



US00D937231S

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

(10) **Patent No.:** **US D937,231 S**

(45) **Date of Patent:** **\*\* Nov. 30, 2021**

(54) **POWER SEMICONDUCTOR PACKAGE**

(71) Applicant: **Cree, Inc.**, Durham, NC (US)

(72) Inventor: **Kuldeep Saxena**, Sewickley, PA (US)

(73) Assignee: **Wolfspeed, Inc.**, Durham, NC (US)

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

(21) Appl. No.: **29/730,568**

(22) Filed: **Apr. 6, 2020**

(51) **LOC (13) 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  
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;  
G02B 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

3,340,347	A *	9/1967	Spiegler .....	H01L 23/057 174/50.52
D259,559	S *	6/1981	Mochizuki .....	D13/182
D259,560	S *	6/1981	Mochizuki .....	D13/182
D259,782	S *	7/1981	Mochizuki .....	D13/182
D259,783	S *	7/1981	Mochizuki .....	D13/182
D260,091	S *	8/1981	Mochizuki .....	D13/182
D260,986	S *	9/1981	Mochizuki .....	D13/182
D345,731	S *	4/1994	Owens .....	D13/182
D396,846	S *	8/1998	Nakayama .....	D13/182
D396,847	S *	8/1998	Nakayama .....	D13/182

(Continued)

OTHER PUBLICATIONS

Cree, Inc., "C2M1000170J: Silicon Carbide Power MOSFET, C2M MOSFET Technology, N-Channel Enhancement Mode," Dec. 2017, 10 pages.

(Continued)

*Primary Examiner* — Elizabeth J Oswecki

(74) *Attorney, Agent, or Firm* — Withrow & Terranova, PLLC

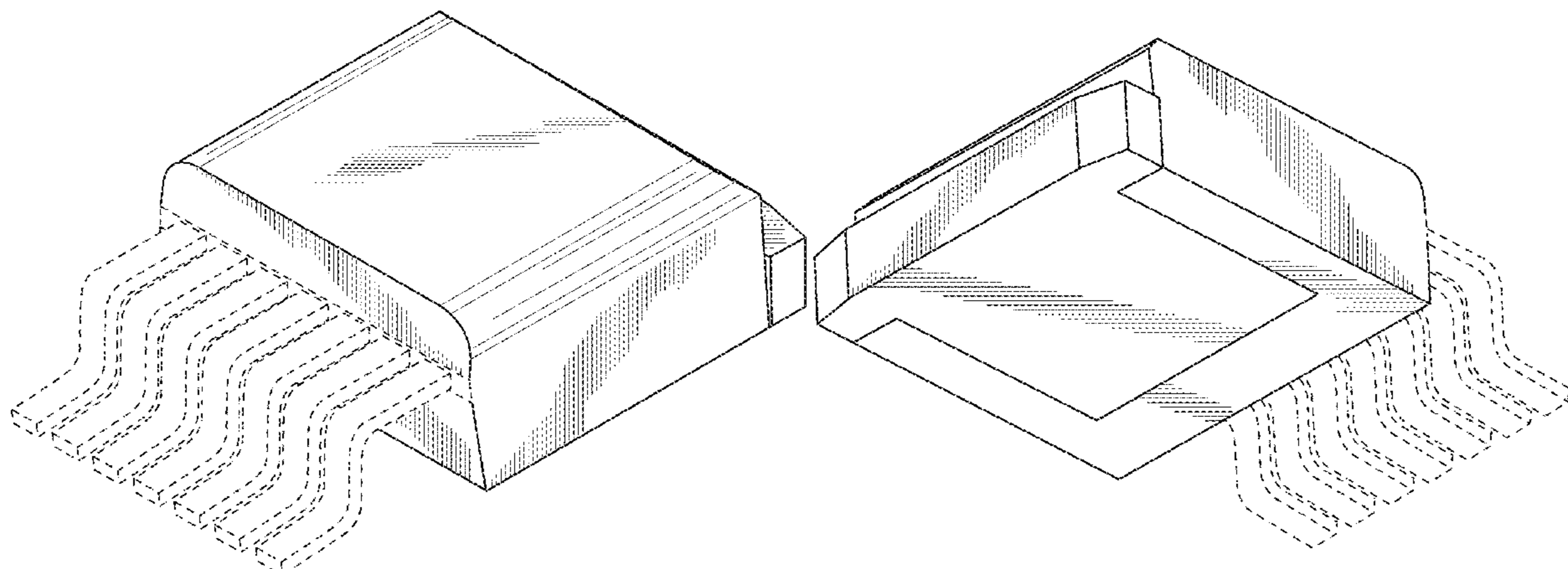
(57) **CLAIM**

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

**DESCRIPTION**

FIG. 1 is a top perspective view of a power semiconductor package showing my new design;  
FIG. 2 is a bottom perspective view thereof;  
FIG. 3 is a top view thereof;  
FIG. 4 is a bottom view thereof;  
FIG. 5 is a front view thereof;  
FIG. 6 is a rear view thereof;  
FIG. 7 is a side view thereof; and,  
FIG. 8 is an opposite side view thereof.  
The broken lines shown in the drawings depict portions of the power semiconductor package that form no part of the claimed design.

**1 Claim, 8 Drawing Sheets**



(56)

References Cited

U.S. PATENT DOCUMENTS

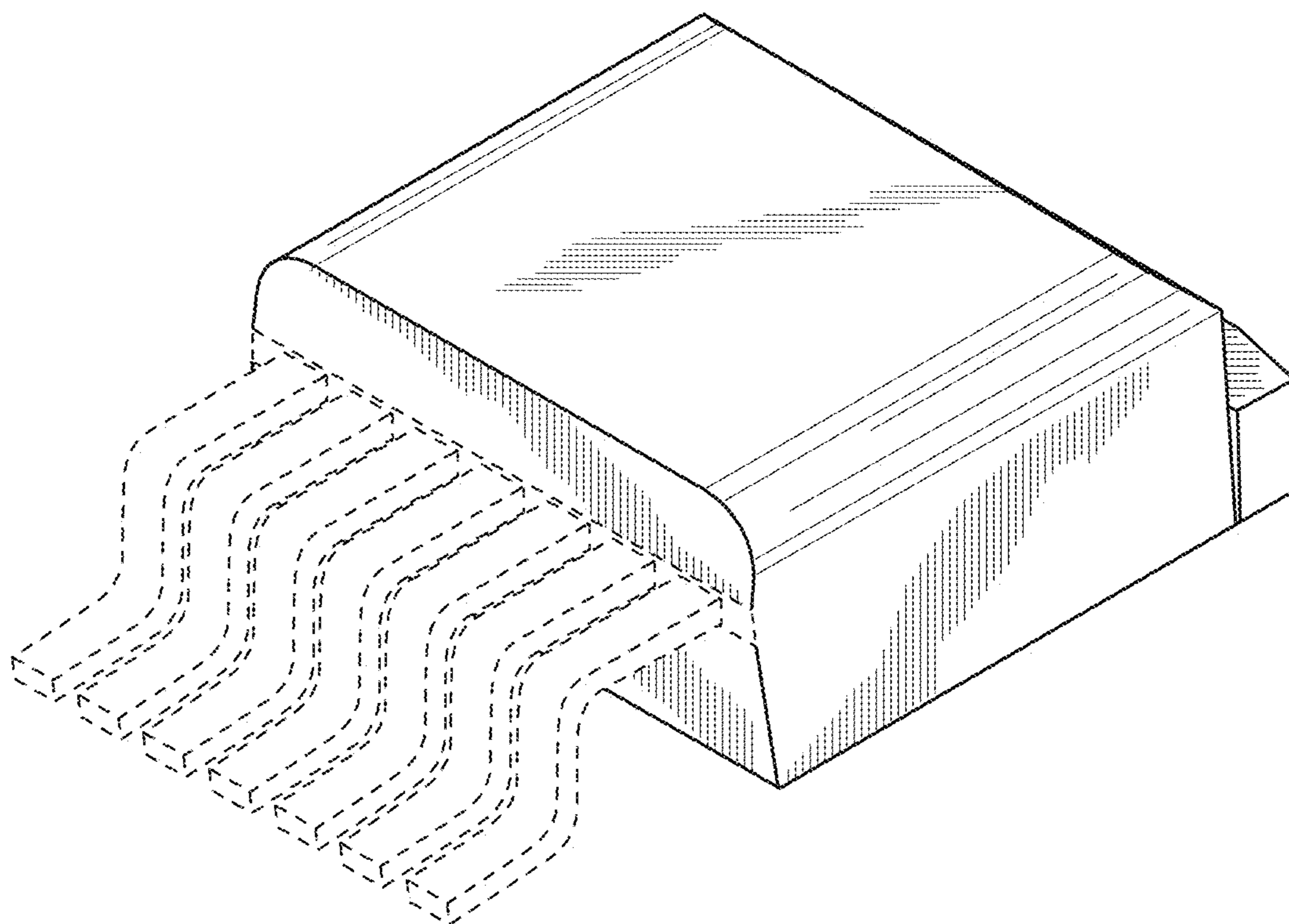
D397,092 S \* 8/1998 Sano ..... D13/182  
 5,798,570 A \* 8/1998 Watanabe ..... H01L 21/565  
 257/796  
 D421,421 S \* 3/2000 Kashio ..... D13/147  
 6,093,957 A \* 7/2000 Kwon ..... H01L 23/49527  
 174/529  
 D432,097 S \* 10/2000 Song ..... D13/182  
 6,238,953 B1 \* 5/2001 Tanaka ..... H01L 23/3107  
 438/112  
 D444,132 S \* 6/2001 Iwanishi ..... D13/182  
 D466,485 S \* 12/2002 Maehara ..... D13/182  
 D466,873 S \* 12/2002 Kasem ..... D13/182  
 D472,528 S \* 4/2003 Kasem ..... D13/182  
 6,555,899 B1 \* 4/2003 Chung ..... H01L 23/49544  
 257/670  
 D475,028 S \* 5/2003 Hori ..... D13/182  
 D475,355 S \* 6/2003 Hori ..... D13/182  
 D475,982 S \* 6/2003 Hori ..... D13/182  
 D476,962 S \* 7/2003 Yoshihira ..... D13/182  
 D489,338 S \* 5/2004 Seddon ..... D13/182  
 D504,874 S \* 5/2005 Celaya ..... D13/182  
 D508,682 S \* 8/2005 Yamada ..... D13/182  
 D510,728 S \* 10/2005 Celaya ..... D13/182  
 D796,459 S \* 9/2017 Iwai ..... D13/182  
 D824,866 S \* 8/2018 Matsubara ..... D13/182  
 D832,227 S \* 10/2018 Chikamatsu ..... D13/182  
 D832,228 S \* 10/2018 Chikamatsu ..... D13/182  
 D853,343 S 7/2019 Nii

D874,411 S 2/2020 Kanda et al.  
 10,600,744 B2 \* 3/2020 Chikamatsu ..... H01L 23/49562  
 D900,759 S \* 11/2020 Majima ..... D13/182  
 D902,877 S \* 11/2020 Hirata ..... D13/182  
 2017/0133315 A1 \* 5/2017 Kawazu ..... H01L 23/047

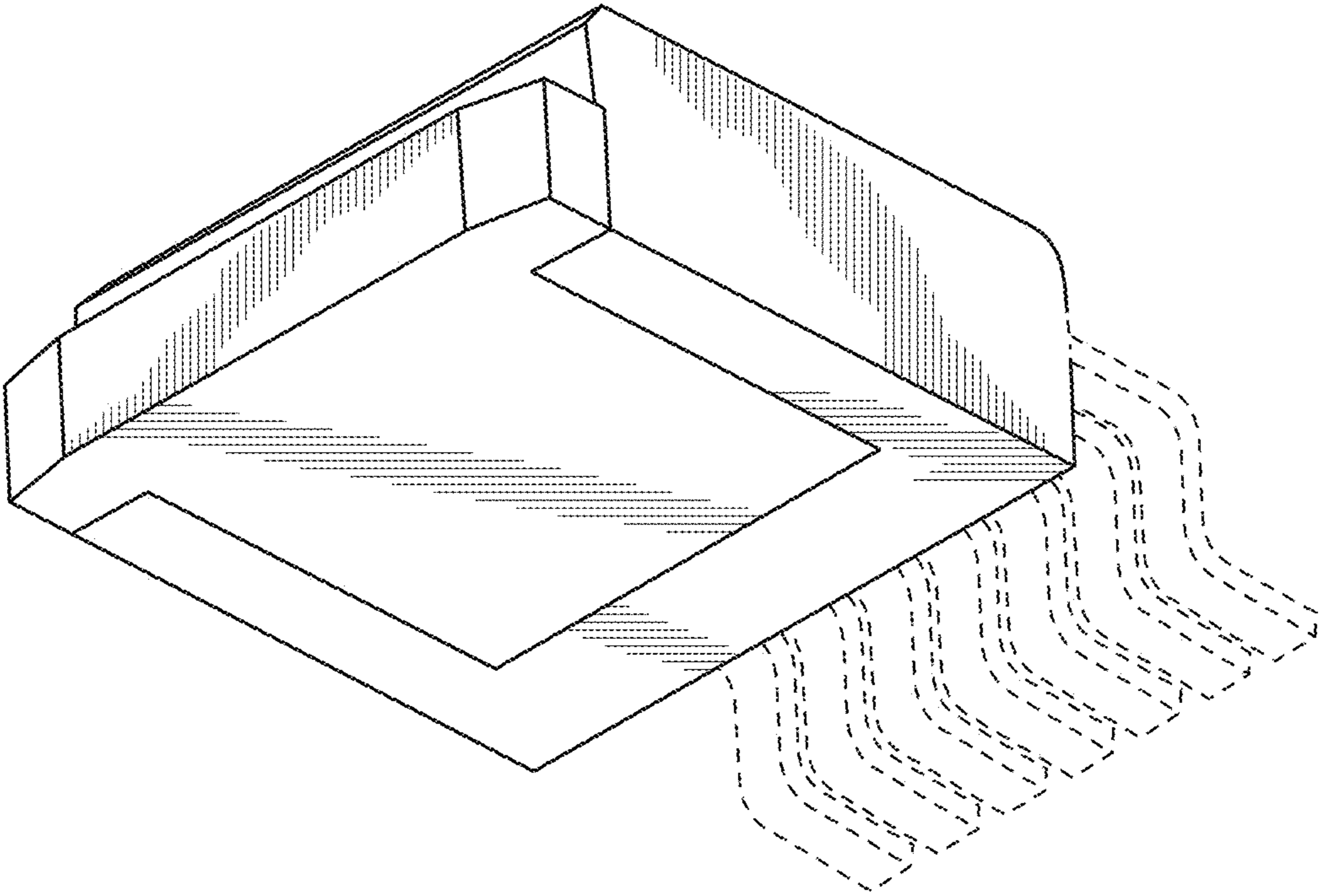
OTHER PUBLICATIONS

Cree, Inc., "C3M0065090J: Silicon Carbide Power MOSFET, C3M MOSFET Technology, N-Channel Enhancement Mode," Jun. 2019, 10 pages.  
 Cree, Inc., "C3M0065100J: Silicon Carbide Power MOSFET, C3M MOSFET Technology, N-Channel Enhancement Mode," Apr. 2017, 10 pages.  
 Cree, Inc., "C3M0075120J: Silicon Carbide Power MOSFET, C3M MOSFET Technology, N-Channel Enhancement Mode," Jul. 2017, 10 pages.  
 Cree, Inc., "C3M0120090J: Silicon Carbide Power MOSFET, C3M MOSFET Technology, N-Channel Enhancement Mode," Jan. 2018, 10 pages.  
 Cree, Inc., "C3M0120100J: Silicon Carbide Power MOSFET, C3M MOSFET Technology, N-Channel Enhancement Mode," Apr. 2017, 10 pages.  
 Cree, Inc., "C3M0280090J: Silicon Carbide Power MOSFET, C3M MOSFET Technology, N-Channel Enhancement Mode," Jan. 2018, 10 pages.  
 Examination Report for Taiwanese Patent Application No. 109305308, dated May 4, 2021, 6 pages.

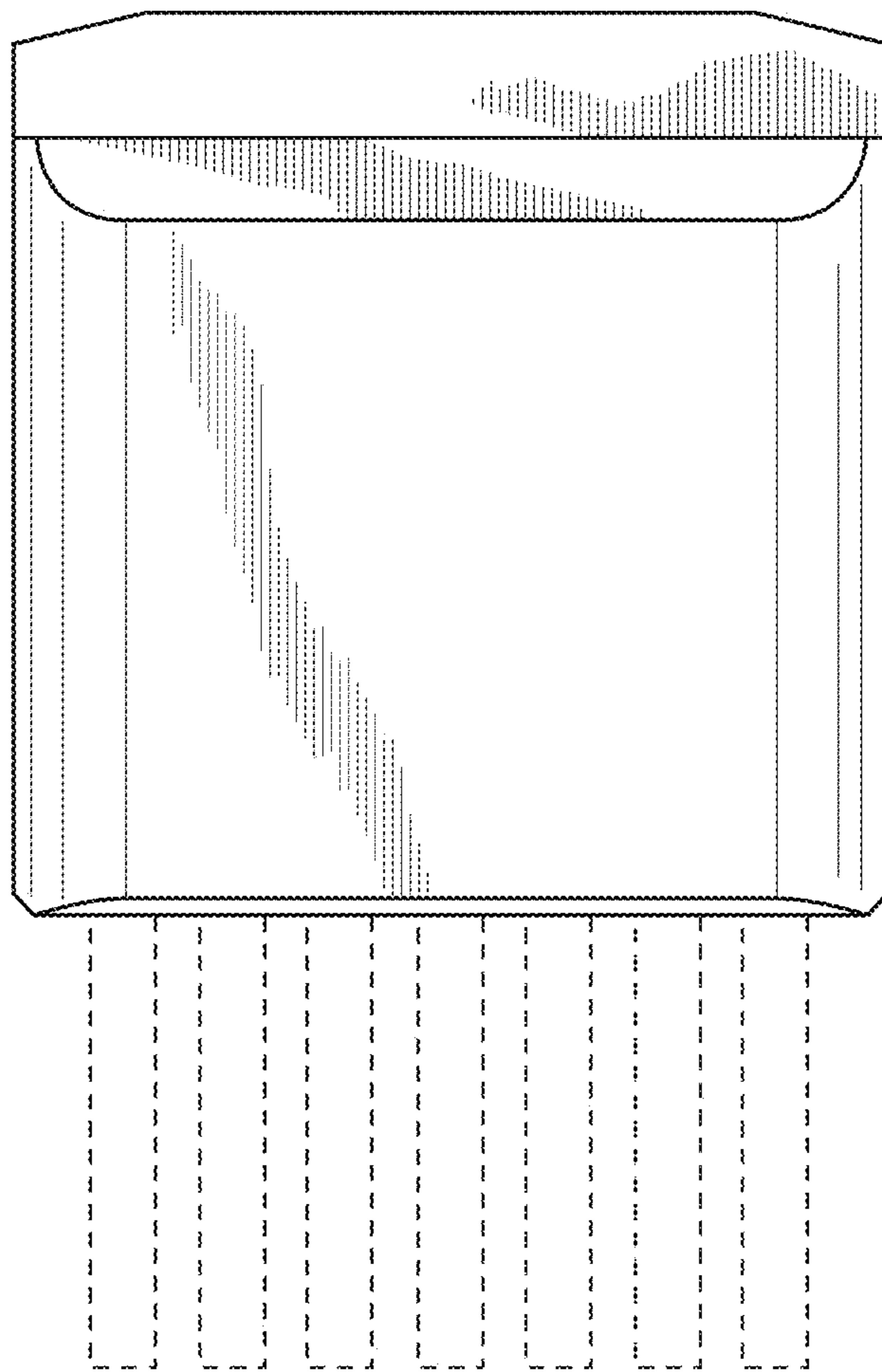
\* cited by examiner



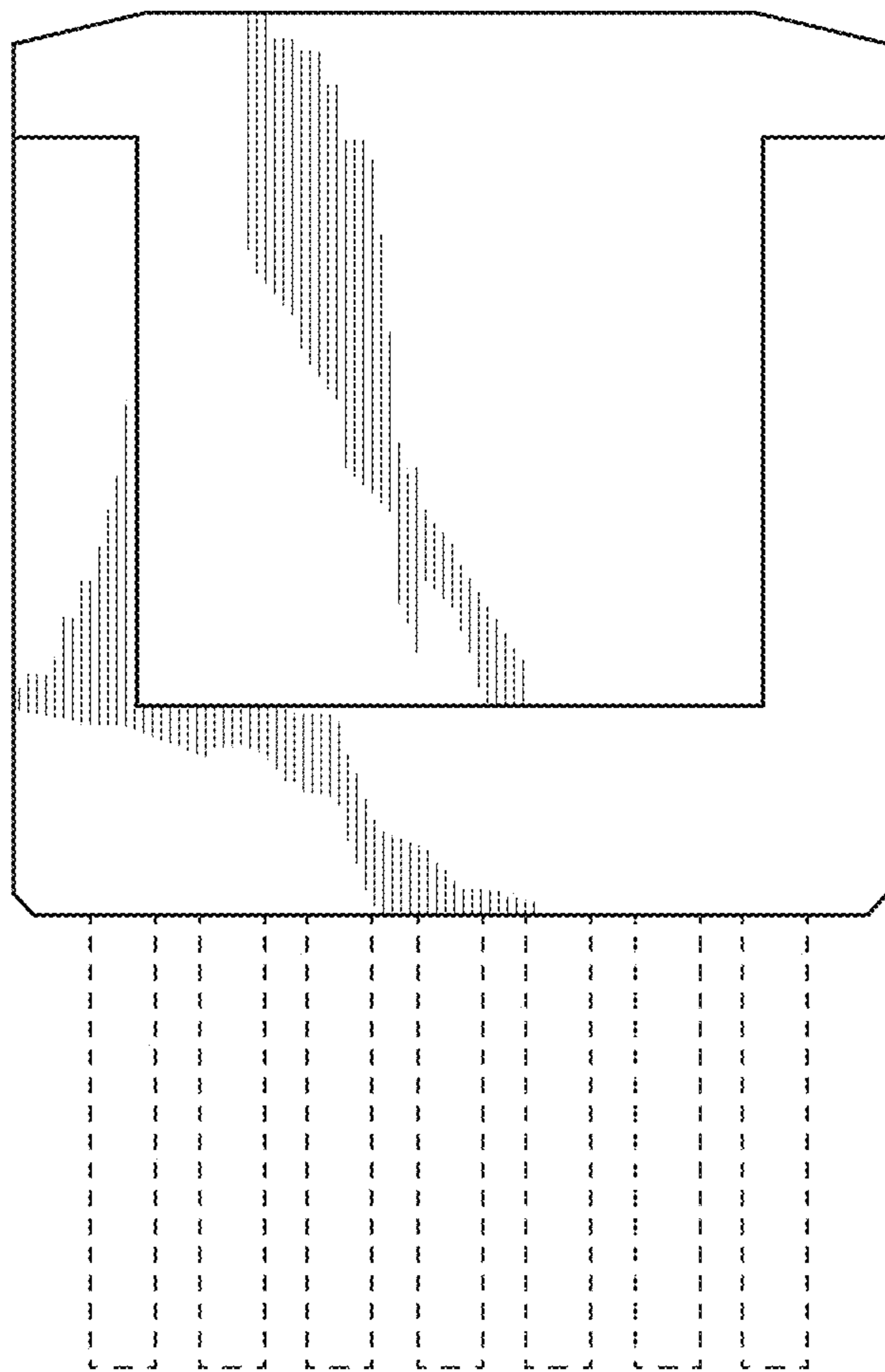
**FIG. 1**



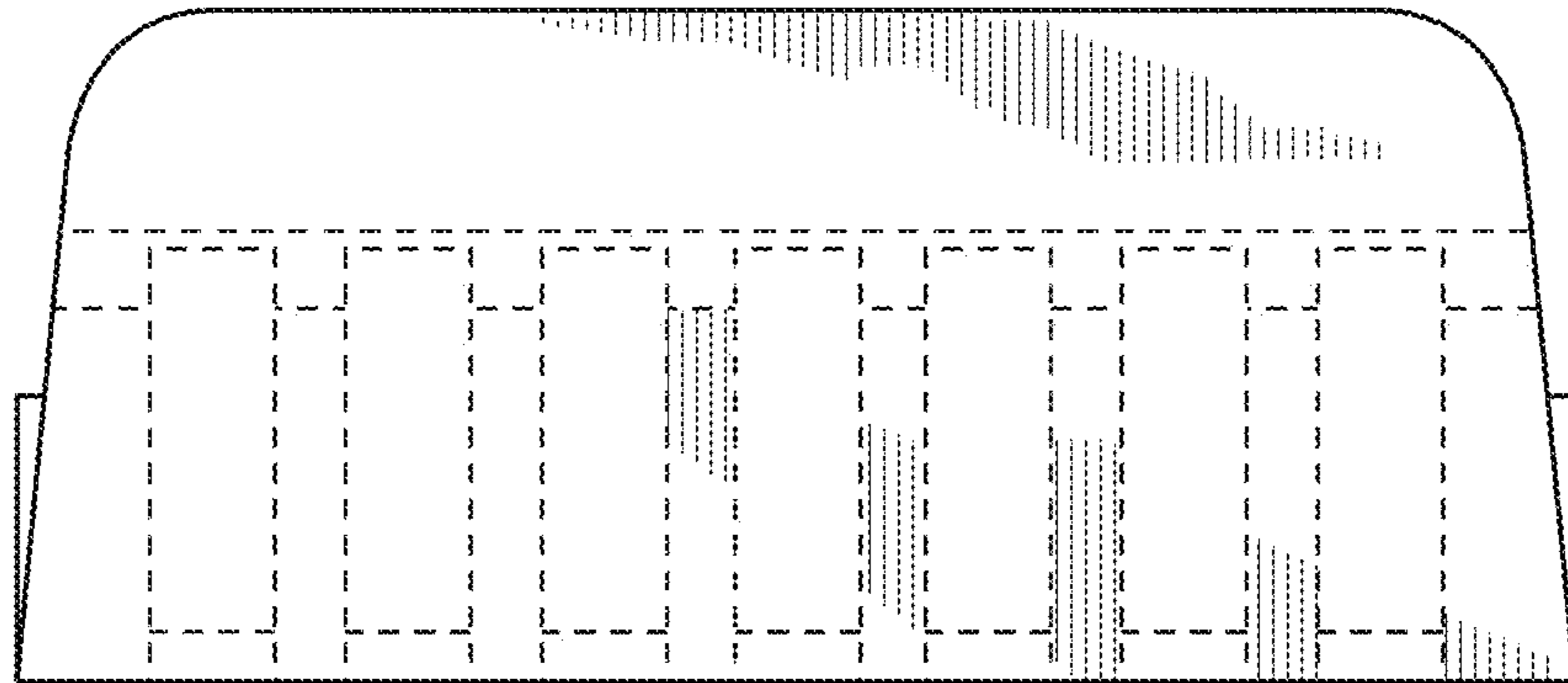
**FIG. 2**



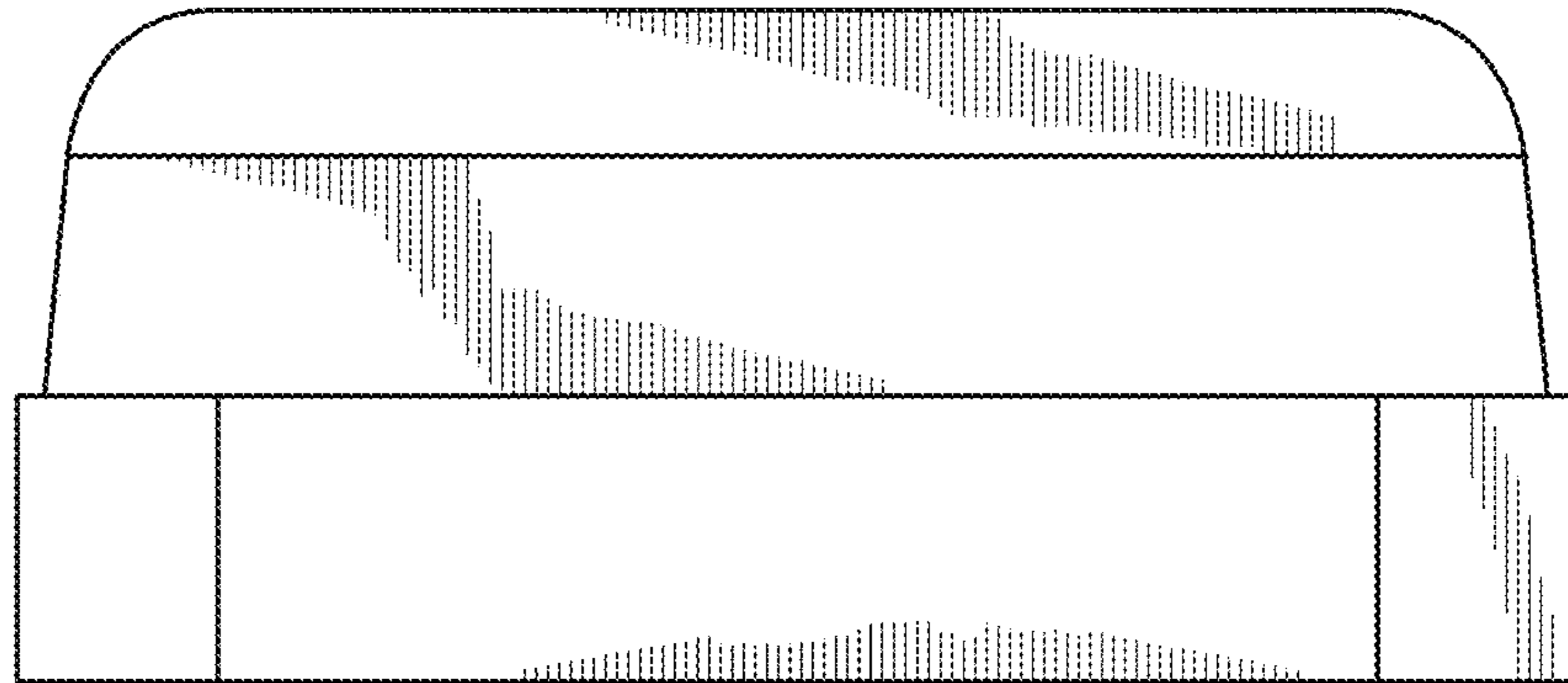
**FIG. 3**



**FIG. 4**



**FIG. 5**



**FIG. 6**



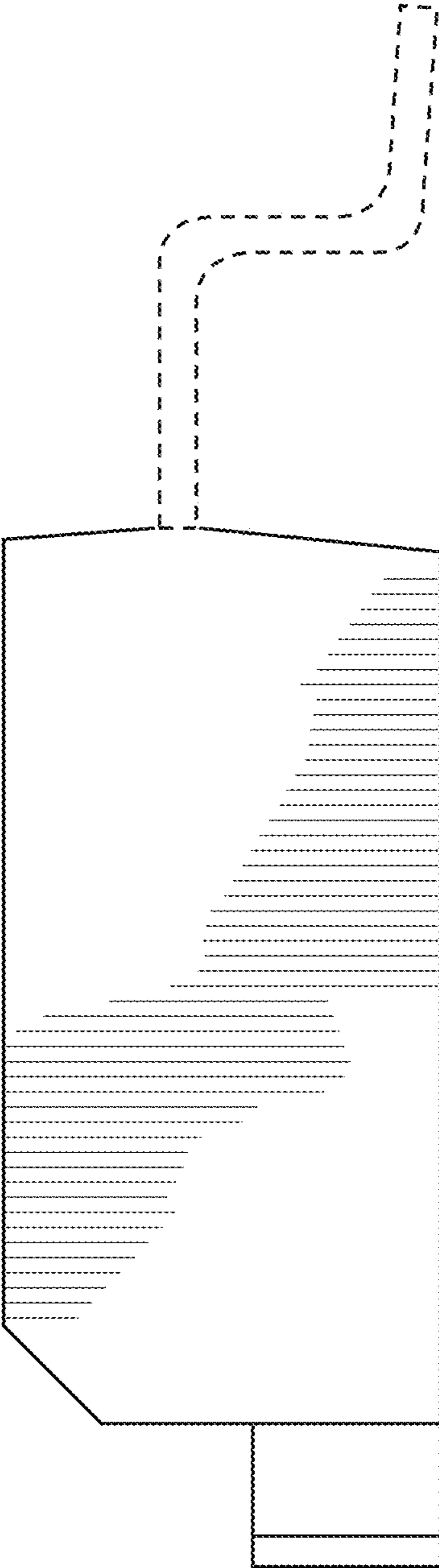


FIG. 7

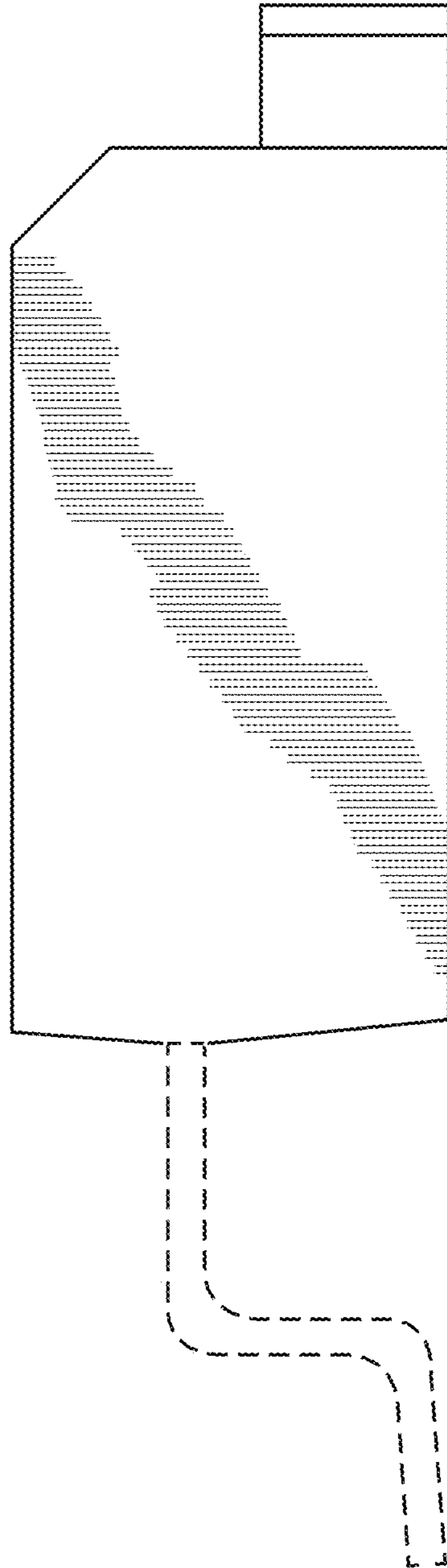


FIG. 8