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

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- (54) **FILTER SHEET FOR A CELL COLLECTING CARTRIDGE**
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- (52) **U.S. Cl.**
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- (58) **Field of Classification Search**
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D24/225, 128; 55/493; 430/281.1; 604/251;
D23/355, 208, 314, 365, 393, 354, 351,
D23/386, 388; D9/732; 210/767; D32/31, 1,
D32/56; 136/244; 435/309.1, 6.14, 91.51;
205/75; D12/194; D5/5
CPC B01D 46/10; G03F 7/031; A61M 5/1411;
A61M 2202/0439; Y02E 10/50; C12M 1/261;
C25D 1/08

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

- D325,070 S * 3/1992 Kopf D23/209
- D328,789 S * 8/1992 Kopf D24/162
- D357,059 S * 4/1995 Kopf D23/209
- 5,792,230 A * 8/1998 Moore et al. 55/493
- 5,858,616 A * 1/1999 Tanaka et al. 430/281.1
- 5,906,598 A * 5/1999 Giesler et al. 604/251
- D448,487 S * 9/2001 Saez et al. D24/216
- D461,896 S * 8/2002 Worthington D24/162
- D480,815 S * 10/2003 Ewing et al. D24/226

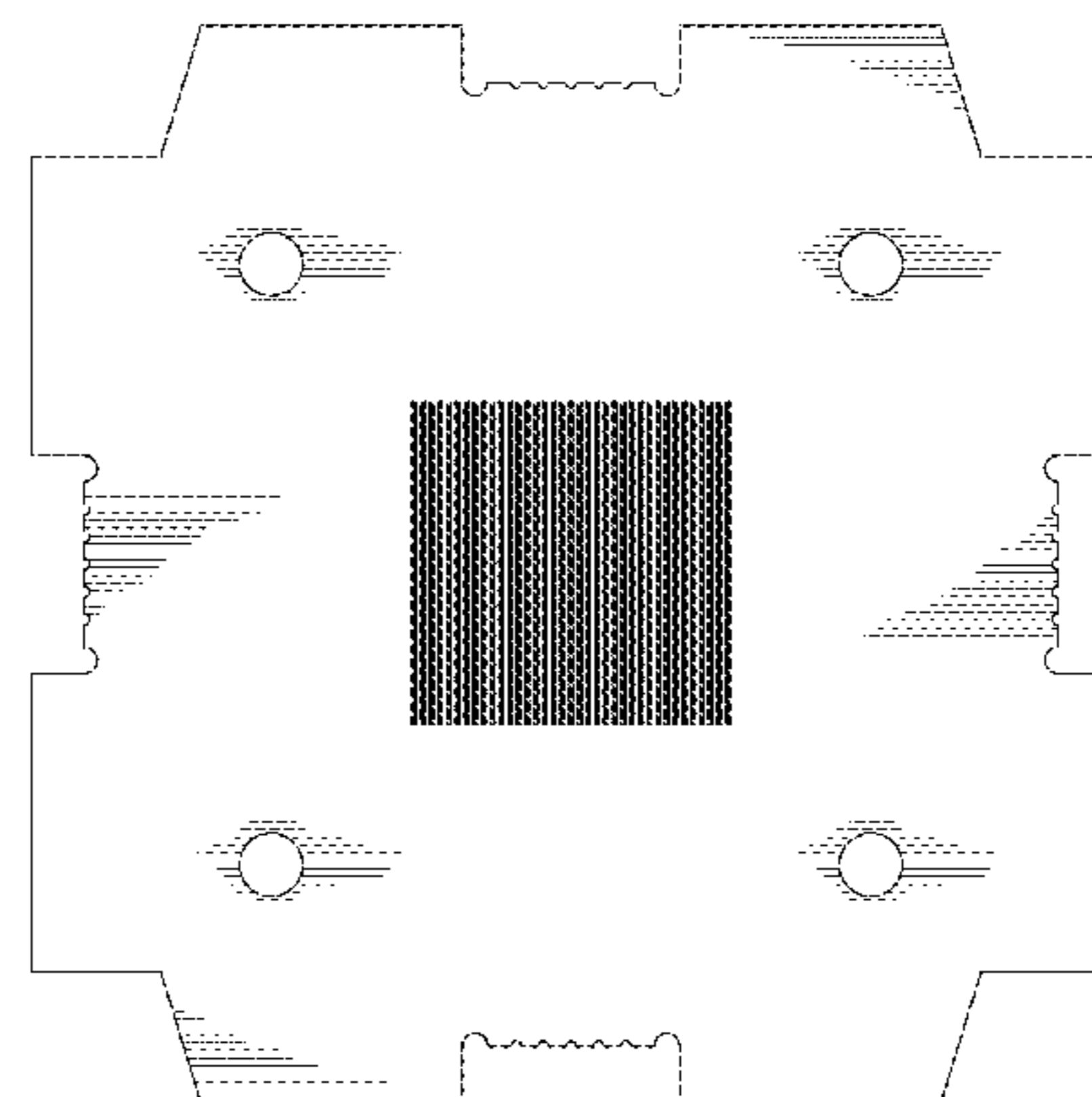
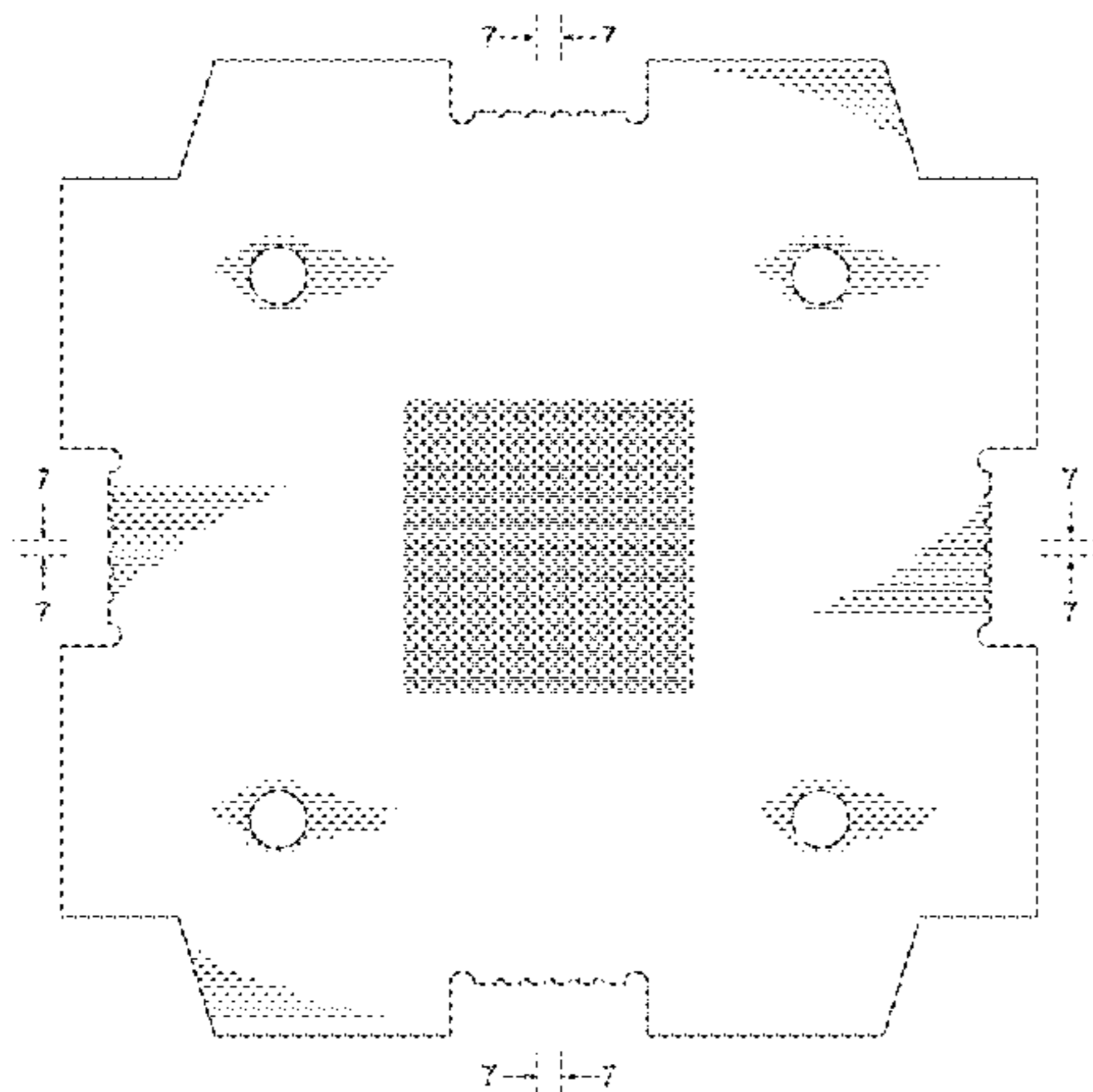
- D503,971 S * 4/2005 Otaki D23/355
- D546,198 S * 7/2007 Currie et al. D9/732
- D559,943 S * 1/2008 Mercer et al. D23/208
- 7,332,096 B2 * 2/2008 Blickhan 210/767
- D570,564 S * 6/2008 Paredes et al. D32/31
- D588,762 S * 3/2009 Dyson et al. D32/31
- D590,486 S * 4/2009 Park D23/314
- D598,564 S * 8/2009 Coyle et al. D24/217
- D612,922 S * 3/2010 Foerster D23/365
- 7,745,180 B2 * 6/2010 Mitsuhashi 435/91.51
- D652,910 S * 1/2012 Duffy D24/110.1
- D661,851 S * 6/2012 Nasrallah D32/1
- D670,049 S * 10/2012 Luebbering et al. D32/31
- D673,257 S * 12/2012 Landaverde, Jr. D24/106
- D704,321 S * 5/2014 Jardine et al. D23/365
- D704,816 S * 5/2014 Butler et al. D23/393
- D705,439 S * 5/2014 Wainwright et al. D24/216
- D710,000 S * 7/2014 Moreno D23/386
- D710,280 S * 8/2014 Maeda D12/194
- D711,059 S * 8/2014 Evans et al. D32/56
- D712,159 S * 9/2014 Clerici et al. D5/5
- D714,927 S * 10/2014 Urano D23/388
- D716,071 S * 10/2014 Holtby et al. D6/586
- D718,434 S * 11/2014 Diamond D23/388
- D721,805 S * 1/2015 Hilliard D24/128
- D723,675 S * 3/2015 Paskow D23/354
- D725,254 S * 3/2015 Roblin D23/365
- D725,761 S * 3/2015 Bordin D23/365
- D728,766 S * 5/2015 Kim et al. D23/351
- D728,773 S * 5/2015 van Haaster D23/393
- D729,402 S * 5/2015 Togawa et al. D24/225
- 2012/0227785 A1 * 9/2012 Tsuruoka et al. 136/244
- 2014/0178890 A1 * 6/2014 Kanbara et al. 435/6.14
- 2014/0238863 A1 * 8/2014 Suzuki et al. 205/75
- 2015/0004687 A1 * 1/2015 Kikuhara et al. 435/309.1
- 2015/0111293 A1 * 4/2015 Kanbara et al. 435/309.1

FOREIGN PATENT DOCUMENTS

- JP 2013-042689 3/2013
- JP 2013-138658 7/2013
- WO WO 2012/173097 A1 12/2012
- WO WO 2013/054786 A1 4/2013

OTHER PUBLICATIONS

Hosokawa et al, Microcavity Array System for Size-Based Enrichment of Circulating Tumor Cells From the Blood of Patients With Small-Cell Lung Cancer, American Chemical Society, 85, May 24, 2013, pp. 5692-5698, ac400167x.
Hitachi, Technology Enabling Cancer Science Advancement, <http://www.InspireTheGenome.com>, Oct. 22, 2013.



(56)

References Cited

OTHER PUBLICATIONS

Hosokawa et al, Development of Microcavity Array System for Enumeration of Circulating Tumor Cells from Whole Blood, Biosensors 2012, May 15, 2012.

Tokyo University of Agriculture and Technology, Hitachi Chemical, Microcavity Array System for Enumeration of Circulating Tumor Cells, Molecular Medicine Tri-Conference 2013, Moscone North Convention Center, San Francisco, CA US, Feb. 11, 2013.

Negishi et al., Microcavity Array System for Size-Based Enrichment of Circulating Tumor Cells from Small Cell Lung Cancer Patients, Tokyo University of Agriculture and Technology, Sep. 5, 2013.

* cited by examiner

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Assistant Examiner — Rhea Shields

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(57)

CLAIM

We claim the ornamental design for a filter sheet for a cell collecting cartridge, as shown and described.

DESCRIPTION

FIG. 1 is a front view of a first embodiment of the filter sheet for a cell collecting cartridge, showing our new design;

FIG. 2 is a rear view thereof;

FIG. 3 is a top plan view thereof;

FIG. 4 is a bottom plan view thereof;

FIG. 5 is a right side view thereof;

FIG. 6 is a left side view thereof;

FIG. 7 is an enlarged view of the 7-7, 7-7 portion thereof;

FIG. 8 is a 8-8 sectional view thereof;

FIG. 9 is a perspective view thereof, with the filter sheet for a cell collecting cartridge shown in an exploded environment;

FIG. 10 is a perspective view thereof, with the filter sheet for a cell collecting cartridge in another environment; and

FIG. 11 is an enlarged view of an opening as shown in FIG. 7;

FIG. 12 is a front view of a second embodiment of the filter sheet for a cell collecting cartridge, showing our new design;

FIG. 13 is a rear view thereof;

FIG. 14 is a top plan view thereof;

FIG. 15 is a bottom plan view thereof;

FIG. 16 is a right side view thereof;

FIG. 17 is a left side view thereof;

FIG. 18 is an enlarged view of the 18-18, 18-18 portion thereof;

FIG. 19 is a 19-19 sectional view thereof;

FIG. 20 is a perspective view thereof, with the filter sheet for a cell collecting cartridge shown in an exploded environment;

FIG. 21 is a perspective view thereof, with the filter sheet for a cell collecting cartridge in another environment; and

FIG. 22 is an enlarged view of an opening as shown in FIG. 18;

FIG. 23 is a front view of a third embodiment of the filter sheet for a cell collecting cartridge, showing our new design;

FIG. 24 is a rear view thereof;

FIG. 25 is a top plan view thereof;

FIG. 26 is a bottom plan view thereof;

FIG. 27 is a right side view thereof;

FIG. 28 is a left side view thereof;

FIG. 29 is an enlarged view of the 29-29, 29-29 portion thereof;

FIG. 30 is a 30-30 sectional view thereof;

FIG. 31 is a perspective view thereof, with the filter sheet for a cell collecting cartridge shown in an exploded environment;

FIG. 32 is a perspective view thereof, with the filter sheet for a cell collecting cartridge in another environment; and

FIG. 33 is an enlarged view of an opening as shown in FIG. 29.

In the drawings, the broken lines are for the purpose of illustrating environment only and form no part of the claimed design.

1 Claim, 33 Drawing Sheets

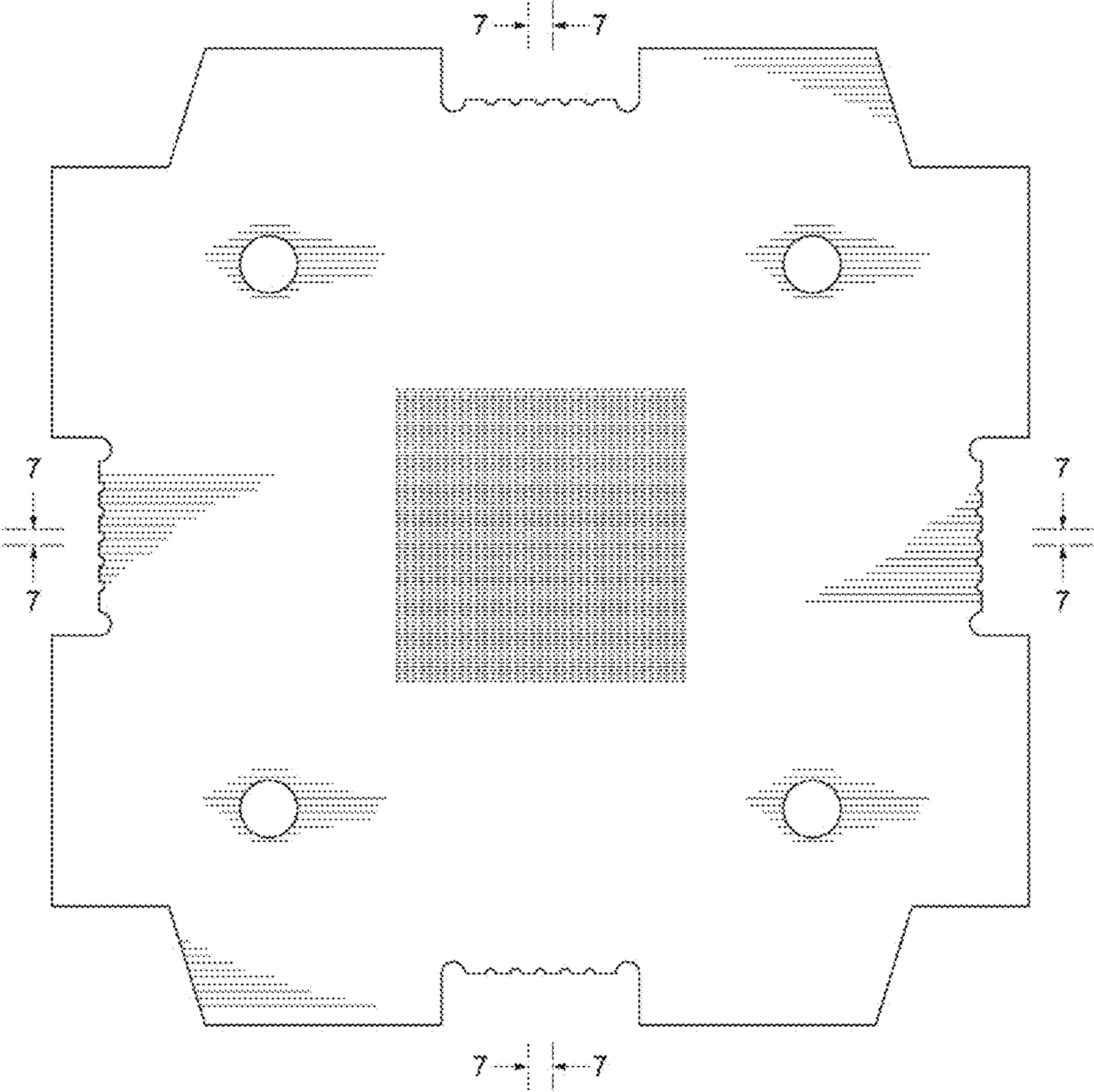


FIG. 1

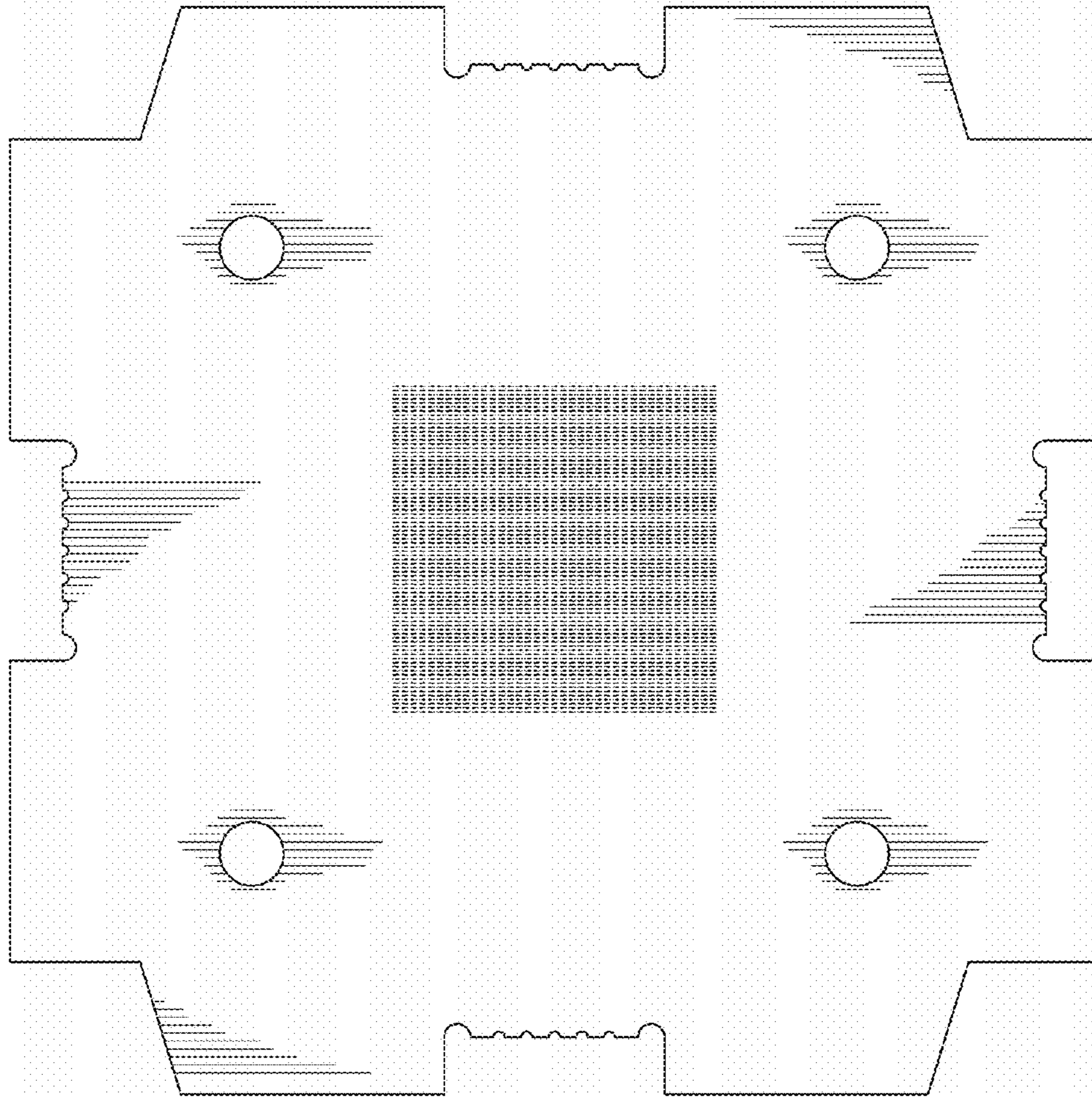


FIG.2



FIG.3



FIG.4



FIG.5



FIG.6

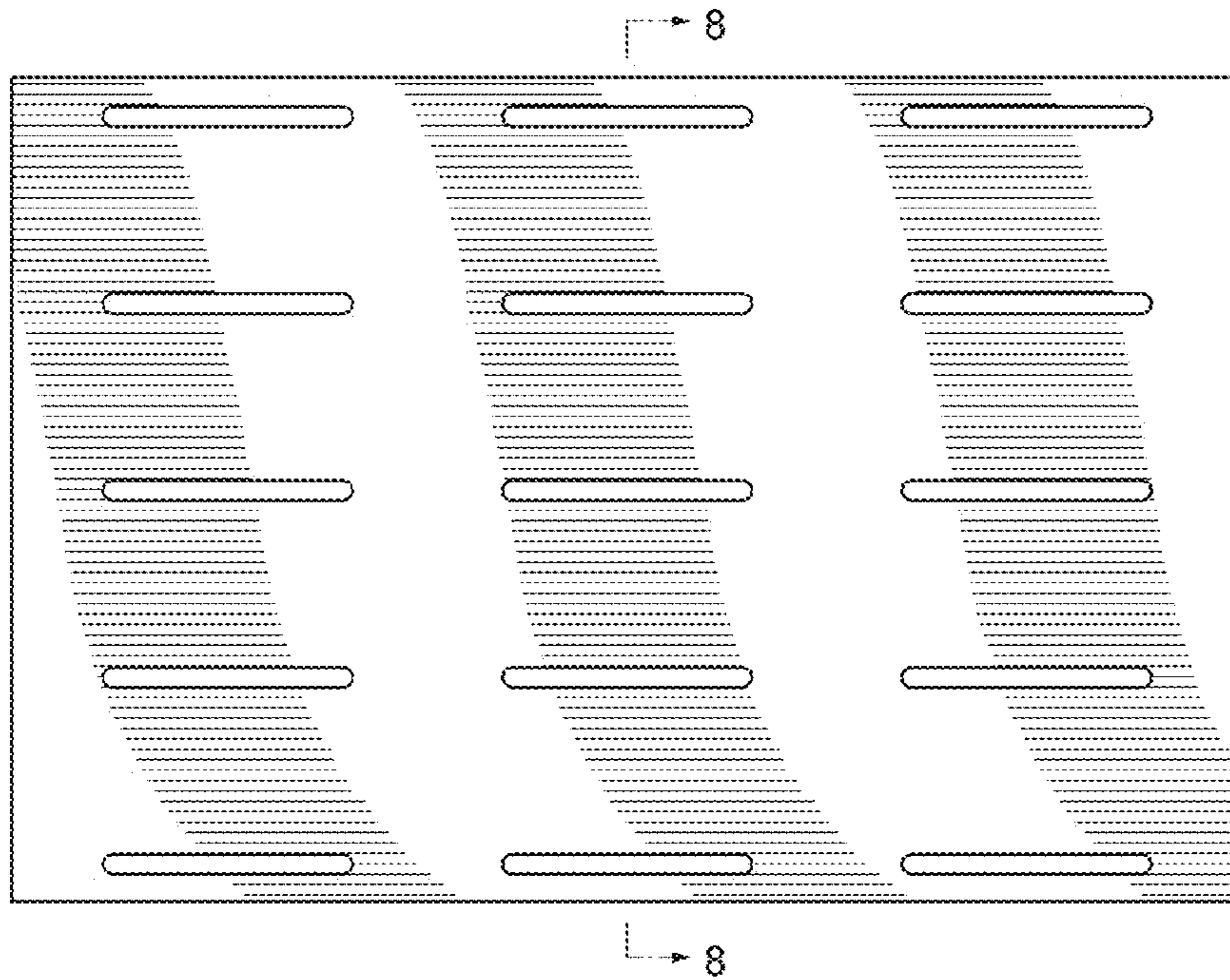


FIG. 7

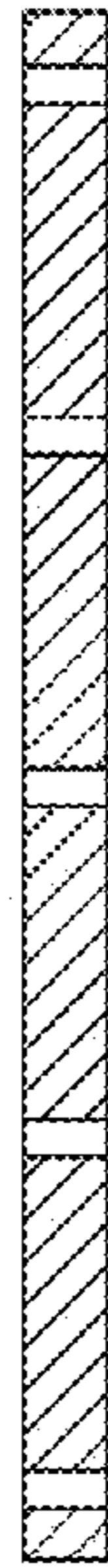


FIG.8

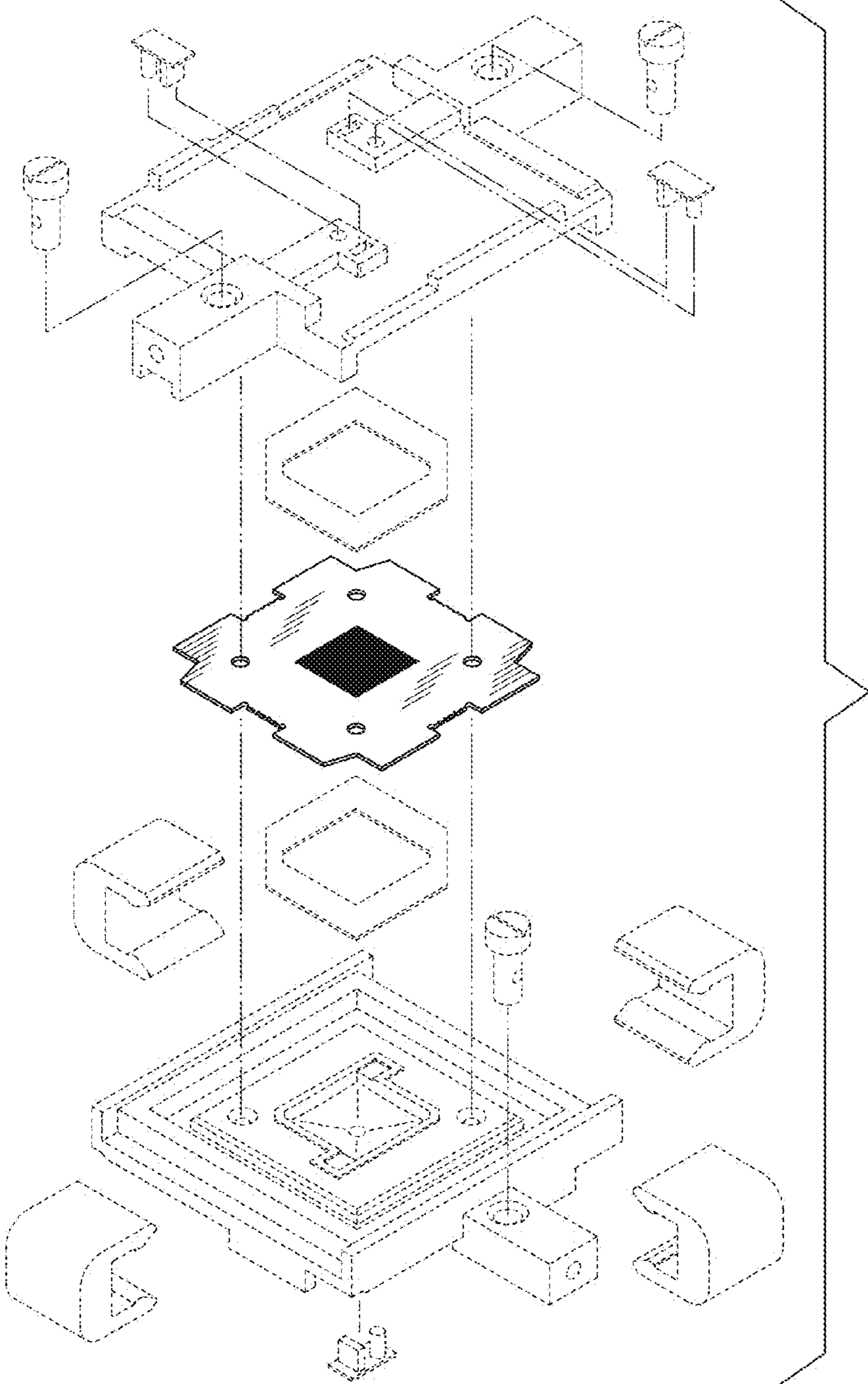


FIG.9

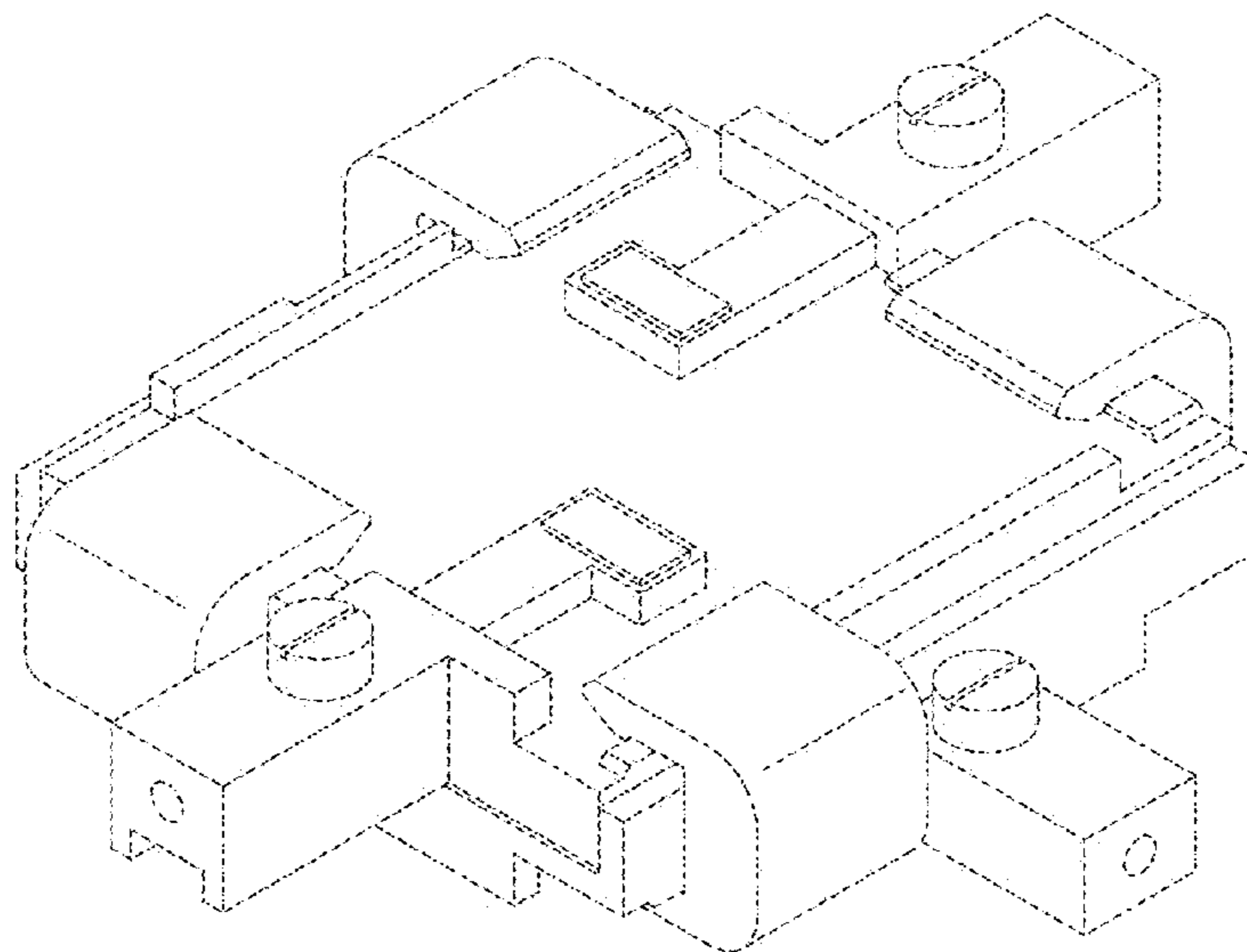


FIG. 10



FIG.11

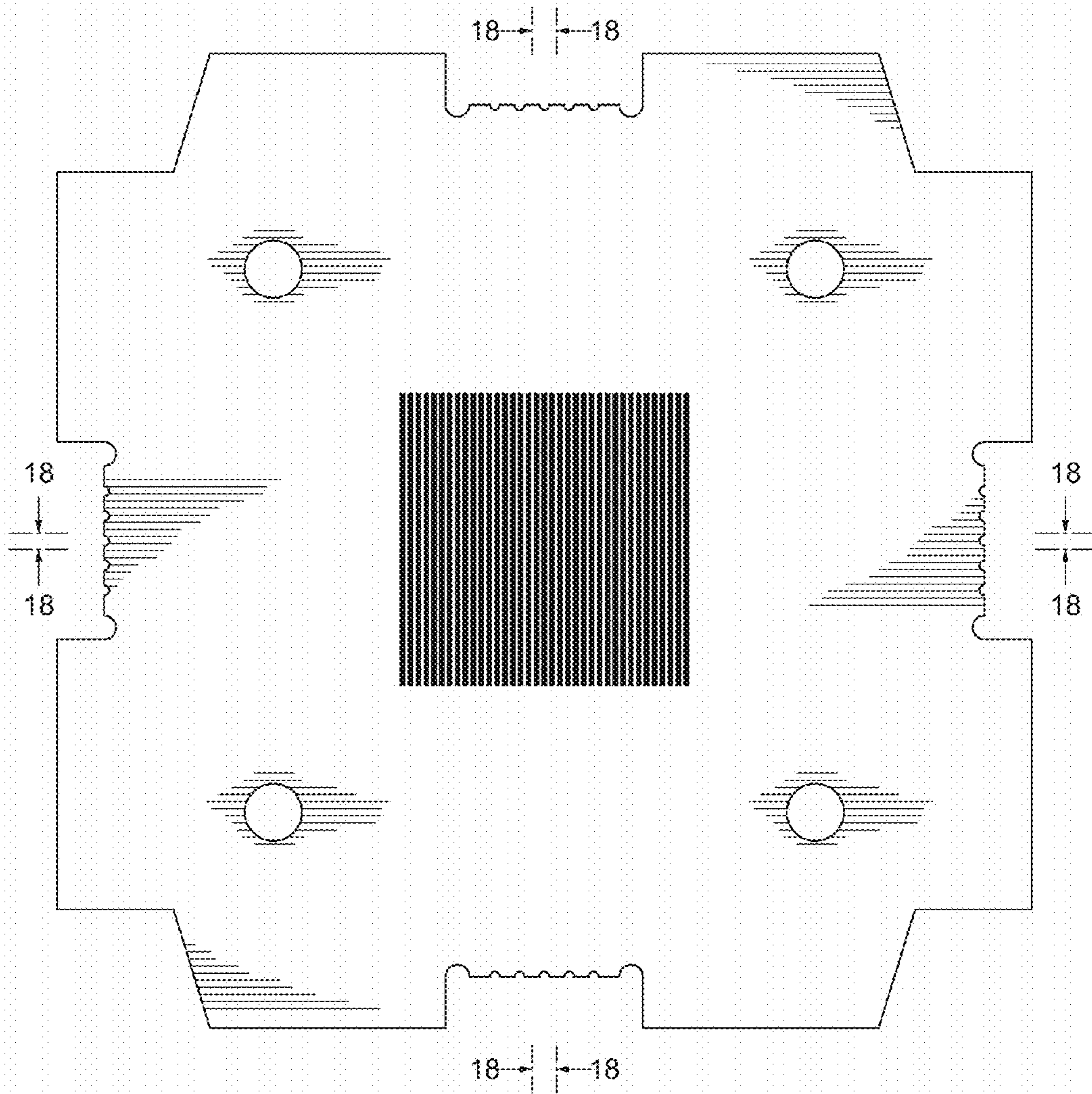


FIG.12

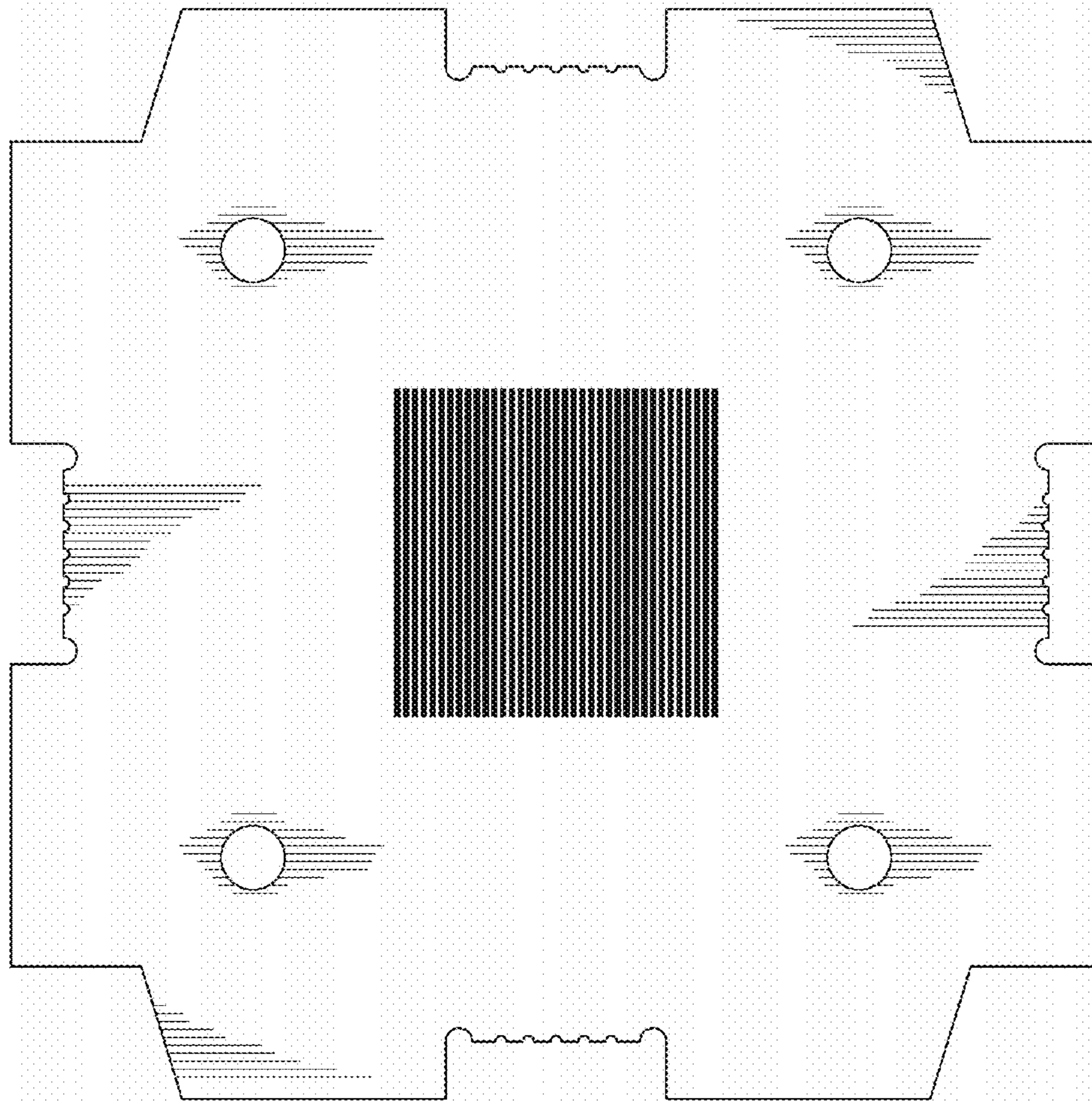


FIG. 13



FIG.14



FIG.15



FIG. 16



FIG.17

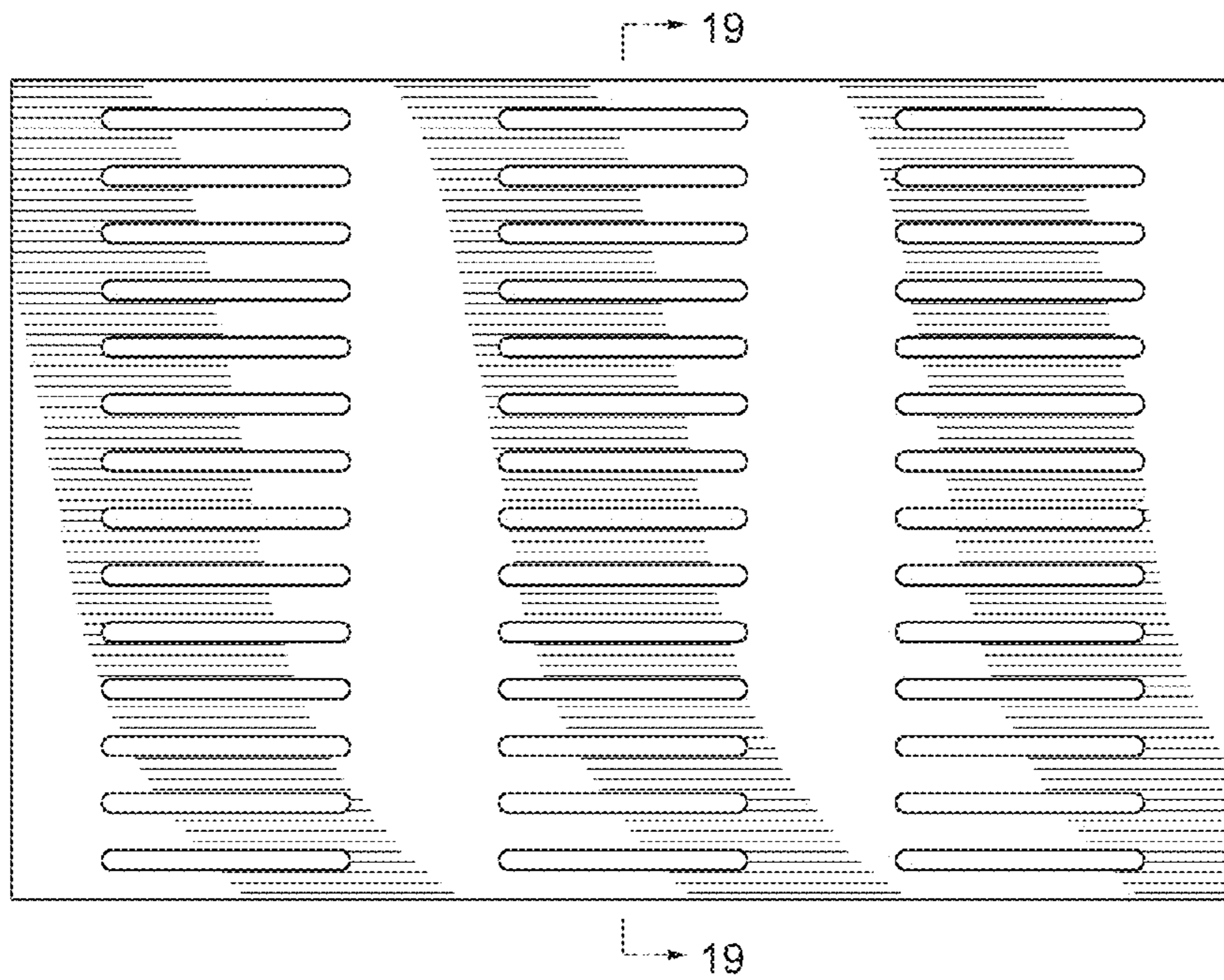


FIG. 18



FIG. 19

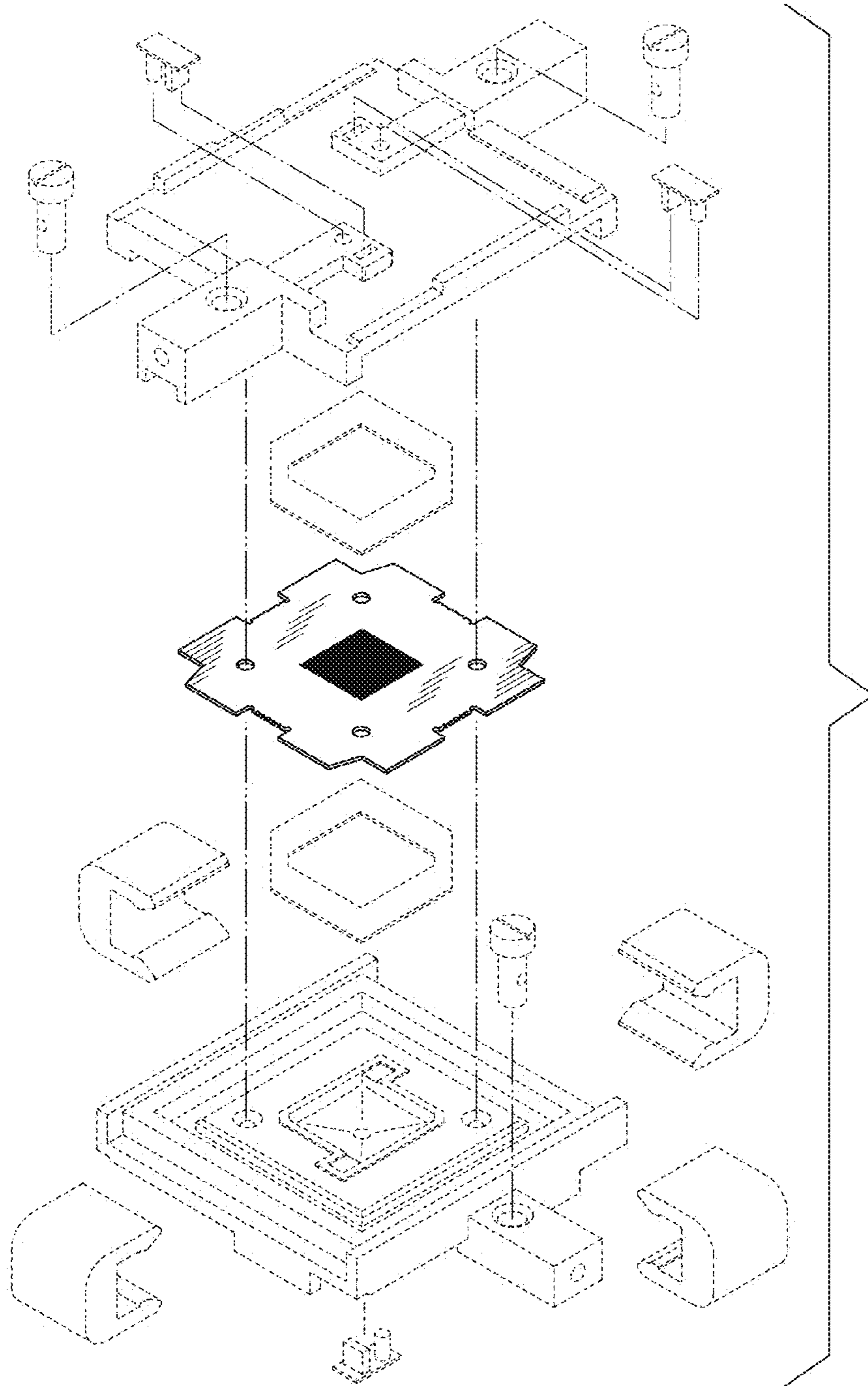


FIG.20

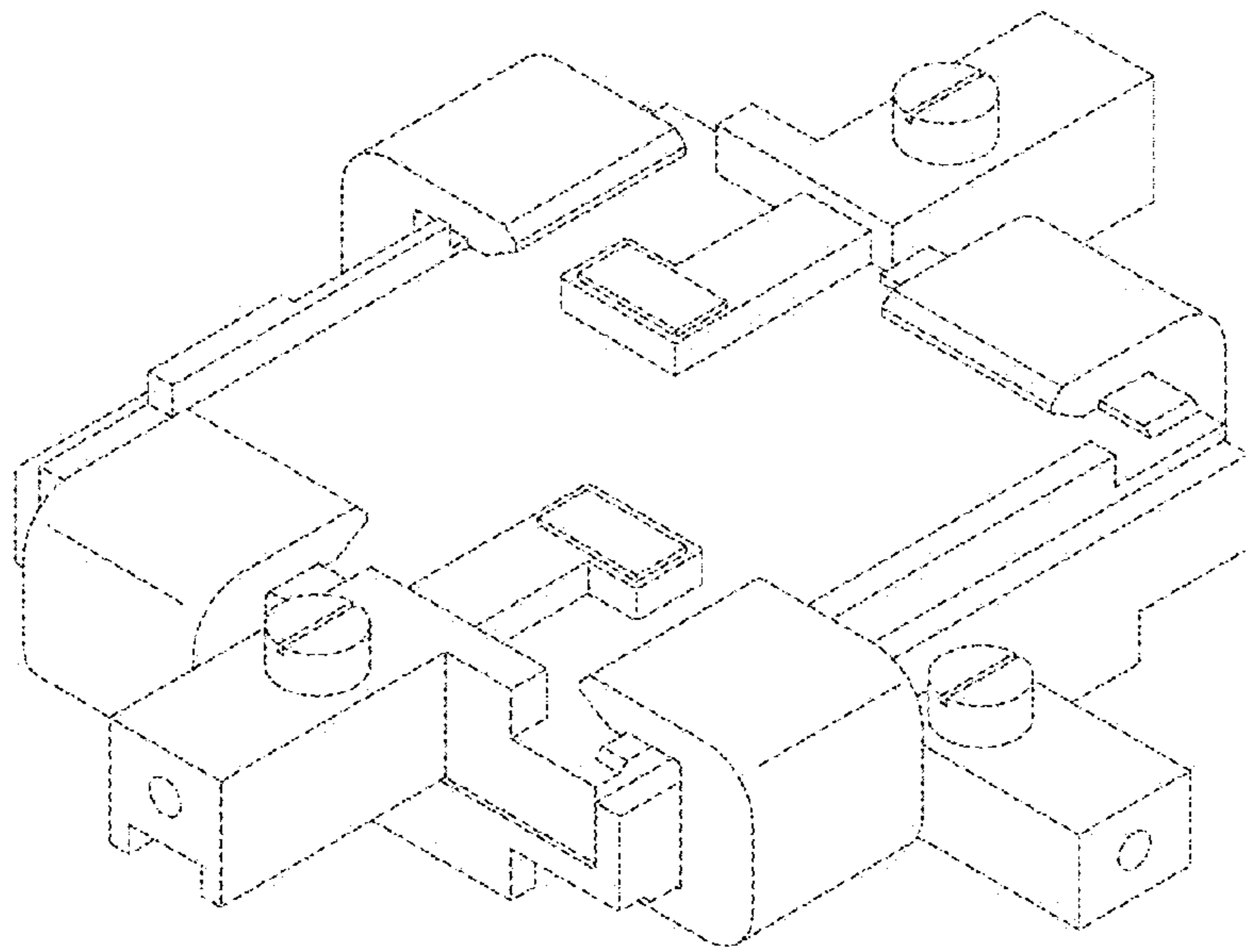


FIG.21



FIG.22

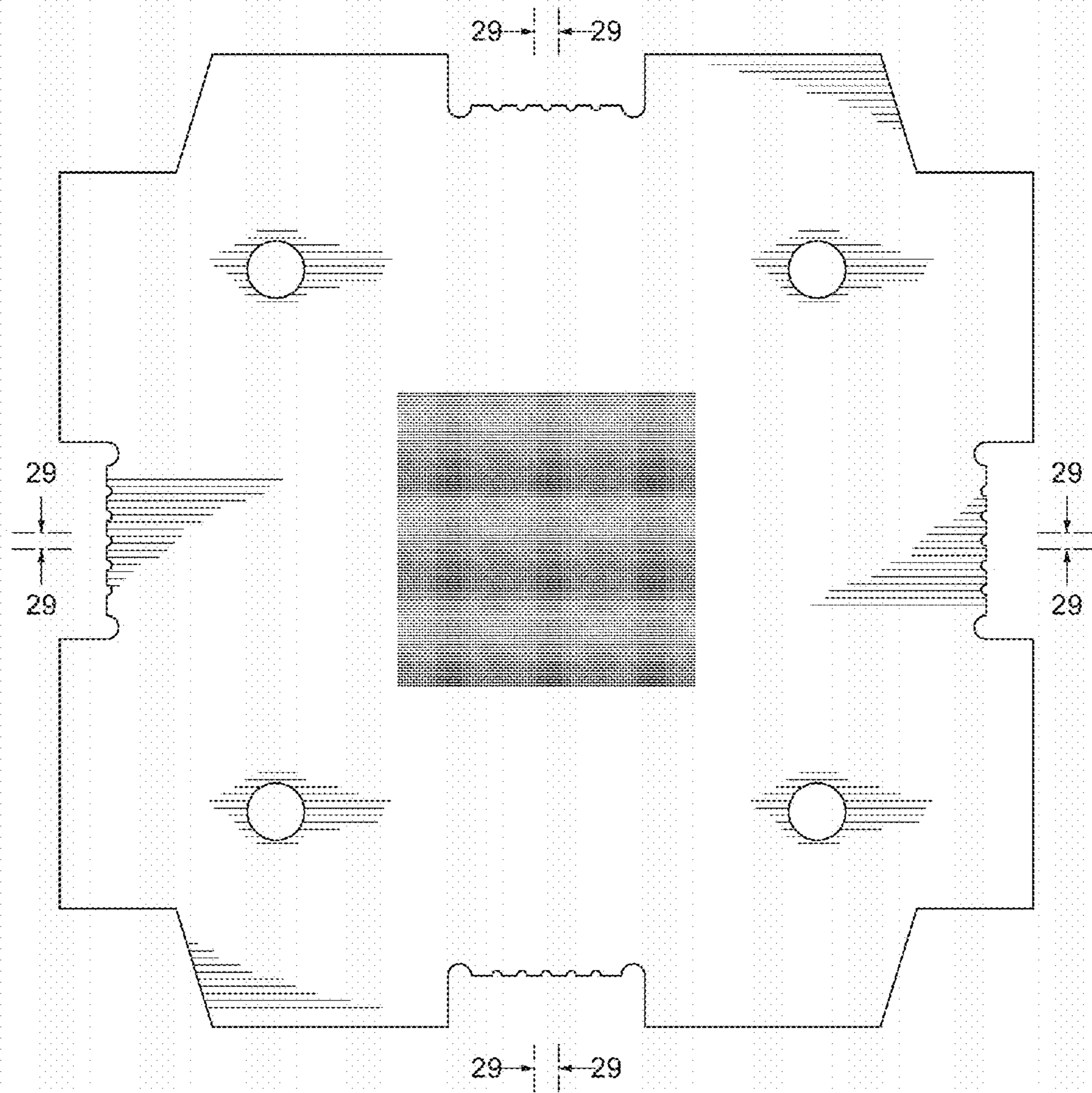


FIG.23

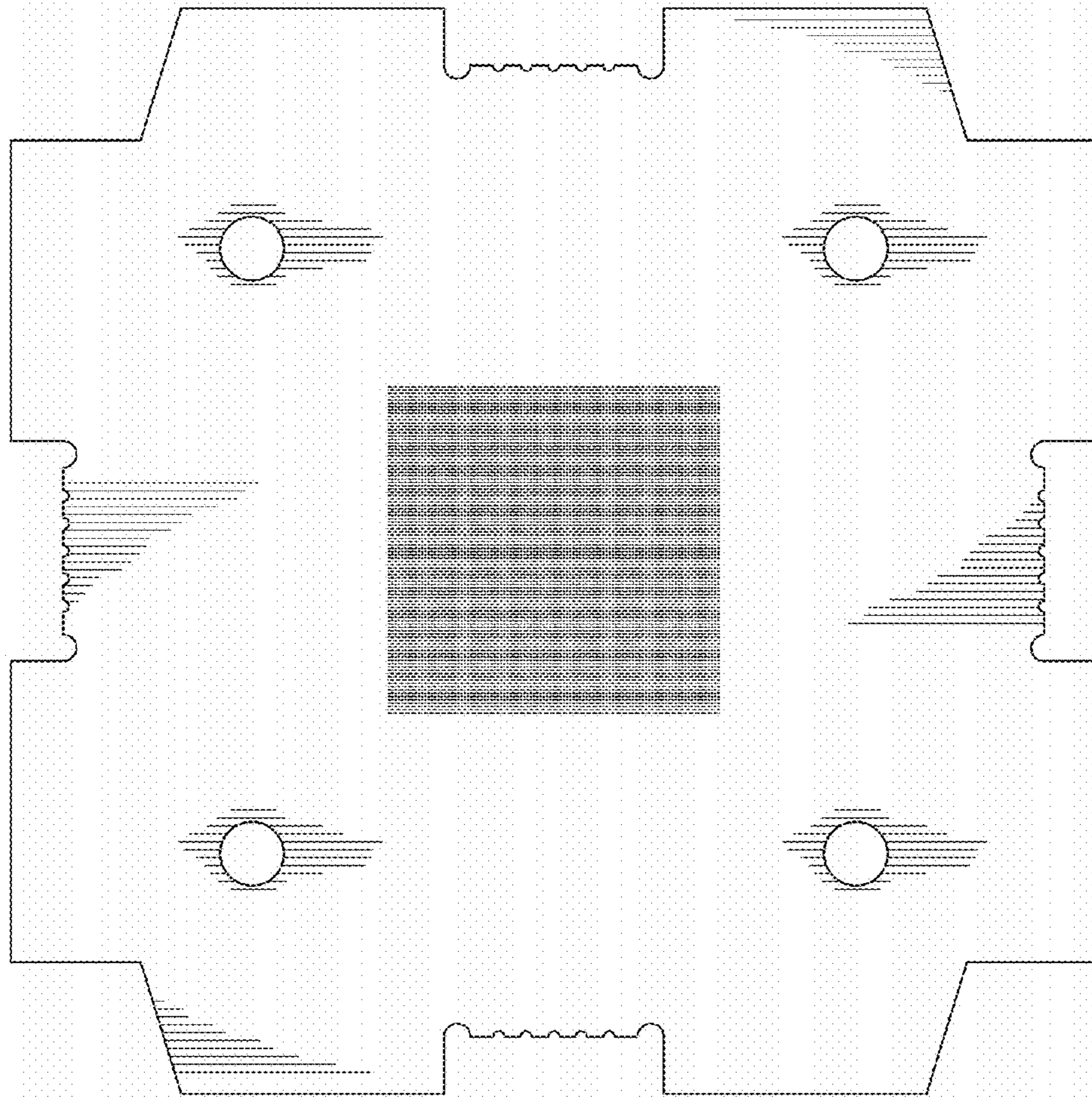


FIG.24



FIG.25



FIG.26



FIG.27



FIG.28

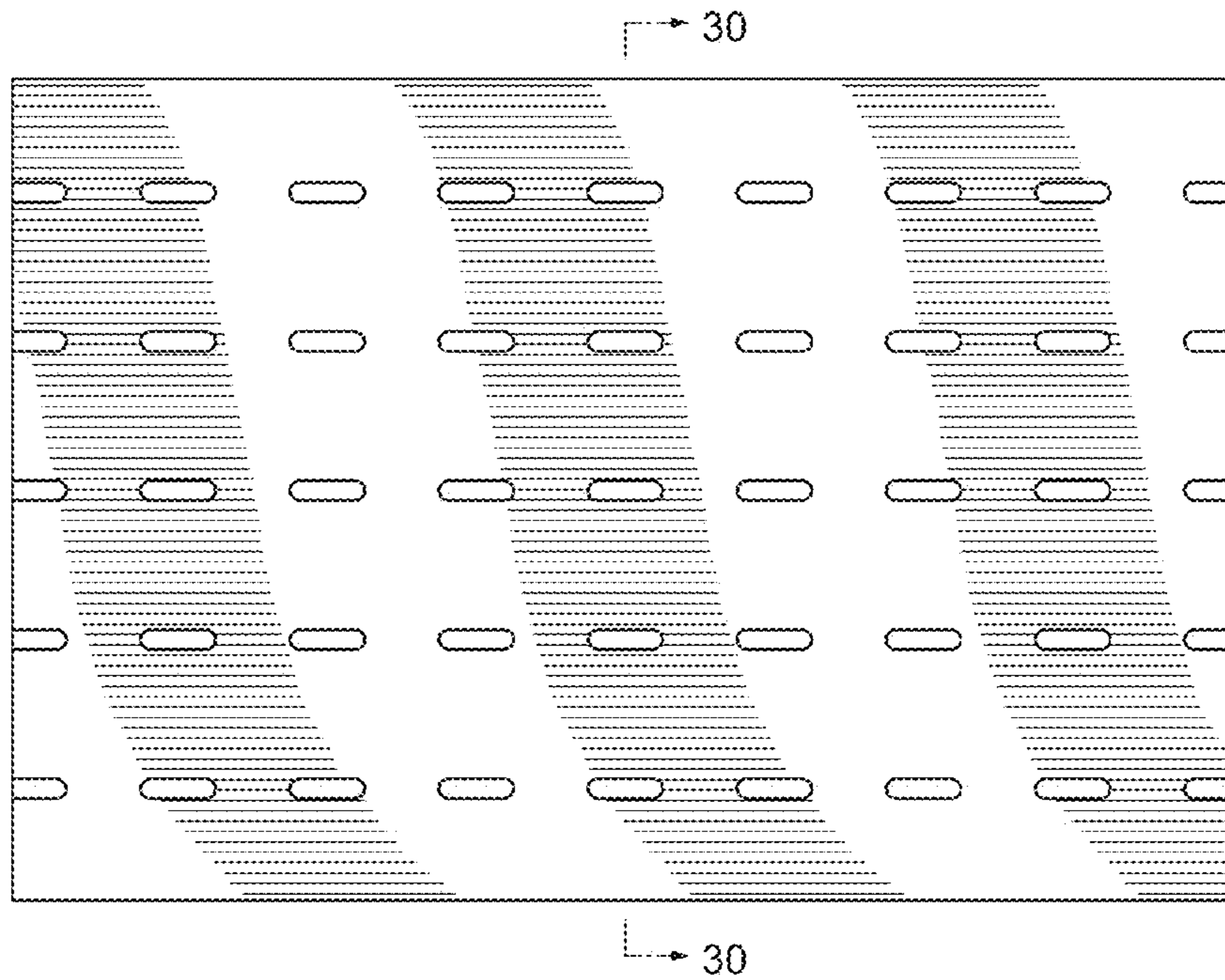


FIG.29

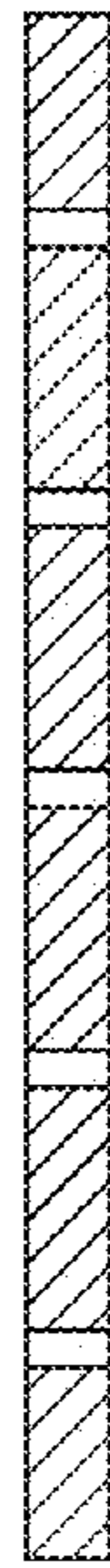


FIG.30

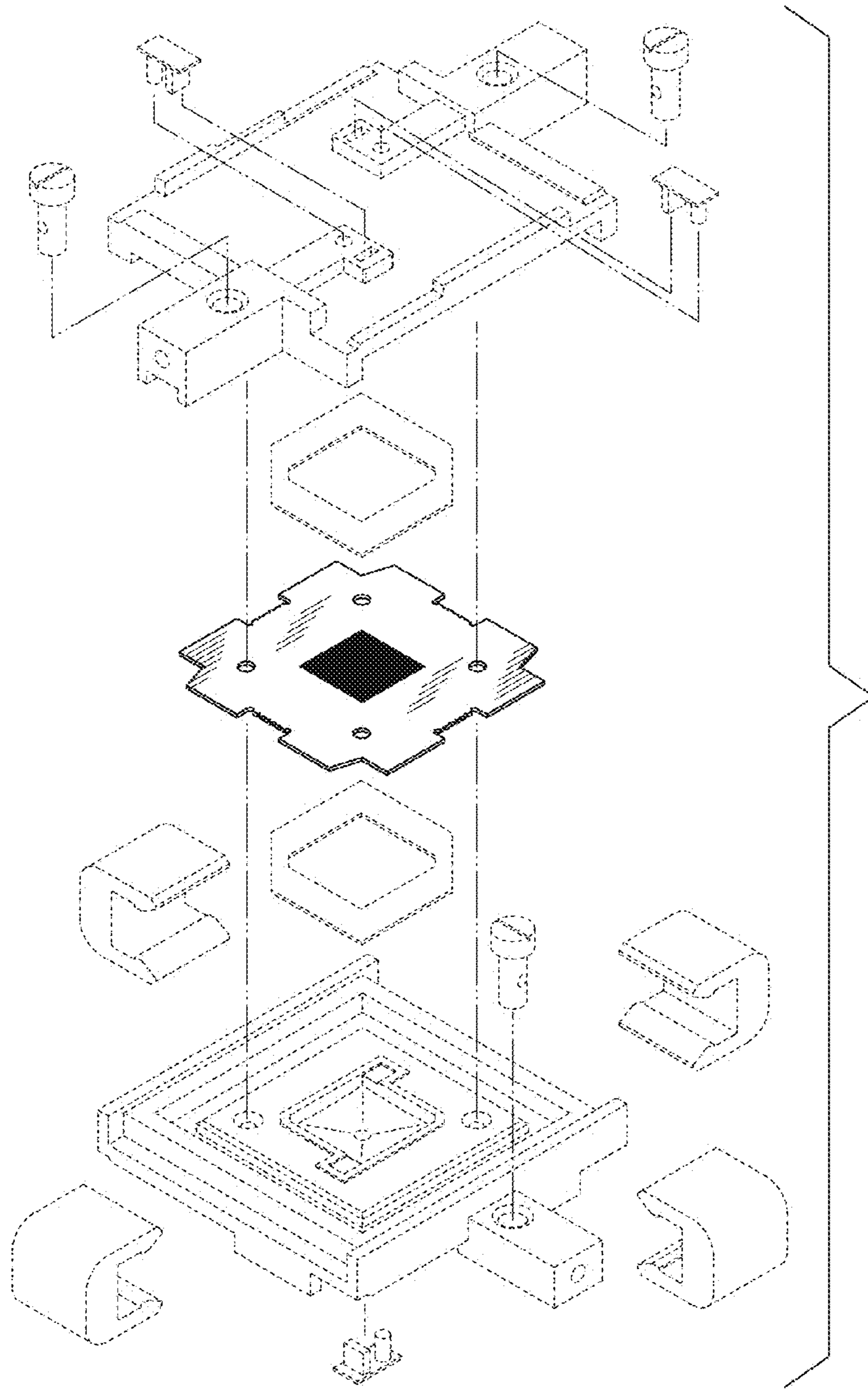


FIG.31

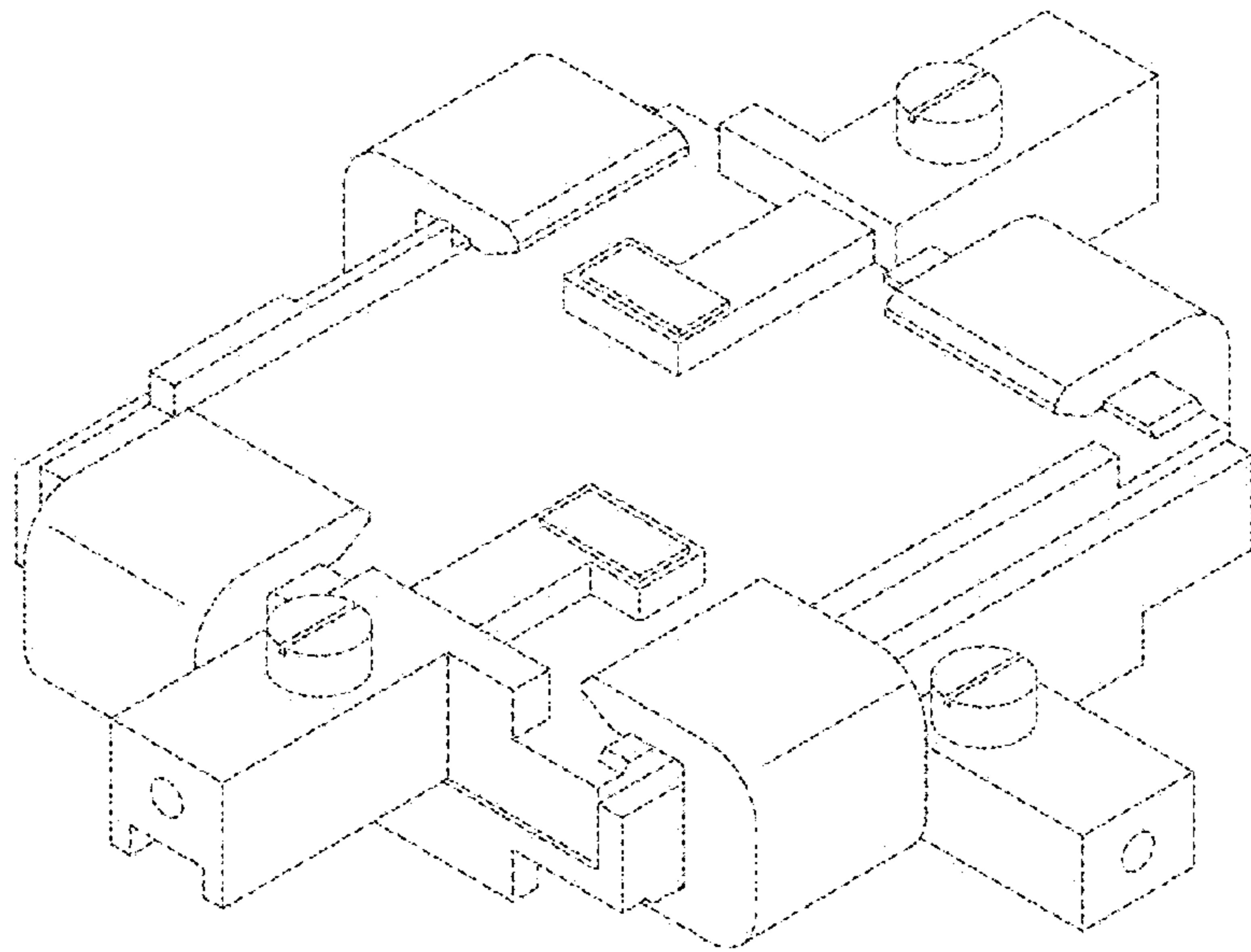


FIG.32



FIG.33