



US00D744659S

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

(10) **Patent No.:** **US D744,659 S**  
(45) **Date of Patent:** **\*\* Dec. 1, 2015**

(54) **EXTENDED WEAR ELECTRODE PATCH**

FOREIGN PATENT DOCUMENTS

(71) Applicant: **Bardy Diagnostics, Inc.**, Vashon, WA (US)

DE 19955211 5/2001  
EP 1859833 11/2007

(Continued)

(72) Inventors: **Jon Mikalson Bishay**, Seattle, WA (US);  
**Gust H. Bardy**, Carnation, WA (US)

OTHER PUBLICATIONS

(73) Assignee: **Bardy Diagnostics, Inc.**, Vashon, WA (US)

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)

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

*Primary Examiner* — T. Chase Nelson

(21) Appl. No.: **29/472,045**

*Assistant Examiner* — Mark Cavanna

(22) Filed: **Nov. 7, 2013**

(74) *Attorney, Agent, or Firm* — Patrick J. S. Inouye

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

(57) **CLAIM**

(52) **U.S. Cl.**

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

USPC ..... **D24/187**

**DESCRIPTION**

(58) **Field of Classification Search**

USPC ..... D24/168, 186–187, 200; 600/301, 544, 600/546, 554, 372, 382, 384, 386–395; 601/21; 602/2; 606/32; 607/45, 46, 607/115, 139, 142, 148, 152; 439/377

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 liner partially peeled back.

FIG. 4 is a front elevational view of the extended wear electrode patch.

FIG. 5 is a rear elevational view of the extended wear electrode patch.

FIG. 6 is a right elevational view of the extended wear electrode patch.

FIG. 7 is a left elevational view of the extended wear electrode patch; and,

FIG. 8 is a bottom plan 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.

CPC ..... A61B 5/0002; A61B 5/0408; A61B 5/04085; A61B 5/0404; A61B 5/04082; A61B 5/6831; A61B 5/04087; A61B 5/0476; A61B 5/0488; A61B 5/05; A61B 18/1492; A61H 2201/10; A61F 7/007; 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.

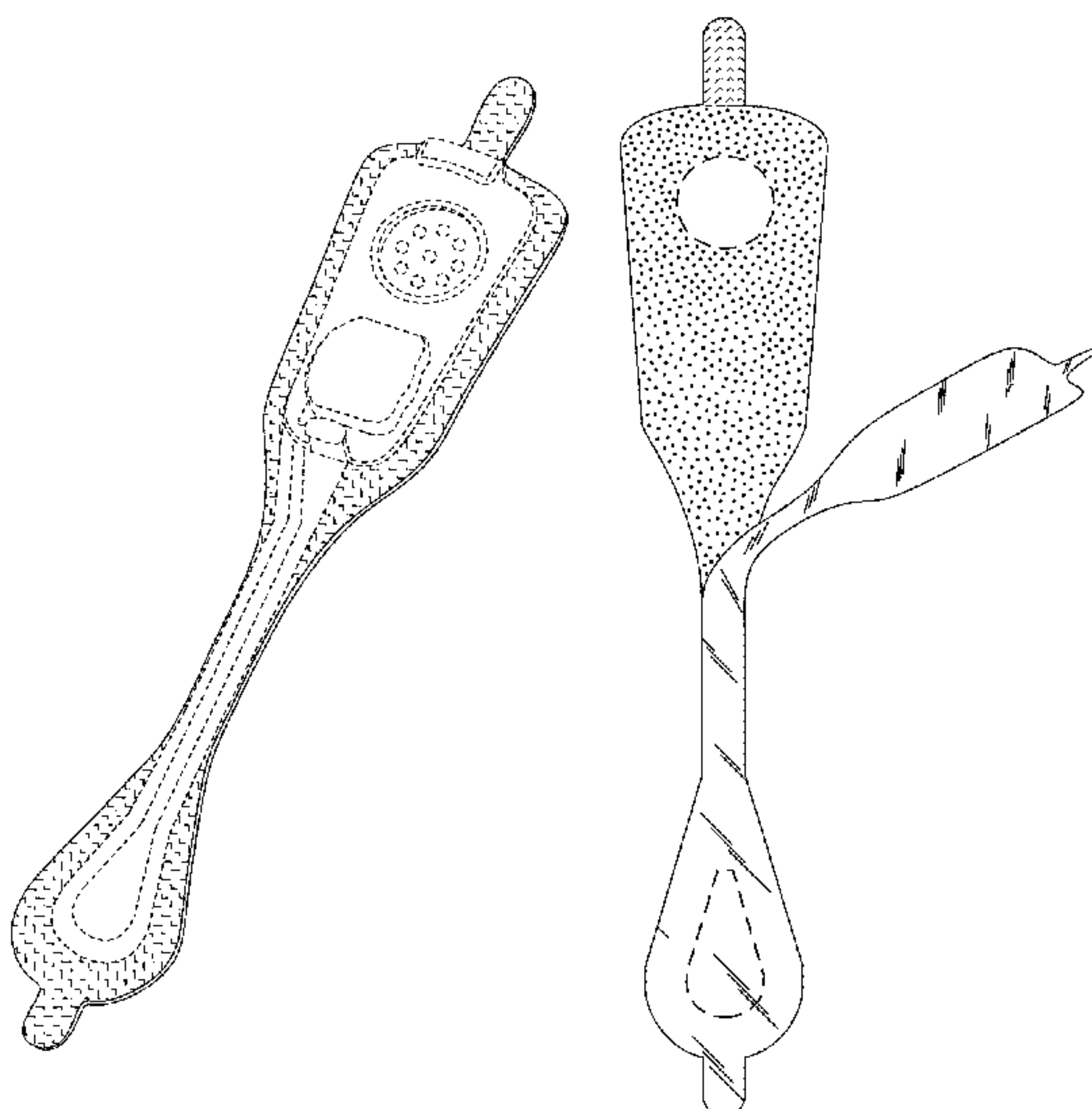
(56) **References Cited**

U.S. PATENT DOCUMENTS

3,215,136 A 11/1965 Holter et al.  
D232,590 S \* 8/1974 Moore ..... D24/187  
4,123,785 A 10/1978 Cherry et al.

(Continued)

**1 Claim, 6 Drawing Sheets**



(56)

References Cited

U.S. PATENT DOCUMENTS

4,532,934	A	8/1985	Kelen		7,020,508	B2	3/2006	Stivoric et al.	
4,550,502	A	11/1985	Grayzel		D519,636	S *	4/2006	Okuda et al. ....	D24/168
4,716,903	A	1/1988	Hansen		7,027,864	B2	4/2006	Snyder et al.	
4,809,705	A	3/1989	Ascher		7,065,401	B2	6/2006	Worden	
4,915,656	A	4/1990	Alferness		7,085,601	B1	8/2006	Bardy et al.	
D326,716	S *	6/1992	Mortara .....	D24/168	7,104,955	B2	9/2006	Bardy	
5,168,876	A	12/1992	Quedens et al.		7,134,996	B2	11/2006	Bardy	
5,215,098	A	6/1993	Steinhaus		7,147,600	B2	12/2006	Bardy	
D341,423	S	11/1993	Bible		D536,673	S *	2/2007	Silber .....	D24/187
5,392,784	A	2/1995	Gudaitis		7,215,991	B2	5/2007	Besson et al.	
D357,069	S	4/1995	Plahn et al.		7,248,916	B2	7/2007	Bardy	
5,402,780	A	4/1995	Faasse, Jr.		7,257,438	B2	8/2007	Kinast	
5,402,884	A	4/1995	Gilman et al.		D558,352	S *	12/2007	Sanfilippo .....	D24/187
5,458,141	A	10/1995	Neil		D558,882	S	1/2008	Brady	
5,473,537	A	12/1995	Glazer et al.		7,328,061	B2	2/2008	Rowlandson et al.	
5,579,919	A	12/1996	Gilman et al.		7,412,395	B2	8/2008	Rowlandson et al.	
5,582,181	A	12/1996	Ruess		D598,114	S *	8/2009	Cryan .....	D24/187
D377,983	S	2/1997	Sabri et al.		D600,352	S *	9/2009	Cryan .....	D24/187
5,623,935	A	4/1997	Faisandier		D606,656	S	12/2009	Kobayashi et al.	
5,697,955	A	12/1997	Stolte		D609,353	S *	2/2010	Cryan .....	D24/187
5,749,902	A	5/1998	Olsen et al.		D613,413	S *	4/2010	Gonopolskiy et al. ....	D24/187
5,817,151	A	10/1998	Olsen et al.		D615,657	S *	5/2010	Anderson et al. ....	D24/187
5,850,920	A	12/1998	Gilman et al.		D615,659	S *	5/2010	Anderson et al. ....	D24/187
D407,159	S	3/1999	Roberg		7,756,721	B1	7/2010	Falchuk et al.	
5,906,583	A	5/1999	Rogel		7,787,943	B2	8/2010	McDonough	
5,951,598	A	9/1999	Bishay et al.		D625,823	S *	10/2010	Schneider et al. ....	D24/187
5,984,102	A	11/1999	Tay		7,874,993	B2	1/2011	Bardy	
D425,203	S *	5/2000	Sheehan et al. ....	D24/187	7,881,785	B2	2/2011	Nassif et al.	
D429,337	S *	8/2000	Sanfilippo .....	D24/187	D639,437	S	6/2011	Bishay et al.	
6,101,413	A	8/2000	Olsen et al.		7,959,574	B2	6/2011	Bardy	
6,115,638	A	9/2000	Groenke		8,116,841	B2	2/2012	Bly et al.	
6,117,077	A	9/2000	Del Mar et al.		D658,768	S *	5/2012	Parker et al. ....	D24/187
6,134,479	A	10/2000	Brewer et al.		8,200,320	B2	6/2012	Kovacs	
D433,755	S *	11/2000	Mastrototaro et al. ....	D24/187	8,231,539	B2	7/2012	Bardy	
6,148,233	A	11/2000	Owen et al.		8,231,540	B2	7/2012	Bardy	
D443,063	S *	5/2001	Pisani et al. ....	D24/187	8,239,012	B2	8/2012	Felix et al.	
6,269,267	B1	7/2001	Bardy et al.		8,249,686	B2	8/2012	Libbus et al.	
6,272,385	B1	8/2001	Bishay et al.		8,260,414	B2	9/2012	Nassif et al.	
6,301,502	B1	10/2001	Owen et al.		8,266,008	B1	9/2012	Siegal et al.	
6,304,773	B1	10/2001	Taylor et al.		8,277,378	B2	10/2012	Bardy	
6,304,780	B1	10/2001	Owen et al.		8,285,356	B2	10/2012	Bly et al.	
6,304,783	B1	10/2001	Lyster et al.		8,285,370	B2	10/2012	Felix et al.	
6,374,138	B1	4/2002	Owen et al.		8,308,650	B2	11/2012	Bardy	
D456,907	S *	5/2002	Sanfilippo .....	D24/187	8,366,629	B2	2/2013	Bardy	
D458,376	S *	6/2002	Rouns et al. ....	D24/168	8,374,688	B2	2/2013	Libbus et al.	
6,418,342	B1	7/2002	Owen et al.		8,386,009	B2 *	2/2013	Lindberg et al. ....	600/390
6,427,083	B1	7/2002	Owen et al.		8,412,317	B2	4/2013	Mazar	
6,456,872	B1	9/2002	Faisandier		8,460,189	B2	6/2013	Libbus et al.	
D468,433	S *	1/2003	Wagner et al. ....	D24/187	8,473,047	B2	6/2013	Chakravarthy et al.	
D469,540	S *	1/2003	Holker et al. ....	D24/187	8,478,418	B2	7/2013	Fahey	
D471,281	S *	3/2003	Baura et al. ....	D24/187	8,585,427	B2 *	11/2013	Ukawa et al. ....	439/377
6,546,285	B1	4/2003	Owen et al.		8,591,430	B2	11/2013	Amurthur et al.	
D475,138	S *	5/2003	Baura et al. ....	D24/187	8,613,708	B2	12/2013	Bishay et al.	
6,605,046	B1	8/2003	Del Mar		8,613,709	B2	12/2013	Bishay et al.	
6,607,485	B2	8/2003	Bardy		8,620,418	B1	12/2013	Kuppuraj et al.	
6,671,545	B2	12/2003	Fincke		8,626,277	B2	1/2014	Felix et al.	
6,671,547	B2	12/2003	Lyster et al.		8,684,925	B2	4/2014	Manicka et al.	
6,694,186	B2	2/2004	Bardy		8,688,190	B2	4/2014	Libbus et al.	
6,704,595	B2	3/2004	Bardy		8,718,752	B2	5/2014	Libbus et al.	
6,705,991	B2	3/2004	Bardy		8,744,561	B2	6/2014	Fahey	
6,754,523	B2	6/2004	Toole		8,774,932	B2	7/2014	Fahey	
D495,055	S *	8/2004	Silber .....	D24/187	8,790,257	B2	7/2014	Libbus et al.	
6,782,293	B2	8/2004	Dupelle et al.		8,790,259	B2	7/2014	Katra et al.	
6,860,897	B2	3/2005	Bardy		8,795,174	B2	8/2014	Manicka et al.	
6,866,629	B2	3/2005	Bardy		8,798,734	B2	8/2014	Kuppuraj et al.	
D505,206	S *	5/2005	Chastain et al. ....	D24/187	8,818,481	B2	8/2014	Bly et al.	
6,887,201	B2	5/2005	Bardy		8,823,490	B2	9/2014	Libbus et al.	
6,893,397	B2	5/2005	Bardy		2002/0013538	A1	1/2002	Teller	
6,904,312	B2	6/2005	Bardy		2002/0120310	A1	8/2002	Linden et al.	
6,908,431	B2	6/2005	Bardy		2002/0193668	A1	12/2002	Munneke	
6,913,577	B2	7/2005	Bardy		2003/0004547	A1	1/2003	Owen et al.	
6,944,498	B2	9/2005	Owen et al.		2003/0073916	A1	4/2003	Yonce	
6,960,167	B2	11/2005	Bardy		2003/0083559	A1	5/2003	Thompson	
6,978,169	B1	12/2005	Guerra		2003/0139785	A1	7/2003	Riff et al.	
6,993,377	B2	1/2006	Flick 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.	



(56)

## References Cited

## U.S. PATENT DOCUMENTS

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.  
 2006/0122469 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.

## 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#.U7rtq7FV7yF>> (Dec. 3, 2012).  
 Bharadwaj et al., Techniques for Accurate ECG signal processing, EE Times, URL <[www.eetimes.com/document.asp?doc\\_id=1278571](http://www.eetimes.com/document.asp?doc_id=1278571)> (Feb. 14, 2011).  
 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](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.

(56)

**References Cited**

## OTHER PUBLICATIONS

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 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).

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.

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 AMS-IEEE Medical Technology Conference On Individualized Healthcare. May 22, 2010.

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

\* cited by examiner

Fig. 1.

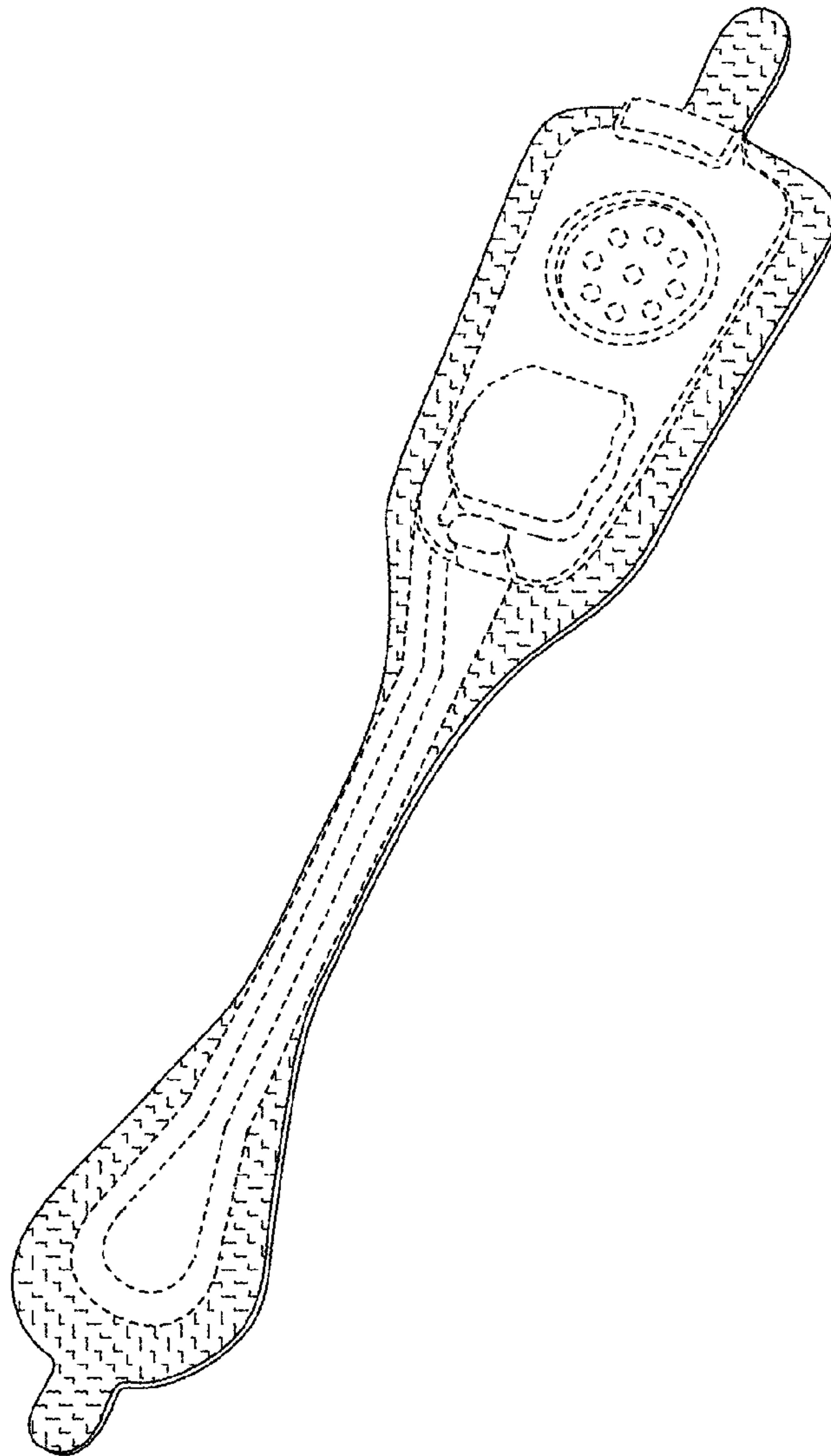




Fig. 2.

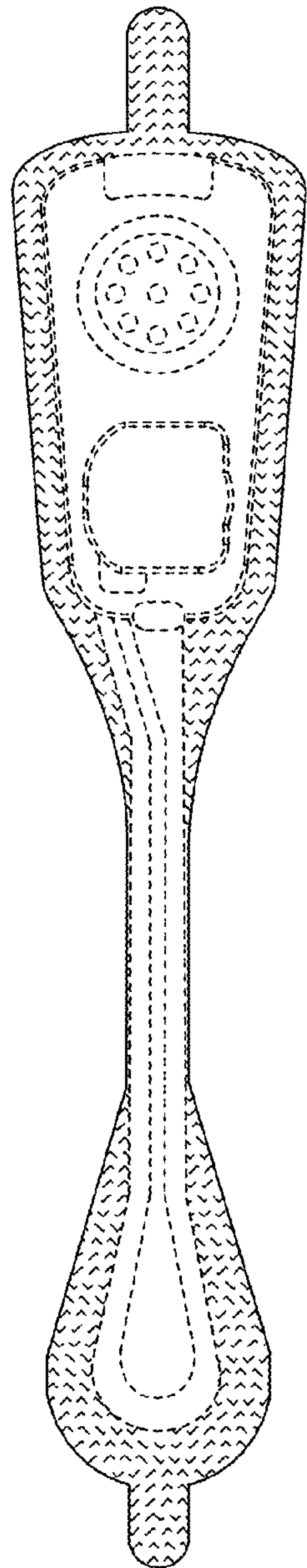
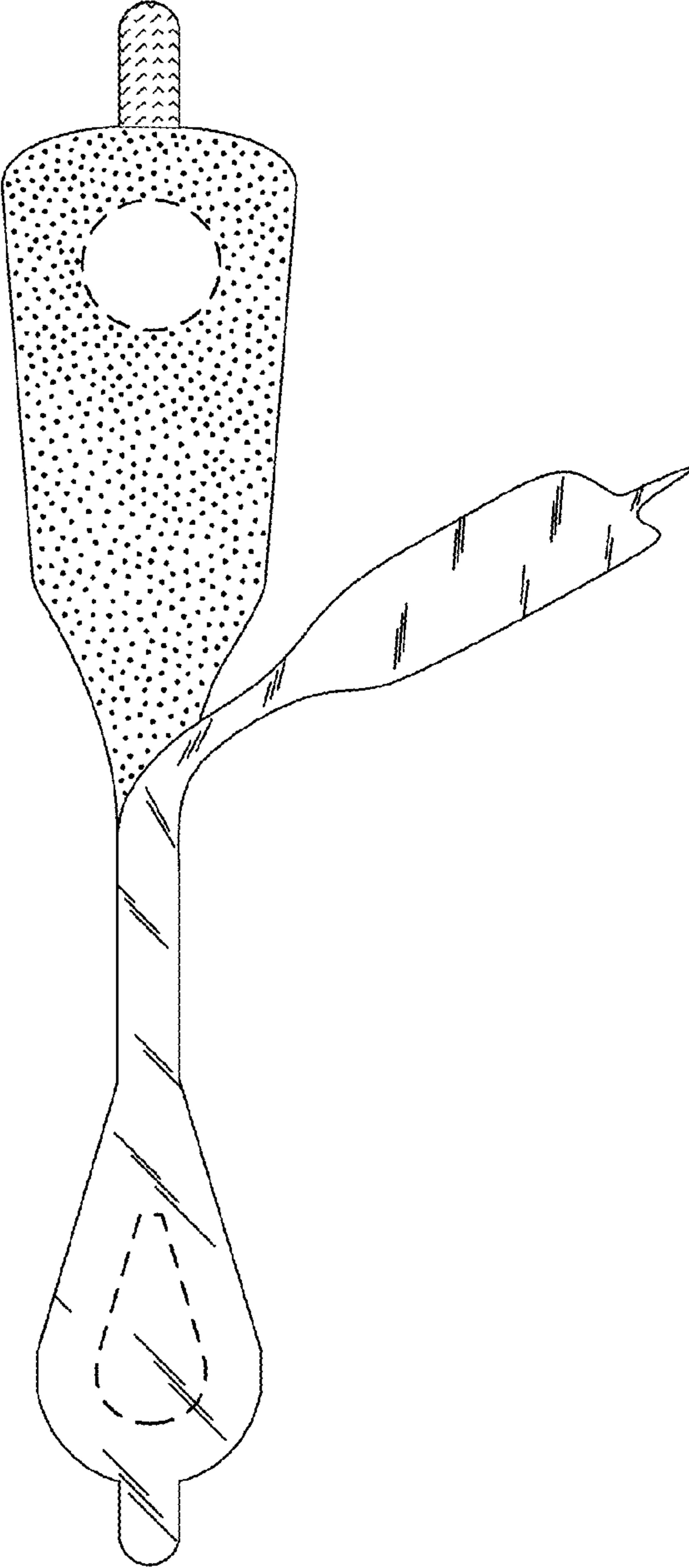
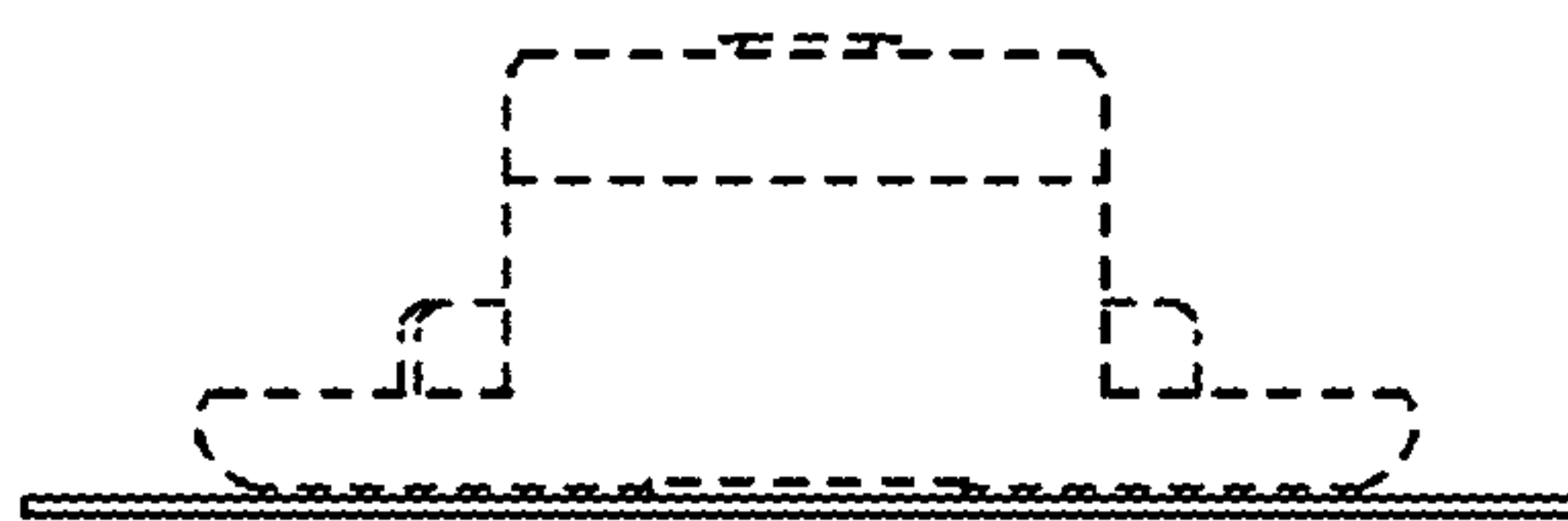


Fig. 3.



**Fig. 4.**



**Fig. 5.**

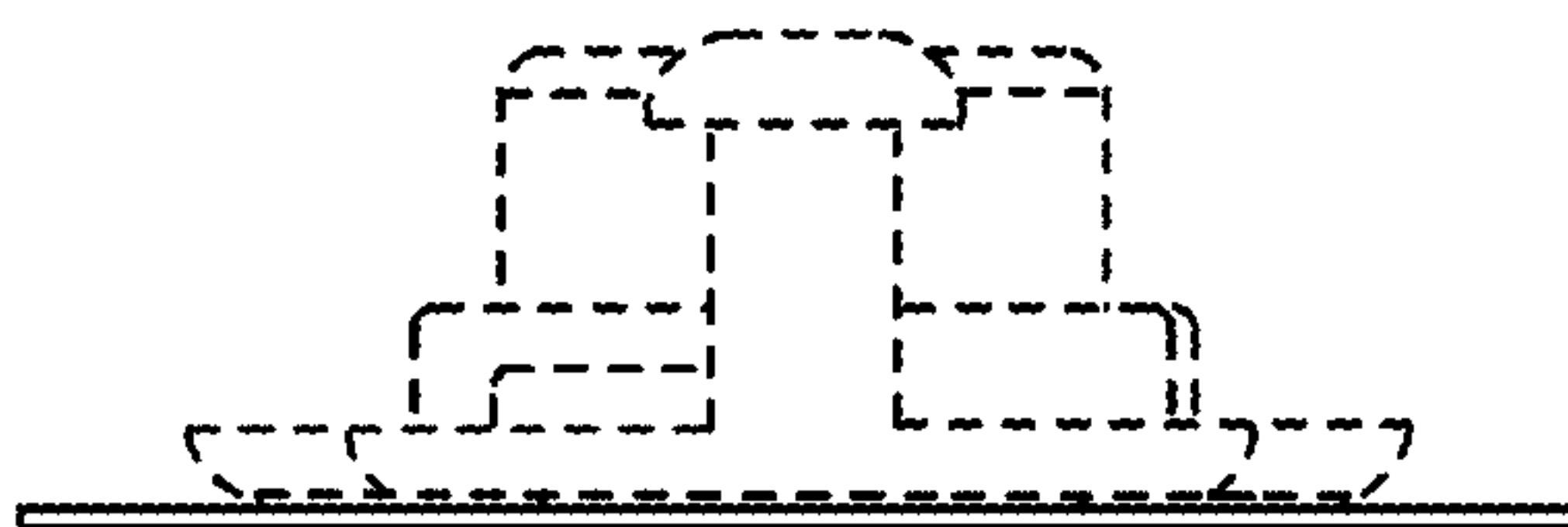




Fig. 6.



Fig. 7.



**Fig. 8.**

