US00D803799S

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

(10) **Patent No.: US D803,799 S**
(45) **Date of Patent: ** Nov. 28, 2017**

(54) **LEAD FRAME**

(71) Applicant: **Kabushiki Kaisha Toshiba**, Minato-ku, Tokyo (JP)

(72) Inventor: **Atsushi Takeshita**, Kitakyusyu Fukuoka (JP)

(73) Assignee: **Kabushiki Kaisha Toshiba**, Tokyo (JP)

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

(21) Appl. No.: **29/543,043**

(22) Filed: **Oct. 20, 2015**

(30) **Foreign Application Priority Data**

Apr. 20, 2015 (JP) 2015-008835

(51) **LOC (10) Cl.** **13-03**
(52) **U.S. Cl.**
USPC **D13/182**
(58) **Field of Classification Search**
USPC D13/118, 123, 133, 154, 173, 180, 182, D13/184, 199; D14/230, 233
(Continued)

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,316,821 B1 * 11/2001 Chang H01L 21/565 257/666
6,409,775 B1 * 6/2002 Tasei H01G 9/012 264/272.18

(Continued)

FOREIGN PATENT DOCUMENTS

CN 201230027175.3 * 10/2012
JP 1038773 S 5/1999

(Continued)

OTHER PUBLICATIONS

Excel Cell Electronic Co., dated Dec. 29, 2014, [online], [site visited Mar. 31, 2017]. Available from Internet, <URL:http://www.ece.com.tw/product.php>.*

Primary Examiner — Thomas Johannes
Assistant Examiner — Shawn T Gingrich
(74) *Attorney, Agent, or Firm* — Jeffri Kaminski; Venable LLP

(57) **CLAIM**

The ornamental design for a lead frame, as shown and described.

DESCRIPTION

FIG. **1** is a front, top and right side perspective view of a lead frame, showing my new design;
FIG. **2** is a front view thereof;
FIG. **3** is a top view thereof;
FIG. **4** is a bottom view thereof;
FIG. **5** is a right side view thereof, the opposite side being symmetrical;
FIG. **6** is a rear view thereof;
FIG. **7** is an enlarged view thereof taken along line **7-7** in FIG. **4**;
FIG. **8** is an enlarged end view thereof taken along line **8-8** in FIG. **2**;
FIG. **9** is an enlarged end view thereof taken along line **9-9** in FIG. **2**;
FIG. **10** is an enlarged fragmented view thereof taken along line **10** in FIG. **2**;
FIG. **11** is an end view thereof taken along line **11-11** in FIG. **10**;
FIG. **12** is an end view thereof taken along line **12-12** in FIG. **10**;
FIG. **13** is an end view thereof taken along line **13-13** in FIG. **10**;
FIG. **14** is an end view thereof taken along line **14-14** in FIG. **10**;
FIG. **15** is an end view thereof taken along line **15-15** in FIG. **10**;
FIG. **16** is an end view thereof taken along line **16-16** in FIG. **10**;
FIG. **17** is an end view thereof taken along line **17-17** in FIG. **10**;
FIG. **18** is an end view thereof taken along line **18-18** in FIG. **10**;

(Continued)

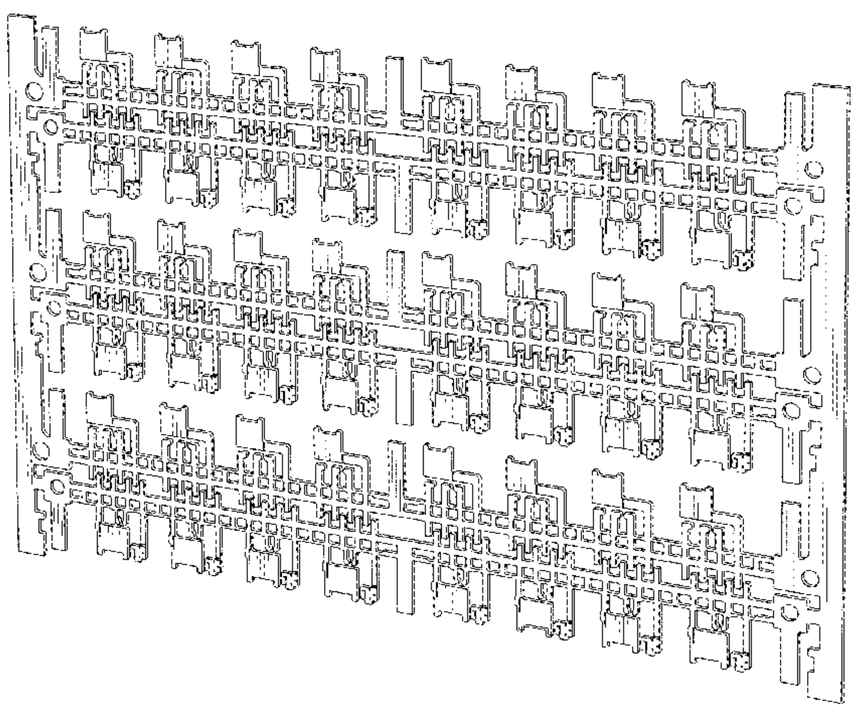


FIG. **19** is an end view thereof taken along line **19-19** in FIG. **10**; and,
FIG. **20** is an end view thereof taken along line **20-20** in FIG. **10**.
The broken lines in FIG. **2** labeled as "**10**" are included to indicate the point at which the magnified view is cut off and form no part of the claimed design. The broken lines shown in FIGS. **8**, **9**, **11**, **12**, **13**, **14**, **16**, **17**, **18**, **19** and **20** are included to show environment and form no part of the claimed design.

1 Claim, 7 Drawing Sheets

(58) **Field of Classification Search**
CPC H01G 9/00; H01H 11/00; H01L 21/00; H01L 21/44; H01L 23/48; H01L 23/49; H01L 23/52; H01L 33/00; H01L 33/62; H01R 12/00; H01R 13/00; H01R 43/00; H05K 1/11; H05K 5/00; H05K 5/02; H05K 13/00
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

D465,207	S	*	11/2002	Williams	D13/182
6,486,538	B1	*	11/2002	Reiss	H01L 23/13 257/668
D483,336	S	*	12/2003	Harnden	D13/182
D483,337	S	*	12/2003	Harnden	D13/182
D484,103	S	*	12/2003	Harnden	D13/182
D484,104	S		12/2003	Harnden et al.	
D484,858	S	*	1/2004	Harnden	D13/182
D484,859	S	*	1/2004	Harnden	D13/182
D485,243	S	*	1/2004	Harnden	D13/182
D485,244	S	*	1/2004	Harnden	D13/182
D485,808	S	*	1/2004	Harnden	D13/182
D486,802	S	*	2/2004	Harnden	D13/182
D487,431	S	*	3/2004	Harnden	D13/182
D487,432	S		3/2004	Harnden et al.	
D488,136	S	*	4/2004	Harnden	D13/182
D491,900	S	*	6/2004	Harnden	D13/182
D492,266	S	*	6/2004	Harnden	D13/182
D494,939	S	*	8/2004	Harnden	D13/182
D505,121	S	*	5/2005	Harnden	D13/182
D505,122	S	*	5/2005	Harnden	D13/182
D513,608	S	*	1/2006	Harnden	D13/182
D588,080	S	*	3/2009	Harnden	D13/182
D588,557	S	*	3/2009	Harnden	D13/182
9,607,934	B2	*	3/2017	Nakabayashi	H01L 23/49541
2010/0052125	A1	*	3/2010	Sasaki	B23K 20/005 257/676
2011/0212341	A1	*	9/2011	Li	H01L 21/4842 428/571
2012/0248588	A1	*	10/2012	Yamabe	H01L 21/4842 257/666
2014/0191381	A1	*	7/2014	Lee et al.	H01L 23/49537 257/676
2014/0252401	A1	*	9/2014	Nakabayashi	H01L 33/62 257/99
2014/0252574	A1	*	9/2014	Nakabayashi	H01L 23/49537 257/666
2014/0327004	A1	*	11/2014	Baterna Marbella	H01L 22/30 257/48
2015/0064849	A1	*	3/2015	Khoo	H01L 24/89 438/123
2016/0005663	A1	*	1/2016	Khoo	H01L 21/78 438/15
2016/0027721	A1	*	1/2016	Lee	H01L 23/49541 174/261
2016/0218051	A1	*	7/2016	Doumae	H01L 23/49541

FOREIGN PATENT DOCUMENTS

JP	1104548	S		3/2001	
JP	30-0329688-01	S		7/2003	
JP	30-0329688	S		7/2003	
JP	1335983	S		7/2008	
JP	1444894	S		6/2012	
JP	1445011	S		6/2012	
JP	1445012	S		6/2012	
JP	1460669	S		1/2013	
JP	2013128007	A	*	6/2013	H01L 24/97

* cited by examiner

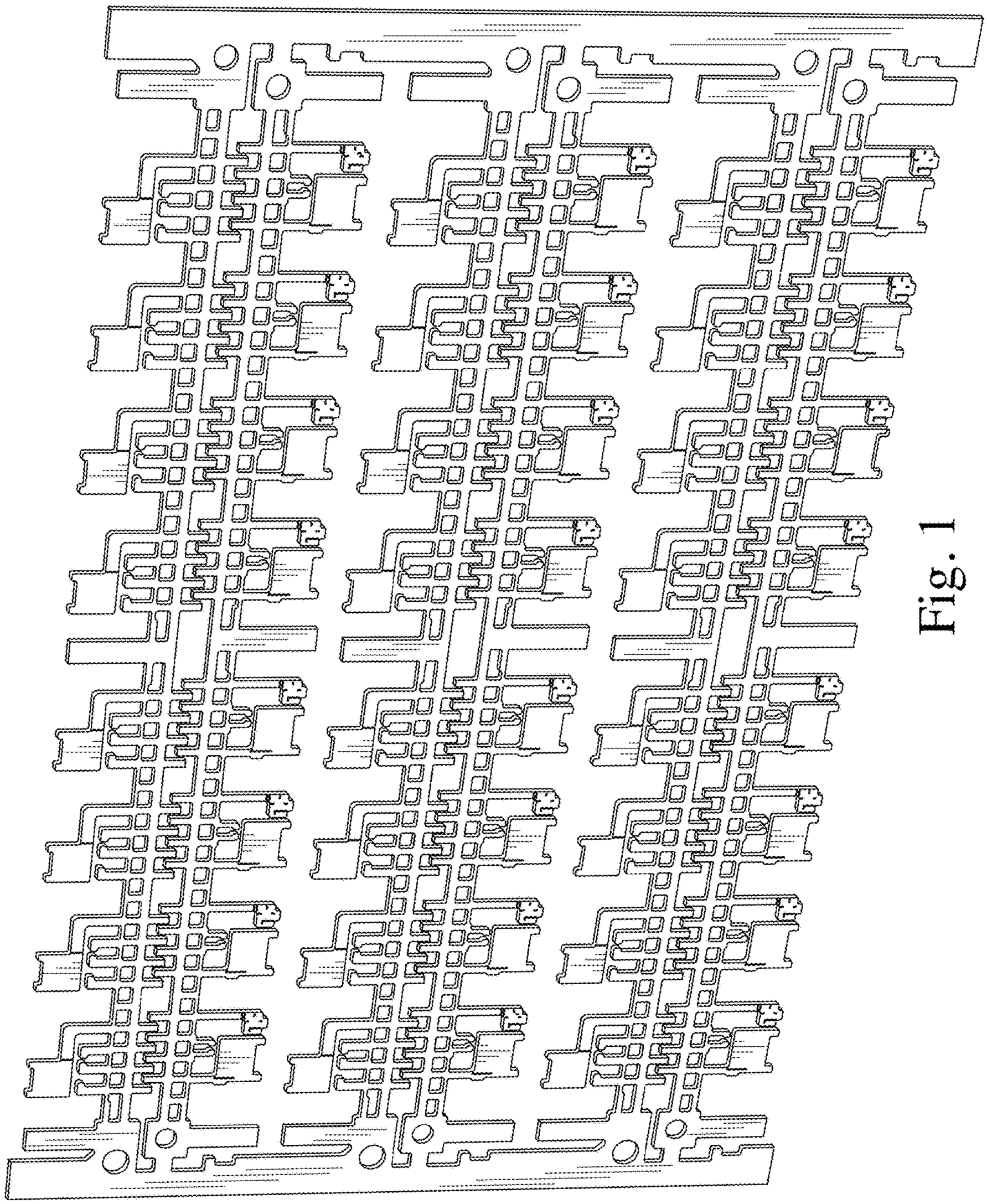
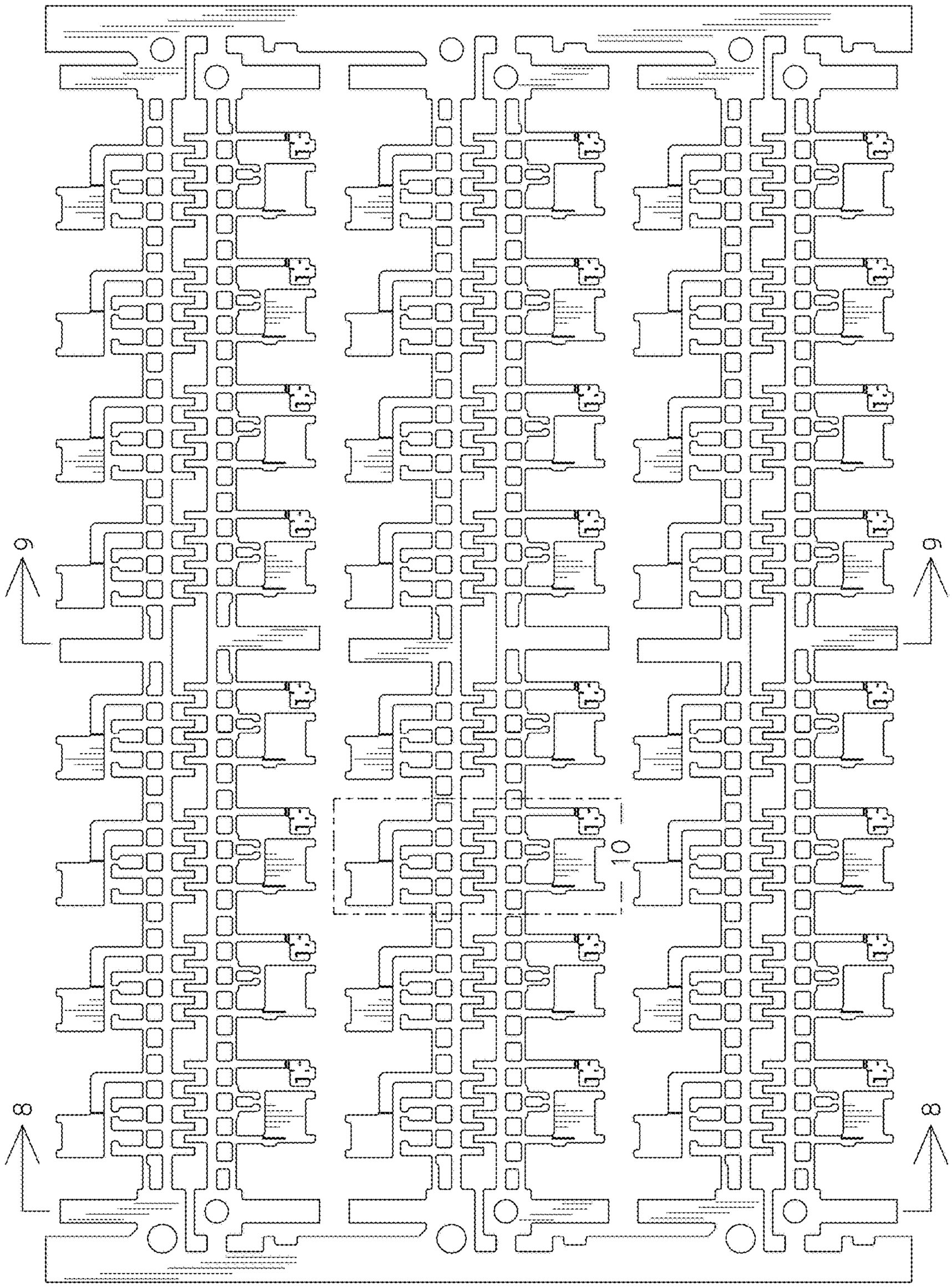


Fig. 1

Fig. 2



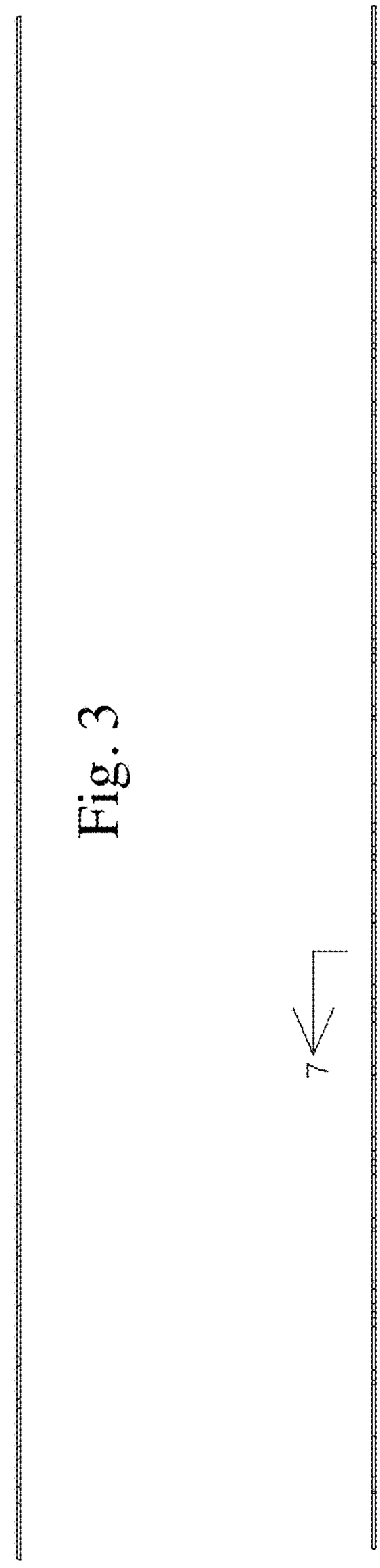


Fig. 5

Fig. 3

Fig. 4

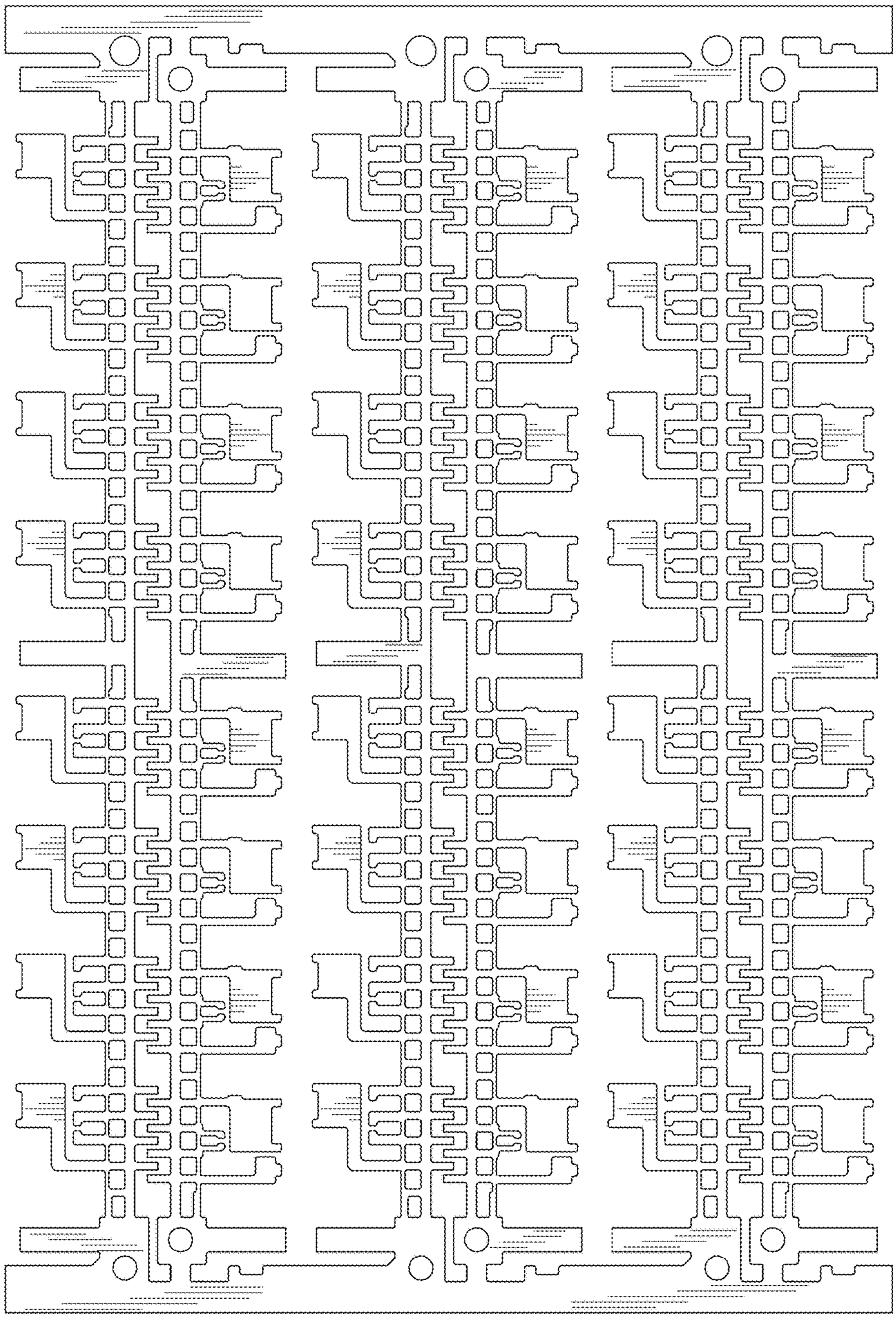


Fig. 6

Fig. 7

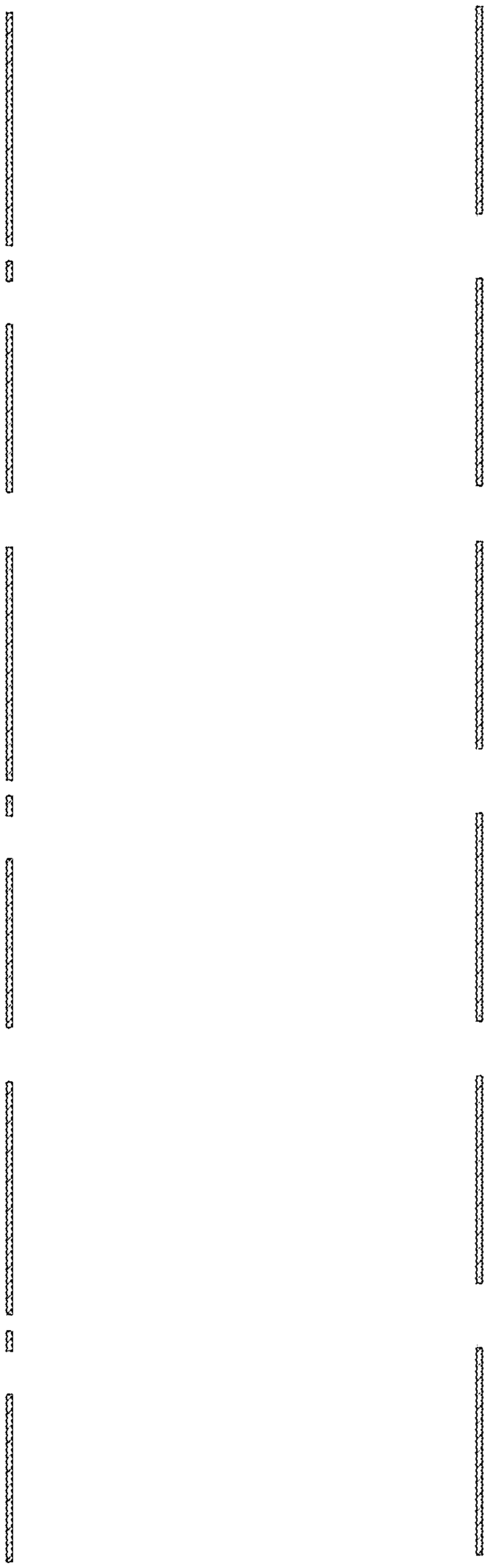


Fig. 8

Fig. 9

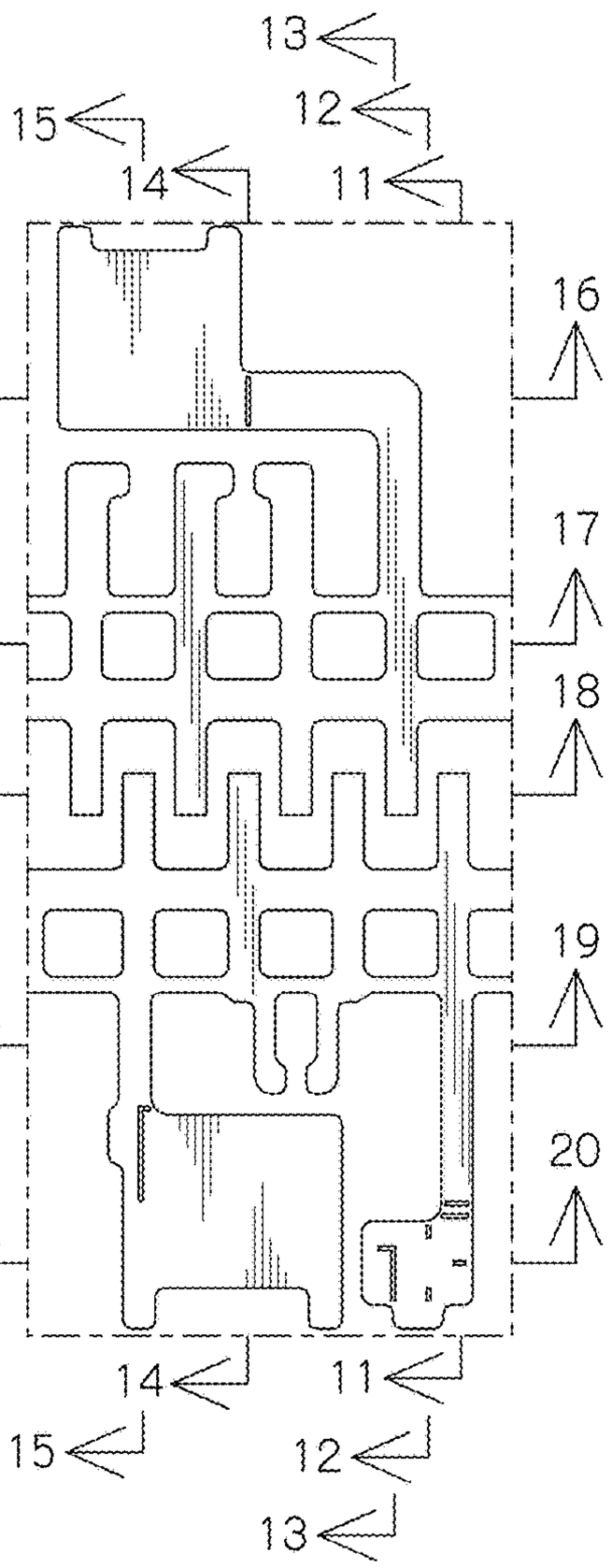


Fig. 10

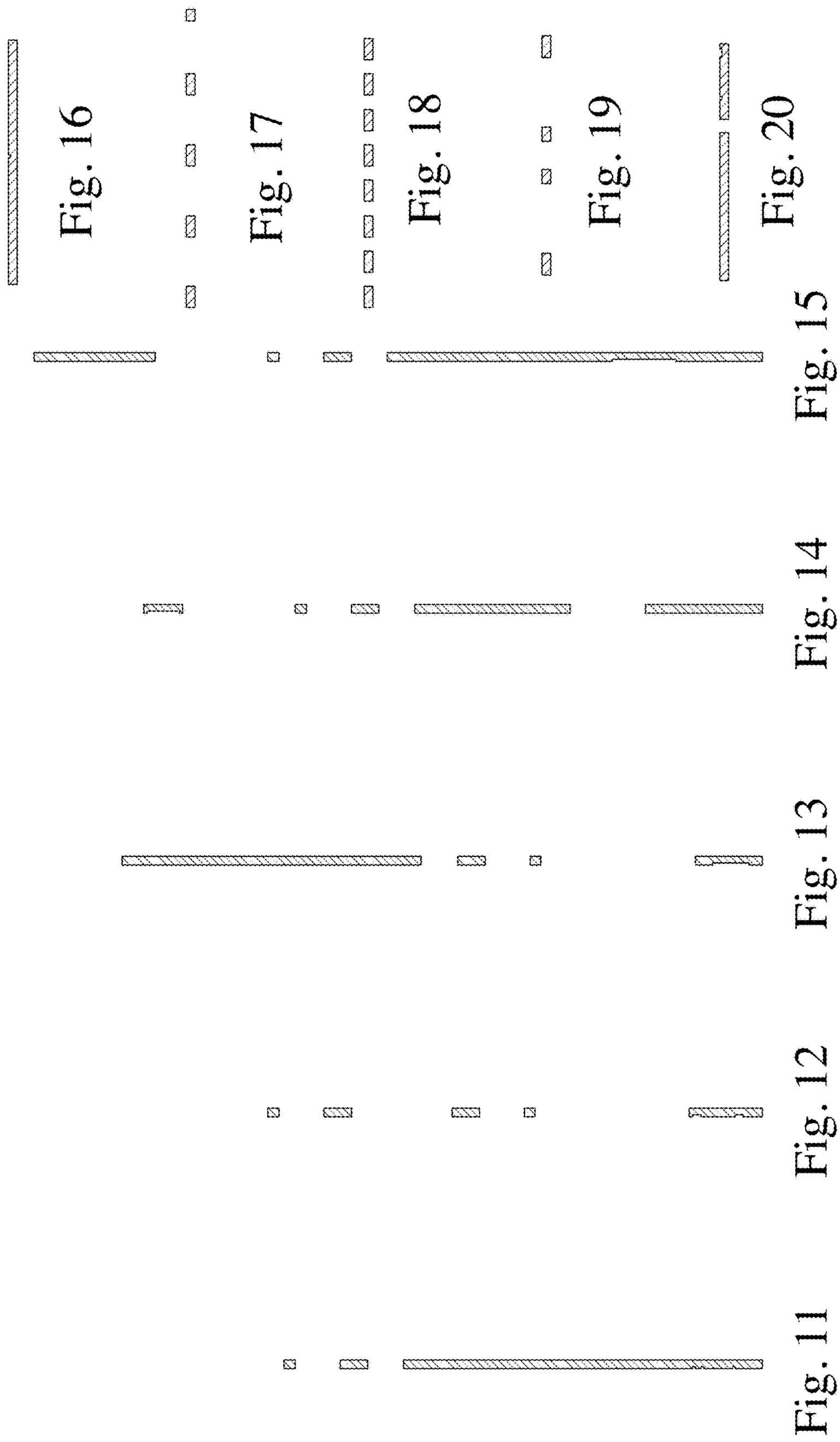


Fig. 11

Fig. 12

Fig. 13

Fig. 14

Fig. 15

Fig. 16

Fig. 17

Fig. 18

Fig. 19

Fig. 20