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Richard et al.

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(54) **SEAL ANCHOR FOR USE IN SURGICAL PROCEDURES**

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(51) **LOC (10) Cl.** **24-02**

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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,468,985 A 5/1949 Krotz
3,402,710 A 9/1968 Paleschuck

3,495,586 A 2/1970 Regenbogen
3,674,007 A 7/1972 Freis
4,016,884 A 4/1977 Kwan-Gett
4,112,932 A 9/1978 Chiulli
4,183,357 A 1/1980 Bentley et al.
4,356,826 A 11/1982 Kubota
4,402,683 A 9/1983 Kopman
D276,937 S 12/1984 Griggs
4,653,476 A 3/1987 Bonnet
4,737,148 A 4/1988 Blake
4,863,430 A 9/1989 Klyce et al.
4,863,438 A 9/1989 Gauderer et al.

(Continued)

FOREIGN PATENT DOCUMENTS

CA 2702419 11/2010
EP 0226026 6/1987

(Continued)

OTHER PUBLICATIONS

U.S. Appl. No. 13/362,021, filed Jan. 31, 2012, Russell Pribanic.

(Continued)

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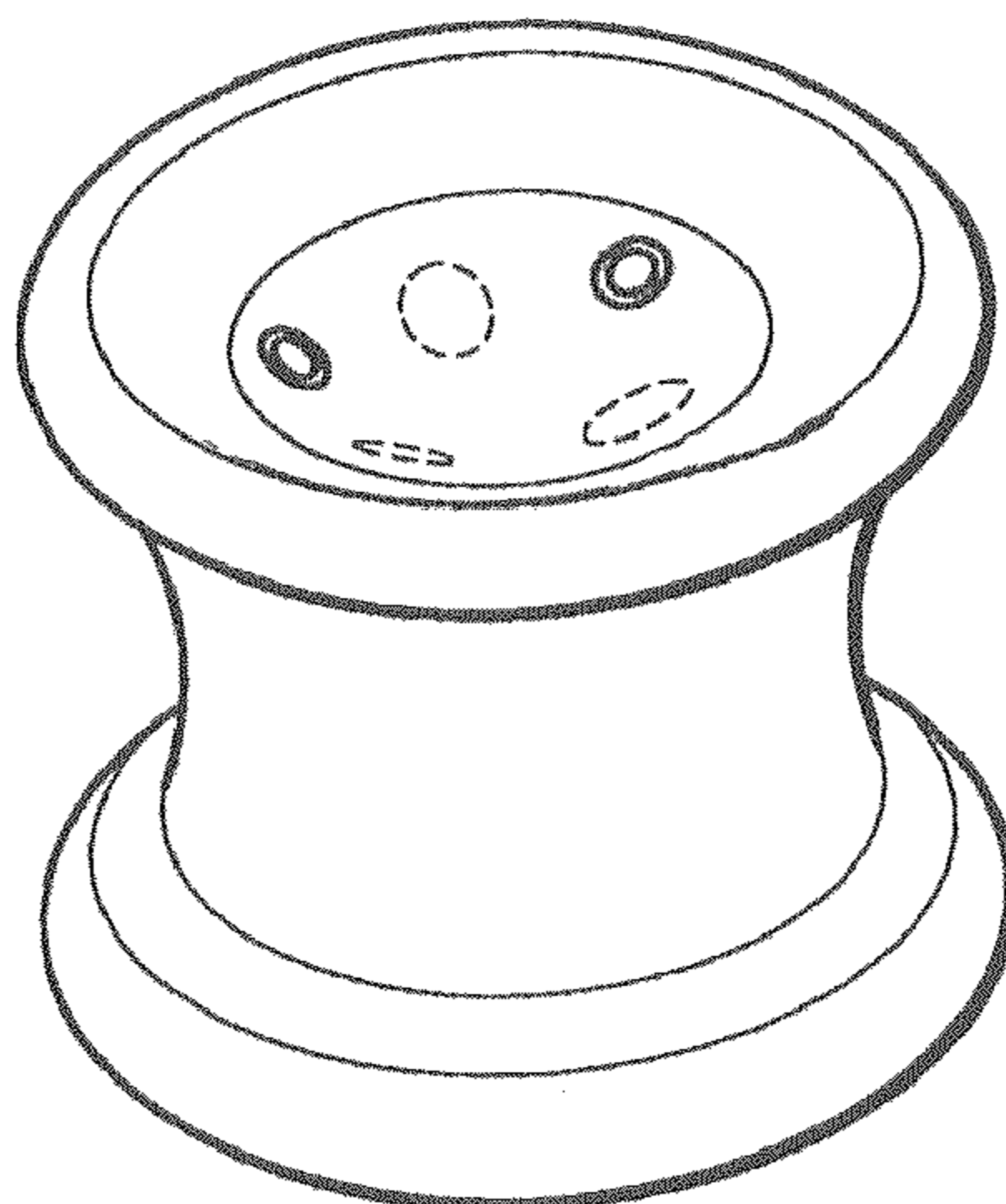
(57) **CLAIM**

The ornamental design for the seal anchor for use in surgical procedures, as shown and described.

DESCRIPTION

FIG. 1 is a top perspective view thereof;
FIG. 2 is a top plan view thereof;
FIG. 3 is a side elevational view thereof; and,
FIG. 4 is a bottom plan view thereof.
The broken lines shown in the figures represent portions of the seal anchor for use in surgical procedures that form no part of the claimed design.

1 Claim, 2 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

4,984,564 A	1/1991	Yuen	5,730,748 A	3/1998	Fogarty et al.
5,002,557 A	3/1991	Hasson	5,735,791 A	4/1998	Alexander, Jr. et al.
5,073,169 A	12/1991	Raiken	5,741,298 A	4/1998	MacLeod
5,082,005 A	1/1992	Kaldany	5,752,970 A	5/1998	Yoon
5,122,122 A	6/1992	Allgood	5,782,817 A	7/1998	Franzel et al.
5,159,921 A	11/1992	Hoover	5,795,290 A	8/1998	Bridges
5,176,697 A	1/1993	Hasson et al.	5,803,921 A	9/1998	Bonadio
5,183,471 A	2/1993	Wilk	5,810,712 A	9/1998	Dunn
5,192,301 A	3/1993	Kamiya et al.	5,813,409 A	9/1998	Leahy et al.
5,197,955 A	3/1993	Stephens et al.	5,830,191 A	11/1998	Hildwein et al.
5,209,754 A	5/1993	Ahluwalia	5,836,871 A	11/1998	Wallace et al.
5,217,466 A	6/1993	Hasson	5,836,913 A	11/1998	Orth et al.
5,242,409 A	9/1993	Buelna	5,840,077 A	11/1998	Rowden et al.
5,242,415 A	9/1993	Kantrowitz et al.	5,842,971 A	12/1998	Yoon
5,257,973 A	11/1993	Villasuso	5,848,992 A	12/1998	Hart et al.
5,257,975 A	11/1993	Foshee	5,853,417 A	12/1998	Fogarty et al.
5,269,772 A	12/1993	Wilk	5,857,461 A	1/1999	Levitsky et al.
5,290,249 A	3/1994	Foster et al.	5,865,817 A	2/1999	Moening et al.
5,312,391 A	5/1994	Wilk	5,871,474 A	2/1999	Hermann et al.
5,312,417 A	5/1994	Wilk	5,876,413 A	3/1999	Fogarty et al.
5,314,417 A	5/1994	Stephens et al.	5,894,843 A	4/1999	Benetti et al.
5,318,516 A	6/1994	Cosmescu	5,899,208 A	5/1999	Bonadio
5,330,486 A	7/1994	Wilk	5,899,913 A	5/1999	Fogarty et al.
5,334,143 A	8/1994	Carroll	5,904,703 A	5/1999	Gilson
5,336,169 A	8/1994	Divilio et al.	5,906,577 A	5/1999	Beane et al.
5,336,203 A	8/1994	Goldhardt et al.	5,914,415 A	6/1999	Tago
5,337,937 A	8/1994	Remiszewski et al.	5,916,198 A	6/1999	Dillow
5,345,927 A	9/1994	Bonutti	5,941,898 A	8/1999	Moening et al.
5,350,364 A	9/1994	Stephens et al.	5,951,588 A	9/1999	Moening
5,360,417 A	11/1994	Gravener et al.	5,957,913 A	9/1999	De la Torre et al.
5,366,478 A	11/1994	Brinkerhoff et al.	5,964,781 A	10/1999	Mollenauer et al.
5,375,588 A	12/1994	Yoon	5,976,174 A	11/1999	Ruiz
5,391,156 A	2/1995	Hildwein et al.	5,997,515 A	12/1999	De la Torre et al.
5,394,863 A	3/1995	Sanford et al.	6,017,355 A	1/2000	Hessel et al.
5,395,367 A	3/1995	Wilk	6,018,094 A	1/2000	Fox
5,437,683 A	8/1995	Neumann et al.	6,024,736 A	2/2000	de la Torre et al.
5,443,453 A	8/1995	Walker et al.	6,030,402 A	2/2000	Thompson et al.
5,445,615 A	8/1995	Yoon	6,033,426 A	3/2000	Kaji
5,451,222 A	9/1995	De Maagd et al.	6,033,428 A	3/2000	Sardella
5,460,170 A	10/1995	Hammerslag	6,042,573 A	3/2000	Lucey
5,464,409 A	11/1995	Mohajer	6,048,309 A	4/2000	Flom et al.
5,480,410 A	1/1996	Cuschieri et al.	6,059,816 A	5/2000	Moening
5,490,843 A	2/1996	Hildwein et al.	6,068,639 A	5/2000	Fogarty et al.
5,507,758 A	4/1996	Thomason et al.	6,077,288 A	6/2000	Shimomura et al.
5,511,564 A	4/1996	Wilk	6,086,603 A	7/2000	Termin et al.
5,514,133 A	5/1996	Golub et al.	6,099,506 A	8/2000	Macoviak et al.
5,514,153 A	5/1996	Bonutti	6,110,154 A	8/2000	Shimomura et al.
5,520,698 A	5/1996	Koh	6,142,936 A	11/2000	Beane et al.
5,522,791 A	6/1996	Leyva	6,156,006 A	12/2000	Brosens et al.
5,524,644 A	6/1996	Crook	6,162,196 A	12/2000	Hart et al.
5,540,648 A	7/1996	Yoon	6,171,282 B1	1/2001	Ragsdale
5,545,150 A	8/1996	Danks et al.	6,197,002 B1	3/2001	Peterson
5,545,179 A	8/1996	Williamson, IV	6,217,555 B1	4/2001	Hart et al.
5,556,385 A	9/1996	Andersen	6,228,063 B1	5/2001	Aboul-Hosn
5,556,387 A	9/1996	Mollenauer et al.	6,234,958 B1	5/2001	Snoke et al.
5,569,159 A	10/1996	Anderson et al.	6,238,373 B1	5/2001	De la Torre et al.
5,577,993 A	11/1996	Zhu et al.	6,241,768 B1	6/2001	Agarwal et al.
5,601,581 A	2/1997	Fogarty et al.	6,251,119 B1	6/2001	Addis
5,624,399 A	4/1997	Ackerman	6,254,534 B1	7/2001	Butler et al.
5,634,911 A	6/1997	Hermann et al.	6,264,604 B1	7/2001	Kieturakis et al.
5,634,937 A	6/1997	Mollenauer et al.	6,276,661 B1	8/2001	Laird
5,643,285 A	7/1997	Rowden et al.	6,293,952 B1	9/2001	Brosens et al.
5,649,550 A	7/1997	Crook	6,315,770 B1	11/2001	de la Torre et al.
5,651,771 A	7/1997	Tangherlini et al.	6,319,246 B1	11/2001	de la Torre et al.
5,653,705 A	8/1997	de la Torre et al.	6,328,720 B1	12/2001	McNally et al.
5,656,013 A	8/1997	Yoon	6,329,637 B1	12/2001	Hembree et al.
5,672,168 A	9/1997	De la Torre et al.	6,371,968 B1	4/2002	Kogasaka et al.
5,683,378 A	11/1997	Christy	6,382,211 B1	5/2002	Crook
5,685,857 A	11/1997	Negus et al.	6,423,036 B1	7/2002	Van Huizen
5,697,946 A	12/1997	Hopper et al.	6,440,061 B1	8/2002	Wenner et al.
5,709,675 A	1/1998	Williams	6,440,063 B1	8/2002	Beane et al.
5,713,858 A	2/1998	Heruth et al.	6,443,957 B1	9/2002	Addis
5,713,869 A	2/1998	Morejon	6,447,489 B1	9/2002	Peterson
5,722,962 A	3/1998	Garcia	6,450,983 B1	9/2002	Rambo
5,728,103 A	3/1998	Picha et al.	6,454,783 B1	9/2002	Piskun
			6,464,686 B1	10/2002	O'Hara et al.
			6,468,292 B1	10/2002	Mollenauer et al.
			6,485,410 B1	11/2002	Loy
			6,488,620 B1	12/2002	Segermark et al.

(56)

References Cited

U.S. PATENT DOCUMENTS

6,488,692	B1	12/2002	Spence et al.	7,258,712	B2	8/2007	Schultz et al.
6,524,283	B1	2/2003	Hopper et al.	7,276,075	B1	10/2007	Callas et al.
6,527,787	B1	3/2003	Fogarty et al.	7,294,103	B2	11/2007	Bertolero et al.
6,544,210	B1	4/2003	Trudel et al.	7,300,399	B2	11/2007	Bonadio et al.
6,551,270	B1	4/2003	Bimbo et al.	7,316,699	B2	1/2008	McFarlane
6,558,371	B2	5/2003	Dorn	7,331,940	B2	2/2008	Sommerich
6,562,022	B2	5/2003	Hoste et al.	7,344,547	B2	3/2008	Piskun
6,572,631	B1	6/2003	McCartney	7,377,898	B2	5/2008	Ewers et al.
6,578,577	B2	6/2003	Bonadio et al.	7,390,322	B2	6/2008	McGuckin, Jr. et al.
6,582,364	B2	6/2003	Butler et al.	7,393,322	B2	7/2008	Wenchell
6,589,167	B1	7/2003	Shimomura et al.	7,412,977	B2	8/2008	Fields et al.
6,589,316	B1	7/2003	Schultz et al.	7,440,661	B2	10/2008	Kobayashi
6,592,543	B1	7/2003	Wortrich et al.	7,445,597	B2	11/2008	Butler et al.
6,613,952	B2	9/2003	Rambo	7,452,363	B2	11/2008	Ortiz
6,623,426	B2	9/2003	Bonadio et al.	7,473,221	B2	1/2009	Ewers et al.
6,669,674	B1	12/2003	Macoviak et al.	7,481,765	B2	1/2009	Ewers et al.
6,676,639	B1	1/2004	Ternström	7,493,703	B2	2/2009	Kim et al.
6,684,405	B2	2/2004	Lezdey	7,513,361	B1	4/2009	Mills, Jr.
6,706,050	B1	3/2004	Giannadakis	7,513,461	B2	4/2009	Reutenauer et al.
6,716,201	B2	4/2004	Blanco	7,520,876	B2	4/2009	Ressemann et al.
6,718,628	B2	4/2004	Munshi	7,537,564	B2	5/2009	Bonadio et al.
6,723,044	B2	4/2004	Pulford et al.	7,540,839	B2	6/2009	Butler et al.
6,723,088	B2	4/2004	Gaskill, III et al.	7,559,893	B2	7/2009	Bonadio et al.
6,725,080	B2	4/2004	Melkent et al.	7,608,082	B2	10/2009	Cuevas et al.
6,800,084	B2	10/2004	Davison et al.	7,625,361	B2	12/2009	Suzuki et al.
6,811,546	B1	11/2004	Callas et al.	7,645,232	B2	1/2010	Shluzas
6,814,078	B2	11/2004	Crook	7,650,887	B2	1/2010	Nguyen et al.
6,830,578	B2	12/2004	O'Heeron et al.	7,704,207	B2	4/2010	Albrecht et al.
6,837,893	B2	1/2005	Miller	7,717,846	B2	5/2010	Zirps et al.
6,840,946	B2	1/2005	Fogarty et al.	7,717,847	B2	5/2010	Smith
6,840,951	B2	1/2005	de la Torre et al.	7,721,742	B2	5/2010	Kaloo et al.
6,846,287	B2	1/2005	Bonadio et al.	7,727,146	B2	6/2010	Albrecht et al.
6,863,674	B2	3/2005	Kasahara et al.	7,730,629	B2	6/2010	Kim
6,878,110	B2	4/2005	Yang et al.	7,736,306	B2	6/2010	Brustad et al.
6,884,253	B1	4/2005	McFarlane	7,753,901	B2	7/2010	Piskun et al.
6,890,295	B2	5/2005	Michels et al.	7,758,500	B2	7/2010	Boyd et al.
6,913,609	B2	7/2005	Yencho et al.	7,762,995	B2	7/2010	Eversull et al.
6,916,310	B2	7/2005	Sommerich	7,766,824	B2	8/2010	Jensen et al.
6,916,331	B2	7/2005	Mollenauer et al.	7,787,963	B2	8/2010	Geistert et al.
6,929,637	B2	8/2005	Gonzalez et al.	7,798,898	B2	9/2010	Luciano, Jr. et al.
6,939,296	B2	9/2005	Ewers et al.	7,798,998	B2	9/2010	Thompson et al.
6,942,633	B2	9/2005	Odland	7,811,251	B2	10/2010	Wenchell et al.
6,945,932	B1	9/2005	Caldwell et al.	7,815,567	B2	10/2010	Albrecht et al.
6,958,037	B2	10/2005	Ewers et al.	7,837,612	B2	11/2010	Gill et al.
6,972,026	B1	12/2005	Caldwell et al.	7,846,123	B2	12/2010	Vassiliades et al.
6,986,752	B2	1/2006	McGuckin, Jr. et al.	7,850,600	B1	12/2010	Piskun
6,991,602	B2	1/2006	Nakazawa et al.	7,850,667	B2	12/2010	Gresham
6,997,909	B2	2/2006	Goldberg	7,867,164	B2	1/2011	Butler et al.
7,001,397	B2	2/2006	Davison et al.	7,896,889	B2	3/2011	Mazzocchi et al.
7,008,377	B2	3/2006	Beane et al.	7,905,829	B2	3/2011	Nishimura et al.
7,011,645	B2	3/2006	McGuckin, Jr. et al.	7,909,760	B2	3/2011	Albrecht et al.
7,014,628	B2	3/2006	Bousquet	7,951,076	B2	5/2011	Hart et al.
7,033,319	B2	4/2006	Pulford et al.	7,955,257	B2	6/2011	Frasier et al.
7,052,454	B2	5/2006	Taylor	7,955,313	B2	6/2011	Boismier
7,056,321	B2	6/2006	Pagliuca et al.	7,998,068	B2	8/2011	Bonadio et al.
7,077,852	B2	7/2006	Fogarty et al.	8,021,296	B2	9/2011	Bonadio et al.
7,081,089	B2	7/2006	Bonadio et al.	8,025,670	B2	9/2011	Sharp et al.
7,083,626	B2	8/2006	Hart et al.	8,038,652	B2	10/2011	Morrison et al.
7,100,614	B2	9/2006	Stevens et al.	8,066,673	B2	11/2011	Hart et al.
7,101,353	B2	9/2006	Lui et al.	8,079,986	B2	12/2011	Taylor et al.
7,104,981	B2	9/2006	Elkins et al.	8,092,430	B2	1/2012	Richard et al.
7,153,261	B2	12/2006	Wenchell	8,105,234	B2	1/2012	Ewers et al.
7,160,309	B2	1/2007	Voss	8,157,786	B2	4/2012	Miller et al.
7,163,510	B2	1/2007	Kahle et al.	8,157,817	B2	4/2012	Bonadio et al.
7,192,436	B2	3/2007	Sing et al.	8,187,177	B2	5/2012	Kahle et al.
7,195,590	B2	3/2007	Butler et al.	8,187,178	B2	5/2012	Bonadio et al.
7,201,725	B1	4/2007	Cragg et al.	8,226,553	B2	7/2012	Shelton et al.
7,214,185	B1	5/2007	Rosney et al.	8,251,900	B2	8/2012	Ortiz et al.
7,217,277	B2	5/2007	Parihar et al.	8,257,252	B2	9/2012	Kleyman
7,223,257	B2	5/2007	Shubayev et al.	8,317,690	B2	11/2012	Ransden et al.
7,223,278	B2	5/2007	Davison et al.	8,323,184	B2	12/2012	Spiegel et al.
7,235,064	B2	6/2007	Hopper et al.	8,328,761	B2	12/2012	Widenhouse et al.
7,235,084	B2	6/2007	Skakoon et al.	8,343,047	B2	1/2013	Albrecht et al.
D545,967	S	7/2007	Joyce et al.	8,388,526	B2	3/2013	Ewers et al.
7,238,154	B2	7/2007	Ewers et al.	8,394,018	B2	3/2013	Piskun
				8,414,485	B2	4/2013	Richard et al.
				8,465,494	B2	6/2013	Butler et al.
				8,480,683	B2	7/2013	Fowler et al.
				8,550,992	B2	10/2013	Kleyman

(56)

References Cited

U.S. PATENT DOCUMENTS

8,574,153 B2 11/2013 Richard
 8,641,610 B2 2/2014 Okoniewski et al.
 8,668,641 B2 * 3/2014 Smith 600/203
 8,684,918 B2 * 4/2014 Stopek 600/215
 8,696,557 B2 4/2014 Fischvogt
 8,727,974 B2 * 5/2014 Kasvikis 600/208
 8,764,647 B2 * 7/2014 Kleyman 600/208
 D712,033 S * 8/2014 Richard et al. D24/145
 D712,034 S * 8/2014 Richard et al. D24/145
 8,795,164 B2 * 8/2014 Stopek 600/215
 2001/0037053 A1 11/2001 Bonadio et al.
 2002/0055714 A1 5/2002 Rothschild
 2003/0014076 A1 1/2003 Mollenauer et al.
 2003/0093104 A1 5/2003 Bonner et al.
 2003/0212383 A1 11/2003 Cote
 2004/0059297 A1 3/2004 Racenet et al.
 2004/0092795 A1 5/2004 Bonadio et al.
 2004/0102804 A1 5/2004 Chin
 2004/0111061 A1 6/2004 Curran
 2004/0138529 A1 7/2004 Wiltshire et al.
 2004/0204734 A1 10/2004 Wagner et al.
 2004/0267096 A1 12/2004 Caldwell et al.
 2005/0020884 A1 1/2005 Hart et al.
 2005/0070935 A1 3/2005 Ortiz
 2005/0096695 A1 5/2005 Olich
 2005/0119525 A1 6/2005 Takemoto
 2005/0137459 A1 6/2005 Chin et al.
 2005/0148823 A1 7/2005 Vaugh et al.
 2005/0192483 A1 9/2005 Bonadio et al.
 2005/0203346 A1 9/2005 Bonadio et al.
 2005/0209608 A1 9/2005 O'Heeron
 2005/0245876 A1 11/2005 Khosravi et al.
 2005/0251092 A1 11/2005 Howell et al.
 2005/0277946 A1 12/2005 Greenhalgh
 2006/0071432 A1 4/2006 Staudner
 2006/0129165 A1 6/2006 Edoga et al.
 2006/0149137 A1 7/2006 Pingleton et al.
 2006/0149306 A1 7/2006 Hart et al.
 2006/0161049 A1 7/2006 Beane et al.
 2006/0161050 A1 7/2006 Butler et al.
 2006/0212063 A1 9/2006 Wilk
 2006/0224161 A1 10/2006 Bhattacharyya
 2006/0241651 A1 10/2006 Wilk
 2006/0247500 A1 11/2006 Voegele et al.
 2006/0247516 A1 11/2006 Hess et al.
 2006/0247586 A1 11/2006 Voegele et al.
 2006/0247673 A1 11/2006 Voegele et al.
 2006/0247678 A1 11/2006 Weisenburgh, II et al.
 2006/0270911 A1 11/2006 Voegele et al.
 2007/0118175 A1 5/2007 Butler et al.
 2007/0203398 A1 8/2007 Bonadio et al.
 2007/0208312 A1 9/2007 Norton et al.
 2007/0270654 A1 11/2007 Pignato
 2007/0270882 A1 11/2007 Hjelle et al.
 2008/0027476 A1 1/2008 Piskun
 2008/0048011 A1 2/2008 Weller
 2008/0097162 A1 4/2008 Bonadio et al.
 2008/0097332 A1 4/2008 Greenhalgh et al.
 2008/0161826 A1 7/2008 Guiraudon
 2008/0194973 A1 8/2008 Imam
 2008/0255519 A1 10/2008 Piskun et al.
 2008/0319261 A1 12/2008 Lucini
 2009/0012477 A1 1/2009 Norton et al.
 2009/0036738 A1 2/2009 Cuschieri et al.
 2009/0093752 A1 4/2009 Richard et al.
 2009/0093850 A1 4/2009 Richard
 2009/0105635 A1 4/2009 Bettuchi et al.
 2009/0131751 A1 5/2009 Spivey et al.
 2009/0182279 A1 7/2009 Wenchell et al.
 2009/0182288 A1 7/2009 Spenciner
 2009/0204067 A1 8/2009 Abu-Halawa
 2009/0227843 A1 9/2009 Smith et al.
 2009/0299292 A1 12/2009 Renaux
 2009/0326330 A1 12/2009 Bonadio et al.
 2009/0326332 A1 12/2009 Carter

2010/0063452 A1 3/2010 Edelman et al.
 2010/0100043 A1 4/2010 Racenet
 2010/0113886 A1 5/2010 Piskun et al.
 2010/0228094 A1 9/2010 Ortiz et al.
 2010/0240960 A1 9/2010 Richard
 2010/0249516 A1 9/2010 Shelton, IV et al.
 2010/0261975 A1 10/2010 Huey et al.
 2010/0280326 A1 11/2010 Hess et al.
 2010/0286484 A1 11/2010 Stellon et al.
 2010/0286506 A1 11/2010 Ransden et al.
 2010/0298646 A1 11/2010 Stellon et al.
 2011/0009704 A1 1/2011 Marczyk et al.
 2011/0021877 A1 1/2011 Fortier et al.
 2011/0028891 A1 2/2011 Okoniewski
 2011/0054257 A1 3/2011 Stopek
 2011/0054258 A1 3/2011 O'Keefe et al.
 2011/0054260 A1 3/2011 Albrecht et al.
 2011/0082341 A1 4/2011 Kleyman et al.
 2011/0082343 A1 4/2011 Okoniewski
 2011/0082346 A1 4/2011 Stopek
 2011/0118553 A1 5/2011 Stopek
 2011/0124968 A1 5/2011 Kleyman
 2011/0124969 A1 5/2011 Stopek
 2011/0124970 A1 5/2011 Kleyman
 2011/0125186 A1 5/2011 Fowler et al.
 2011/0166423 A1 7/2011 Farascioni et al.
 2011/0251463 A1 10/2011 Kleyman
 2011/0251464 A1 10/2011 Kleyman
 2011/0251465 A1 10/2011 Kleyman
 2011/0251466 A1 10/2011 Kleyman et al.
 2011/0313250 A1 12/2011 Kleyman
 2012/0059640 A1 3/2012 Roy et al.
 2012/0130177 A1 5/2012 Davis
 2012/0130179 A1 5/2012 Rockrohr
 2012/0130181 A1 5/2012 Davis
 2012/0130182 A1 5/2012 Rodrigues, Jr. et al.
 2012/0130183 A1 5/2012 Barnes
 2012/0130184 A1 5/2012 Richard
 2012/0130185 A1 5/2012 Pribanic
 2012/0130186 A1 5/2012 Stopek et al.
 2012/0130187 A1 5/2012 Okoniewski
 2012/0130188 A1 5/2012 Okoniewski
 2012/0130190 A1 5/2012 Kasvikis
 2012/0130191 A1 5/2012 Pribanic
 2012/0149987 A1 6/2012 Richard et al.
 2012/0157777 A1 6/2012 Okoniewski
 2012/0157779 A1 6/2012 Vischvogt
 2012/0157780 A1 6/2012 Okoniewski et al.
 2012/0157781 A1 6/2012 Kleyman
 2012/0157782 A1 6/2012 Alfieri
 2012/0157783 A1 6/2012 Okoniewski et al.
 2012/0157784 A1 6/2012 Kleyman et al.
 2012/0157785 A1 6/2012 Kleyman
 2012/0157786 A1 6/2012 Pribanic
 2012/0190931 A1 7/2012 Stopek
 2012/0190932 A1 7/2012 Okoniewski
 2012/0190933 A1 7/2012 Kleyman
 2012/0245425 A1 9/2012 Okoniewski
 2012/0253134 A1 10/2012 Smith
 2013/0178708 A1 7/2013 Malkowski et al.
 2013/0184646 A1 7/2013 Richard et al.
 2013/0225931 A1 * 8/2013 Cruz et al. 600/204
 2013/0245373 A1 9/2013 Okoniewski
 2013/0253277 A1 9/2013 Smith
 2013/0253278 A1 * 9/2013 Smith 600/204
 2013/0274559 A1 10/2013 Fowler et al.
 2013/0310651 A1 11/2013 Alfieri
 2014/0039268 A1 2/2014 Richard
 2014/0051933 A1 2/2014 Okoniewski
 2014/0121466 A1 * 5/2014 Okoniewski et al. 600/204
 2014/0142392 A1 * 5/2014 Smith 600/203
 2014/0171745 A1 * 6/2014 Stopek 600/204
 2015/0038796 A1 * 2/2015 Okoniewski 600/204

FOREIGN PATENT DOCUMENTS

EP 0538060 4/1993
 EP 630660 6/1994
 EP 0950376 10/1999

(56)

References Cited

FOREIGN PATENT DOCUMENTS

EP	1188415	3/2002
EP	0807416	4/2004
EP	1312318	12/2005
EP	1774918	4/2007
EP	1932485	6/2008
EP	2044889	4/2009
EP	2044897	8/2009
EP	2095781	9/2009
EP	2098182	9/2009
EP	2181657	5/2010
EP	2226025	9/2010
EP	2229900	9/2010
EP	2238924	10/2010
EP	2238925	10/2010
EP	2238933	10/2010
EP	2248478	11/2010
EP	2248482	11/2010
EP	2253283	11/2010
EP	2272450	1/2011
EP	2277464	1/2011
EP	2292165	3/2011
EP	2343019	7/2011
GB	2469083	4/2009
WO	WO84/01512	4/1984
WO	WO93/14801	8/1993
WO	WO94/04067	3/1994
WO	WO96/10963	4/1996
WO	WO96/36283	11/1996
WO	WO97/33520	9/1997
WO	WO97/42889	11/1997
WO	WO99/16368	4/1999
WO	WO99/22804	5/1999
WO	WO00/32116	6/2000
WO	WO00/32120	6/2000
WO	WO01/08581	2/2001
WO	WO01/49363	7/2001
WO	WO02/07611	1/2002
WO	WO03/034908	5/2003
WO	WO03/071926	9/2003
WO	WO2004/043275	5/2004
WO	WO2004/054456	7/2004
WO	WO2004/075741	9/2004
WO	WO2004/075930	9/2004
WO	WO2005/058409	6/2005
WO	WO2006/019723	2/2006
WO	WO2006/100658	9/2006

WO	WO2006/110733	10/2006
WO	WO2007/018458	2/2007
WO	WO2007/095703	8/2007
WO	WO2007/143200	12/2007
WO	WO2008/015566	2/2008
WO	WO2008/042005	4/2008
WO	WO2008/077080	6/2008
WO	WO2008/093313	8/2008
WO	WO2008/103151	8/2008
WO	WO2008/121294	10/2008
WO	WO2009/036343	3/2009
WO	WO2010/141409	12/2010

OTHER PUBLICATIONS

U.S. Appl. No. 13/456,375, filed Apr. 26, 2012, Danyel J. Racenet.
 European Search Report EP08253236 dated Feb. 10, 2009.
 European Search Report EP09251613 dated Mar. 24, 2011.
 European Search Report EP09251623 dated Dec. 7, 2011.
 European Search Report EP10250526 dated Jun. 23, 2010.
 European Search Report EP10250638 dated Jul. 19, 2010.
 European Search Report EP10250643 dated Jun. 23, 2010.
 European Search Report EP10250881 dated Aug. 18, 2010.
 European Search Report EP10250885 dated Aug. 18, 2010.
 European Search Report EP10250944 dated Jul. 29, 2010.
 European Search Report EP10251218 dated Jun. 15, 2011.
 European Search Report EP10251317 dated Oct. 15, 2011.
 European Search Report EP10251359 dated Nov. 8, 2010.
 European Search Report EP10251399 dated Sep. 13, 2010.
 European Search Report EP10251486 dated Oct. 19, 2010.
 European Search Report EP10251693 dated Feb. 3, 2011.
 European Search Report EP10251718 dated Jan. 28, 2011.
 European Search Report EP10251751 dated Apr. 28, 2011.
 European Search Report EP10251796 dated Jan. 31, 2011.
 European Search Report EP10251955 dated Feb. 21, 2011.
 European Search Report EP10251983 dated Feb. 15, 2011.
 European Search Report EP10251984 dated Feb. 10, 2011.
 European Search Report EP10251985 dated Feb. 15, 2011.
 European Search Report EP10251986 dated Mar. 7, 2011.
 European Search Report EP11190051 dated Jan. 25, 2012.
 European Search Report EP11194126 dated May 2, 2012.
 European Search Report EP11194221 dated Jun. 11, 2012.
 European Search Report EP11250790 dated Jan. 25, 2012.
 European Search Report EP11250792.6 dated Feb. 24, 2012.
 European Search Report EP12152128 dated Apr. 20, 2012.

* cited by examiner

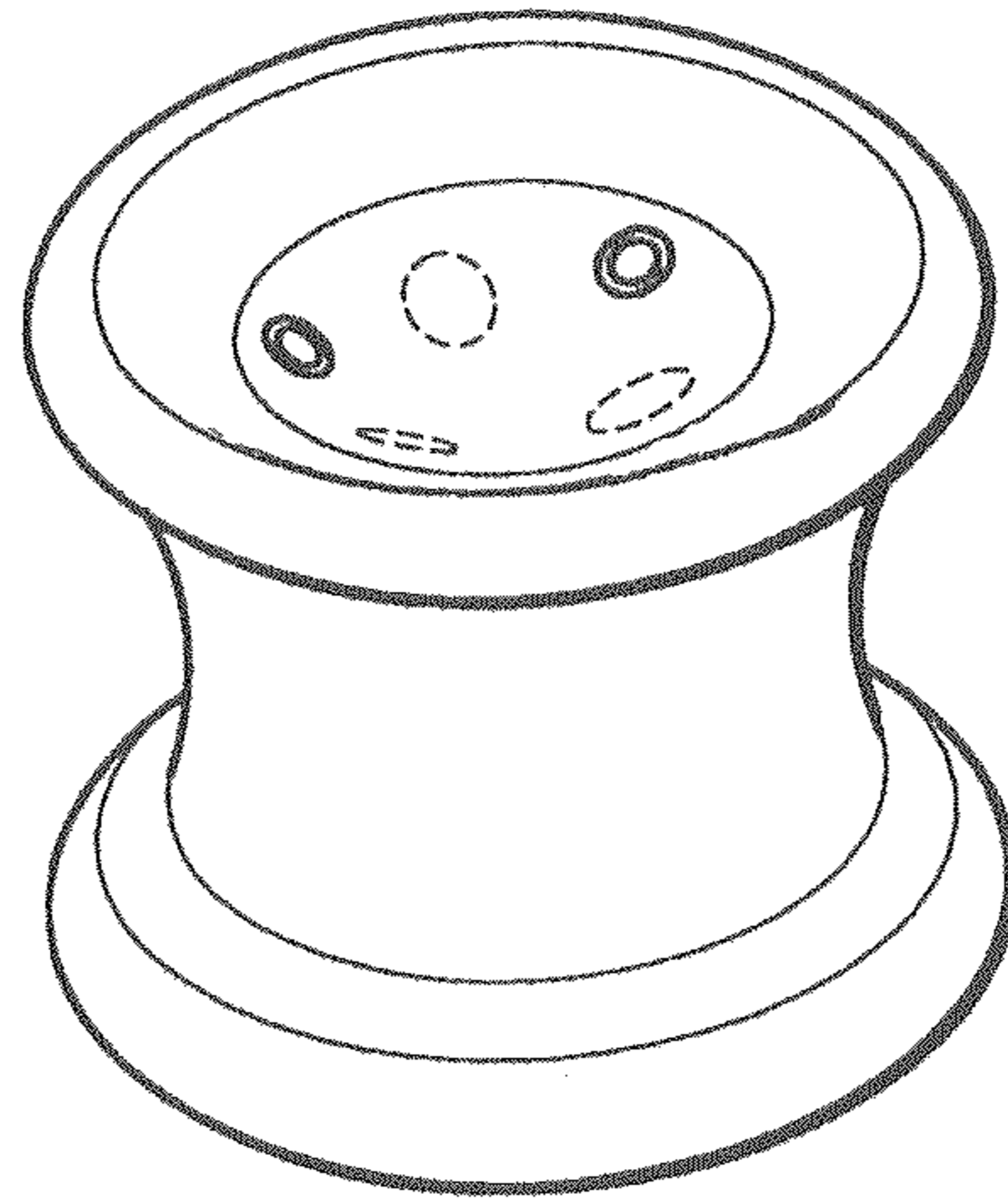


FIG. 1

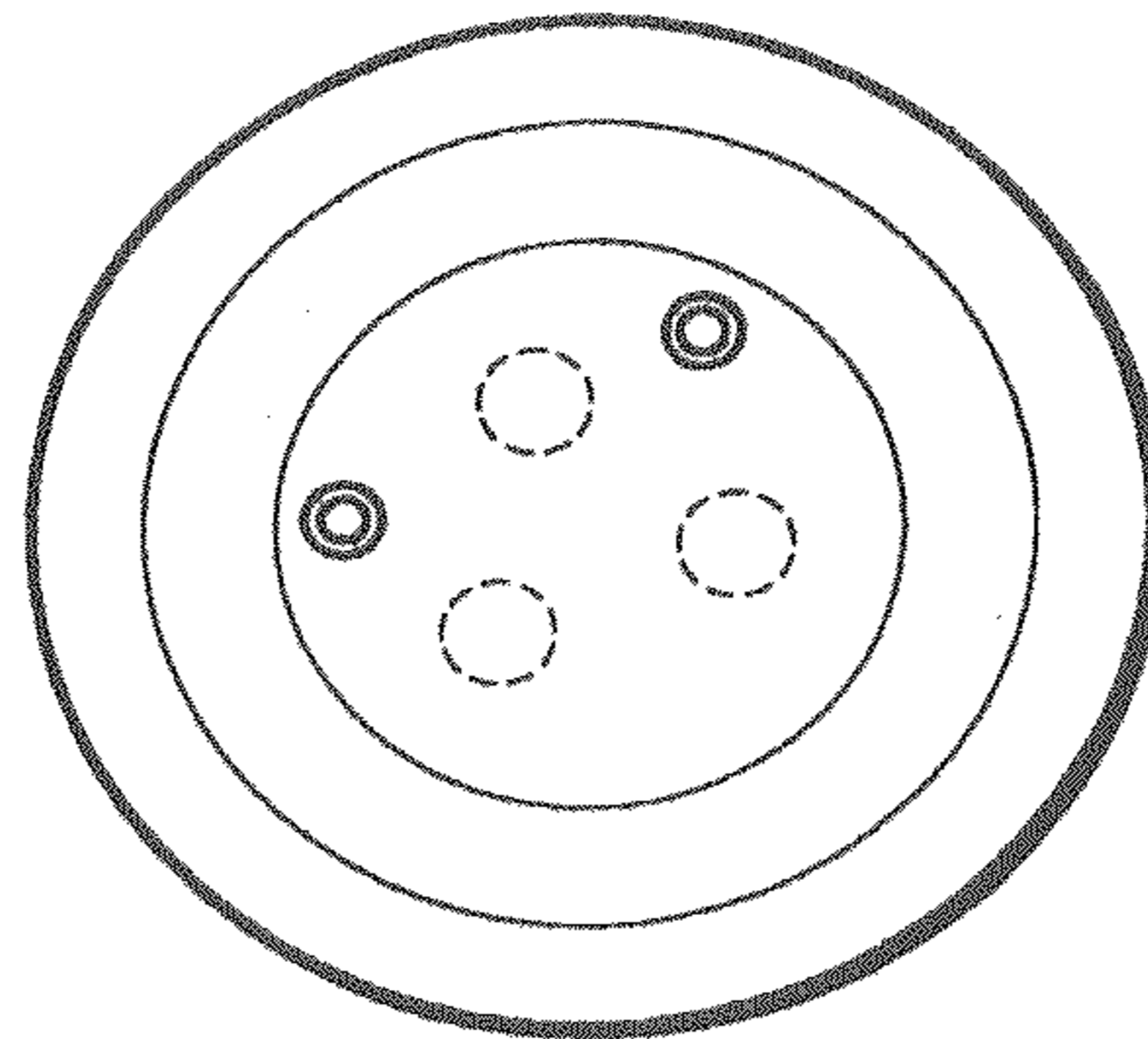


FIG. 2

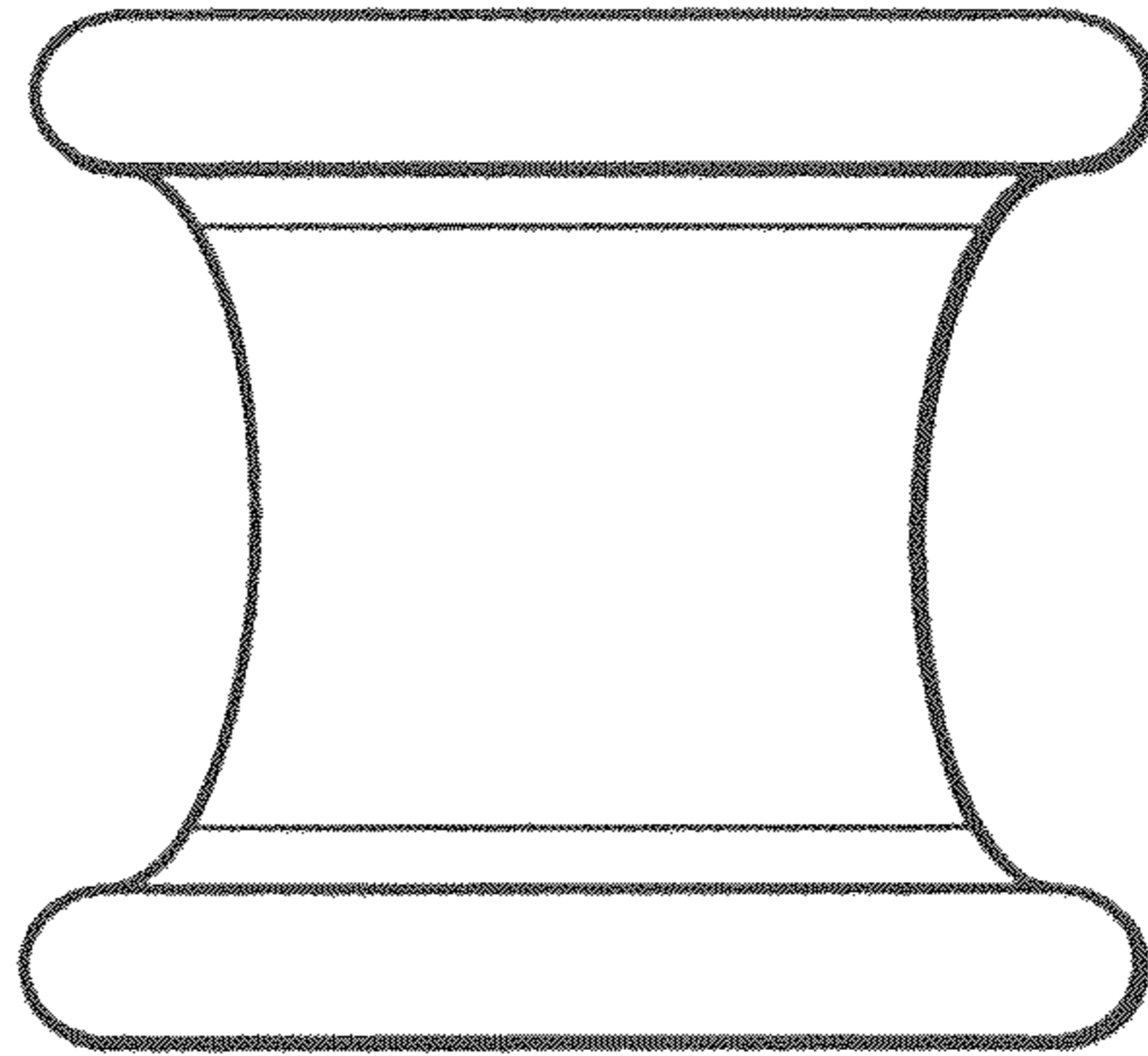


FIG. 3

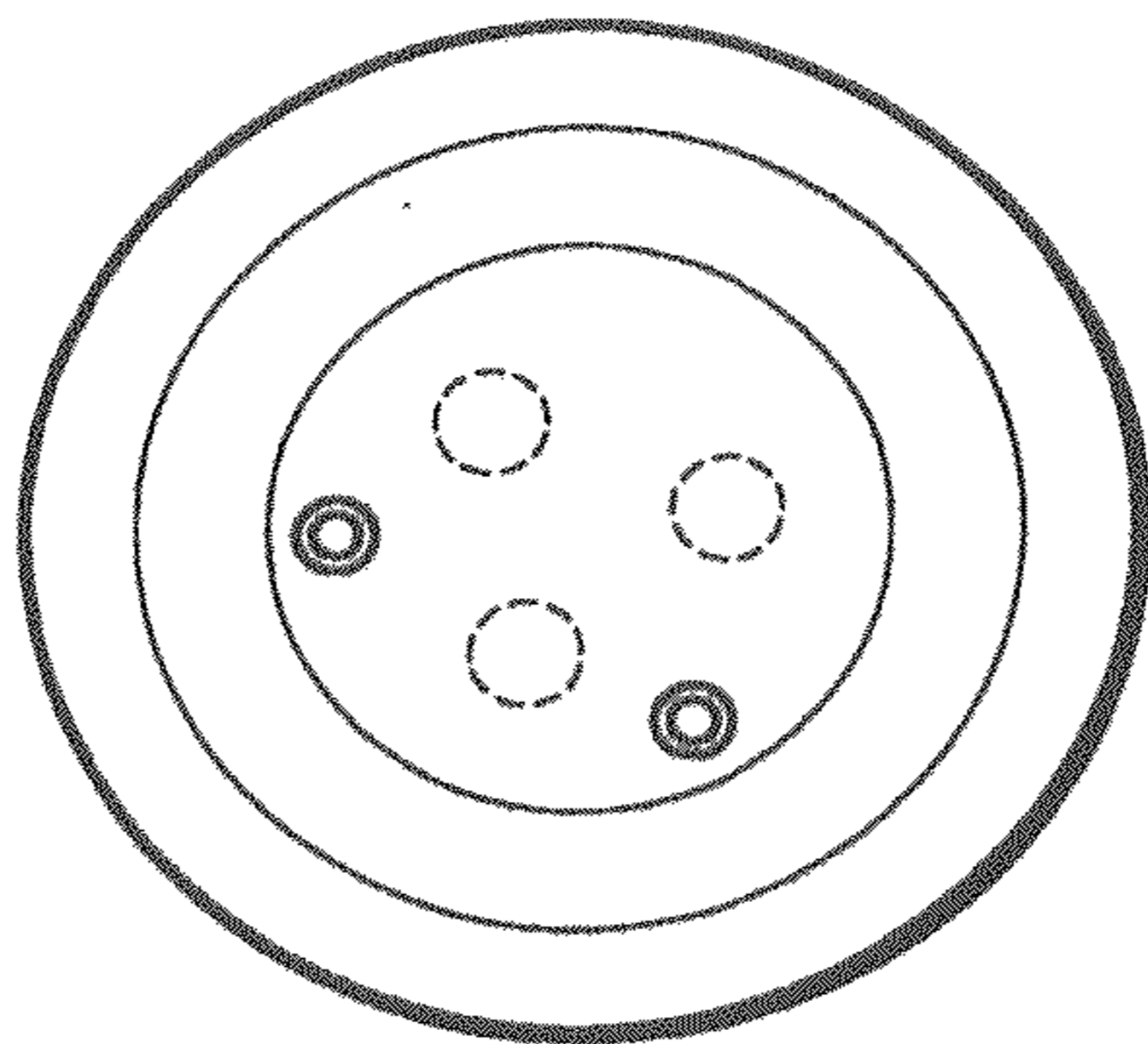


FIG. 4