



US00D805042S

(12) **United States Design Patent**
Huang

(10) **Patent No.:** **US D805,042 S**

(45) **Date of Patent:** **** Dec. 12, 2017**

(54) **COMBINED HEAT EXCHANGER BASE AND EMBEDDED HEAT PIPES**

(71) Applicant: **Tsung-Hsien Huang, I-Lan Hsien (TW)**

(72) Inventor: **Tsung-Hsien Huang, I-Lan Hsien (TW)**

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

(21) Appl. No.: **29/543,611**

(22) Filed: **Oct. 27, 2015**

(51) **LOC (10) Cl.** **13-03**

(52) **U.S. Cl.**
USPC **D13/179**

(58) **Field of Classification Search**
USPC D13/125, 179, 122, 182; D23/415, 330
CPC .. H05K 7/20; H05K 7/20172; H05K 7/20127;
H05K 7/20336; H05K 7/20154; H05K
7/20272; H01L 23/34; H01L 23/3672;
H01L 23/40; H01L 23/4006; H01L
23/4093; H01L 23/427; H01L 23/46;
F28D 15/0275; F28D 1/0426; F28D
15/0208; F28D 15/04; F28F 1/30; F28F
2215/00; G06F 1/20

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

D487,885 S *	3/2004	Fan	.....	D13/179
6,717,813 B1 *	4/2004	Garner	.....	H01L 23/4093
				257/E23.086
D533,145 S *	12/2006	O'Sullivan	.....	D13/179
D567,771 S *	4/2008	Wu	.....	D13/179
D579,423 S *	10/2008	Chang	.....	D13/179
7,609,521 B2 *	10/2009	Wu	.....	F28D 15/0275
				165/104.33
7,753,109 B2 *	7/2010	Min	.....	F28D 15/0266
				165/104.33
7,866,043 B2 *	1/2011	Lin	.....	B21D 53/02
				165/104.33

7,990,699 B2 *	8/2011	Lian	.....	F28D 15/0275
				165/104.21
8,448,694 B2 *	5/2013	Sun	.....	H01L 23/427
				165/104.21
D715,750 S *	10/2014	Mira	.....	D13/179
2004/0201963 A1 *	10/2004	Garner	.....	H01L 23/4093
				361/700

(Continued)

OTHER PUBLICATIONS

Alibaba, "High quality industrial OEM ODM copper pipe embedded heat sink", Accessed Apr. 13, 2017. (https://www.alibaba.com/product-detail/High-quality-industrial-OEM-ODM-copper_2010407847.html).*

Primary Examiner — Jennifer Rivard

Assistant Examiner — April Rivas

(74) *Attorney, Agent, or Firm* — Pai Patent & Trademark Law Firm; Chao-Chang David Pai

(57) **CLAIM**

The ornamental design for a combined heat exchanger base and embedded heat pipes, as shown and described.

DESCRIPTION

FIG. 1 is a front bottom perspective view of a combined heat exchanger base and embedded heat pipes, showing my new design;

FIG. 2 is a front elevational view thereof;

FIG. 3 is a rear elevational view thereof;

FIG. 4 is a left side elevational view thereof;

FIG. 5 is a right side elevational view thereof;

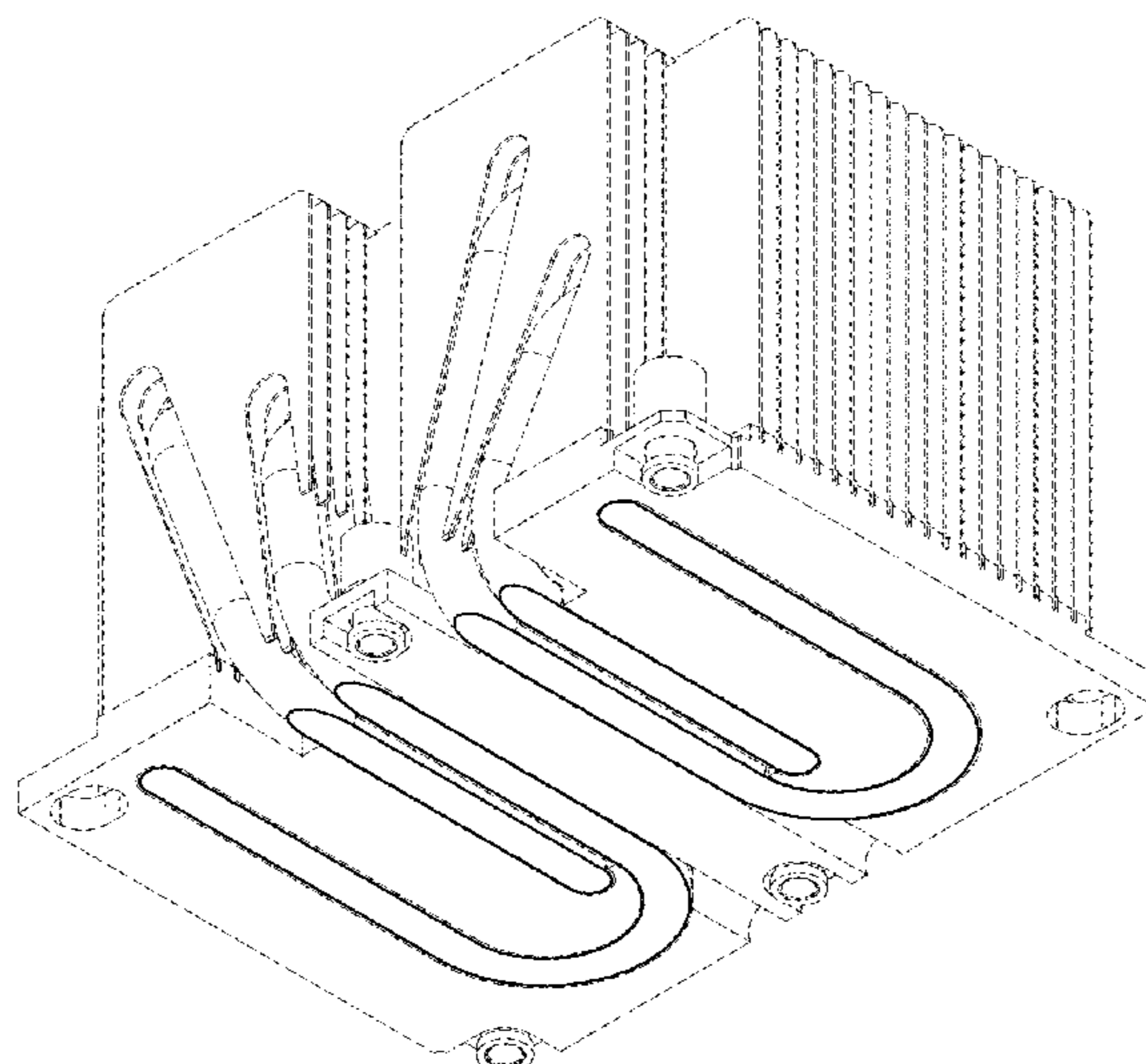
FIG. 6 is a top plan view thereof;

FIG. 7 is a bottom plan view thereof; and,

FIG. 8 is a front top perspective view thereof.

The broken lines illustrate portions of the combined heat exchanger base and embedded heat pipes and form no part of the claimed design.

1 Claim, 5 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

2005/0056400	A1 *	3/2005	Chen	.....	F28D 15/02	2013/0043006	A1 *	2/2013	Peng	.....	H01L 23/3672
					165/80.3						165/104.26
2005/0103476	A1 *	5/2005	Chen	.....	F28D 15/0275	2013/0168056	A1 *	7/2013	Wu	.....	F28D 15/0233
					165/104.33						165/104.26
2005/0139347	A1 *	6/2005	Chen	.....	F28D 15/02	2014/0041838	A1 *	2/2014	Lin	.....	H05K 7/20336
					165/104.33						165/104.21
2006/0291166	A1 *	12/2006	Cheng	.....	G06F 1/20	2014/0138074	A1 *	5/2014	Huang	.....	H01L 23/427
					361/700						165/185
2007/0211432	A1 *	9/2007	Peng	.....	G06F 1/20	2014/0202666	A1 *	7/2014	Cheng	.....	F28F 3/06
					361/700						165/104.26
2009/0008065	A1 *	1/2009	Jin	.....	F28D 15/0233	2015/0062820	A1 *	3/2015	Lam	.....	H01L 23/473
					165/104.33						361/700
2009/0059536	A1 *	3/2009	Lai	.....	H01L 23/4093	2015/0144307	A1 *	5/2015	Lin	.....	H05K 7/20336
					361/710						165/104.21
2011/0024087	A1 *	2/2011	Lin	.....	H01L 23/427	2015/0276321	A1 *	10/2015	Huang	.....	F28D 15/02
					165/104.26						165/104.21
2011/0048677	A1 *	3/2011	Lin	.....	F28D 15/0275	2016/0209121	A1 *	7/2016	Yeh	.....	F28D 15/0233
					165/104.26						2016/0295679
2012/0067550	A1 *	3/2012	Shih	.....	F28D 15/0233						10/2016
					165/104.21						Yeini
										
											H01L 23/427
											2016/0298909
											10/2016
											Yeh
										
											F28D 15/0275
											2016/0360639
											12/2016
											Hsieh
										
											H01L 23/34

* cited by examiner

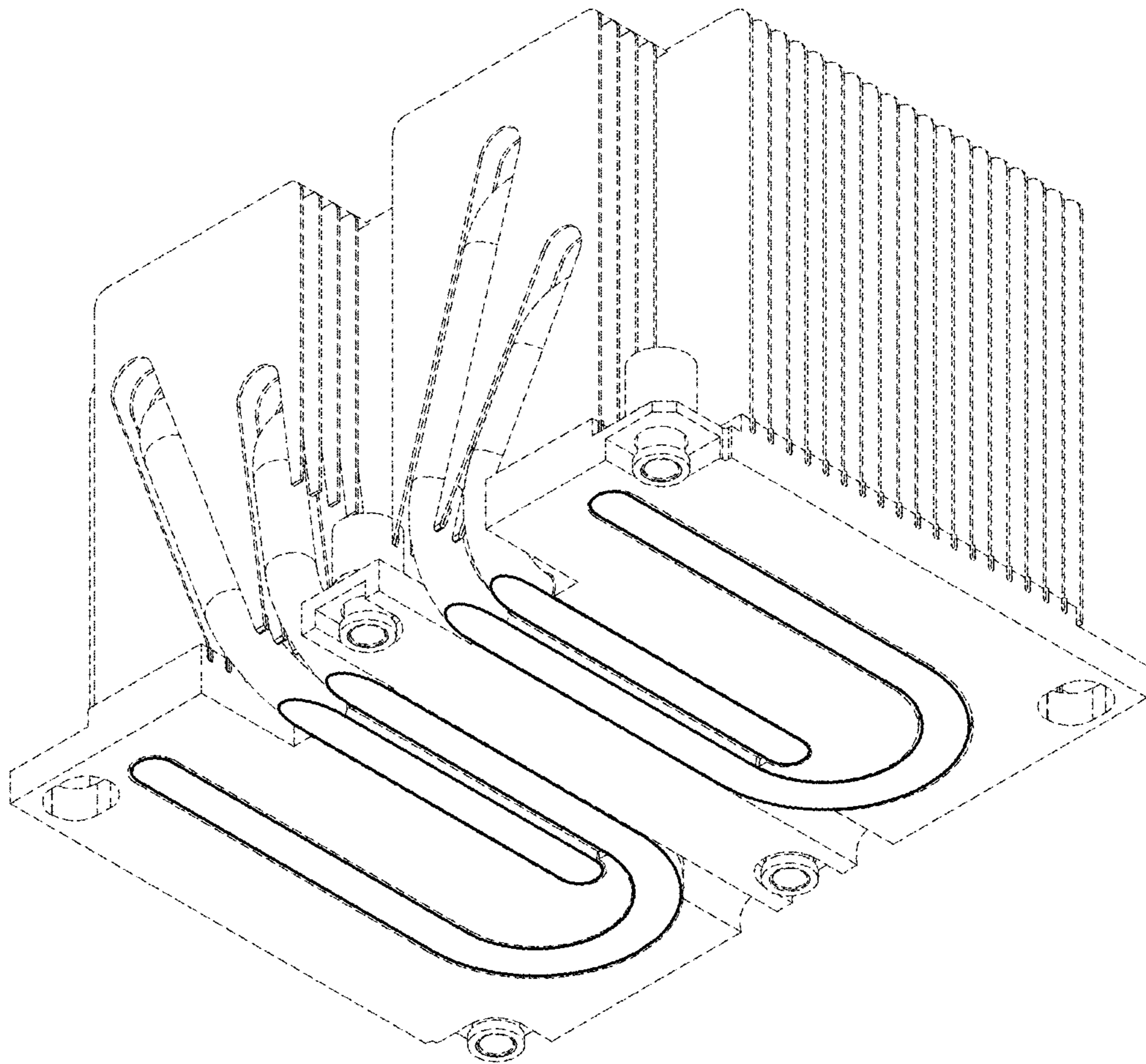


FIG. 1

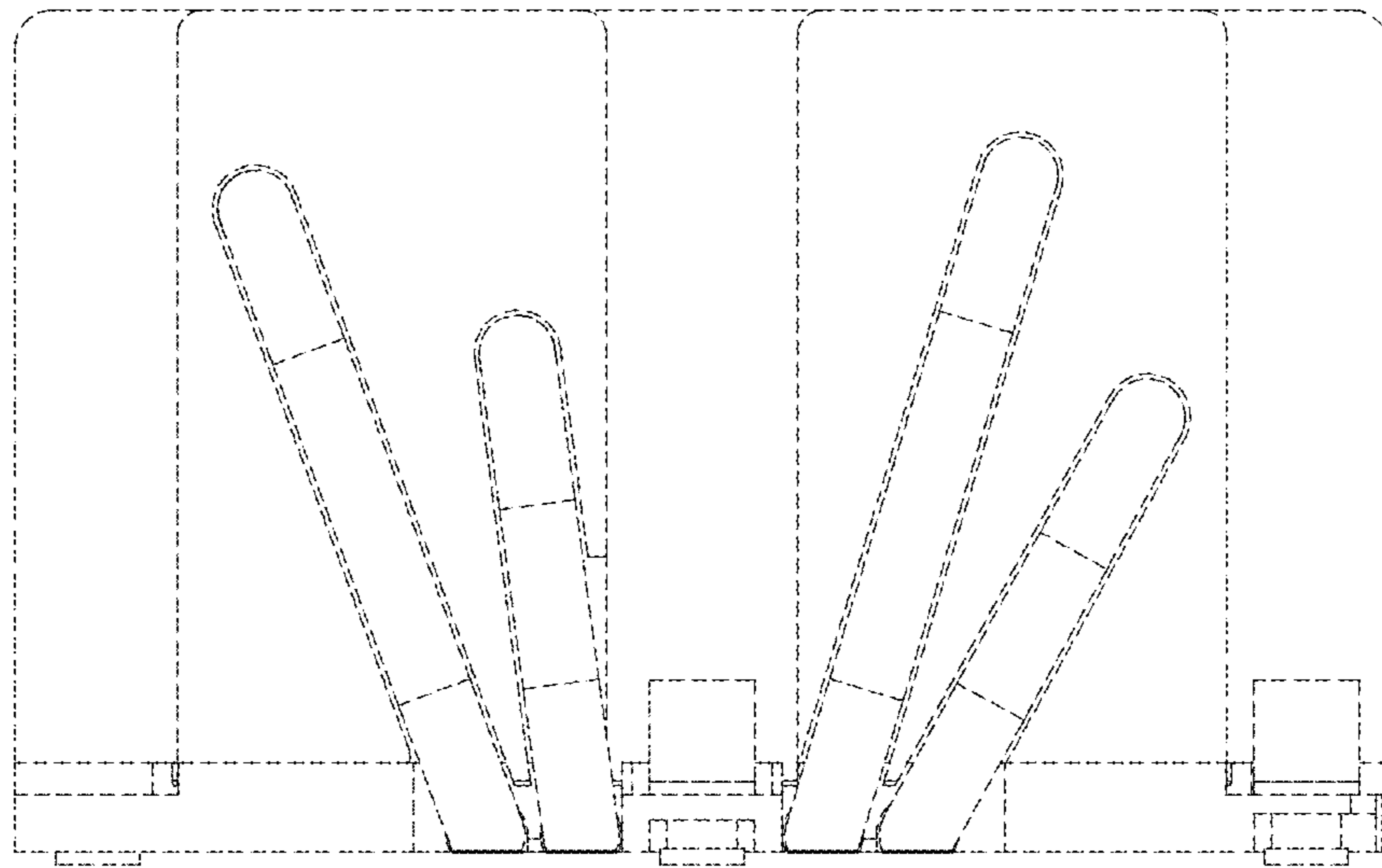


FIG. 2

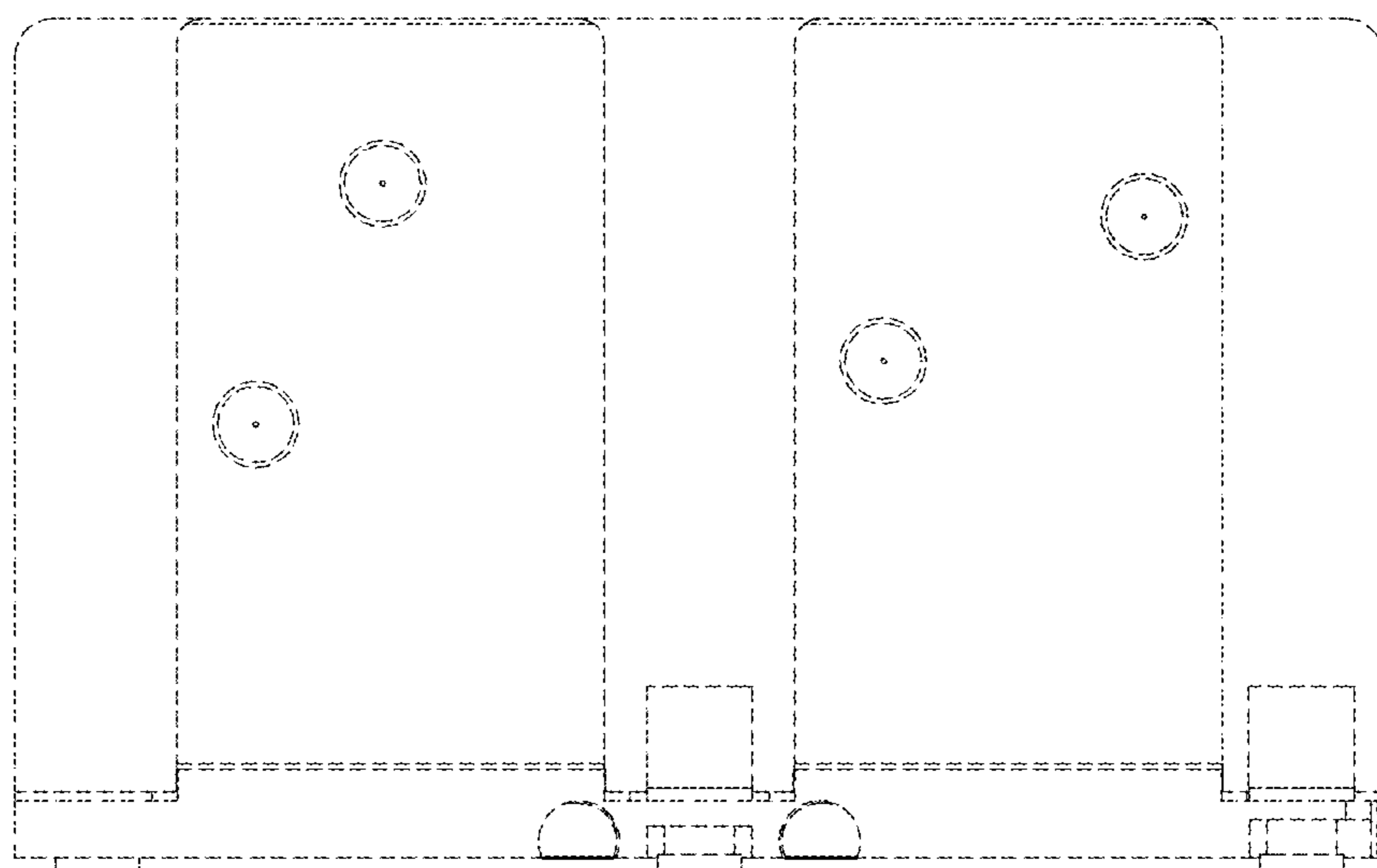


FIG. 3

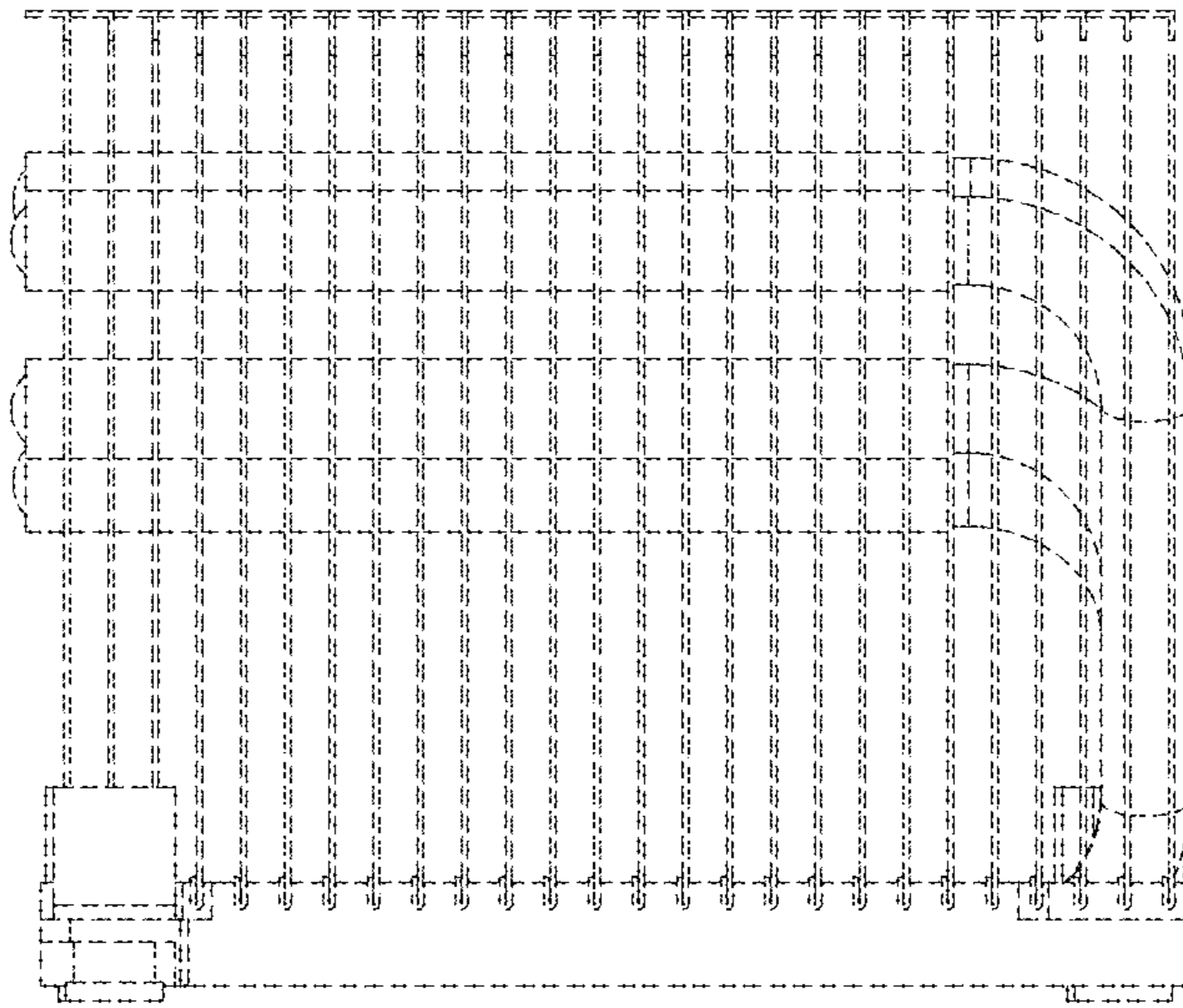


FIG. 4

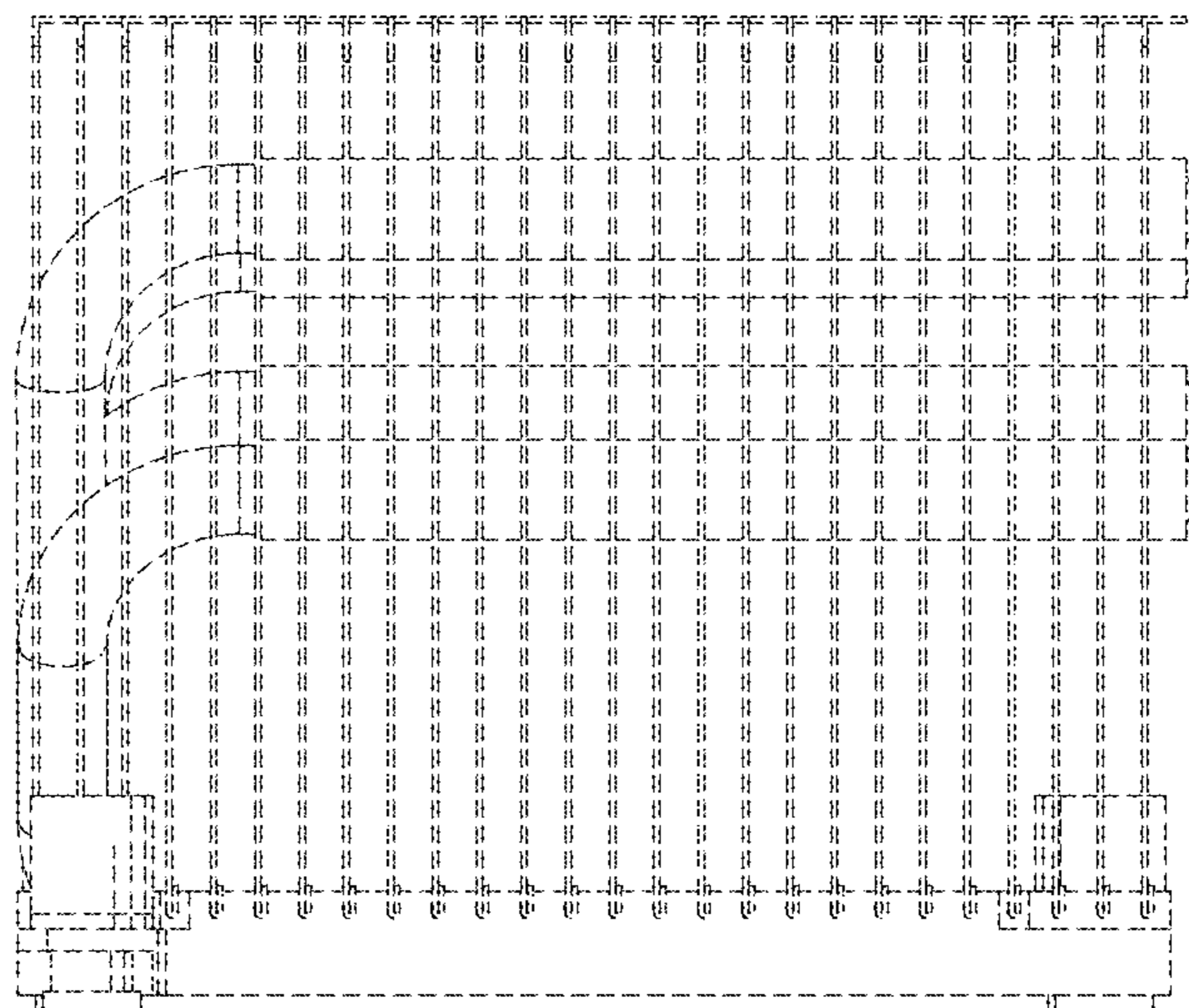


FIG. 5

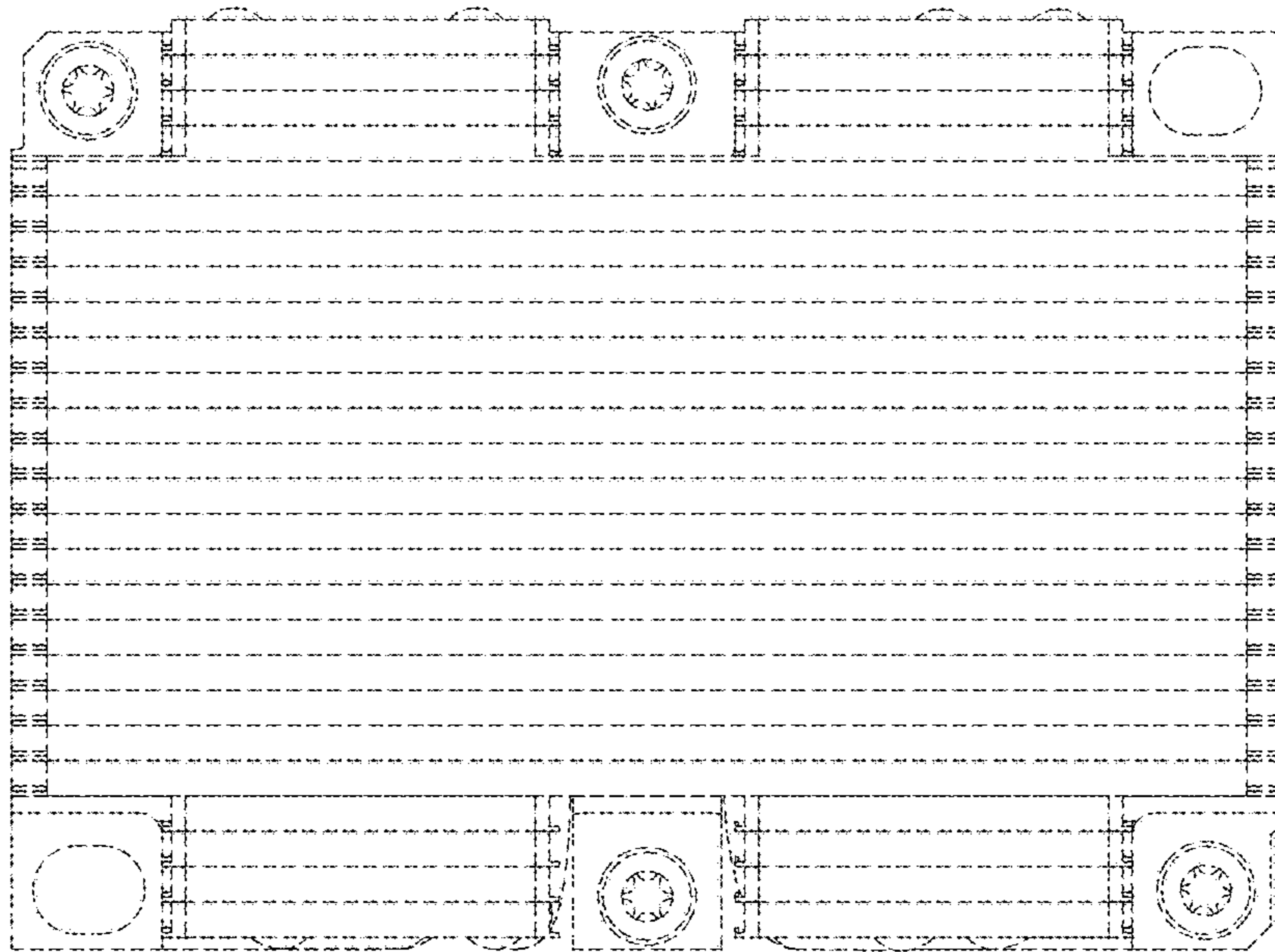


FIG. 6

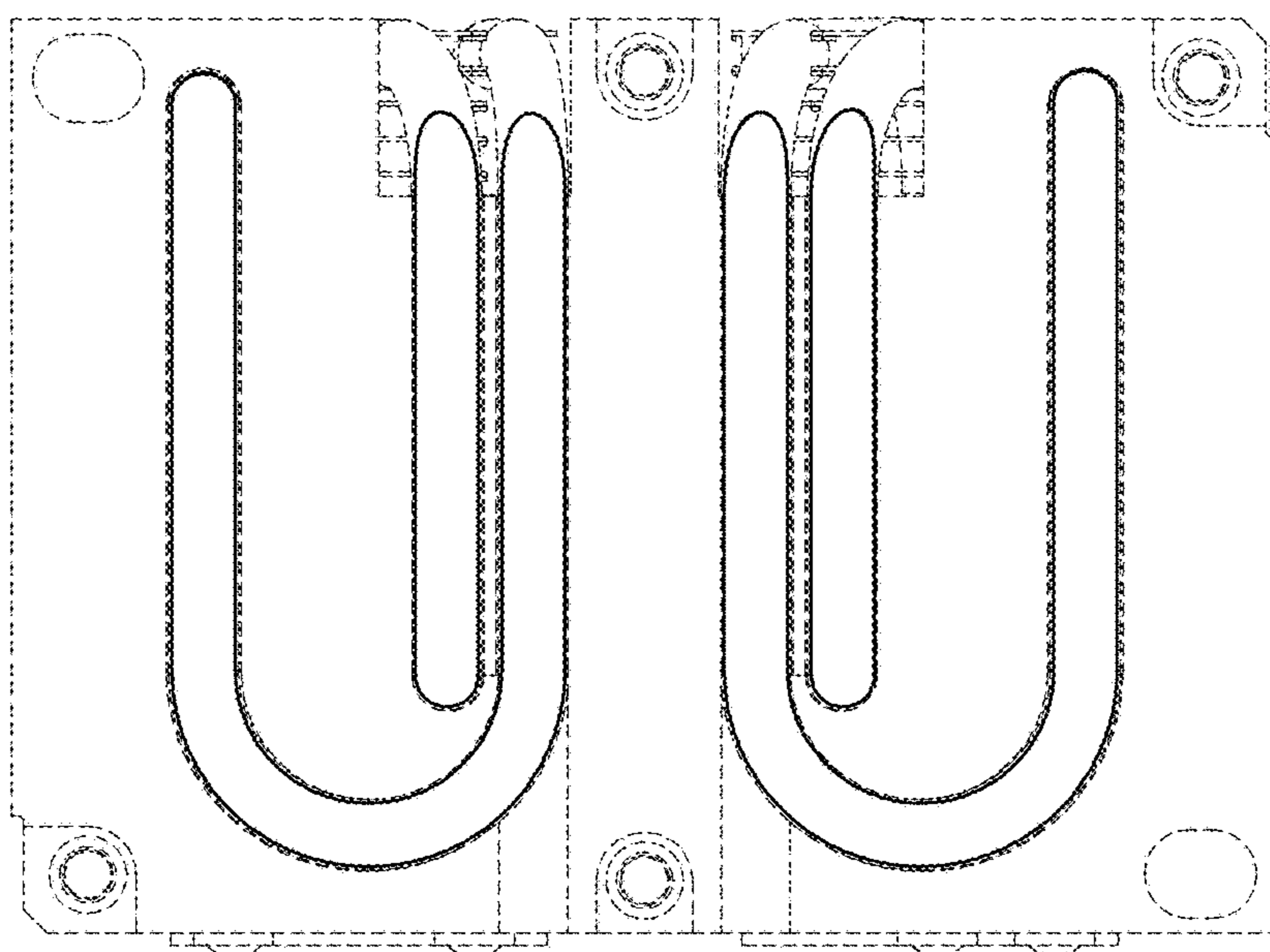


FIG. 7

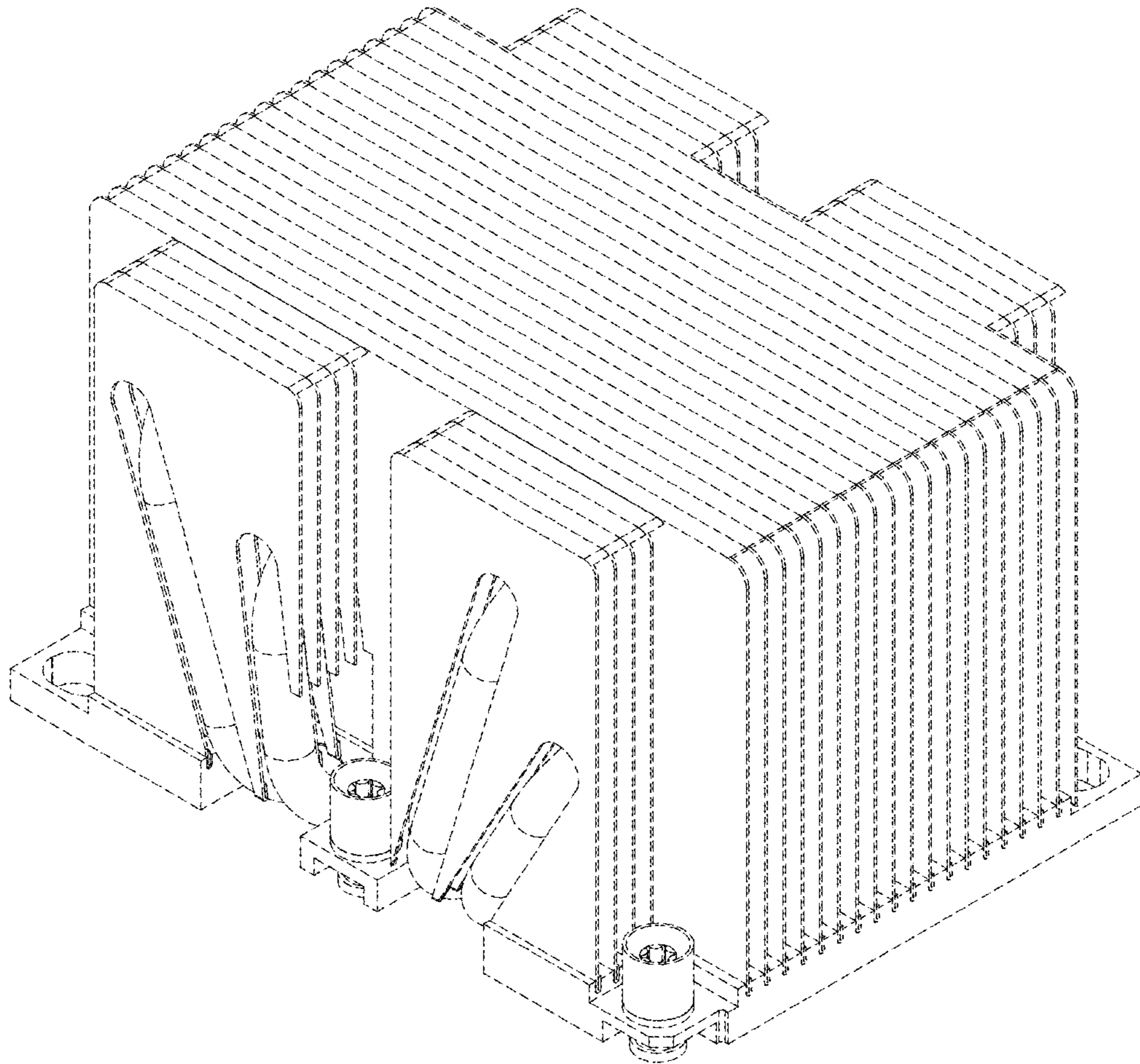


FIG. 8