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(12) **United States Design Patent** (10) **Patent No.:** **US D826,185 S**
Kosugi et al. (45) **Date of Patent:** **** Aug. 21, 2018**

(54) **CEILING HEATER FOR SUBSTRATE PROCESSING APPARATUS**

(71) Applicant: **Hitachi Kokusai Electric Inc.**, Tokyo (JP)

(72) Inventors: **Tetsuya Kosugi**, Toyama (JP);
Takatomo Yamaguchi, Toyama (JP);
Shuhei Saido, Toyama (JP)

(73) Assignee: **HITACHI KOKUSAI ELECTRIC INC.**, Tokyo (JP)

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

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(30) **Foreign Application Priority Data**

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(51) **LOC (11) Cl.** **13-03**

(52) **U.S. Cl.**
USPC **D13/182**

(58) **Field of Classification Search**
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D15/140, 144.1
CPC H01L 21/67011; H01L 21/67098; H01L
21/67103; H01L 21/67109; H01L
21/67115

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

D176,456 S * 12/1955 Glynn D23/417
6,653,603 B2 * 11/2003 Yamaguchi H01L 21/67103
118/724
D601,521 S * 10/2009 Komatsu D13/182
D649,126 S * 11/2011 Takahashi D13/182
9,719,629 B2 * 8/2017 Boguslavskiy F16M 13/02
D797,690 S * 9/2017 Furutani D13/182

D798,250 S * 9/2017 Furutani D13/182
2003/0183614 A1 * 10/2003 Yamaguchi C30B 31/10
219/390
2004/0149719 A1 * 8/2004 Nakamura H01L 21/67103
219/444.1
2005/0072716 A1 * 4/2005 Quiles H01L 21/67109
206/710

(Continued)

FOREIGN PATENT DOCUMENTS

JP 2013004891 A * 1/2013 B01D 46/10

OTHER PUBLICATIONS

EC21 Inc. <URL: https://diamondhrichard.en.ec21.com/Duplex_Winding_Infrared_Coil_Ceramic--5521314_8834245.html> Visited Feb. 28, 2018. Duplex Winding Infrared Coil/Ceramic Cooker/ Heating Plate/Radiant Element/Hob.*

(Continued)

Primary Examiner — Thomas Johannes

Assistant Examiner — Lauren McVey

(74) *Attorney, Agent, or Firm* — Fitch, Even, Tabin & Flannery, LLP

(57) **CLAIM**

We claim the ornamental design for a ceiling heater for substrate processing apparatus, as shown and described.

DESCRIPTION

FIG. 1 is a front, bottom and right side perspective view of a ceiling heater for substrate processing apparatus showing our new design;

FIG. 2 is a front elevational view thereof;

FIG. 3 is a left side elevational view thereof;

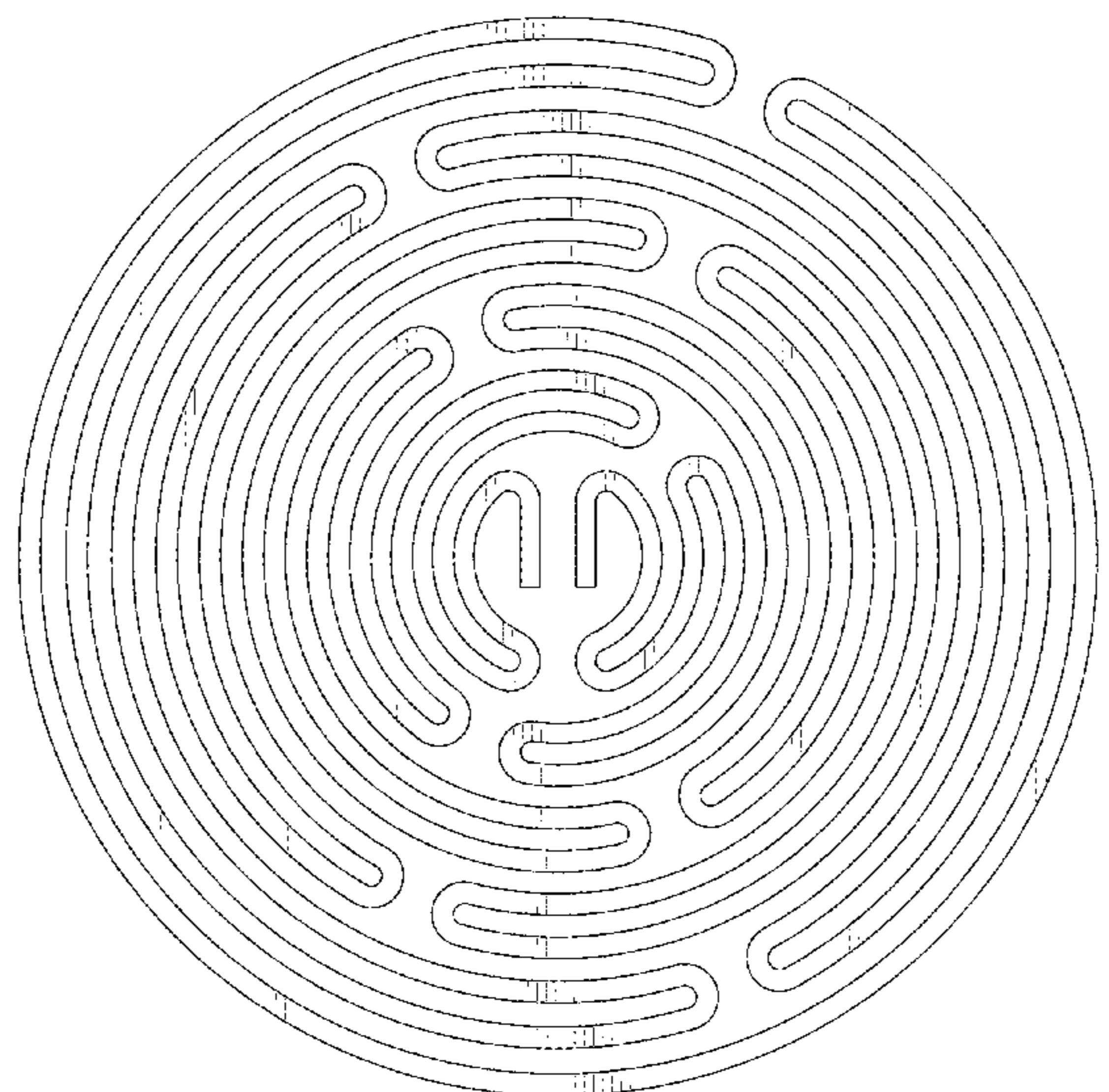
FIG. 4 is a right side elevational view thereof;

FIG. 5 is a top plan view thereof;

FIG. 6 is a bottom plan view thereof; and,

FIG. 7 is a rear elevational view thereof.

1 Claim, 4 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

2006/0130763 A1* 6/2006 Emerson C23C 16/46
118/725
2007/0095289 A1* 5/2007 Arami F27B 5/04
118/725
2014/0021673 A1* 1/2014 Chen F28D 15/00
269/289 R

OTHER PUBLICATIONS

Modello designs. <URL: <https://www.modellocustomstencils.com/collections/medallion-stencils>> Visited Feb. 28, 2018. Medallion Stencils.*

* cited by examiner

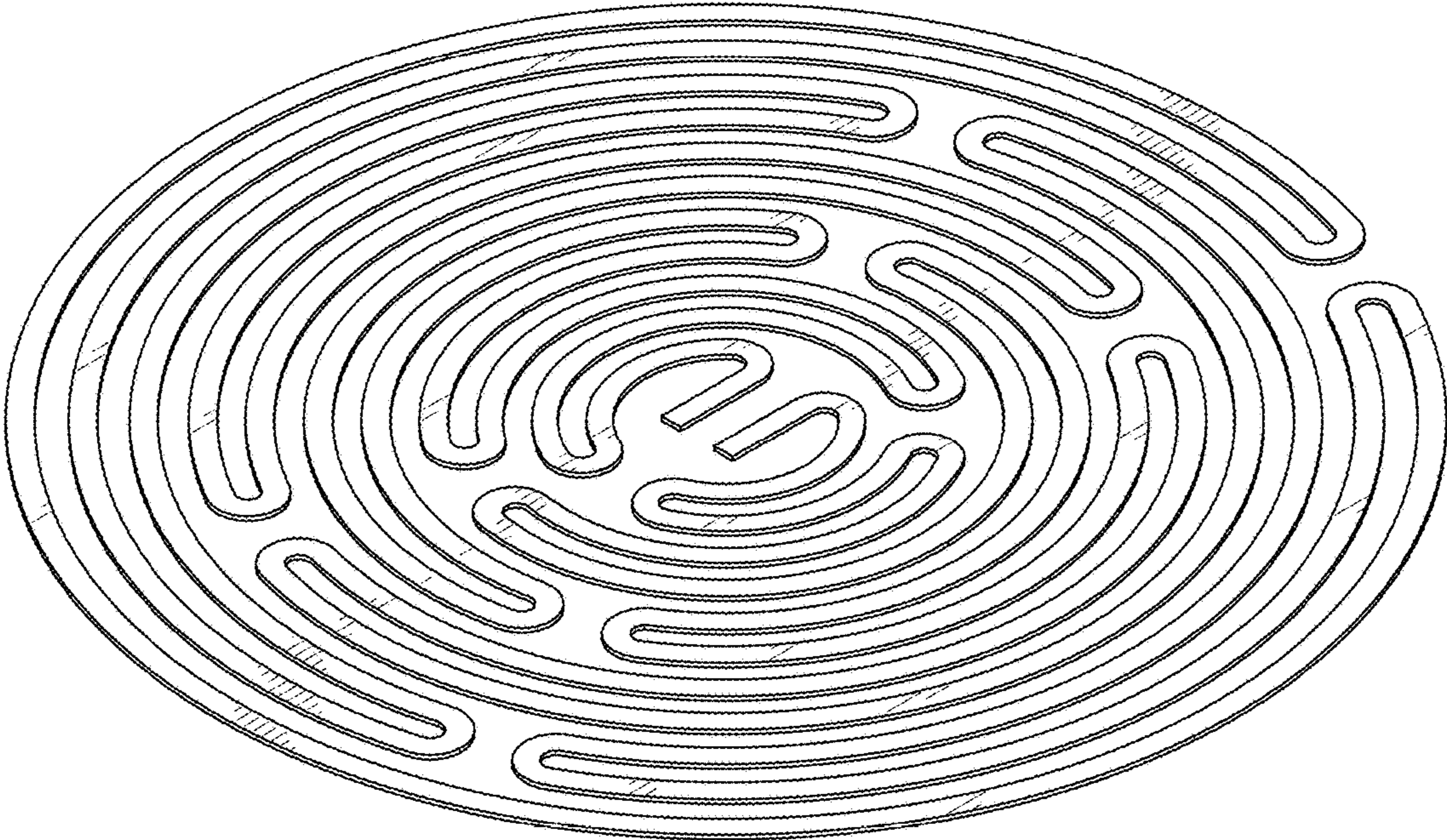


FIG. 1

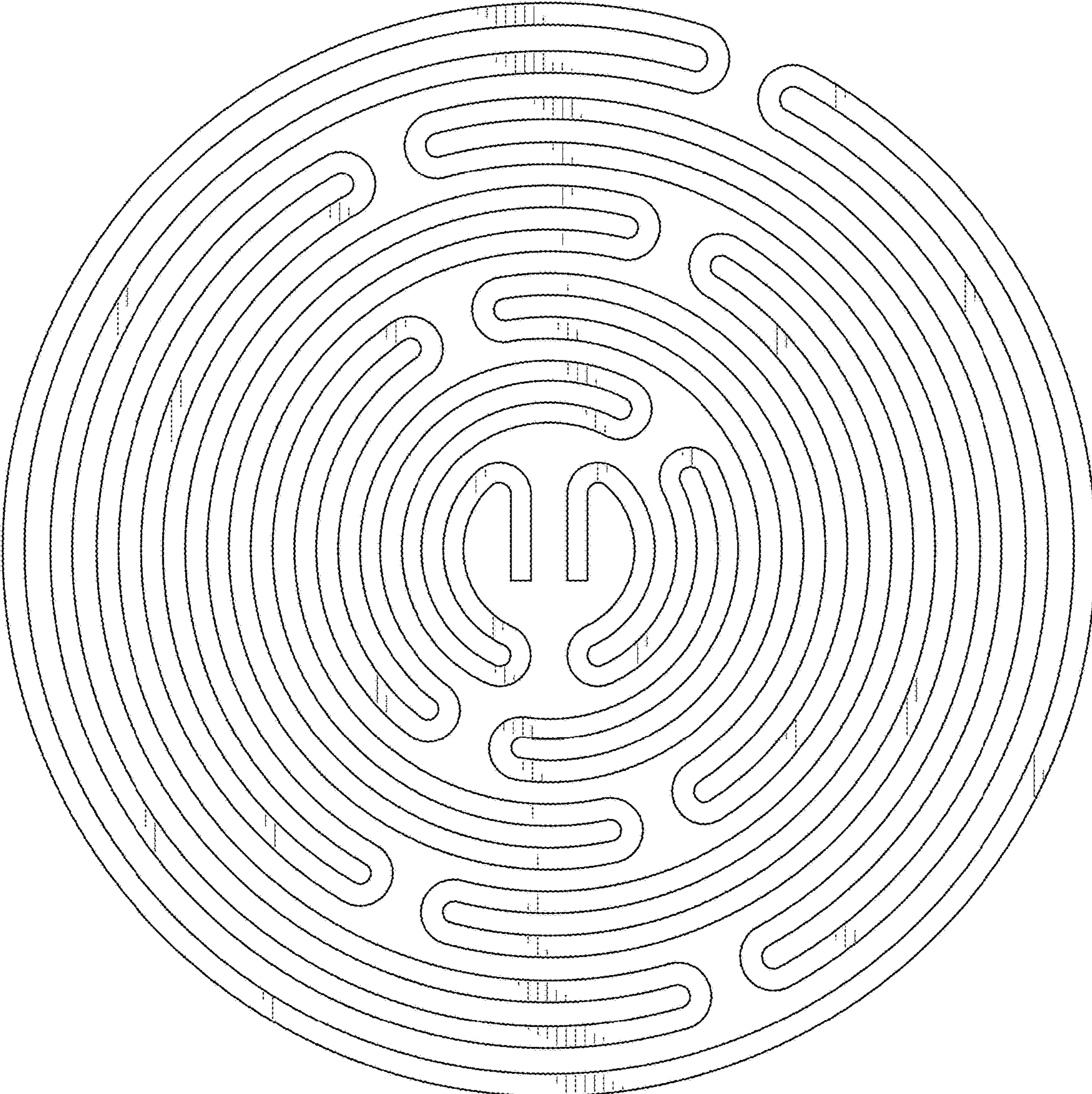


FIG. 2



FIG. 3



FIG. 4

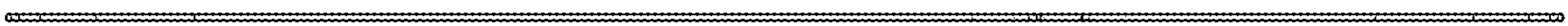


FIG. 5

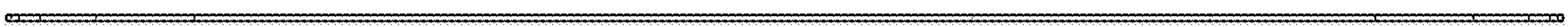


FIG. 6

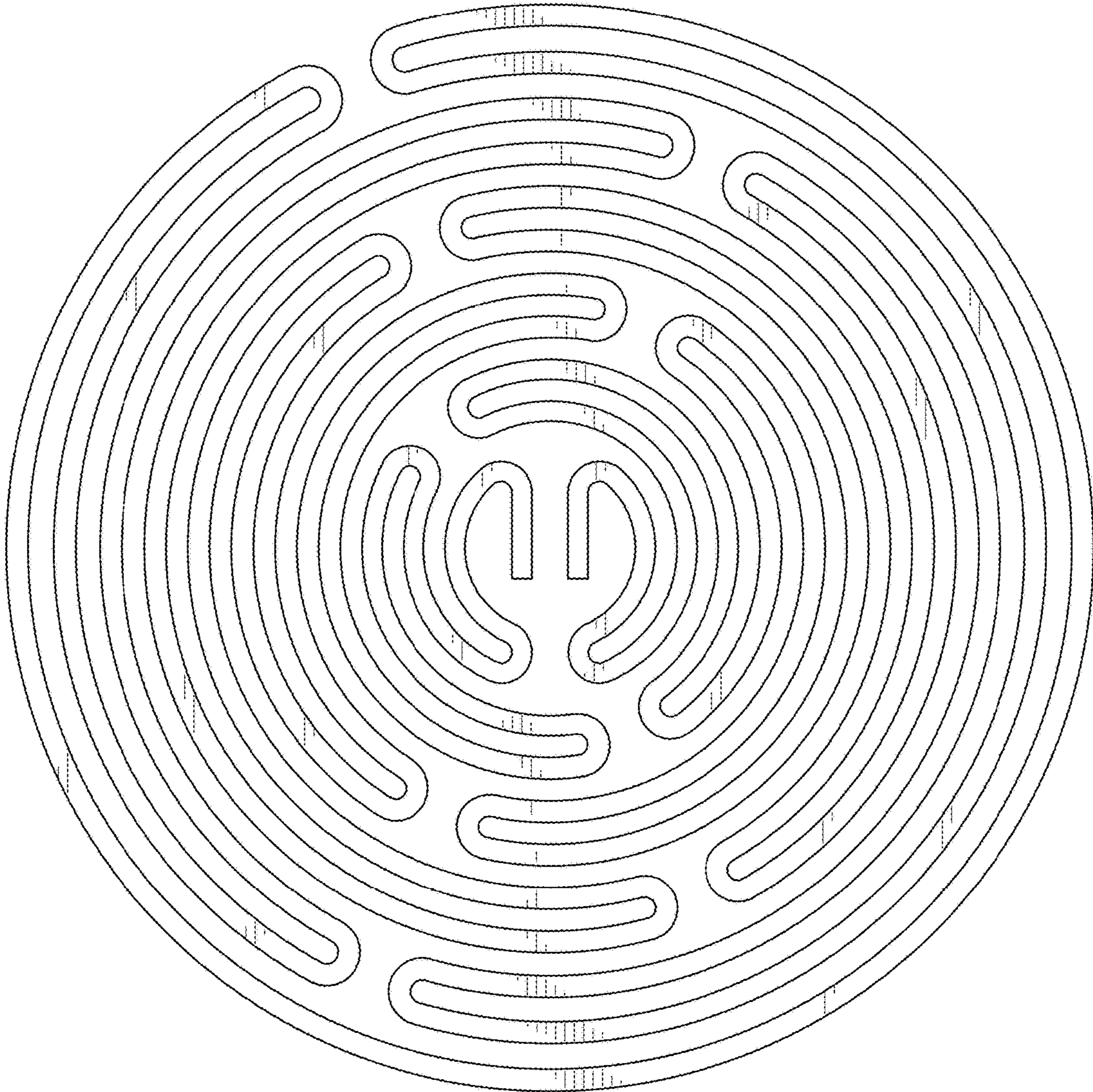


FIG. 7