

US00D694281S

(12) **United States Design Patent**  
**Frazier**

(10) **Patent No.:** **US D694,281 S**

(45) **Date of Patent:** **\*\* Nov. 26, 2013**

(54) **LOWER SET INSERT WITH A LOWER BALL SEAT FOR A DOWNHOLE PLUG**

(76) Inventor: **W. Lynn Frazier**, Corpus Christi, TX (US)

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

(21) Appl. No.: **29/398,398**

(22) Filed: **Jul. 29, 2011**

(51) **LOC (9) Cl.** ..... **15-03**

(52) **U.S. Cl.**  
USPC ..... **D15/21**

(58) **Field of Classification Search**

USPC ..... D15/21, 28, 138, 139, 140; D8/70, 71; 417/448, 453, 456, 459, 460; 166/123, 166/124, 135, 138, 193, 118, 133, 134, 170, 166/173, 206, 244.1, 316, 318, 332.1, 336, 166/373, 375, 376, 381, 386, 387; 175/317; 294/86.3; 340/854.4, 853.1

See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

RE17,217 E	2/1929	Burch	
1,736,486 A *	11/1929	Carnahan	417/569
2,040,889 A	5/1933	Whinnen	
2,223,602 A	10/1938	Cox	
2,160,228 A	5/1939	Pustmueller	
2,286,126 A	7/1940	Thornhill	
2,230,447 A	2/1941	Ross	
2,331,532 A	10/1943	Ross	
2,376,605 A	5/1945	Lawrence	
2,593,520 A	10/1945	Baker et al.	
2,616,502 A	3/1948	Lenz	
2,756,827 A	6/1948	Farrar	
2,555,627 A	6/1951	Baker	
2,714,932 A	8/1951	Thompson	
2,589,506 A	3/1952	Morrisett	

2,737,242 A	8/1952	Baker
2,640,546 A	6/1953	Baker et al.
2,833,354 A	2/1955	Sailers
3,054,453 A	3/1955	Bonner
2,713,910 A	7/1955	Baker et al.
2,830,666 A	7/1956	Rhodes
3,160,209 A	10/1956	Bonner
3,082,824 A	3/1959	Taylor et al.
3,062,296 A	12/1960	Brown

(Continued)

**FOREIGN PATENT DOCUMENTS**

GB	914030	12/1962
WO	WO2010127457	11/2010

**OTHER PUBLICATIONS**

“Teledyne Merla Oil Tools-Products-Services,” Teledyne Merla, Aug. 1990 (40 pages).

(Continued)

*Primary Examiner* — Mark Goodwin

(74) *Attorney, Agent, or Firm* — Edmonds & Nolte, P.C.

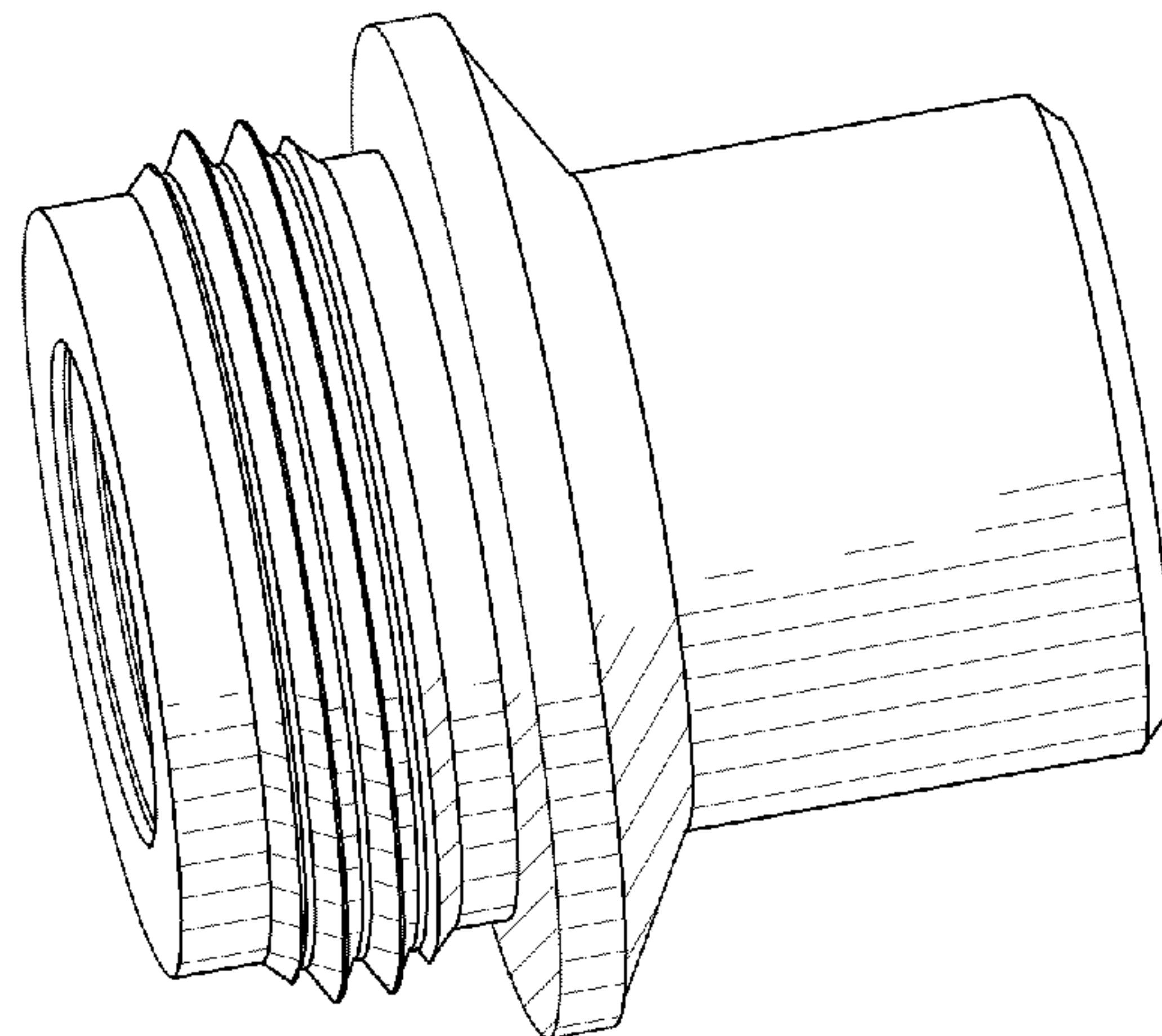
(57) **CLAIM**

The ornamental design for a lower set insert with lower ball seat for a downhole plug, as shown and described.

**DESCRIPTION**

FIG. 1 is a perspective view of a lower set insert with lower ball seat for a downhole plug showing my new design; FIG. 2 is a top plan view thereof; FIG. 3 is a front side plan view thereof, wherein the front side plan view and the back side plan views are identical; FIG. 4 is a bottom plan view thereof; and, FIG. 5 is a left side plan view thereof, wherein the left side plan view and the right side plan views are identical.

**1 Claim, 2 Drawing Sheets**



(56)

References Cited

U.S. PATENT DOCUMENTS

3,163,225 A	2/1961	Perkins		5,316,081 A	5/1994	Baski et al.	
D194,437 S *	1/1963	Salter .....	D15/21	5,318,131 A	6/1994	Baker	
3,282,342 A	11/1963	Mott		D350,887 S	9/1994	Sjolander et al.	
3,291,218 A	2/1964	Lebourg		5,343,954 A	9/1994	Bohlen et al.	
3,013,612 A	12/1964	Angel		D353,756 S	12/1994	Graves	
3,308,895 A	12/1964	Oxford et al.		D355,428 S	2/1995	Hatcher	
3,393,743 A	11/1965	Stanescu		5,390,737 A	2/1995	Jacobi et al.	
3,273,588 A	9/1966	Dollison		5,392,540 A	2/1995	Cooper et al.	
3,429,375 A	12/1966	Craig		5,392,856 A *	2/1995	Broussard et al. ....	166/285
3,298,437 A	1/1967	Conrad		5,419,399 A	5/1995	Smith	
3,298,440 A	1/1967	Current		RE35,088 E	11/1995	Gilbert	
3,306,362 A	2/1967	Urbanosky		5,484,191 A	1/1996	Sollami	
3,356,140 A	12/1967	Young		5,490,339 A	2/1996	Accettola	
3,507,327 A *	4/1970	Chenoweth .....	166/134	5,540,279 A	7/1996	Branch et al.	
3,517,742 A	6/1970	Williams		5,564,502 A	10/1996	Crow et al.	
3,554,280 A	1/1971	Tucker		5,593,292 A	1/1997	Ivey	
3,602,305 A	8/1971	Kisling		D377,969 S	2/1997	Grantham	
3,623,551 A	11/1971	Randermann, Jr.		5,655,614 A	8/1997	Azar	
3,687,202 A	8/1972	Young et al.		5,701,959 A	12/1997	Hushbeck et al.	
3,787,101 A	1/1974	Sugden		5,785,135 A	7/1998	Crawley	
3,818,987 A	6/1974	Ellis		5,791,825 A	8/1998	Gardner et al.	
3,851,706 A	12/1974	Ellis		5,803,173 A	9/1998	Fraser, III et al.	
3,860,066 A	1/1975	Pearce et al.		5,810,083 A	9/1998	Kilgore	
3,926,253 A	12/1975	Duke		5,819,846 A	10/1998	Bolt, Jr.	
4,035,024 A	7/1977	Fink		D408,830 S *	4/1999	Nathenson et al. ....	D15/21
4,049,015 A	9/1977	Brown		D413,126 S *	8/1999	Warren et al. ....	D15/21
4,134,455 A	1/1979	Read		D415,180 S	10/1999	Rosanwo	
4,151,875 A	5/1979	Sullaway		5,961,185 A	10/1999	Friant et al.	
4,185,689 A	1/1980	Harris		5,984,007 A	11/1999	Yuan et al.	
4,189,183 A	2/1980	Borowski		5,988,277 A *	11/1999	Vick et al. ....	166/123
4,250,960 A	2/1981	Chammas		6,012,519 A	1/2000	Allen et al.	
4,314,608 A	2/1982	Richardson		D420,013 S *	2/2000	Warren et al. ....	D15/21
4,381,038 A	4/1983	Sugden		6,082,451 A *	7/2000	Giroux et al. ....	166/72
4,391,547 A	7/1983	Jackson		6,085,446 A	7/2000	Posch	
4,405,017 A	9/1983	Allen et al.		6,098,716 A	8/2000	Hromas et al.	
4,432,418 A	2/1984	Mayland		6,105,694 A	8/2000	Scott	
4,436,151 A	3/1984	Callihan et al.		6,142,226 A	11/2000	Vick	
4,437,516 A	3/1984	Cockrell		6,152,232 A	11/2000	Webb et al.	
4,457,376 A	7/1984	Carmody et al.		6,167,963 B1	1/2001	McMahan et al.	
4,493,374 A	1/1985	Magee, Jr.		6,182,752 B1	2/2001	Smith, Jr. et al.	
4,532,995 A	8/1985	Kaufman		6,196,323 B1 *	3/2001	Møksvold .....	166/368
4,548,442 A	10/1985	Sugden et al.		6,199,636 B1	3/2001	Harrison	
4,554,981 A	11/1985	Davies		6,220,349 B1	4/2001	Vargus et al.	
4,566,541 A	1/1986	Moussy et al.		6,283,148 B1	9/2001	Spears et al.	
4,585,067 A	4/1986	Blizzard et al.		6,341,823 B1	1/2002	Sollami	
4,595,052 A	6/1986	Kristiansen		6,367,569 B1	4/2002	Walk	
4,602,654 A	7/1986	Stehling et al.		6,394,180 B1	5/2002	Berscheidt et al.	
4,688,641 A	8/1987	Knieriemen		6,457,267 B1	10/2002	Porter et al.	
4,708,163 A	11/1987	Deaton		6,491,108 B1	12/2002	Slup	
4,708,202 A	11/1987	Sukup et al.		6,543,963 B2	4/2003	Bruso	
D293,798 S	1/1988	Johnson		6,581,681 B1	6/2003	Zimmerman et al.	
4,776,410 A	10/1988	Perkin et al.		6,629,563 B2	10/2003	Doane	
4,784,226 A	11/1988	Wyatt		6,685,451 B1 *	2/2004	Ivey .....	417/555.2
4,792,000 A	12/1988	Perkin et al.		6,695,049 B2	2/2004	Ostocke et al.	
4,830,103 A	5/1989	Blackwell et al.		6,708,768 B2 *	3/2004	Slup et al. ....	166/382
4,848,459 A	7/1989	Blackwell et al.		6,708,770 B2	3/2004	Slup et al.	
4,893,678 A	1/1990	Stokley et al.		6,725,935 B2	4/2004	Szarka et al.	
5,020,590 A	6/1991	McLeod		6,739,398 B1	5/2004	Yokley et al.	
5,074,063 A	12/1991	Vannette		6,755,628 B1 *	6/2004	Howell .....	417/448
5,082,061 A	1/1992	Dollison		6,769,491 B2	8/2004	Zimmerman et al.	
5,095,980 A	3/1992	Watson		6,779,948 B2	8/2004	Bruso	
5,113,940 A	5/1992	Glaser		6,796,376 B2	9/2004	Frazier	
5,117,915 A	6/1992	Mueller et al.		6,799,633 B2	10/2004	McGregor	
5,154,228 A	10/1992	Gambertoglio et al.		6,834,717 B2	12/2004	Bland	
5,183,068 A	2/1993	Prosser		6,851,489 B2	2/2005	Hinds	
5,188,182 A	2/1993	Echols, III et al.		6,854,201 B1	2/2005	Hunter et al.	
5,207,274 A	5/1993	Streich et al.		6,902,006 B2	6/2005	Myerley et al.	
5,209,310 A	5/1993	Clydesdale		6,918,439 B2	7/2005	Dallas	
5,219,380 A	6/1993	Young et al.		6,938,696 B2	9/2005	Dallas	
5,224,540 A	7/1993	Streich et al.		6,944,977 B2	9/2005	Deniau et al.	
5,230,390 A	7/1993	Zastressek et al.		7,021,389 B2	4/2006	Bishop et al.	
5,234,052 A	8/1993	Coone et al.		7,040,410 B2	5/2006	McGuire et al.	
5,253,705 A	10/1993	Clary et al.		7,055,632 B2	6/2006	Dallas	
5,295,735 A	3/1994	Cobbs et al.		7,069,997 B2	7/2006	Coyes et al.	
5,311,939 A	5/1994	Pringle et al.		7,107,875 B2	9/2006	Haugen et al.	
				7,124,831 B2	10/2006	Turley et al.	
				7,128,091 B2	10/2006	Istre, Jr.	
				7,150,131 B2	12/2006	Barker	
				7,163,066 B2 *	1/2007	Lehr .....	166/386



(56)

References Cited

U.S. PATENT DOCUMENTS

7,168,494 B2	1/2007	Starr et al.	
7,237,615 B2 *	7/2007	Dallas et al. ....	166/379
7,278,490 B2 *	10/2007	McGuire et al. ....	166/379
7,281,584 B2	10/2007	McGarian et al.	
D560,109 S	1/2008	Huang	
7,325,617 B2	2/2008	Murray	
7,337,847 B2	3/2008	McGarian et al.	
7,350,582 B2	4/2008	McKeachnie et al.	
7,353,879 B2	4/2008	Todd et al.	
7,363,967 B2	4/2008	Burriss, II et al.	
7,373,973 B2	5/2008	Smith et al.	
7,428,922 B2	9/2008	Fripp et al.	
D585,916 S *	2/2009	Greenleaf .....	D15/128
7,527,104 B2	5/2009	Branch et al.	
7,552,779 B2	6/2009	Murray	
D597,110 S	7/2009	Anitua Aldecoa	
D597,571 S *	8/2009	Darr .....	D15/139
7,600,572 B2	10/2009	Slup et al.	
7,604,058 B2	10/2009	McGuire	
7,637,326 B2	12/2009	Bolding et al.	
7,644,767 B2	1/2010	Kalb et al.	
7,644,774 B2	1/2010	Branch et al.	
D612,875 S	3/2010	Beynon	
7,673,677 B2	3/2010	King et al.	
7,690,436 B2	4/2010	Turley et al.	
D618,715 S	6/2010	Corcoran	
7,735,549 B1	6/2010	Nish et al.	
7,740,079 B2	6/2010	Clayton et al.	
7,775,286 B2	8/2010	Duphorne	
7,775,291 B2 *	8/2010	Jacob .....	166/386
7,784,550 B2	8/2010	Nutley et al.	
7,798,236 B2	9/2010	McKeachnie et al.	
7,810,558 B2	10/2010	Shkurti et al.	
D629,820 S	12/2010	Van Ryswyk	
7,866,396 B2	1/2011	Rytlewski	
7,878,242 B2	2/2011	Gray	
7,886,830 B2	2/2011	Bolding et al.	
7,900,696 B1	3/2011	Nish et al.	
7,909,108 B2	3/2011	Swor et al.	
7,909,109 B2	3/2011	Angman et al.	
D635,429 S	4/2011	Hakki	
7,918,278 B2	4/2011	Barbee	
7,921,923 B2	4/2011	McGuire	
7,921,925 B2	4/2011	Maguire et al.	
7,926,571 B2	4/2011	Hofman	
8,061,381 B2 *	11/2011	Ford .....	137/515.7
8,074,718 B2	12/2011	Roberts	
8,079,413 B2	12/2011	Frazier	
8,113,276 B2	2/2012	Greenlee et al.	
8,127,856 B1	3/2012	Nish et al.	
8,128,383 B2 *	3/2012	Pulliam .....	417/448
D657,807 S	4/2012	Frazier	
8,231,947 B2	7/2012	Vaidya et al.	
D672,794 S *	12/2012	Frazier .....	D15/139
8,459,346 B2 *	6/2013	Frazier .....	166/124
2001/0040035 A1	11/2001	Appleton et al.	
2003/0024706 A1	2/2003	Allamon	
2003/0188860 A1	10/2003	Zimmerman et al.	
2004/0150533 A1	8/2004	Hall et al.	
2005/0173126 A1	8/2005	Starr et al.	
2006/0001283 A1	1/2006	Bakke	
2006/0011389 A1	1/2006	Booth et al.	
2006/0278405 A1	12/2006	Turley et al.	
2007/0051521 A1	3/2007	Fike et al.	
2007/0068670 A1	3/2007	Booth et al.	
2007/0107908 A1	5/2007	Vaidya et al.	
2007/0151722 A1 *	7/2007	Lehr et al. ....	166/123
2007/0227745 A1	10/2007	Roberts et al.	
2007/0240883 A1	10/2007	Telfer	
2008/0060821 A1	3/2008	Smith et al.	
2008/0110635 A1	5/2008	Loretz et al.	
2008/0271898 A1 *	11/2008	Turley et al. ....	166/382
2009/0044957 A1	2/2009	Clayton et al.	
2009/0114401 A1	5/2009	Purkis	
2009/0126933 A1	5/2009	Telfer	
2009/0211749 A1	8/2009	Nguyen et al.	
2010/0064859 A1	3/2010	Stephens	
2010/0084146 A1	4/2010	Roberts	
2010/0132960 A1	6/2010	Shkurti et al.	
2010/0155050 A1	6/2010	Frazier	
2010/0252252 A1	10/2010	Harris et al.	
2010/0263857 A1 *	10/2010	Frazier .....	166/127
2010/0263876 A1	10/2010	Frazier	
2010/0276159 A1	11/2010	Mailand et al.	
2010/0288503 A1	11/2010	Cuiper et al.	
2011/0005779 A1	1/2011	Lembcke	
2011/0036564 A1	2/2011	Williamson	
2011/0061856 A1	3/2011	Kellner et al.	
2011/0067889 A1 *	3/2011	Marya et al. ....	166/386
2011/0088915 A1	4/2011	Stanojic et al.	
2011/0103915 A1	5/2011	Tedeschi	
2011/0168404 A1	7/2011	Telfer et al.	
2011/0198082 A1	8/2011	Stromquist et al.	
2011/0240295 A1	10/2011	Porter et al.	
2011/0259610 A1	10/2011	Shkurti et al.	
2011/0277989 A1 *	11/2011	Frazier .....	166/193
2011/0290473 A1 *	12/2011	Frazier .....	166/135
2012/0006532 A1 *	1/2012	Frazier .....	166/196

OTHER PUBLICATIONS

“78/79 Catalog: Packers-Plugs-Completions Tools,” Pengo Industires, Inc., 1978-1979 (12 pages).

“MAP Oil Tools Inc. Catalog,” MAP Oil Tools, Apr. 1999 (46 pages).

“Lovejoy—where the world turns for couplings,” Lovejoy, Inc., Dec. 2000 (30 pages).

“Halliburton Services, Sales & Service Catalog,” Halliburton Services, 1970-1971 (2 pages).

“1975-1976 Packer Catalog,” Gearhart-Owen Industries Inc., 1975-1976 (52 pages).

“Formation Damage Control Utilizing Composite-Bridge Plug Technology for Monobore, Multizone Stimulation Operations,” Gary Garfield, SPE, May 15, 2001 (8 pages).

“Composite Bridge Plug Technique for Multizone Commingled Gas Wells,” Gary Garfield, SPE, Mar. 24, 2001 (6 pages).

“Composite Research: Composite bridge plugs used in multi-zone wells to avoid costly kill-weight fluids,” Gary Garfield, SPE, Mar. 24, 2001 (4 pages).

“It’s About Time—Quick Drill Composite Bridge Plug,” Baker Oil Tools, Jun. 2002 (2 pages).

“Baker Hughes-Baker Oil Tools-Workover Systems-QUIK Drill Composite Bride Plug,” Baker Oil Tools, Dec. 2000 (3 pages).

“Baker Hughes 100 Years of Service,” Baker Hushes In Depth, Special Centennial Issue, Publication COR-07-13127, vol. 13, No. 2, Baker Hughes Incorporated, Jul. 2007 (92 pages).

“Halliburton Services, Sales & Service Catalog No. 43,” Halliburton Co., 1985 (202 pages).

“Alpha Oil Tools Catalog,” Alpha Oil Tools, 1997 (136 pages).

\* cited by examiner

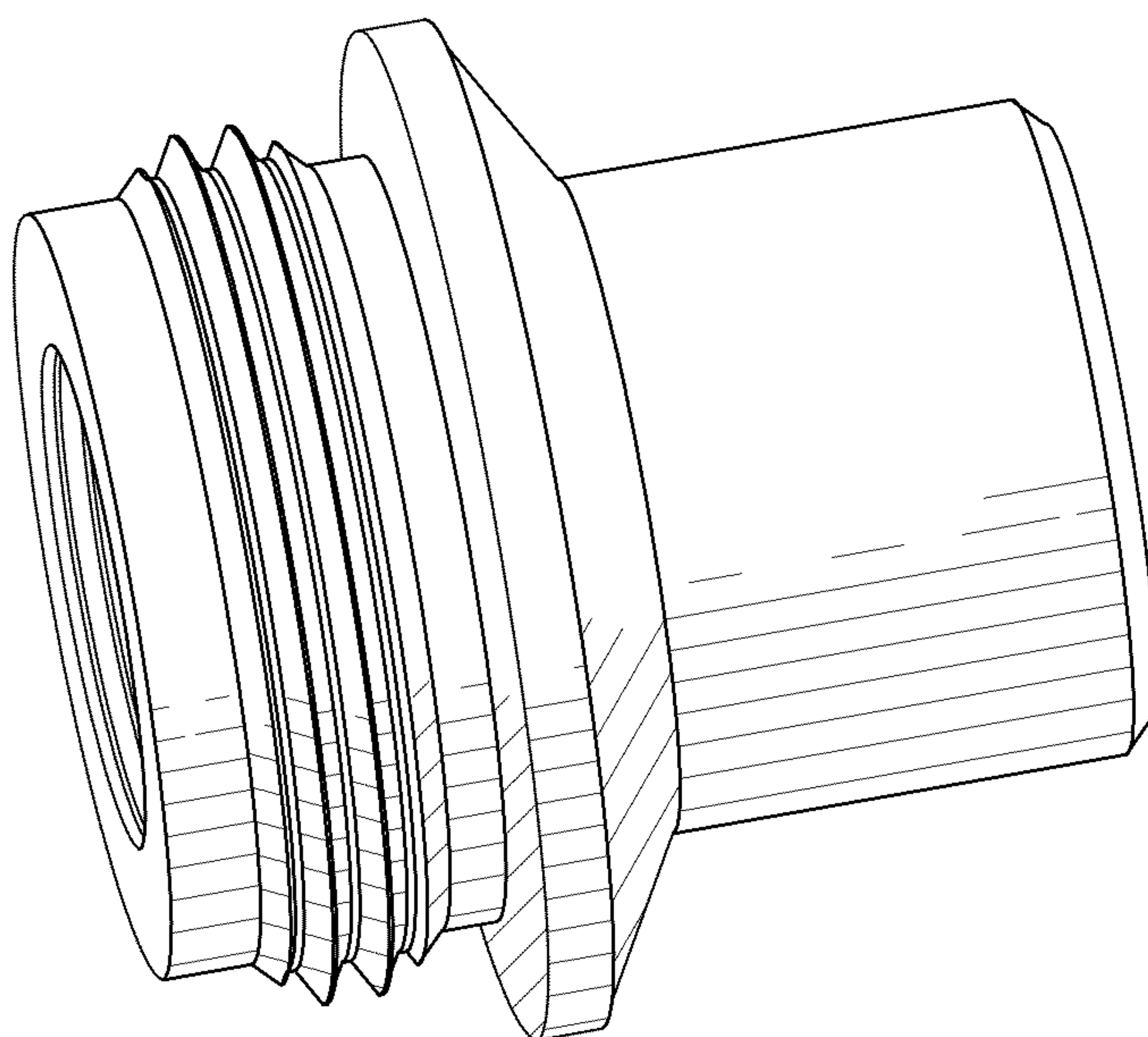


FIG. 1

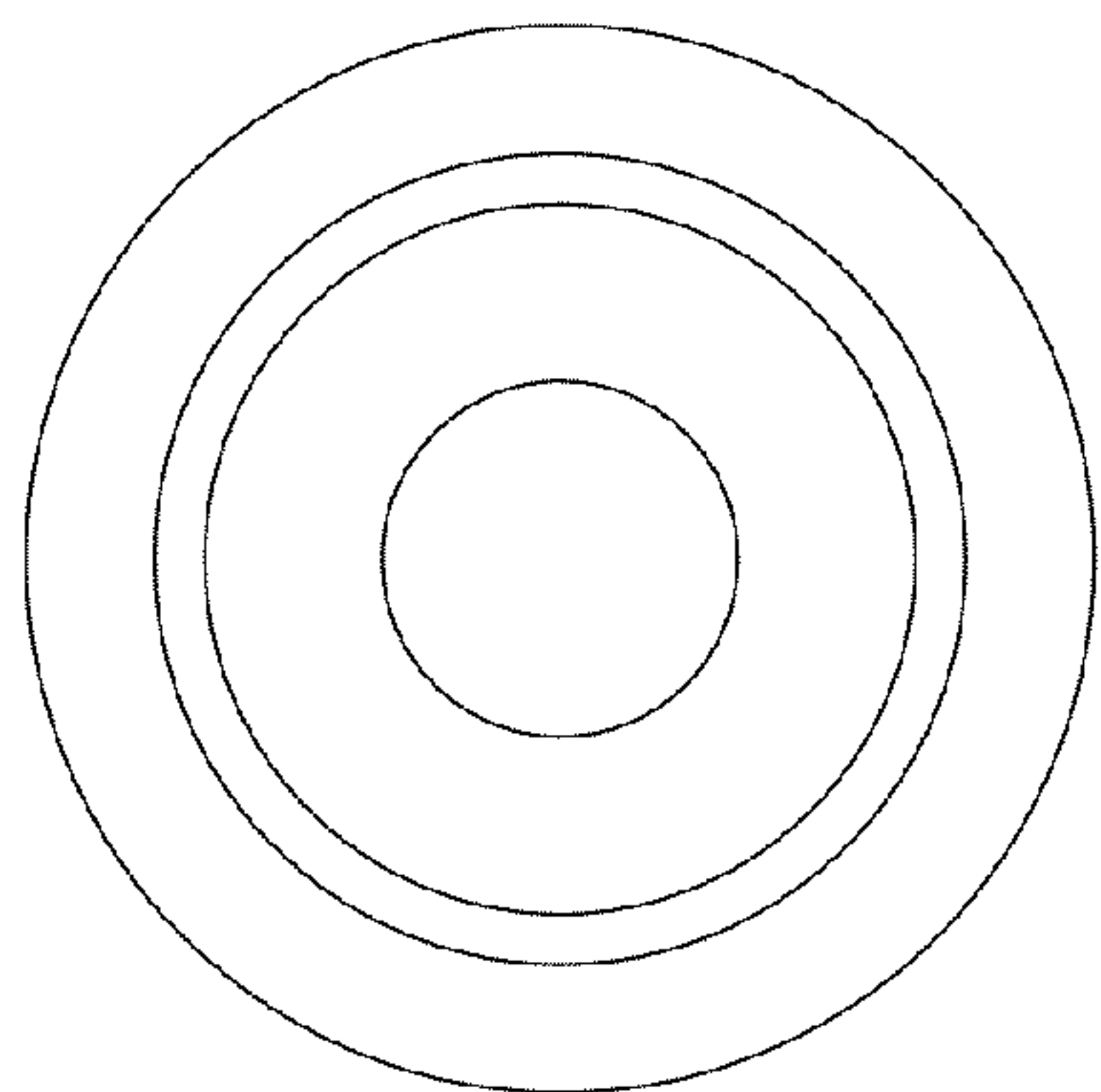


FIG. 2

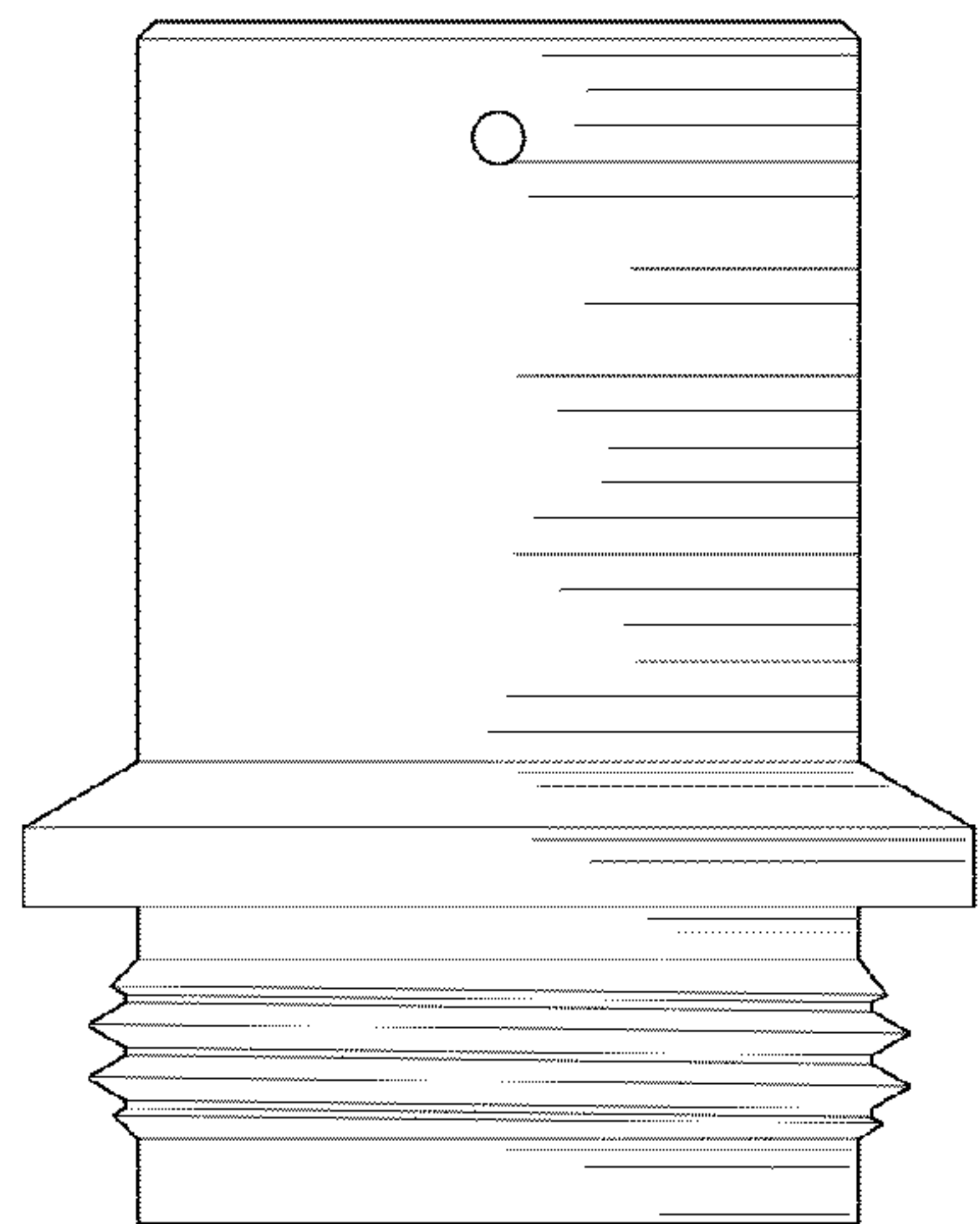


FIG. 3

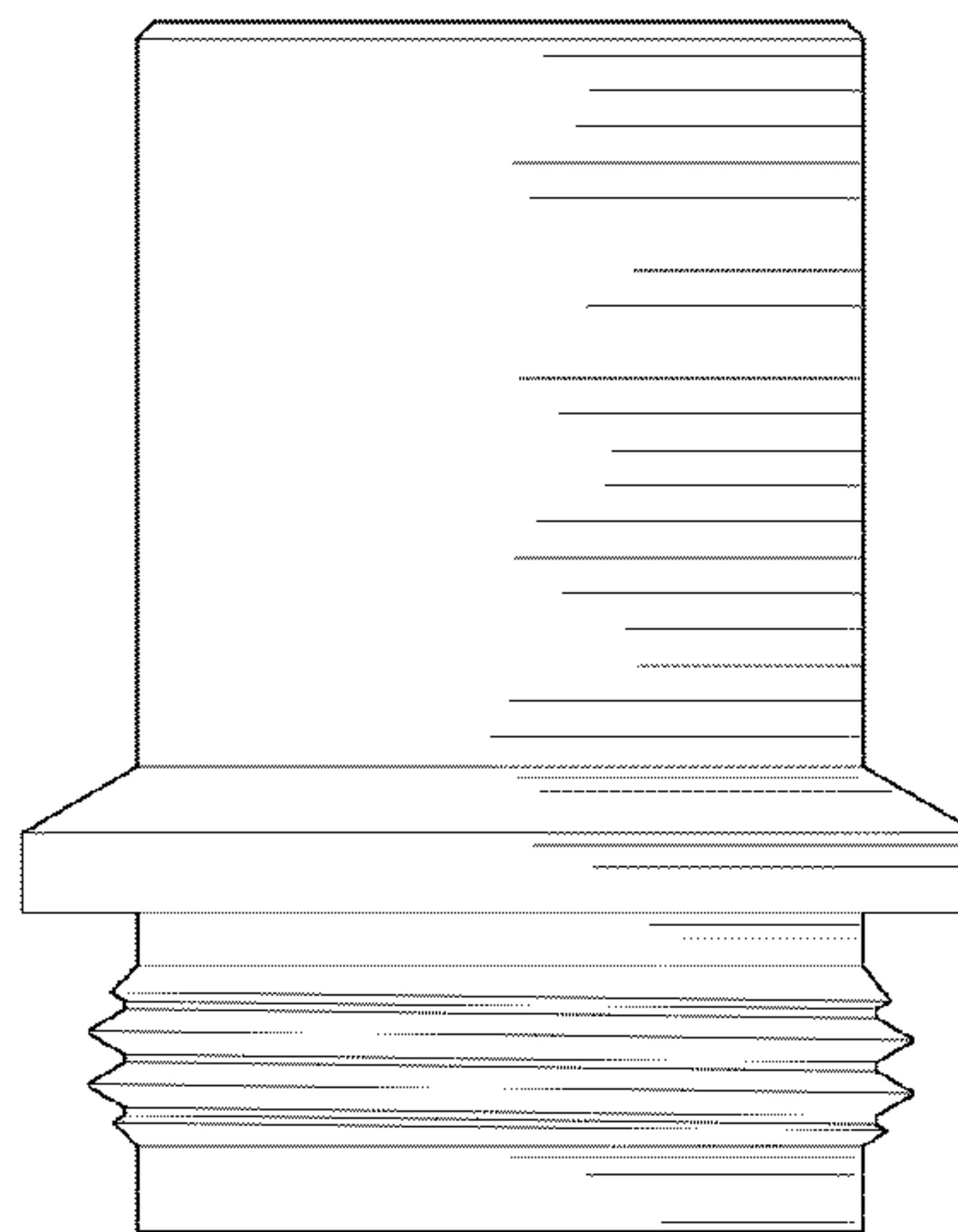


FIG. 4

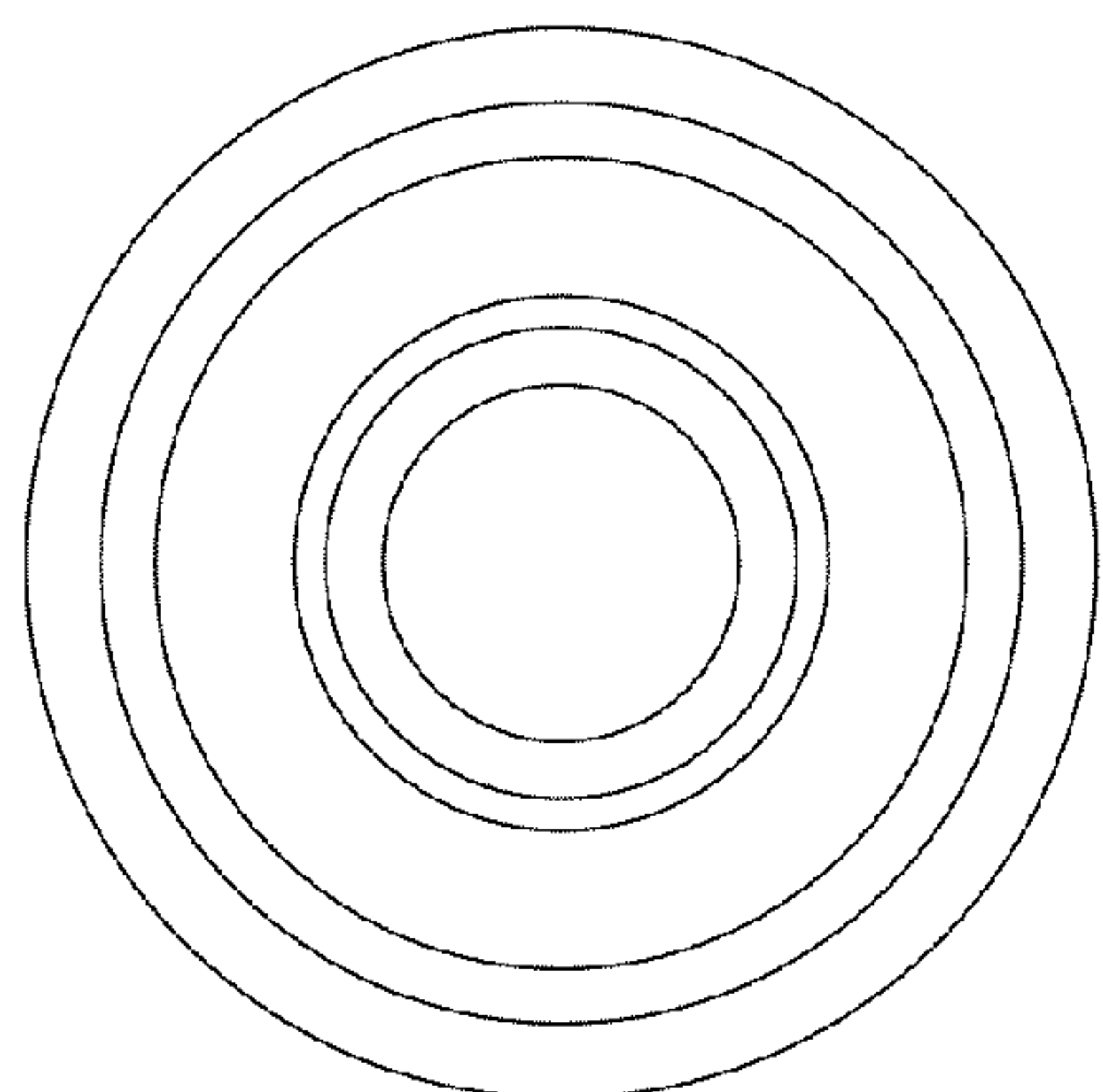


FIG. 5