



US00D847102S

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

(10) **Patent No.:** **US D847,102 S**

(45) **Date of Patent:** **** Apr. 30, 2019**

(54) **LIGHT EMITTING DIODE**

FOREIGN PATENT DOCUMENTS

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KR 3020040006301 3/2004

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(57) **CLAIM**

The ornamental design for a light-emitting diode, as shown and described.

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

DESCRIPTION

(21) Appl. No.: **29/602,266**

(22) Filed: **Apr. 28, 2017**

Related U.S. Application Data

(60) Division of application No. 29/512,178, filed on Dec. 17, 2014, now abandoned, which is a (Continued)

(30) **Foreign Application Priority Data**

Feb. 8, 2013 (TW) 102301220
Jun. 17, 2014 (TW) 102301220D02

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

(52) **U.S. Cl.**
USPC **D13/180**

(58) **Field of Classification Search**
USPC D13/180; D26/1
(Continued)

(56) **References Cited**

U.S. PATENT DOCUMENTS

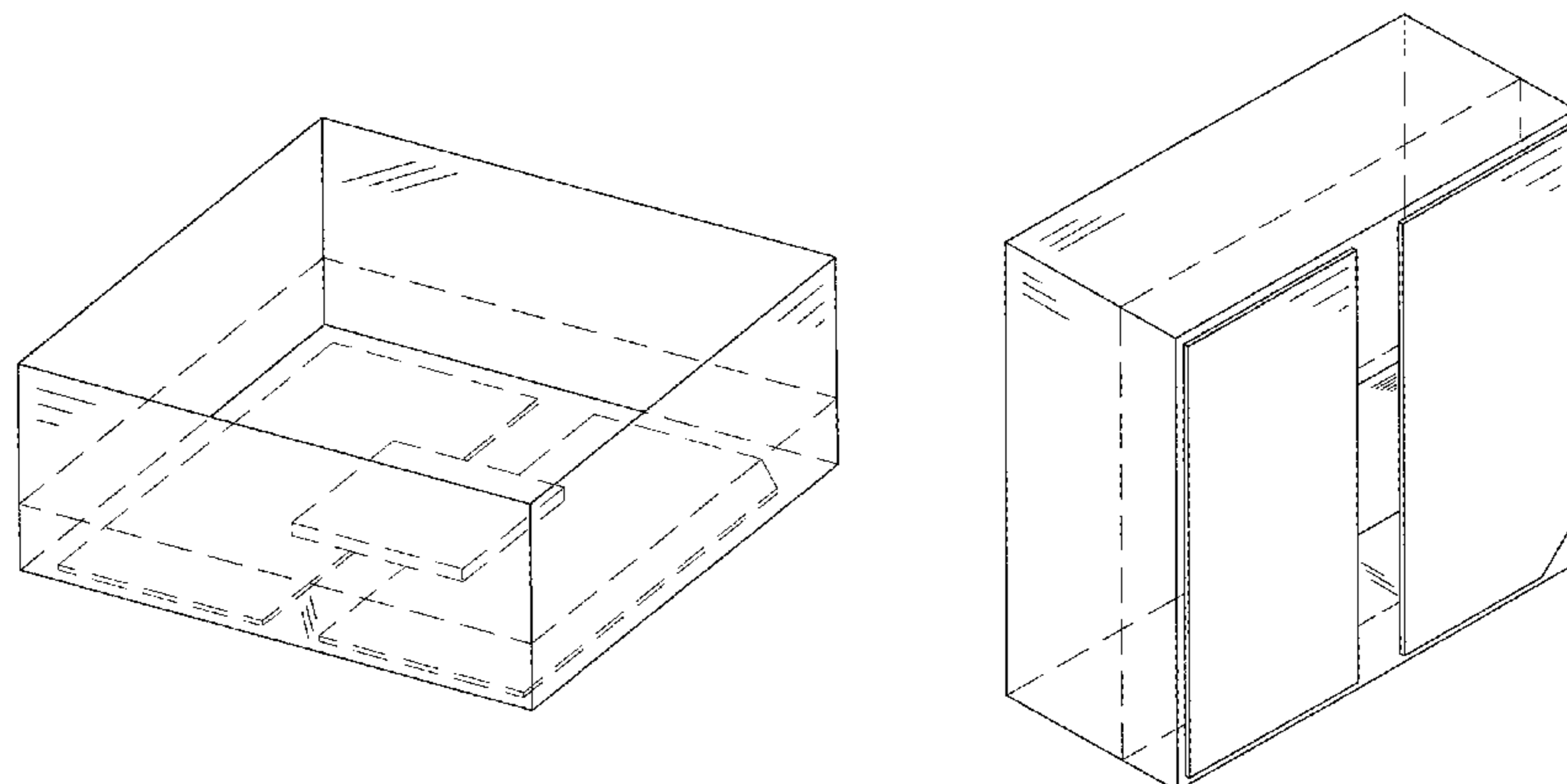
5,760,422 A 6/1998 Ishinaga
6,392,342 B1 5/2002 Parikka

(Continued)

FIG. 1 is a top perspective view of a light-emitting diode showing our new design, in which diagonal line shading is used to illustrate transparent surfaces, and the chip and electrode pads are not transparent;
FIG. 2 is a bottom perspective view thereof;
FIG. 3 is a front elevational view thereof;
FIG. 4 is a rear elevational view thereof;
FIG. 5 is a left side view thereof;
FIG. 6 is a right side view thereof;
FIG. 7 is a top plan view thereof; and
FIG. 8 is a bottom plan view thereof.
FIG. 9 is a top perspective view of a light-emitting diode showing our new design, in which diagonal line shading is used to illustrate transparent surfaces, and the chip and electrode pads are not transparent;
FIG. 10 is a bottom perspective view thereof;
FIG. 11 is a front elevational view thereof;
FIG. 12 is a rear elevational view thereof;
FIG. 13 is a left side view thereof;
FIG. 14 is a right side view thereof;
FIG. 15 is a top plan view thereof; and,
FIG. 16 is a bottom plan view thereof.

The broken lines in the drawings depict portions of light emitting diode that form no part of the claimed design.

1 Claim, 10 Drawing Sheets



Related U.S. Application Data

continuation-in-part of application No. 29/496,938, filed on Jul. 18, 2014, now Pat. No. Des. 744,965, which is a continuation of application No. 29/462,785, filed on Aug. 8, 2013, now Pat. No. Des. 710,811.

(58) **Field of Classification Search**

CPC H01L 25/167; H01L 25/0753; H01L 27/0248; H01L 27/15; H01L 27/156; H01L 31/02; H01L 33/00; H01L 33/04; H01L 33/08; H01L 33/10; H01L 33/20; H01L 33/38; H01L 33/42; H01L 33/48; H01L 33/62; H01L 33/483; H01L 33/486; H01L 23/60; F21K 9/00; F21K 9/30; F21K 9/54

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,657,238 B2	12/2003	Ueda
D514,074 S	1/2006	Kamidoi et al.
D528,226 S	9/2006	Nagai et al.
7,385,653 B2	6/2008	Kim et al.
D576,571 S	9/2008	Itai
7,696,522 B2	4/2010	Ono et al.
7,714,334 B2	5/2010	Lin
7,750,361 B2	7/2010	Watanabe
7,781,888 B2	8/2010	Kobayakawa et al.
D626,097 S	10/2010	Takeuchi et al.
D629,767 S	12/2010	Shimizu et al.
7,967,491 B2	6/2011	Hsu et al.
D653,628 S	2/2012	Miyashita
D653,629 S	2/2012	Miyashita
8,242,514 B2	8/2012	Joung
D672,731 S	12/2012	Bergmann et al.
D676,002 S	2/2013	Watanabe
D676,003 S	2/2013	Takeda et al.

D682,225 S	5/2013	Bergmann et al.	
D689,830 S	9/2013	Bergmann et al.	
D694,201 S	11/2013	Iino	
8,648,360 B2	2/2014	Chen	
D709,840 S	7/2014	Tsai et al.	
D710,811 S	8/2014	Chen et al.	
8,888,320 B2	11/2014	Lueken et al.	
D719,535 S	12/2014	Iino et al.	
D724,039 S	3/2015	Iino et al.	
D724,548 S	3/2015	Iino et al.	
D731,987 S	6/2015	Ishida et al.	
D731,989 S	6/2015	Huang et al.	
D744,965 S	12/2015	Chen et al.	
D778,846 S *	2/2017	Song	D13/180
D778,847 S *	2/2017	Song	D13/180
D780,135 S *	2/2017	Chen	D13/180
D823,269 S *	7/2018	Iino	D13/180
2002/0123163 A1 *	9/2002	Fujii	H01L 33/486 438/26
2003/0107045 A1	6/2003	Eisert et al.	
2004/0164395 A1 *	8/2004	Kobayakawa	H01L 21/4828 257/690
2006/0163602 A1	7/2006	Isokawa	
2007/0075323 A1	4/2007	Kanazawa et al.	
2007/0096114 A1	5/2007	Aoki et al.	
2007/0223170 A1 *	9/2007	Sato	H01C 1/142 361/118
2008/0151557 A1	6/2008	Su et al.	
2008/0165539 A1	7/2008	Hsu et al.	
2010/0096644 A1	4/2010	Kong	
2011/0291145 A1 *	12/2011	Han	H01L 33/0079 257/98
2012/0032203 A1	2/2012	Urano	
2012/0080674 A1	4/2012	Shimizu et al.	
2013/0134472 A1	5/2013	Zhang	
2013/0193474 A1	8/2013	Kim et al.	
2013/0240922 A1	9/2013	Yamamoto	
2013/0328074 A1 *	12/2013	Lowes	H01L 27/15 257/89
2014/0070249 A1 *	3/2014	Yoon	H01L 33/62 257/98

* cited by examiner

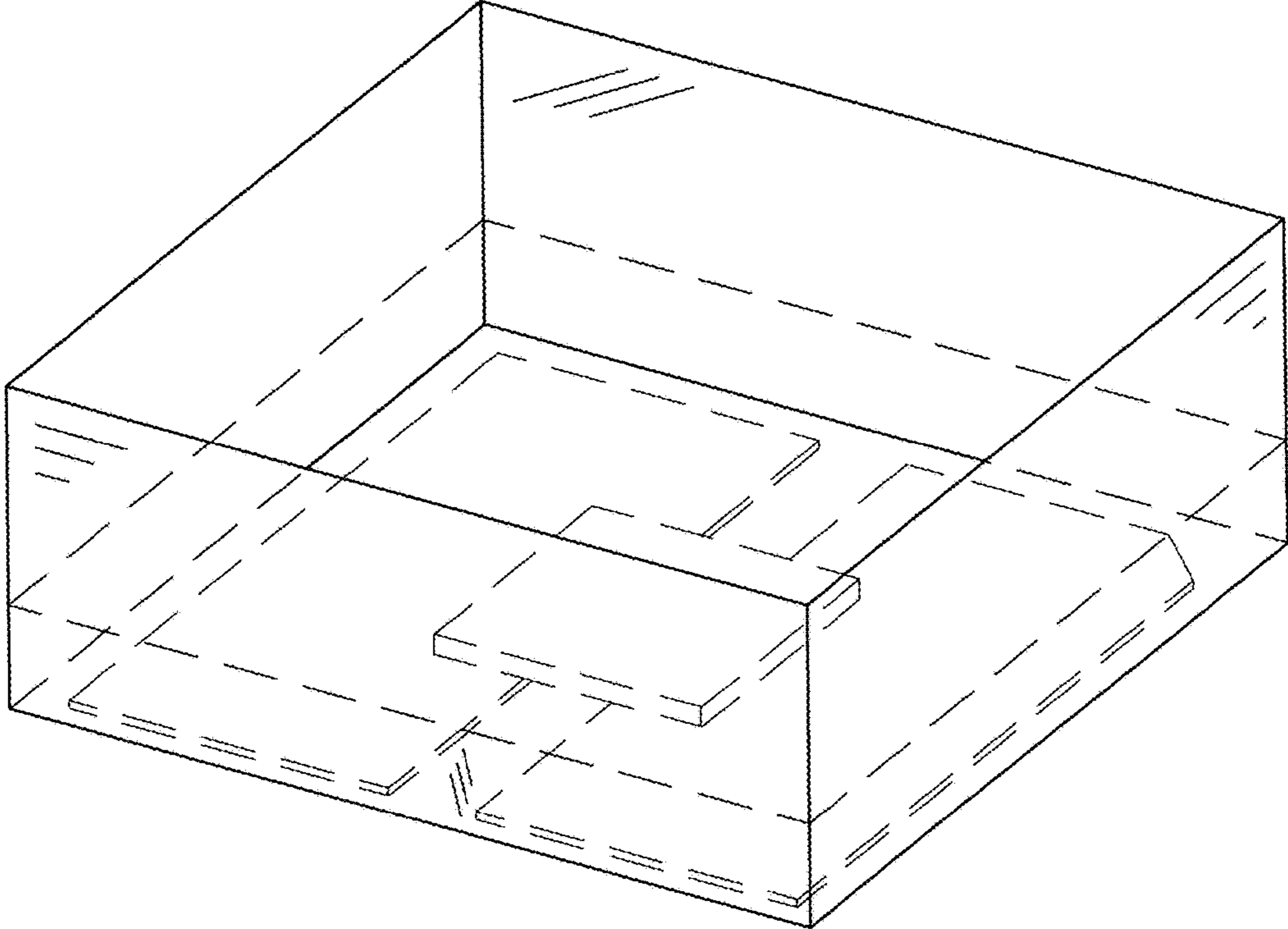


FIG. 1

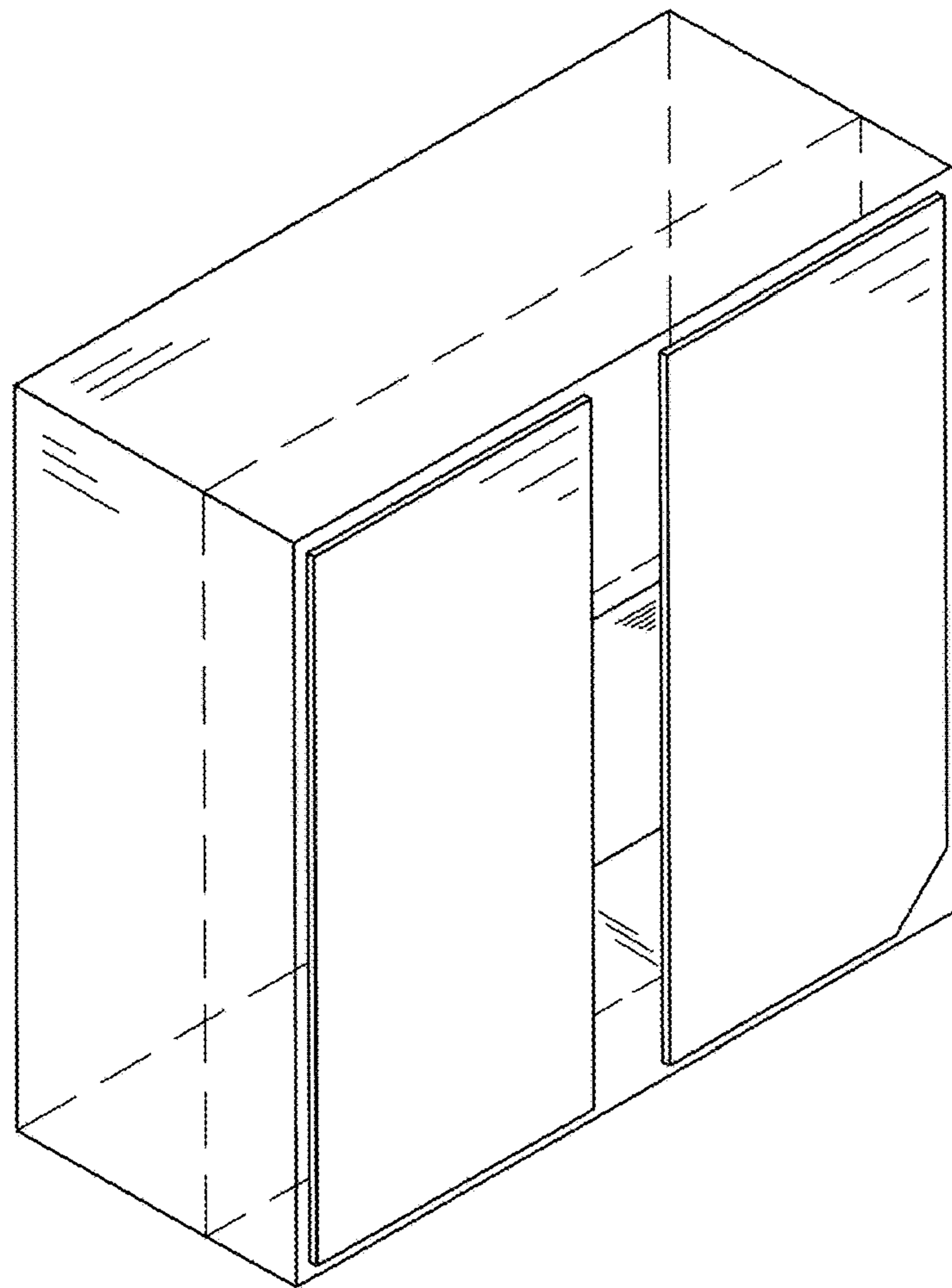


FIG. 2

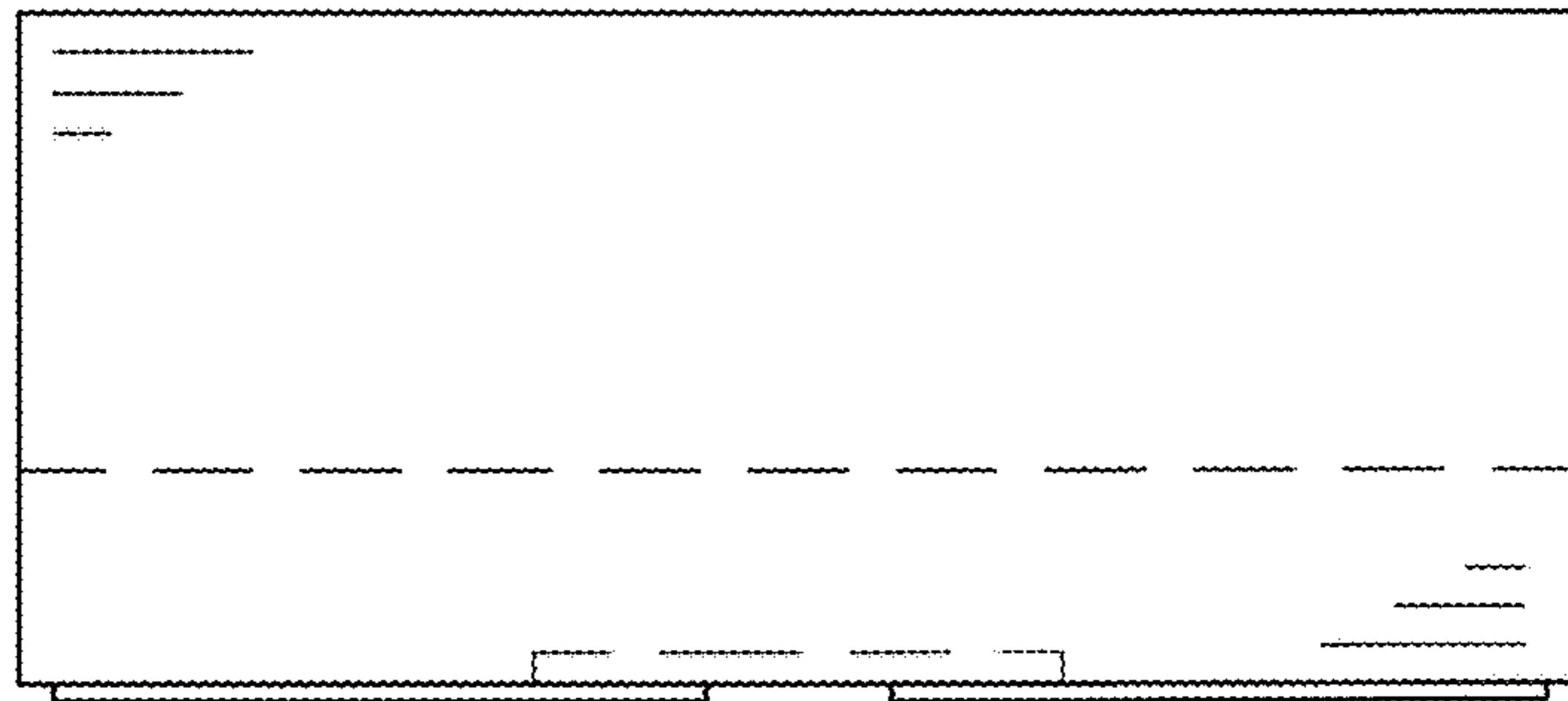


FIG. 3

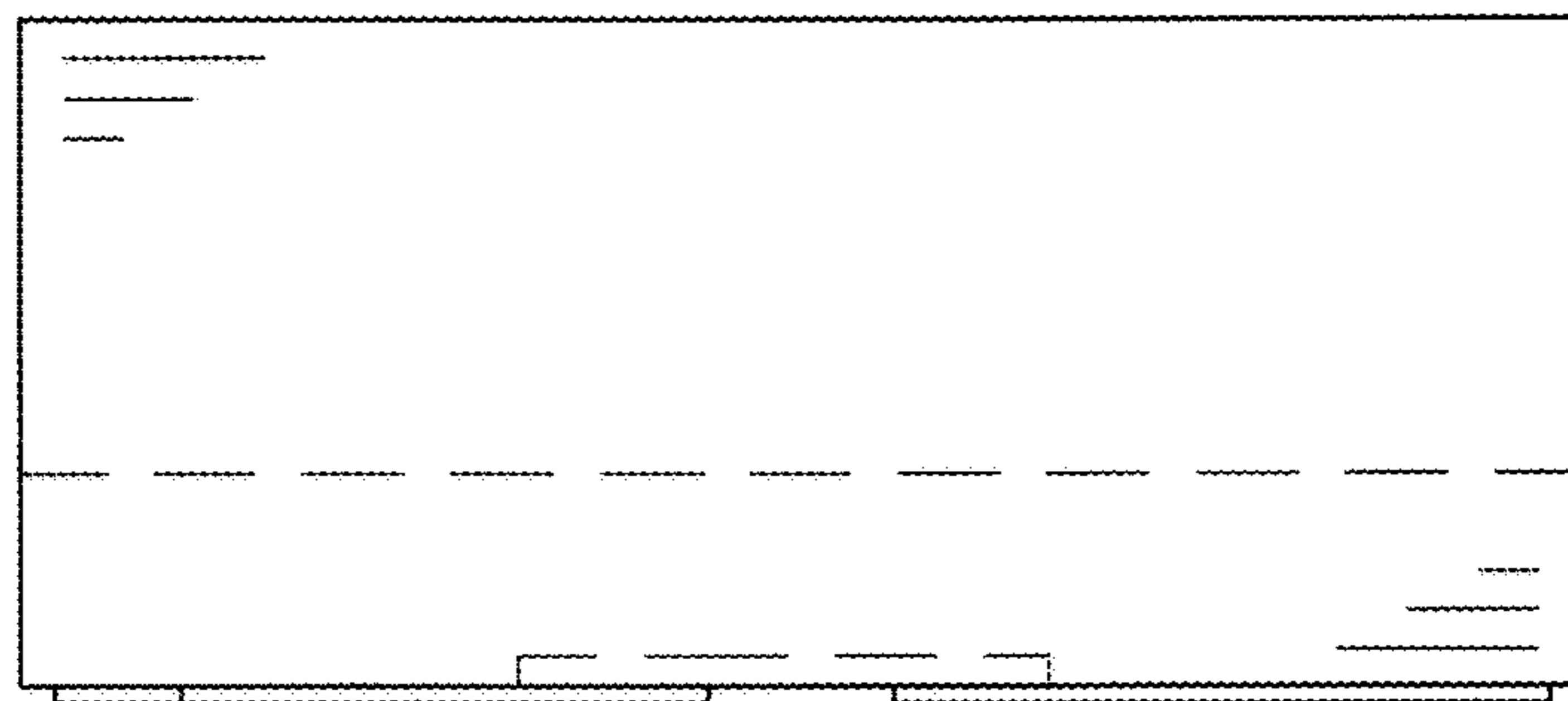


FIG. 4

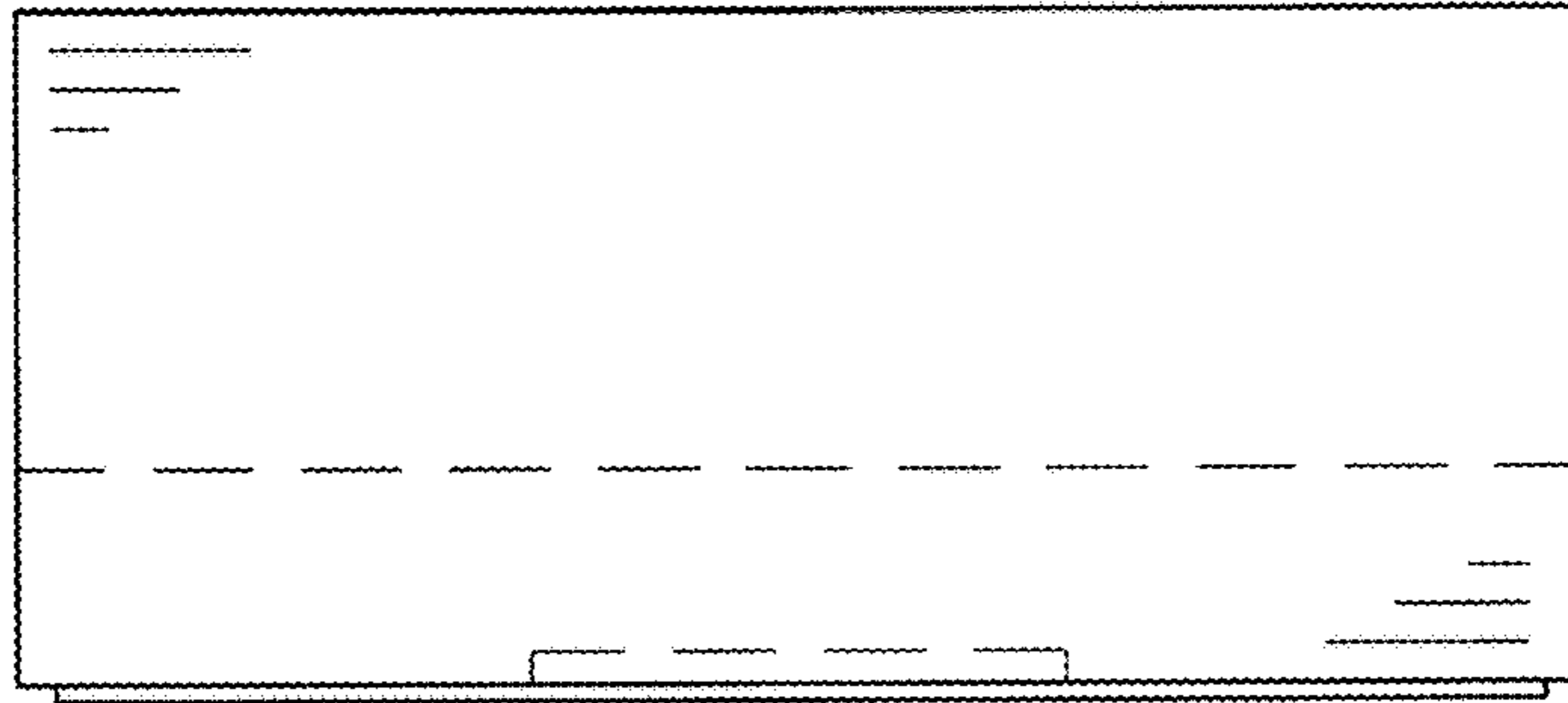


FIG. 5

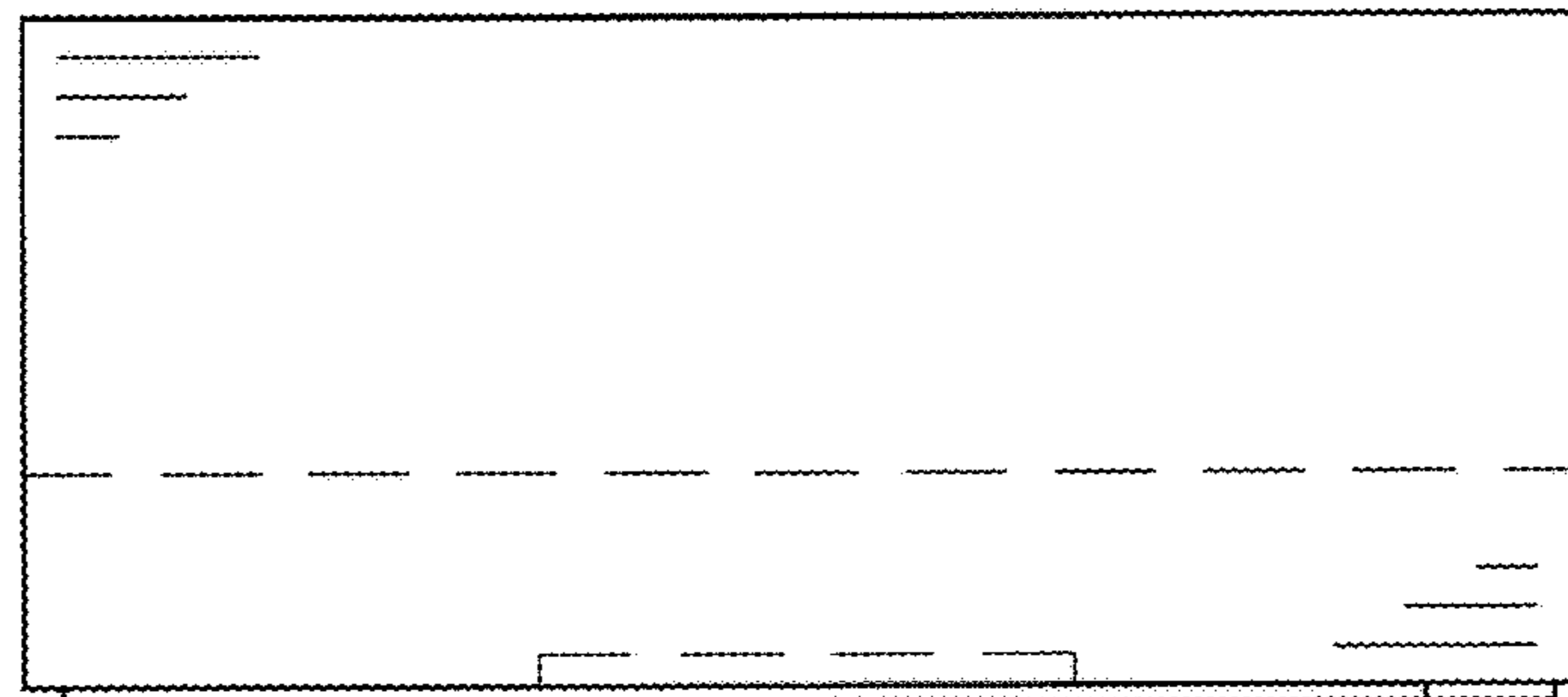


FIG. 6

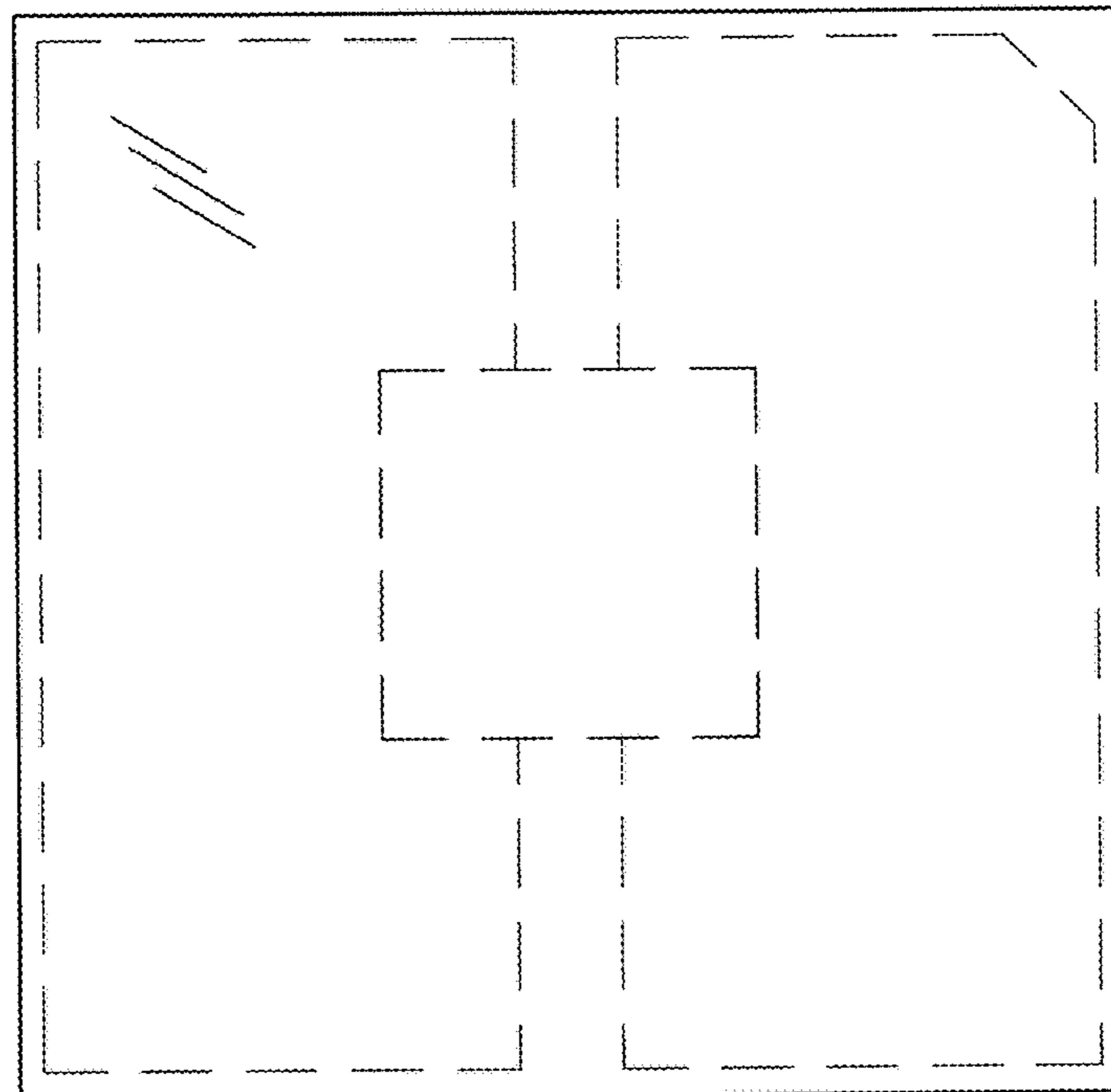


FIG. 7

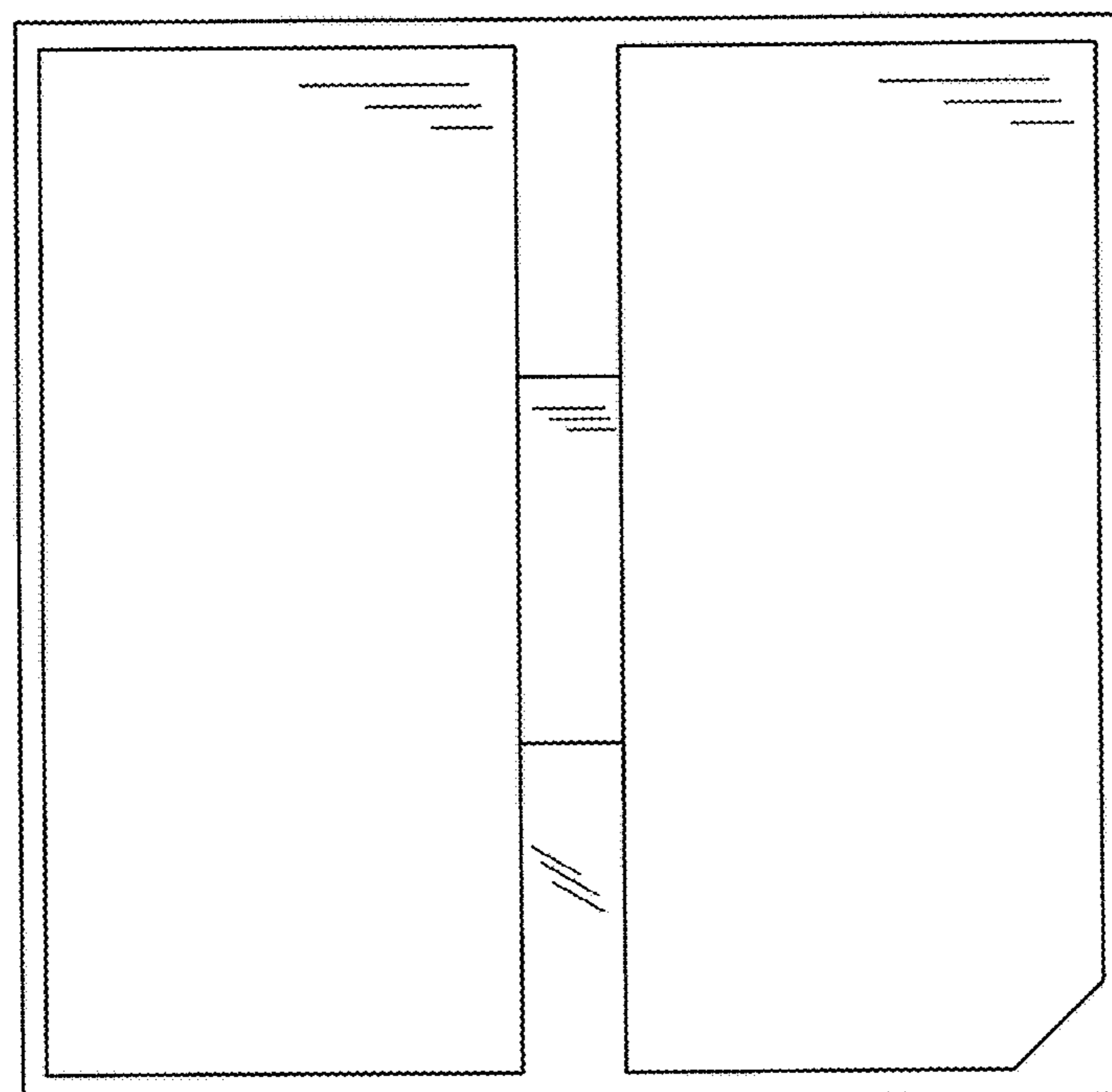


FIG. 8

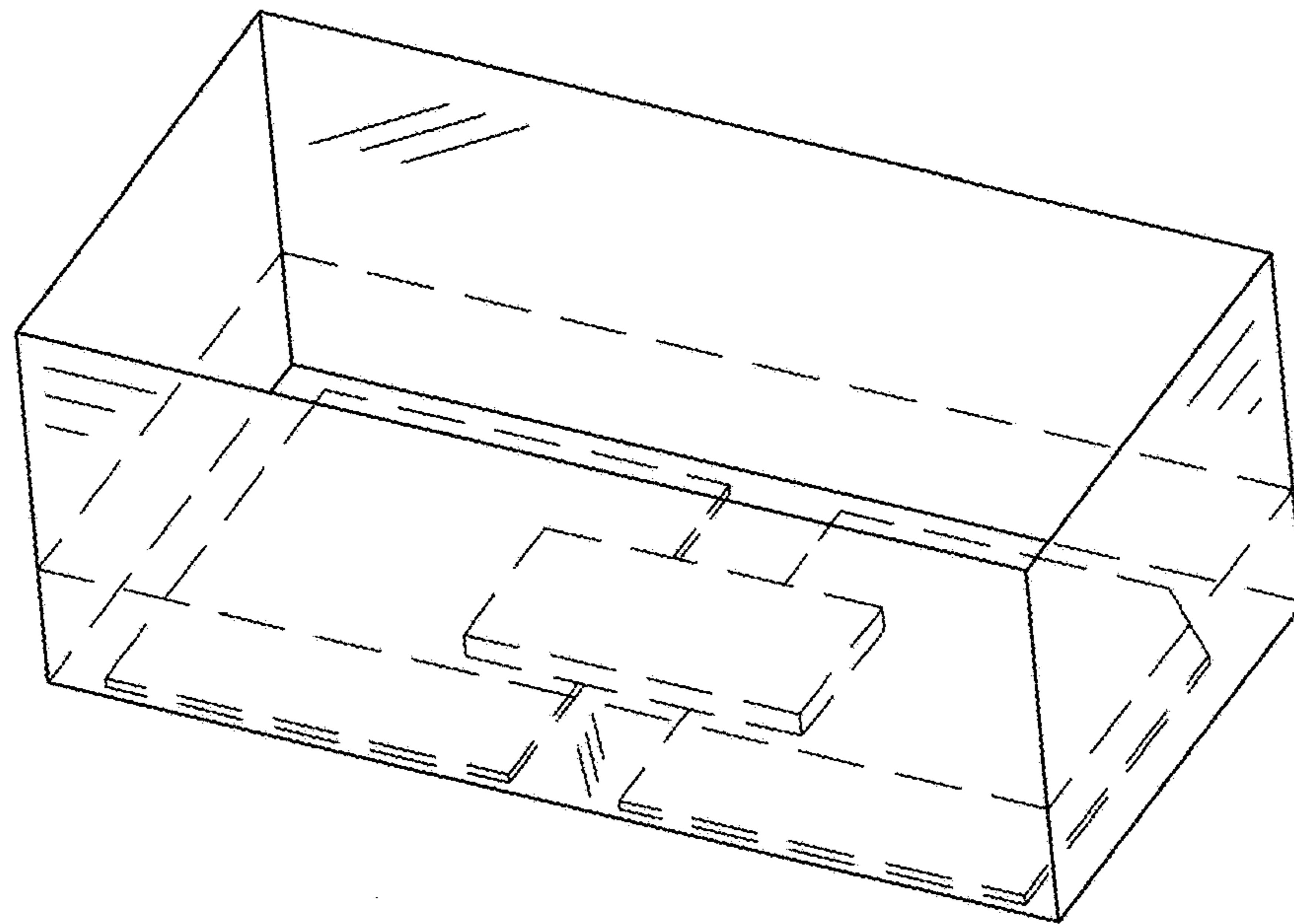


FIG. 9

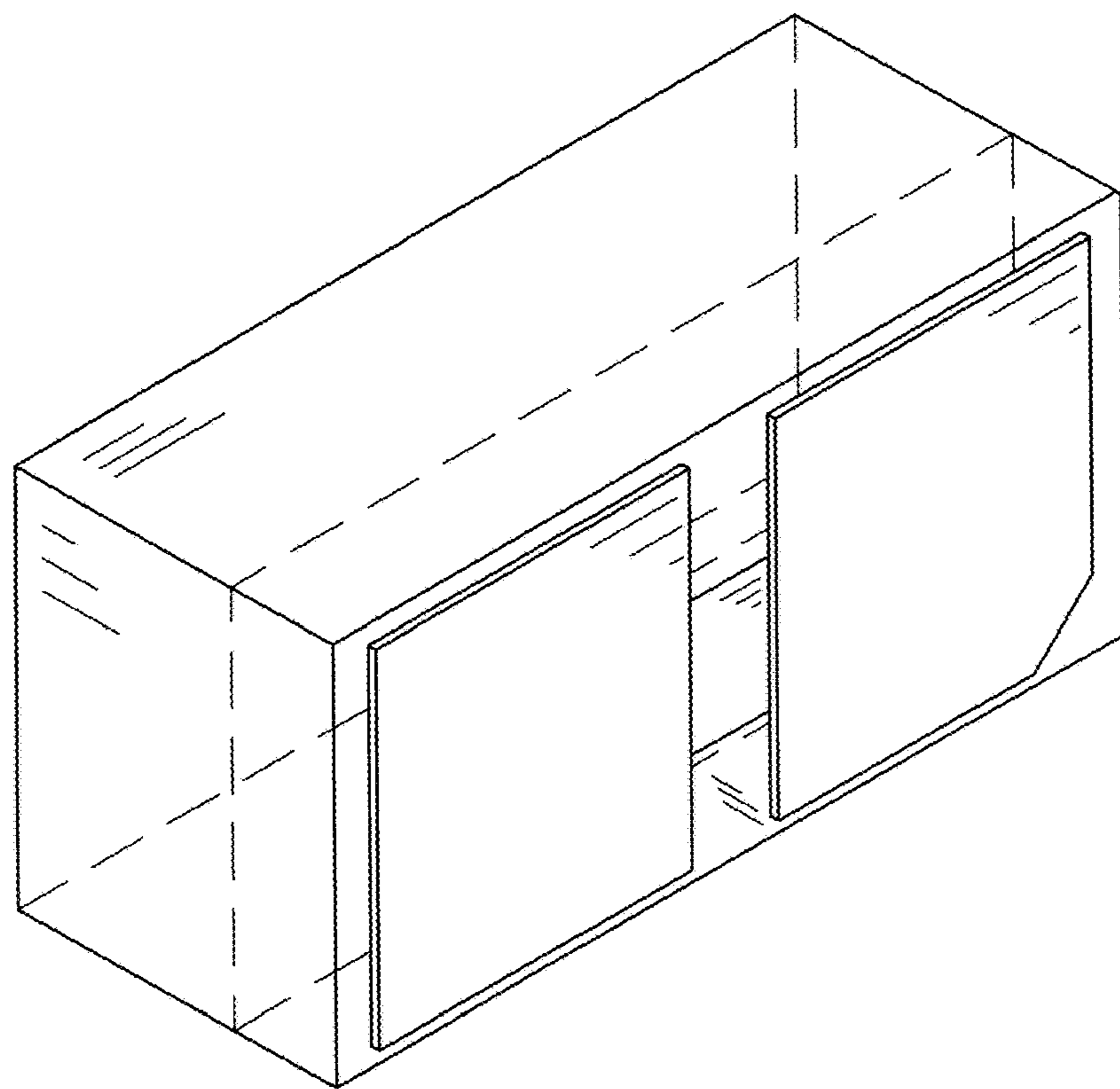


FIG. 10



FIG. 11

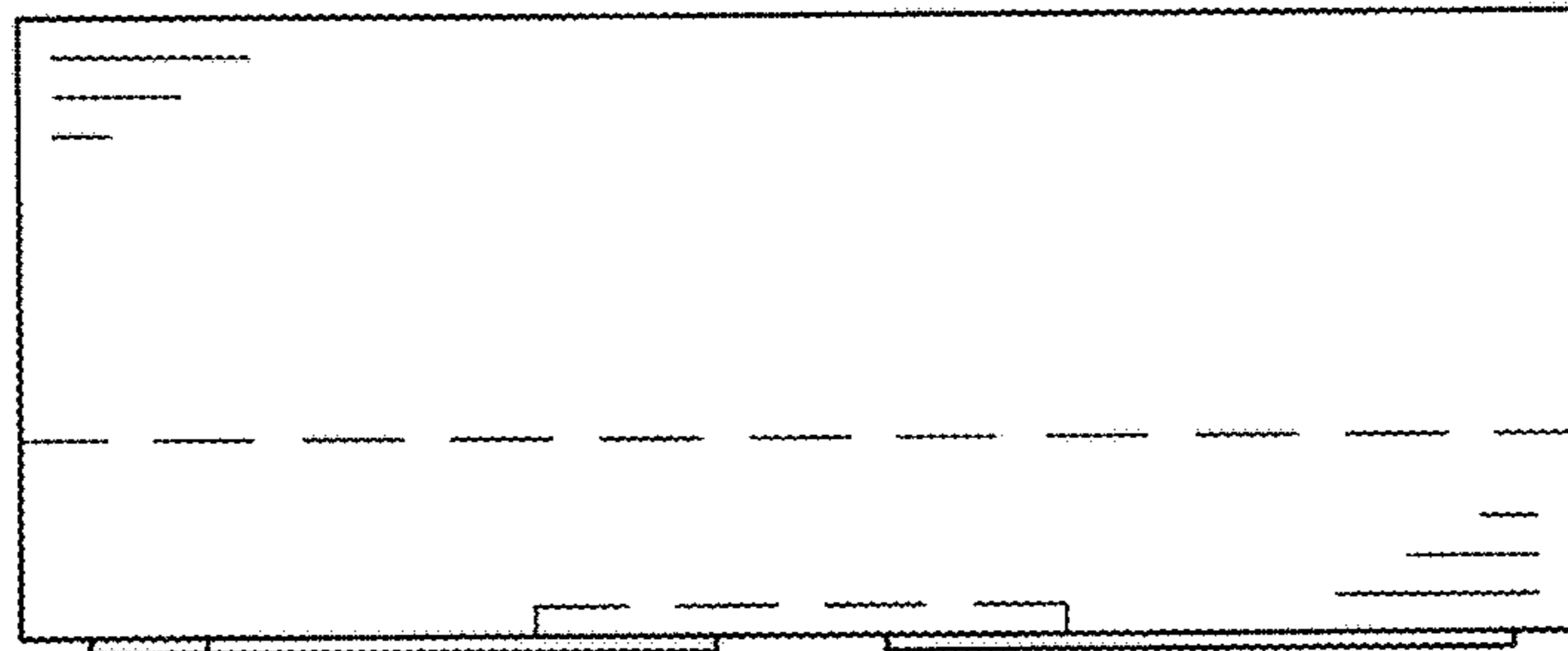


FIG. 12

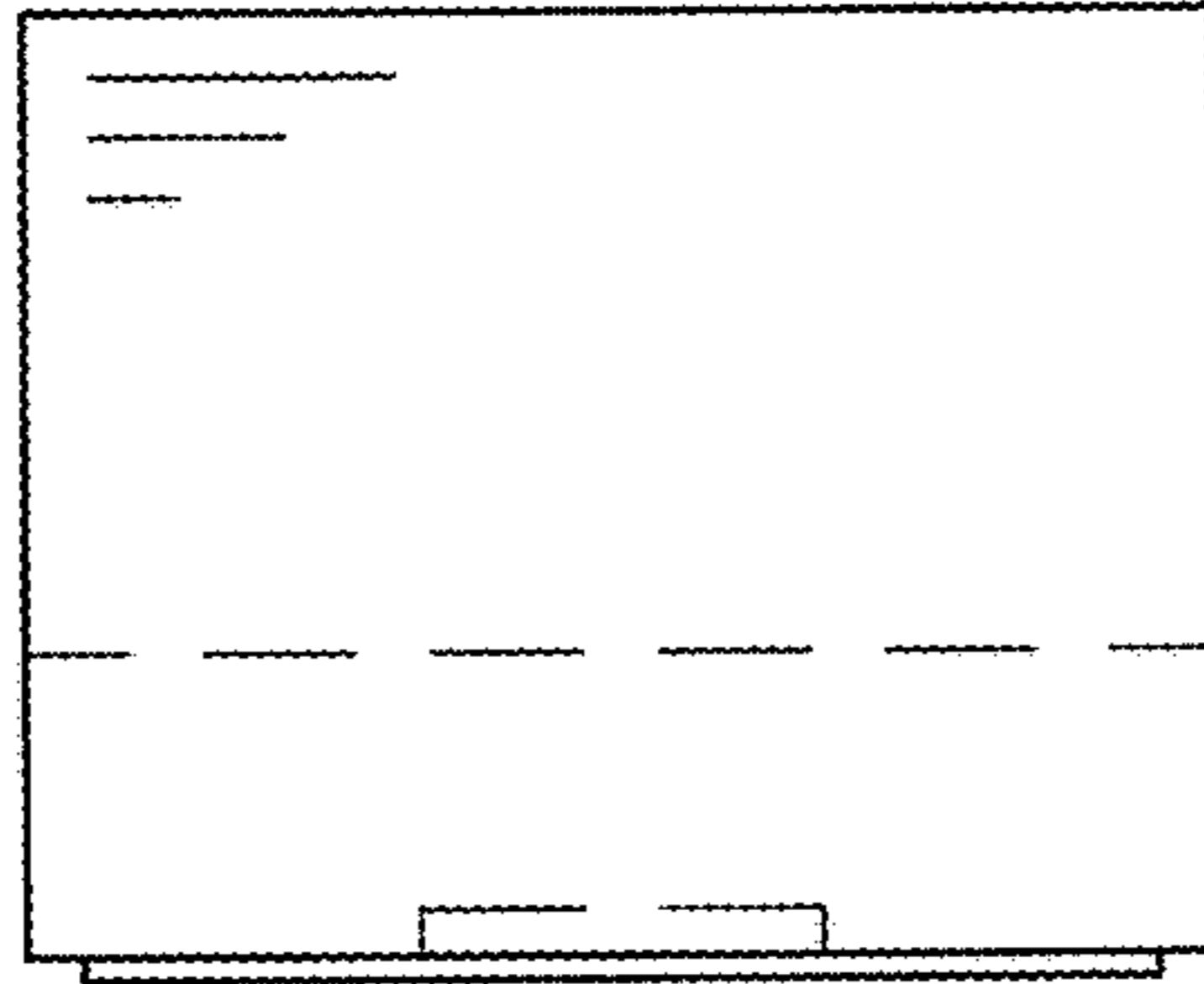


FIG. 13

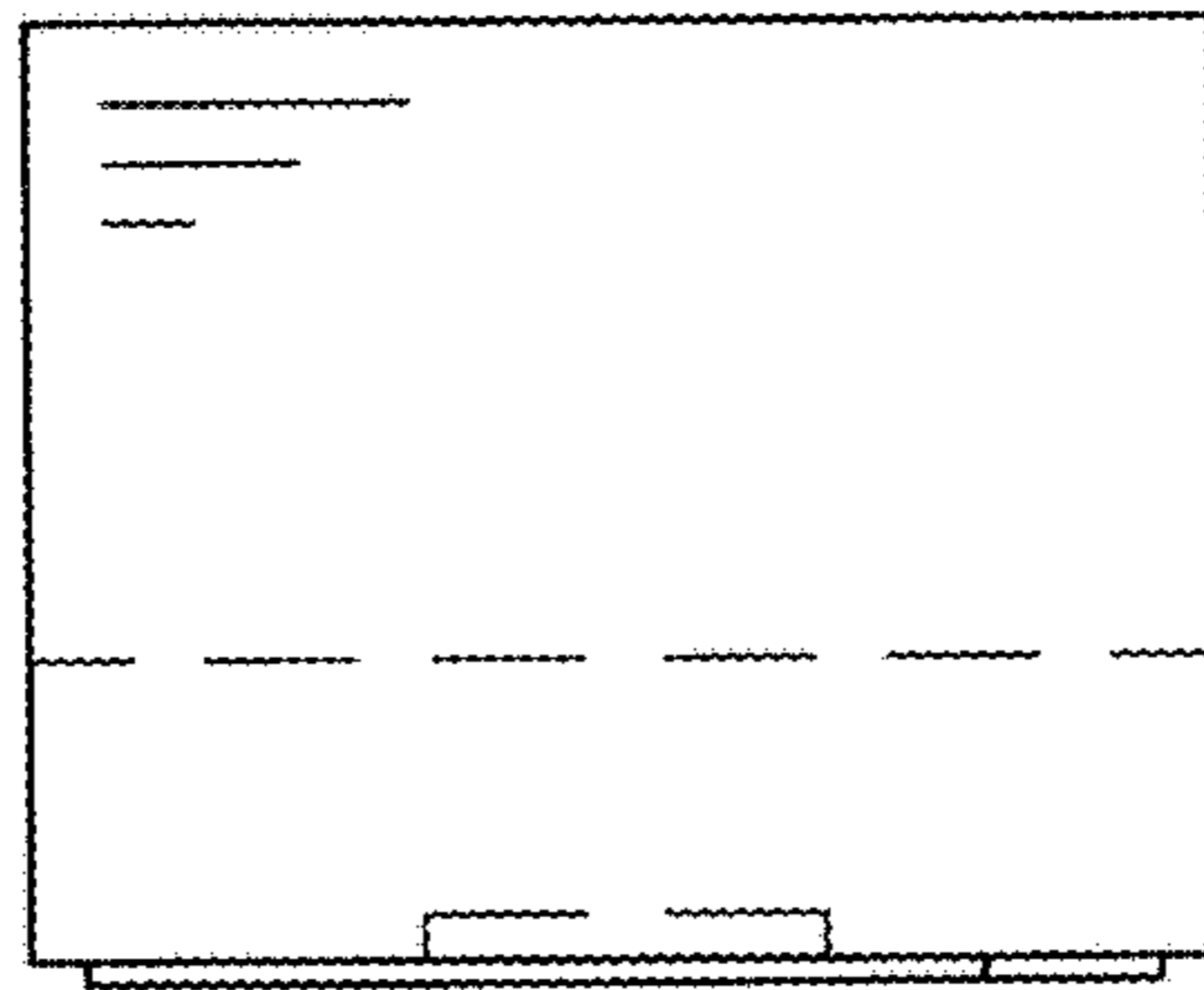


FIG. 14

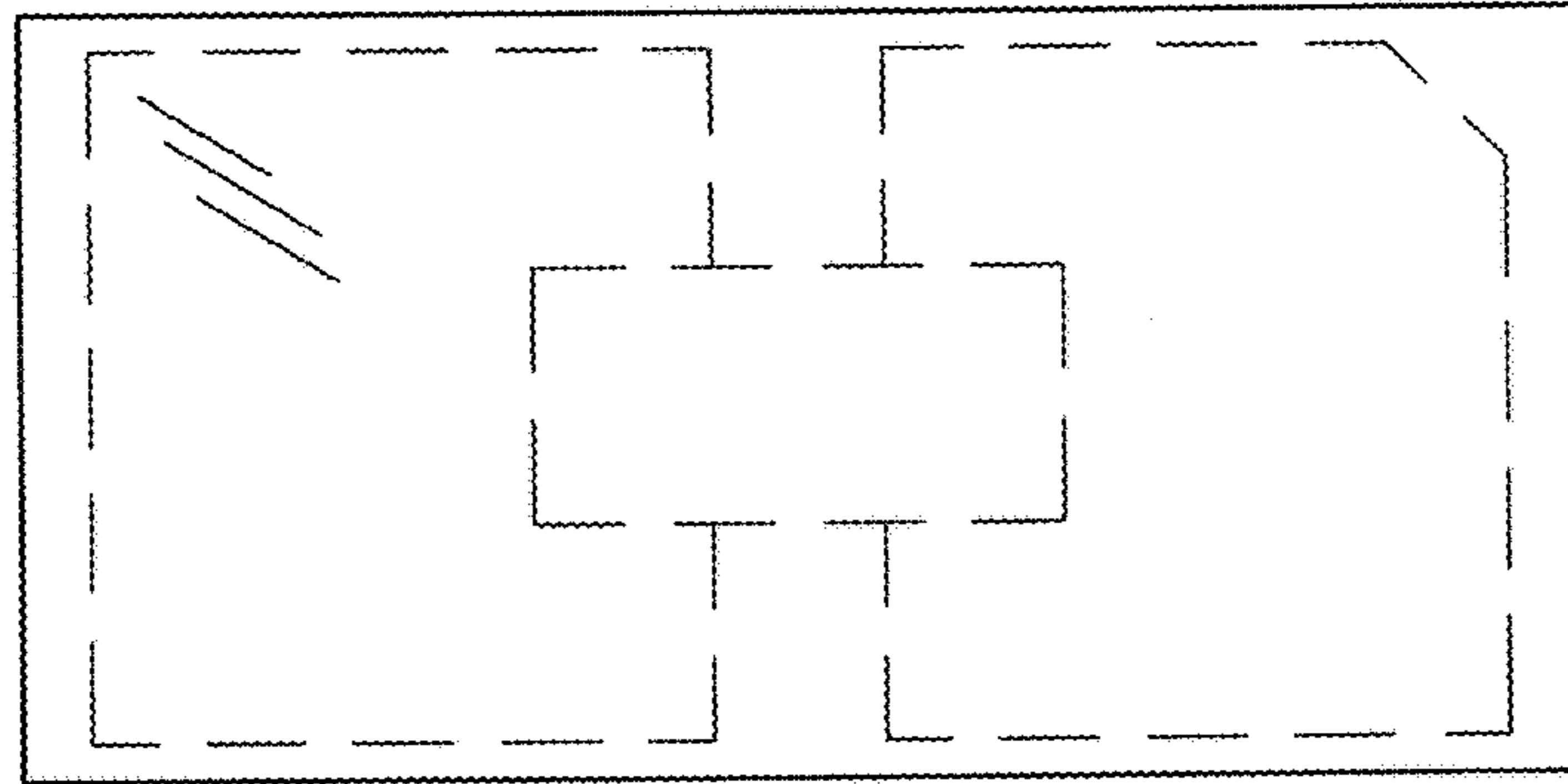


FIG. 15

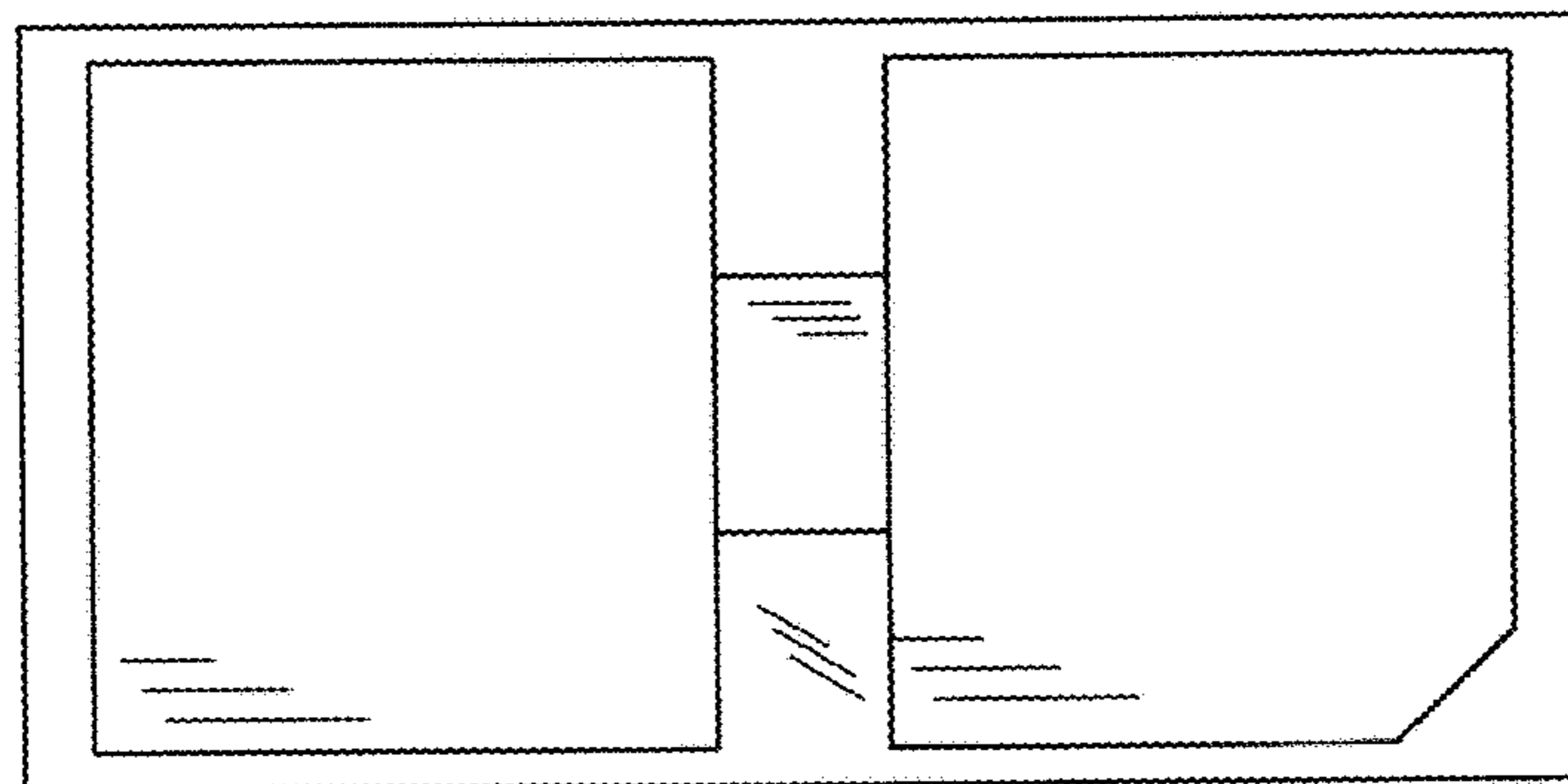


FIG. 16