



US00D619099S

(12) **United States Design Patent**  
**Ngo**

(10) **Patent No.:** **US D619,099 S**  
(45) **Date of Patent:** **\*\* Jul. 6, 2010**

(54) **ELECTRICAL CONNECTOR**

(75) Inventor: **Hung Viet Ngo**, Harrisburg, PA (US)

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

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

(21) Appl. No.: **29/331,717**

(22) Filed: **Jan. 30, 2009**

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

(52) **U.S. Cl.** ..... **D13/154**

(58) **Field of Classification Search** ..... D13/133,  
D13/146-147, 154, 184, 199; 439/64, 79,  
439/159-160, 260, 325, 329, 395, 492, 495,  
439/607-610, 630

See application file for complete search history.

(56) **References Cited**

**U.S. PATENT DOCUMENTS**

318,186 A	5/1885	Hertzog
1,477,527 A	12/1923	Raettig
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, Jr.
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
3,420,087 A	1/1969	Hatfield et al.
3,497,850 A	2/1970	Gallo, Sr.
3,514,740 A	5/1970	Filson et al.
3,538,486 A	11/1970	Shlesinger, Jr.
3,634,811 A	1/1972	Teagno
3,669,054 A	6/1972	Desso et al.
3,692,994 A	9/1972	Hirschmann et al.
3,748,633 A	7/1973	Lundergan
3,750,092 A	7/1973	Bury
3,789,348 A	1/1974	Lenaerts et al.
3,845,451 A	10/1974	Neidecker

3,871,015 A 3/1975 Lin et al.  
3,910,671 A 10/1975 Townsend  
3,942,856 A 3/1976 Mindheim, et al

(Continued)

**FOREIGN PATENT DOCUMENTS**

DE 1 665 181 4/1974

(Continued)

**OTHER PUBLICATIONS**

Drawing No. 10080594-1AD0078LF: PWRBLD 2P .3" Cable Assembly, 2 pages, Oct. 8, 2008.

(Continued)

*Primary Examiner*—Daniel D Bui  
(74) *Attorney, Agent, or Firm*—Woodcock Washburn LLP

(57) **CLAIM**

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

**DESCRIPTION**

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.

FIG. 1 is a top, right, front perspective view of an electrical connector according to my design;

FIG. 2 is a front elevation view thereof;

FIG. 3 is a rear elevation view thereof;

FIG. 4 is a right side elevation view thereof;

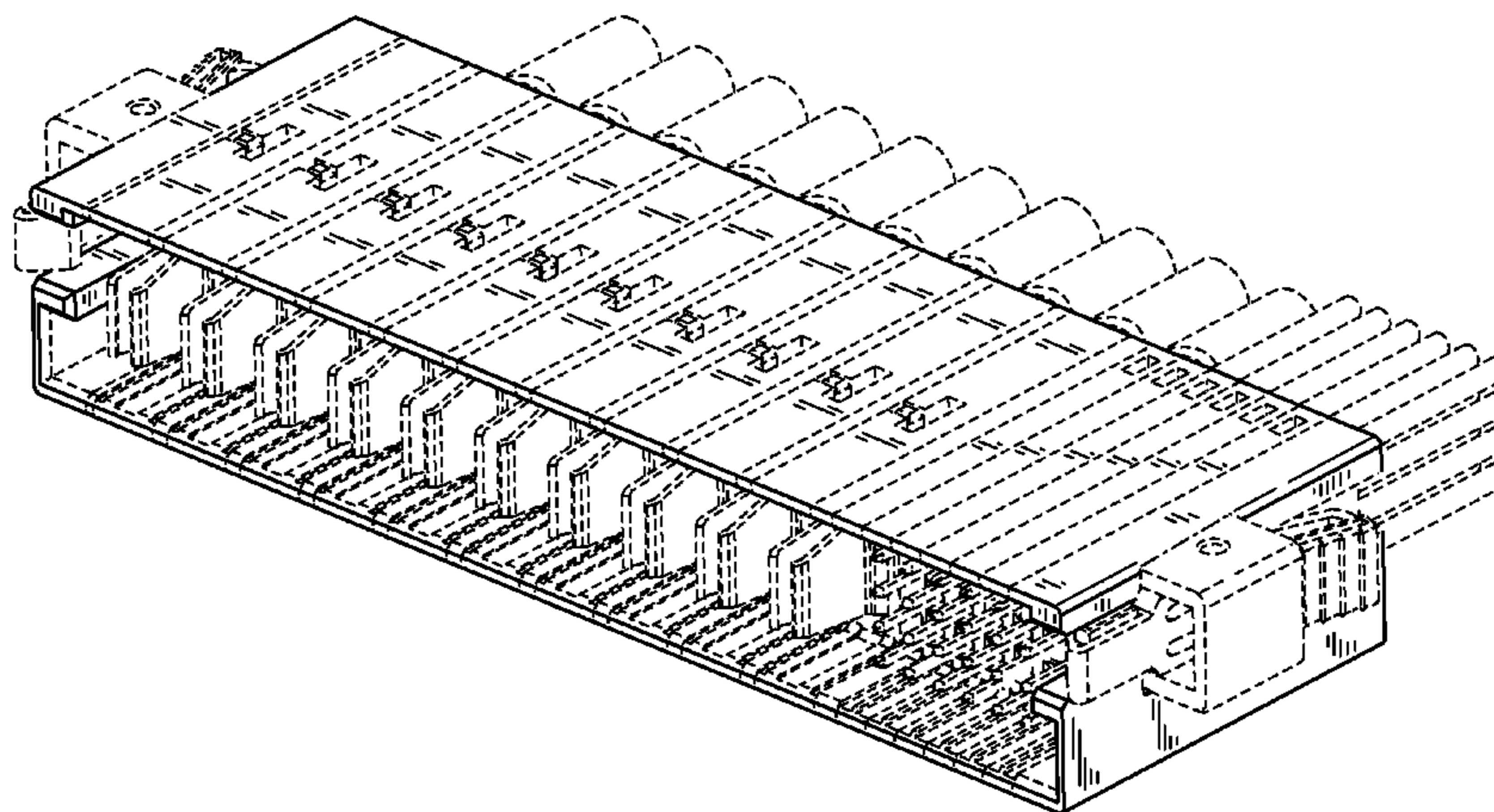
FIG. 5 is a left side elevation view thereof;

FIG. 6 is a top plan view thereof; and,

FIG. 7 is a bottom plan view thereof.

The broken line portion of the figure drawings is included to show unclaimed subject matter only and forms no part of the claimed design.

**1 Claim, 5 Drawing Sheets**



# US D619,099 S

Page 2

U.S. PATENT DOCUMENTS				
		5,024,610	A	6/1991 French et al.
		5,035,639	A	7/1991 Kilpatrick et al.
		5,046,960	A	9/1991 Fedder
		5,052,953	A	10/1991 Weber
		5,066,236	A	11/1991 Broeksteeg
		5,077,893	A	1/1992 Mosquera et al.
		5,082,459	A	1/1992 Billman et al.
		5,094,634	A	3/1992 Dixon et al.
		5,104,329	A	4/1992 Brown et al.
		5,104,332	A	4/1992 McCoy
		5,107,328	A	4/1992 Kinsman
		5,108,301	A	4/1992 Torok
		5,137,959	A	8/1992 Block et al.
		5,139,426	A	8/1992 Barkus et al.
		5,151,056	A	9/1992 McClune
		5,152,700	A	10/1992 Bogursky et al.
		5,158,471	A	10/1992 Fedder et al.
		5,174,770	A	12/1992 Sasaki et al.
		5,194,480	A	3/1993 Block et al.
		5,196,987	A	3/1993 Webber et al.
		5,207,591	A	5/1993 Ozaki et al.
		5,213,518	A	5/1993 Weidler
		5,213,868	A	5/1993 Liberty et al.
		5,214,308	A	5/1993 Nishiguchi et al.
		5,238,414	A	8/1993 Yaegashi et al.
		5,254,012	A	10/1993 Wang
		5,274,918	A	1/1994 Reed
		5,276,964	A	1/1994 Anderson, Jr. et al.
		5,281,168	A	1/1994 Krehbiel et al.
		5,286,212	A	2/1994 Broeksteeg
		5,295,843	A	3/1994 Davis et al.
		5,298,791	A	3/1994 Liberty et al.
		5,302,135	A	4/1994 Lee
		5,321,582	A	6/1994 Casperson
		5,358,422	A	10/1994 Schaffer et al.
		5,362,249	A	11/1994 Carter
		5,376,012	A	12/1994 Clark
		5,381,314	A	1/1995 Rudy, Jr. et al.
		5,400,949	A	3/1995 Hirvonen et al.
		5,403,206	A	4/1995 McNamara et al.
		5,403,210	A	4/1995 Hasegawa
		5,427,543	A	6/1995 Dynia
		5,431,578	A	7/1995 Wayne
		5,435,876	A	7/1995 Alfaro et al.
		5,457,342	A	10/1995 Herbst, II
		5,458,426	A	10/1995 Ito
		5,475,922	A	12/1995 Tamura et al.
		5,478,244	A	12/1995 Maue et al.
		5,490,040	A	2/1996 Gaudenzi et al.
		5,503,565	A	4/1996 McCoy
		5,511,987	A	4/1996 Shinchi
		5,512,519	A	4/1996 Hwang
		5,533,915	A	7/1996 Deans
		5,549,480	A	8/1996 Cheng
		5,558,542	A	9/1996 O'Sullivan et al.
		5,564,952	A	10/1996 Davis et al.
		5,577,928	A	11/1996 Duclos
		5,582,519	A	12/1996 Buchter
		5,588,859	A	12/1996 Maurice
		5,590,463	A	1/1997 Feldman et al.
		5,605,489	A	2/1997 Gale et al.
		5,609,502	A	3/1997 Thumma
		5,618,187	A	4/1997 Goto
		5,622,511	A	4/1997 Jarrett
		5,637,008	A	6/1997 Kozel
		5,643,009	A	7/1997 Dinkel et al.
		5,643,013	A	7/1997 Weidler et al.
		5,664,968	A	9/1997 Mickiewicz
		5,664,973	A	9/1997 Emmert et al.
		5,667,392	A	9/1997 Kocher et al.
		5,691,041	A	11/1997 Frankeny et al.
		5,702,255	A	12/1997 Murphy et al.
		5,716,234	A	2/1998 Phillips
3,944,312	A	3/1976	Koenig	
3,972,580	A	8/1976	Pemberton et al.	
3,998,517	A	12/1976	Griffin	
4,005,923	A	2/1977	Davis, Jr.	
4,070,088	A	1/1978	Vaden	
4,073,564	A	2/1978	Davis, Jr.	
4,076,362	A	2/1978	Ichimura	
4,082,407	A	4/1978	Smorzaniuk et al.	
4,130,327	A	12/1978	Spaulding	
4,136,919	A	1/1979	Howard et al.	
4,159,861	A	7/1979	Anhalt	
4,217,024	A	8/1980	Aldridge et al.	
4,227,762	A	10/1980	Scheiner	
4,260,212	A	4/1981	Ritchie et al.	
4,288,139	A	9/1981	Cobaugh et al.	
4,371,912	A	2/1983	Guzik	
4,383,724	A	5/1983	Verhoeven	
4,402,563	A	9/1983	Sinclair	
4,403,821	A	9/1983	Zimmerman et al.	
4,473,113	A	9/1984	Whitfield et al.	
4,500,160	A	2/1985	Bertsch	
4,505,529	A	3/1985	Barkus	
4,533,187	A	8/1985	Kirkman	
4,536,955	A	8/1985	Gudgeon	
4,545,610	A	10/1985	Lakritz et al.	
4,552,425	A	11/1985	Billman	
4,560,222	A	12/1985	Dambach	
4,564,259	A	1/1986	Vandame	
4,596,433	A	6/1986	Oesterheld et al.	
4,603,930	A	8/1986	Ito	
4,626,637	A	12/1986	Olsson et al.	
4,659,158	A	4/1987	Sakamoto et al.	
4,669,801	A	6/1987	Worth	
4,685,886	A	8/1987	Denlinger et al.	
4,689,718	A	8/1987	Maue et al.	
4,709,976	A	12/1987	Nakama et al.	
4,717,360	A	1/1988	Czaja	
4,767,344	A	8/1988	Noschese	
4,776,803	A	10/1988	Pretchel et al.	
4,780,088	A	10/1988	Means	
4,782,893	A	11/1988	Thomas	
4,790,763	A	12/1988	Weber et al.	
4,790,764	A	12/1988	Kawaguchi et al.	
4,815,987	A	3/1989	Kawano et al.	
4,818,237	A	4/1989	Weber	
4,820,169	A	4/1989	Weber et al.	
4,820,182	A	4/1989	Harwath et al.	
4,838,809	A	6/1989	Mouissie	
4,845,592	A	7/1989	Himes, Jr. et al.	
4,850,884	A	7/1989	Sawai et al.	
4,867,696	A	9/1989	Demler, Jr. et al.	
4,867,713	A	9/1989	Ozu et al.	
4,875,865	A	10/1989	Demler, Jr. et al.	
4,878,611	A	11/1989	LoVasco et al.	
4,881,905	A	11/1989	Demler, Jr. et al.	
4,900,271	A	2/1990	Colleran et al.	
4,907,990	A	3/1990	Bertho et al.	
4,915,641	A	4/1990	Miskin et al.	
4,917,625	A	4/1990	Haile	
4,941,830	A	7/1990	Tkazyik et al.	
4,950,186	A	8/1990	Kaley et al.	
4,954,090	A	9/1990	Shimochi	
4,963,102	A	10/1990	Gettig et al.	
4,965,699	A	10/1990	Jorden et al.	
4,968,263	A	11/1990	Silbernagel et al.	
4,973,257	A	11/1990	Lhotak	
4,973,271	A	11/1990	Ishizuka et al.	
4,974,119	A	11/1990	Martin	
4,975,084	A	12/1990	Fedder et al.	
4,979,074	A	12/1990	Morley et al.	
5,016,968	A	5/1991	Hammond et al.	

# US D619,099 S

Page 3

5,727,963	A	3/1998	LeMaster	6,190,215	B1	2/2001	Pendleton et al.
5,730,609	A	3/1998	Harwath	6,193,537	B1	2/2001	Harper, Jr. et al.
5,741,144	A	4/1998	Elco et al.	6,196,871	B1	3/2001	Szu
5,741,161	A	4/1998	Cahaly et al.	6,202,916	B1	3/2001	Updike et al.
5,742,484	A	4/1998	Gillette et al.	6,206,722	B1	3/2001	Ko et al.
5,743,009	A	4/1998	Matsui et al.	6,210,197	B1	4/2001	Yu
5,745,349	A	4/1998	Lemke	6,210,240	B1	4/2001	Comerci et al.
5,746,608	A	5/1998	Taylor	6,212,755	B1	4/2001	Shimada et al.
5,749,746	A	5/1998	Tan et al.	6,215,180	B1	4/2001	Chen et al.
5,755,595	A	5/1998	Davis et al.	6,219,913	B1	4/2001	Uchiyama
5,772,451	A	6/1998	Dozier, II et al.	6,220,884	B1	4/2001	Lin
5,782,644	A	7/1998	Kiat	6,220,895	B1	4/2001	Lin
5,785,557	A	7/1998	Davis	6,220,896	B1	4/2001	Bertoncini et al.
5,787,971	A	8/1998	Dodson	6,234,851	B1	5/2001	Phillips
5,795,191	A	8/1998	Preputnick et al.	6,238,225	B1	5/2001	Middlehurst et al.
5,810,607	A	9/1998	Shih et al.	6,250,942	B1	6/2001	Lemke et al.
5,817,973	A	10/1998	Elco et al.	6,257,478	B1	7/2001	Straub
5,823,798	A	10/1998	Zintler et al.	6,259,039	B1	7/2001	Chroneos, Jr. et al.
5,827,094	A	10/1998	Aizawa et al.	6,261,132	B1	7/2001	Koseki et al.
5,831,314	A	11/1998	Wen	6,269,539	B1	8/2001	Takahashi et al.
5,857,857	A	1/1999	Fukuda	6,272,474	B1	8/2001	Garcia
5,865,651	A	2/1999	Dague et al.	6,274,474	B1	8/2001	Caletka et al.
5,872,046	A	2/1999	Kaeriyama et al.	6,280,230	B1	8/2001	Takase et al.
5,874,776	A	2/1999	Kresge et al.	6,293,827	B1	9/2001	Stokoe
5,876,219	A	3/1999	Taylor et al.	6,299,492	B1	10/2001	Pierini et al.
5,876,248	A	3/1999	Brunker et al.	6,309,245	B1	10/2001	Sweeney
5,882,214	A	3/1999	Hillbish et al.	6,312,277	B1	11/2001	Holub
5,882,231	A	3/1999	Takano et al.	6,319,075	B1	11/2001	Clark et al.
5,883,782	A	3/1999	Thurston et al.	6,322,377	B2	11/2001	Middlehurst et al.
5,888,884	A	3/1999	Wojnarowski	6,328,602	B1	12/2001	Yamasaki et al.
5,904,594	A	5/1999	Longueville et al.	6,335,224	B1	1/2002	Peterson et al.
5,908,333	A	6/1999	Perino et al.	6,347,952	B1	2/2002	Hasegawa et al.
5,919,050	A	7/1999	Kehley et al.	6,350,134	B1	2/2002	Fogg et al.
5,923,995	A	7/1999	Kao et al.	6,358,094	B1	3/2002	Belopolsky et al.
5,924,899	A	7/1999	Paagman	6,359,783	B1	3/2002	Noble
5,930,114	A	7/1999	Kuzmin et al.	6,360,940	B1	3/2002	Bolde et al.
5,937,140	A	8/1999	Leonard et al.	6,361,375	B1	3/2002	Sinclair
5,955,888	A	9/1999	Frederickson et al.	6,362,961	B1	3/2002	Chiou
5,961,355	A	10/1999	Morlion et al.	6,363,607	B1	4/2002	Chen et al.
5,971,817	A	10/1999	Longueville	6,371,773	B1	4/2002	Crofoot et al.
5,975,921	A	11/1999	Shuey	6,379,188	B1	4/2002	Cohen et al.
5,980,270	A	11/1999	Fjelstad et al.	6,386,924	B2	5/2002	Long
5,980,321	A	11/1999	Cohen et al.	6,394,818	B1	5/2002	Smalley, Jr.
5,984,726	A	11/1999	Wu	6,402,566	B1	6/2002	Middlehurst et al.
5,993,259	A	11/1999	Stokoe et al.	6,409,543	B1	6/2002	Astbury, Jr. et al.
6,012,948	A	1/2000	Wu	6,428,328	B2	8/2002	Haba et al.
6,027,360	A	2/2000	Jenkins	6,431,914	B1	8/2002	Billman
6,036,549	A	3/2000	Wulff	6,435,914	B1	8/2002	Billman
6,041,498	A	3/2000	Hillbish et al.	6,448,549	B1	9/2002	Safae-Rad
6,050,862	A	4/2000	Ishii	6,450,829	B1	9/2002	Weisz-Margulescu
6,059,170	A	5/2000	Jimarez et al.	6,461,183	B1	10/2002	Ohkita et al.
6,062,911	A	5/2000	Davis et al.	6,461,202	B2	10/2002	Kline
6,063,696	A	5/2000	Brenner et al.	6,471,523	B1	10/2002	Shuey
6,066,048	A	5/2000	Lees	6,471,548	B2	10/2002	Bertoncini et al.
6,068,520	A	5/2000	Winings et al.	6,472,474	B2	10/2002	Burkhardt et al.
6,071,152	A	6/2000	Achammer et al.	6,489,567	B2	12/2002	Zachrai
6,077,130	A	6/2000	Hughes et al.	6,506,081	B2	1/2003	Blanchfield et al.
6,089,878	A	7/2000	Meng	6,551,112	B1	1/2003	Li et al.
6,095,827	A	8/2000	Dutkowsky et al.	6,514,103	B2	2/2003	Pape et al.
6,123,554	A	9/2000	Ortega et al.	6,537,111	B2	3/2003	Brammer et al.
6,125,535	A	10/2000	Chiou et al.	6,544,046	B1	4/2003	Hahn et al.
6,139,336	A	10/2000	Olson	6,554,647	B1	4/2003	Cohen et al.
6,146,157	A	11/2000	Lenoir et al.	6,572,410	B1	6/2003	Volstorf et al.
6,146,202	A	11/2000	Ramey et al.	6,575,774	B2	6/2003	Ling et al.
6,146,203	A	11/2000	Elco et al.	6,575,776	B1	6/2003	Conner et al.
6,152,756	A	11/2000	Huang et al.	6,585,536	B1	7/2003	Wu
6,171,140	B1	1/2001	Anbo et al.	6,592,381	B2	7/2003	Cohen et al.
6,174,198	B1	1/2001	Wu et al.	6,604,967	B2	8/2003	Middlehurst et al.
6,178,106	B1	1/2001	Umemoto et al.	741,052	A1	10/2003	Mahon
6,180,891	B1	1/2001	Murdeswar	6,629,854	B2	10/2003	Murakami
6,183,287	B1	2/2001	Po	6,652,318	B1	11/2003	Winings et al.
6,183,301	B1	2/2001	Paagman	6,663,426	B2	12/2003	Fedder et al.
6,190,213	B1	2/2001	Reichart et al.	6,665,189	B1	12/2003	Lebo



WO WO 2008117180 10/2008

OTHER PUBLICATIONS

Drawing No. 10080591-HAB0023LF: PWRBLADE PM 24S+6P C&A, Sep. 24, 2008.

U.S. Appl. No. 12/317,366, filed Dec. 22, 2008, Minich.

U.S. Appl. No. 12/317,336, filed Dec. 22, 2008, Minich.

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 2001, 1 p.

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, Welome 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.

FCI, PWRBLADE Power Distribution Connector System, 2003, [www.fciconnect.com](http://www.fciconnect.com), 2 pages.

FCI, PWRBLADE Power Distribution Connector System, Technology Innovation Service, 2003, 2-3.

FCI, "PWRBLADE, new Power Distribution connector for electronic applications," Product News, 2003, [www.fciconnect.com](http://www.fciconnect.com), 1 page.

FCI, Act Connectors in Action, Panorama, 2003, 1 page.

\* cited by examiner

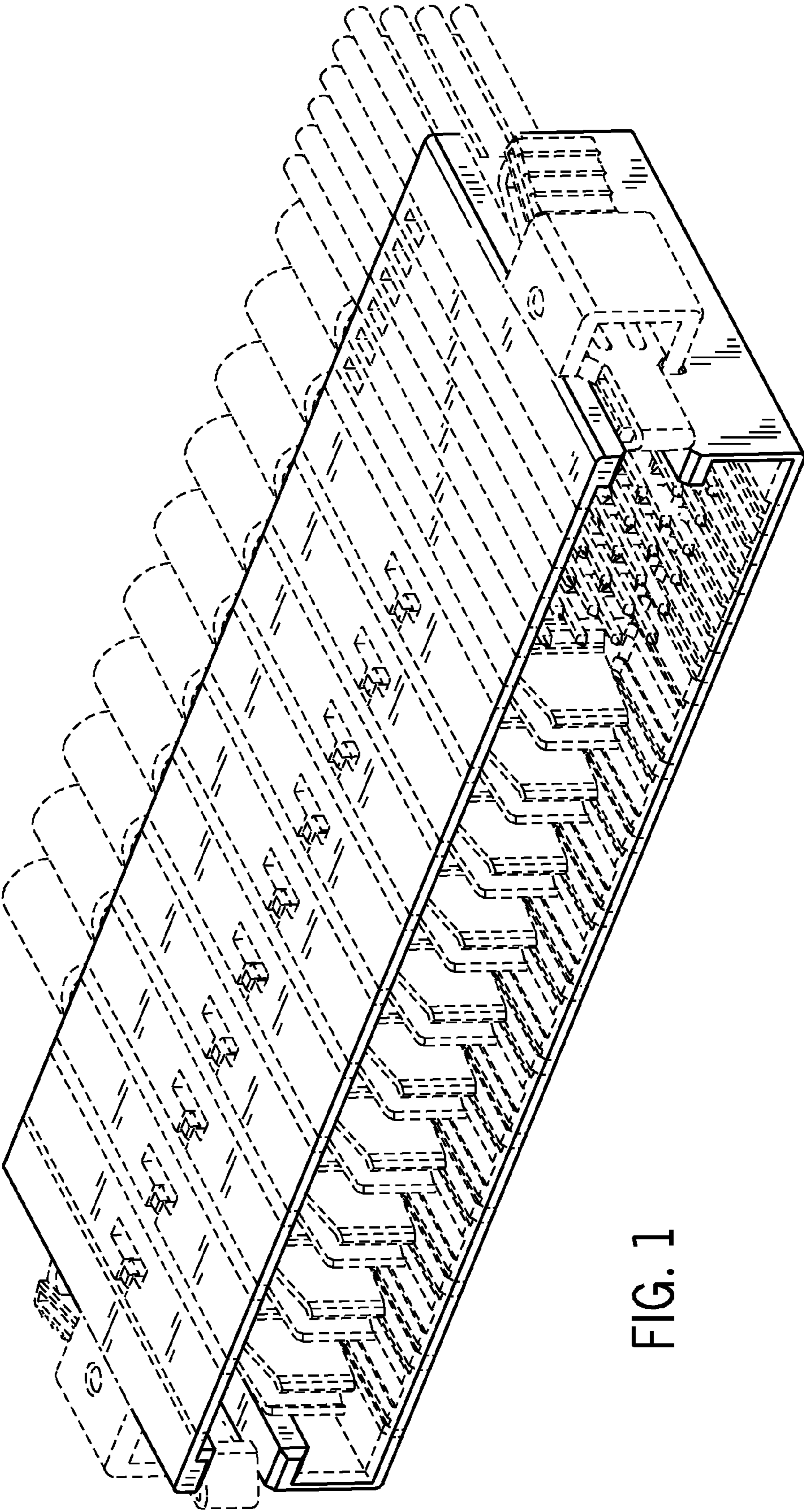


FIG. 1

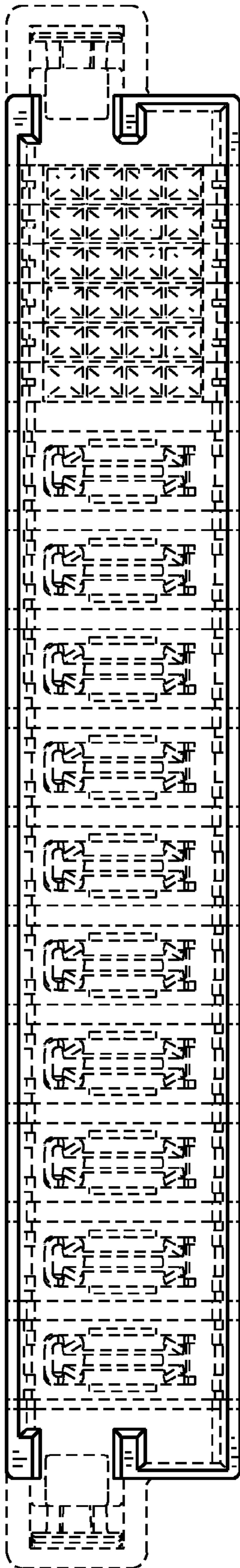


FIG. 2

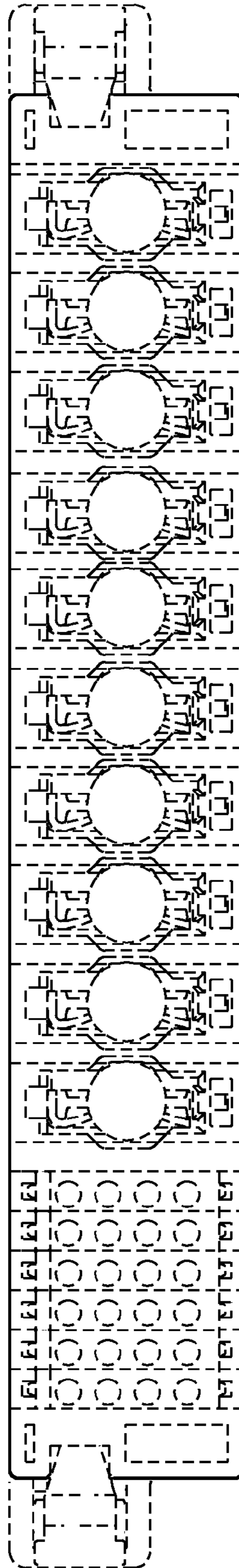


FIG. 3

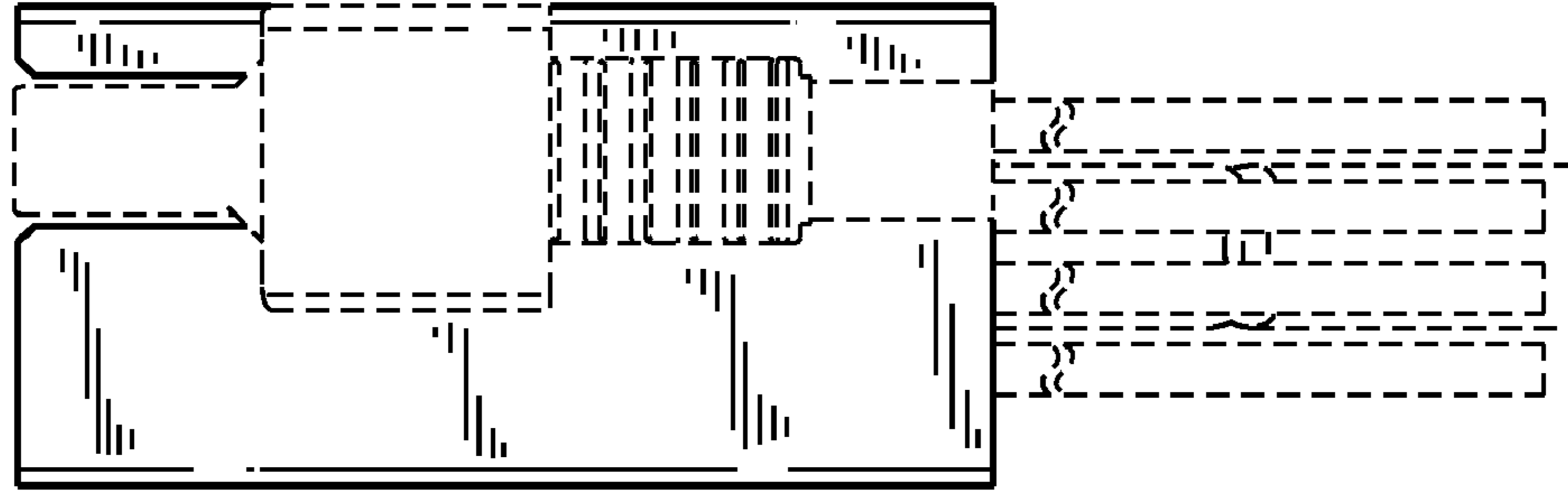


FIG. 4

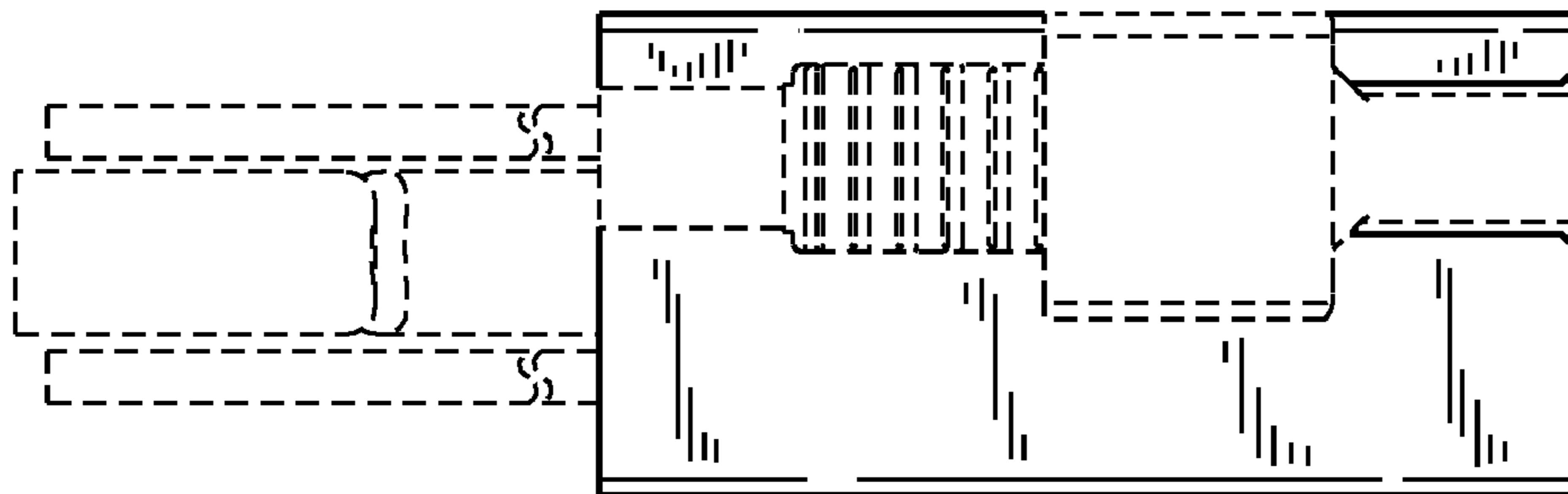


FIG. 5



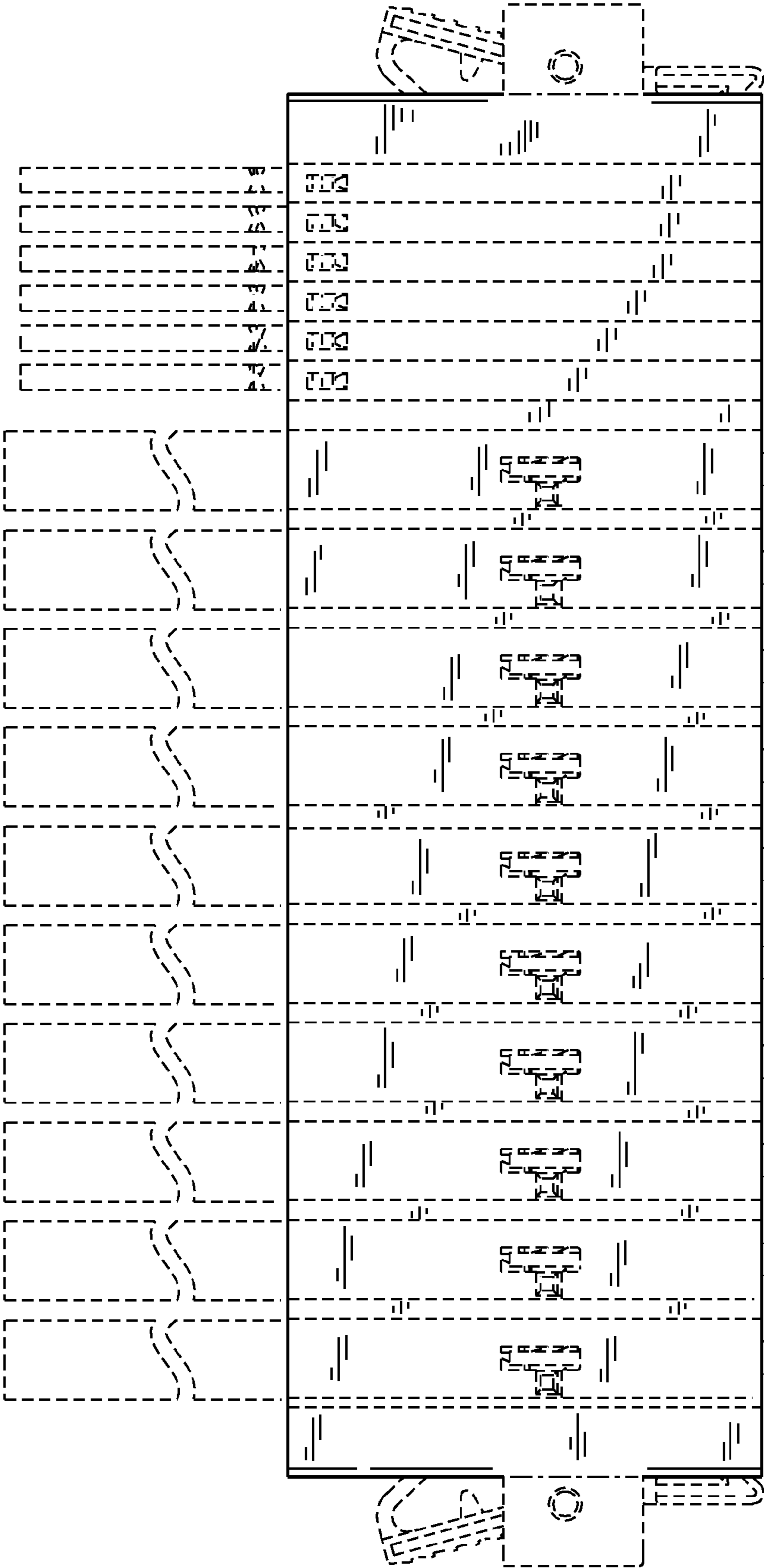


FIG. 6

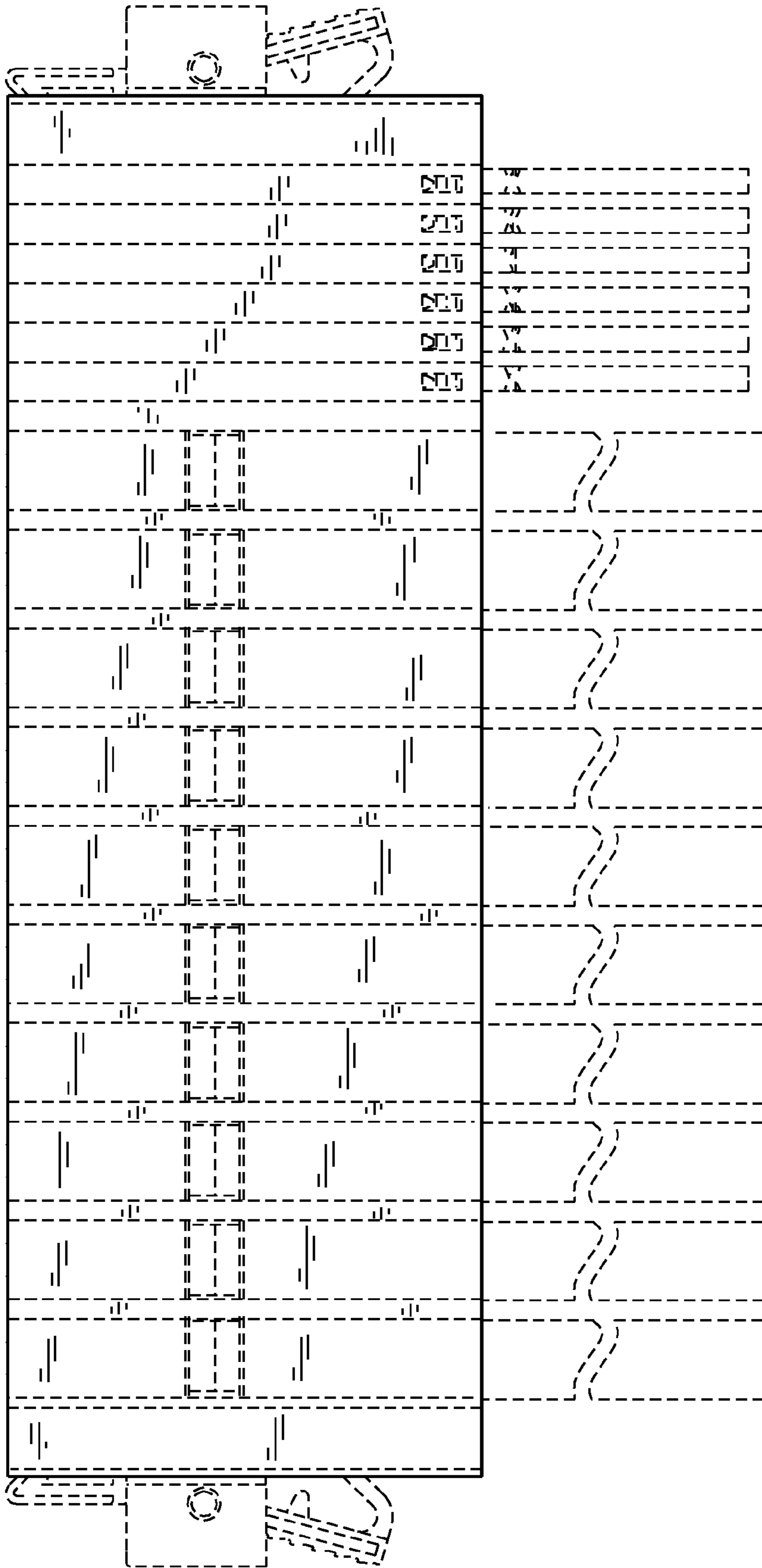


FIG. 7