



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.

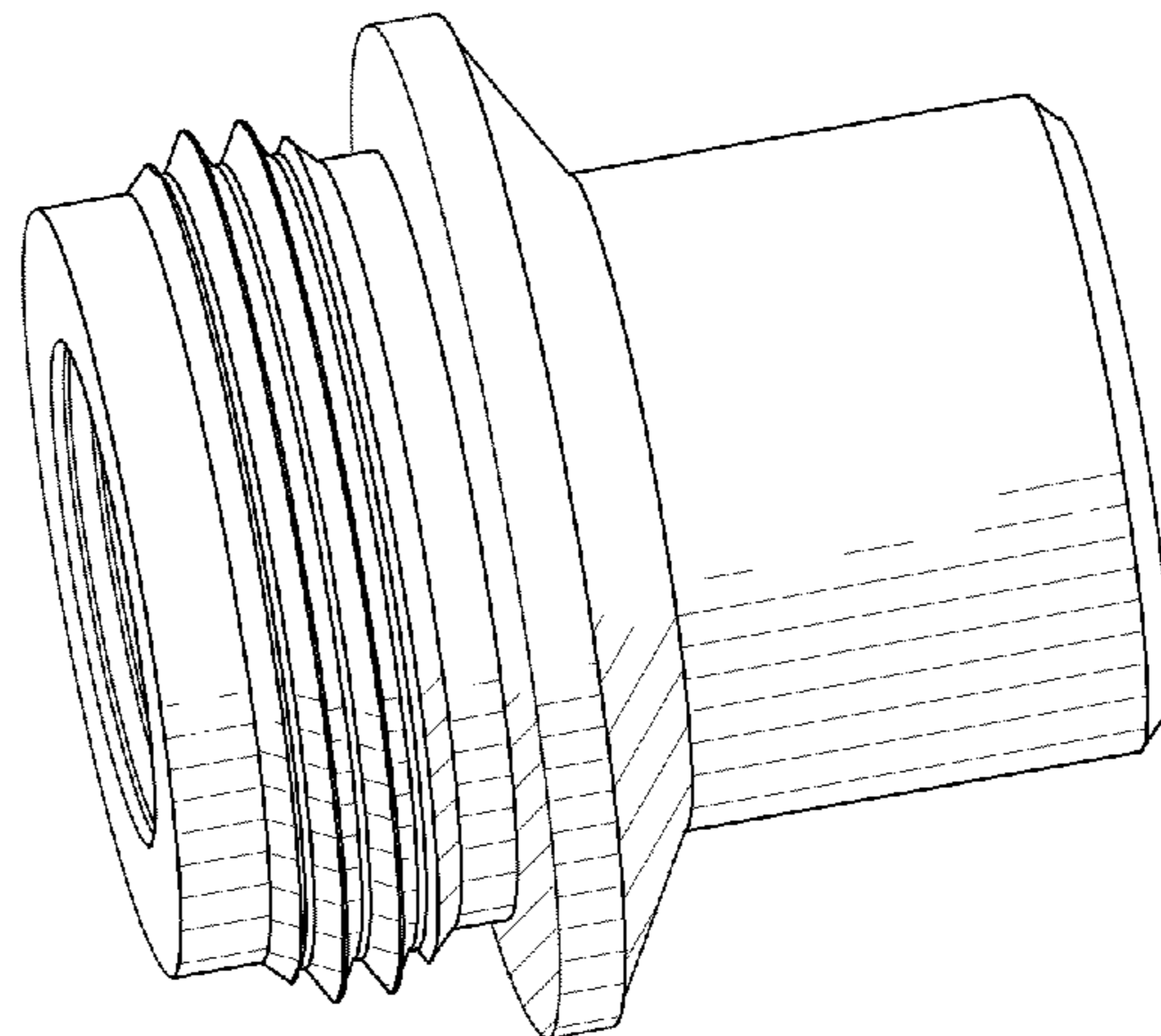
(57) **CLAIM**

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

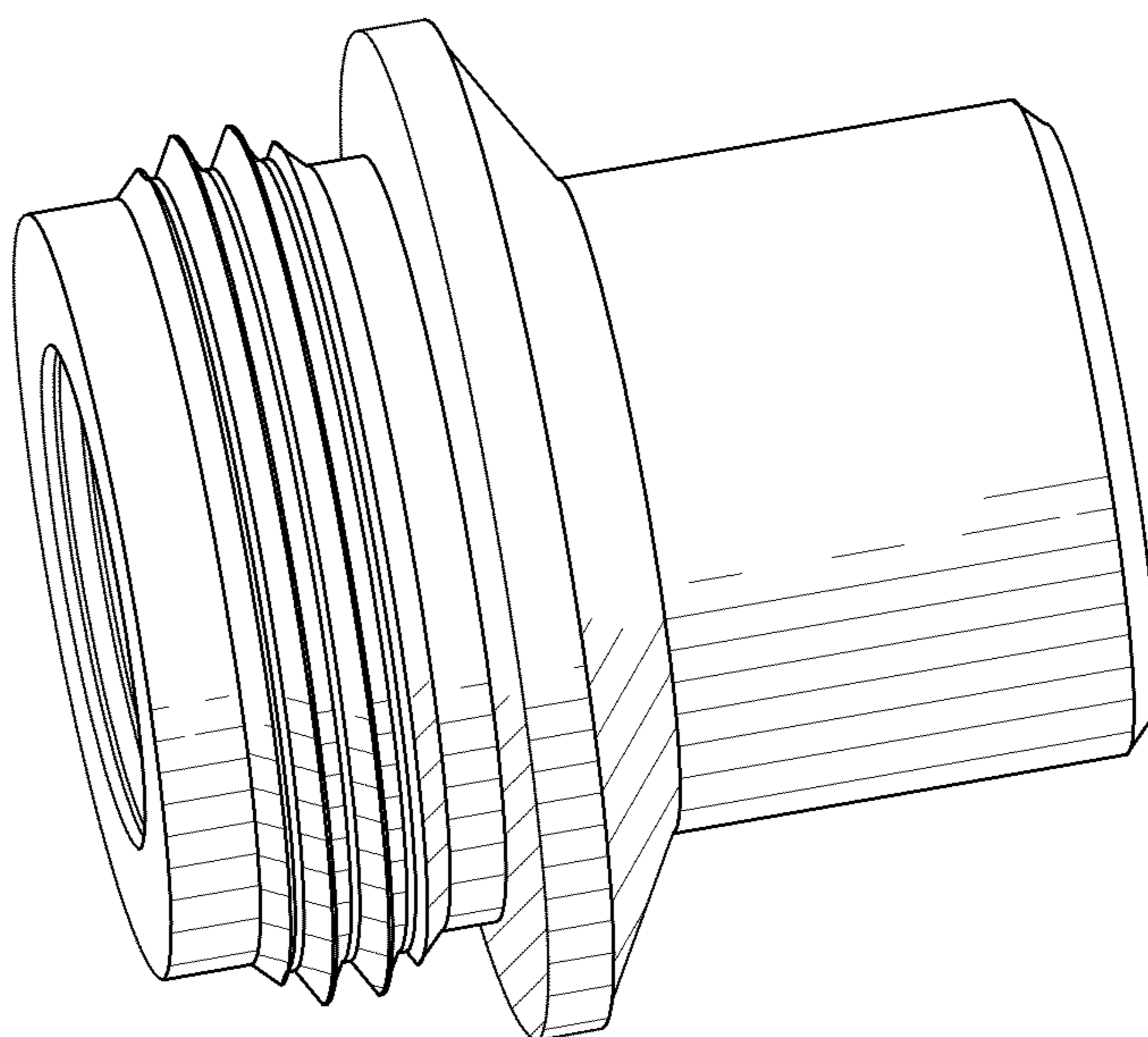


FIG. 1

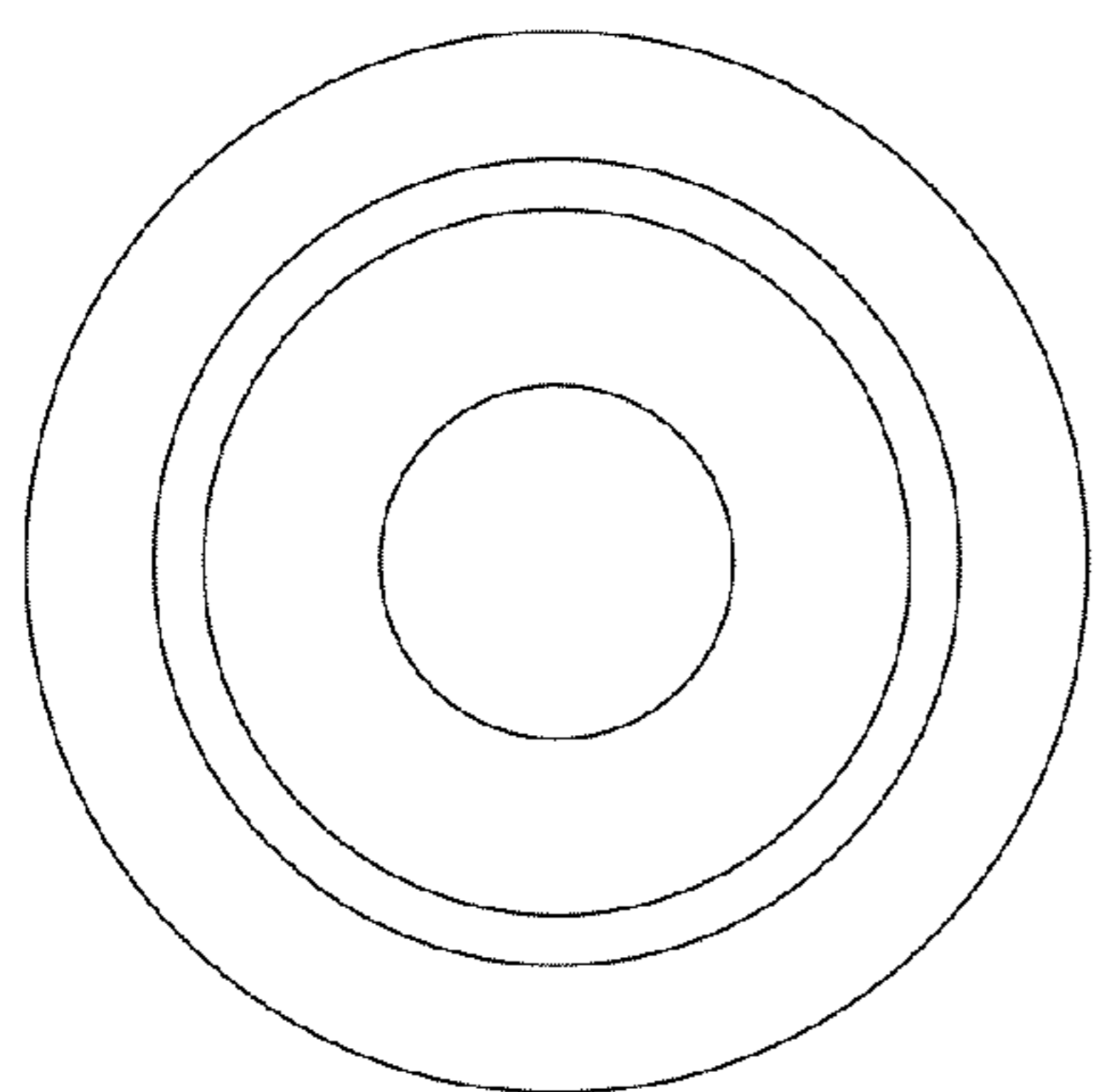


FIG. 2

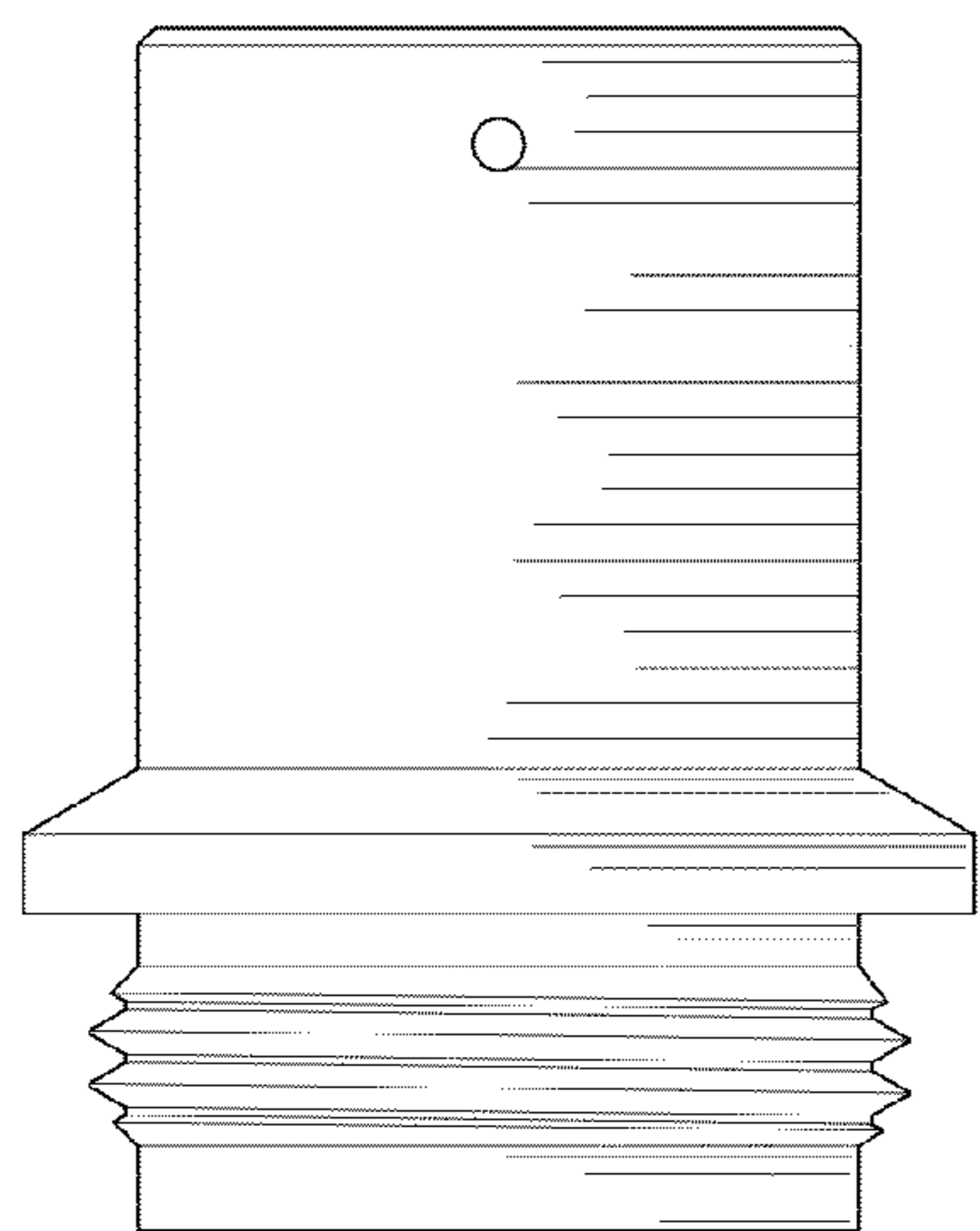


FIG. 3

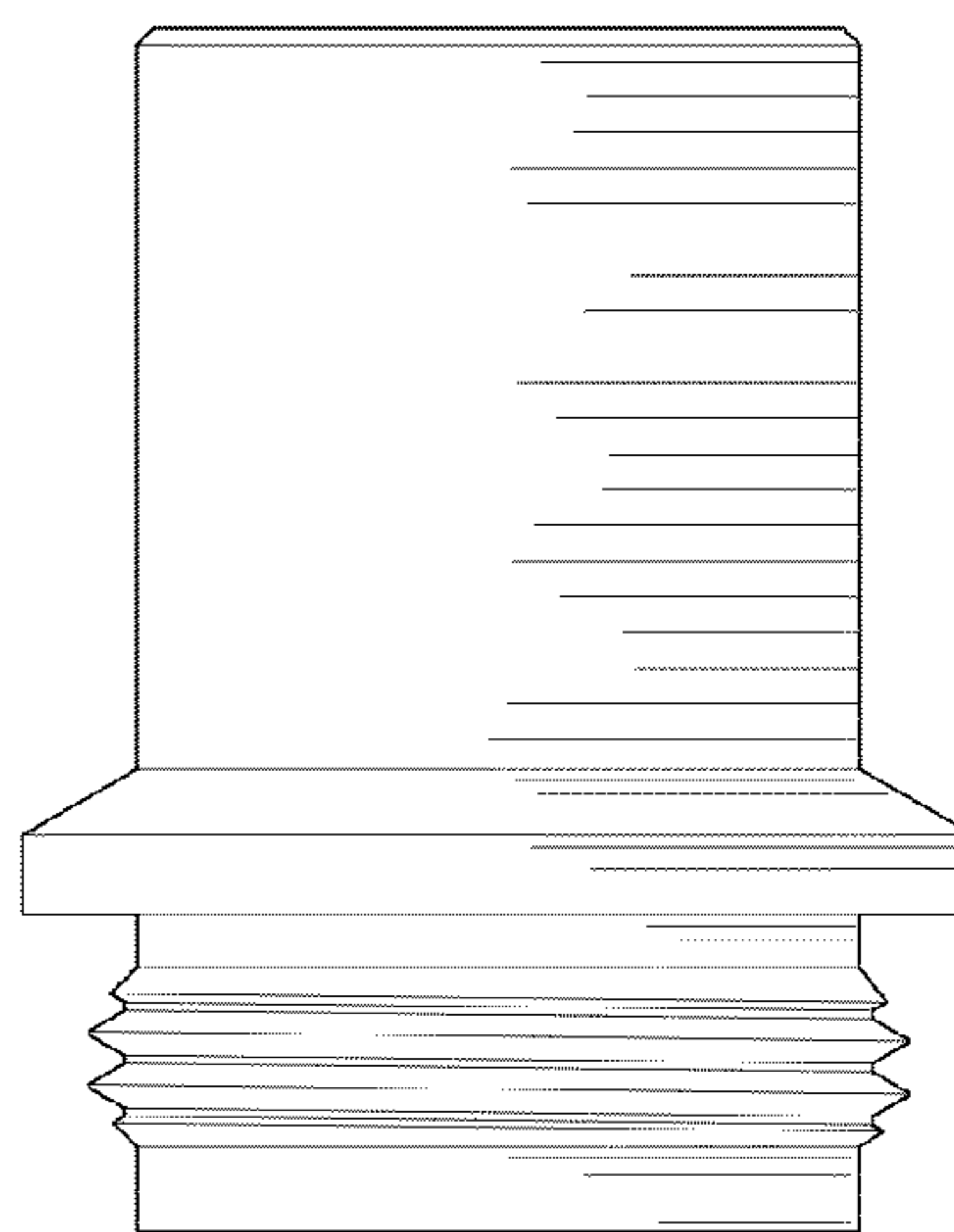


FIG. 4

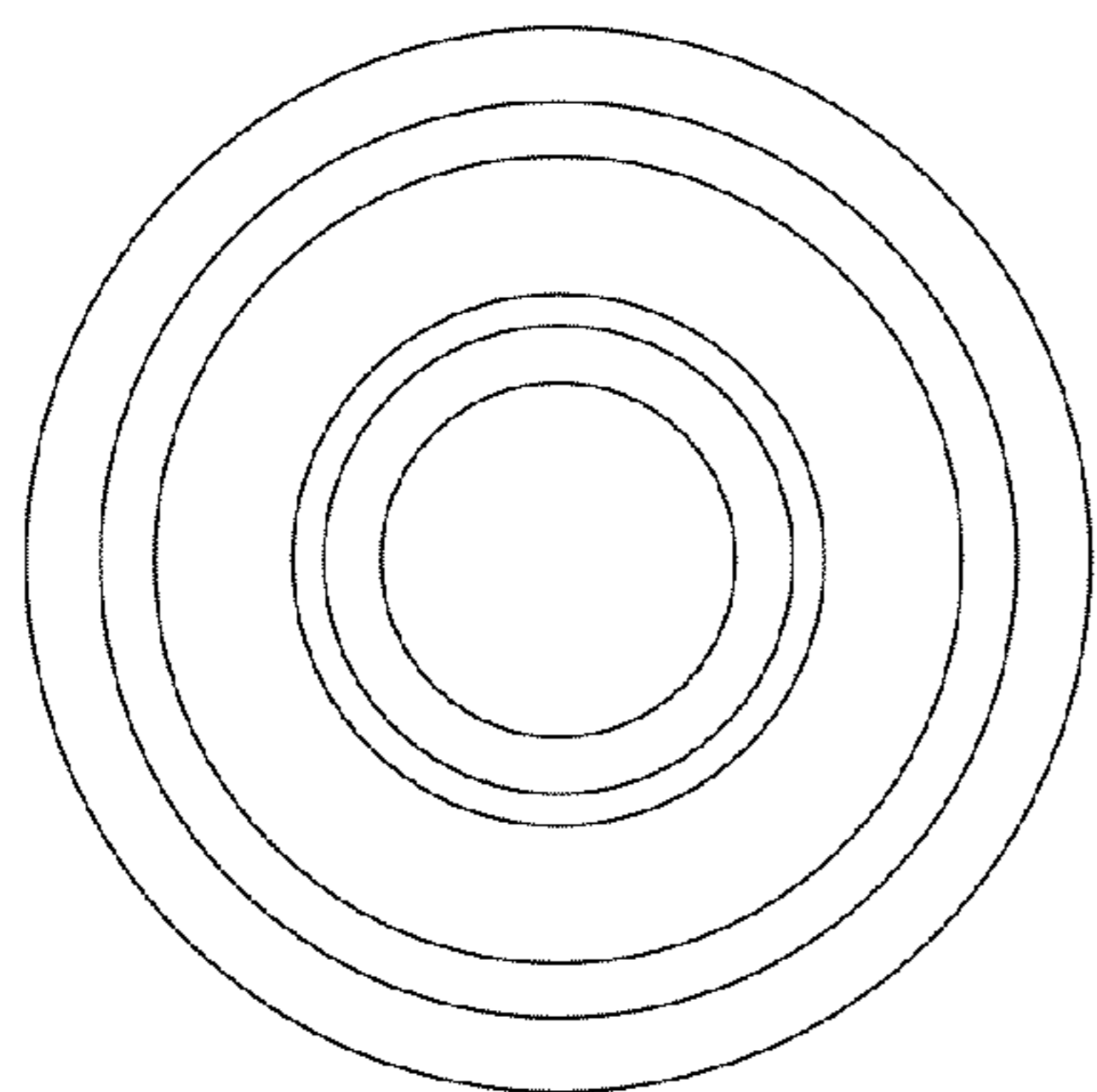


FIG. 5