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

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(54) **EXTENDED WEAR ELECTRODE PATCH**

FOREIGN PATENT DOCUMENTS

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(US)

DE 19955211 5/2001
EP 1859833 11/2007

(Continued)

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OTHER PUBLICATIONS

15 of the Hottest Wearable Gadgets, URL <<http://thehottestgadgets.com/2008/09/the-15-hottest-wearable-gadgets-001253>> (Web page cached on Sep. 27, 2008).

(Continued)

(73) Assignee: **BARDY DIAGNOSTICS, INC.**,
Vashon, WA (US)

(**) Term: **15 Years**

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(21) Appl. No.: **29/539,018**

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(57) **CLAIM**

The ornamental design for an extended wear electrode patch,
as shown and described.

(51) **LOC (10) Cl.** **24-01**

(52) **U.S. Cl.**
USPC **D24/187**

DESCRIPTION

(58) **Field of Classification Search**
USPC D24/168, 186–187, 189, 200; 600/301,
600/544, 546, 554, 372, 382, 384,
600/386–395; 601/21; 302/2; 606/32;
607/45, 46, 115, 139, 142, 148, 152,
607/40, 72; 439/377; 602/41–48, 54–55, 58
CPC A61B 5/0404; A61B 5/0017; A61H
2201/10; A61F 7/007; A61F 13/02; A61F
13/00038; A61F 2013/00119; A61F
2013/00536; A61N 1/3605; A61N 1/36021;
A61N 1/05; A61N 1/0472; A61N 1/046;
A61N 1/0476; A61N 1/0492
See application file for complete search history.

FIG. 1 is a perspective view showing an extended wear electrode patch;
FIG. 2 is a top plan view of the extended wear electrode patch;
FIG. 3 is a bottom plan view of the extended wear electrode patch with a peel-away backing layer fully adhered;
FIG. 4 is a bottom plan view of the extended wear electrode patch with the peel-away backing layer partially peeled away;
FIG. 5 is a front elevational view of the extended wear electrode patch;
FIG. 6 is a rear elevational view of the extended wear electrode patch;
FIG. 7 is a right elevational view of the extended wear electrode patch; and,
FIG. 8 is a left elevational view of the extended wear electrode patch.
The broken lines are included for the purpose of illustrating portions of the extended wear electrode patch that form no part of the claimed design.

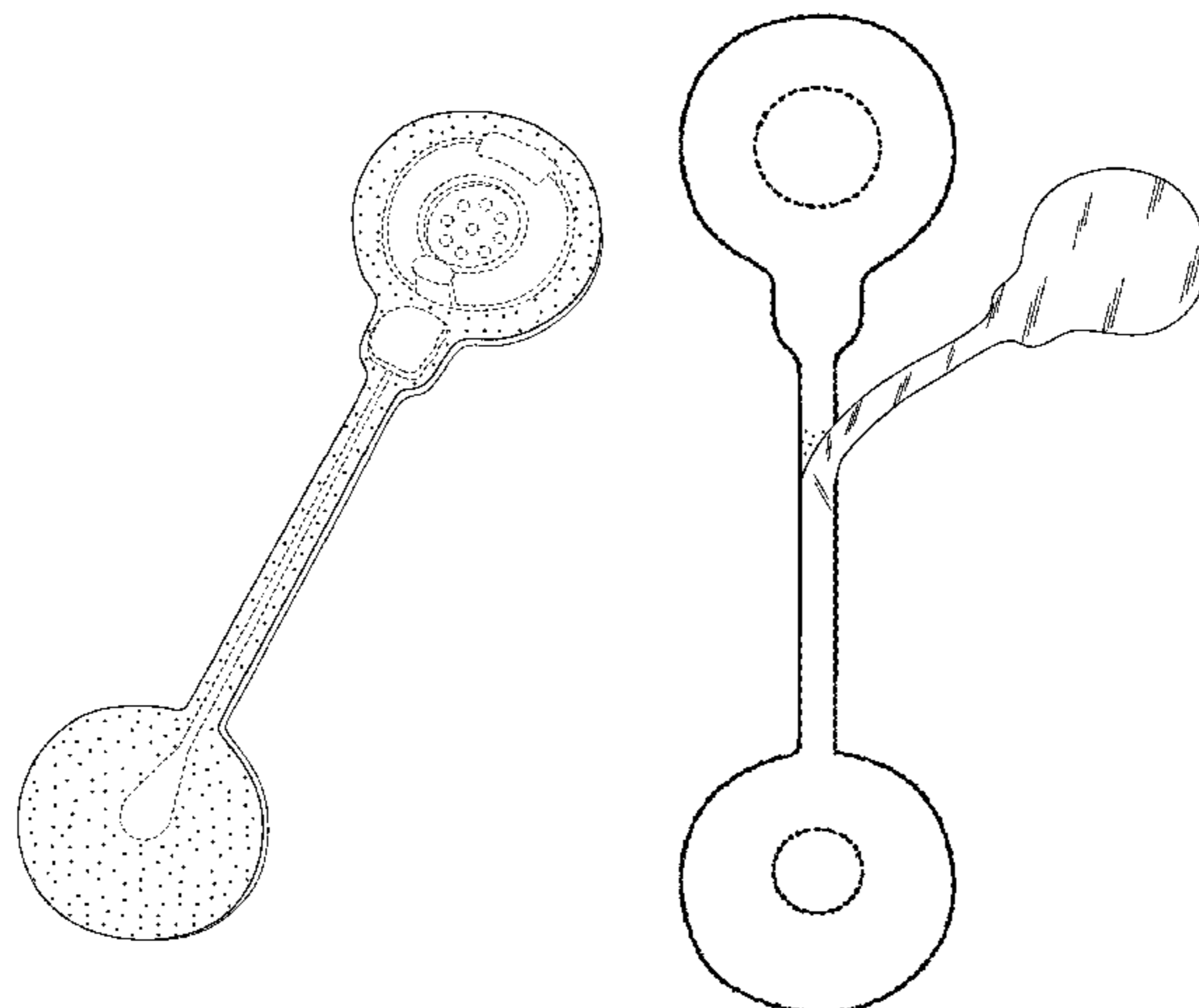
(56) **References Cited**

U.S. PATENT DOCUMENTS

3,215,136 A 11/1965 Holler et al.
3,543,761 A * 12/1970 Bradley A61N 1/05
607/72

(Continued)

1 Claim, 6 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

D232,590 S	8/1974	Moore		6,705,991 B2	3/2004	Bardy	
D240,166 S *	6/1976	Cartmell	D24/187	6,754,523 B2	6/2004	Toole	
4,123,785 A	10/1978	Cherry et al.		D495,055 S	8/2004	Silber	
4,331,153 A *	5/1982	Healy	A61B 5/0408	6,782,293 B2	8/2004	Dupelle et al.	
			600/392	6,860,897 B2	3/2005	Bardy	
4,353,372 A *	10/1982	Ayer	A61B 5/04085	6,866,629 B2	3/2005	Bardy	
			600/393	D505,206 S	5/2005	Chastain et al.	
4,532,934 A	8/1985	Kelen		6,887,201 B2	5/2005	Bardy	
4,550,502 A	11/1985	Grayzel		6,893,397 B2	5/2005	Bardy	
4,716,903 A	1/1988	Hansen		6,904,312 B2	6/2005	Bardy	
4,809,705 A	3/1989	Ascher		6,908,431 B2	6/2005	Bardy	
4,915,656 A	4/1990	Alferness		6,913,577 B2	7/2005	Bardy	
4,957,109 A *	9/1990	Groeger	A61B 5/0017	6,944,498 B2	9/2005	Owen et al.	
			600/391	6,960,167 B2	11/2005	Bardy	
5,042,481 A *	8/1991	Suzuki	A61B 5/04085	6,978,169 B1	12/2005	Guerra	
			600/391	6,993,377 B2	1/2006	Flick et al.	
D326,716 S	6/1992	Mortara		7,020,508 B2	3/2006	Stivoric et al.	
5,168,876 A	12/1992	Quedens et al.		D519,636 S	4/2006	Okuda et al.	
5,215,098 A	6/1993	Steinhaus		7,027,864 B2	4/2006	Snyder et al.	
D341,423 S	11/1993	Bible		7,065,401 B2	6/2006	Worden	
5,392,784 A	2/1995	Gudaitis		7,085,601 B1	8/2006	Bardy et al.	
D357,069 S	4/1995	Plahn et al.		7,104,955 B2	9/2006	Bardy	
5,402,780 A	4/1995	Faasse, Jr.		7,134,996 B2	11/2006	Bardy	
5,402,884 A	4/1995	Gilman et al.		7,147,600 B2	12/2006	Bardy	
5,458,141 A	10/1995	Neil		D536,673 S	2/2007	Silber	
5,473,537 A	12/1995	Glazer et al.		7,215,991 B2	5/2007	Besson et al.	
5,579,919 A	12/1996	Gilman et al.		7,248,916 B2	7/2007	Bardy	
5,582,181 A	12/1996	Ruess		7,257,438 B2	8/2007	Kinast	
D377,983 S	2/1997	Sabri et al.		D558,352 S	12/2007	Sanfilippo	
5,623,935 A	4/1997	Faisandier		D558,882 S	1/2008	Brady	
5,697,955 A	12/1997	Stolte		7,328,061 B2	2/2008	Rowlandson et al.	
D389,244 S *	1/1998	Dunshee	D24/189	D565,183 S *	3/2008	Cheng	D24/168
5,749,902 A	5/1998	Olsen et al.		7,412,395 B2	8/2008	Rowlandson et al.	
5,817,151 A	10/1998	Olsen et al.		D597,676 S	8/2009	Copeland et al.	
5,850,920 A	12/1998	Gilman et al.		D598,114 S	8/2009	Cryan	
D407,159 S	3/1999	Roberg		D600,352 S	9/2009	Cryan	
D409,752 S *	5/1999	Bishay	D24/187	D606,656 S	12/2009	Kobayashi et al.	
5,906,583 A	5/1999	Rogel		D609,353 S	2/2010	Cryan	
5,951,598 A	9/1999	Bishay et al.		D613,413 S	4/2010	Gonopolskiy et al.	
5,984,102 A	11/1999	Tay		D615,657 S	5/2010	Anderson et al.	
D425,203 S	5/2000	Sheehan et al.		D615,659 S	5/2010	Anderson et al.	
D429,337 S	8/2000	Sanfilippo		7,756,721 B1	7/2010	Falchuk et al.	
6,101,413 A	8/2000	Olsen et al.		7,787,943 B2	8/2010	McDonough	
6,115,638 A	9/2000	Groenke		D625,823 S	10/2010	Schneider et al.	
6,117,077 A	9/2000	Del Mar et al.		7,874,993 B2	1/2011	Bardy	
D432,656 S *	10/2000	Nash	D24/189	7,881,785 B2	2/2011	Nassif et al.	
6,134,479 A	10/2000	Brewer et al.		D639,437 S	6/2011	Bishay et al.	
D433,755 S	11/2000	Mastrototaro et al.		7,959,574 B2	6/2011	Bardy	
6,148,233 A	11/2000	Owen et al.		8,116,841 B2	2/2012	Bly et al.	
D443,063 S	5/2001	Pisani et al.		D658,768 S	5/2012	Parker, III et al.	
6,269,267 B1	7/2001	Bardy et al.		8,200,320 B2	6/2012	Kovacs	
6,272,385 B1	8/2001	Bishay et al.		D663,849 S *	7/2012	McGusty	D24/187
6,298,255 B1 *	10/2001	Cordero	A61B 5/04085	8,231,539 B2	7/2012	Bardy	
			600/372	8,231,540 B2	7/2012	Bardy	
6,301,502 B1	10/2001	Owen et al.		8,239,012 B2	8/2012	Felix et al.	
6,304,773 B1	10/2001	Taylor et al.		8,249,686 B2	8/2012	Libbus et al.	
6,304,780 B1	10/2001	Owen et al.		8,260,414 B2	9/2012	Nassif et al.	
6,304,783 B1	10/2001	Lyster et al.		8,266,008 B1	9/2012	Siegel et al.	
6,374,138 B1	4/2002	Owen et al.		8,277,378 B2	10/2012	Bardy	
D456,907 S	5/2002	Sanfilippo		8,285,356 B2	10/2012	Bly et al.	
D458,376 S	6/2002	Rouns et al.		8,285,370 B2	10/2012	Felix et al.	
6,418,342 B1	7/2002	Owen et al.		8,308,650 B2	11/2012	Bardy	
6,427,083 B1	7/2002	Owen et al.		8,366,629 B2	2/2013	Bardy	
6,456,872 B1	9/2002	Faisandier		8,374,688 B2	2/2013	Libbus et al.	
D468,433 S	1/2003	Wagner et al.		8,386,009 B2	2/2013	Lindberg et al.	
D469,540 S	1/2003	Holker et al.		8,412,317 B2	4/2013	Mazar	
D471,281 S	3/2003	Baura et al.		8,460,189 B2	6/2013	Libbus et al.	
6,546,285 B1	4/2003	Owen et al.		8,473,047 B2	6/2013	Chakravarthy et al.	
D475,138 S	5/2003	Baura et al.		8,478,418 B2	7/2013	Fahey	
6,605,046 B1	8/2003	Del Mar		8,585,427 B2	11/2013	Ukawa et al.	
6,607,485 B2	8/2003	Bardy		8,591,430 B2	11/2013	Amurthur et al.	
6,671,545 B2	12/2003	Fincke		8,613,708 B2	12/2013	Bishay et al.	
6,671,547 B2	12/2003	Lyster et al.		8,613,709 B2	12/2013	Bishay et al.	
6,694,186 B2	2/2004	Bardy		8,620,418 B1	12/2013	Kuppuraj et al.	
6,704,595 B2	3/2004	Bardy		8,626,277 B2	1/2014	Felix et al.	
				D702,357 S *	4/2014	Vosch	D24/187
				8,684,925 B2	4/2014	Manicka et al.	
				8,688,190 B2	4/2014	Libbus et al.	
				8,718,752 B2	5/2014	Libbus et al.	

(56)

References Cited

U.S. PATENT DOCUMENTS

8,744,561 B2 6/2014 Fahey
 8,774,932 B2 7/2014 Fahey
 8,790,257 B2 7/2014 Libbus et al.
 8,790,259 B2 7/2014 Katra et al.
 8,795,174 B2 8/2014 Manicka et al.
 8,798,734 B2 8/2014 Kuppuraj et al.
 8,818,481 B2 8/2014 Bly et al.
 D712,554 S * 9/2014 Igwebuike D24/189
 8,823,490 B2 9/2014 Libbus et al.
 D714,942 S 10/2014 Hwang et al.
 D717,960 S * 11/2014 Einck D24/187
 D718,458 S * 11/2014 Vosch D24/187
 D719,660 S * 12/2014 Vosch D24/187
 D739,942 S 9/2015 Pernu et al.
 D745,689 S * 12/2015 Chan D24/189
 D748,275 S * 1/2016 Vosch D24/187
 D752,764 S * 3/2016 Peters D24/187
 2002/0013538 A1 1/2002 Teller
 2002/0120310 A1 8/2002 Linden et al.
 2002/0193668 A1 12/2002 Munneke
 2003/0004547 A1 1/2003 Owen et al.
 2003/0073916 A1 4/2003 Yonce
 2003/0083559 A1 5/2003 Thompson
 2003/0139785 A1 7/2003 Riff et al.
 2004/0008123 A1 1/2004 Carrender
 2004/0019288 A1 1/2004 Kinast
 2004/0034284 A1 2/2004 Aversano et al.
 2004/0049132 A1 3/2004 Barron et al.
 2004/0087836 A1 5/2004 Green et al.
 2004/0148194 A1 7/2004 Wellons et al.
 2004/0243435 A1 12/2004 Williams
 2004/0256453 A1 12/2004 Lammler
 2004/0260188 A1 12/2004 Syed et al.
 2005/0096717 A1 5/2005 Bishay et al.
 2005/0108055 A1 5/2005 Ott et al.
 2005/0154267 A1 7/2005 Bardy
 2005/0182308 A1 8/2005 Bardy
 2005/0182309 A1 8/2005 Bardy
 2005/0228243 A1 10/2005 Bardy
 2005/0245839 A1 11/2005 Stivoric et al.
 2006/0025824 A1 2/2006 Freeman et al.
 2006/0041201 A1 2/2006 Behbehani et al.
 2006/0058695 A1 3/2006 Chen
 2006/0122469 A1 6/2006 Martel
 2006/0224072 A1 10/2006 Shennib
 2006/0235320 A1 10/2006 Tan et al.
 2006/0253006 A1 11/2006 Bardy
 2007/0003115 A1 1/2007 Patton et al.
 2007/0050209 A1 3/2007 Yered
 2007/0078324 A1 4/2007 Wijisiriwardana
 2007/0093719 A1 4/2007 Nichols, Jr. et al.
 2007/0100667 A1 5/2007 Bardy
 2007/0123801 A1 5/2007 Goldberger et al.
 2007/0136091 A1 6/2007 McTaggart
 2007/0179357 A1 8/2007 Bardy
 2007/0203415 A1 8/2007 Bardy
 2007/0203423 A1 8/2007 Bardy
 2007/0208233 A1 9/2007 Kovacs
 2007/0225611 A1 9/2007 Kumar et al.
 2007/0244405 A1 10/2007 Xue et al.
 2007/0249946 A1 10/2007 Kumar et al.
 2007/0255153 A1 11/2007 Kumar et al.
 2007/0265510 A1 11/2007 Bardy
 2007/0276270 A1 11/2007 Tran
 2007/0293738 A1 12/2007 Bardy
 2007/0293739 A1 12/2007 Bardy
 2007/0293740 A1 12/2007 Bardy
 2007/0293741 A1 12/2007 Bardy
 2007/0293772 A1 12/2007 Bardy
 2008/0051668 A1 2/2008 Bardy
 2008/0058661 A1 3/2008 Bardy
 2008/0139953 A1 6/2008 Baker et al.
 2008/0194927 A1 8/2008 KenKnight et al.
 2008/0208014 A1 8/2008 KenKnight et al.
 2008/0284599 A1 11/2008 Zdeblick et al.

2008/0288026 A1 11/2008 Cross et al.
 2008/0306359 A1 12/2008 Zdeblick et al.
 2009/0069867 A1 3/2009 KenKnight et al.
 2009/0073991 A1 3/2009 Landrum et al.
 2009/0076336 A1 3/2009 Mazar et al.
 2009/0076341 A1 3/2009 James et al.
 2009/0076342 A1 3/2009 Amurthur et al.
 2009/0076343 A1 3/2009 James et al.
 2009/0076346 A1 3/2009 James et al.
 2009/0076349 A1 3/2009 Libbus et al.
 2009/0076397 A1 3/2009 Libbus et al.
 2009/0076401 A1 3/2009 Mazar et al.
 2009/0076559 A1 3/2009 Libbus et al.
 2009/0112116 A1 4/2009 Lee et al.
 2009/0216132 A1 8/2009 Orbach
 2009/0270747 A1 10/2009 Van Dam et al.
 2009/0292194 A1 11/2009 Libbus et al.
 2010/0022897 A1 1/2010 Parker et al.
 2010/0056881 A1 3/2010 Libbus et al.
 2010/0081913 A1 4/2010 Cross et al.
 2010/0185063 A1 7/2010 Bardy
 2010/0191154 A1 7/2010 Berger et al.
 2010/0191310 A1 7/2010 Bly
 2010/0234716 A1 9/2010 Engel
 2011/0144470 A1 6/2011 Mazar et al.
 2011/0245711 A1 10/2011 Katra et al.
 2012/0035432 A1 2/2012 Katra et al.
 2012/0088998 A1 4/2012 Bardy et al.
 2012/0088999 A1 4/2012 Bishay et al.
 2012/0089000 A1 4/2012 Bishay et al.
 2012/0089001 A1 4/2012 Bishay et al.
 2012/0089037 A1 4/2012 Bishay et al.
 2012/0089412 A1 4/2012 Bardy et al.
 2012/0089417 A1 4/2012 Bardy et al.
 2012/0095352 A1 4/2012 Tran
 2012/0101396 A1 4/2012 Solosko et al.
 2012/0302906 A1 11/2012 Felix et al.
 2013/0079611 A1 3/2013 Besko
 2013/0096395 A1 4/2013 Katra et al.
 2013/0123651 A1 5/2013 Bardy
 2013/0158361 A1 6/2013 Bardy
 2013/0274584 A1 10/2013 Finlay et al.
 2013/0275158 A1 10/2013 Fahey
 2013/0331665 A1 12/2013 Libbus et al.
 2013/0338448 A1 12/2013 Libbus et al.
 2014/0012154 A1 1/2014 Mazar et al.
 2014/0142411 A1 5/2014 Lin et al.

FOREIGN PATENT DOCUMENTS

EP 2465415 6/2012
 EP 2589333 5/2013
 WO 0078213 12/2000
 WO 03032192 4/2003
 WO 2006009767 1/2006
 WO 2006014806 2/2006
 WO 2007092543 8/2007
 WO 2008010216 1/2008
 WO 2009036306 3/2009
 WO 2009036327 3/2009
 WO 2009112976 9/2009
 WO 2009112978 9/2009
 WO 2009112979 9/2009
 WO 2009142975 11/2009
 WO 2010066507 6/2010
 WO 2011047207 4/2011
 WO 2012140559 10/2012
 WO 2012146957 11/2012

OTHER PUBLICATIONS

Alivecor's Heart Monitor for iPhone Receives FDA Clearance, URL <<http://www.businesswire.com/news/home/20121203005545/en/AliveCor%E2%80%99s-Heart-Monitor-iPhone-Receives-FDA-Clearance#.U7rtq7FVtyF>> Dec. 3, 2012).
 Bharadwaj et al., Techniques for Accurate ECG signal processing, EE Times, URL <www.eetimes.com/document.asp?doc_id=1278571> (Feb. 14, 2011).

(56)

References Cited

OTHER PUBLICATIONS

Chen et al., "Monitoring Body Temperature of Newborn Infants At Neonatal Intensive Care Units Using Wearable Sensors," *BodyNets 2010*, Corfu Island, Greece. (Sep. 10, 2010).

Epstein, Andrew E et al.; ACC/AHA/HRS 2008 Guidelines for Device-Based Therapy of Cardiac Rhythm Abnormalities. *J. Am. Coll. Cardiol.* 2008; 51; e1-e62, 66 Pgs.

Fitbit automatically tracks your fitness and sleep, URL <<http://www.fitbit.com/>> (Web page cached on Sep. 10, 2008).

Smith, Kevin, "Jawbone Up VS. Fitbit Flex: Which Is the Best Fitness Band?" URL <<http://www.businessinsider.com/fitbit-flex-vs-jawbone-up-2013-5?op=1>> (Jun. 1, 2013).

Kligfield, Paul et al., Recommendations for the Standardization and Interpretation of the Electrocardiogram: Part I. *J. Am. Coll. Cardiol.* 2007; 49; 1109-27, 75 Pgs.

Lauren Gravitz, "When Your Diet Needs a Band-Aid," *Technology Review*, MIT. (May 1, 2009).

Lieberman, Jonathan, "How Telemedicine Is Aiding Prompt ECG Diagnosis in Primary Care," *British Journal of Community Nursing*, vol. 13, No. 3, Mar. 1, 2008, pp. 123-126, XP009155082, ISSN: 1462-4753.

McManus et al., "A Novel Application for the Detection of an Irregular Pulse using an iPhone 4S in Patients with Atrial Fibrillation," vol. 10(3), pp. 315-319 (Mar. 2013).

Nike+ Fuel Band, URL <http://www.nike.com/us/en_us/c/nikeplus-fuelband> (Web page cached on Jan. 11, 2013).

P. Libby et al., "Braunwald's Heart Disease—A Textbook of Cardiovascular Medicine," Chs. 11, pp. 125-148 and 12, pp. 149-193 (8th ed. 2008), American Heart Association.

Initial hands-on with Polar Loop activity tracker, URL <<http://www.dcrainmaker.com/2013/09/polar-loop-firstlook.html>> (Sep. 17, 2013).

Sittig et al., "A Computer-Based Outpatient Clinical Referral System," *International Journal of Medical Informatics*, Shannon, IR, vol. 55, No. 2, Aug. 1, 1999, pp. 149-158, XO004262434, ISSN: 1386-5056(99)00027-1.

Sleepview, URL <<http://www.clevemed.com/sleepview/overview.shtml>> (Web pages cached on Feb. 23, 2010, Dec. 29, 2012 and Sep. 4, 2013).

Actigraphy/ Circadian Rhythm SOMNOwatch, URL <<http://www.somnomedics.eu/news-events/publications/somnowatchtm.html>> (Web page cached on Jan. 23, 2010).

Zio Event Card, URL <<http://www.irhythmtech.com/zio-solution/zio-event/>> (Web page cached on Mar. 11, 2013).

Zio Patch System, URL <<http://www.irhythmtech.com/zio-solution/zio-system/index.html>> (Web page cached on Sep. 8, 2013).

Seifert, Dan, "Samsung dives into fitness wearable with the Gear Fit/ The Verge," URL <<http://www.theverge.com/2014/2/24/5440310/samsung-dives-into-fitness-wearables-with-the-gear-fit>> (Feb. 24, 2014).

Soper, Taylor, "Samsung's new Galaxy S5 flagship phone has fingerprint reader, heart rate monitor," URL <<http://www.geekwire.com/2014/samsung-galaxy-s5-fingerprint/>> (Feb. 24, 2014).

Dolcourt, Jessica, "See the Samsung Galaxy S5's Heart rate monitor in action," URL <<http://www.cnet.com/news/see-the-samsung-galaxy-s5s-heart-rate-monitor-in-action/>> (Feb. 25, 2014).

Saadi et al. "Heart Rhythm Analysis Using ECG Recorded With a Novel Sternum Based Patch Technology—A Pilot Study." *Cardio technix 2013—Proceedings of the International Congress on Cardiovascular Technologies*, Sep. 20, 2013.

Anonymous. "Omegawave Launches Consumer App 2.0 in U.S. Endurance Sportswire—Endurance Sportswire." Jul. 11, 2013. URL: <http://endurancesportswire.com/omegawave-launches-consumer-app-2-0-in-u-s/>.

Chan et al. "Wireless Patch Sensor for Remote Monitoring of Heart Rate, Respiration, Activity, and Falls." pp. 6115-6118. 2013 35th Annual International Conference of the IEEE Engineering in Medical and Biology Society. Jul. 1, 2013.

Wei et al. "A Stretchable and Flexible System for Skin-Mounted Measurement of Motion Tracking and Physiological Signals." pp. 5772-5775. 2014 36th Annual International Conference of the IEEE Engineering in Medicine and Biology Society. Aug. 26, 2014.

Daoud et al. "Fall Detection Using Shimmer Technology and Multiresolution Analysis." Aug. 2, 2013. URL: <https://decibel.ni.com/content/docs/DOC-26652>.

Libbus. "Adherent Cardiac Monitor With Wireless Fall Detection for Patients With Unexplained Syncope." Abstracts of the First AMA-IEEE Medical Technology Conference on Individualized Healthcare. May 22, 2010.

US 6,527,714, 03/2003, Bardy (withdrawn)

* cited by examiner

Fig. 1.

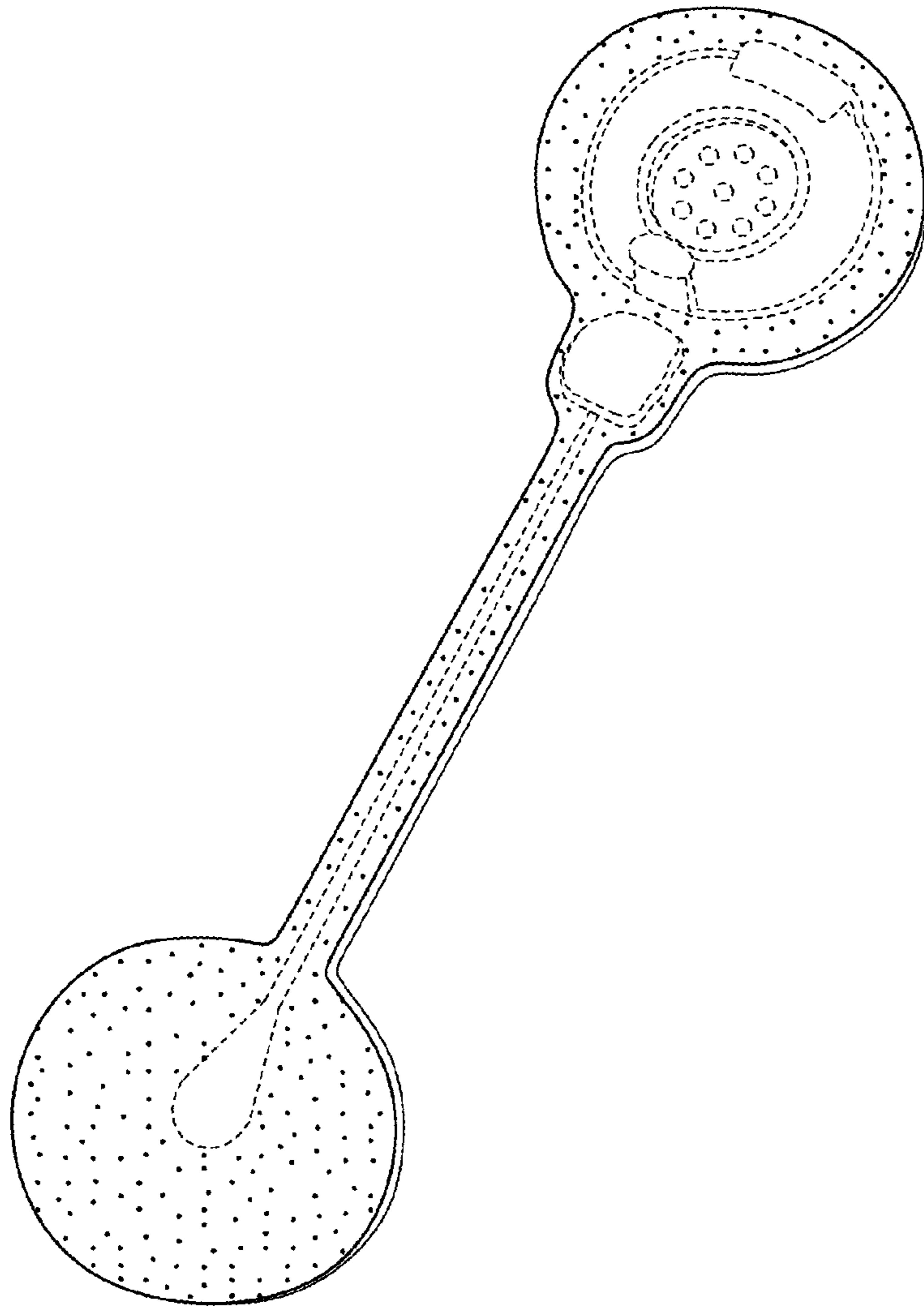


Fig. 2.

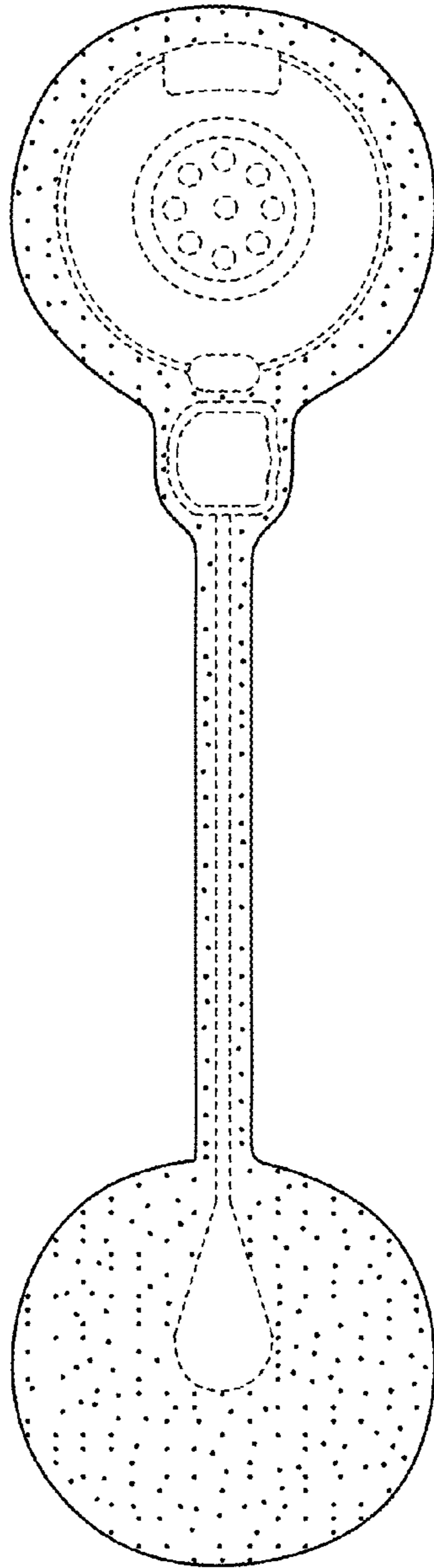


Fig. 3.

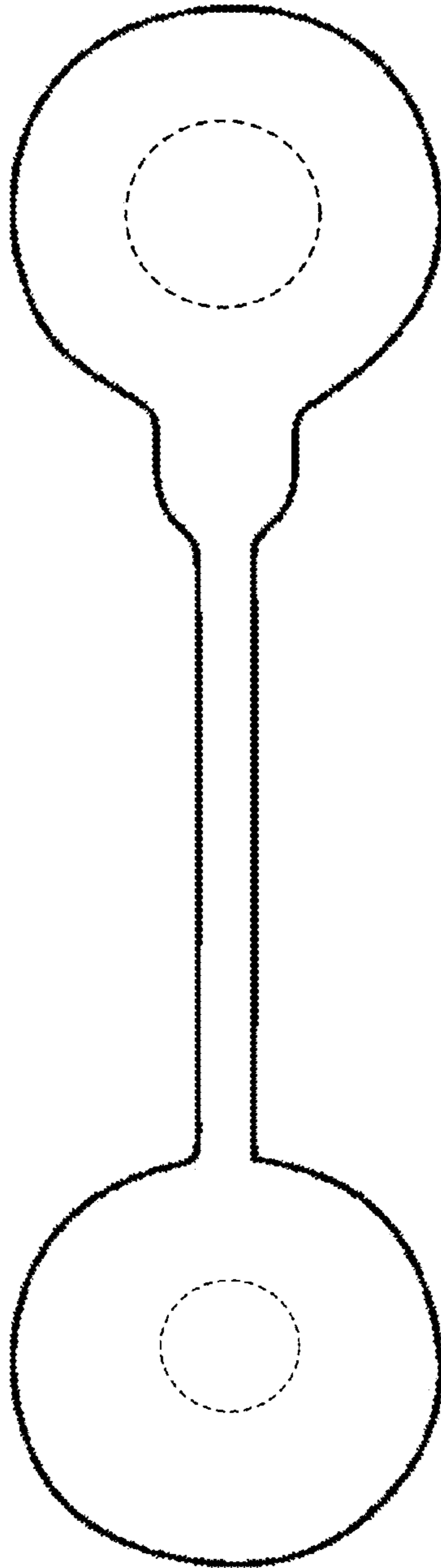


Fig. 4.

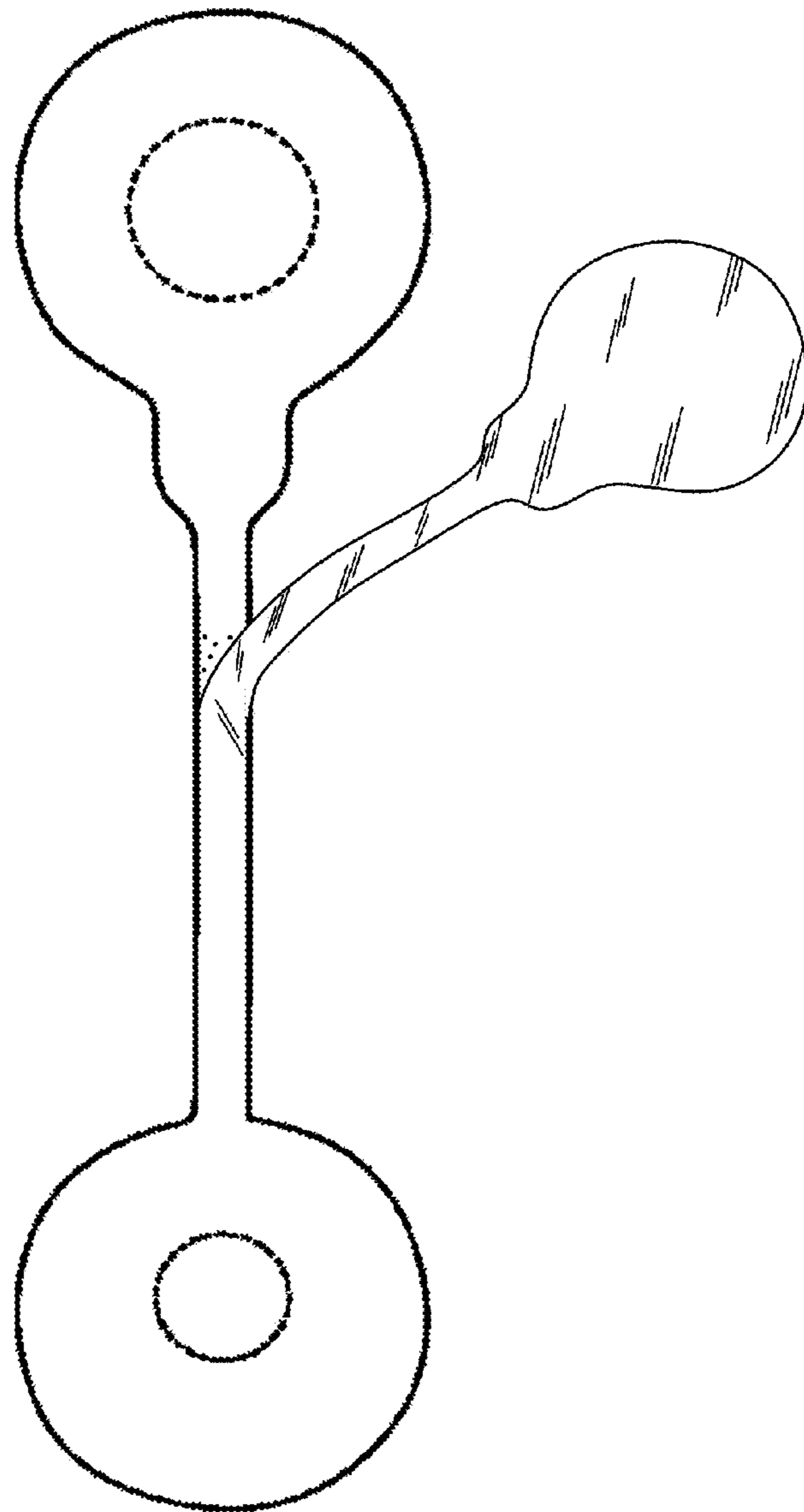


Fig. 5.

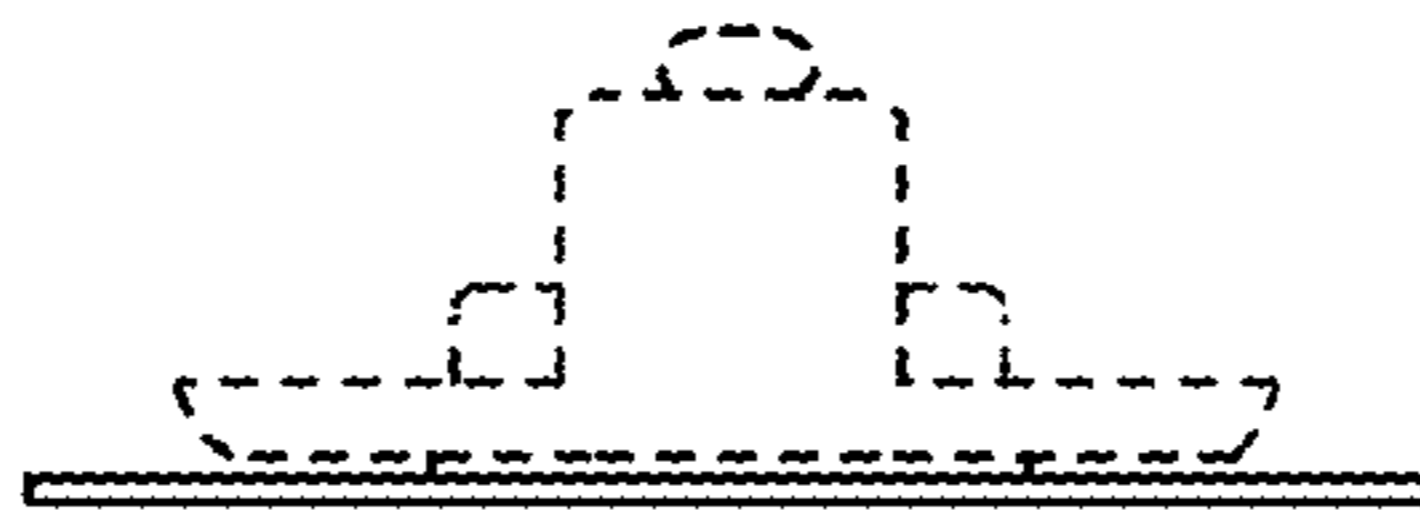


Fig. 6.

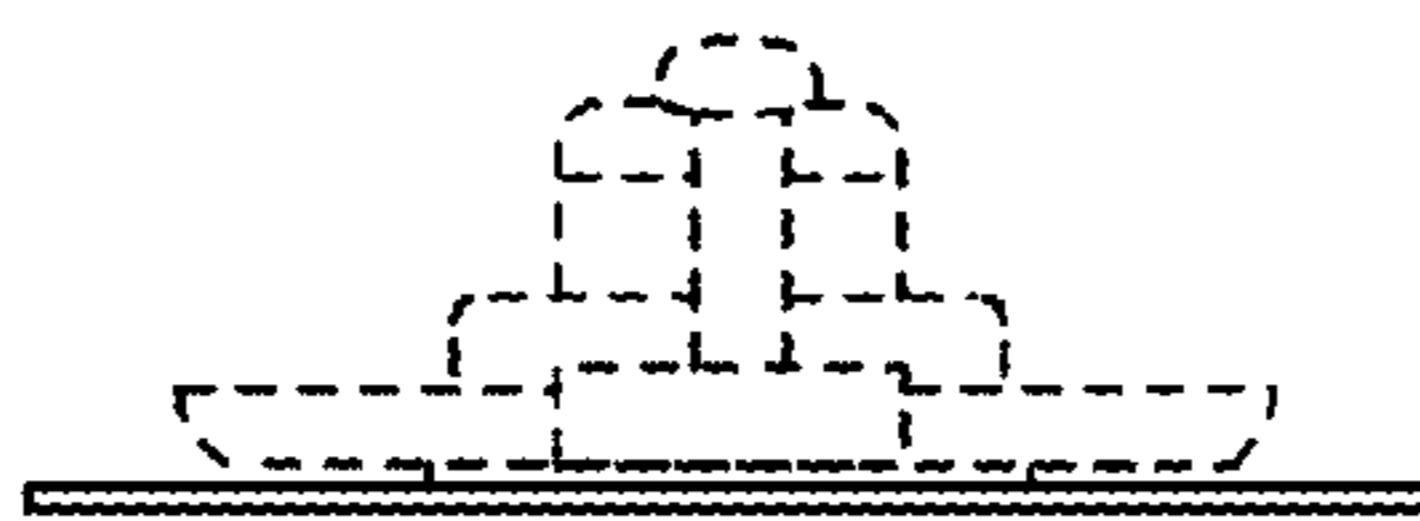


Fig. 7.

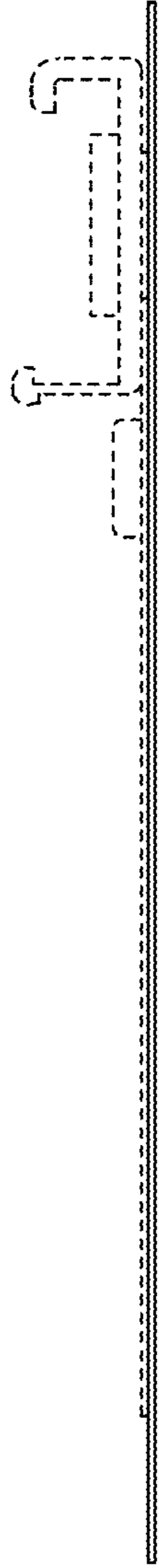


Fig. 8.

