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(12) **United States Design Patent** (10) **Patent No.:** **US D933,230 S**
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(54) **CERVICAL CAGE**

FOREIGN PATENT DOCUMENTS

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DE G9304368.6 U1 5/2003
FR 2722980 A1 2/1996

(Continued)

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OTHER PUBLICATIONS

US 7,063,700 B2, 06/2006, Michelson (withdrawn)

(Continued)

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(57) **CLAIM**

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The ornamental design for a cervical cage, as shown and described.

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(58) **Field of Classification Search**

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See application file for complete search history.

DESCRIPTION

FIG. 1 shows a front perspective view of a cervical cage;
FIG. 2 shows a front view of the cervical cage of FIG. 1;
FIG. 3 shows a rear view of the cervical cage of FIG. 1;
FIG. 4 shows a right side view of the cervical cage of FIG. 1;

FIG. 5 shows a left side view of the cervical cage of FIG. 1;
FIG. 6 shows a top view of the cervical cage of FIG. 1;
FIG. 7 shows a bottom view of the cervical cage of FIG. 1;
FIG. 8 shows a front perspective view of a cervical cage;
FIG. 9 shows a front view of the cervical cage of FIG. 8;
FIG. 10 shows a rear view of the cervical cage of FIG. 8;
FIG. 11 shows a right side view of the cervical cage of FIG. 8;

FIG. 12 shows a left side view of the cervical cage of FIG. 8;

FIG. 13 shows a top view of the cervical cage of FIG. 8; and,
FIG. 14 shows a bottom view of the cervical cage of FIG. 8.
The broken lines in FIGS. 1-14 illustrate the environment and boundaries of the cervical cage and form no part of the claimed design.

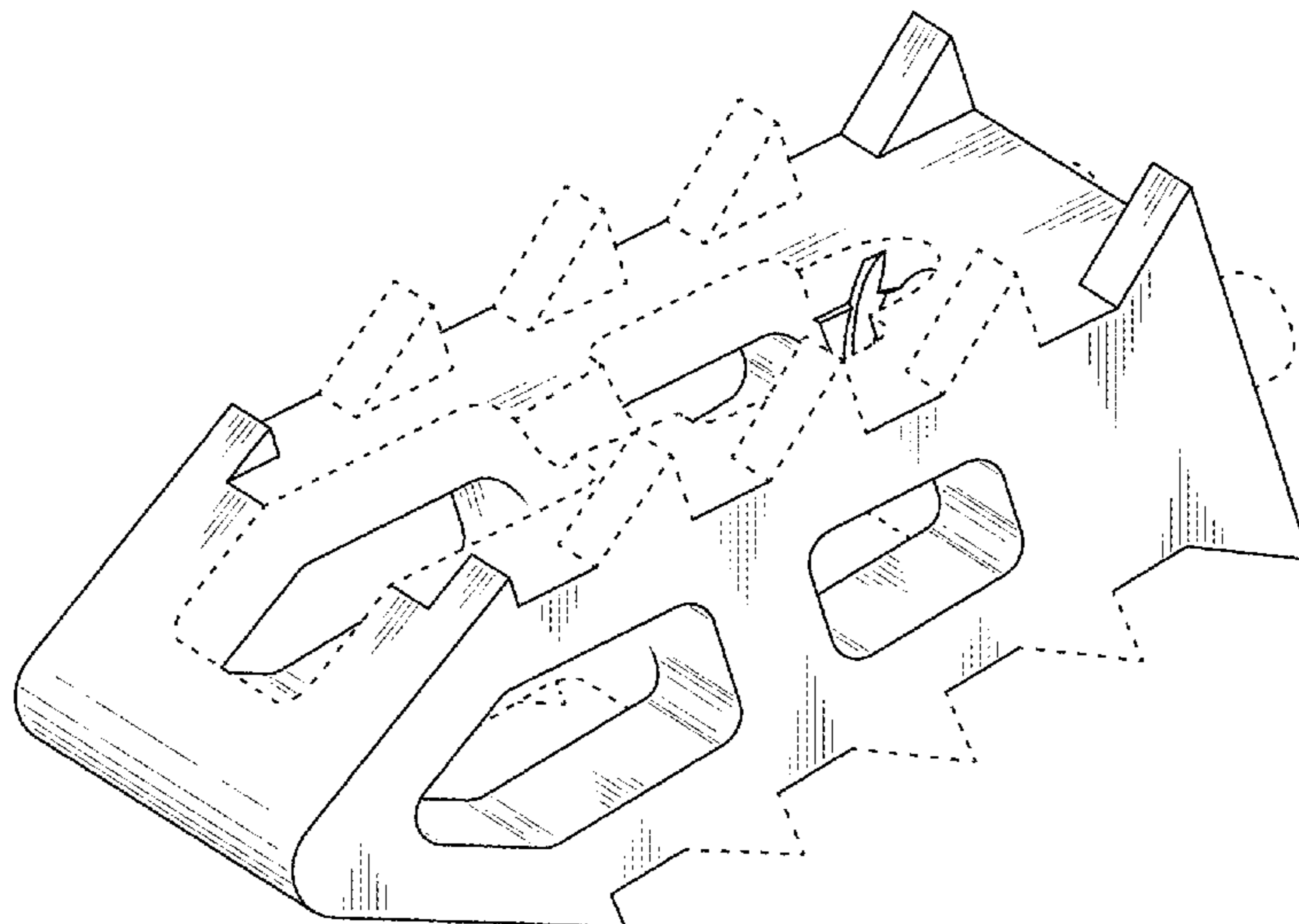
(56) **References Cited**

U.S. PATENT DOCUMENTS

1,934,962 A	11/1933	Barry
2,708,376 A	5/1955	Booth
2,984,241 A	5/1961	Carlson
3,486,505 A	12/1969	Morrison
4,479,491 A	10/1984	Martin
4,530,355 A	7/1985	Griggs
4,604,995 A	8/1986	Stephens et al.
4,772,287 A	9/1988	Ray et al.
4,877,020 A	10/1989	Vich
4,878,915 A	11/1989	Brantigan

(Continued)

1 Claim, 10 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

5,015,247 A	5/1991	Michelson	6,423,083 B2	7/2002	Reiley et al.
5,026,373 A	6/1991	Ray et al.	6,425,919 B1	7/2002	Lambrecht
5,100,405 A	3/1992	McLaren	6,436,098 B1	8/2002	Michelson
5,135,528 A	8/1992	Winston	6,436,142 B1	8/2002	Paes et al.
5,192,327 A	3/1993	Brantigan	6,443,988 B2	9/2002	Felt et al.
5,236,460 A	8/1993	Barber	6,451,023 B1	9/2002	Salazar et al.
5,443,514 A	8/1995	Steffee	6,454,807 B1	9/2002	Jackson
5,484,437 A	1/1996	Michelson	6,478,796 B2	11/2002	Zucherman et al.
5,489,307 A	2/1996	Kuslich et al.	6,500,206 B1	12/2002	Bryan
5,505,732 A	4/1996	Michelson	6,514,256 B2	2/2003	Zucherman et al.
5,527,312 A	6/1996	Ray	6,530,955 B2	3/2003	Boyle et al.
5,549,679 A	8/1996	Kuslich et al.	6,558,390 B2	5/2003	Cragg
5,554,191 A	9/1996	Lahille et al.	6,565,574 B2	5/2003	Michelson
5,571,191 A	11/1996	Fitz	6,565,605 B2	5/2003	Fallin et al.
5,584,832 A	12/1996	Schlapfer et al.	6,569,186 B1	5/2003	Winters et al.
5,593,409 A	1/1997	Michelson	6,575,919 B1	6/2003	Reiley et al.
5,632,747 A	5/1997	Scarborough et al.	6,575,979 B1	6/2003	Cragg
5,649,945 A	7/1997	Ray et al.	6,579,319 B2	6/2003	Goble et al.
5,653,763 A	8/1997	Errico et al.	6,582,432 B1	6/2003	Michelson
5,665,122 A	9/1997	Kambin	6,582,467 B1	6/2003	Teitelbaum et al.
5,674,295 A	10/1997	Ray et al.	6,607,530 B1	8/2003	Carl et al.
5,720,748 A	2/1998	Kuslich et al.	6,610,091 B1	8/2003	Reiley
5,741,253 A	4/1998	Michelson	6,626,905 B1	9/2003	Schmiel et al.
5,772,661 A	6/1998	Michelson	6,632,235 B2	10/2003	Weikel et al.
5,792,044 A	8/1998	Foley et al.	6,635,060 B2	10/2003	Hanson et al.
5,797,909 A	8/1998	Michelson	6,641,582 B1	11/2003	Hanson et al.
5,836,948 A	11/1998	Zucherman et al.	6,648,893 B2	11/2003	Dudasik
5,879,353 A	3/1999	Terry	6,652,584 B2	11/2003	Michelson
5,885,299 A	3/1999	Winslow et al.	6,663,647 B2	12/2003	Reiley et al.
5,891,147 A	4/1999	Moskovitz	6,666,866 B2	12/2003	Martz et al.
5,895,426 A	4/1999	Scarborough et al.	6,679,886 B2	1/2004	Weikel et al.
5,899,908 A	5/1999	Kuslich et al.	6,682,535 B2	1/2004	Hoogland
5,928,238 A	7/1999	Scarborough et al.	6,685,742 B1	2/2004	Jackson
5,953,820 A	9/1999	Vasudeva	6,709,458 B2	3/2004	Michelson
5,961,522 A	10/1999	Mehdizadeh	6,712,853 B2	3/2004	Kuslich
5,976,146 A	11/1999	Ogawa et al.	6,719,773 B1	4/2004	Boucher et al.
6,008,433 A	12/1999	Stone	6,719,794 B2	4/2004	Gerber et al.
6,033,405 A	3/2000	Winslow et al.	6,723,095 B2	4/2004	Hammerslag
6,045,580 A	4/2000	Scarborough et al.	6,733,534 B2	5/2004	Sherman
6,063,088 A	5/2000	Winslow	6,740,093 B2	5/2004	Hochschuler et al.
RE36,758 E	6/2000	Fitz	6,751,875 B2	6/2004	Jones
6,080,155 A	6/2000	Michelson	6,770,074 B2	8/2004	Michelson
6,090,143 A	7/2000	Meriwether et al.	6,793,679 B2	9/2004	Michelson
6,096,038 A	8/2000	Michelson	6,805,715 B2	10/2004	Reuter et al.
6,099,531 A	8/2000	Bonutti	6,808,537 B2	10/2004	Michelson
6,102,950 A	8/2000	Vaccaro	6,823,871 B2	11/2004	Schmieding
6,113,602 A	9/2000	Sand	6,840,941 B2	1/2005	Rogers et al.
6,149,650 A	11/2000	Michelson	6,851,430 B2	2/2005	Tsou
RE37,005 E	12/2000	Michelson et al.	6,875,213 B2	4/2005	Michelson
6,159,245 A	12/2000	Meriwether et al.	6,899,719 B2	5/2005	Reiley et al.
6,176,882 B1	1/2001	Biedermann et al.	6,921,403 B2	7/2005	Cragg et al.
6,179,873 B1	1/2001	Zientek	6,923,813 B2	8/2005	Phillips et al.
6,190,388 B1	2/2001	Michelson et al.	6,958,077 B2	10/2005	Suddaby
6,190,414 B1	2/2001	Young et al.	6,962,606 B2	11/2005	Michelson
6,193,757 B1	2/2001	Foley et al.	6,964,686 B2	11/2005	Gordon
6,200,322 B1	3/2001	Branch et al.	6,966,930 B2	11/2005	Arnin et al.
6,210,412 B1	4/2001	Michelson	6,972,035 B2	12/2005	Michelson
RE37,161 E	5/2001	Michelson et al.	6,974,478 B2	12/2005	Reiley et al.
6,224,595 B1	5/2001	Michelson	6,979,333 B2	12/2005	Hammerslag
6,224,607 B1	5/2001	Michelson	6,986,772 B2	1/2006	Michelson
6,224,630 B1	5/2001	Bao et al.	7,001,385 B2	2/2006	Bonutti
6,245,108 B1	6/2001	Biscup	7,008,453 B1	3/2006	Michelson
6,248,110 B1	6/2001	Reiley et al.	7,033,362 B2	4/2006	McGahan et al.
D444,878 S	7/2001	Walter	7,033,392 B2	4/2006	Schmiel et al.
D445,188 S	7/2001	Walter	7,033,394 B2	4/2006	Michelson
6,264,656 B1	7/2001	Michelson	7,066,961 B2	6/2006	Michelson
6,267,763 B1	7/2001	Castro	D524,443 S	7/2006	Blain
6,270,498 B1	8/2001	Michelson	7,083,623 B2	8/2006	Michelson
6,283,966 B1	9/2001	Boufburg	7,090,698 B2	8/2006	Fallin et al.
6,315,795 B1	11/2001	Scarborough et al.	7,096,972 B2	8/2006	Orozco, Jr.
6,325,827 B1	12/2001	Lin	7,101,398 B2	9/2006	Dooris et al.
6,371,984 B1	4/2002	Van Dyke et al.	7,115,128 B2	10/2006	Michelson
6,371,988 B1	4/2002	Pafford et al.	7,118,598 B2	10/2006	Michelson
6,402,784 B1	6/2002	Wardlaw	7,128,760 B2	10/2006	Michelson
6,423,063 B1	7/2002	Bonutti	7,156,877 B2	1/2007	Lotz et al.
			7,166,110 B2	1/2007	Yundt
			7,175,023 B2	2/2007	Martin
			7,179,263 B2	2/2007	Zdeblick et al.
			7,207,991 B2	4/2007	Michelson

(56)

References Cited

U.S. PATENT DOCUMENTS

D541,940 S	5/2007	Blain	7,914,530 B2	3/2011	Michelson
7,220,280 B2	5/2007	Kast et al.	7,918,891 B1	4/2011	Curran et al.
7,255,703 B2	8/2007	Mujwid et al.	7,922,729 B2	4/2011	Michelson
7,261,739 B2	8/2007	Ralph et al.	7,922,766 B2	4/2011	Grob et al.
7,264,622 B2	9/2007	Michelson	7,935,136 B2	5/2011	Alamin et al.
7,273,498 B2	9/2007	Bianchi et al.	7,938,857 B2	5/2011	Krueger et al.
7,288,093 B2	10/2007	Michelson	7,942,903 B2	5/2011	Moskowitz et al.
7,291,149 B1	11/2007	Michelson	7,988,712 B2	8/2011	Hale et al.
7,300,440 B2	11/2007	Zdeblick et al.	7,988,714 B2	8/2011	Puekert et al.
7,326,211 B2	2/2008	Padget et al.	7,998,174 B2	8/2011	Malandain et al.
7,326,214 B2	2/2008	Michelson	8,007,534 B2	8/2011	Michelson
7,371,238 B2	5/2008	Soboleski et al.	8,029,540 B2	10/2011	Winslow et al.
7,399,303 B2	7/2008	Michelson	8,043,334 B2	10/2011	Fisher et al.
7,410,501 B2	8/2008	Michelson	8,052,728 B2	11/2011	Hestad
7,431,722 B1	10/2008	Michelson	8,062,303 B2	11/2011	Berry et al.
7,445,636 B2	11/2008	Michelson	8,066,705 B2	11/2011	Michelson
7,452,359 B1	11/2008	Michelson	D650,481 S	12/2011	Gottlieb et al.
7,452,369 B2	11/2008	Barry	8,097,034 B2	1/2012	Michelson
7,465,304 B1	12/2008	Haufe et al.	8,100,944 B2	1/2012	Laurysen et al.
7,476,226 B2	1/2009	Weikel et al.	D653,757 S	2/2012	Binder
7,476,251 B2	1/2009	Zucherman et al.	8,114,158 B2	2/2012	Carl et al.
7,479,160 B2	1/2009	Branch et al.	8,118,838 B2	2/2012	Winslow et al.
7,491,205 B1	2/2009	Michelson	8,128,660 B2	3/2012	Mitchel et al.
7,491,240 B1	2/2009	Carver et al.	8,133,261 B2	3/2012	Fisher et al.
7,500,992 B2	3/2009	Li	8,142,503 B2	3/2012	Malone
7,517,358 B2	4/2009	Peterson	8,147,553 B2	4/2012	Vresilovic et al.
7,524,333 B2	4/2009	Lambrecht et al.	8,162,981 B2	4/2012	Vestgaarden
7,569,054 B2	8/2009	Michelson	8,172,877 B2	5/2012	Winslow et al.
7,569,057 B2	8/2009	Liu et al.	8,177,872 B2	5/2012	Nelson et al.
7,580,743 B2	8/2009	Bourlion et al.	8,197,513 B2	6/2012	Fisher et al.
7,591,851 B2	9/2009	Winslow et al.	8,206,418 B2	6/2012	Triplett et al.
7,601,170 B2	10/2009	Winslow et al.	8,267,966 B2	9/2012	McCormack et al.
7,608,077 B2	10/2009	Cragg et al.	D674,900 S	1/2013	Janice et al.
7,608,107 B2	10/2009	Michelson	8,348,979 B2	1/2013	McCormack
7,615,079 B2	11/2009	Flickinger et al.	8,361,152 B2	1/2013	McCormack et al.
7,618,451 B2	11/2009	Berez et al.	8,366,748 B2	2/2013	Kleiner
7,632,291 B2	12/2009	Stephens et al.	8,382,767 B2	2/2013	Wassinger et al.
7,641,664 B2	1/2010	Pagano	D677,791 S	3/2013	Danacioglu et al.
7,648,509 B2	1/2010	Stark	8,394,107 B2	3/2013	Fanger et al.
7,648,523 B2	1/2010	Mirkovic et al.	8,394,129 B2	3/2013	Morgenstern et al.
7,655,027 B2	2/2010	Michelson	D681,205 S	4/2013	Farris et al.
7,655,043 B2	2/2010	Peterman et al.	8,425,558 B2	4/2013	McCormack et al.
7,662,173 B2	2/2010	Cragg et al.	8,512,347 B2	8/2013	McCormack et al.
D611,147 S	3/2010	Hanson et al.	8,523,908 B2	9/2013	Malone
7,682,378 B2	3/2010	Truckai et al.	8,529,609 B2	9/2013	Helgerson et al.
7,686,805 B2	3/2010	Michelson	8,623,054 B2	1/2014	McCormack et al.
7,686,807 B2	3/2010	Padget et al.	8,668,722 B2	3/2014	Pavlov et al.
7,699,878 B2	4/2010	Pavlov et al.	8,753,345 B2	6/2014	Mccormack et al.
D615,653 S	5/2010	Horton	8,753,347 B2	6/2014	McCormack et al.
7,708,761 B2	5/2010	Petersen	8,764,755 B2	7/2014	Michelson
7,722,619 B2	5/2010	Michelson	8,828,062 B2	9/2014	McCormack et al.
D619,719 S	7/2010	Pannu	8,834,530 B2	9/2014	McCormack
D620,113 S	7/2010	Courtney et al.	8,845,727 B2	9/2014	Gottlieb et al.
7,763,024 B2	7/2010	Bertagnoli et al.	8,870,882 B2	10/2014	Kleiner
7,763,050 B2	7/2010	Winslow et al.	D723,690 S	3/2015	McCormack et al.
7,776,090 B2	8/2010	Winslow et al.	D723,691 S *	3/2015	McCormack D24/155
D623,748 S	9/2010	Horton et al.	8,998,905 B2	4/2015	Marik et al.
D623,749 S	9/2010	Horton et al.	9,005,288 B2	4/2015	Mccormack et al.
7,789,898 B2	9/2010	Peterman	9,011,492 B2	4/2015	McCormack et al.
D627,468 S	11/2010	Richter et al.	D732,667 S	6/2015	McCormack et al.
7,824,431 B2	11/2010	McCormack	9,186,193 B2	11/2015	Kleiner et al.
7,837,713 B2	11/2010	Peterson	D745,156 S	12/2015	McCormack et al.
7,846,183 B2	12/2010	Blain	9,211,198 B2	12/2015	Michelson
7,846,184 B2	12/2010	Sasso et al.	9,220,608 B2	12/2015	McKay
7,850,733 B2	12/2010	Baynham et al.	D750,249 S	2/2016	Grimberg, Jr. et al.
7,862,589 B2	1/2011	Thramann	9,271,765 B2	3/2016	Blain
7,867,277 B1	1/2011	Tohmeh	9,333,086 B2	5/2016	McCormack et al.
D631,967 S	2/2011	Horton	9,358,127 B2	6/2016	Duffield et al.
7,879,098 B1	2/2011	Simmons, Jr.	9,381,049 B2	7/2016	McCormack et al.
7,887,565 B2	2/2011	Michelson	9,427,264 B2	8/2016	Kleiner et al.
7,892,261 B2	2/2011	Bonutti	9,504,583 B2	11/2016	Blain
7,892,286 B2	2/2011	Michelson	9,622,791 B2	4/2017	Mccormack et al.
7,896,803 B2	3/2011	Schara et al.	9,622,873 B2	4/2017	Mccormack
7,896,903 B2	3/2011	Link	9,622,874 B2	4/2017	Mccormack et al.
7,901,439 B2	3/2011	Horton	9,629,665 B2	4/2017	Mccormack et al.
			9,717,403 B2	8/2017	Kleiner et al.
			9,937,053 B2	4/2018	Melkent et al.
			10,039,649 B2	8/2018	Mccormack et al.
			10,149,673 B2	12/2018	Mccormack et al.

(56)

References Cited

U.S. PATENT DOCUMENTS

10,172,721 B2	1/2019	Mccormack et al.	2006/0004367 A1	1/2006	Alamin et al.
D841,165 S *	2/2019	McCormack D24/155	2006/0015184 A1	1/2006	Winterbottom et al.
D841,167 S	2/2019	Ricca et al.	2006/0036243 A1	2/2006	Sasso et al.
10,201,375 B2	2/2019	Mccormack et al.	2006/0036247 A1	2/2006	Michelson
10,206,787 B2 *	2/2019	Voellmicke A61F 2/447	2006/0036323 A1	2/2006	Carl et al.
10,219,910 B2	3/2019	Mccormack	2006/0041311 A1	2/2006	McLeer
10,226,285 B2	3/2019	Mccormack et al.	2006/0058793 A1	3/2006	Michelson
10,238,501 B2	3/2019	Mccormack et al.	2006/0058878 A1	3/2006	Michelson
10,327,913 B2	6/2019	Palmatier et al.	2006/0069442 A1	3/2006	Michelson
10,456,175 B2	10/2019	McCormack et al.	2006/0079905 A1	4/2006	Beyar et al.
10,568,666 B2	2/2020	McCormack et al.	2006/0079962 A1	4/2006	Michelson
10,588,672 B2	3/2020	McCormack et al.	2006/0085068 A1	4/2006	Barry
D884,895 S	5/2020	McCormack et al.	2006/0085074 A1	4/2006	Raiszadeh
D887,552 S	6/2020	Tanaka et al.	2006/0095028 A1	5/2006	Bleich
10,682,243 B2	6/2020	Phan et al.	2006/0095036 A1	5/2006	Hammerslag
2001/0004710 A1	6/2001	Felt et al.	2006/0111779 A1	5/2006	Peterson
2001/0047208 A1	11/2001	Michelson	2006/0111780 A1	5/2006	Petersen
2001/0053914 A1	12/2001	Landry et al.	2006/0111781 A1	5/2006	Petersen
2002/0026195 A1	2/2002	Layne et al.	2006/0142762 A1	6/2006	Michelson
2002/0068941 A1	6/2002	Hanson et al.	2006/0149289 A1	7/2006	Winslow et al.
2002/0107519 A1	8/2002	Dixon et al.	2006/0184172 A1	8/2006	Michelson
2002/0143343 A1	10/2002	Castro	2006/0189991 A1	8/2006	Bickley
2002/0147496 A1	10/2002	Belef et al.	2006/0190081 A1	8/2006	Kraus et al.
2002/0147497 A1	10/2002	Belef et al.	2006/0195109 A1	8/2006	McGahan et al.
2002/0165612 A1	11/2002	Gerber et al.	2006/0200137 A1	9/2006	Soboleski et al.
2002/0169471 A1	11/2002	Ferdinand	2006/0200138 A1	9/2006	Michelson
2002/0177866 A1	11/2002	Weikel et al.	2006/0200139 A1	9/2006	Michelson
2003/0023312 A1	1/2003	Thalgott	2006/0206118 A1	9/2006	Kim et al.
2003/0028251 A1	2/2003	Mathews	2006/0217812 A1	9/2006	Lambrecht et al.
2003/0032962 A1	2/2003	McGahan et al.	2006/0229627 A1	10/2006	Hunt et al.
2003/0033017 A1	2/2003	Lotz et al.	2006/0235391 A1	10/2006	Sutterlin, III
2003/0105526 A1	6/2003	Bryant et al.	2006/0241597 A1	10/2006	Mitchell et al.
2003/0109928 A1	6/2003	Pasquet et al.	2006/0241626 A1	10/2006	McGahan et al.
2003/0139816 A1	7/2003	Michelson	2006/0241758 A1	10/2006	Peterman et al.
2003/0144737 A1	7/2003	Sherman	2006/0247632 A1	11/2006	Winslow et al.
2003/0149438 A1	8/2003	Nichols et al.	2006/0247633 A1	11/2006	Winslow et al.
2003/0158553 A1	8/2003	Michelson	2006/0247650 A1	11/2006	Yerby et al.
2003/0225416 A1	12/2003	Bonvallet et al.	2006/0259142 A1	11/2006	Dooris et al.
2004/0059337 A1	3/2004	Hanson et al.	2006/0271195 A1	11/2006	Thramann
2004/0073217 A1	4/2004	Michelson	2006/0276790 A1	12/2006	Dawson et al.
2004/0087948 A1	5/2004	Suddaby	2006/0276801 A1	12/2006	Yerby et al.
2004/0087956 A1	5/2004	Weikel et al.	2006/0276897 A1	12/2006	Winslow et al.
2004/0106999 A1	6/2004	Mathews	2006/0293663 A1	12/2006	Walkenhorst et al.
2004/0133277 A1	7/2004	Michelson	2007/0016195 A1	1/2007	Winslow et al.
2004/0133280 A1	7/2004	Trieu	2007/0016196 A1	1/2007	Winslow et al.
2004/0162562 A1	8/2004	Martz	2007/0016218 A1	1/2007	Winslow et al.
2004/0215344 A1	10/2004	Hochshculer et al.	2007/0032871 A1	2/2007	Michelson
2005/0010294 A1	1/2005	Michelson	2007/0043362 A1	2/2007	Malandain et al.
2005/0015097 A1	1/2005	Mujwid et al.	2007/0050031 A1	3/2007	Khosrowshahi
2005/0015149 A1	1/2005	Michelson	2007/0055245 A1	3/2007	Sasso et al.
2005/0027358 A1	2/2005	Suddaby	2007/0055263 A1	3/2007	Way et al.
2005/0033432 A1	2/2005	Gordon et al.	2007/0073402 A1	3/2007	Vresilovic et al.
2005/0038511 A1	2/2005	Martz et al.	2007/0083265 A1	4/2007	Malone
2005/0049705 A1	3/2005	Hale et al.	2007/0123863 A1	5/2007	Winslow et al.
2005/0055096 A1	3/2005	Serhan et al.	2007/0123888 A1	5/2007	Bleich et al.
2005/0065518 A1	3/2005	Michelson	2007/0135814 A1	6/2007	Farris
2005/0065519 A1	3/2005	Michelson	2007/0135921 A1	6/2007	Park
2005/0065608 A1	3/2005	Michelson	2007/0149976 A1	6/2007	Hale et al.
2005/0065609 A1	3/2005	Wardlaw	2007/0149983 A1	6/2007	Link
2005/0080422 A1	4/2005	Otte et al.	2007/0150061 A1	6/2007	Trieu
2005/0090829 A1	4/2005	Martz et al.	2007/0161991 A1	7/2007	Altarac et al.
2005/0090901 A1	4/2005	Studer	2007/0162138 A1	7/2007	Heinz
2005/0119680 A1	6/2005	Dykes	2007/0179617 A1	8/2007	Brown et al.
2005/0124993 A1	6/2005	Chappuis	2007/0179619 A1	8/2007	Grob et al.
2005/0149192 A1	7/2005	Zucherman et al.	2007/0191861 A1	8/2007	Allard et al.
2005/0159650 A1	7/2005	Raymond et al.	2007/0225721 A1	9/2007	Thelen et al.
2005/0159746 A1	7/2005	Grob et al.	2007/0225812 A1	9/2007	Gill
2005/0177240 A1	8/2005	Blain	2007/0244483 A9	10/2007	Winslow et al.
2005/0182417 A1	8/2005	Pagano	2007/0250167 A1	10/2007	Bray et al.
2005/0216018 A1	9/2005	Sennett	2007/0276491 A1	11/2007	Ahrens
2005/0234455 A1	10/2005	Binder et al.	2007/0282441 A1	12/2007	Stream et al.
2005/0240188 A1	10/2005	Chow et al.	2007/0288014 A1	12/2007	Shaddock et al.
2005/0251146 A1	11/2005	Martz et al.	2007/0293949 A1	12/2007	Salerni et al.
2005/0251257 A1	11/2005	Mitchell et al.	2007/0299451 A1	12/2007	Tulkis
2005/0267480 A1	12/2005	Suddaby	2008/0015581 A1	1/2008	Eckman
			2008/0021457 A1	1/2008	Anderson et al.
			2008/0021464 A1	1/2008	Morin et al.
			2008/0058954 A1	3/2008	Trieu
			2008/0065219 A1	3/2008	Dye

(56)

References Cited

U.S. PATENT DOCUMENTS

2008/0097436 A1 4/2008 Culbert et al.
 2008/0108996 A1 5/2008 Padget et al.
 2008/0140207 A1 6/2008 Olmos et al.
 2008/0154377 A1 6/2008 Voellmicke
 2008/0161810 A1 7/2008 Melkent
 2008/0161929 A1 7/2008 McCormack et al.
 2008/0167657 A1 7/2008 Greenhaigh
 2008/0177311 A1 7/2008 Winslow et al.
 2008/0216846 A1 9/2008 Levin
 2008/0234677 A1 9/2008 Dahners et al.
 2008/0234758 A1 9/2008 Fisher et al.
 2008/0249571 A1 10/2008 Sasso et al.
 2008/0255564 A1 10/2008 Michelson
 2008/0255618 A1 10/2008 Fisher et al.
 2008/0255622 A1 10/2008 Mickiewicz et al.
 2008/0255666 A1 10/2008 Fisher et al.
 2008/0255667 A1 10/2008 Horton
 2008/0275455 A1 11/2008 Berry et al.
 2008/0287955 A1 11/2008 Michelson
 2008/0300685 A1 12/2008 Carls et al.
 2008/0306537 A1 12/2008 Culbert
 2008/0312744 A1 12/2008 Vresilovic et al.
 2009/0131986 A1 5/2009 Lee et al.
 2009/0138053 A1 5/2009 Assell et al.
 2009/0177215 A1 7/2009 Stack et al.
 2009/0177237 A1 7/2009 Zucherman et al.
 2009/0234397 A1 9/2009 Petersen
 2009/0248076 A1 10/2009 Reynolds et al.
 2009/0263461 A1 10/2009 McKay
 2009/0270929 A1 10/2009 Suddaby et al.
 2009/0275994 A1 11/2009 Phan et al.
 2010/0082065 A1 4/2010 Butler et al.
 2010/0086185 A1 4/2010 Weiss
 2010/0093829 A1 4/2010 Gorman
 2010/0111829 A1 5/2010 Drapeau et al.
 2010/0114105 A1 5/2010 Butters et al.
 2010/0114318 A1 5/2010 Gittings et al.
 2010/0145391 A1 6/2010 Kleiner
 2010/0145459 A1 6/2010 Mcdonough et al.
 2010/0211104 A1 8/2010 Moumene et al.
 2010/0286783 A1* 11/2010 Lechmann A61F 2/4455
 623/17.12
 2011/0004247 A1 1/2011 Lechmann et al.
 2011/0022089 A1 1/2011 Assell et al.
 2011/0054613 A1 3/2011 Hansen
 2011/0077686 A1 3/2011 Mishra et al.
 2011/0082548 A1 4/2011 Assell et al.
 2011/0144755 A1 6/2011 Baynham et al.
 2011/0184470 A1 7/2011 Gorek et al.
 2011/0190821 A1 8/2011 Chin et al.
 2011/0245930 A1 10/2011 Alley et al.
 2011/0295327 A1 12/2011 Moskowitz et al.
 2011/0307061 A1 12/2011 Assell et al.
 2012/0010659 A1 1/2012 Angert et al.
 2012/0010662 A1 1/2012 O'Neil et al.
 2012/0010669 A1 1/2012 O'Neil et al.
 2012/0065613 A1 3/2012 Pepper et al.
 2012/0130496 A1 5/2012 Duffield et al.
 2012/0143334 A1 6/2012 Boyce et al.
 2012/0179259 A1 7/2012 Mcdonough et al.
 2012/0215259 A1 8/2012 Cannestra
 2012/0265250 A1 10/2012 Ali
 2012/0283776 A1 11/2012 Mishra
 2012/0323242 A1 12/2012 Tsuang et al.
 2013/0013070 A1 1/2013 McCormack et al.
 2013/0023889 A1 1/2013 Blain et al.
 2013/0110168 A1 5/2013 McCormack et al.
 2013/0110243 A1 5/2013 Patterson et al.
 2013/0123922 A1 5/2013 McCormack et al.
 2013/0144389 A1 6/2013 Bonutti
 2013/0226239 A1 8/2013 Altarac et al.
 2013/0253649 A1 9/2013 Davis
 2013/0274763 A1 10/2013 Drapeau et al.
 2013/0310839 A1 11/2013 McCormack et al.
 2013/0310943 A1 11/2013 McCormack et al.

2013/0317548 A1 11/2013 Malone
 2013/0338720 A1 12/2013 Kleiner
 2014/0012318 A1 1/2014 Goel
 2014/0100657 A1* 4/2014 McCormack A61B 17/1604
 623/17.11
 2014/0135930 A1* 5/2014 Georges A61F 2/4455
 623/17.16
 2014/0172103 A1* 6/2014 O'Neil A61F 2/4611
 623/17.16
 2014/0228959 A1 8/2014 Niemiec et al.
 2014/0296916 A1 10/2014 McCormack et al.
 2015/0025635 A1 1/2015 Laubert
 2015/0100129 A1 4/2015 Waugh et al.
 2015/0201977 A1 7/2015 McCormack et al.
 2015/0297357 A1* 10/2015 McCormack A61B 17/7074
 606/104
 2015/0328005 A1 11/2015 Padovani et al.
 2015/0328010 A1 11/2015 Martynova et al.
 2015/0342648 A1 12/2015 McCormack et al.
 2015/0342649 A1 12/2015 McCormack et al.
 2016/0008040 A1 1/2016 McCormack et al.
 2016/0242754 A1 8/2016 McCormack et al.
 2016/0250035 A1 9/2016 De Villiers et al.
 2016/0317316 A1 11/2016 McCormack et al.
 2017/0027713 A1 2/2017 Kleiner
 2017/0135733 A1 5/2017 Donner et al.
 2017/0189199 A1 7/2017 Maier et al.
 2017/0281360 A1 10/2017 Seifert
 2017/0348027 A1 12/2017 McCormack et al.
 2017/0354444 A1 12/2017 McCormack et al.
 2017/0360571 A1 12/2017 Mesiwala
 2018/0161077 A1 6/2018 McCormack et al.
 2018/0303631 A1 10/2018 Phan et al.
 2019/0209151 A1 7/2019 McCormack et al.
 2019/0239932 A1 8/2019 McCormack et al.
 2019/0240041 A1 8/2019 McCormack et al.
 2019/0247099 A1 8/2019 McCormack et al.
 2019/0307571 A1 10/2019 McCormack
 2019/0307572 A1 10/2019 McCormack et al.
 2019/0350626 A1 11/2019 McCormack et al.
 2020/0085475 A1 3/2020 McCormack et al.
 2020/0155205 A1 5/2020 Tanaka et al.
 2020/0289285 A1 9/2020 Siemionow et al.

FOREIGN PATENT DOCUMENTS

JP 2014516268 A 7/2014
 WO 9641582 A1 12/1996
 WO 99/49818 A1 10/1999
 WO 00/035388 6/2000
 WO 00/53126 A1 9/2000
 WO 01/01895 A1 1/2001
 WO 02/34120 A2 5/2002
 WO 2002/038062 5/2002
 WO 02/076335 A2 10/2002
 WO 02076335 10/2002
 WO 2006058221 6/2006
 WO 2006130791 12/2006
 WO 2007120903 A2 10/2007
 WO 2008083349 A1 7/2008
 WO 2008127978 A2 10/2008
 WO 2008153732 A1 12/2008
 WO 2009089367 7/2009
 WO 2009148619 12/2009
 WO 2010030994 3/2010
 WO 2010074714 7/2010
 WO 2010107692 A1 9/2010
 WO 2011050140 A1 4/2011
 WO 2013043584 A2 3/2013
 WO 2014188280 A2 11/2014
 WO 2016049784 4/2016

OTHER PUBLICATIONS

Atul Goel, Facetal distraction as treatment for single—and multi-level cervical spondylotic radiculopathy and myelopathy: a preliminary report, J Neurosurg Spine, Jun. 2011, pp. 689-696.

(56)

References Cited

OTHER PUBLICATIONS

Press Release, Interventional Spine, Inc., Interventional Spine, Inc. Introduces the PERPOS Fusion Facet Prep Kit, Oct. 14, 2008, 1 Page.

Press Release, minSURG Corp., Orthopedic Development Corporation's TruFUSE Procedure Tops 1,750 Patients in First Year, Sep. 24, 2007, 1 Page.

Press Release, Interventional Spine, Inc., FDA Grants Conditional Approval to Interventional Spine's PercuDyn System IDE Application, Jul. 1, 2008, 1 Page.

Stein, et al., "Percutaneous Facet Joint Fusion: Preliminary Experience," *Journal of Vascular and Interventional Radiology*, Jan.-Feb. 1993, pp. 69-74, vol. 4, No. 1.

Providence Medical Technology, "Cavux Cervical Cages", first available Oct. 5, 2016. (<https://web.archive.org/web/20161005063842/https://providencemt.com/cavux-cervical-cages/>).

Spinal News International, "FDA clears Renovis Surgical 3D-printed titanium standalone cervical cage", first available Apr. 11, 2016. <https://spinalnewsinternational.com/fda-clears-renovis-surgical-3d-printed-titanium-standalone-cervical-cage/>.

Providence Medical Technology, "Posterior Cervical Stabilization System (PCSS)", first available Jun. 21, 2020. (<https://web.archive.org/web/20200621181620/https://providencemt.com/pcss/>).

Research Gate, "DTRAX Posterior Cervical Cage", first available Jul. 2016. (https://www.researchgate.net/figure/DTRAX-Posterior-Cervical-Cage-Note-The-cervical-cages-are-manufactured-from-implant_fig3_305314436).

* cited by examiner

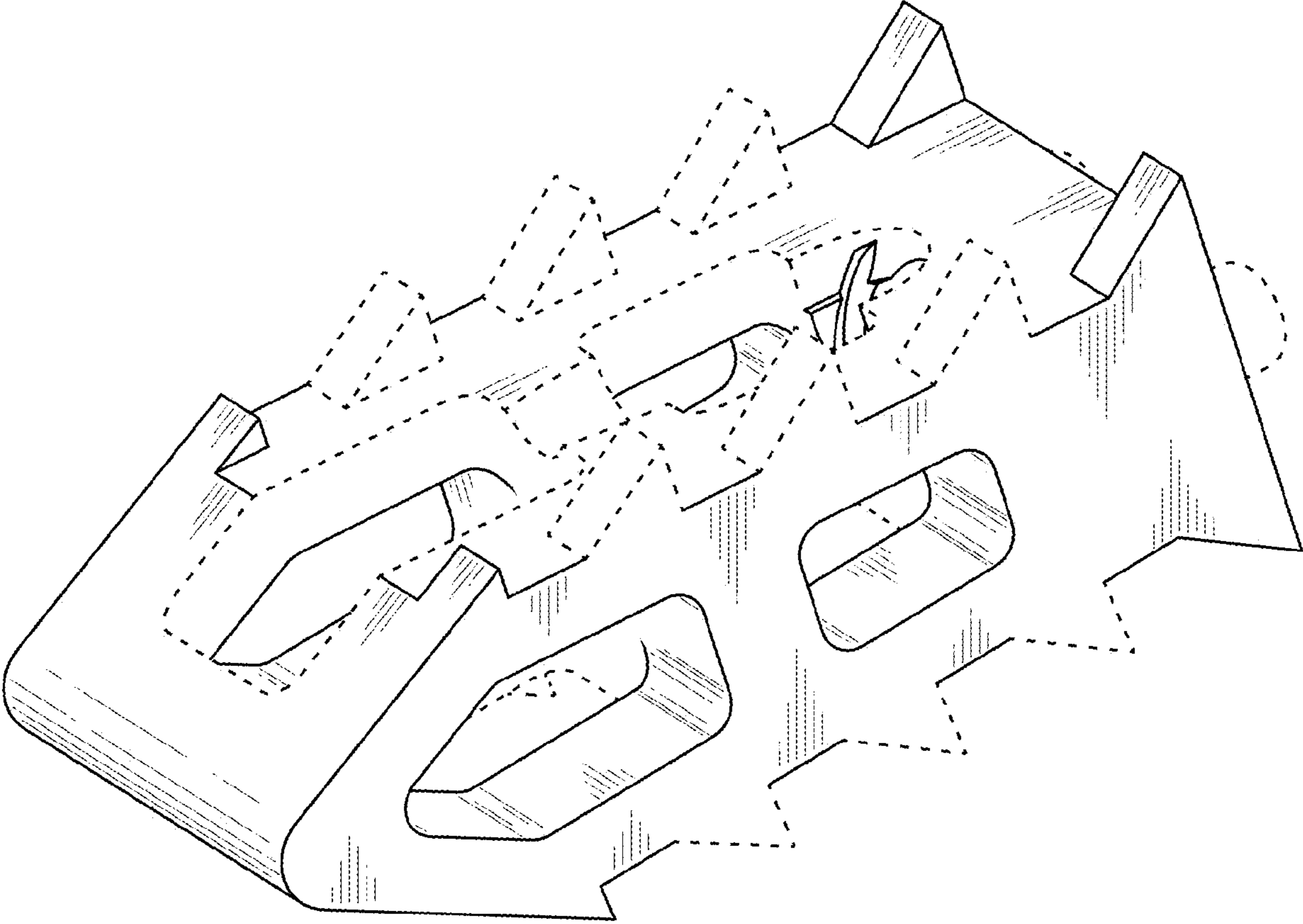


FIG. 1

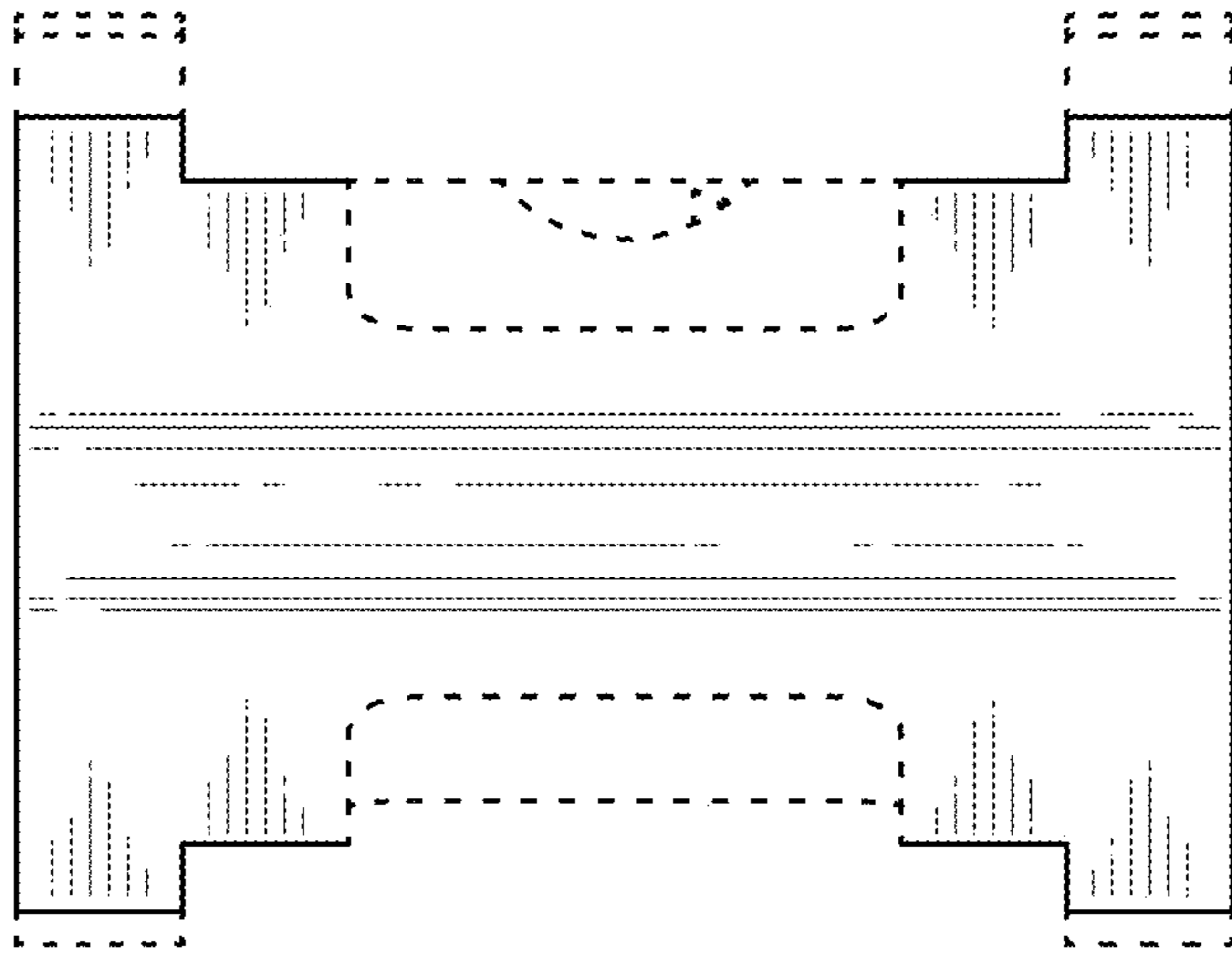


FIG. 2

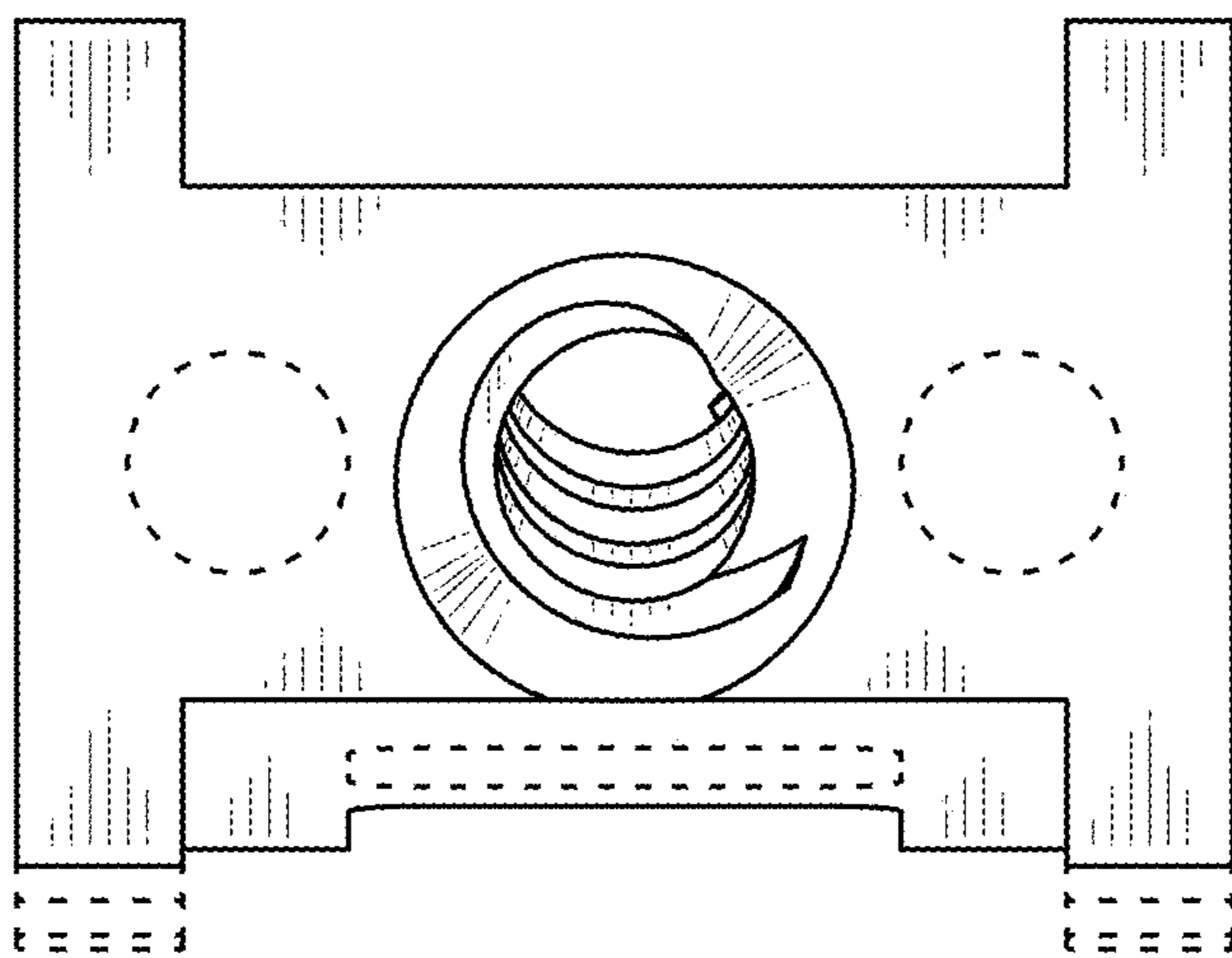


FIG. 3

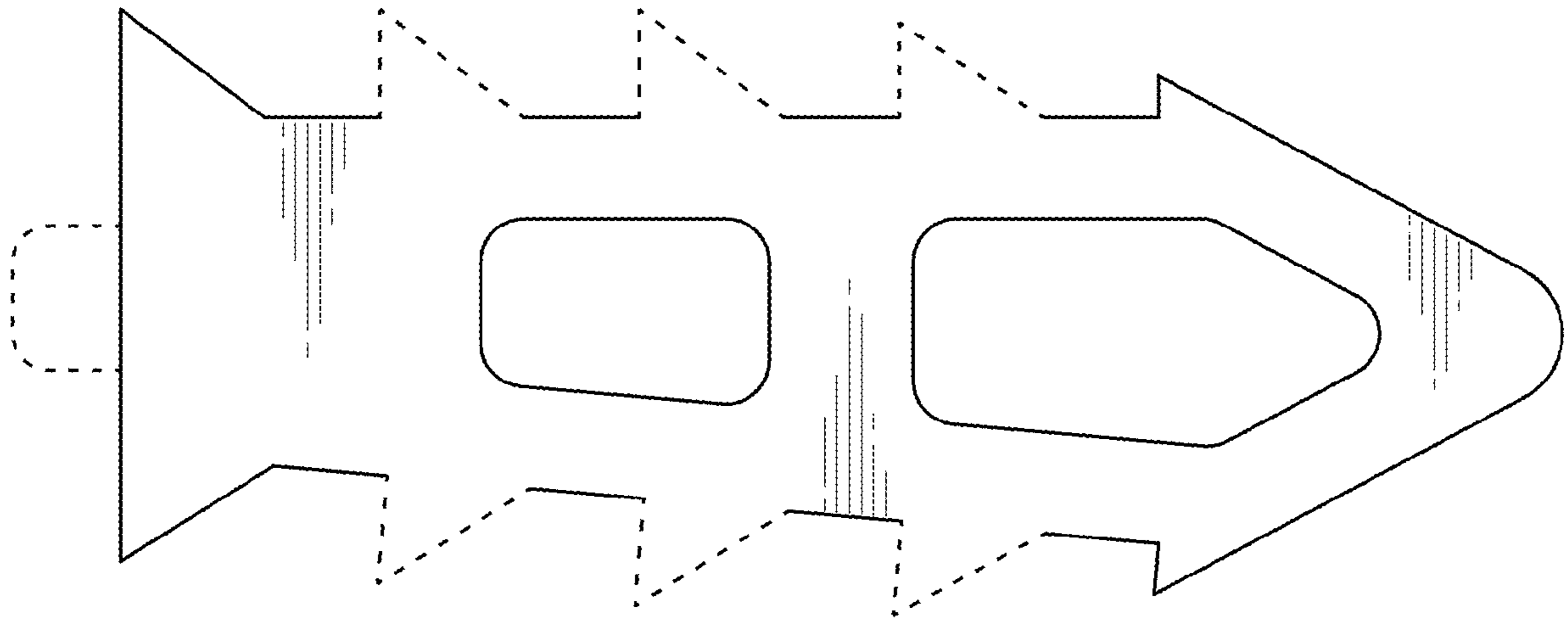


FIG. 4

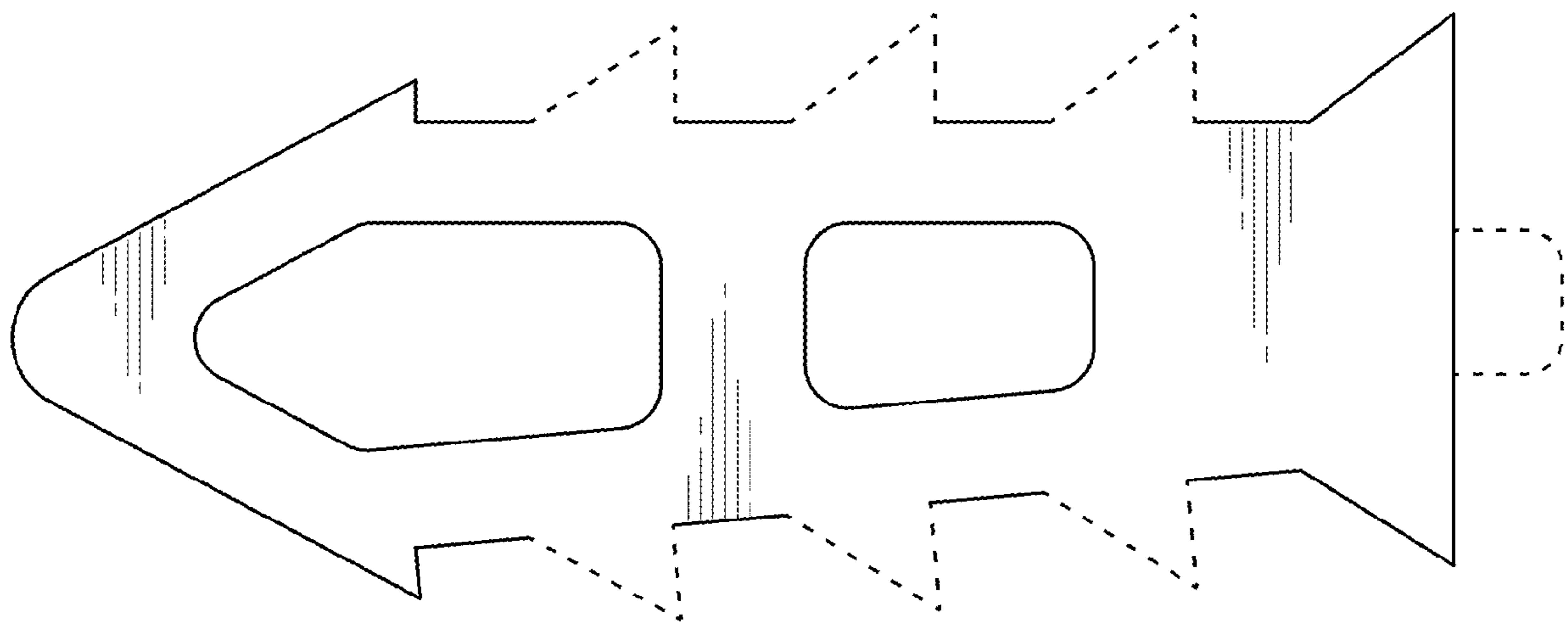


FIG. 5

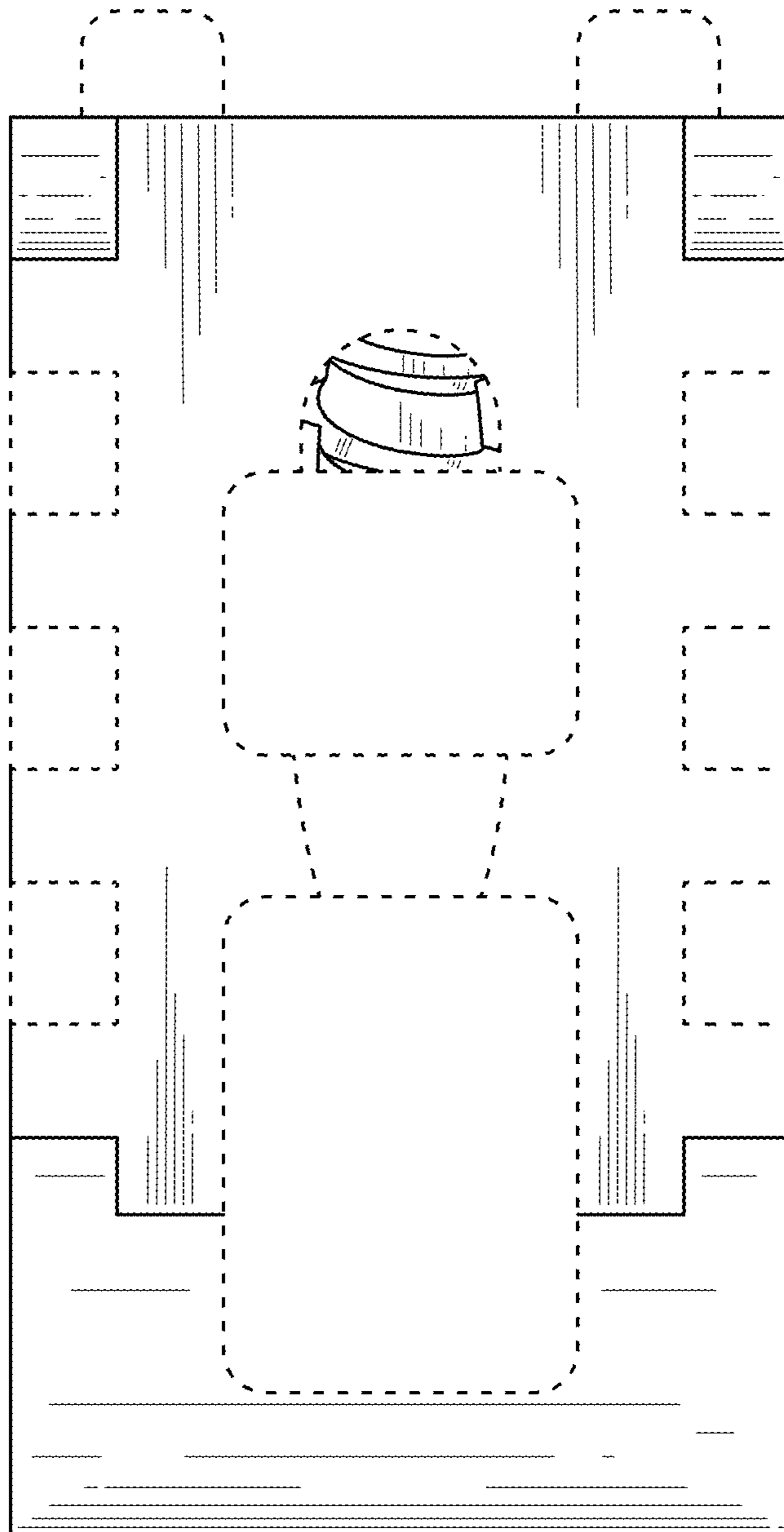


FIG. 6

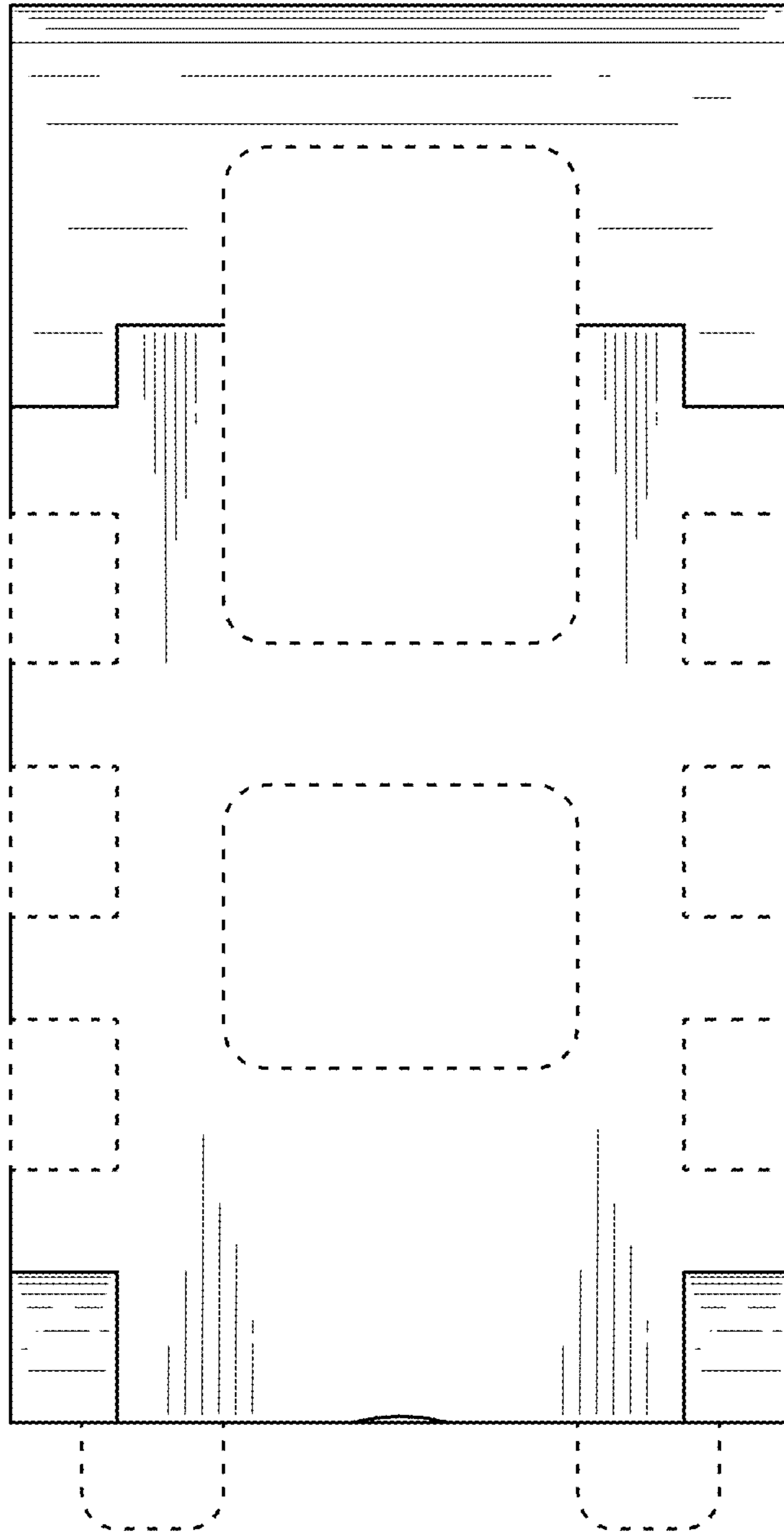


FIG. 7

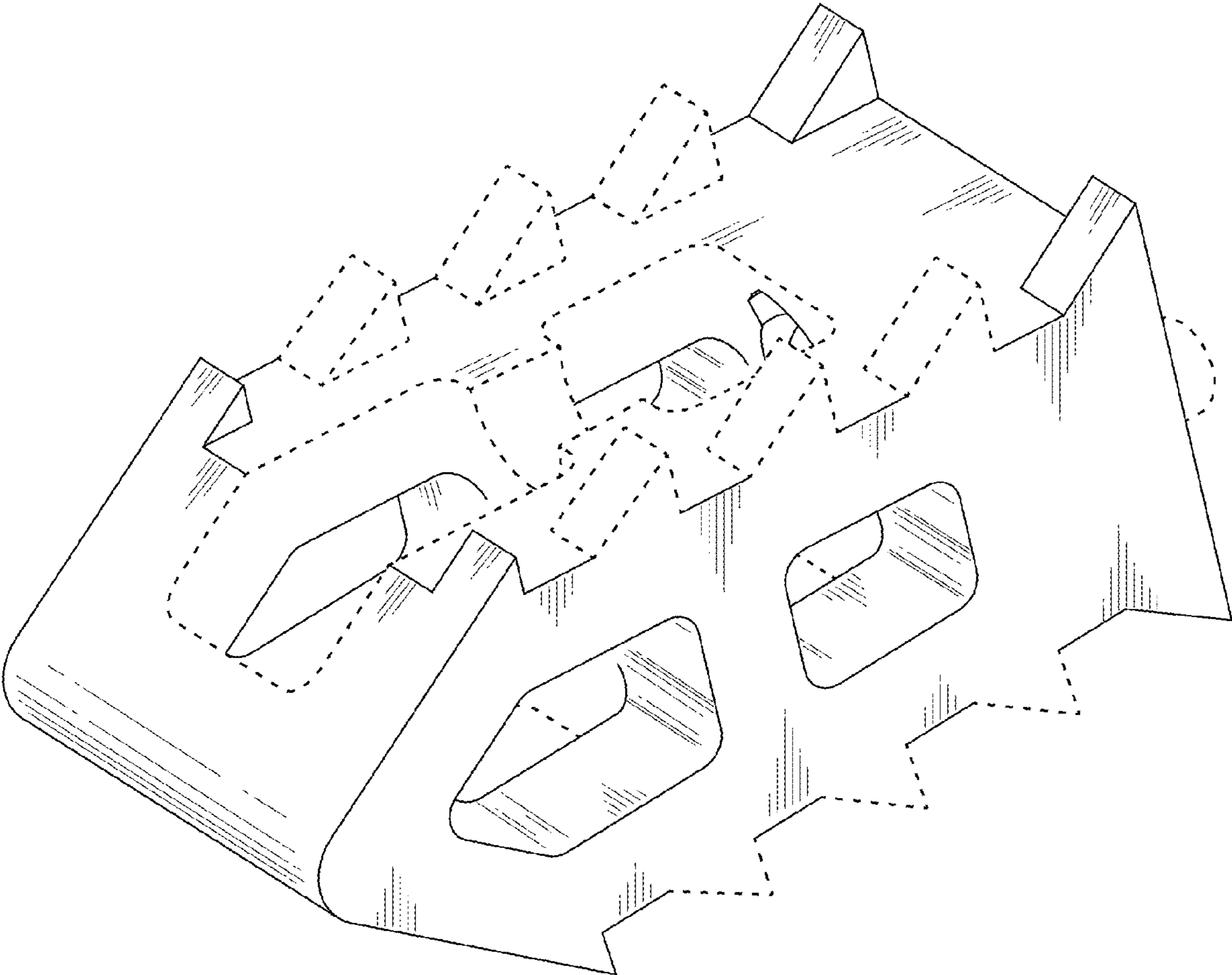


FIG. 8

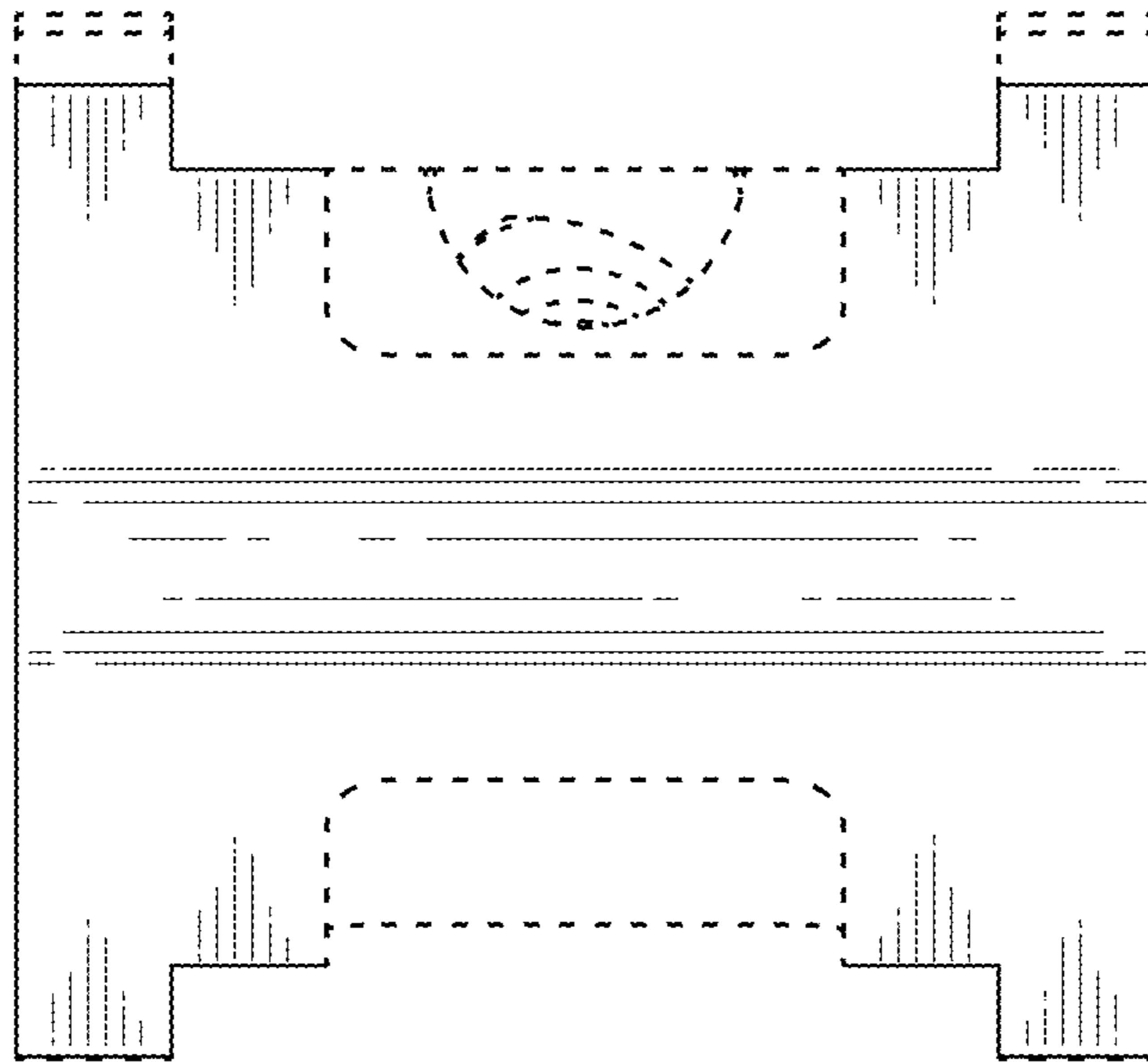


FIG. 9

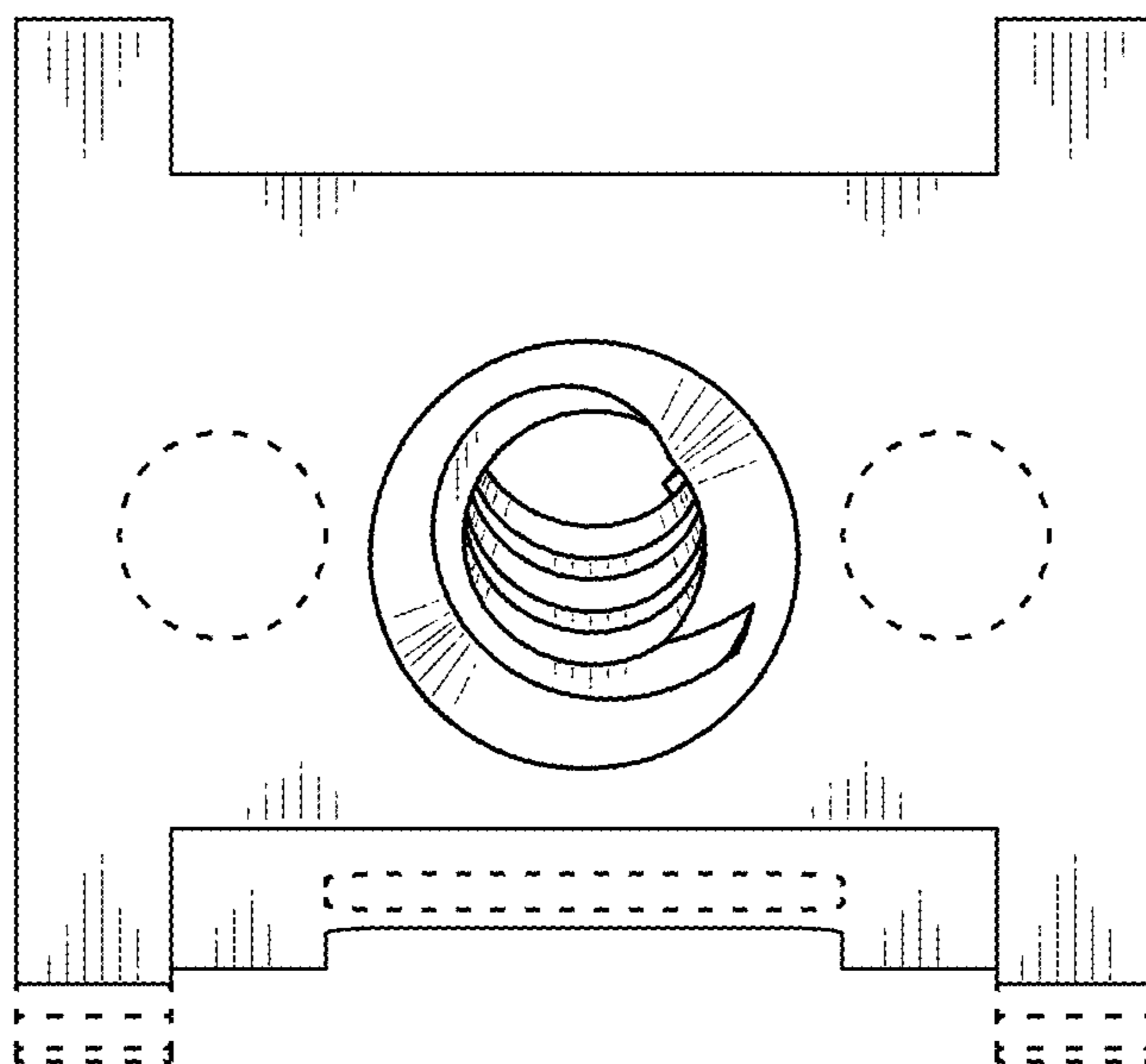


FIG. 10

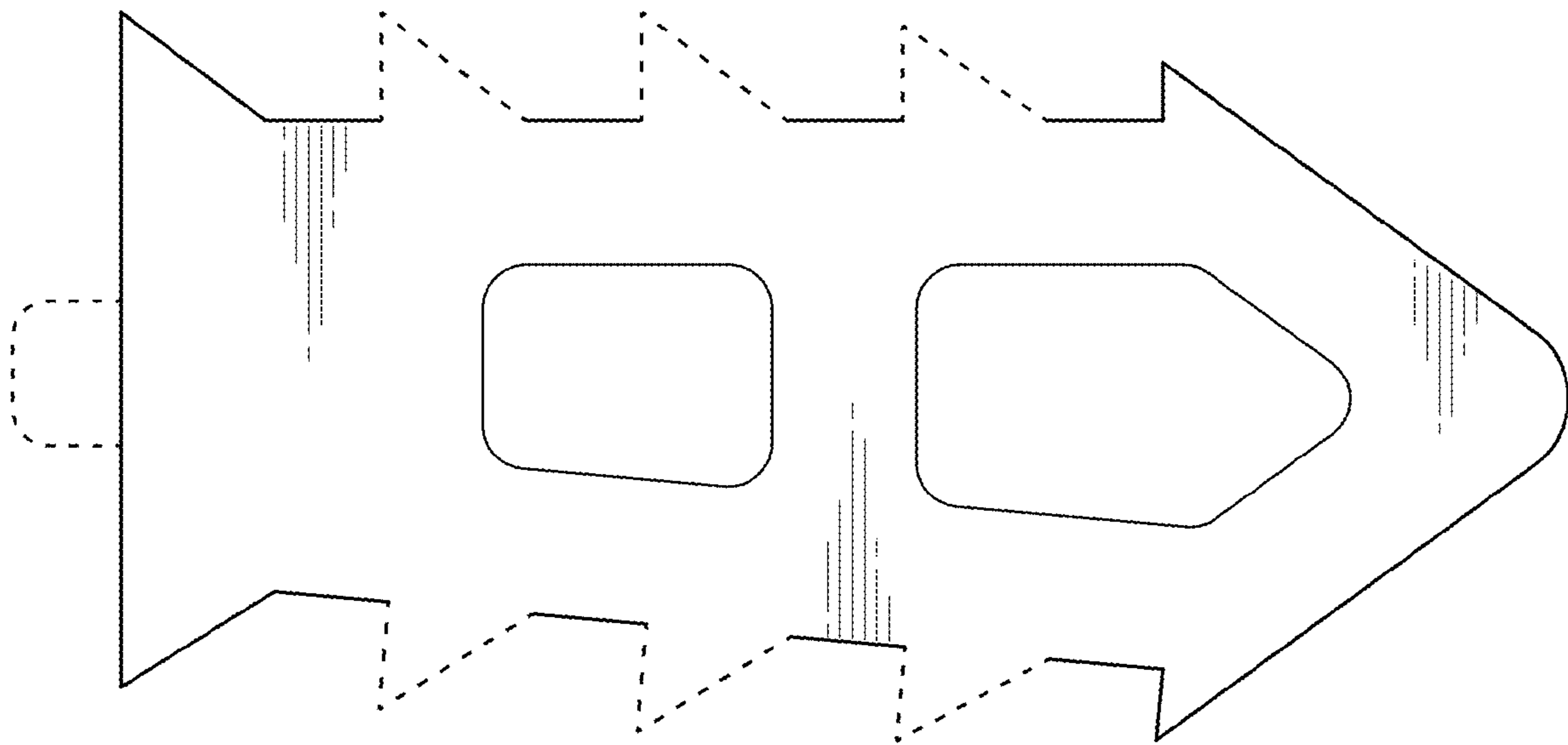


FIG. 11

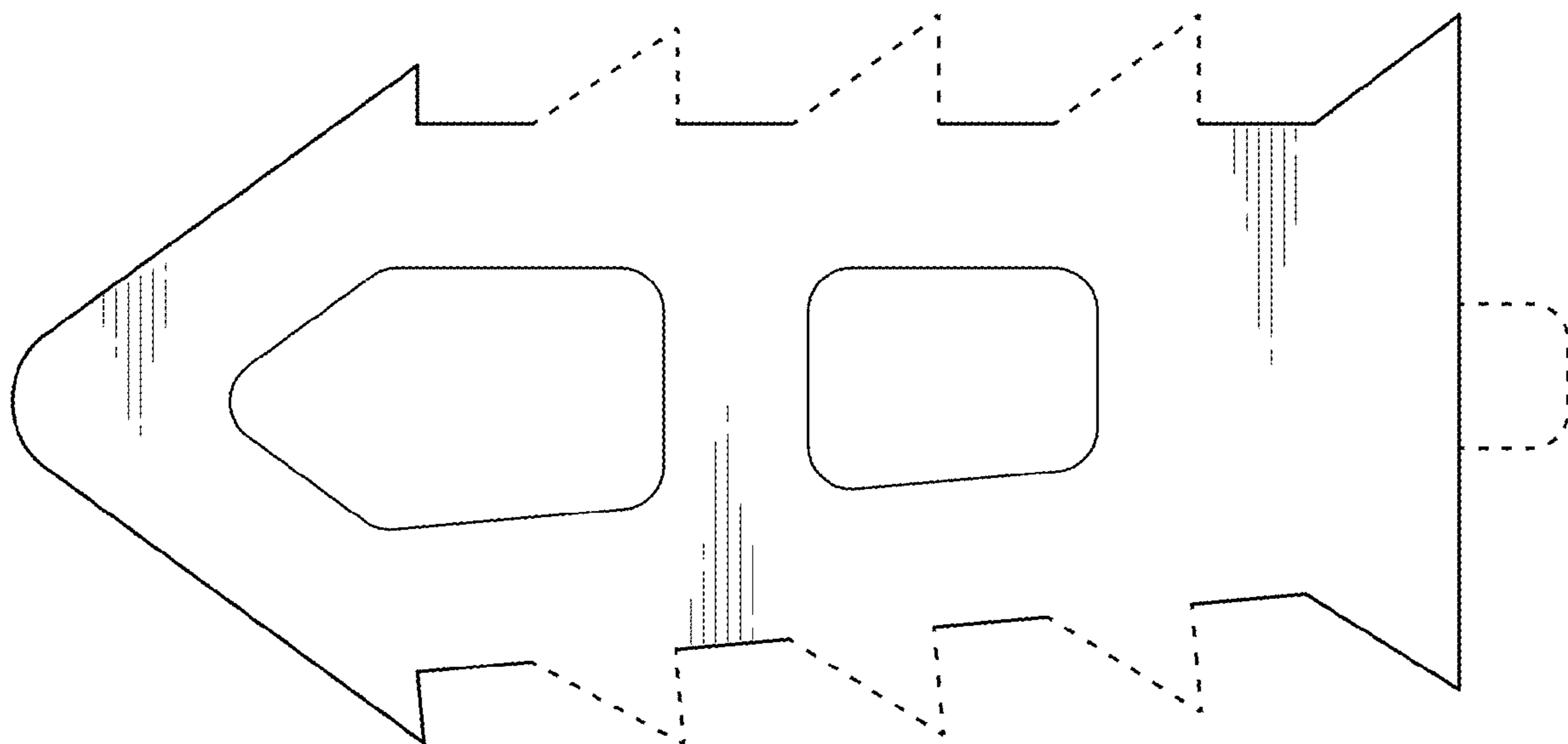


FIG. 12

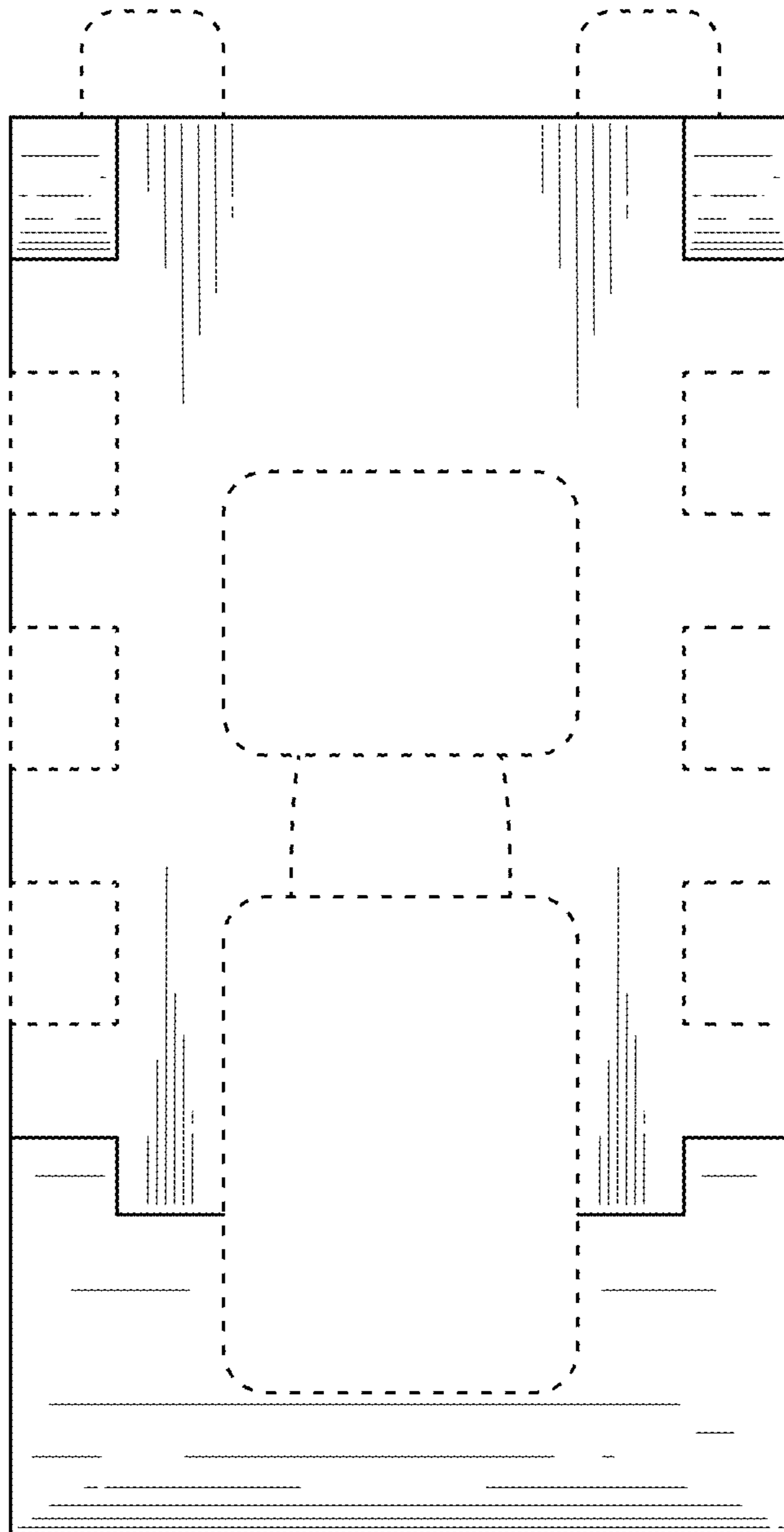


FIG. 13

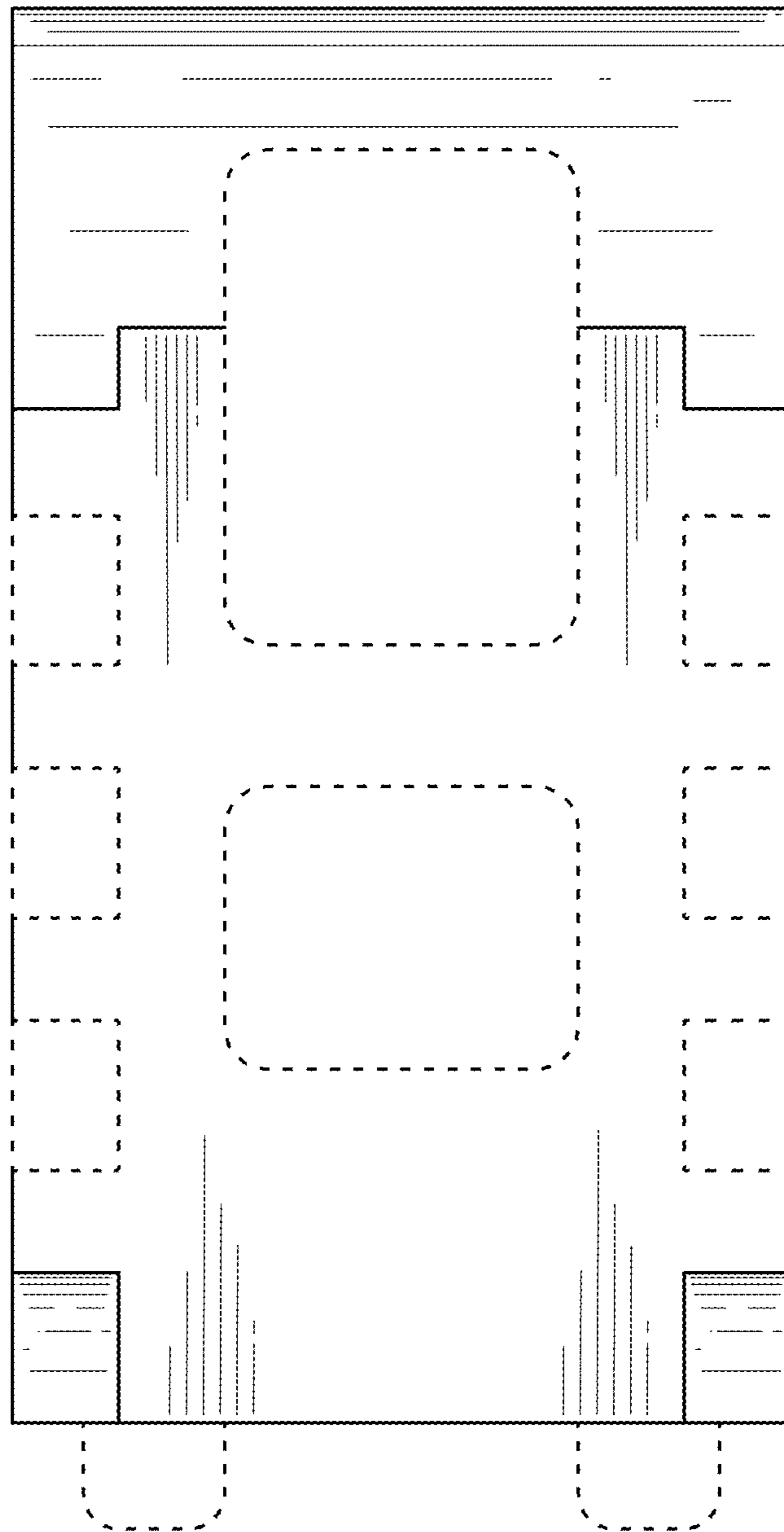


FIG. 14