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(12) **United States Design Patent** (10) **Patent No.:** **US D546,768 S**
Sengupta et al. (45) **Date of Patent:** **** Jul. 17, 2007**

(54) **THREE-PORT HIGH PERFORMANCE MINI HOLLOW FIBER MEMBRANE CONTACTOR**

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(**) Term: **14 Years**

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Related U.S. Application Data

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(51) **LOC (8) Cl.** **13-03**

(52) **U.S. Cl.** **D13/151**; D13/133; D13/146

(58) **Field of Classification Search** D13/133, D13/146, 151–156, 184; D8/349, 352, 354, D8/387; D23/207, 209; 174/167, 152 R; 210/321.83, 321.87, 321.89, 644; 264/234; 439/207, 252, 249, 933–934

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,228,877	A	1/1966	Mahon	
3,755,034	A	8/1973	Mahon et al.	
3,855,849	A	12/1974	Lordan	
4,220,535	A	9/1980	Leonard	
4,664,681	A	5/1987	Anazawa et al.	
4,906,372	A *	3/1990	Hopkins	210/321.74
4,929,354	A *	5/1990	Meyering et al.	210/321.61
4,940,617	A	7/1990	Baurmeister	
5,186,832	A	2/1993	Mancusi et al.	

5,264,171	A	11/1993	Prasad et al.	
5,284,584	A	2/1994	Huang et al.	
5,352,361	A	10/1994	Prasad et al.	
D357,058	S	4/1995	Englehard	
5,449,457	A	9/1995	Prasad	
5,525,069	A	6/1996	Roscizewski et al.	
5,979,668	A	11/1999	Kane et al.	
D438,844	S	3/2001	Meyer et al.	
6,207,053	B1	3/2001	Carroll et al.	
D443,858	S	6/2001	Treiger et al.	
D473,524	S *	4/2003	Koehler	D13/156
D496,000	S *	9/2004	Cornell	D13/156
D506,439	S	6/2005	Wang	
2003/0009942	A1	1/2003	Amendola et al.	
2006/0054556	A1 *	3/2006	David et al.	210/644

* cited by examiner

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(57) **CLAIM**

The ornamental design for a three-port high performance mini hollow fiber membrane contactor, as shown and described.

DESCRIPTION

FIG. 1 is a perspective view of a three-port high performance mini hollow fiber membrane contactor showing our new design;

FIG. 2 is first side elevational view thereof;

FIG. 3 is a second side elevational view thereof;

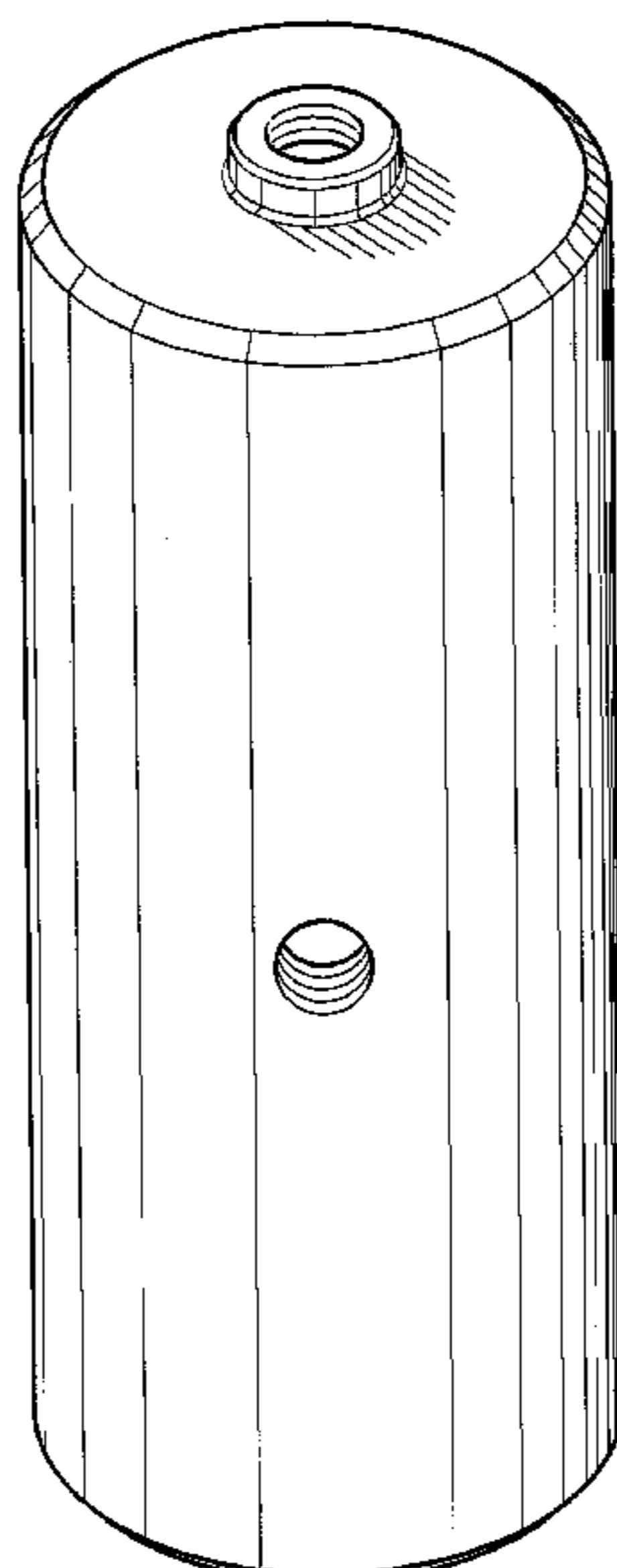
FIG. 4 is a third side elevational view thereof;

FIG. 5 is a fourth side elevational view thereof;

FIG. 6 is a top plan view thereof; and,

FIG. 7 is a bottom plan view thereof.

1 Claim, 4 Drawing Sheets



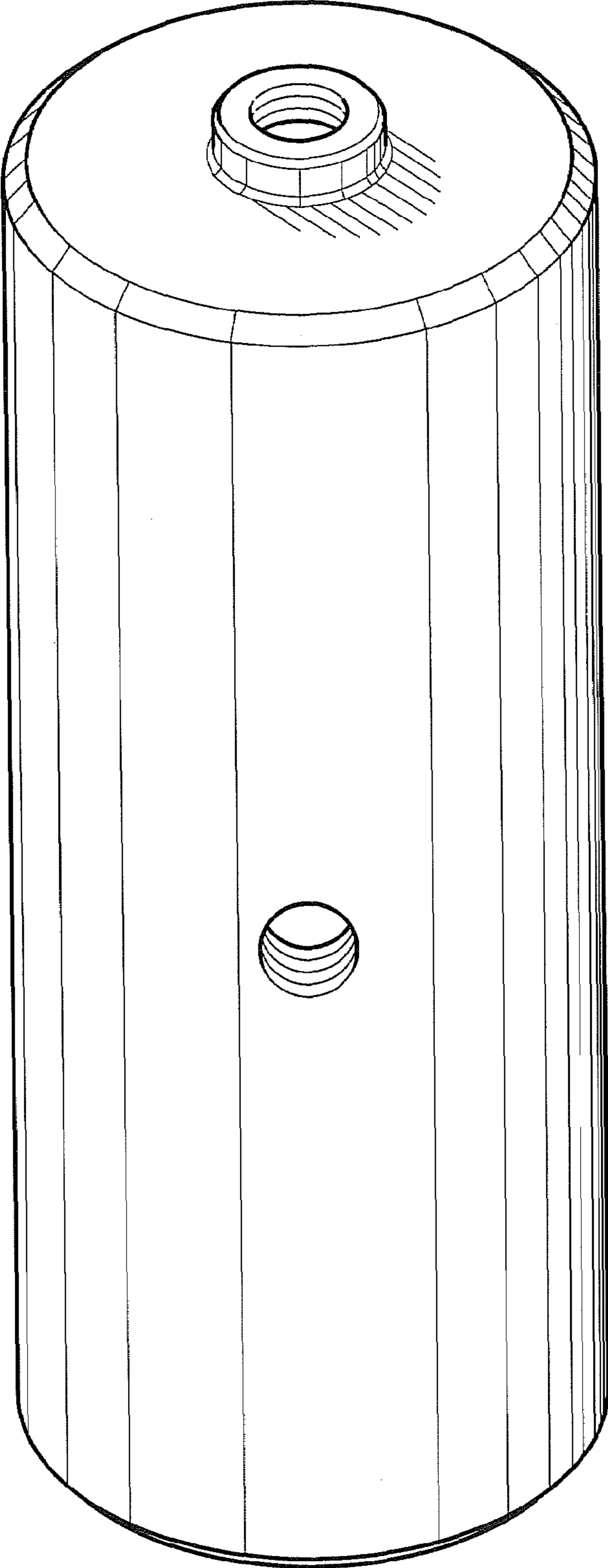


Fig. 1

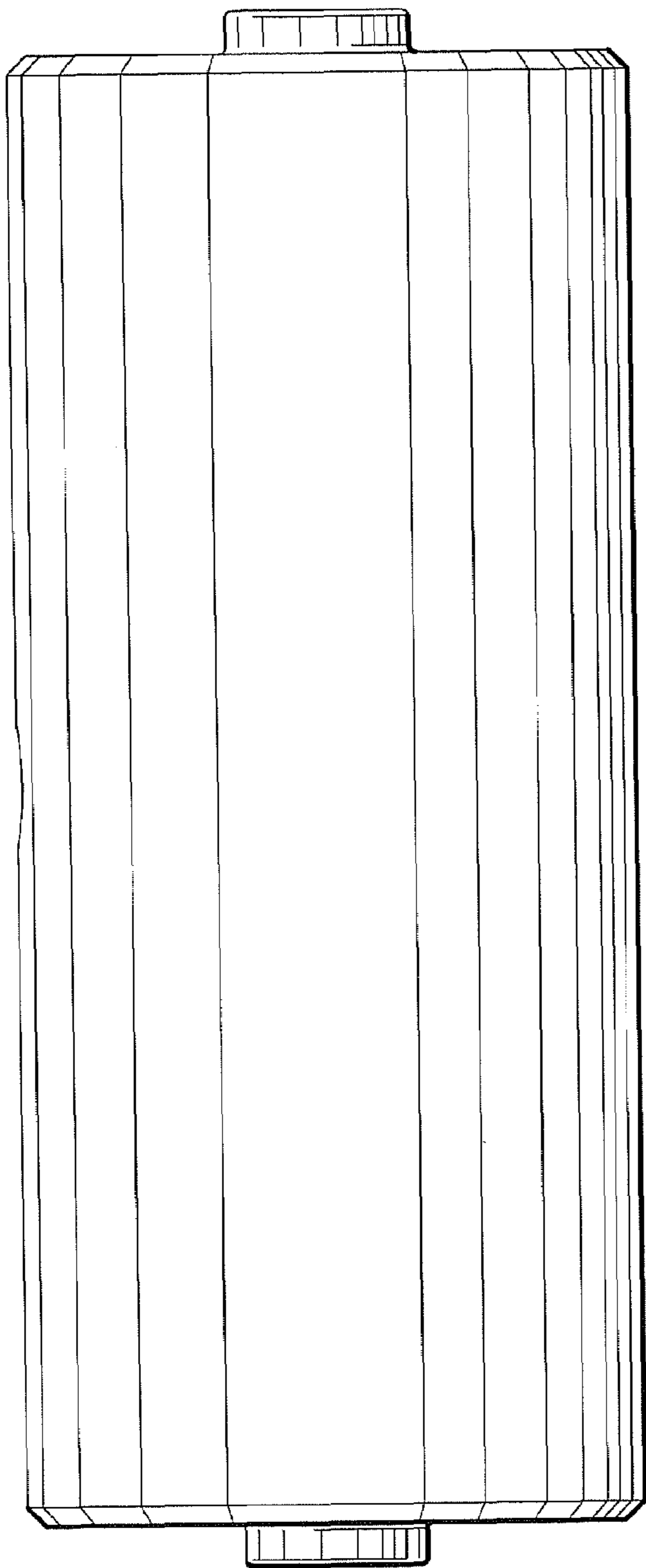


Fig. 2

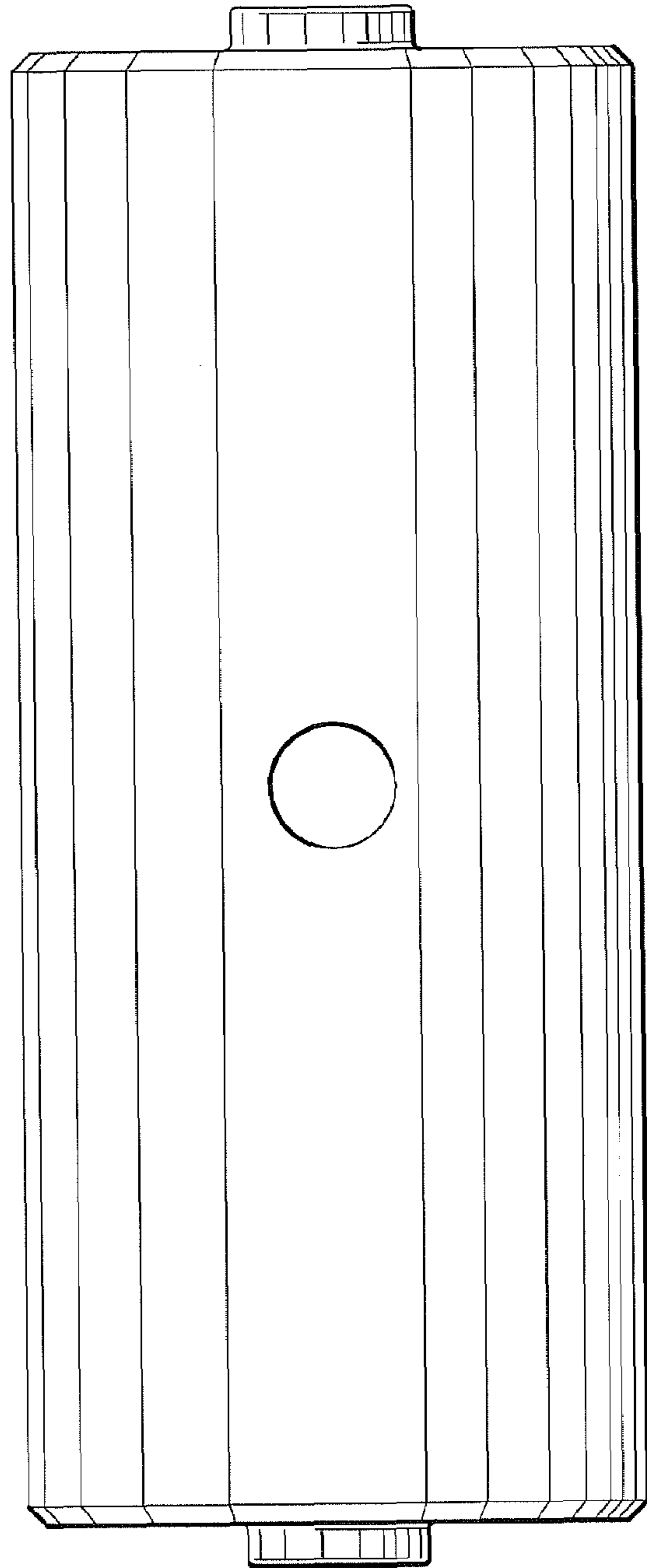


Fig. 3

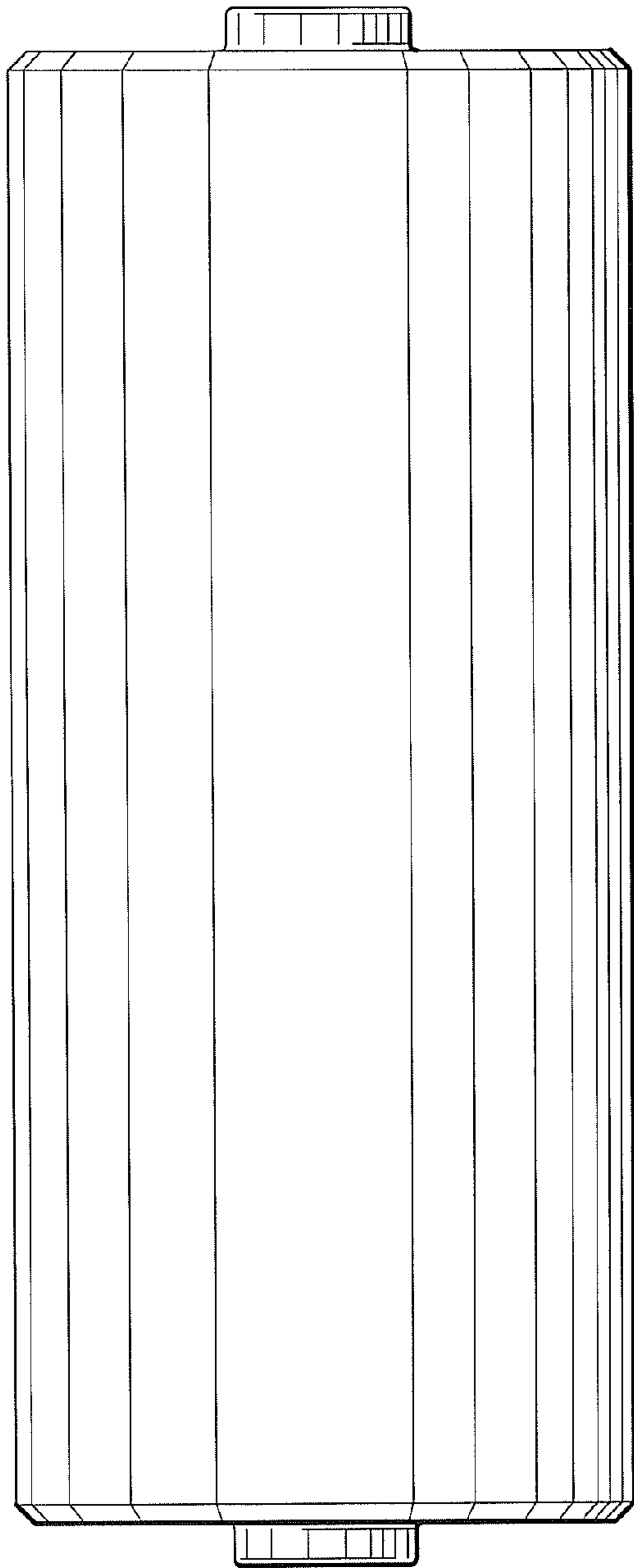


Fig. 4

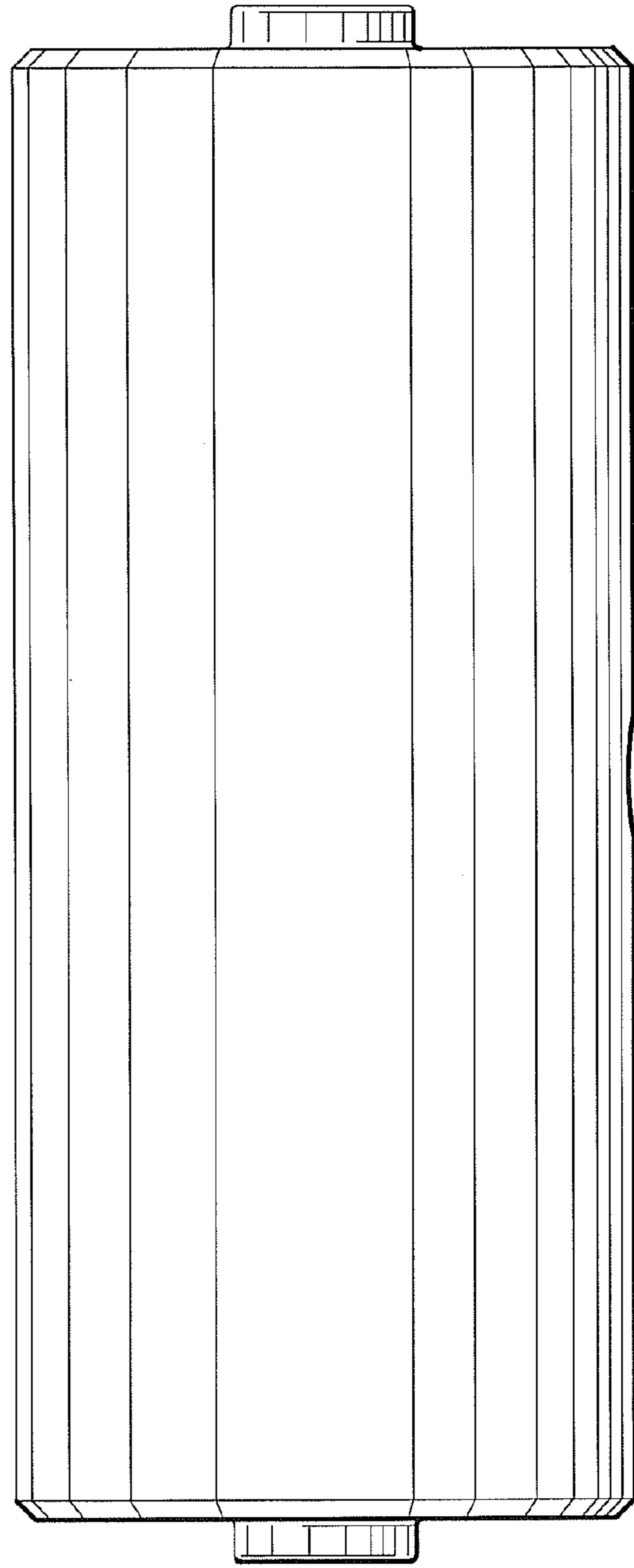


Fig. 5

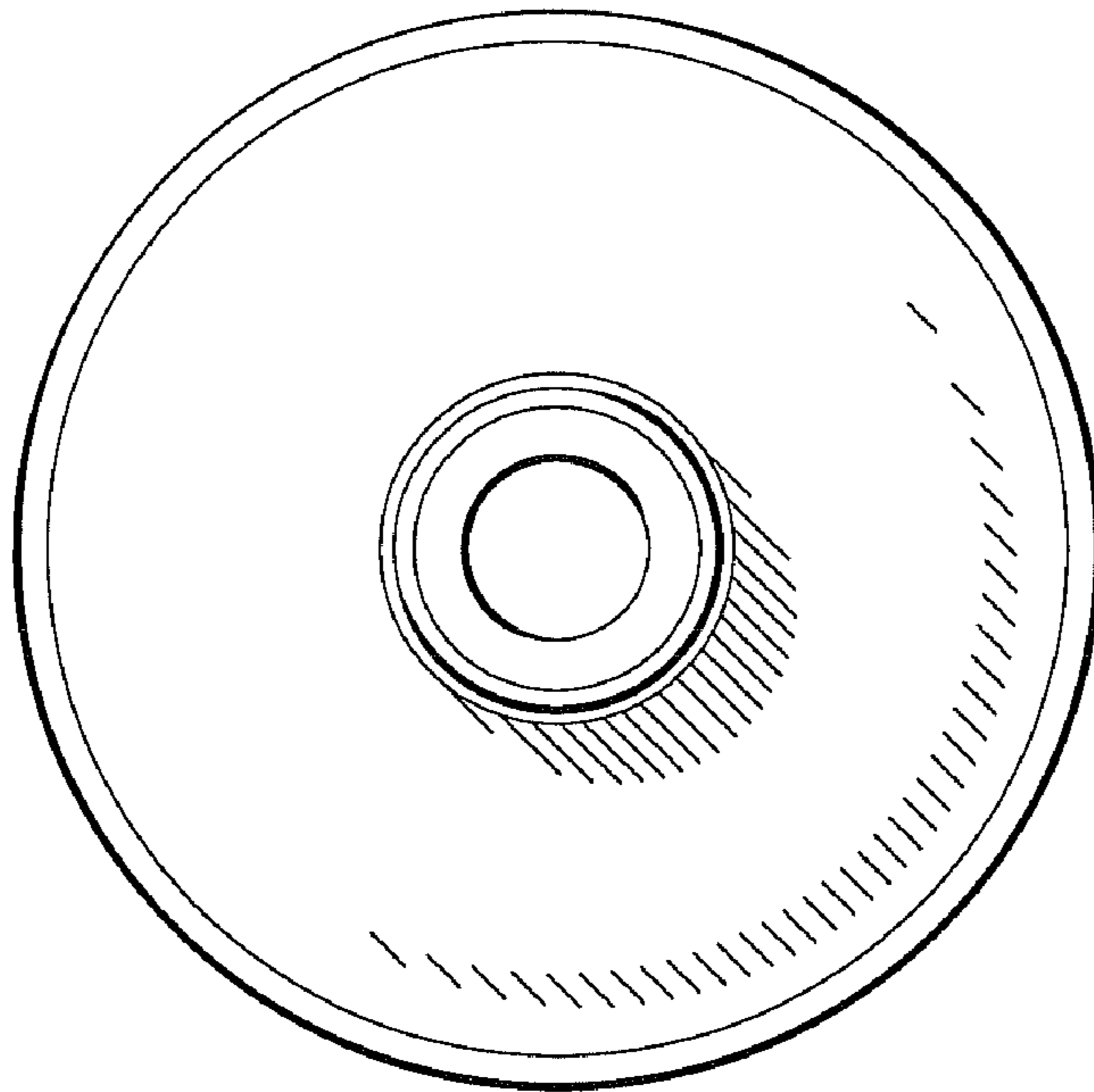


Fig. 6

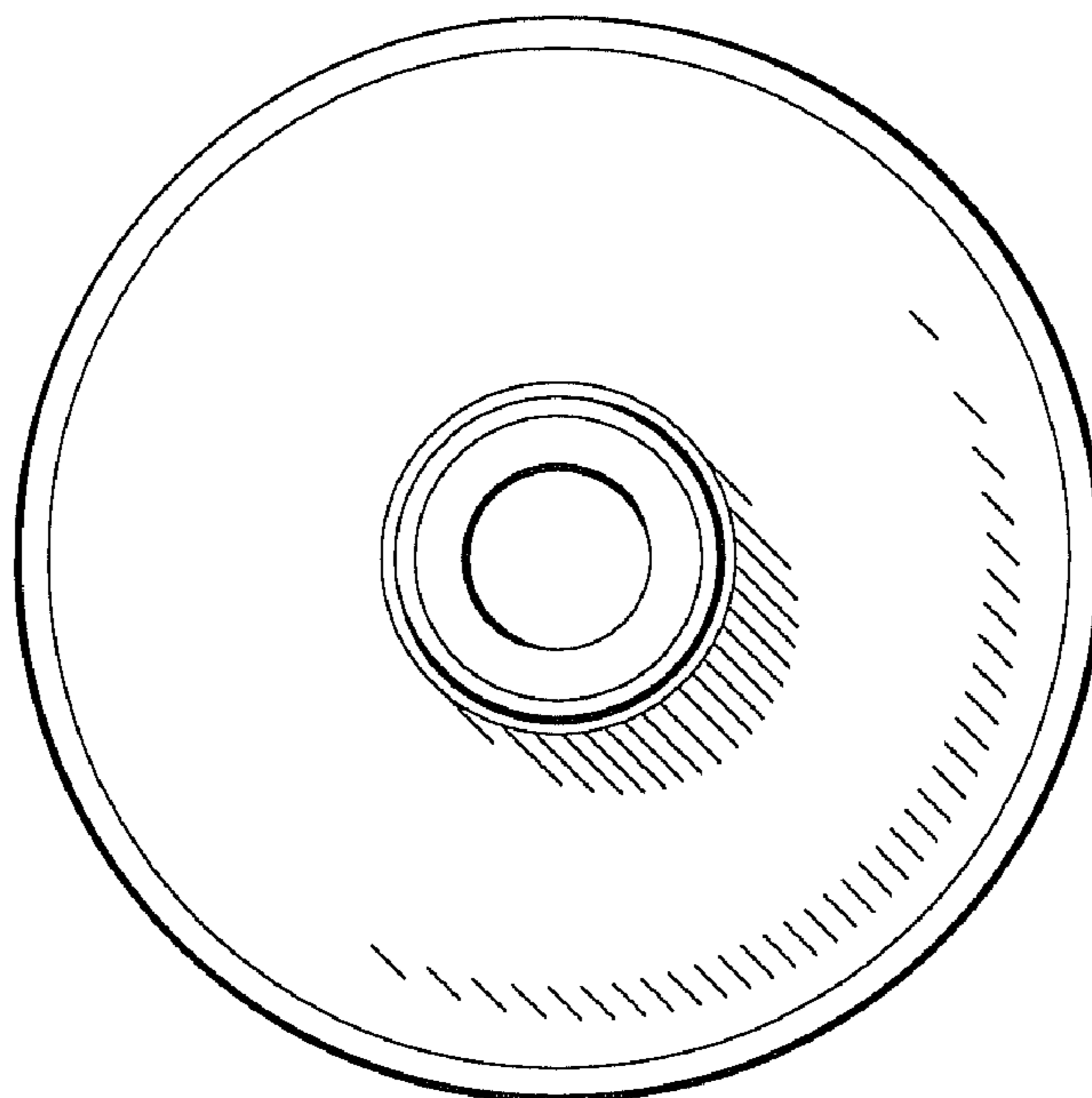


Fig. 7