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

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(54) **SHELL LINER**

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(52) **U.S. Cl.**
USPC **D15/141; D15/147**

(58) **Field of Classification Search**
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D15/141, 143, 145, 147, 199; D3/304,
D3/309
CPC B07B 13/003; B07B 13/075; B07B 1/24;
A01K 43/00
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

- D15,814 S * 2/1885 Essig D15/11
- D169,834 S * 6/1953 Bergmann D15/147
- 2,679,309 A * 5/1954 Reading A01K 43/00
198/446
- 3,428,161 A * 2/1969 Niederer A01K 43/00
198/445
- D214,024 S * 5/1969 Beaumont D15/13
- 3,610,400 A * 10/1971 Burkholder A01K 43/00
198/384
- D223,093 S * 3/1972 Cato 174/5 R

- D225,032 S * 10/1972 Gonsalves D15/147
 - D243,380 S * 2/1977 Berger D15/147
 - D248,078 S * 6/1978 Warnekros 141/98
 - 4,165,041 A * 8/1979 Larsen B02C 17/22
241/182
 - D256,243 S * 8/1980 Ryan D15/11
 - D256,244 S * 8/1980 Ryan D15/11
 - 4,235,386 A * 11/1980 Larsen B02C 17/22
241/182
 - D259,791 S * 7/1981 Davis, Jr. D15/147
 - D262,972 S * 2/1982 Ronck D15/11
- (Continued)

OTHER PUBLICATIONS

<http://www.aiaengineering.com/cement/cement-tmi-shell-liners.php>—Retrieved on Feb. 26, 2018.*

(Continued)

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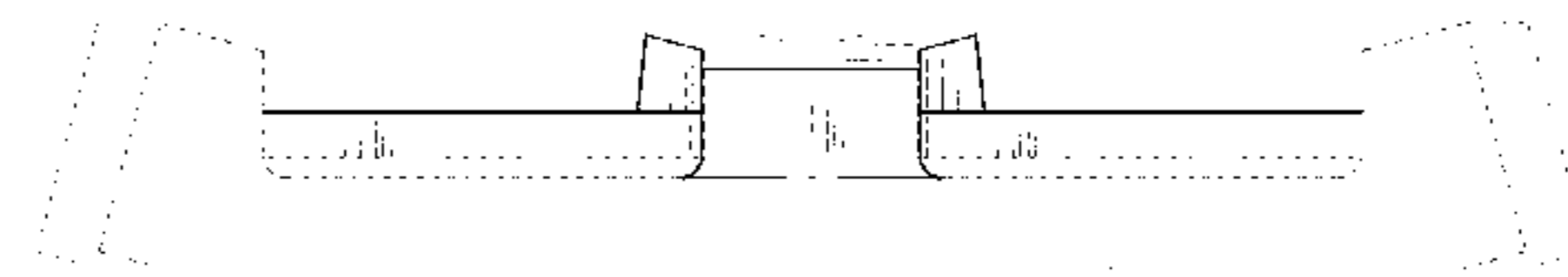
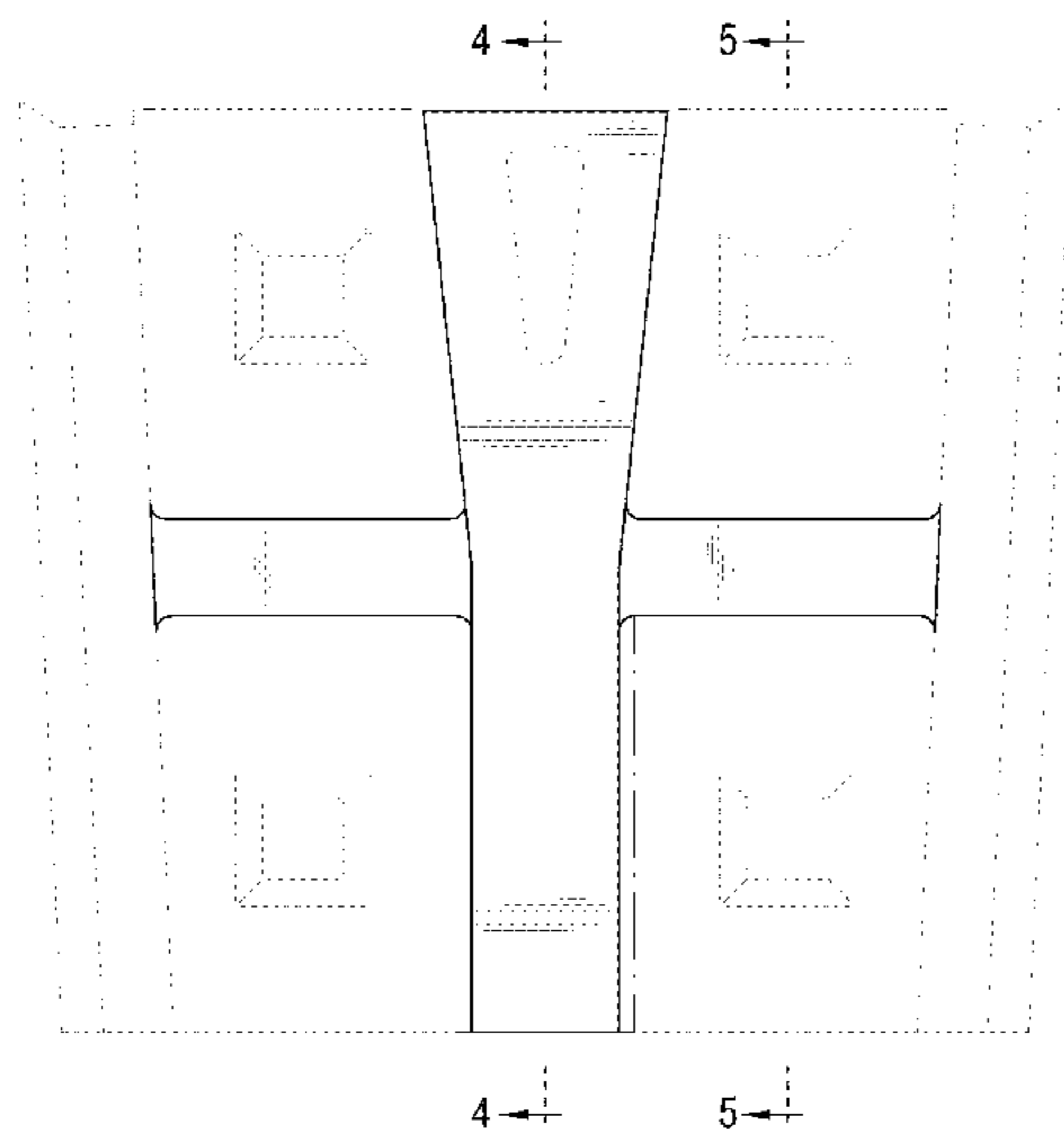
(57) **CLAIM**

The ornamental design for a shell liner, as shown and described.

DESCRIPTION

FIG. 1 is a front elevational view of the shell liner; FIG. 2 is a top plan view thereof; FIG. 3 is a bottom plan view thereof; FIG. 4 is a cross-sectional view thereof taken at line 4-4 in FIG. 1; and, FIG. 5 is a cross-sectional view thereof taken at line 5-5 in FIG. 1. The broken lines depict portions of the shell liner that is not claimed and the dot-dash chain line depicts a boundary of the claimed subject matter. The broken lines and dot-dash chain lines form no part of the claimed design.

1 Claim, 3 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

4,319,719 A * 3/1982 Larsen B02C 17/22
 241/183
 D273,085 S * 3/1984 Wetmore D15/28
 D273,237 S * 3/1984 Tippett D27/194
 D284,668 S * 7/1986 Salley Gordon D15/28
 D299,348 S * 1/1989 Nja D15/11
 D299,351 S * 1/1989 Edmisson D15/29
 4,800,875 A * 1/1989 Ray A61F 2/4601
 141/331
 D311,744 S * 10/1990 Misico D15/28
 D313,419 S * 1/1991 Edmisson D15/28
 D365,575 S * 12/1995 Geiser D15/28
 D374,281 S * 10/1996 Markles D24/122
 6,343,756 B1 * 2/2002 Weil B02C 17/22
 241/299
 D494,605 S * 8/2004 Calmer D15/28
 D566,731 S * 4/2008 Myers D15/17
 D567,823 S * 4/2008 Hagio D15/28
 RE42,029 E * 1/2011 Raterman D15/28
 D646,306 S * 10/2011 Bradley D15/28
 D675,287 S * 1/2013 Chastine D23/248
 D680,560 S * 4/2013 Fundakowski D15/28

D694,283 S * 11/2013 Shimozono D15/28
 D697,945 S * 1/2014 Healey D15/28
 D712,937 S * 9/2014 Wennerborn D15/28
 D727,982 S * 4/2015 Renski D15/28
 D736,266 S * 8/2015 Lundberg D15/11
 D748,681 S * 2/2016 Renski D15/28
 9,375,722 B2 * 6/2016 Fernandez B02C 17/225
 D802,036 S * 11/2017 Kesselman D15/145
 D810,149 S * 2/2018 Linde D15/28
 2003/0062772 A1 * 4/2003 Rasmussen B62D 55/26
 305/191
 2003/0118432 A1 * 6/2003 Lee B66C 23/64
 414/722
 2014/0224617 A1 * 8/2014 Kalkhoff A01K 43/00
 198/341.01

OTHER PUBLICATIONS

<http://www.ballmillrubberlining.net/rubber-shell-plate-liner-2457172.html>—Retrieved on Feb. 26, 2018.*
<http://www.ballmillrubberlining.net/shell-plate-rubber-liner-2457167.html>—Retrieved on Feb. 26, 2018.*

* cited by examiner

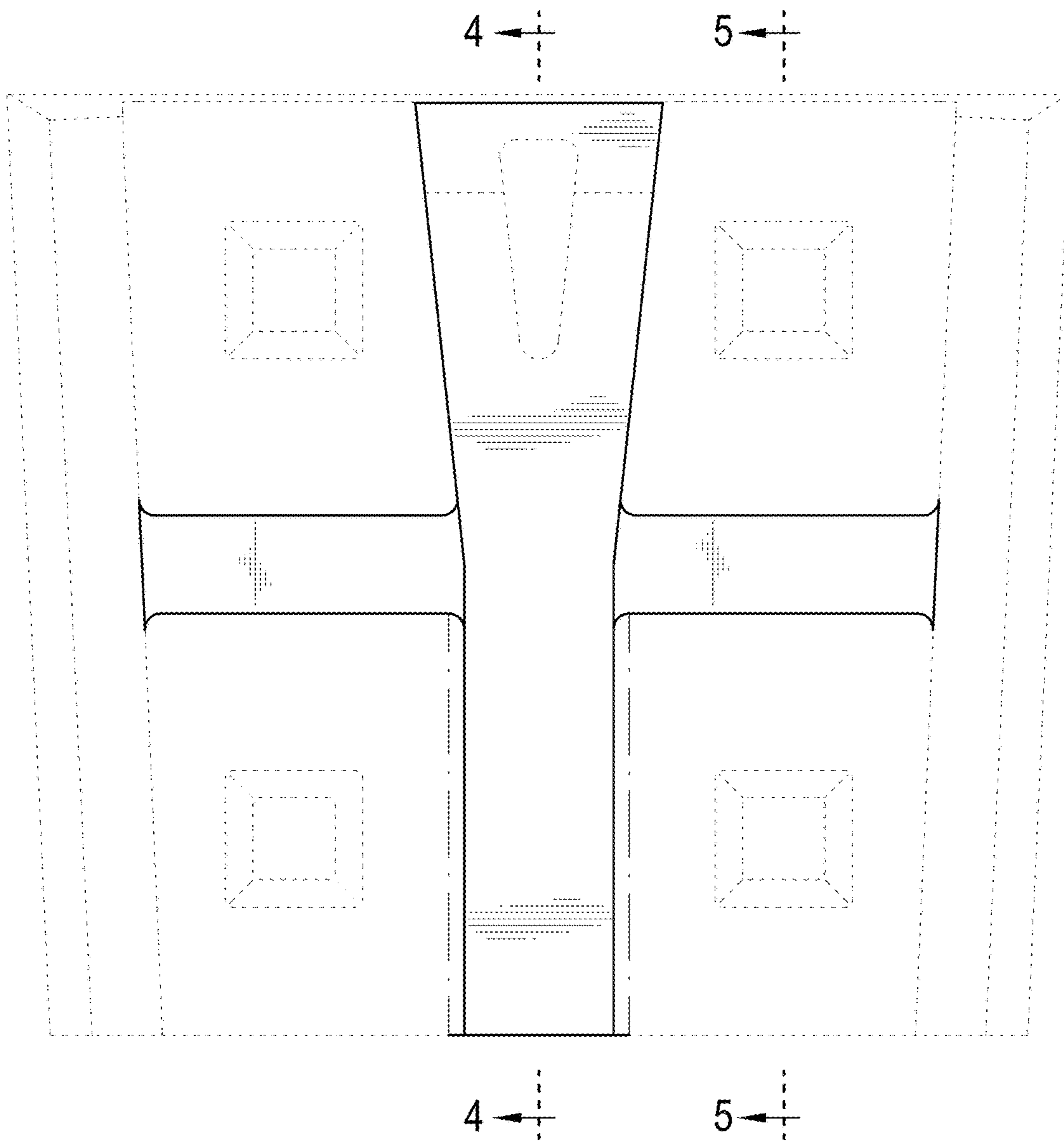


FIG. 1

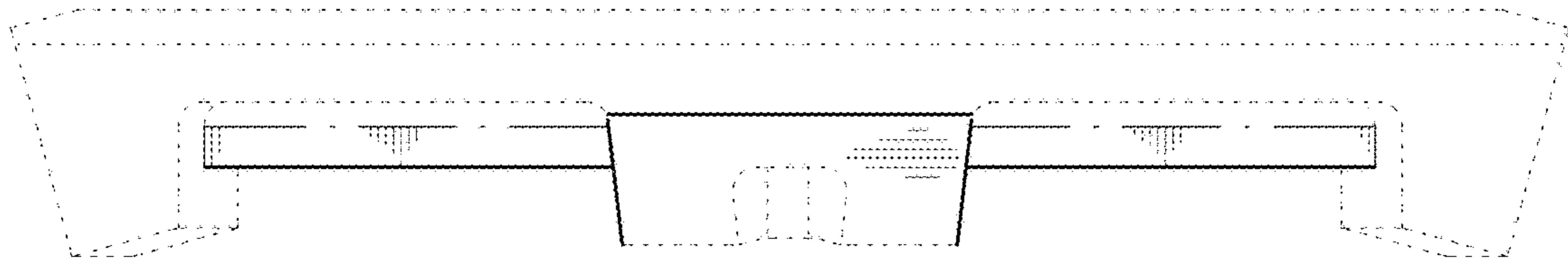


FIG. 2

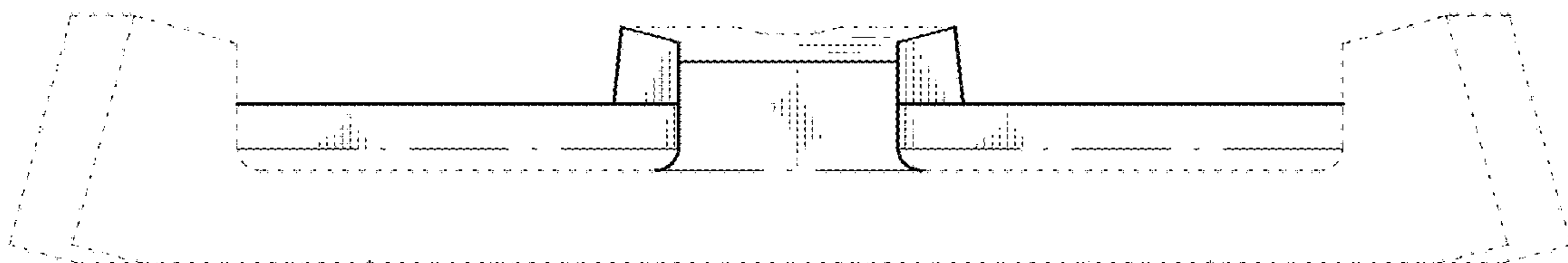


FIG. 3

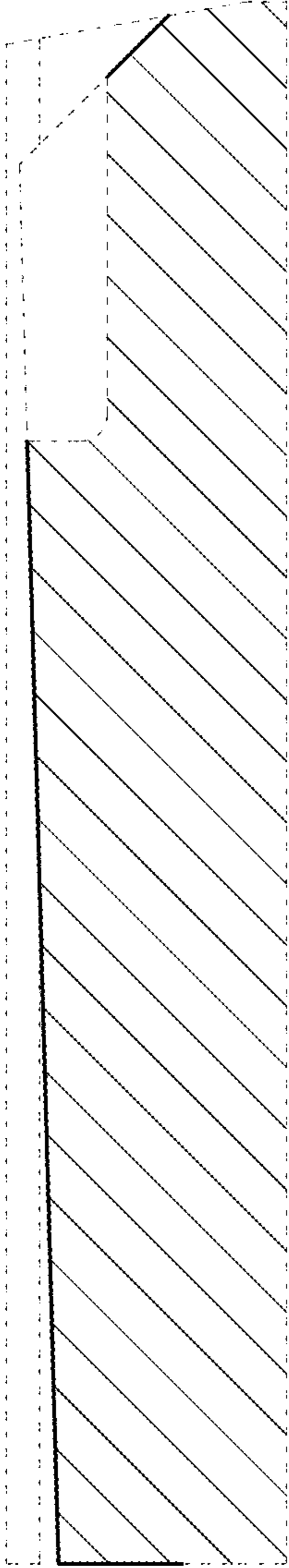


FIG. 4

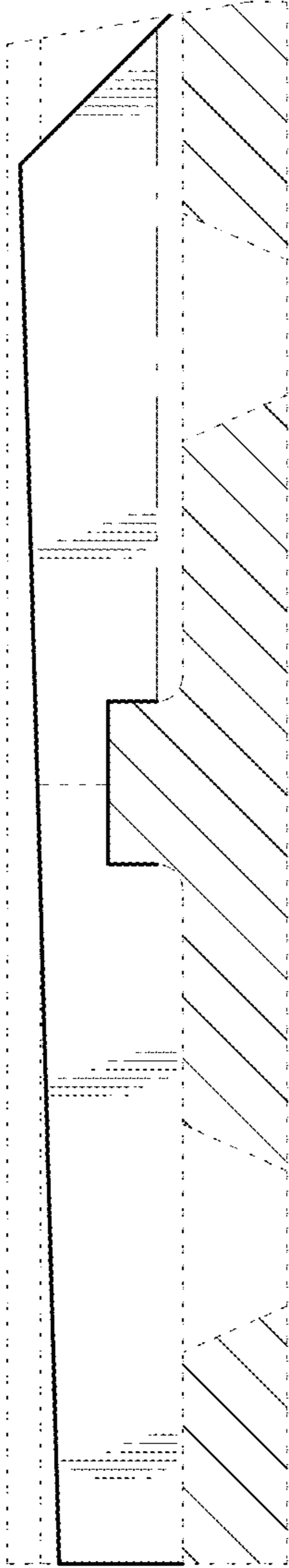


FIG. 5