



US00D874446S

(12) **United States Design Patent** (10) **Patent No.:** **US D874,446 S**
He et al. (45) **Date of Patent:** **** Feb. 4, 2020**

(54) **ANTENNA**
(71) Applicant: **Airgain Incorporated**, San Diego, CA (US)
(72) Inventors: **Ziming He**, Irvine, CA (US); **Bei Zheng**, Zhang Jia Gang (CN)
(73) Assignee: **Airgain Incorporated**, San Diego, CA (US)

D608,769 S 1/2010 Bufe
D612,368 S 3/2010 Yang et al.
7,705,783 B2 4/2010 Rao et al.
7,729,662 B2 6/2010 Abramov et al.
D621,819 S 8/2010 Tsai et al.
7,843,390 B2 11/2010 Liu
D633,483 S 3/2011 Su et al.
(Continued)

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

FOREIGN PATENT DOCUMENTS

CN 303453728 * 11/2015

(21) Appl. No.: **29/644,392**

OTHER PUBLICATIONS

(22) Filed: **Apr. 17, 2018**

Planar dipole antenna on a dielectric substrate. [https://www.researchgate.net/figure/Planar-dipole-antenna-on-a-dielectric-substrate_fig1_...site](https://www.researchgate.net/figure/Planar-dipole-antenna-on-a-dielectric-substrate_fig1_...) visited Sep. 21, 2019 (Year: 2019).*

(51) **LOC (12) Cl.** **14-03**

(52) **U.S. Cl.**
USPC **D14/230**

(Continued)

(58) **Field of Classification Search**
USPC D14/230, 232-236
CPC .. H01Q 1/24; H01Q 1/22; H01Q 1/38; H01Q 9/28; H01Q 1/12

Primary Examiner — Lilyana Bekic
Assistant Examiner — John R Yeh
(74) *Attorney, Agent, or Firm* — Clause Eight IPS; Michael Catania

See application file for complete search history.

(57) **CLAIM**

(56) **References Cited**

The ornamental design for an antenna, as shown and described.

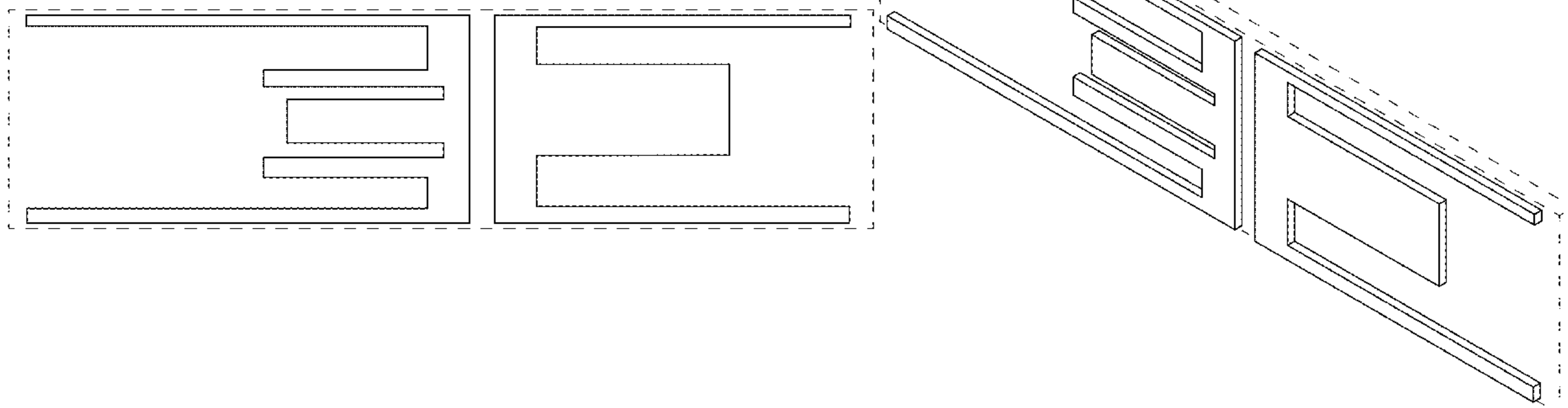
U.S. PATENT DOCUMENTS

DESCRIPTION

7,061,437 B2 6/2006 Lin et al.
7,148,849 B2 12/2006 Lin
7,215,296 B2 5/2007 Abramov et al.
D546,821 S 7/2007 Oliver
D549,696 S 8/2007 Oshima et al.
7,333,067 B2 2/2008 Hung et al.
7,336,959 B2 2/2008 Khitrik et al.
D573,589 S 7/2008 Montgomery et al.
7,405,704 B1 8/2008 Lin et al.
D578,114 S * 10/2008 Oliver D14/230
7,477,195 B2 1/2009 Vance
D592,195 S 5/2009 Wu et al.
7,570,215 B2 8/2009 Abramov et al.
D599,334 S 9/2009 Chiang
D606,053 S 12/2009 Wu et al.
D607,442 S 1/2010 Su et al.

FIG. 1 is a top plan view of an antenna, showing our new design;
FIG. 2 is an enlarged right side elevation view thereof;
FIG. 3 is an enlarged left side elevation view thereof;
FIG. 4 is a front elevation view thereof;
FIG. 5 is a rear elevation view thereof;
FIG. 6 is a bottom plan view thereof; and,
FIG. 7 is a top perspective view thereof.
The broken lines in the drawings depict environment only and form no part of the claimed design.

1 Claim, 6 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

D635,127 S 3/2011 Tsai et al.
 7,907,971 B2 3/2011 Salo et al.
 D635,560 S 4/2011 Tsai et al.
 D635,963 S 4/2011 Podduturi
 D635,964 S 4/2011 Podduturi
 D635,965 S 4/2011 Mi et al.
 D636,382 S 4/2011 Podduturi
 7,965,242 B2 6/2011 Abramov et al.
 D649,962 S 12/2011 Tseng et al.
 D650,370 S * 12/2011 Huang D14/230
 D651,198 S 12/2011 Mi et al.
 D654,059 S 2/2012 Mi et al.
 D654,060 S 2/2012 Ko et al.
 D658,639 S 5/2012 Huang et al.
 D659,129 S 5/2012 Mi et al.
 D659,685 S 5/2012 Huang et al.
 D659,688 S 5/2012 Huang et al.
 8,175,036 B2 5/2012 Visuri et al.
 8,184,601 B2 5/2012 Abramov et al.
 D662,916 S 7/2012 Huang et al.
 8,248,970 B2 8/2012 Abramov et al.
 D671,097 S 11/2012 Mi et al.
 8,310,402 B2 11/2012 Yang
 D676,429 S 2/2013 Gosalia et al.
 D678,255 S 3/2013 Ko et al.
 8,423,084 B2 4/2013 Abramov et al.
 D684,565 S 6/2013 Wei
 D685,352 S 7/2013 Wei
 D685,772 S 7/2013 Zheng et al.
 D686,600 S 7/2013 Yang
 D689,474 S 9/2013 Yang et al.
 D692,870 S 11/2013 He
 D694,738 S 12/2013 Yang
 D695,279 S 12/2013 Yang et al.
 D695,280 S 12/2013 Yang et al.
 D703,195 S 4/2014 Zheng
 D703,196 S 4/2014 Zheng
 D706,247 S 6/2014 Zheng et al.
 D706,750 S 6/2014 Bringuir
 D706,751 S 6/2014 Chang et al.
 D708,602 S 7/2014 Gosalia et al.
 D709,053 S 7/2014 Chang et al.
 D710,339 S * 8/2014 Bishop D14/230
 D710,832 S 8/2014 Yang
 D710,833 S 8/2014 Zheng et al.
 8,854,265 B1 10/2014 Yang et al.
 D716,775 S 11/2014 Bidermann
 8,928,537 B2 * 1/2015 Kerselaers H01Q 1/3275
 343/700 MS
 D787,476 S * 5/2017 Lee D14/218
 D802,563 S * 11/2017 Manivannan D14/230
 D803,194 S * 11/2017 Yang D14/230
 D823,838 S * 7/2018 Gosalia D14/230
 10,020,566 B2 * 7/2018 Baek H01Q 1/3275
 10,069,199 B2 * 9/2018 Chen H01Q 1/38

10,224,630 B2 * 3/2019 Ielci H01Q 1/243
 10,270,170 B2 * 4/2019 Foster H01Q 7/00
 D856,983 S * 8/2019 Zheng D14/230
 D859,374 S * 9/2019 He D14/230
 D864,926 S * 10/2019 Chen D14/230
 2002/0003499 A1 1/2002 Kouam et al.
 2003/0184492 A1 * 10/2003 Chiang H01Q 1/2258
 343/833
 2004/0108957 A1 * 6/2004 Umehara H01Q 1/243
 343/700 MS
 2004/0183727 A1 * 9/2004 Choi H01Q 1/22
 343/700 MS
 2004/0183728 A1 * 9/2004 Zinanti H01Q 1/085
 343/700 MS
 2004/0222936 A1 11/2004 Hung et al.
 2005/0073462 A1 4/2005 Lin et al.
 2005/0190108 A1 9/2005 Lin et al.
 2006/0055610 A1 * 3/2006 Borisov H01P 1/203
 343/719
 2006/0208900 A1 9/2006 Tavassoli Hozouri
 2006/0214857 A1 * 9/2006 Ollikainen H01Q 1/243
 343/702
 2007/0030203 A1 2/2007 Tsai et al.
 2007/0040028 A1 * 2/2007 Kawamata G06K 19/07749
 235/435
 2007/0290928 A1 * 12/2007 Chang G06K 19/07786
 343/700 MS
 2008/0068276 A1 * 3/2008 Noro H01Q 1/243
 343/791
 2008/0143630 A1 * 6/2008 Kato G06K 19/07749
 343/795
 2008/0150829 A1 6/2008 Lin et al.
 2009/0002244 A1 1/2009 Woo
 2009/0058739 A1 3/2009 Konishi
 2009/0135072 A1 5/2009 Ke et al.
 2009/0262028 A1 10/2009 Murnbru et al.
 2010/0188297 A1 7/2010 Chen et al.
 2010/0309067 A1 12/2010 Tsou et al.
 2011/0006950 A1 1/2011 Park et al.
 2011/0095949 A1 * 4/2011 Wong H01Q 1/243
 343/702
 2011/0128200 A1 * 6/2011 Hossain H01Q 7/00
 343/745
 2012/0038514 A1 2/2012 Bang
 2012/0223862 A1 * 9/2012 Kerselaers H01Q 1/3275
 343/700 MS
 2012/0229348 A1 9/2012 Chiang
 2012/0242546 A1 9/2012 Hu et al.

OTHER PUBLICATIONS

Airgain | Embedded Antennas, website 2019, <http://www.airgain.com/products/embedded-antennas/>, site visited Sep. 23, 2019 (Year: 2019).*

* cited by examiner

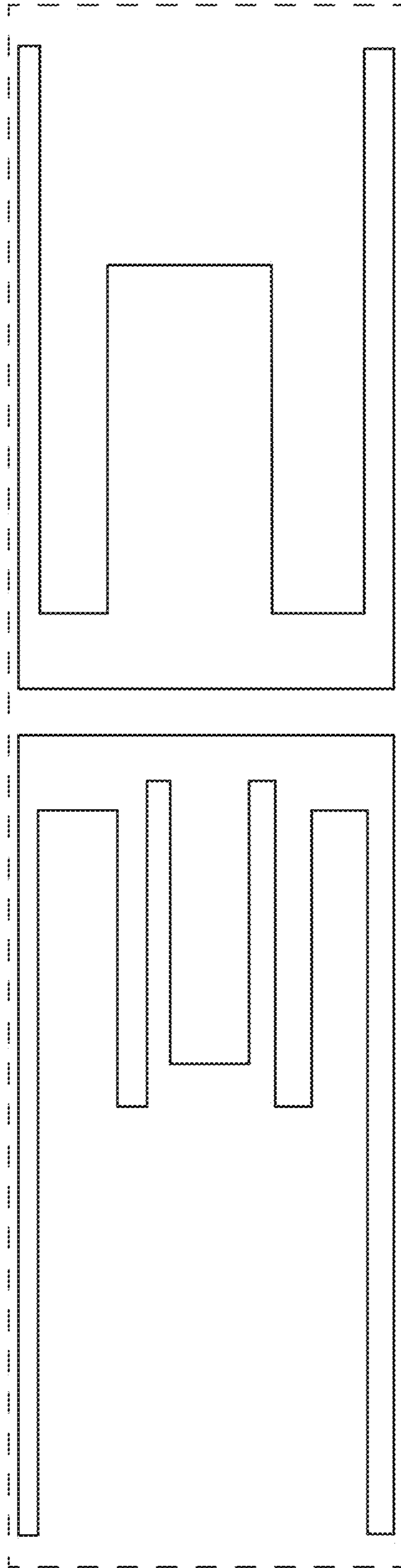


FIG. 1

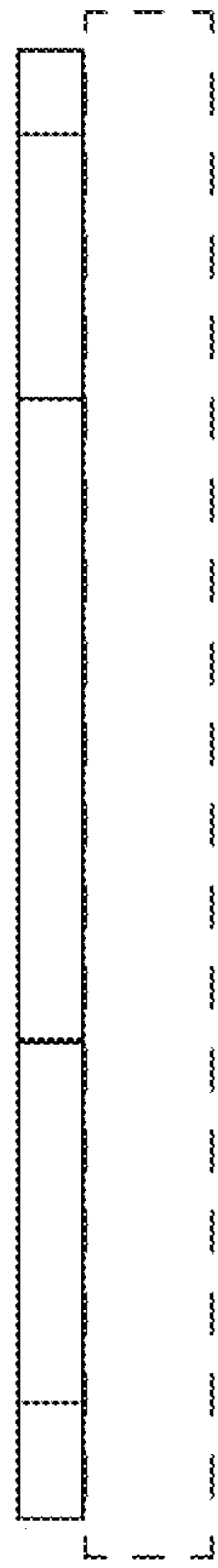


FIG. 2

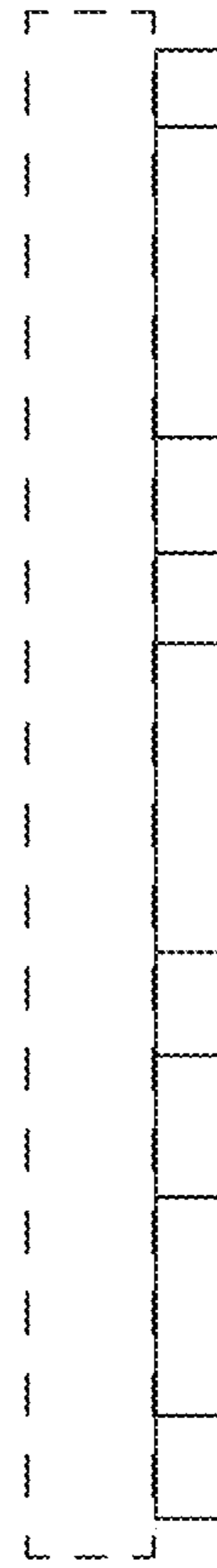


FIG. 3

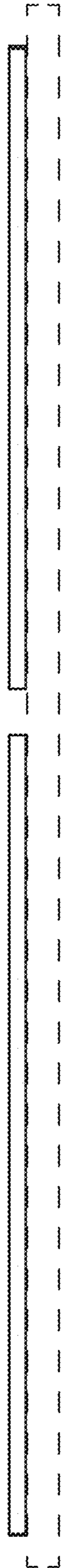


FIG. 4

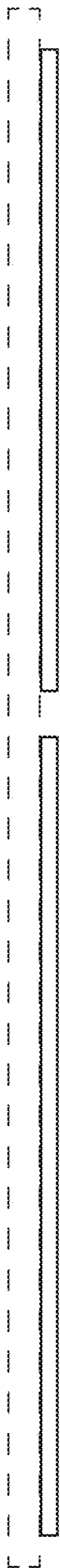


FIG. 5

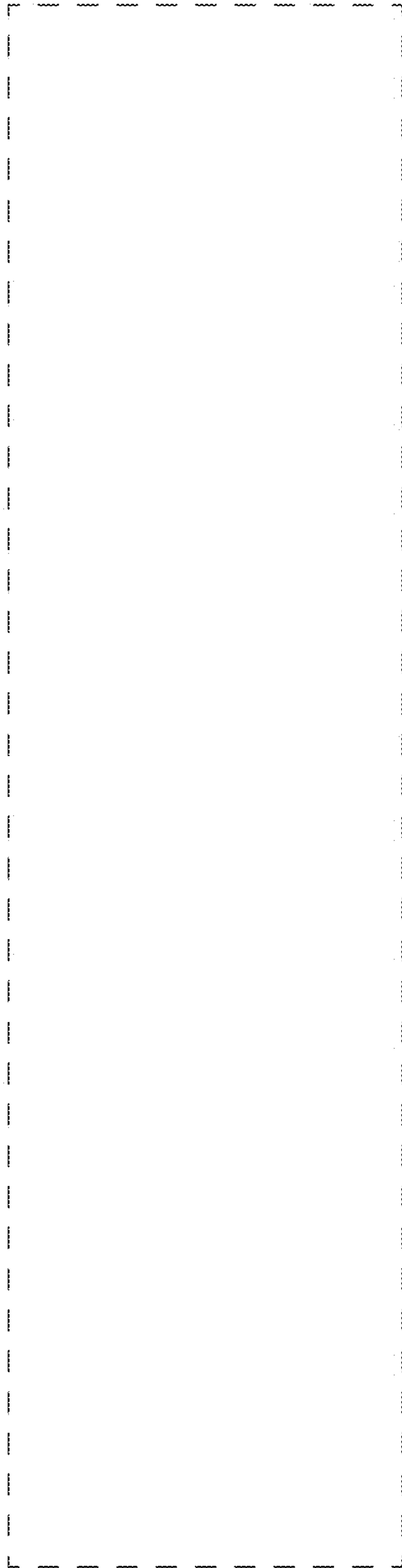


FIG. 6

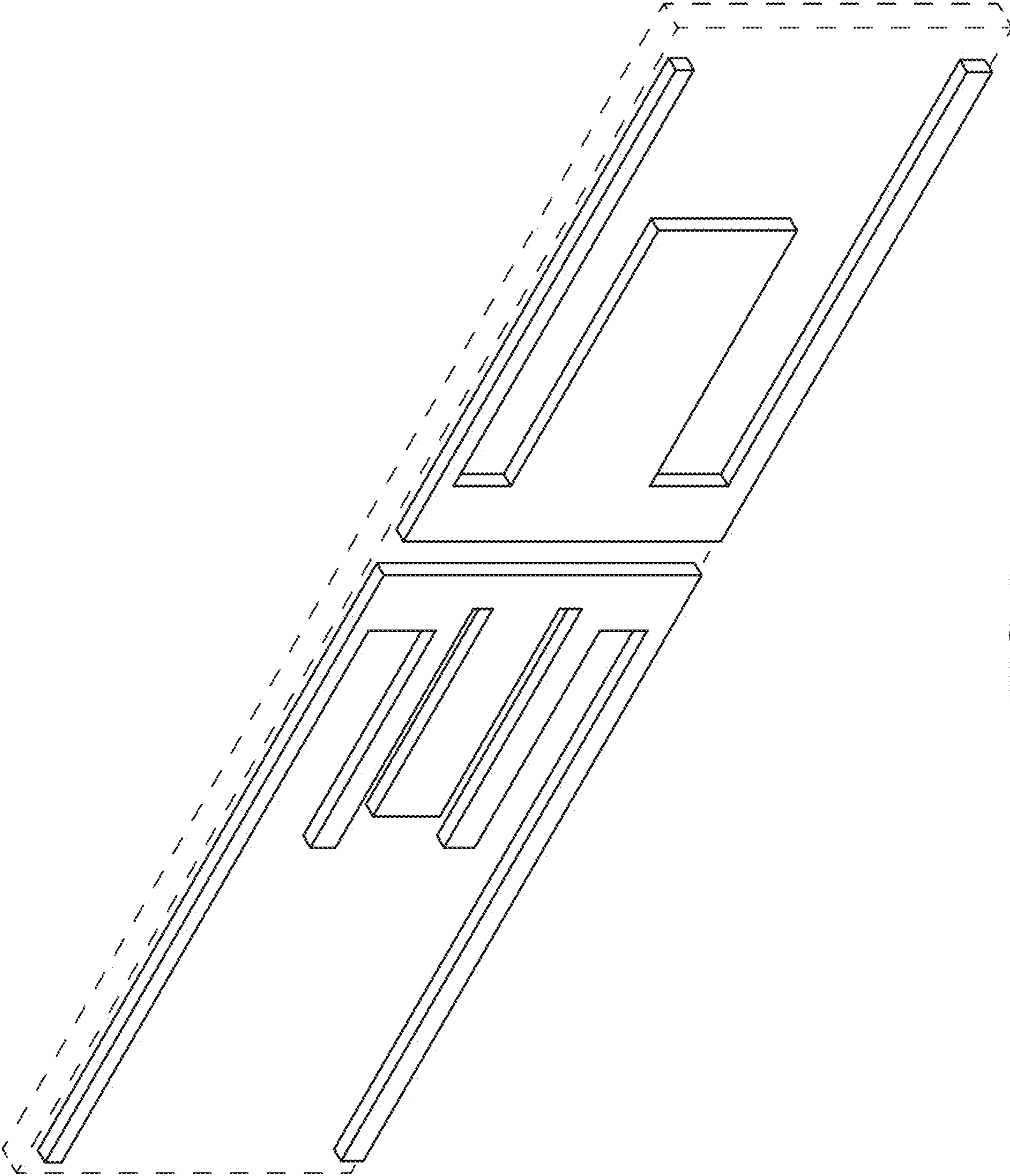


FIG. 7