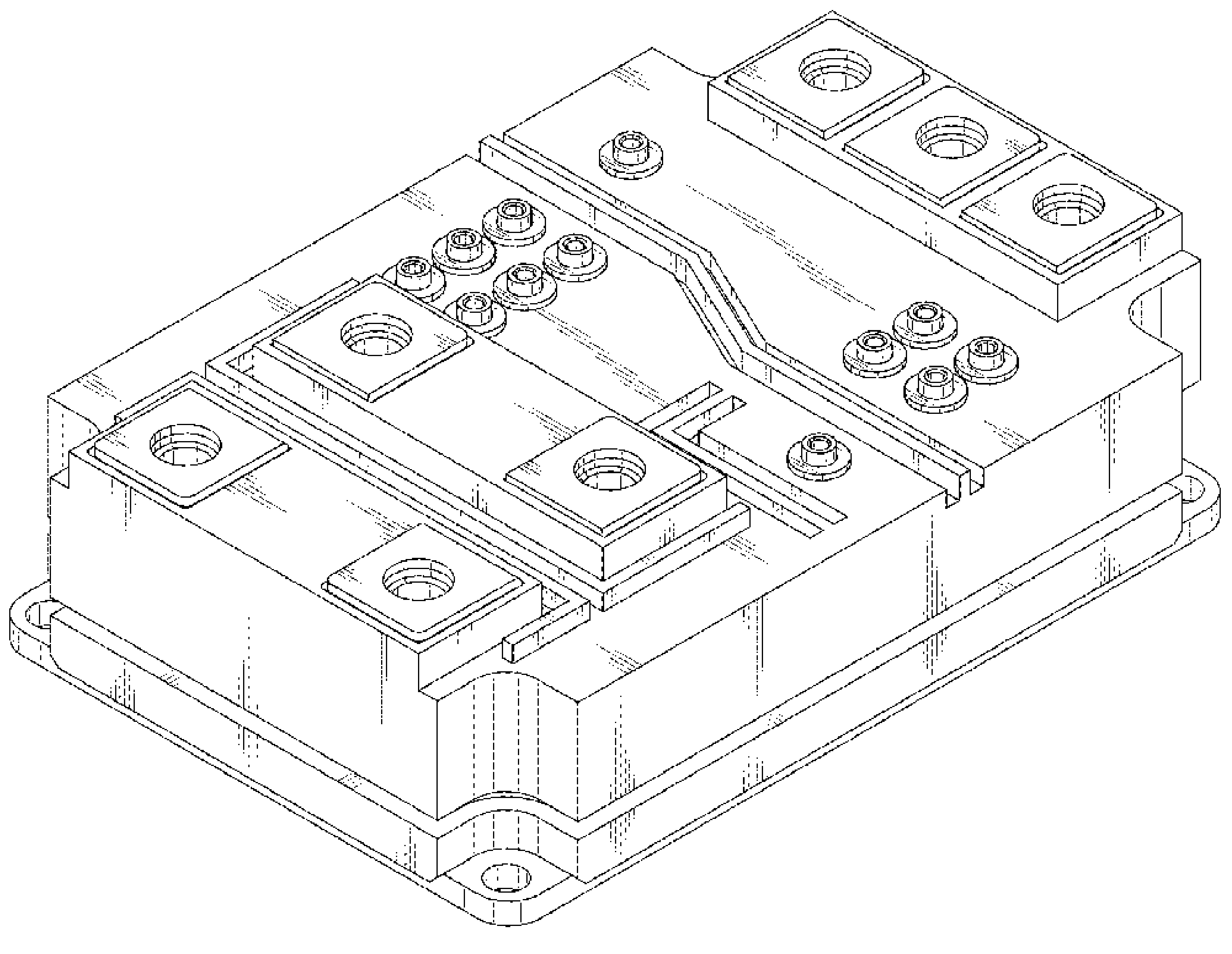
(57) **CLAIM**

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

DESCRIPTION

FIG. **1** is a front, left side, bottom perspective view of a power semiconductor device, showing our new design;
FIG. **2** is a front, right side, top perspective view thereof;
FIG. **3** is a front view thereof;
FIG. **4** is a rear view thereof;
FIG. **5** is a left side view hereof;
FIG. **6** is a right side view thereof;
FIG. **7** is a top view thereof;
FIG. **8** is a bottom view thereof;
FIG. **9** is a cross sectional view taken along line **9-9** in FIG. **3**; and,
FIG. **10** is another cross sectional view taken along line **10-10** in FIG. **3**.
The broken lines in FIG. **4** illustrate unclaimed portions of the power semiconductor device and form no part of the claimed design.

1 Claim, 9 Drawing Sheets



(56) References Cited

U.S. PATENT DOCUMENTS

D364,385	S	*	11/1995	Shimizu	D13/146
D441,726	S	*	5/2001	Sofue	D13/182
D476,959	S	*	7/2003	Yamada	D13/182
D587,662	S	*	3/2009	Soutome	D13/182
D589,012	S	*	3/2009	Soyano	D13/182
D606,951	S	*	12/2009	Soyano	D13/182
D653,633	S	*	2/2012	Soyano	D13/182
D653,634	S	*	2/2012	Soyano	D13/182
D686,174	S	*	7/2013	Soyano	D13/182
D703,625	S	*	4/2014	Lim	D13/182
D704,670	S	*	5/2014	Chen	D13/182
D704,671	S	*	5/2014	Chen	D13/182
D710,317	S	*	8/2014	Chen	D13/182
D710,318	S	*	8/2014	Chen	D13/182
D710,319	S	*	8/2014	Chen	D13/182
D712,853	S	*	9/2014	Nakamura	D13/182
D721,048	S	*	1/2015	Nakamura	D13/182
D721,340	S	*	1/2015	Nakamura	D13/182
D748,595	S	*	2/2016	Bertalan	D13/182
D754,084	S	*	4/2016	Kawase	D13/182
D759,604	S	*	6/2016	Yoneyama	D13/182
D762,185	S	*	7/2016	Muehlensiep	D13/182
D762,597	S	*	8/2016	Bertalan	D13/182
D766,851	S	*	9/2016	Yoneyama	D13/182
D767,516	S	*	9/2016	Yoneyama	D13/182
D769,834	S	*	10/2016	Kawase	D13/182
D772,184	S	*	11/2016	Soyano	D13/182
D773,412	S	*	12/2016	Yoneyama	D13/182
D773,413	S	*	12/2016	Yoneyama	D13/182
D774,479	S	*	12/2016	Soyano	D13/182
D775,091	S	*	12/2016	Edenharter	D13/182
D775,593	S	*	1/2017	Edenharter	D13/182
D776,071	S	*	1/2017	Edenharter	D13/182

* cited by examiner

Fig. 1

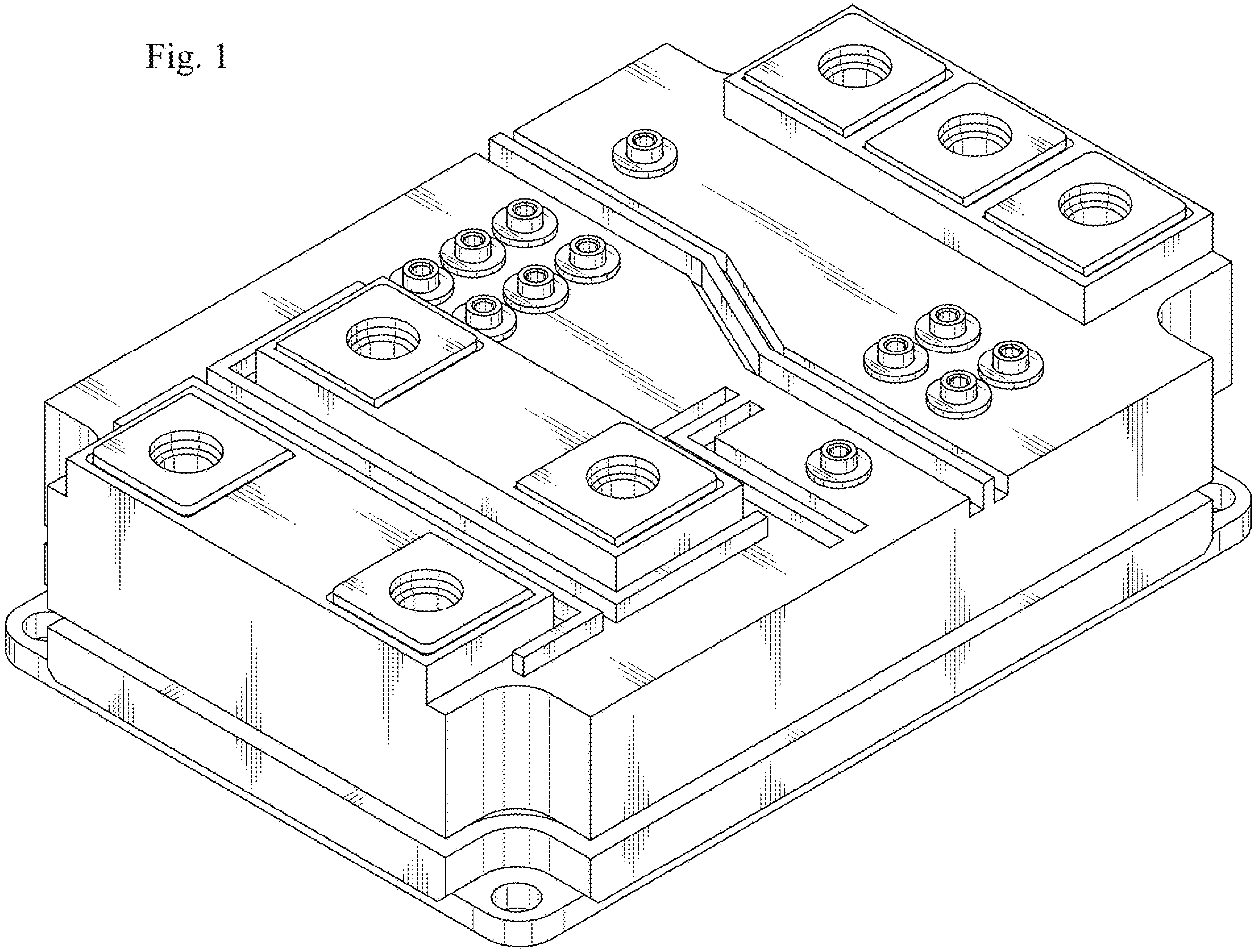
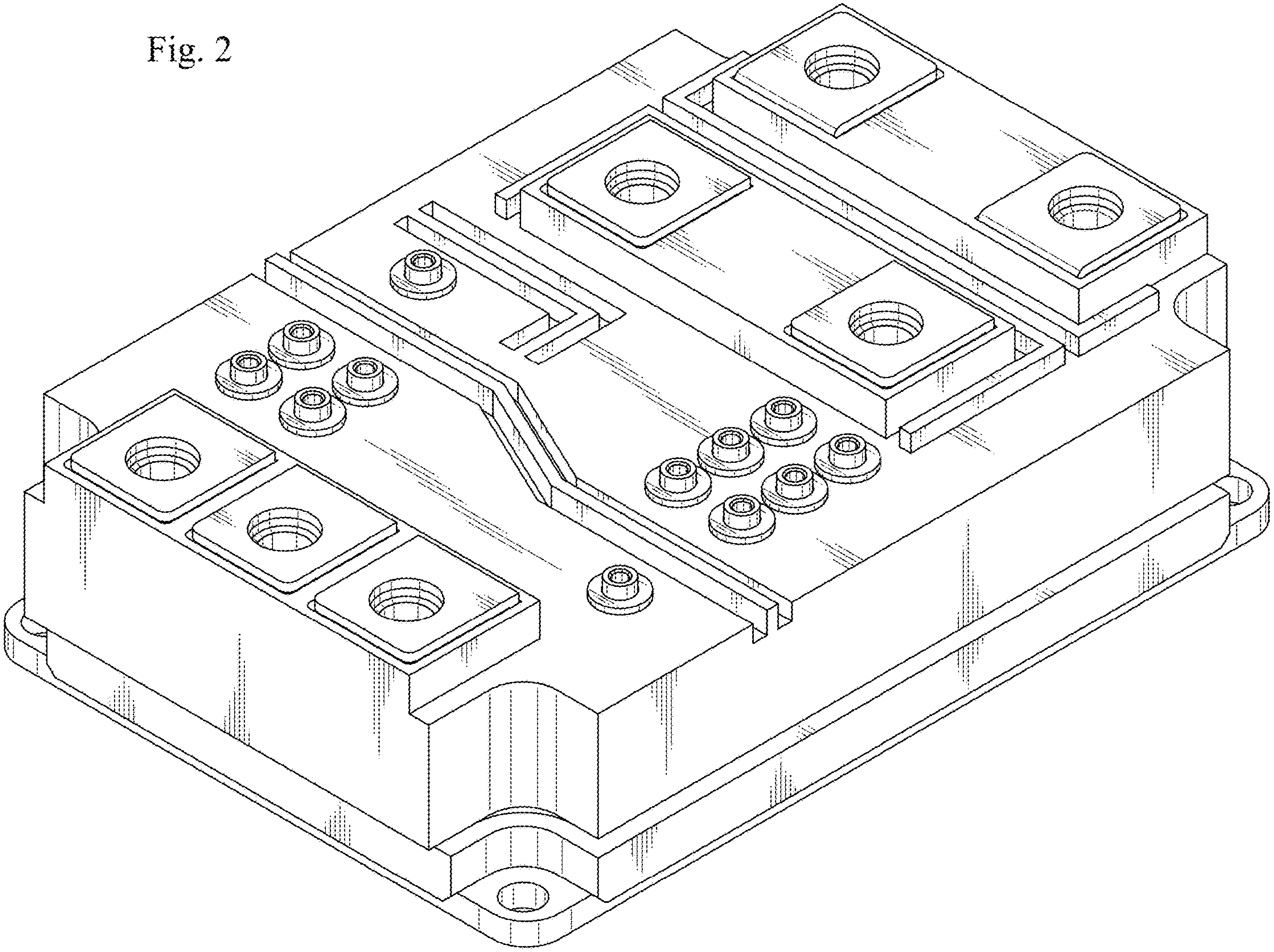


Fig. 2



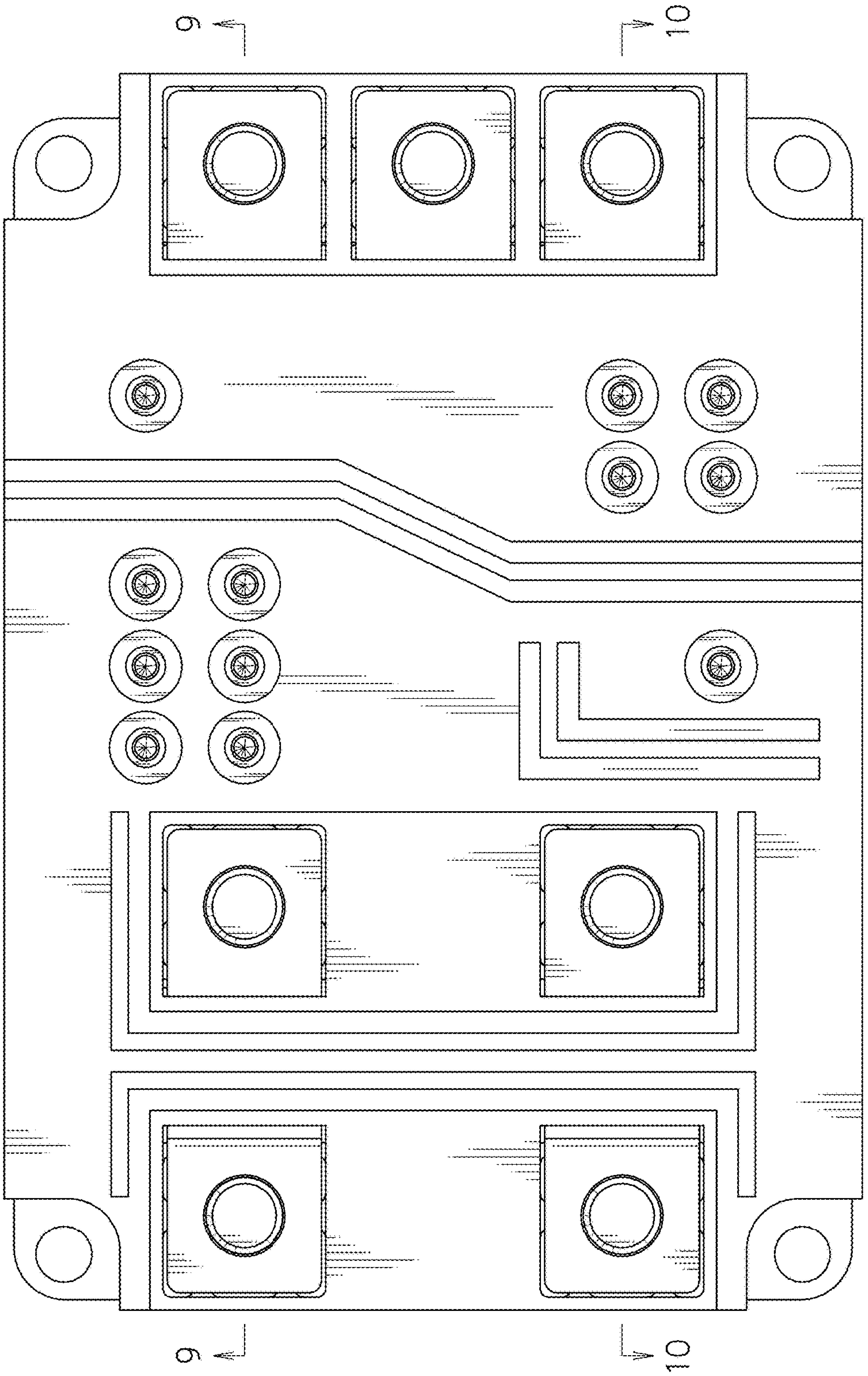


Fig. 3

Fig. 4

Fig. 5

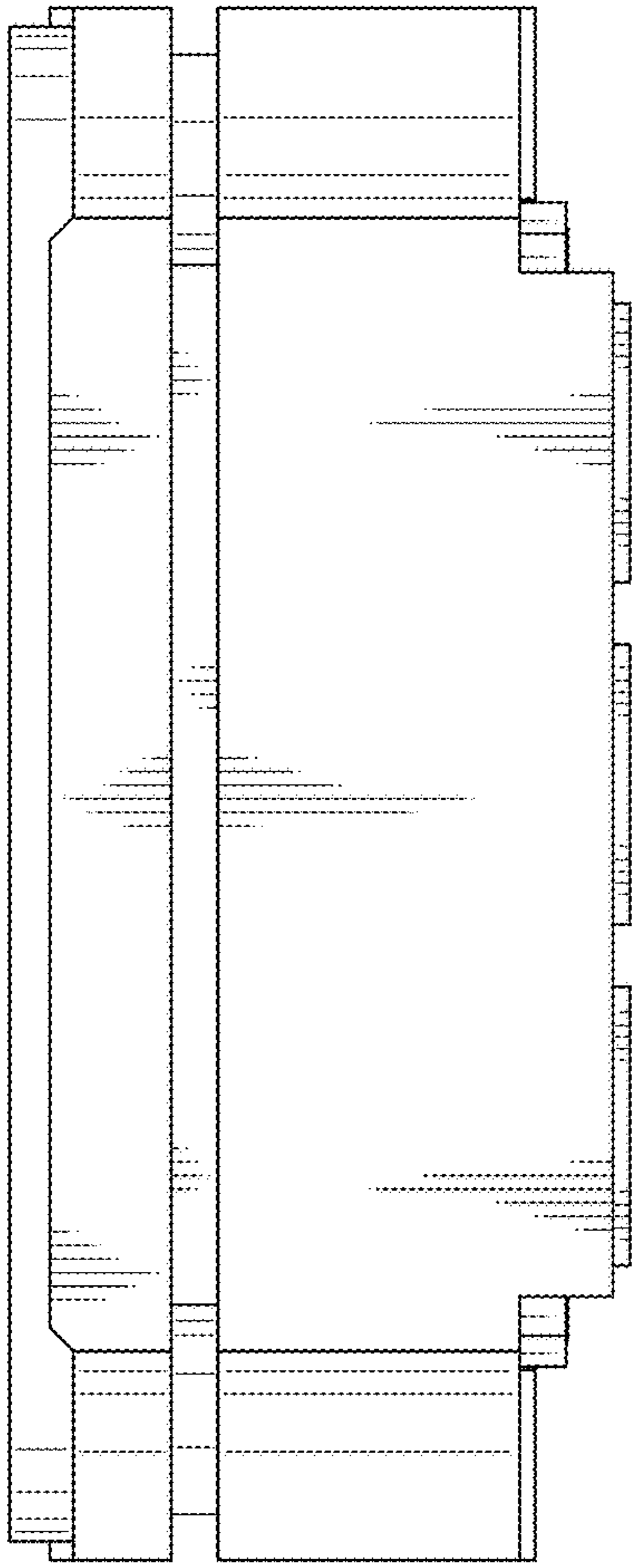


Fig. 6

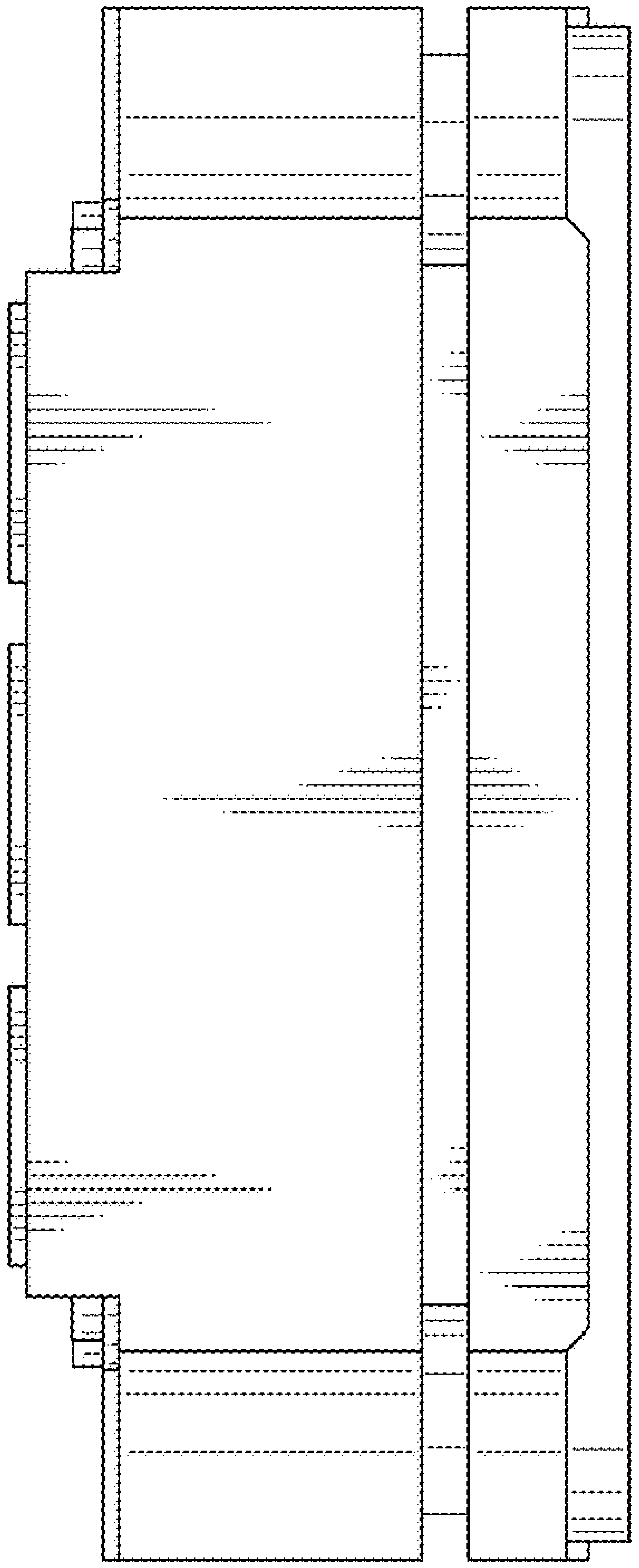


Fig. 7

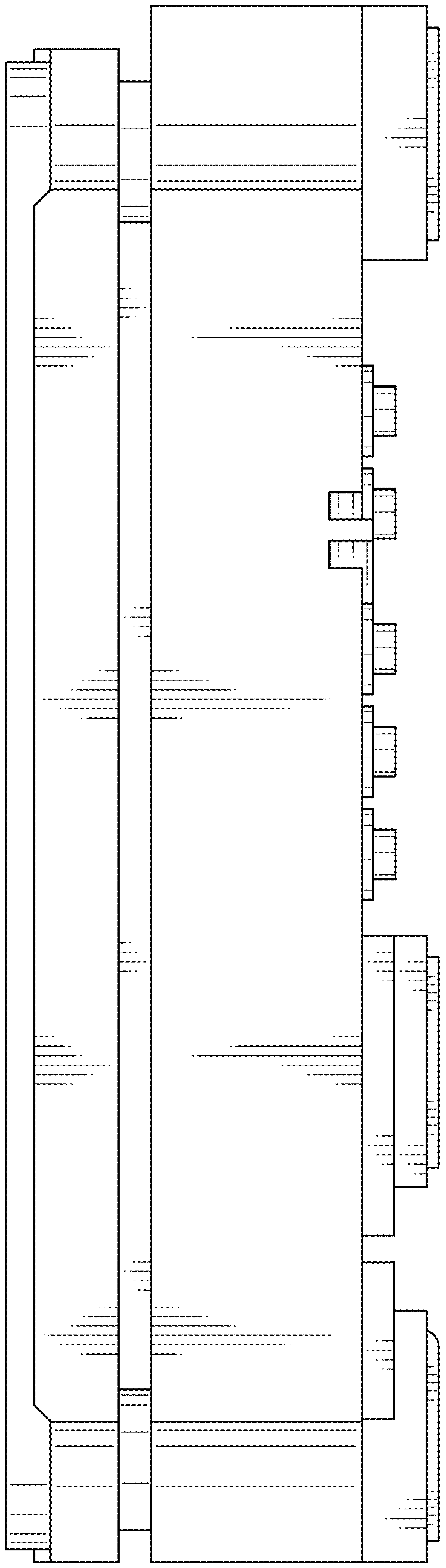


Fig. 8

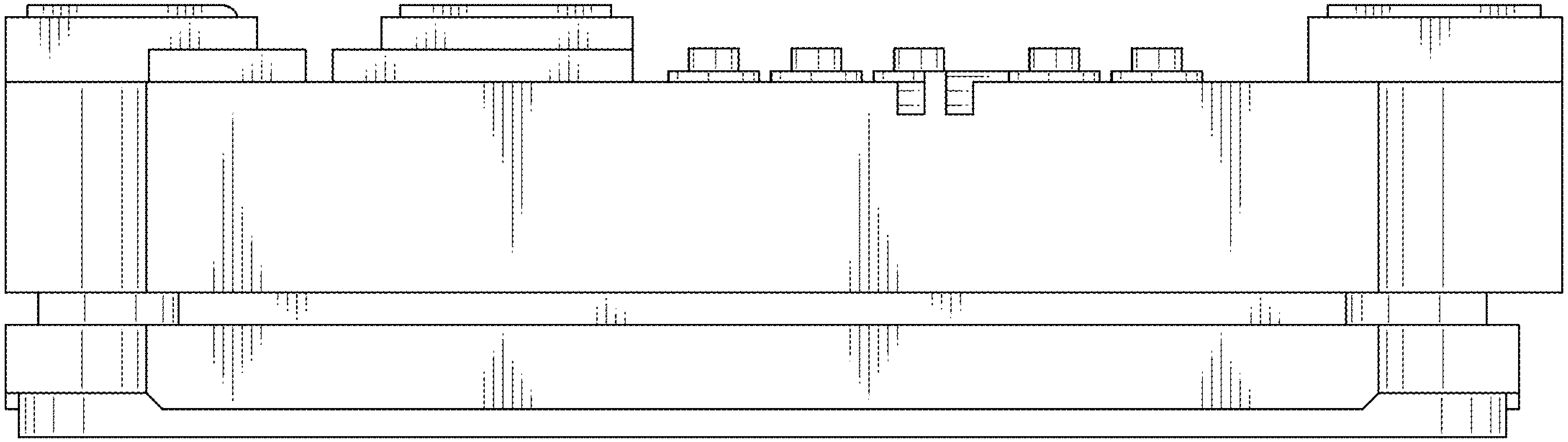


Fig. 9

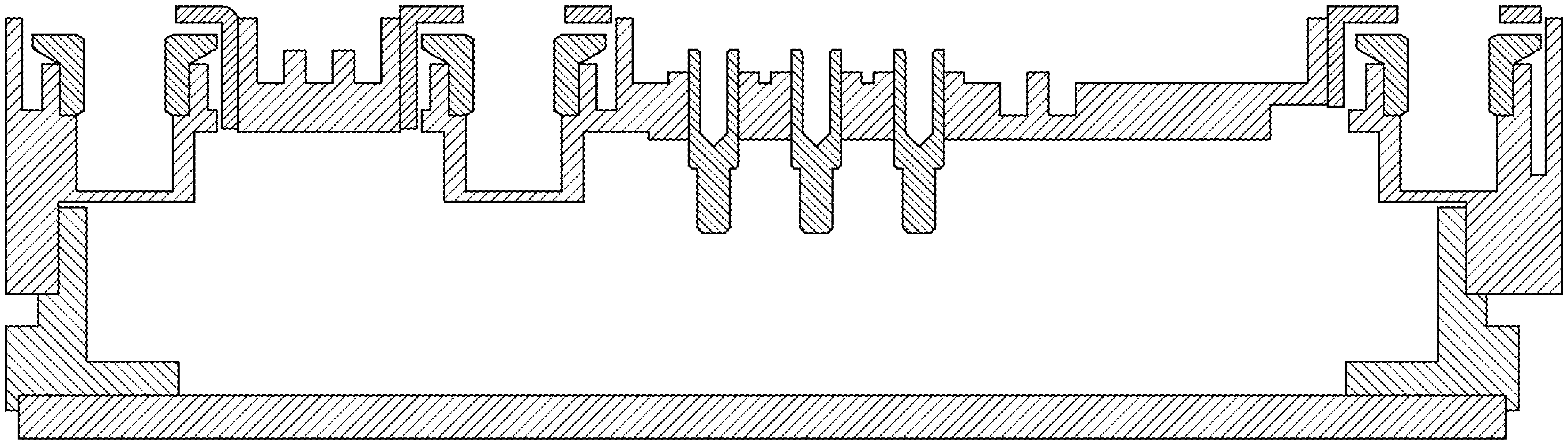


Fig. 10