



US00D746942S

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

(10) **Patent No.:** **US D746,942 S**
(45) **Date of Patent:** **** Jan. 5, 2016**

- (54) **LOW WEIGHT PRESSURE VESSEL**
- (71) Applicant: **Advanced Lightweight Engineering B.V., Delft (NL)**
- (72) Inventors: **Jan Jacobus Matthijs Koppert, Delft (NL); Faris Saad, Delft (NL)**
- (73) Assignee: **Advanced Lightweight Engineering B.V., Delft (NL)**

4,785,956	A	11/1988	Kepler	
D306,639	S *	3/1990	Wills D23/205
5,287,987	A	2/1994	Gaiser	
5,499,739	A	3/1996	Greist, III	
5,526,994	A	6/1996	Murphy	
5,822,838	A	10/1998	Seal	
6,176,386	B1	1/2001	Beukers	
6,357,439	B1	3/2002	Cook	
7,086,553	B2	8/2006	Debecker	
7,219,812	B2	5/2007	Debecker	

(Continued)

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

FOREIGN PATENT DOCUMENTS

(21) Appl. No.: **29/509,442**

CN	1074281	A	7/1993
CN	1419642	A	5/2003

(22) Filed: **Nov. 18, 2014**

(Continued)

(30) **Foreign Application Priority Data**

OTHER PUBLICATIONS

Oct. 21, 2014 (EM) 002561423

International Search Report from PCT/NL2010/050804, dated Apr. 28, 2011.

(51) **LOC (10) Cl.** **23-01**

(Continued)

(52) **U.S. Cl.**
USPC **D23/202**

(58) **Field of Classification Search**
USPC D23/202-205, 211.1; 220/581, 565,
220/586, 587, 4.13, 4.12; 206/6

CPC B65D 90/08
See application file for complete search history.

Primary Examiner — Robin V Webster

(74) *Attorney, Agent, or Firm* — Swanson & Bratschun, L.L.C.

(56) **References Cited**

CLAIM

The ornamental design for a low weight pressure vessel, as shown and described.

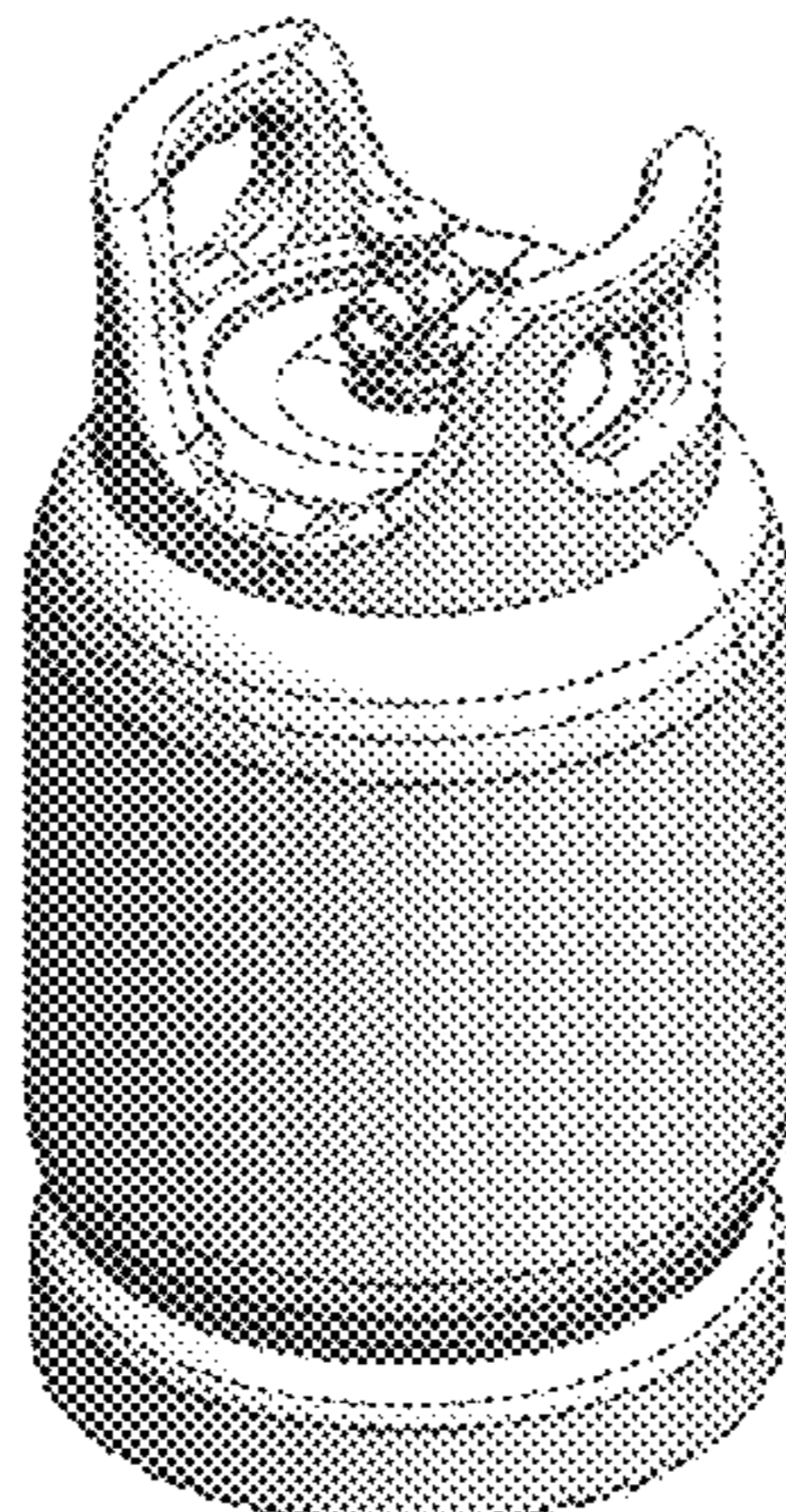
U.S. PATENT DOCUMENTS

DESCRIPTION

2,294,858	A *	9/1942	Allen	A62C 13/003
					220/581
2,541,065	A *	2/1951	Jabour	F17C 1/00
					215/375
2,858,992	A	11/1958	Wentz		
3,047,191	A	7/1962	Young		
3,184,092	A	5/1965	George		
3,207,352	A	9/1965	Reinhart, Jr.		
3,228,549	A	1/1966	Courtney		
D213,249	S *	1/1969	Winegardner	D23/204
3,448,253	A	6/1969	Bramblett		

FIG. 1 is a front, right top perspective view of a low weight pressure vessel;
FIG. 2 is a front elevation view thereof;
FIG. 3 is a rear elevation view thereof;
FIG. 4 is a right side elevation view thereof;
FIG. 5 is a left side elevation view thereof;
FIG. 6 is a top plan view thereof; and,
FIG. 7 is a bottom plan view thereof.

1 Claim, 7 Drawing Sheets



(56)

References Cited

OTHER PUBLICATIONS

U.S. PATENT DOCUMENTS

D566,807 S * 4/2008 Oliveira D23/205
8,863,977 B2 10/2014 Koppert
2004/0045970 A1 3/2004 Debecker
2006/0151506 A1 7/2006 Koppert
2009/0255940 A1 10/2009 Murate

FOREIGN PATENT DOCUMENTS

DE 19631546 C1 11/1977
GB 703811 1/1952
JP 1011138 A 5/1998
JP 2001050494 2/2001
WO WO 97/12175 A1 4/1997
WO WO 97/17570 A1 5/1997
WO WO 2007/079971 7/2007
WO WO 2010/091062 8/2010

Koppert & Beukers (2000) SAMPE Journal 36(6):8-15, "Full Composite Isotensoid Pressure Vessels or How Composites Can Compete with Steel".

Office Action dated May 12, 2004 from U.S. Appl. No. 10/182,884. Patent Abstracts of Japan (May 1998) vol. 1998, No. 10, Publication No. 10119138 A.

Rosato & Grove (1964) Polymer Engineering and Technology p. 216-233, 270-271, "Filiament Winding: it's development, manufacture, applications and design".

Search Report from CN 201080071150.1 dated Apr. 22, 2014 (in English).

* cited by examiner

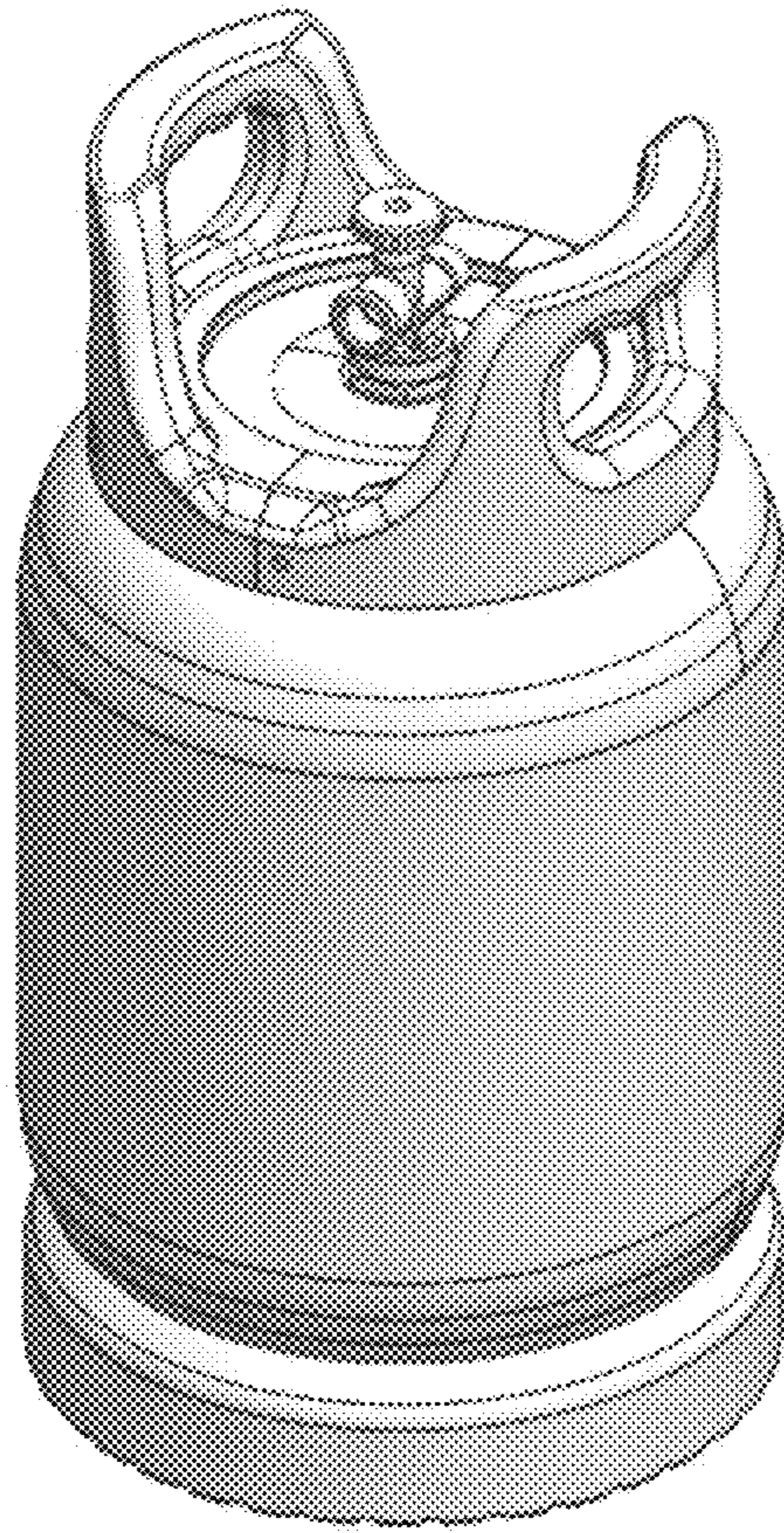


Figure 1

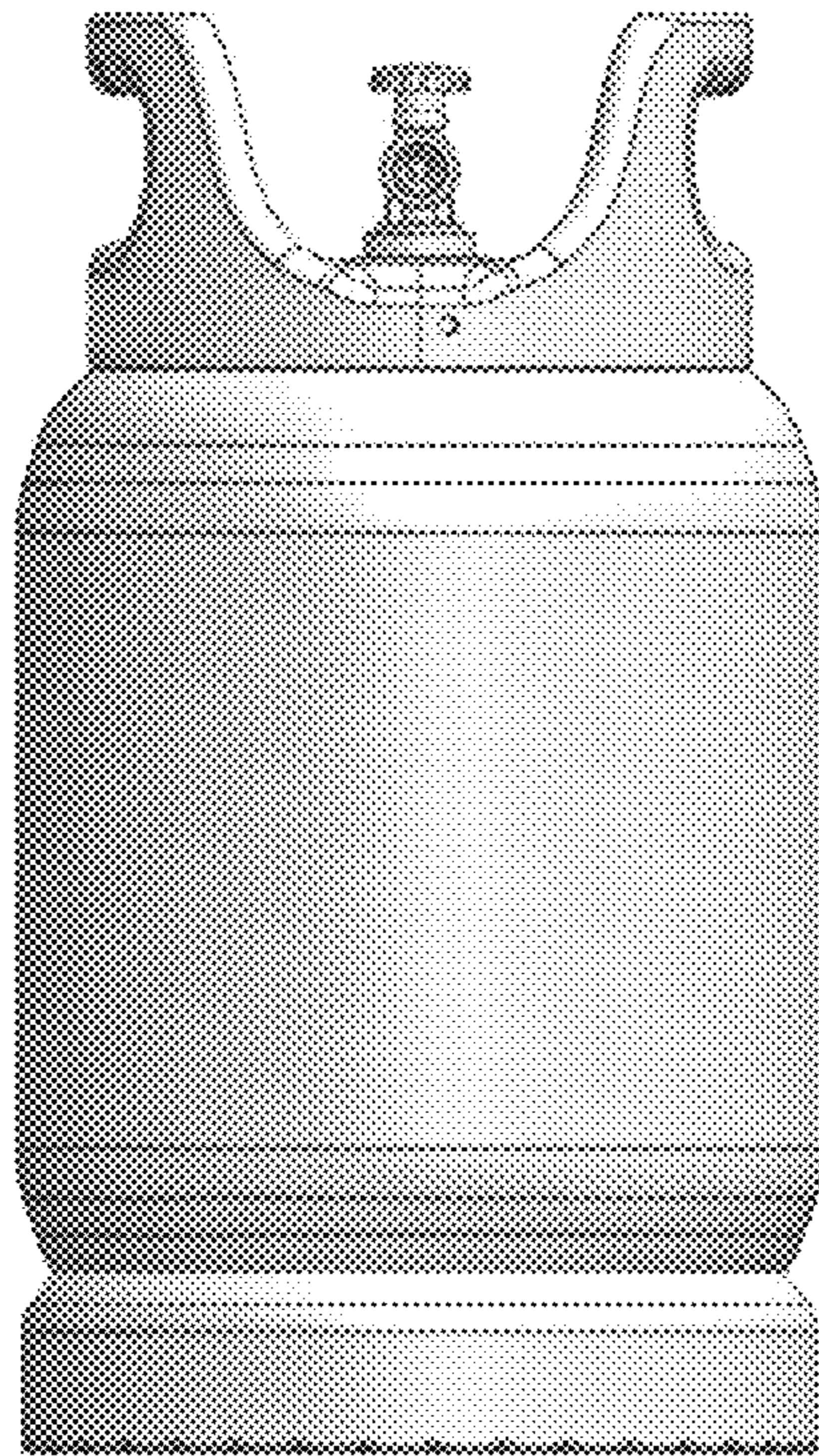


Figure 2

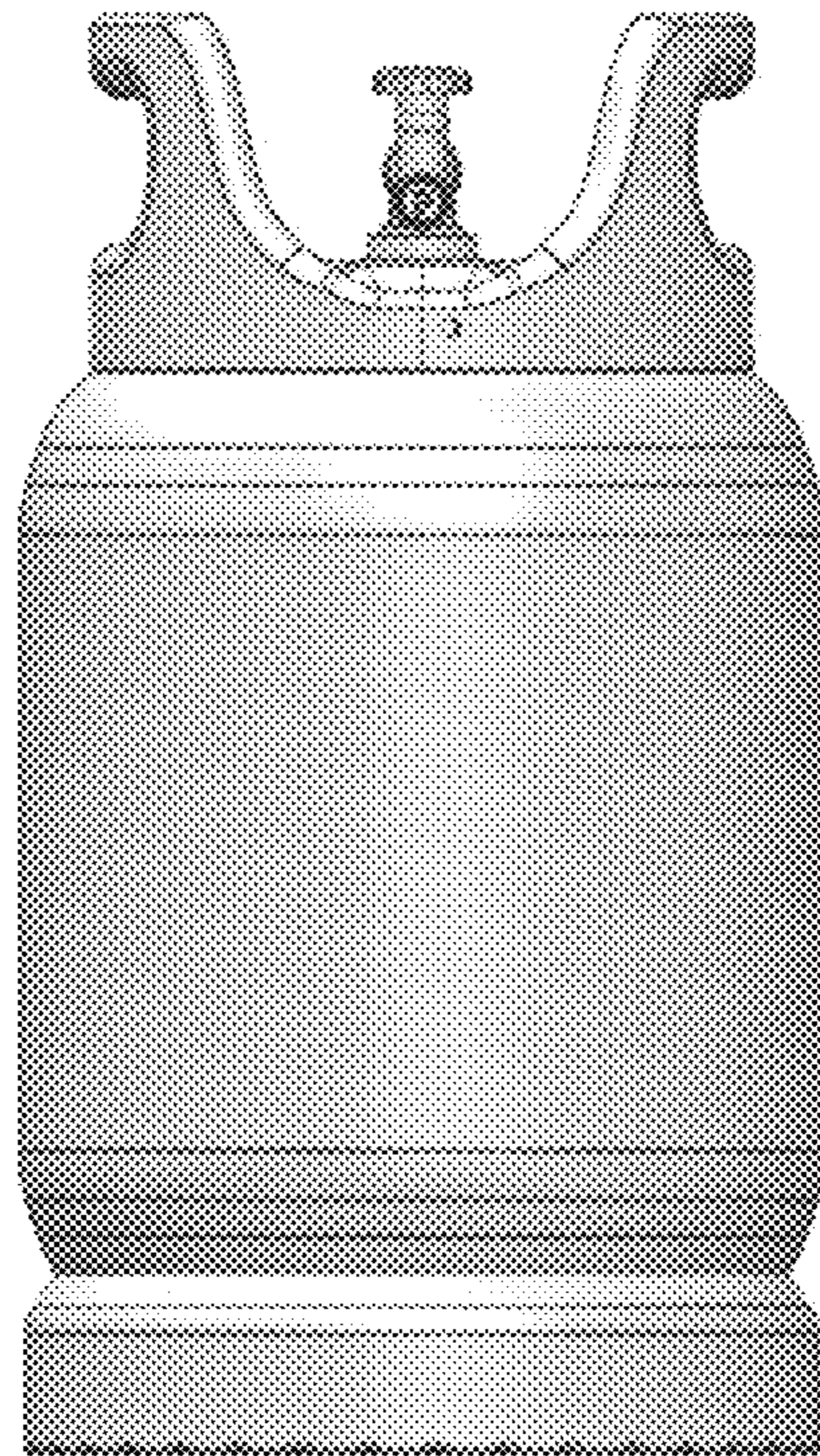


Figure 3

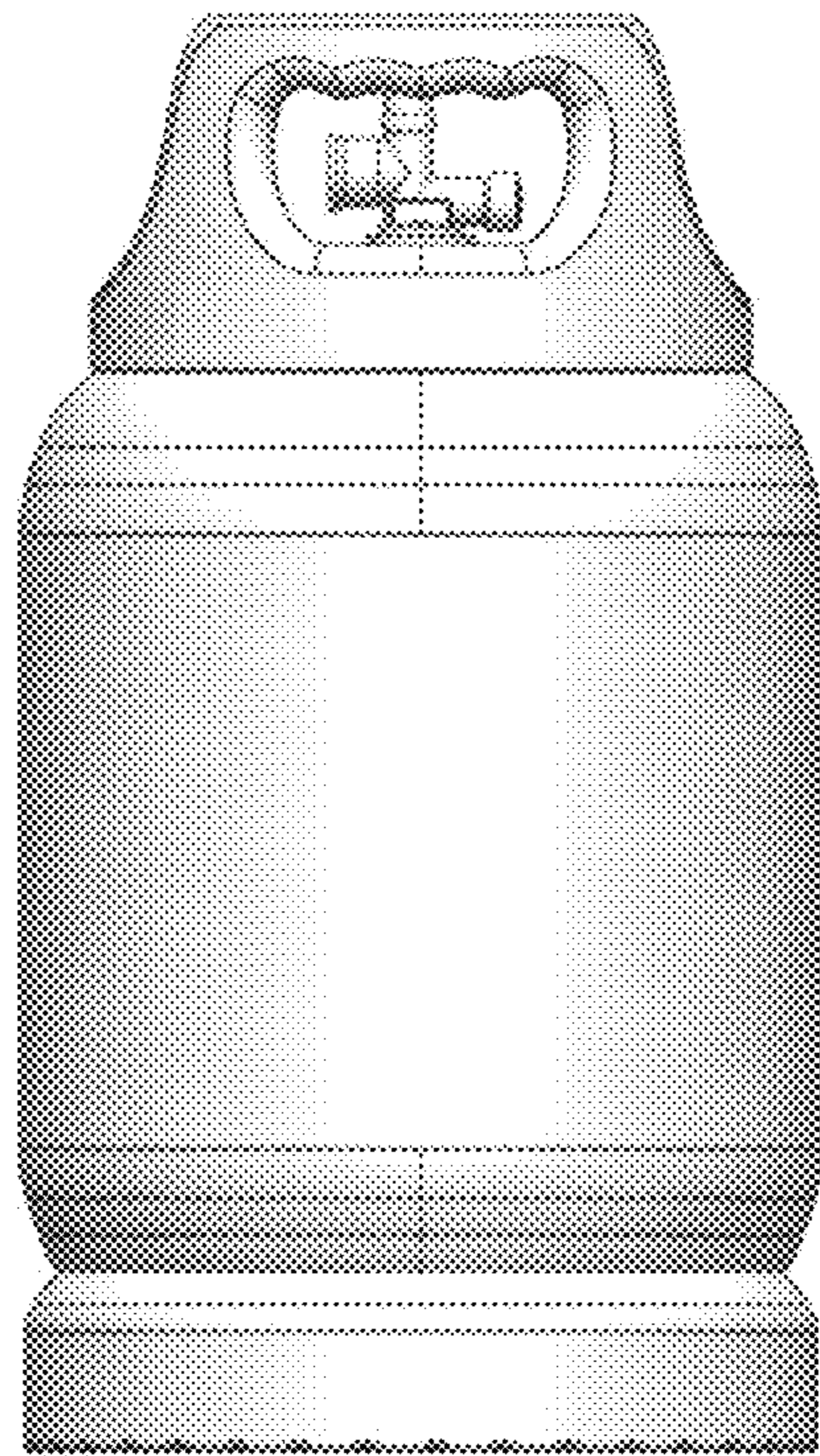


Figure 4

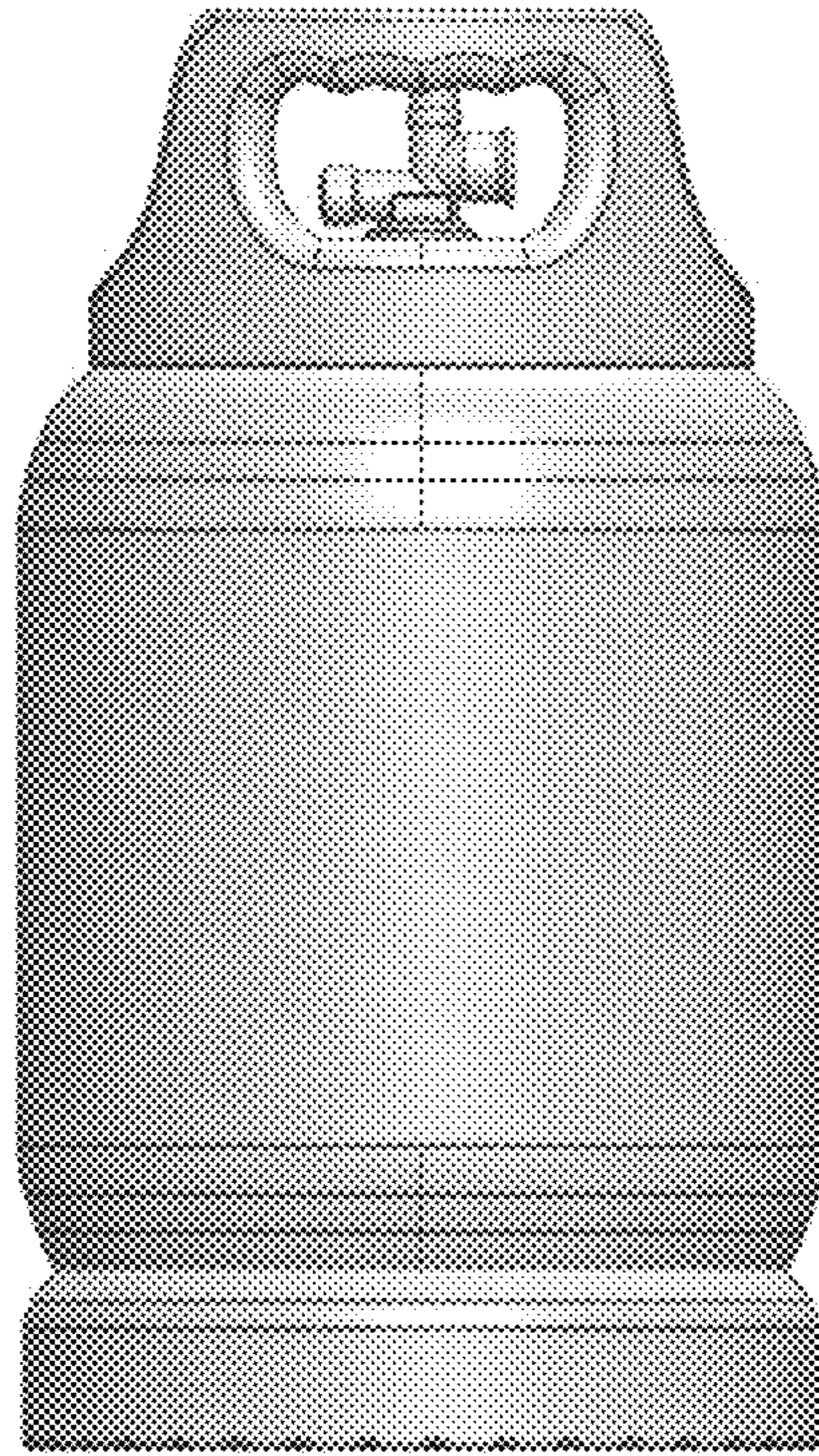


Figure 5

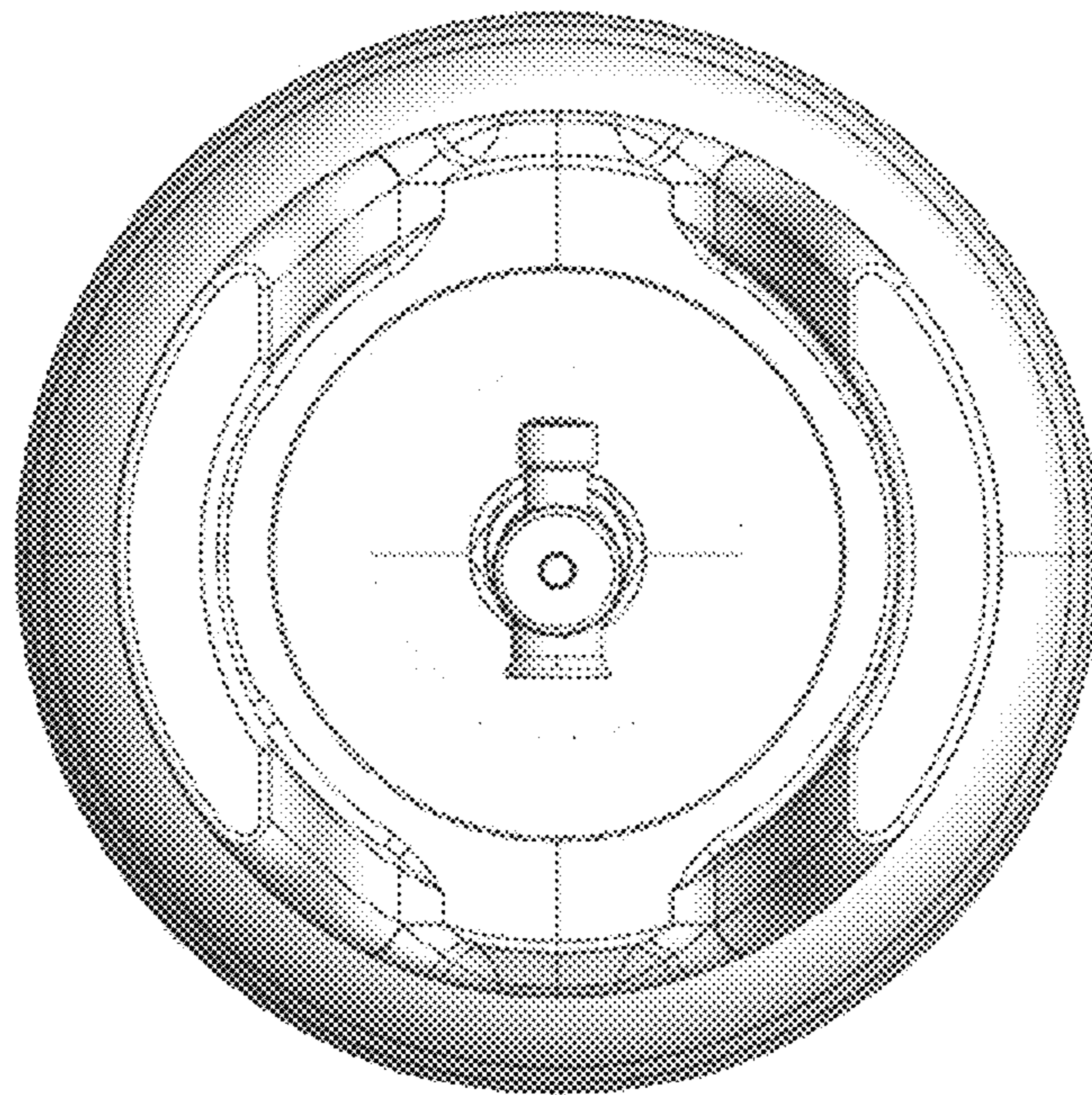


Figure 6

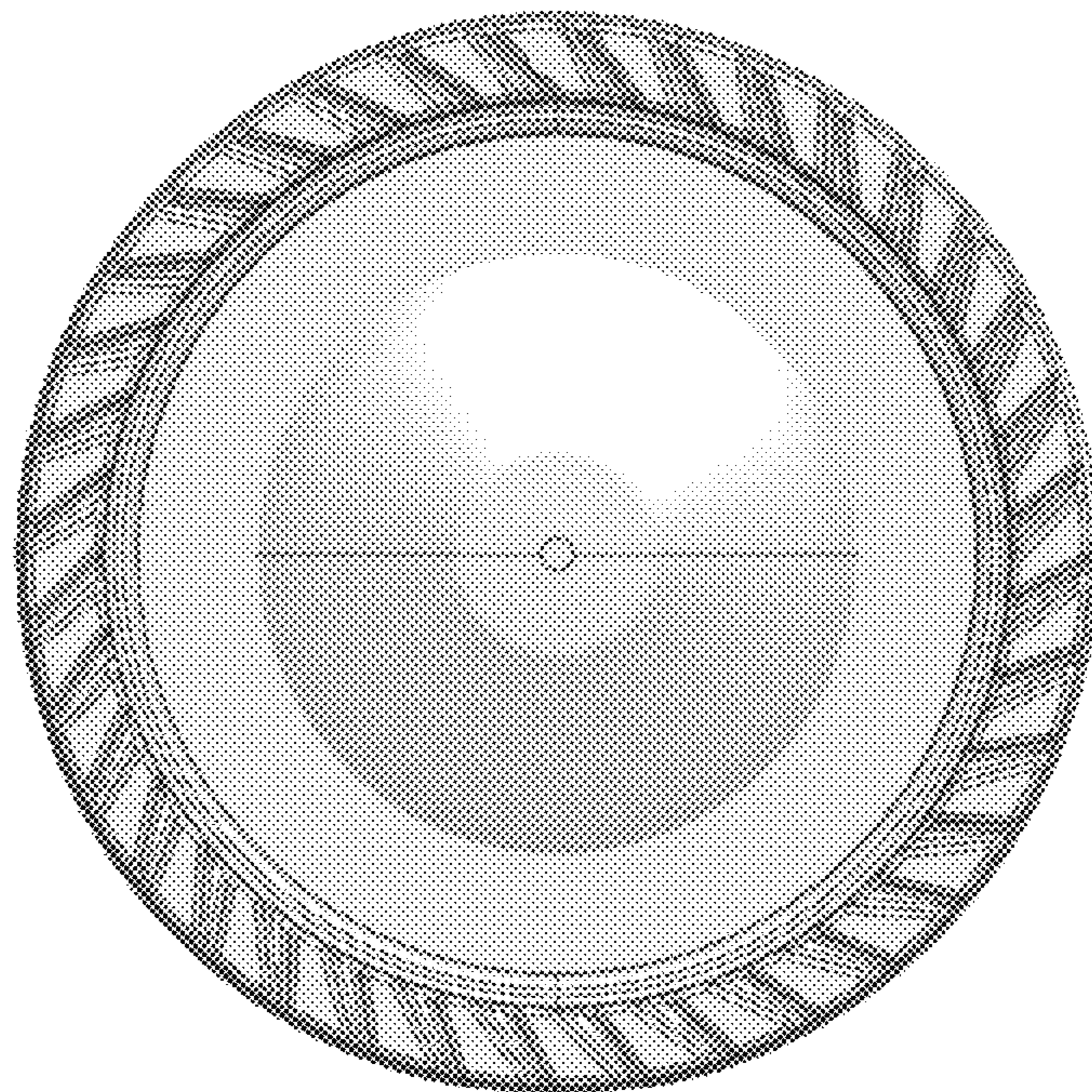


Figure 7