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

(10) **Patent No.:** **US D653,621 S**
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(54) **ASYMMETRICAL ELECTRICAL CONNECTOR**
(75) Inventors: **Charles M. Gross**, York, PA (US); **John David Dodds**, Harrisburg, PA (US)

3,420,087 A 1/1969 Hatfield et al.
3,514,740 A 5/1970 Filson et al.
3,538,486 A 11/1970 Shlesinger
3,634,811 A 1/1972 Teagno

(Continued)

(73) Assignee: **FCI Americas Technology LLC**, Carson City, NV (US)

FOREIGN PATENT DOCUMENTS

DE 1 665 181 4/1974

(Continued)

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

OTHER PUBLICATIONS

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(22) Filed: **Mar. 5, 2010**

(Continued)

Related U.S. Application Data

(63) Continuation of application No. 29/334,904, filed on Apr. 3, 2009, now Pat. No. Des. 618,180.

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(74) *Attorney, Agent, or Firm* — Woodcock Washburn LLP

(51) **LOC (9) Cl.** **13-03**

(52) **U.S. Cl.** **D13/146**

(58) **Field of Classification Search** D13/133, D13/146, 147, 154, 156, 184, 199; 439/607.1, 439/607.4, 607.22, 607.23, 607.24, 607.25, 439/607.31, 607.35, 607.36, 607.37, 607.38, 439/607.39, 607.55, 607.56, 607.67, 607.68, 439/655, 660, 678, 682, 686, 692, 696

See application file for complete search history.

(57) **CLAIM**

The ornamental design for an asymmetrical electrical connector, as shown and described.

DESCRIPTION

This application is related by subject matter to U.S. patent application Ser. No. 29/334,906 filed Apr. 3, 2009, now U.S. Pat. No. D618,181.

FIG. 1 is a top, left, rear perspective view of an electrical connector according to our design;

FIG. 2 is a rear elevation view thereof;

FIG. 3 is a top plan view thereof;

FIG. 4 is a left side elevation view thereof;

FIG. 5 is a bottom plan view thereof;

FIG. 6 is a right side elevation view thereof; and,

FIG. 7 is a front elevation view thereof.

In a preferred embodiment, the nature of this product is an electrical connector in the form of an electrical connector housing configured for retaining a plurality of electrical contacts.

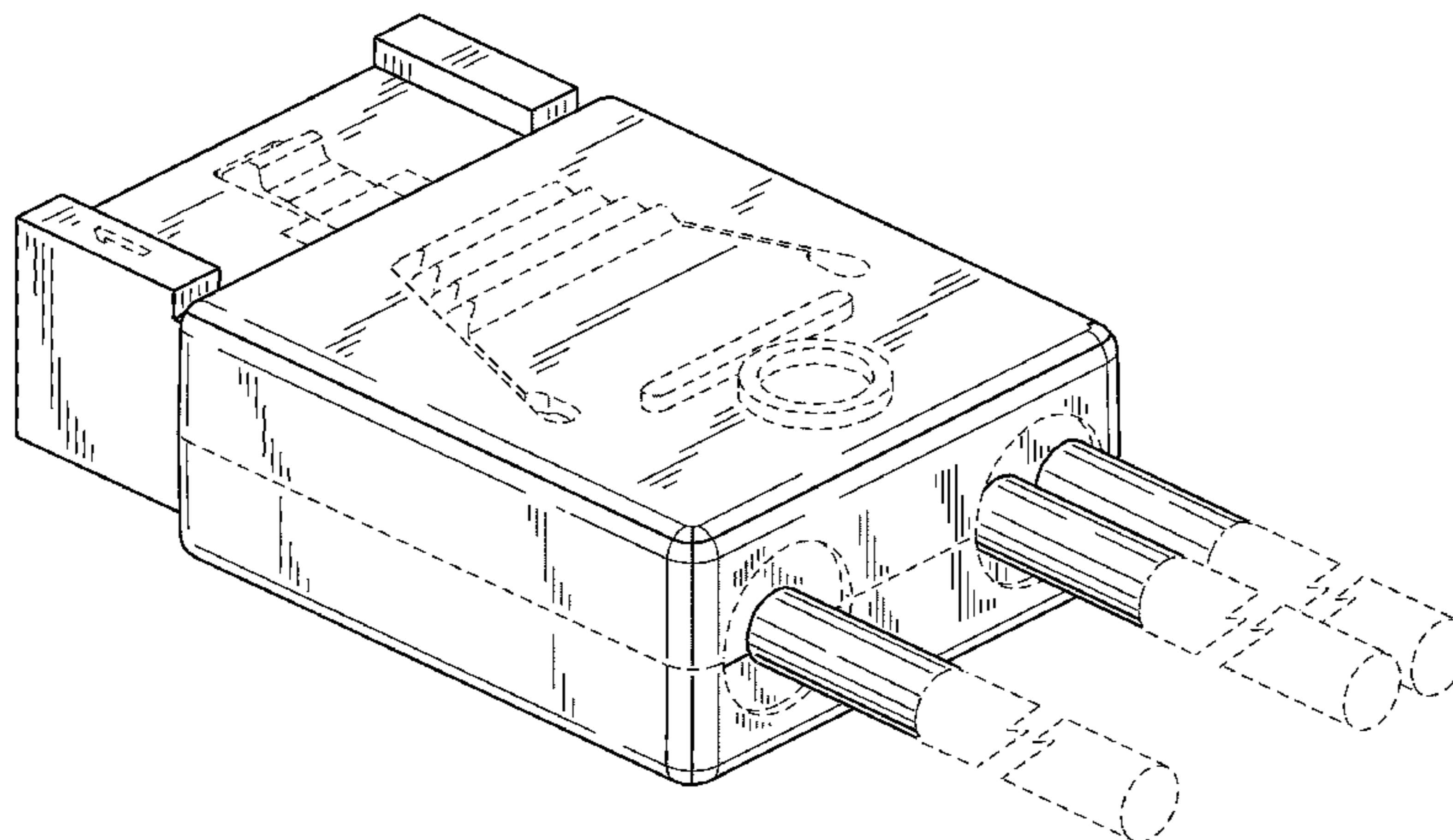
The broken line in the figure drawings is included for the purpose of illustrating environment and forms no part of the claimed design.

(56) **References Cited**

U.S. PATENT DOCUMENTS

318,186 A 5/1885 Hertzog
741,052 A 10/1903 Mahon
1,477,527 A 12/1923 Raettig
D86,515 S 3/1932 Cox
2,248,675 A 7/1941 Huppert
2,430,011 A 11/1947 Gillentine
2,759,163 A 8/1956 Ustin et al.
2,762,022 A 9/1956 Benander et al.
2,844,644 A 7/1958 Soule
3,011,143 A 11/1961 Dean
3,178,669 A 4/1965 Roberts
3,208,030 A 9/1965 Evans et al.
3,286,220 A 11/1966 Marley et al.
3,411,127 A 11/1968 Adams

1 Claim, 7 Drawing Sheets



US D653,621 S

U.S. PATENT DOCUMENTS				
3,669,054 A	6/1972	Desso et al.	5,321,582 A	6/1994 Casperson
3,692,994 A	9/1972	Hirschman et al.	5,381,314 A	1/1995 Rudy, Jr. et al.
3,748,633 A	7/1973	Lundergan	D355,409 S	2/1995 Krokaugger
3,845,451 A	10/1974	Neidecker	5,400,949 A	3/1995 Hirvonen et al.
3,871,015 A	3/1975	Lin et al.	5,427,543 A	6/1995 Dynia
3,942,856 A	3/1976	Mindheim et al.	5,431,578 A	7/1995 Wayne
3,972,580 A	8/1976	Pemberton et al.	5,457,342 A	10/1995 Herbst, II
4,070,088 A	1/1978	Vaden	5,458,426 A	10/1995 Ito
4,076,362 A	2/1978	Ichimura	5,475,922 A	12/1995 Tamura et al.
4,082,407 A	4/1978	Smorzaniuk et al.	5,490,040 A	2/1996 Gavdenzi et al.
4,136,919 A	1/1979	Howard et al.	5,511,987 A	4/1996 Schinchi
4,159,861 A	7/1979	Anhalt	5,512,519 A	4/1996 Hwang
4,217,024 A	8/1980	Aldridge et al.	5,533,915 A	7/1996 Deans
4,260,212 A	4/1981	Ritchie et al.	5,558,542 A	9/1996 O'Sullivan et al.
4,288,139 A	9/1981	Cobaugh et al.	5,564,952 A	10/1996 Davis et al.
4,371,912 A	2/1983	Guzik	5,577,928 A	11/1996 Duclos
4,383,724 A	5/1983	Verhoevan	5,588,859 A	12/1996 Maurice
4,402,563 A	9/1983	Sinclair	5,590,463 A	1/1997 Feldman et al.
4,403,821 A	9/1983	Zimmerman et al.	5,609,502 A	3/1997 Thumma
4,473,113 A	9/1984	Whitfield et al.	5,618,187 A	4/1997 Goto
4,505,529 A	3/1985	Barkus	5,637,008 A	6/1997 Kozel
4,533,187 A	8/1985	Kirkman	5,643,009 A	7/1997 Dinkel et al.
4,536,955 A	8/1985	Gudgeon	5,664,968 A	9/1997 Micklevicz
4,545,610 A	10/1985	Lakritz et al.	5,664,973 A	9/1997 Emmert et al.
4,552,425 A	11/1985	Billman	5,667,392 A	9/1997 Kocher et al.
4,560,222 A	12/1985	Dambach	5,691,041 A	11/1997 Frankeny et al.
4,564,259 A	1/1986	Vandame	D387,733 S *	12/1997 Lee D13/147
4,596,433 A	6/1986	Oesterheld et al.	5,702,255 A	12/1997 Murphy et al.
4,685,886 A	8/1987	Denlinger et al.	5,727,963 A	3/1998 LeMaster
4,717,360 A	1/1988	Czaja	5,730,609 A	3/1998 Harwath
4,767,344 A	8/1988	Noschese	5,741,144 A	4/1998 Elco et al.
4,776,803 A	10/1988	Pretchel et al.	5,741,161 A	4/1998 Cahaly et al.
4,782,893 A	11/1988	Thomas	5,742,484 A	4/1998 Gillette et al.
4,790,763 A	12/1988	Weber et al.	5,743,009 A	4/1998 Matsui et al.
4,815,987 A	3/1989	Kawano et al.	5,745,349 A	4/1998 Lemke
4,818,237 A	4/1989	Weber	5,746,608 A	5/1998 Taylor
4,820,169 A	4/1989	Weber et al.	5,749,746 A	5/1998 Tan et al.
4,820,182 A	4/1989	Harwath et al.	5,755,595 A	5/1998 Davis et al.
4,867,713 A	9/1989	Ozu et al.	5,772,451 A	6/1998 Dozier, II et al.
4,878,611 A	11/1989	LoVasco et al.	5,782,644 A	7/1998 Kiat
4,881,905 A	11/1989	Demler, Jr. et al.	5,787,971 A	8/1998 Dodson
4,900,271 A	2/1990	Colleran et al.	5,795,191 A	8/1998 Preputnick et al.
4,907,990 A	3/1990	Bertho et al.	5,810,607 A	9/1998 Shih et al.
4,915,641 A	4/1990	Miskin et al.	5,817,973 A	10/1998 Elco et al.
4,963,102 A	10/1990	Gettig et al.	5,827,094 A	10/1998 Aizawa et al.
4,965,699 A	10/1990	Jordan et al.	5,831,314 A	11/1998 Wen
4,973,257 A	11/1990	Lhotak	5,857,857 A	1/1999 Fukuda
4,973,271 A	11/1990	Ishizuka et al.	5,874,776 A	2/1999 Kresge et al.
4,974,119 A	11/1990	Martin	5,876,219 A	3/1999 Taylor
4,975,084 A	12/1990	Fedder et al.	5,876,248 A	3/1999 Brunker et al.
4,979,074 A	12/1990	Morley et al.	5,882,214 A	3/1999 Hillbish et al.
5,016,968 A	5/1991	Hammond et al.	5,883,782 A	3/1999 Thurston et al.
5,024,610 A	6/1991	French et al.	5,888,884 A	3/1999 Wojnarowski
5,035,639 A	7/1991	Kilpatrick et al.	5,908,333 A	6/1999 Perino et al.
5,046,960 A	9/1991	Fedder et al.	5,919,050 A	7/1999 Kehley et al.
5,052,953 A	10/1991	Weber	5,930,114 A	7/1999 Kuzmin et al.
5,066,236 A	11/1991	Broeksteeg	5,955,888 A	9/1999 Frederickson et al.
5,077,893 A	1/1992	Mosquera et al.	5,961,355 A	10/1999 Morlion et al.
5,082,459 A	1/1992	Billman et al.	5,971,817 A	10/1999 Longueville
5,094,634 A	3/1992	Dixon et al.	5,975,921 A	11/1999 Shuey
5,104,332 A	4/1992	McCoy	5,980,270 A	11/1999 Fjelstad et al.
5,137,959 A	8/1992	Block et al.	5,980,321 A	11/1999 Cohen et al.
5,139,426 A	8/1992	Barkus et al.	5,984,726 A	11/1999 Wu
5,151,056 A	9/1992	McClune	5,993,259 A	11/1999 Stokoe et al.
5,152,700 A	10/1992	Bogursky et al.	6,012,948 A	1/2000 Wu
5,174,770 A	12/1992	Sasaki et al.	6,036,549 A	3/2000 Wulff
5,194,480 A	3/1993	Block et al.	6,041,498 A	3/2000 Hillbish et al.
5,213,868 A	5/1993	Liberty et al.	6,050,862 A	4/2000 Ishii
5,214,308 A	5/1993	Nishiguchi	6,059,170 A	5/2000 Jimarez et al.
5,238,414 A	8/1993	Yaegashi et al.	6,066,048 A	5/2000 Lees
5,254,012 A	10/1993	Wang	6,068,520 A	5/2000 Winings et al.
5,274,918 A	1/1994	Reed	6,071,152 A	6/2000 Achammer et al.
5,276,964 A	1/1994	Anderson, Jr. et al.	6,077,130 A	6/2000 Hughes et al.
5,285,163 A	2/1994	Liotta	6,089,878 A	7/2000 Meng
5,286,212 A	2/1994	Broeksteeg	6,095,827 A	8/2000 Dutkowsky et al.
5,295,843 A	3/1994	Davis et al.	6,123,554 A	9/2000 Ortega et al.
5,298,791 A	3/1994	Liberty et al.	6,125,535 A	10/2000 Chiou et al.
5,302,135 A	4/1994	Lee	6,139,336 A	10/2000 Olson
			6,146,157 A	11/2000 Lenoir et al.

US D653,621 S

Page 3

6,146,202	A	11/2000	Ramey et al.	6,712,621	B2	3/2004	Li et al.
6,146,203	A	11/2000	Elco et al.	6,716,068	B2	4/2004	Wu
6,152,756	A	11/2000	Huang et al.	6,740,820	B2	5/2004	Cheng
6,174,198	B1	1/2001	Wu et al.	D492,295	S	6/2004	Glatt
6,180,891	B1	1/2001	Murdeshwar	6,743,037	B2	6/2004	Kassa et al.
6,183,287	B1	2/2001	Po	6,746,278	B2	6/2004	Nelson et al.
6,183,301	B1	2/2001	Paagman	6,769,883	B2	8/2004	Brid et al.
6,190,213	B1	2/2001	Reichart et al.	6,769,935	B2	8/2004	Stokoe et al.
6,193,537	B1	2/2001	Harper, Jr. et al.	6,776,635	B2	8/2004	Blanchfield et al.
6,196,871	B1	3/2001	Szu	6,776,649	B2	8/2004	Pape et al.
6,202,916	B1	3/2001	Updike et al.	6,780,027	B2	8/2004	Allison et al.
6,206,722	B1	3/2001	Ko et al.	6,790,088	B2	9/2004	Ono et al.
6,210,197	B1	4/2001	Yu	6,796,831	B1	9/2004	Yasufuku et al.
6,210,240	B1	4/2001	Comerci et al.	6,810,783	B1	11/2004	Larose
6,212,755	B1	4/2001	Shimada et al.	6,811,440	B1	11/2004	Rothermel et al.
6,215,180	B1	4/2001	Chen et al.	6,814,590	B2	11/2004	Minich et al.
6,219,913	B1	4/2001	Uchiyama	6,829,143	B2	12/2004	Russell et al.
6,220,884	B1	4/2001	Lin	6,835,103	B2	12/2004	Middlehurst et al.
6,220,895	B1	4/2001	Lin	6,843,687	B2	1/2005	McGowan et al.
6,220,896	B1	4/2001	Bertoncici et al.	6,848,886	B2	2/2005	Schmaling et al.
6,234,851	B1	5/2001	Phillips	6,848,950	B2	2/2005	Allison et al.
6,238,225	B1	5/2001	Middlehurst et al.	6,848,953	B2	2/2005	Schell et al.
6,257,478	B1	7/2001	Straub	D502,919	S	3/2005	Studnicky, III
6,259,039	B1	7/2001	Chroneos, Jr. et al.	6,869,294	B2	3/2005	Clark et al.
6,261,132	B1	7/2001	Koseki et al.	6,884,117	B2	4/2005	Korsunsky et al.
6,269,539	B1	8/2001	Takahashi et al.	6,890,221	B2	5/2005	Wagner
6,274,474	B1	8/2001	Caletka et al.	6,905,367	B2	6/2005	Crane, Jr. et al.
6,280,230	B1	8/2001	Takase et al.	6,929,504	B2	8/2005	Ling et al.
6,293,827	B1	9/2001	Stokoe et al.	6,947,012	B2	9/2005	Aisenbrey
6,299,492	B1	10/2001	Pierini et al.	6,969,268	B2	11/2005	Brunker et al.
6,309,245	B1	10/2001	Sweeney	6,975,511	B1	12/2005	Lebo et al.
6,319,075	B1	11/2001	Clark et al.	6,994,569	B2	2/2006	Minich et al.
6,322,377	B2	11/2001	Middlehurst et al.	7,001,189	B1	2/2006	McGowan et al.
6,328,602	B1	12/2001	Yamasaki et al.	7,059,892	B1	6/2006	Trout
6,347,952	B1	2/2002	Hasegawa et al.	7,059,919	B2	6/2006	Clark et al.
6,350,134	B1	2/2002	Fogg et al.	7,065,871	B2	6/2006	Minich et al.
6,359,783	B1	3/2002	Noble	7,070,464	B2	7/2006	Clark et al.
6,360,940	B1	3/2002	Bolde et al.	7,074,096	B2	7/2006	Copper et al.
6,362,961	B1	3/2002	Chiou	7,086,147	B2	8/2006	Caletka et al.
6,363,607	B1	4/2002	Chen et al.	7,097,465	B1	8/2006	Korsunsky et al.
6,371,773	B1	4/2002	Crofoot et al.	7,101,228	B2	9/2006	Hammer et al.
6,379,188	B1	4/2002	Cohen et al.	7,104,812	B1	9/2006	Bogiel et al.
6,386,924	B2	5/2002	Long	7,114,963	B2	10/2006	Shuey et al.
6,394,818	B1	5/2002	Smalley, Jr.	RE39,380	E	11/2006	Davis
6,402,566	B1	6/2002	Middlehurst et al.	7,137,848	B1	11/2006	Trout et al.
6,409,543	B1	6/2002	Astbury, Jr. et al.	7,168,963	B2	1/2007	Minich et al.
6,428,328	B2	8/2002	Haba et al.	7,182,642	B2	2/2007	Ngo et al.
6,431,914	B1	8/2002	Billman	7,204,699	B2	4/2007	Stoner
6,435,914	B1	8/2002	Billman	D542,736	S	5/2007	Riku
6,450,829	B1	9/2002	Weisz-Margulescu	7,220,141	B2	5/2007	Daily et al.
6,461,183	B1	10/2002	Ohkita et al.	7,258,562	B2	8/2007	Daily et al.
6,461,202	B2	10/2002	Kline	D550,158	S	9/2007	Victor
6,471,523	B1	10/2002	Shuey	7,273,382	B2	9/2007	Igarashi et al.
6,471,548	B2	10/2002	Bertoncini et al.	D554,591	S	11/2007	Victor
6,472,474	B2	10/2002	Burkhardt et al.	7,303,427	B2	12/2007	Swain
6,488,549	B1	12/2002	Weller et al.	7,335,043	B2	2/2008	Hgo et al.
6,489,567	B2	12/2002	Zachrai	7,384,289	B2	6/2008	Minich
6,506,081	B2	1/2003	Blanchfield et al.	7,402,064	B2	7/2008	Daily
6,514,103	B2	2/2003	Pape et al.	7,425,145	B2	9/2008	Ngo
6,537,111	B2	3/2003	Brammer et al.	7,452,249	B2	11/2008	Daily
6,544,046	B1	4/2003	Hahn et al.	7,458,839	B2	12/2008	Ngo
6,551,112	B1	4/2003	Li et al.	7,476,108	B2	1/2009	Swain et al.
6,554,647	B1	4/2003	Cohen et al.	7,541,135	B2	6/2009	Swain
6,572,410	B1	6/2003	Volstorf et al.	2001/0003685	A1	6/2001	Aritani
6,575,774	B2	6/2003	Ling et al.	2002/0106930	A1	8/2002	Pape et al.
6,575,776	B1	6/2003	Conner et al.	2002/0142676	A1	10/2002	Hosaka et al.
6,592,381	B2	7/2003	Cohen et al.	2002/0159235	A1	10/2002	Miller et al.
6,604,967	B2	8/2003	Middlehurst et al.	2002/0193019	A1	12/2002	Blanchfield et al.
6,629,854	B2	10/2003	Murakami	2003/0119378	A1	6/2003	Avery
6,652,318	B1	11/2003	Winings et al.	2003/0143894	A1	7/2003	Kline et al.
6,663,426	B2	12/2003	Hasircoglu et al.	2003/0219999	A1	11/2003	Minich et al.
6,665,189	B1	12/2003	Lebo	2003/0220021	A1	11/2003	Whiteman, Jr. et al.
6,669,514	B2	12/2003	Weibking et al.	2003/0236035	A1	12/2003	Kuroda et al.
6,672,884	B1	1/2004	Toh et al.	2004/0077224	A1	4/2004	Marchese
6,672,907	B2	1/2004	Azuma	2005/0112952	A1	5/2005	Wang et al.
6,679,709	B2	1/2004	Takeuchi	2006/0003620	A1	1/2006	Daily et al.
6,692,272	B2	2/2004	Lemke et al.	2006/0128197	A1	6/2006	McGowan et al.
6,702,594	B2	3/2004	Lee et al.	2006/0281354	A1	12/2006	Ngo et al.
6,705,902	B1	3/2004	Yi et al.				

2007/0293084 A1 12/2007 Ngo
 2008/0248670 A1 10/2008 Daily et al.
 2010/0055983 A1 3/2010 Wu

WO WO 97/44859 11/1997
 WO WO 98/15989 4/1998
 WO WO 0016445 3/2000
 WO WO 01/29931 4/2001
 WO WO 01/39332 5/2001
 WO WO 02103847 12/2002
 WO WO 2005065254 7/2005
 WO WO 2007064632 6/2007
 WO WO 2008117180 10/2008

FOREIGN PATENT DOCUMENTS

DE 102 26 279 C1 11/2003
 EP 0 273 683 A2 7/1988
 EP 0 321 257 B1 4/1993
 EP 0 623 248 B1 11/1995
 EP 0 789 422 A2 8/1997
 EP 1 091 449 B1 9/2004
 GB 1 162 705 8/1969
 JP 05344728 12/1993
 JP 6068943 3/1994
 JP 06-236788 8/1994
 JP 07-114958 5/1995
 JP 07169523 7/1995
 JP 08096918 4/1996
 JP 0 812 5379 5/1996
 JP 9199215 7/1997
 JP 2000-003743 1/2000
 JP 2000-003744 1/2000
 JP 2000-003745 1/2000
 JP 2000-003746 1/2000
 JP 2000-228243 8/2000
 JP 2001-135388 5/2001
 JP 2003-217785 7/2003
 KR 100517561 9/2005
 TW 576555 8/1991
 TW 546872 8/2003
 WO WO 97/43885 11/1997

OTHER PUBLICATIONS

Finan, J.M., "Thermally Conductive Thermoplastics", LNP Engineering Plastics, Inc., Plastics Engineering 2000, www.4spe.org, 4 pages.
 Metral 1000 Series, PCB Mounted Receptacle Assembly, FCI Web Site page, 2001, 1 page.
 Ogando, J., "And now—An Injection-Molded Heat Exchanger", Sure, plastics are thermal insulators, but additive packages allow them to conduct heat instead, Global Design News, Nov. 1, 2000, 4 pages.
 Power TwinBlade™ I/O Cable Connector RA-North-South, No. GS-20_072, Aug. 6, 2007, 11 pages.
 Product Datasheets, 10 Bgit/s XENPAK 850 nm Transponder (TRP10GVP2045), Copyright 2005, MergeOptics GmbH, 13 pages.
 Product Datasheets, Welcome to XENPAK.org., Copyright 2001, http://www.xenpak.org, 1 page.
 Sherman, L.M., "Plastics that Conduct Heat", Plastics Technology Online, Jun. 2001, http://www.plasticstechnology.com, 4 pages.

* cited by examiner

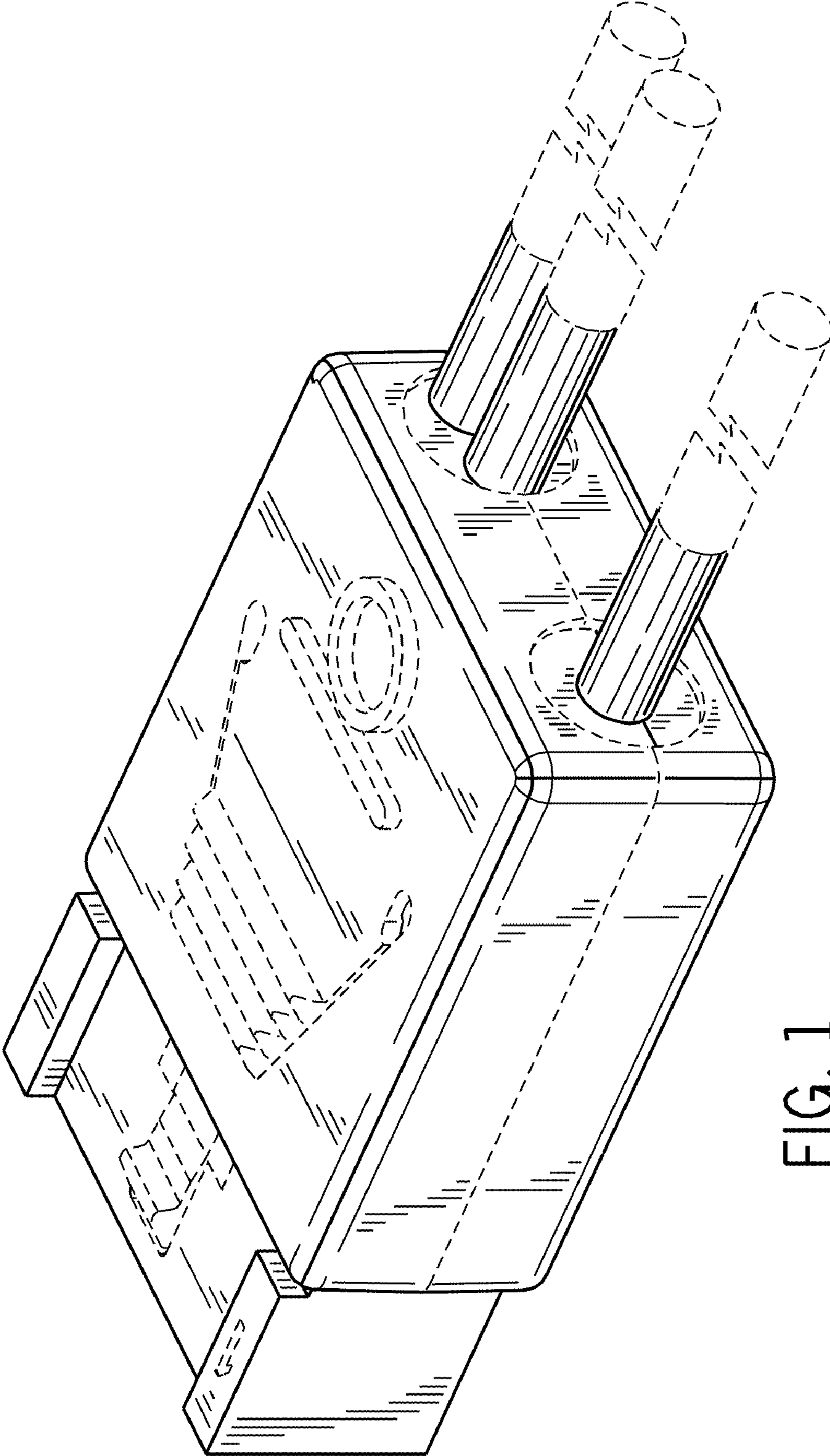


FIG. 1

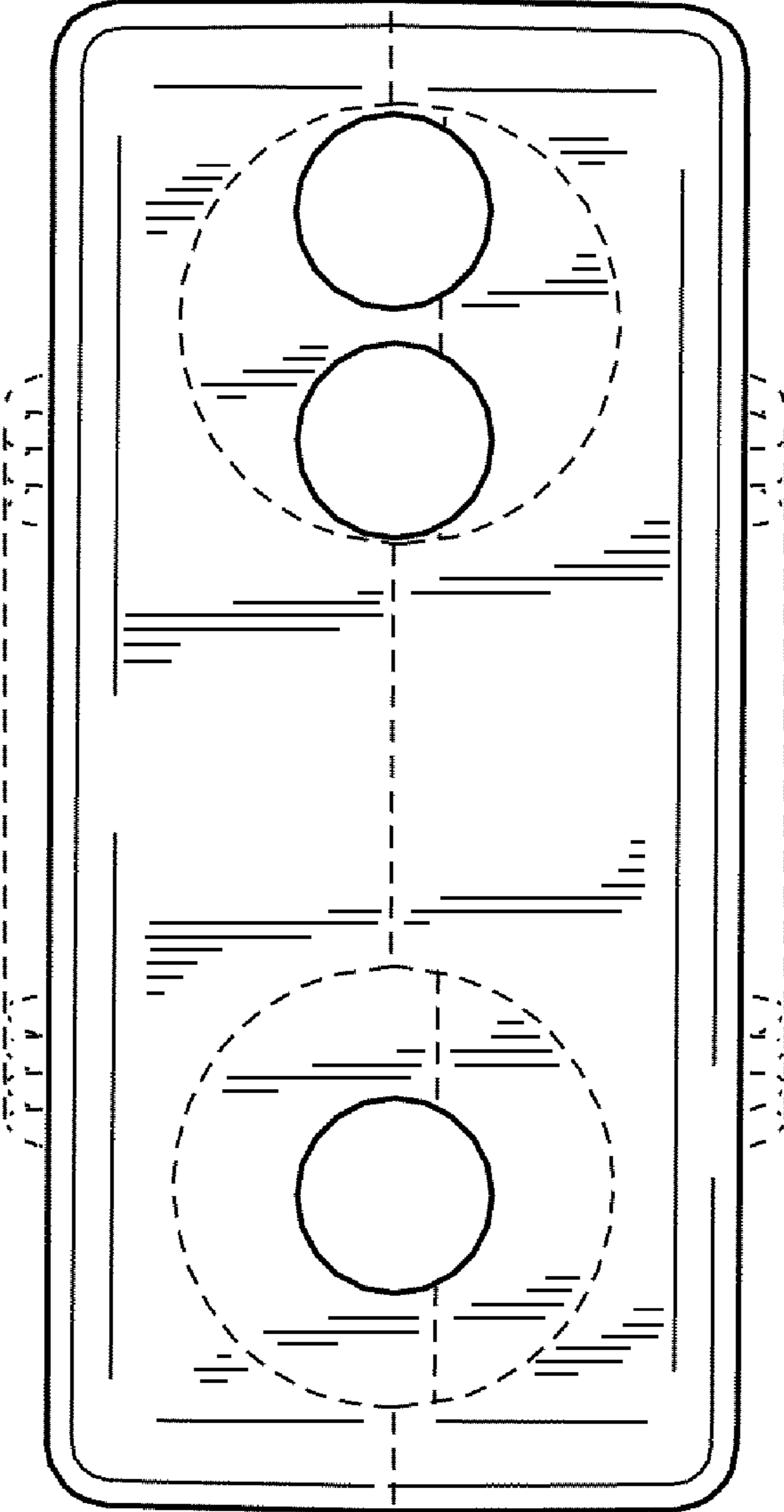


FIG. 2

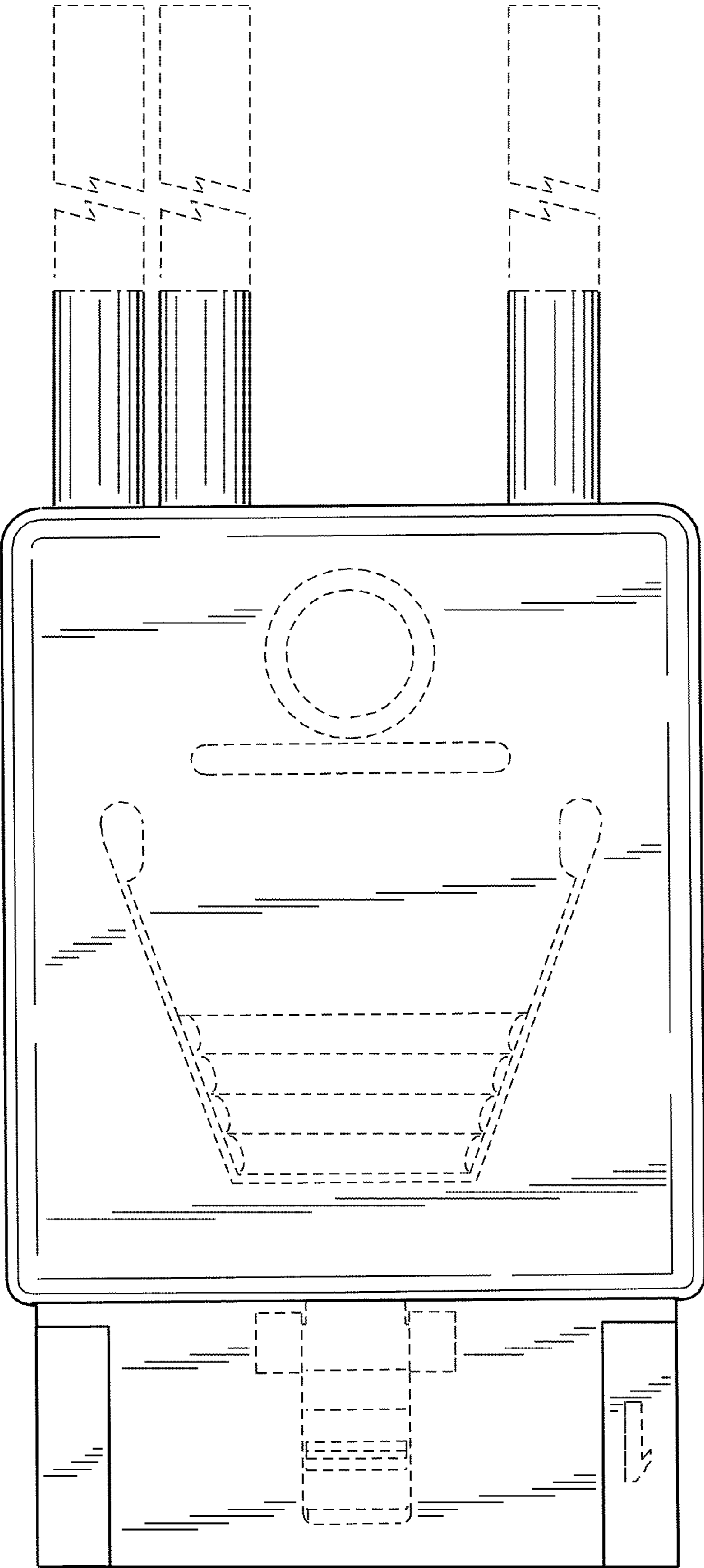


FIG. 3

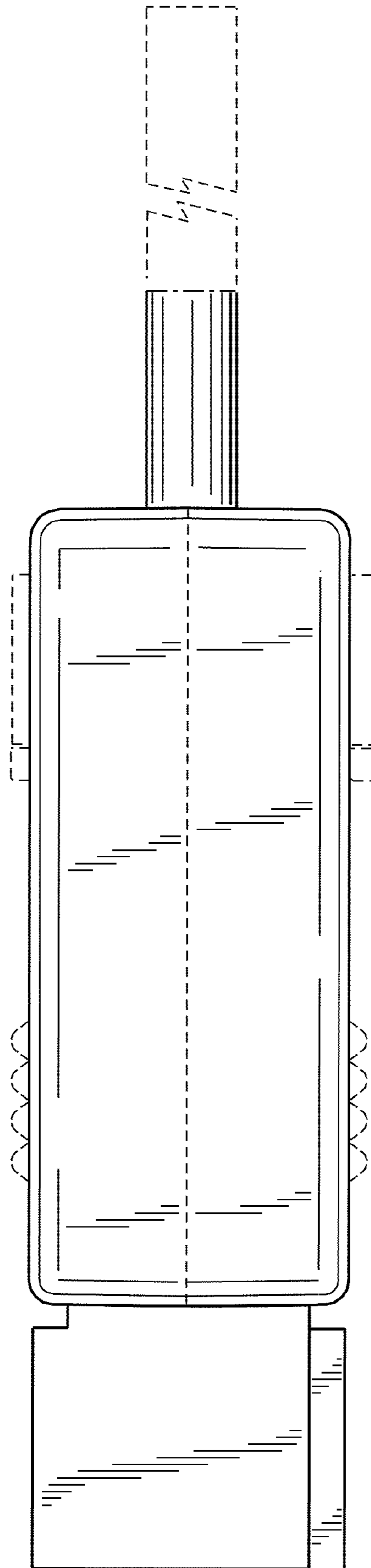


FIG. 4

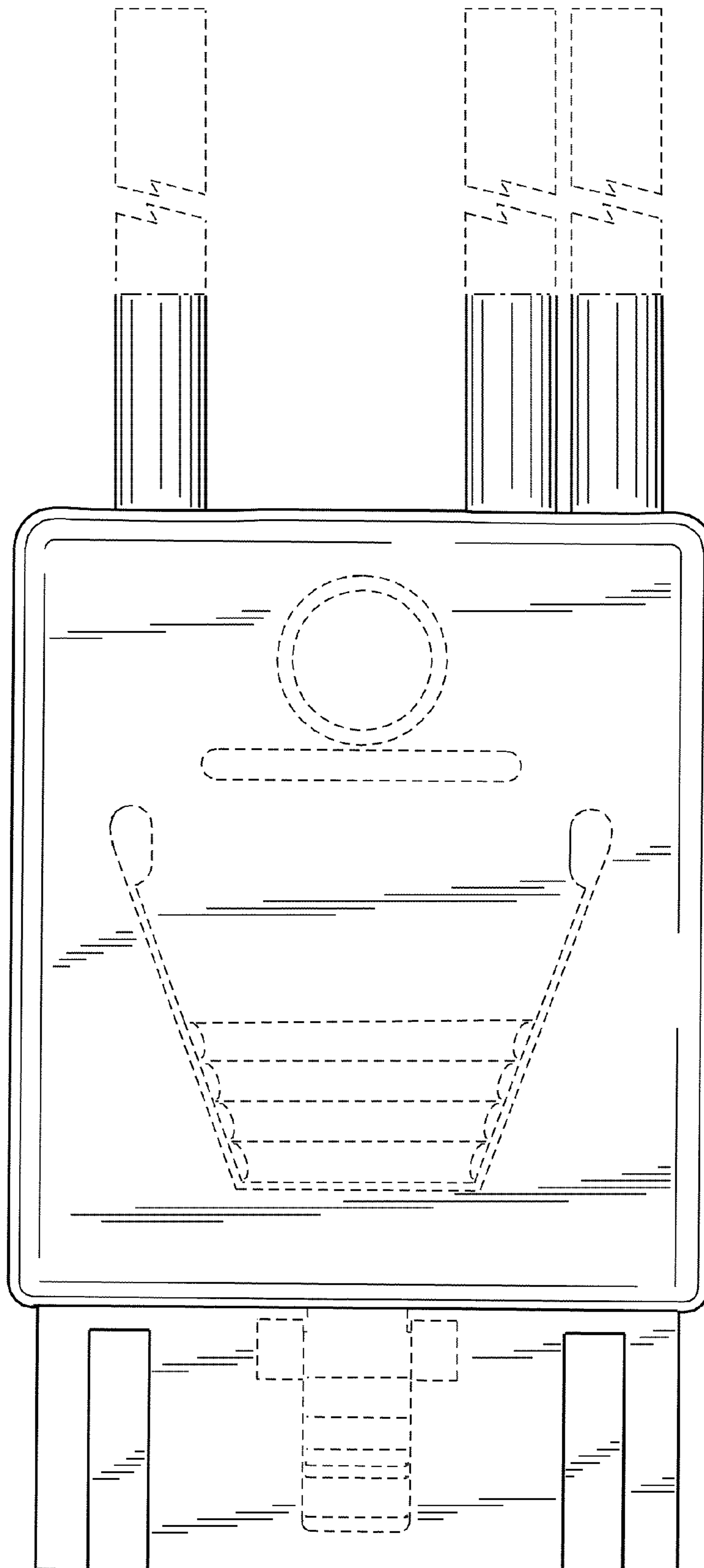


FIG. 5

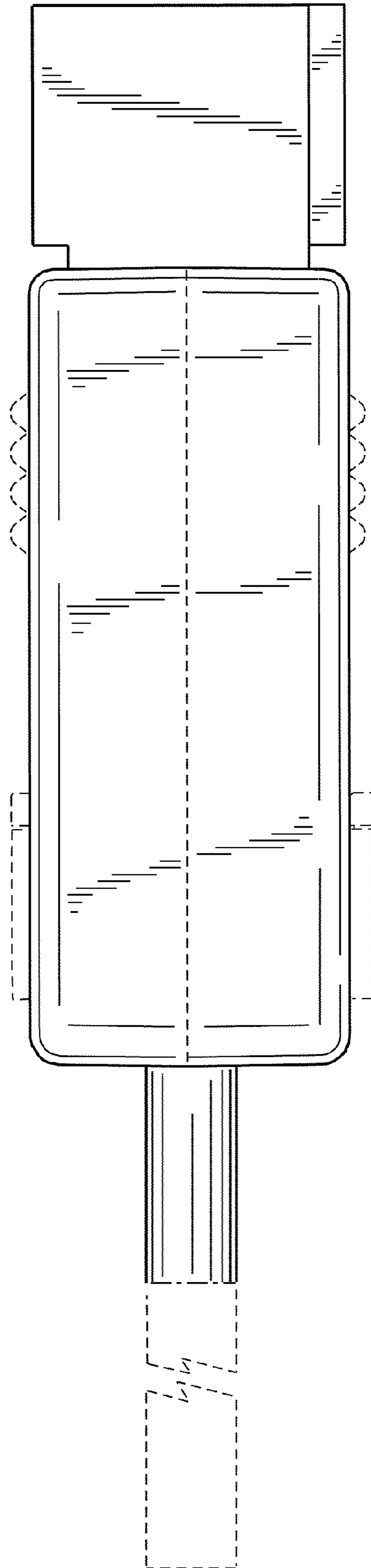


FIG. 6

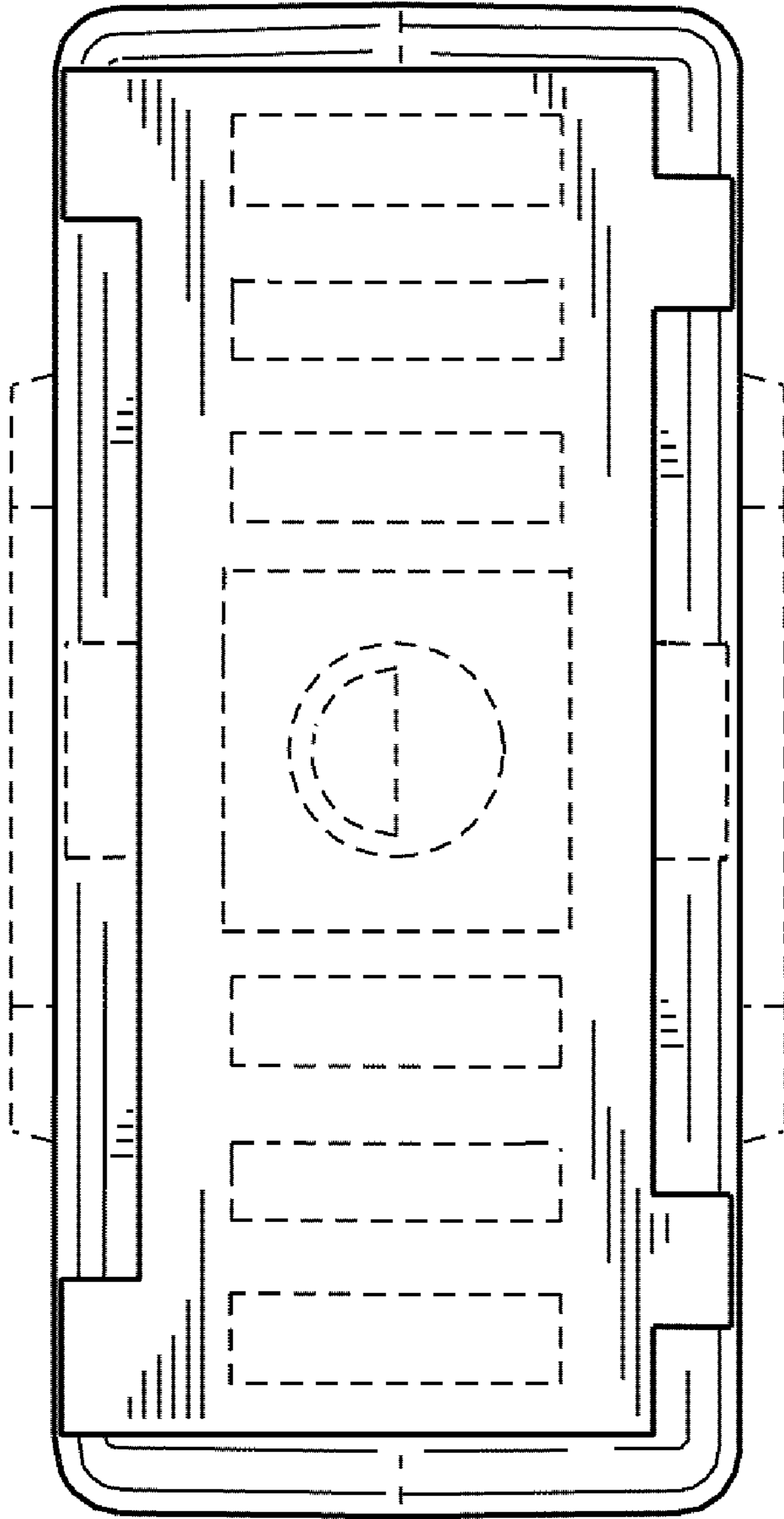


FIG. 7