



US00D798830S

(12) **United States Design Patent** (10) **Patent No.:** **US D798,830 S**
Anzai et al. (45) **Date of Patent:** **** *Oct. 3, 2017**

(54) **COOLING DEVICE FOR AN ELECTRONIC COMPONENT HEAT SINK**

F28D 15/02; F28F 1/30; F28F 2215/00;
G06F 1/20

See application file for complete search history.

(71) Applicant: **NIPPON LIGHT METAL COMPANY, LTD**, Tokyo (JP)

(56) **References Cited**

(72) Inventors: **Eiji Anzai**, Shizuoka (JP); **Takumi Nakamura**, Shizuoka (JP)

U.S. PATENT DOCUMENTS

(73) Assignee: **NIPPON LIGHT METAL COMPANY, LTD**, Tokyo (JP)

5,014,117 A * 5/1991 Horvath H01L 23/4338
165/185
6,478,082 B1 * 11/2002 Li F28F 3/02
165/185
D567,343 S * 4/2008 Kinney, Jr. D23/314
D586,763 S * 2/2009 Hua D13/179
D601,515 S * 10/2009 Meyer, IV D13/179
D676,118 S * 2/2013 Hansen D23/330
D689,835 S * 9/2013 Smith D13/182
D763,804 S * 8/2016 Sakamoto D13/179
2004/0031587 A1 * 2/2004 Fong F28F 3/027
165/80.3
2004/0244947 A1 * 12/2004 Chen F28F 3/04
165/80.3
2006/0289147 A1 * 12/2006 Zuo F28D 15/0266
165/104.26

(*) Notice: This patent is subject to a terminal disclaimer.

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

(21) Appl. No.: **29/566,046**

(Continued)

(22) Filed: **May 26, 2016**

Primary Examiner — Jennifer Rivard

Assistant Examiner — April Rivas

(30) **Foreign Application Priority Data**

(74) *Attorney, Agent, or Firm* — Oliff PLC

Dec. 4, 2015 (JP) 2015-027261

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

(57) **CLAIM**

The ornamental design for a cooling device for an electronic component heat sink, as shown and described.

(52) **U.S. Cl.**

USPC **D13/179**

DESCRIPTION

(58) **Field of Classification Search**

USPC D13/179, 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 1/426; F28D
1/0426; F28D 15/0208; F28D 15/04;

FIG. 1 is a front, bottom, left-side perspective view of a cooling device for an electronic component heat sink showing our new design, the front, top, left-side being a mirror image thereof;
FIG. 2 is a front elevational view thereof;
FIG. 3 is a rear elevational view thereof;
FIG. 4 is a right-side elevational view thereof;
FIG. 5 is a left-side elevational view thereof;
FIG. 6 is an enlarged view of an area shown in a dashed line box labeled "6" in FIG. 2; and,

(Continued)

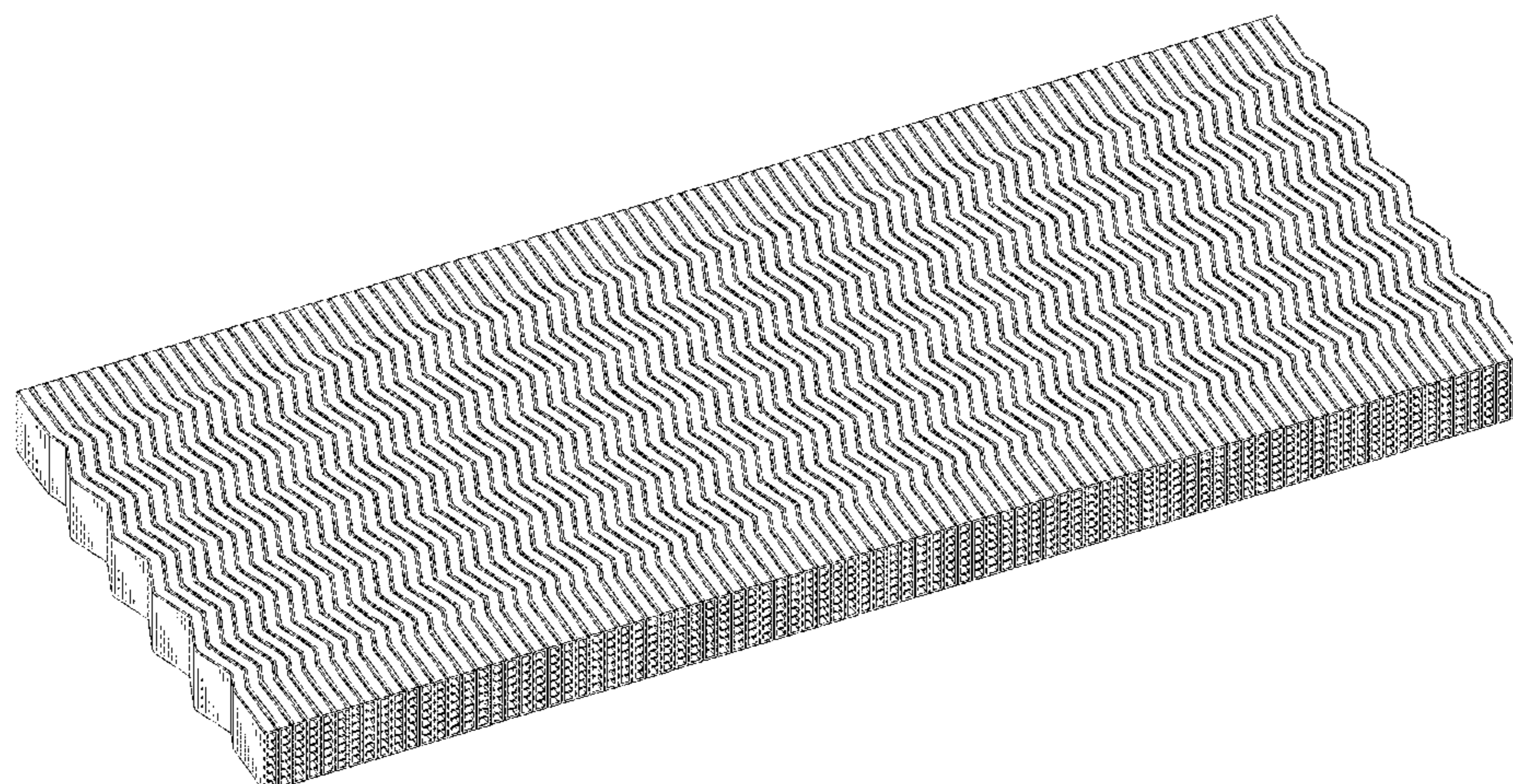


FIG. 7 is an enlarged view of an area shown in a dashed line box labeled "7" in FIG. 3.

The dashed line boxes identify areas that are enlarged, and form no part of the claimed design.

1 Claim, 6 Drawing Sheets

(56)

References Cited

U.S. PATENT DOCUMENTS

2008/0017360 A1* 1/2008 Campbell F28F 1/32
165/148
2009/0032217 A1* 2/2009 Wayman F28F 13/14
165/80.3
2009/0303681 A1* 12/2009 Tian H01L 23/367
361/692

2009/0321045 A1* 12/2009 Hernon F28F 13/003
165/80.2
2010/0236755 A1* 9/2010 Li H01L 23/3672
165/80.3
2013/0020060 A1* 1/2013 Moser B21D 53/04
165/148
2013/0186604 A1* 7/2013 Geppert F28D 1/0461
165/140
2015/0173242 A1* 6/2015 Blomberg F28D 15/0266
62/259.2
2016/0054074 A1* 2/2016 Agostini F28F 9/0278
165/104.26
2016/0153725 A1* 6/2016 Cheng F28D 15/0275
165/185
2016/0192534 A1* 6/2016 Pons H01L 23/3672
361/689
2016/0341488 A1* 11/2016 Wan F28D 15/0266
2017/0055370 A1* 2/2017 Tsai H01L 23/473

* cited by examiner

FIG. 1

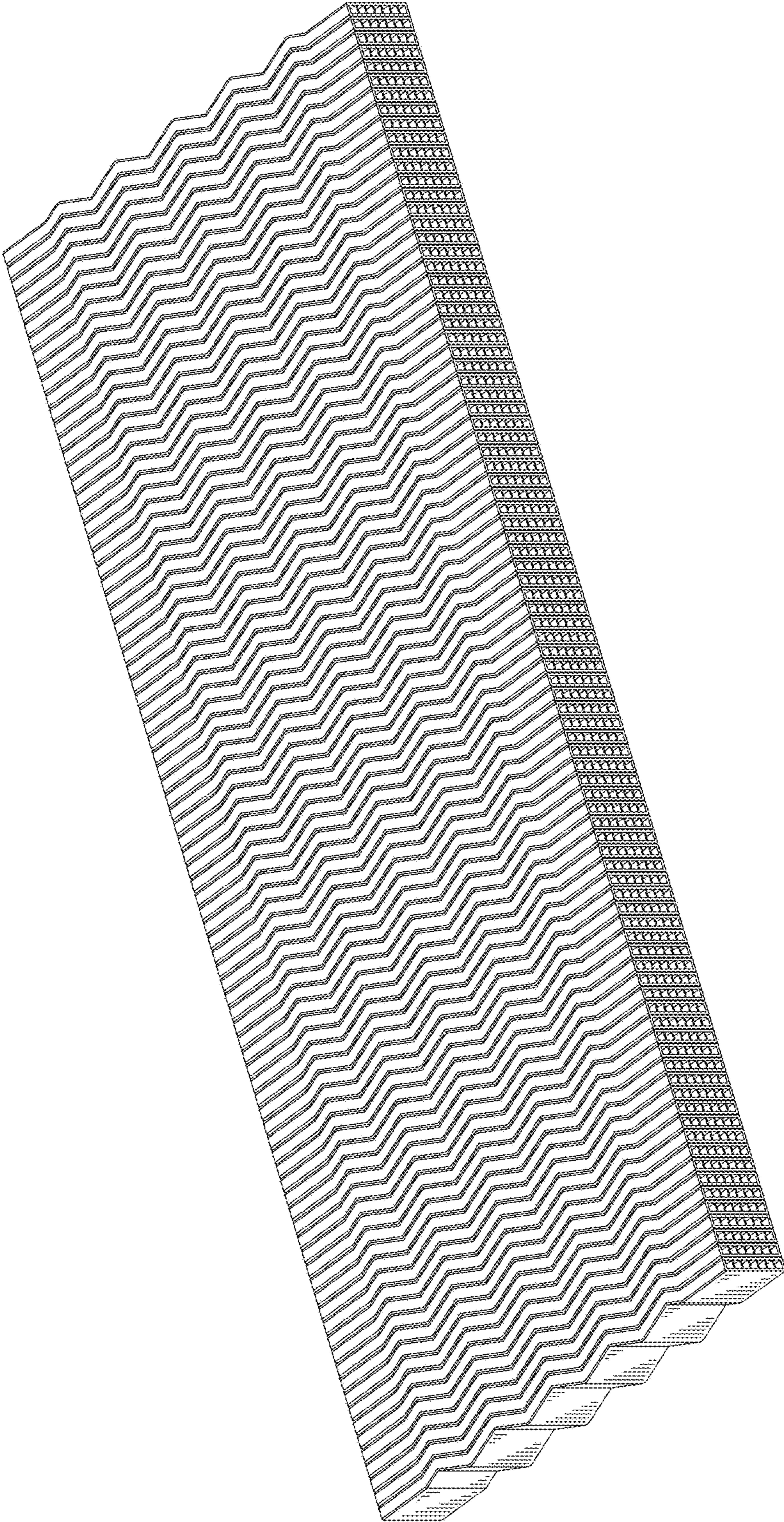


FIG. 2

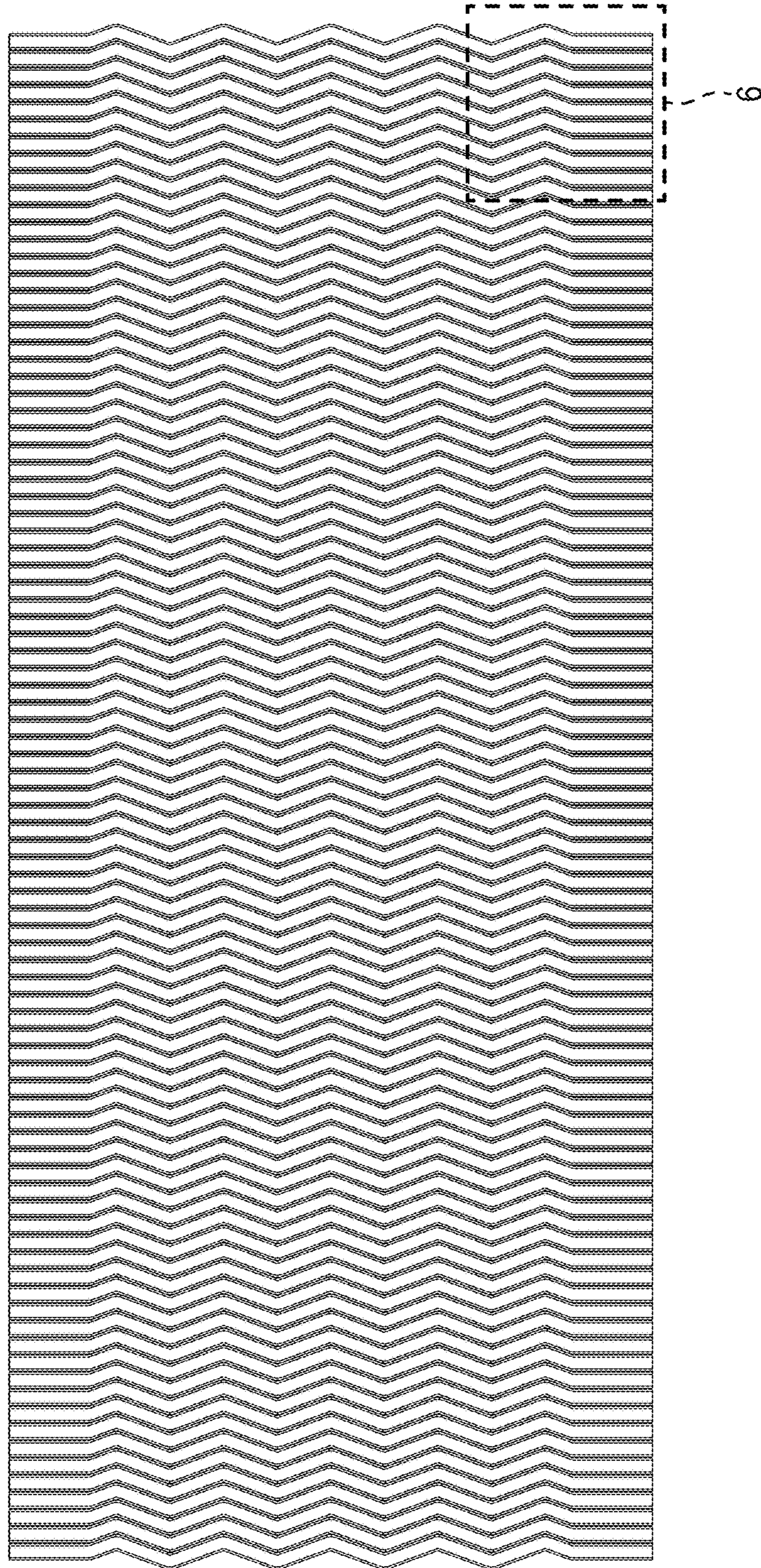


FIG. 3

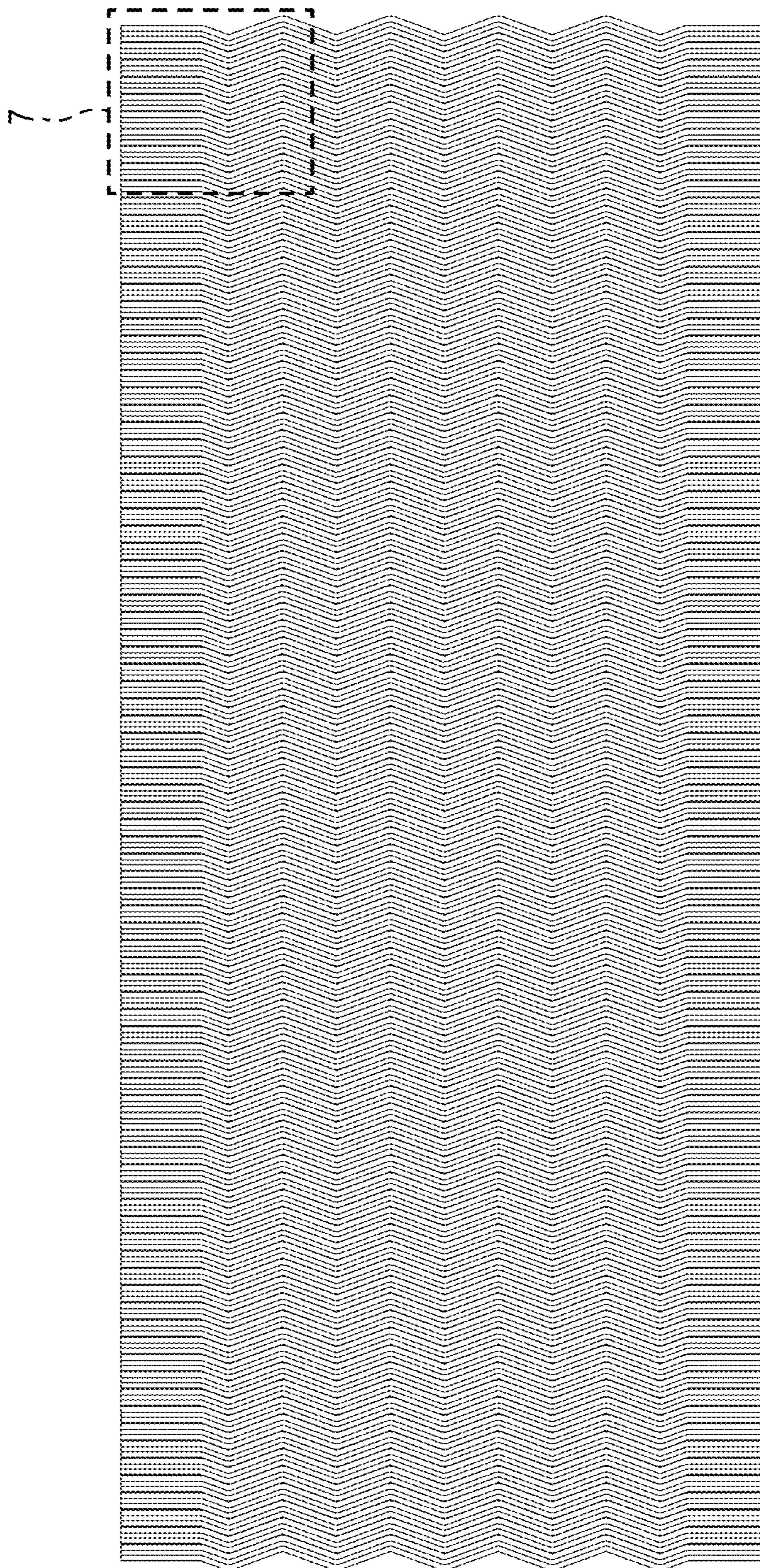


FIG. 4

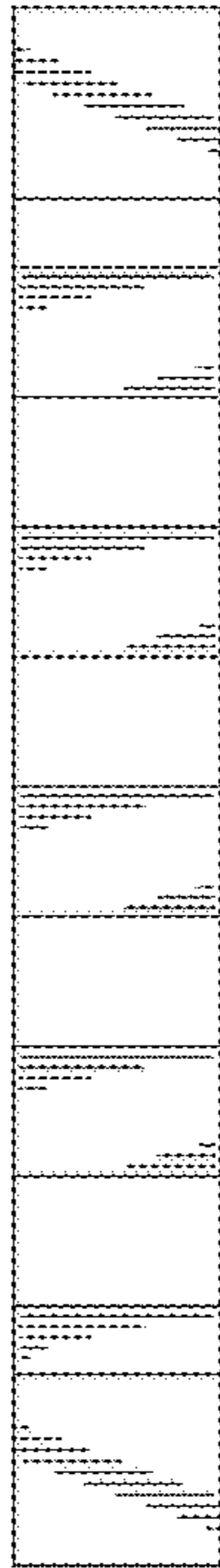
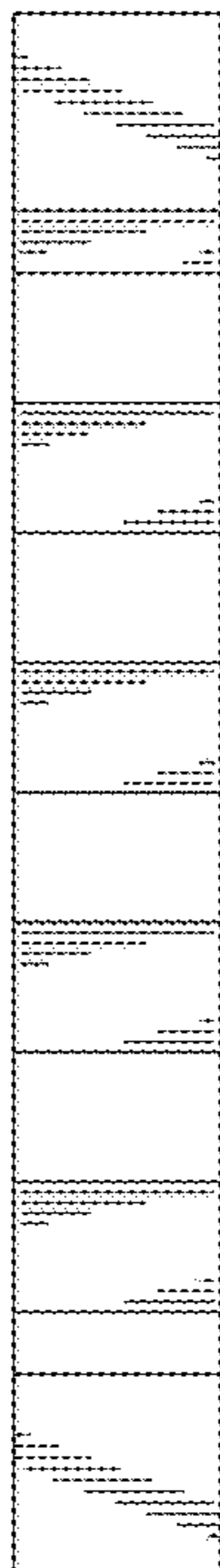


FIG. 5



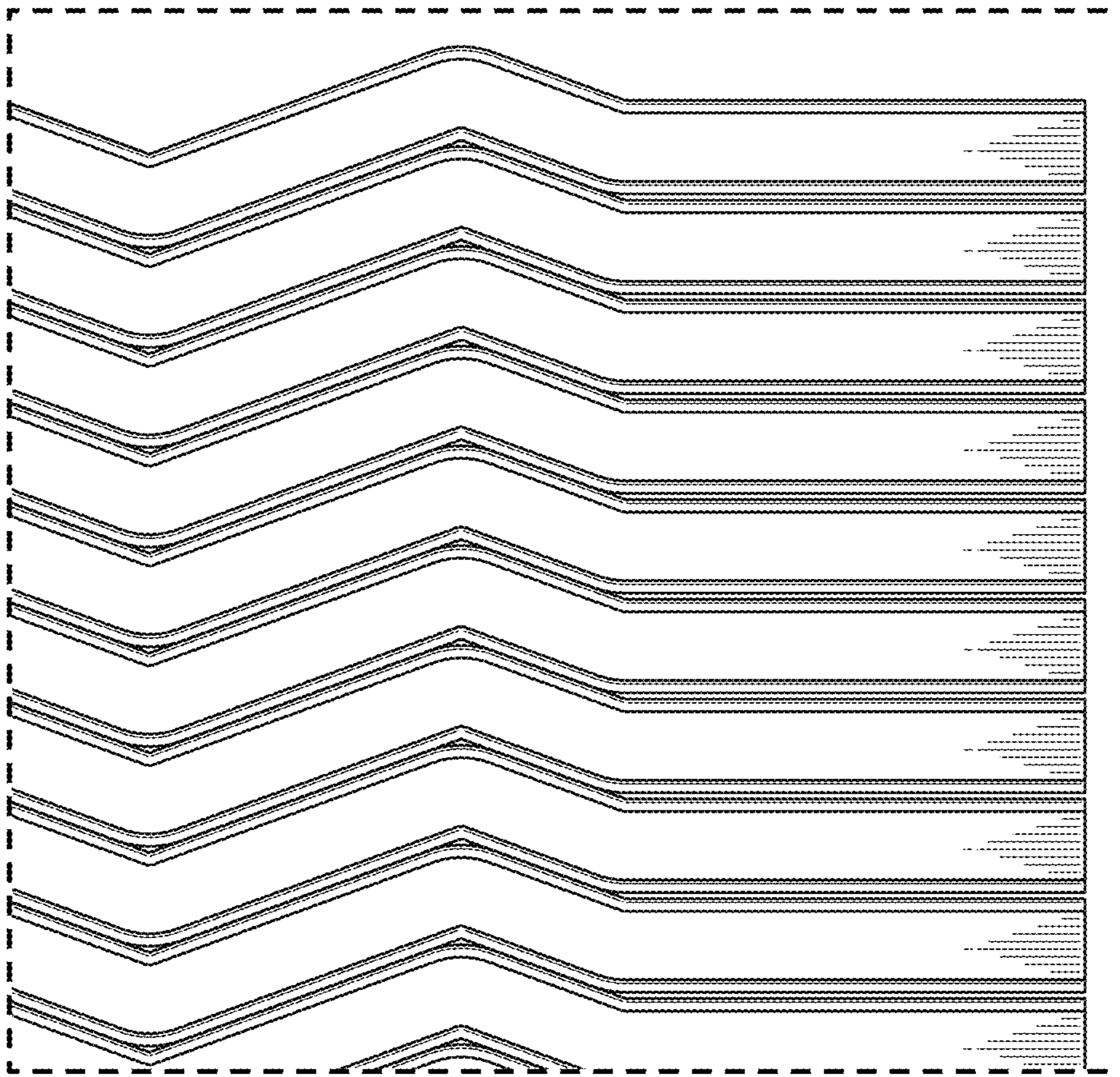


FIG. 6

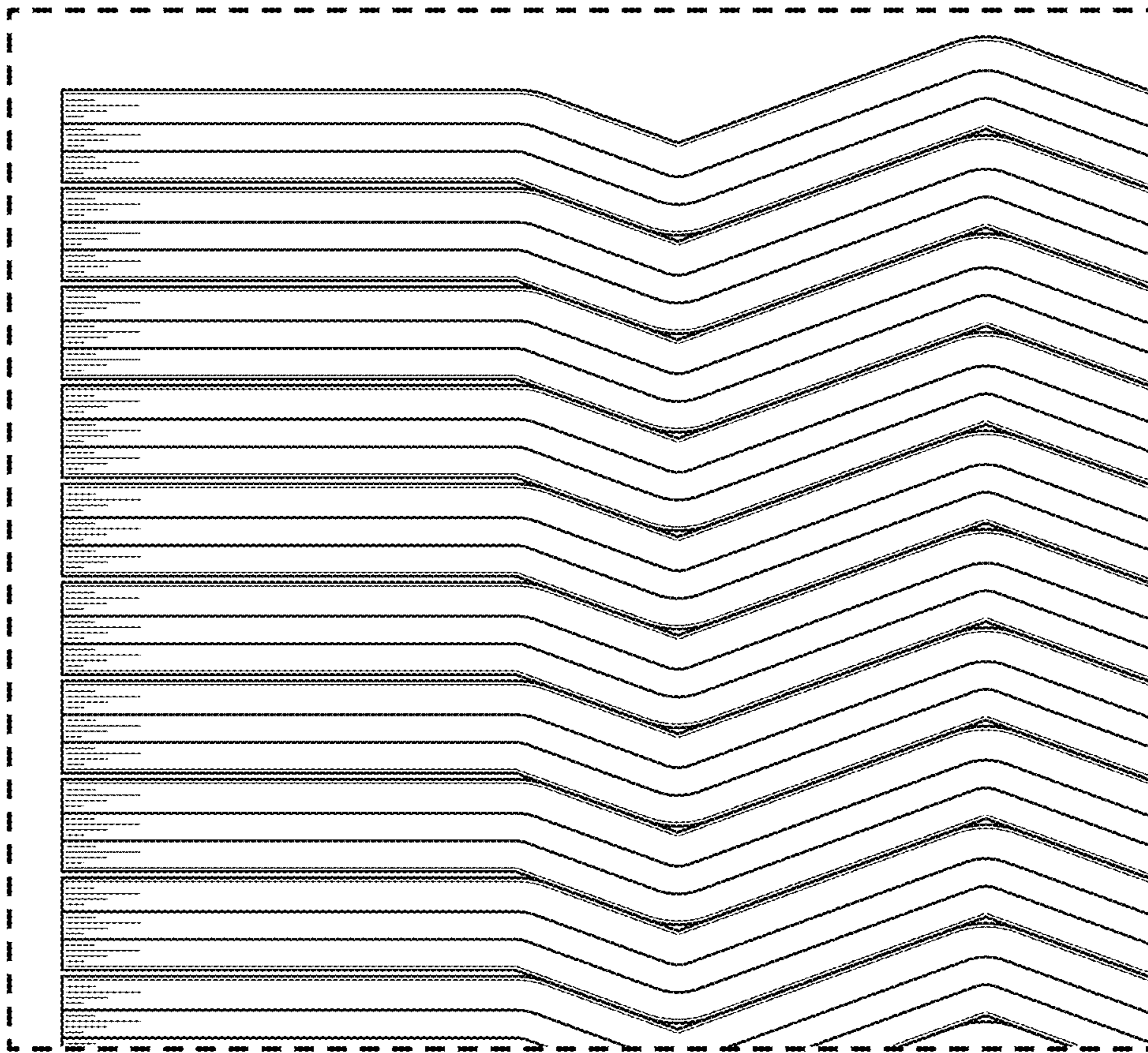


FIG. 7