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

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(54) **SEMICONDUCTOR PACKAGE**

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

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Related U.S. Application Data

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(30) **Foreign Application Priority Data**

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

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

(58) **Field of Classification Search**
USPC D13/182; 257/678, 684, 690, 691; 361/679.01, 713, 728, 736, 760, 761, 772, 361/775, 783, 820; 174/250, 253; 438/15, 25, 26, 51, 55, 63, 64, 106
CPC . H01L 21/00; H01L 2224/42; H01L 2224/43; H01L 2021/00; H01L 2021/02; H01L 2021/04; H01L 21/4814; H01L 21/4846; H01L 21/4871; H01L 21/67144; H01L 23/02; H01L 23/14; H01L 23/147; H01L 2924/171; H01L 2924/1711; H01L 2924/1715; H01L 2924/17151; H01L 2924/181; H01L 2924/1811; H01L
(Continued)

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,498,585 A * 2/1950 Seiden H03H 9/1028
310/355
2,817,046 A * 12/1957 Weiss H01L 23/041
257/794

(Continued)

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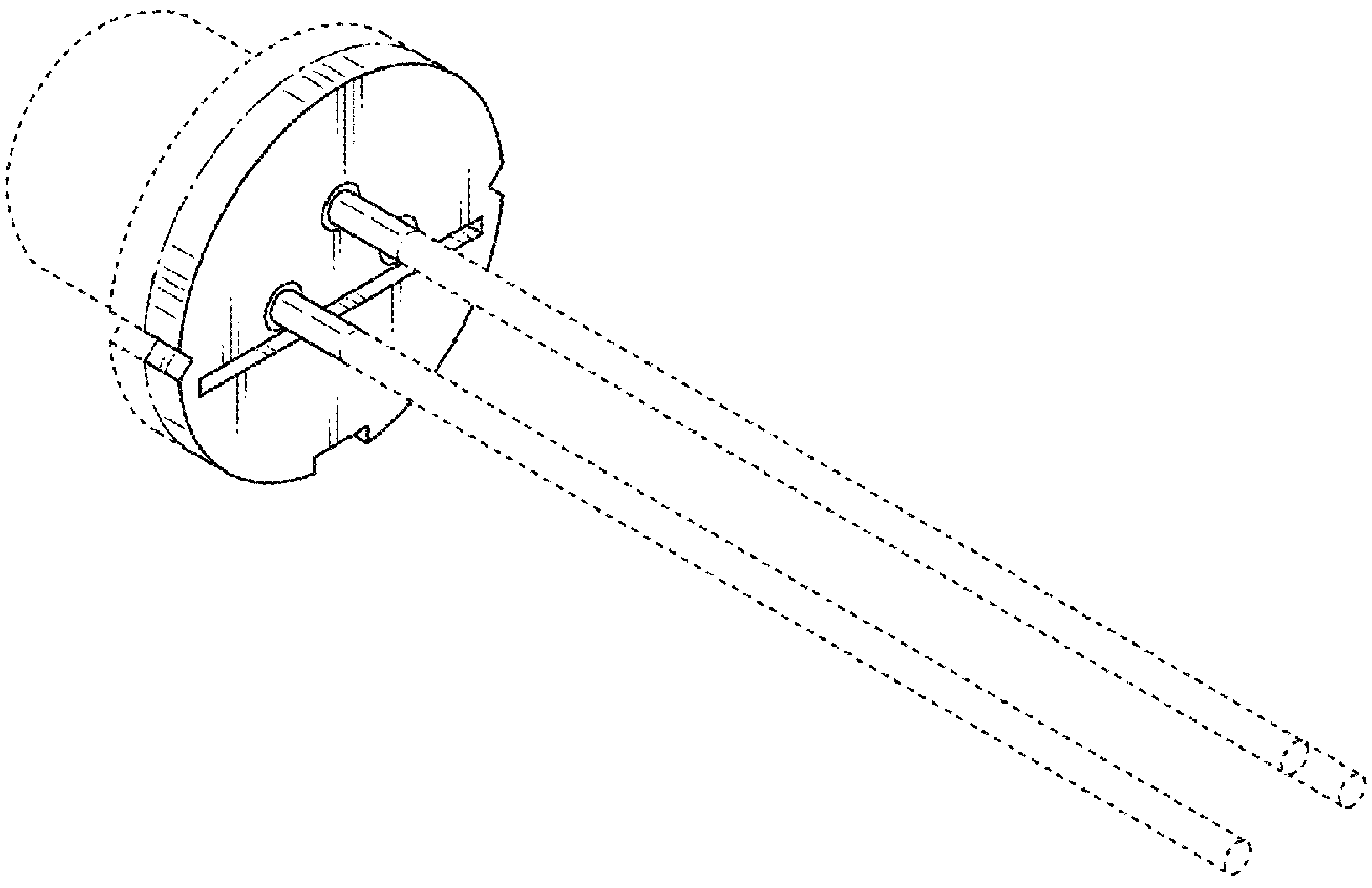
(57) **CLAIM**

The ornamental design for a semiconductor package, as shown and described.

DESCRIPTION

FIG. **1** is a front, top and left side perspective view of a semiconductor package showing our new design;
FIG. **2** is a front view thereof;
FIG. **3** is a rear view thereof;
FIG. **4** is a top view thereof;
FIG. **5** is a bottom view thereof;
FIG. **6** is a left side view thereof; the right side view being a mirror image thereof;
FIG. **7** is a cross-sectional view taken along line **7-7** in FIG. **2**, with the internal structure shown in broken lines; and,
FIG. **8** is a perspective view of FIG. **1**, shown in a state of use.
The parts shown in even dashed broken lines do not form part of the claimed design. The dot and dashed lines mean a boundary between the claimed portion and the non-claimed portion and form no part of the claimed design.

1 Claim, 5 Drawing Sheets



(58) **Field of Classification Search**

CPC 2924/1815; H01L 2924/19042; H01L 2924/1905; H01L 2224/08054; H01L 23/58; H05B 41/14; H02B 6/4201; G02B 6/4256; G02B 6/4257; G02B 6/4261; G02B 6/4262; G02B 6/428; G02B 6/4281; H05K 1/14; H05K 1/141; H05K 1/142; H05K 1/144; H05K 1/18; H05K 1/181; H05K 1/182; H05K 1/026

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,986,678	A *	5/1961	Andres	H01L 23/488 257/708
3,458,779	A	7/1969	Blank et al.	
3,510,732	A *	5/1970	Amans	H01L 29/242 257/77
3,562,609	A *	2/1971	Addamiano	H01L 23/045 257/77
3,614,550	A *	10/1971	Marinace	H01S 5/30 372/44.01
3,715,636	A *	2/1973	Jaffe	H01L 33/343 257/76
3,774,086	A *	11/1973	Vincent, Jr.	F21K 2/005 257/95
3,805,347	A *	4/1974	Collins	H01L 33/58 445/24
3,962,719	A *	6/1976	Pfaff	H05K 7/1053 257/678
4,032,963	A *	6/1977	Thome	H01L 33/483 257/100
4,143,394	A *	3/1979	Schoberl	H01L 33/56 257/98
4,152,624	A *	5/1979	Knaebel	H01L 33/483 257/434
4,267,559	A	5/1981	Johnson et al.	
D277,955	S	3/1985	Takahashi	
D278,048	S	3/1985	Takahashi	
D278,049	S	3/1985	Takahashi et al.	
D280,812	S	10/1985	Takahashi	
D288,805	S *	3/1987	Nishizawa	D13/180
4,878,107	A *	10/1989	Hopper	H03K 17/941 257/415
5,266,817	A	11/1993	Lin	
5,459,350	A	10/1995	Date et al.	
5,512,784	A	4/1996	Fried et al.	
5,564,819	A	10/1996	Yamaguchi	
D420,983	S	2/2000	Choi	
6,034,424	A *	3/2000	Fujimura	G02B 6/4204 257/696
6,147,367	A	11/2000	Yang et al.	
6,335,548	B1 *	1/2002	Roberts	H01L 23/49562 257/98
6,404,065	B1	6/2002	Choi	
6,521,916	B2 *	2/2003	Roberts	B60Q 1/2665 257/100
D476,296	S	6/2003	Koizumi	
D482,666	S	11/2003	Kamada	
D483,338	S *	12/2003	Takagi	D13/182
D484,105	S *	12/2003	Takagi	D13/182
6,707,073	B1 *	3/2004	Yamamoto	H01S 5/02212 257/100
D489,695	S	5/2004	Komoto	
D494,147	S *	8/2004	Takagi	D13/182
6,784,464	B2 *	8/2004	Ichikawa	H01L 24/78 257/99
6,803,608	B1 *	10/2004	Chen	H01L 33/54 257/81
D505,664	S *	5/2005	Takagi	D13/182
D515,520	S	2/2006	Komoto	
D623,546	S	9/2010	Nishikawa et al.	
D623,547	S	9/2010	Nishikawa et al.	
D623,548	S	9/2010	Nishikawa et al.	
7,834,433	B2 *	11/2010	Xiaochun	H01L 24/83 257/675
7,889,770	B2 *	2/2011	Honda	H01S 5/02212 372/34
D877,707	S *	3/2020	Itakura	D13/182
2008/0111087	A1 *	5/2008	Nishikawa	G01J 1/02 250/492.1

* cited by examiner

Fig. 1

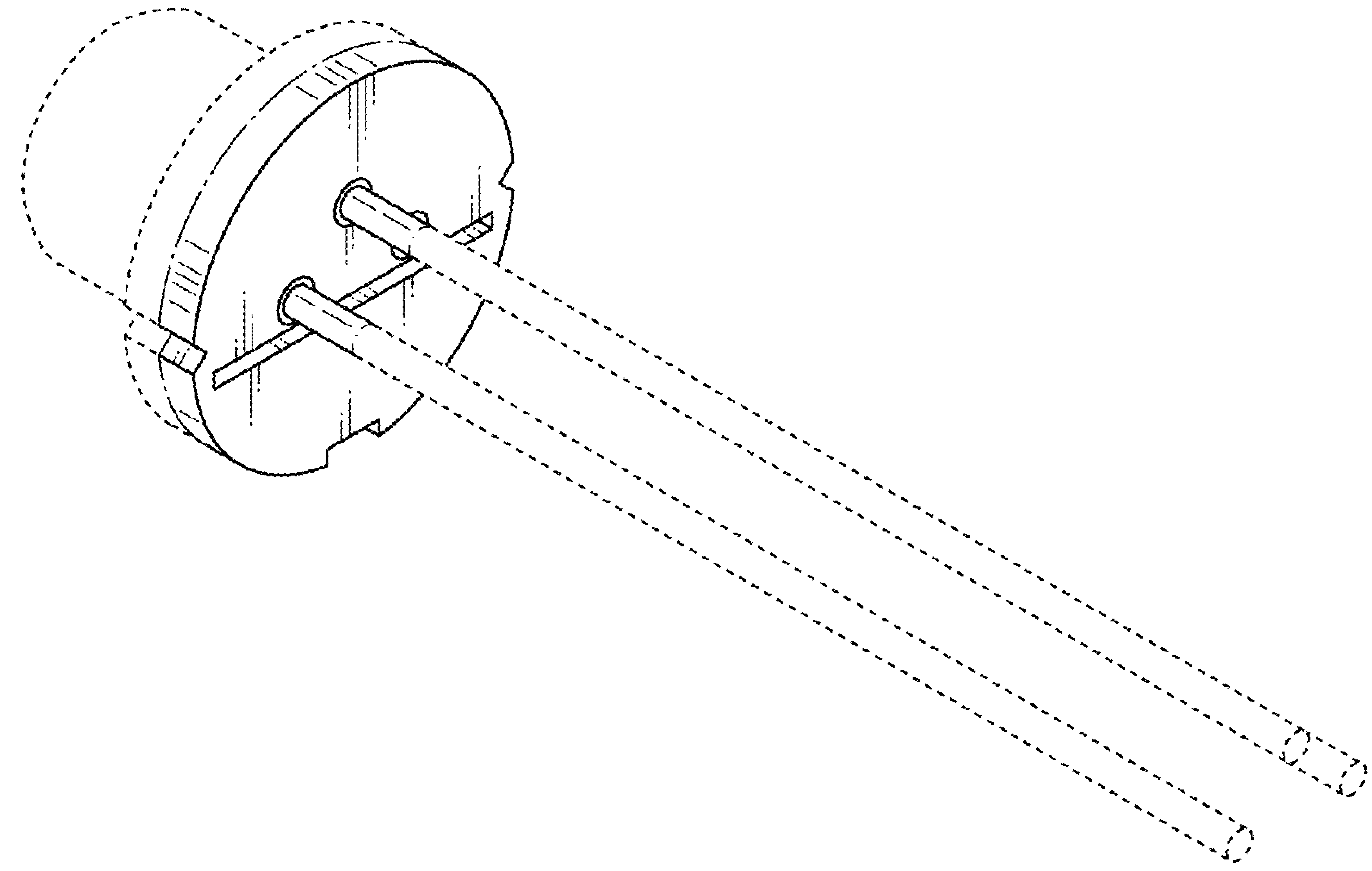


Fig. 2

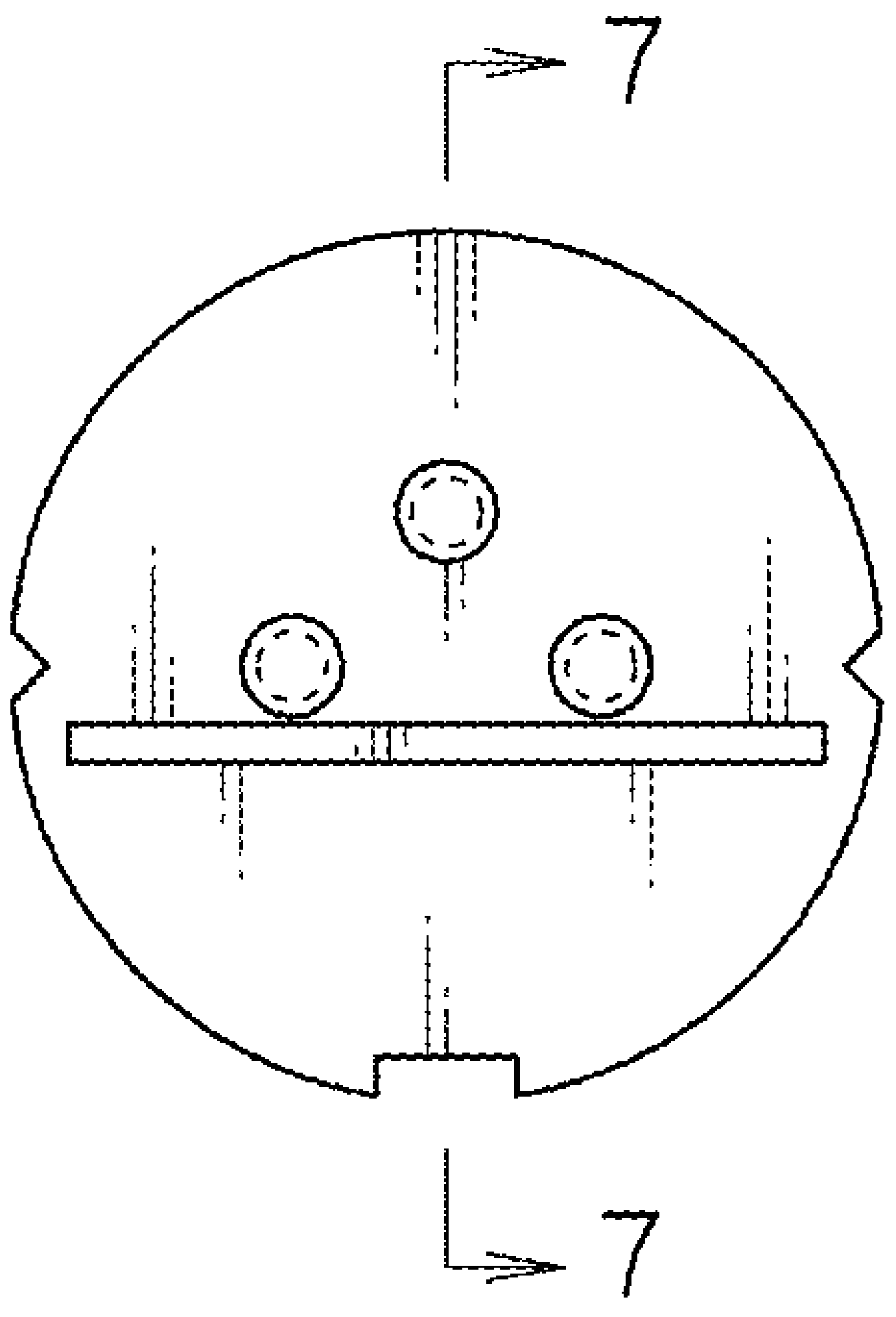


Fig. 3

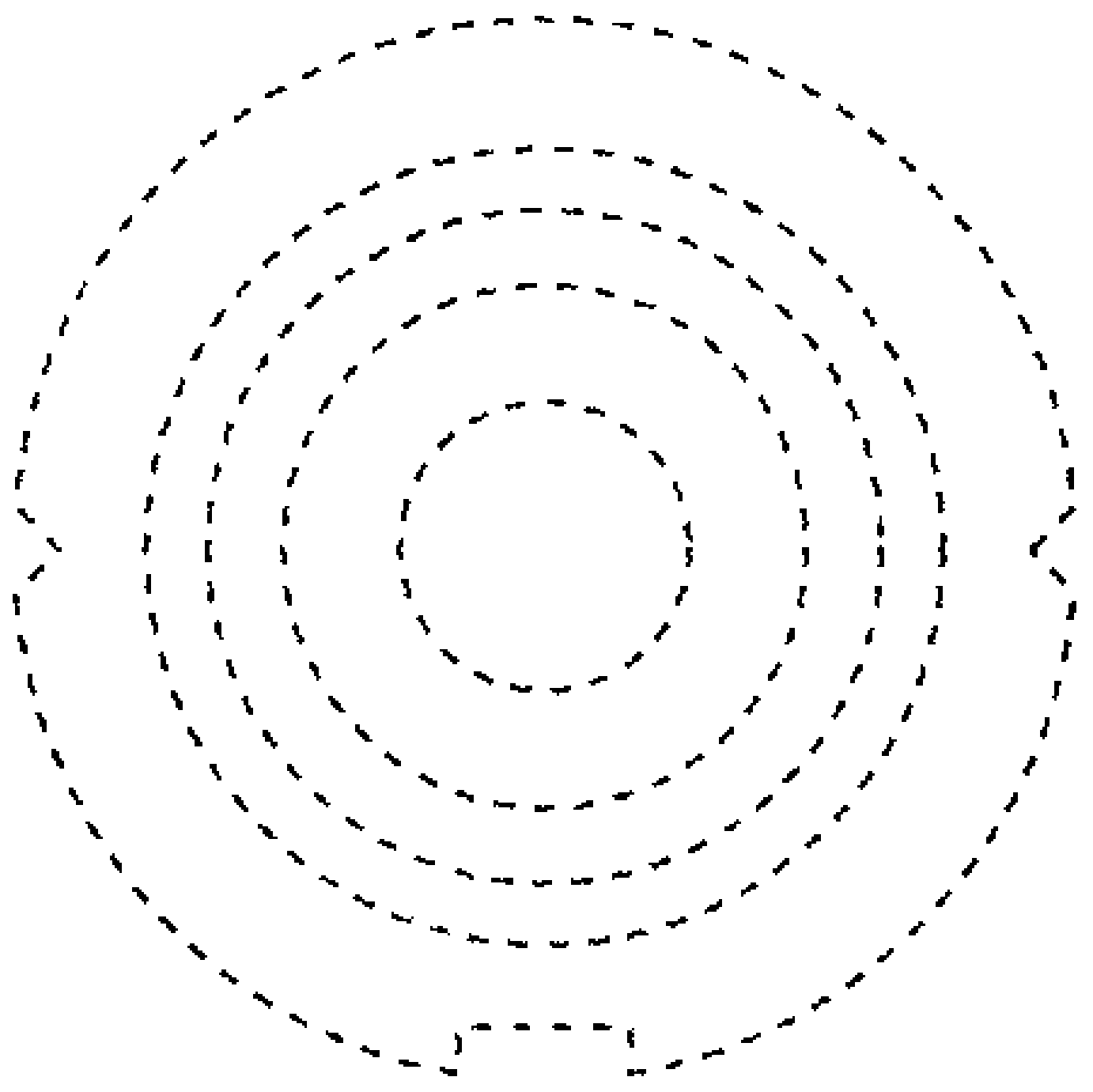


Fig. 4

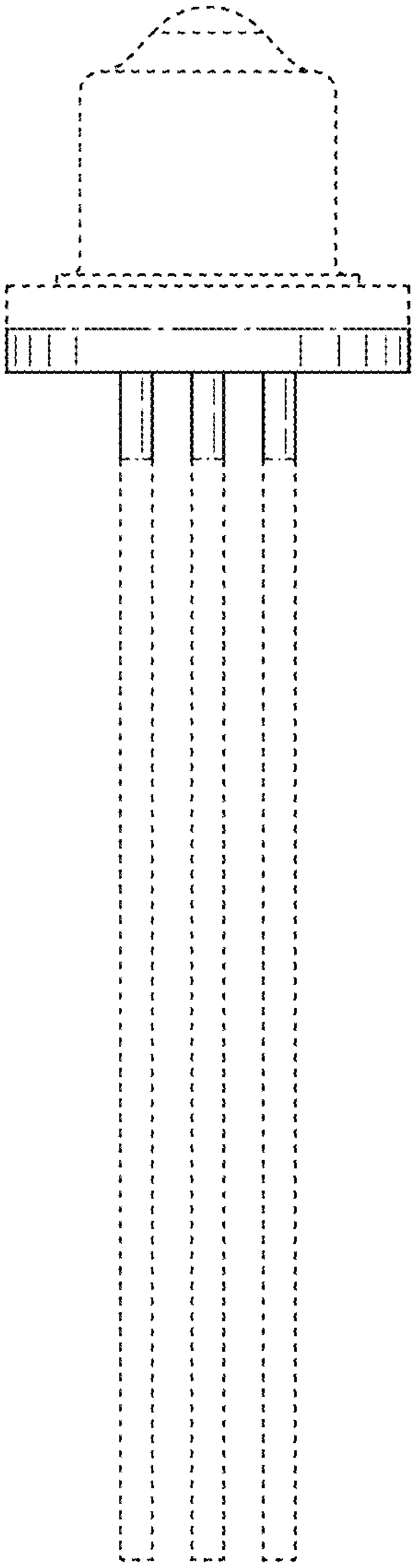


Fig. 5

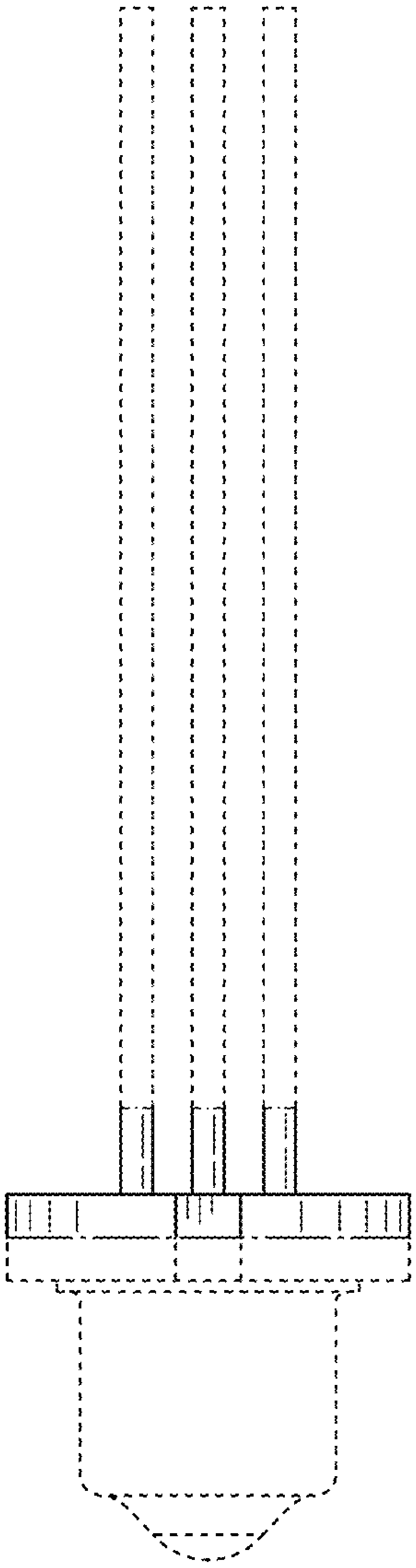


Fig. 6

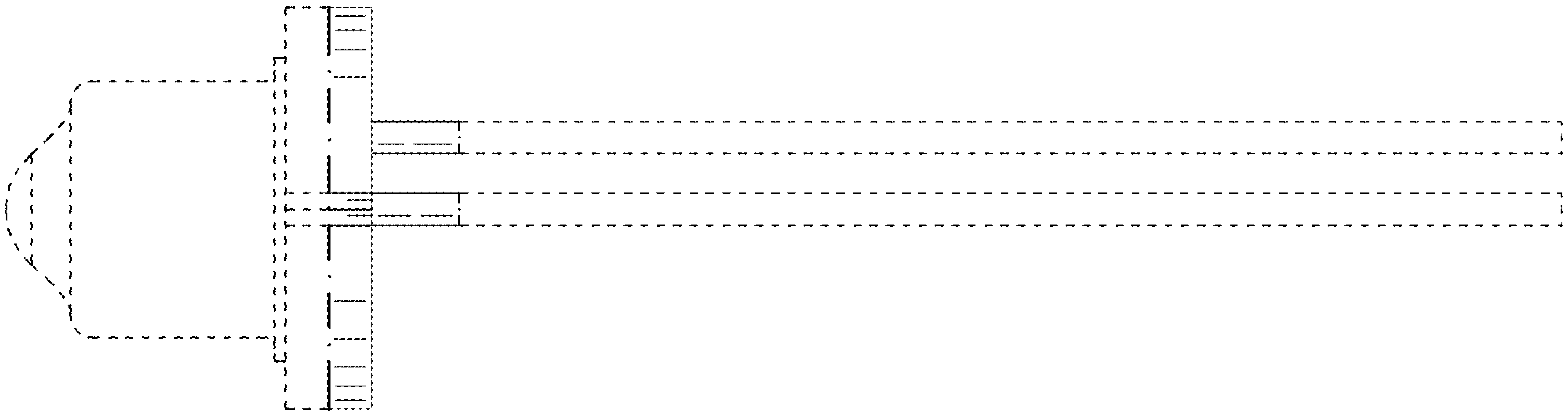


Fig. 7

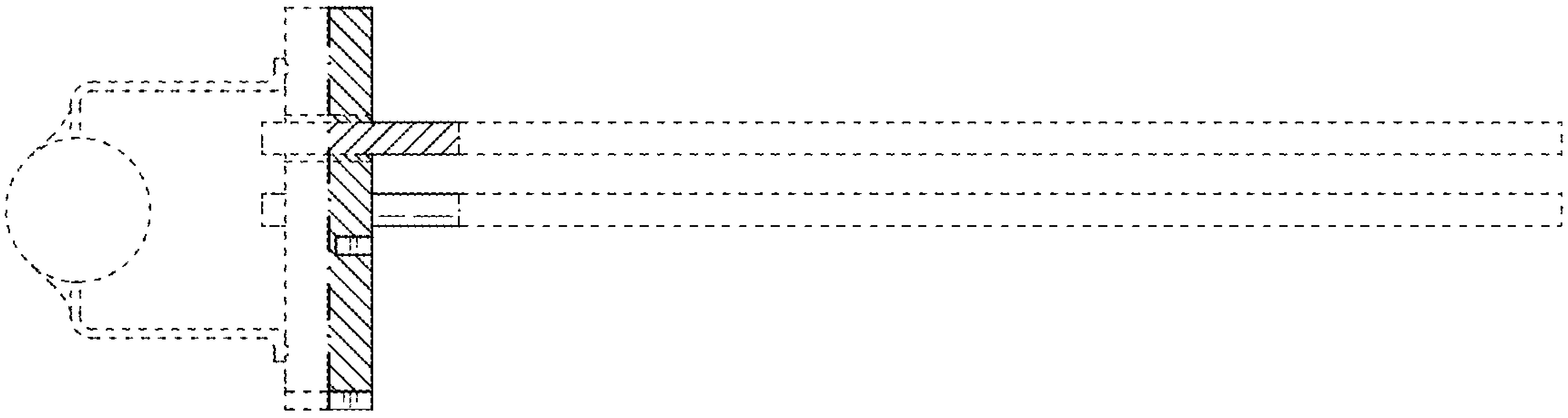


Fig. 8