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(54) **PROSTHETIC HEART VALVE ELEMENT**

5,078,739 A 1/1992 Martin
5,108,420 A 4/1992 Marks
5,314,473 A 5/1994 Godin
5,332,402 A 7/1994 Teitelbaum
5,397,351 A 3/1995 Pavcnik et al.
5,405,378 A 4/1995 Strecker

(71) Applicant: **CARDIOVALVE LTD.**, Or Yehuda (IL)

(72) Inventors: **Ilia Hariton**, Zichron Yaakov (IL); **Boaz Harari**, Ganey Tikva (IL); **Meni Iamberger**, Kfar Saba (IL); **Aviram Baum**, Tel Aviv (IL)

(Continued)

FOREIGN PATENT DOCUMENTS

(73) Assignee: **CARDIOVALVE LTD.**, Or Yehuda (IL)

EP 0170262 A2 2/1986
EP 1264582 A2 12/2002
(Continued)

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OTHER PUBLICATIONS

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Alexander S. Geha, et al., Replacement of degenerated mitral and aortic bioprostheses without explanation Ann Thorac Surg, Jun. 2001; 72:1509-1514.

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

(57) **CLAIM**

USPC **D24/155**

The ornamental design for a prosthetic heart valve element, as shown and described.

(58) **Field of Classification Search**

USPC D24/155
CPC A61F 2/07; A61F 2/90; A61F 2/958; A61F 2002/016; A61F 2002/072; A61F 2002/075; A61F 2002/91541; A61F 2220/0075; A61F 2230/0069

DESCRIPTION

See application file for complete search history.

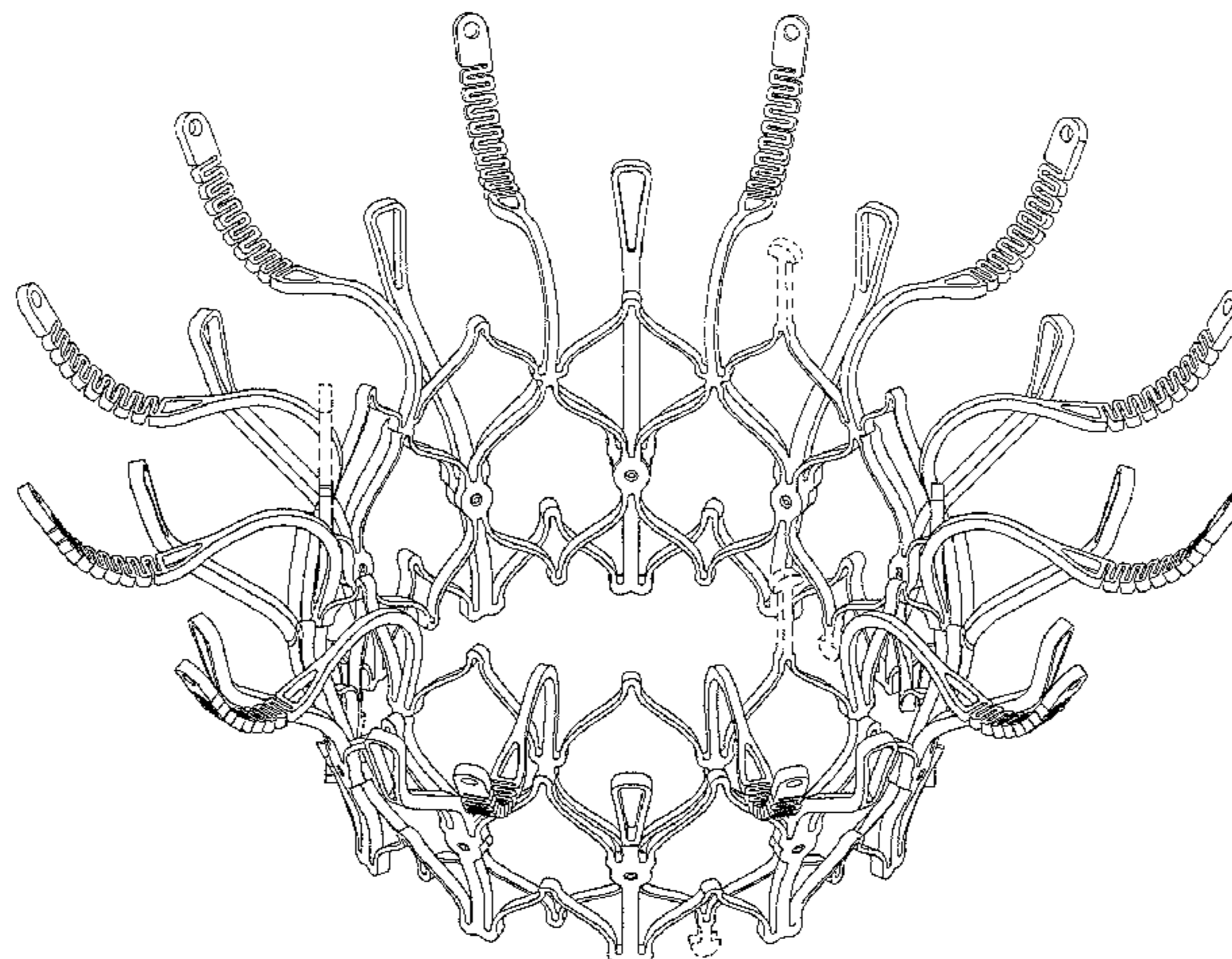
FIG. 1 is a perspective view from above of a prosthetic heart valve element showing a first embodiment of our new design;
FIG. 2 is a perspective view from below thereof;
FIG. 3 is a front side view thereof;
FIG. 4 is a left side view thereof;
FIG. 5 is a top plan view thereof; and,
FIG. 6 is a bottom plan view thereof.
The broken line showing is included for the purpose of illustrating unclaimed subject matter and forms no part of the claimed design.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,261,342 A 4/1981 Aranguren Duo
4,275,469 A 6/1981 Gabbay
4,423,525 A 1/1984 Vallana et al.
4,853,986 A 8/1989 Allen
4,892,541 A 1/1990 Alonso
4,994,077 A 2/1991 Dobben

1 Claim, 6 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

5,443,500 A	8/1995	Sigwart	7,201,772 B2	4/2007	Schwammenthal et al.
5,473,812 A	12/1995	Morris et al.	7,226,477 B2	6/2007	Cox
5,607,444 A	3/1997	Lam	7,288,111 B1	10/2007	Holloway et al.
5,607,470 A	3/1997	Milo	7,316,716 B2	1/2008	Egan
5,647,857 A	7/1997	Anderson et al.	7,329,279 B2	2/2008	Haug et al.
5,702,397 A	12/1997	Goble et al.	7,335,213 B1	2/2008	Hyde et al.
5,765,682 A	6/1998	Bley et al.	7,351,256 B2	4/2008	Hojeibane et al.
5,868,777 A	2/1999	Lam	7,374,573 B2	5/2008	Gabbay
5,873,906 A	2/1999	Lau et al.	7,377,938 B2	5/2008	Sarac et al.
5,954,766 A	9/1999	Zadno-Azizi et al.	7,381,218 B2	6/2008	Schreck
5,980,565 A	11/1999	Jayaraman	7,381,219 B2	6/2008	Salahieh et al.
6,019,787 A	2/2000	Richard et al.	7,404,824 B1	7/2008	Webler et al.
6,042,607 A	3/2000	Williamson, IV et al.	7,422,603 B2	9/2008	Lane
6,059,827 A	5/2000	Fenton, Jr.	7,429,269 B2	9/2008	Schwammenthal et al.
6,074,417 A	6/2000	Peredo	7,442,204 B2	10/2008	Schwammenthal et al.
6,113,612 A	9/2000	Swanson et al.	7,445,630 B2	11/2008	Lashinski et al.
6,120,534 A	9/2000	Ruiz	7,455,677 B2	11/2008	Vargas et al.
6,152,937 A	11/2000	Peterson et al.	7,455,688 B2	11/2008	Furst et al.
6,165,210 A	12/2000	Lau et al.	7,462,162 B2	12/2008	Phan et al.
6,187,020 B1	2/2001	Zegdi et al.	7,481,838 B2	1/2009	Carpentier et al.
6,193,745 B1	2/2001	Fogarty et al.	7,510,575 B2	3/2009	Spenser et al.
6,264,700 B1	7/2001	Kilcoyne et al.	7,513,909 B2	4/2009	Lane et al.
6,287,339 B1	9/2001	Vazquez et al.	7,524,331 B2	4/2009	Birdsall
6,312,465 B1	11/2001	Griffin et al.	7,527,646 B2	5/2009	Rahdert et al.
6,332,893 B1	12/2001	Mortier et al.	7,556,646 B2	7/2009	Yang et al.
6,334,873 B1	1/2002	Lane et al.	7,582,111 B2	9/2009	Krolik et al.
6,350,278 B1	2/2002	Lenker et al.	7,585,321 B2	9/2009	Cribier
6,352,561 B1	3/2002	Leopold et al.	7,597,711 B2	10/2009	Drews et al.
6,391,036 B1	5/2002	Berg et al.	7,611,534 B2	11/2009	Kapadia et al.
6,402,780 B2	6/2002	Williamson, IV et al.	7,621,948 B2	11/2009	Herrmann et al.
6,409,755 B1	6/2002	Vrba	7,625,403 B2	12/2009	Krivoruchko
6,419,696 B1	7/2002	Ortiz et al.	7,632,302 B2	12/2009	Vreeman et al.
6,428,550 B1	8/2002	Vargas et al.	7,648,528 B2	1/2010	Styrc
6,440,164 B1	8/2002	DiMatteo et al.	7,682,380 B2	3/2010	Thornton et al.
6,454,799 B1	9/2002	Schreck	7,708,775 B2	5/2010	Rowe et al.
6,458,153 B1	10/2002	Bailey et al.	7,717,952 B2	5/2010	Case et al.
6,482,228 B1	11/2002	Norred	7,717,955 B2	5/2010	Lane et al.
6,511,491 B2	1/2003	Grudem et al.	7,731,741 B2	6/2010	Eidenschink
6,530,952 B2	3/2003	Vesely	7,748,389 B2	7/2010	Salahieh et al.
6,540,782 B1	4/2003	Snyders	7,753,922 B2	7/2010	Starksen
6,551,350 B1	4/2003	Thornton et al.	7,758,595 B2	7/2010	Allen et al.
6,558,396 B1	5/2003	Inoue	7,758,632 B2	7/2010	Hojeibane et al.
6,558,418 B2	5/2003	Carpentier et al.	7,758,640 B2	7/2010	Vesely
6,569,196 B1	5/2003	Vesely	7,771,467 B2	8/2010	Svensson
6,602,263 B1	8/2003	Swanson et al.	7,771,469 B2	8/2010	Liddicoat
6,616,675 B1	9/2003	Evard et al.	7,776,083 B2	8/2010	Vesely
6,652,556 B1	11/2003	VanTassel et al.	7,780,726 B2	8/2010	Seguin
6,669,724 B2	12/2003	Park et al.	7,785,341 B2	8/2010	Forster et al.
6,682,558 B2	1/2004	Tu et al.	7,799,069 B2	9/2010	Bailey et al.
6,699,256 B1	3/2004	Logan et al.	7,803,181 B2	9/2010	Furst et al.
6,716,244 B2	4/2004	Klaco	7,811,316 B2	10/2010	Kalman et al.
6,719,781 B1	4/2004	Kim	7,824,442 B2	11/2010	Salahieh et al.
6,719,788 B2	4/2004	Cox	7,837,645 B2	11/2010	Bessler et al.
6,730,118 B2	5/2004	Spenser et al.	7,837,727 B2	11/2010	Goetz et al.
6,733,525 B2	5/2004	Yang et al.	7,842,081 B2	11/2010	Yadin
6,764,518 B2	7/2004	Godin	7,850,725 B2	12/2010	Vardi et al.
6,767,362 B2	7/2004	Schreck	7,871,432 B2	1/2011	Bergin
6,797,002 B2	9/2004	Spence et al.	7,871,436 B2	1/2011	Ryan et al.
6,821,297 B2	11/2004	Snyders	7,887,583 B2	2/2011	Macoviak
6,830,585 B1	12/2004	Artof et al.	7,892,281 B2	2/2011	Seguin et al.
6,830,638 B2	12/2004	Boylan et al.	7,896,915 B2	3/2011	Guyenot et al.
6,893,460 B2	5/2005	Spenser et al.	7,914,544 B2	3/2011	Nguyen et al.
6,960,217 B2	11/2005	Bolduc	7,914,569 B2	3/2011	Nguyen et al.
6,964,684 B2	11/2005	Ortiz et al.	7,927,370 B2	4/2011	Webler et al.
6,974,476 B2	12/2005	McGuckin, Jr. et al.	7,942,927 B2	5/2011	Kaye et al.
7,011,681 B2	3/2006	Vesely	7,947,072 B2	5/2011	Yang et al.
7,018,406 B2	3/2006	Seguin et al.	7,947,075 B2	5/2011	Goetz et al.
7,041,132 B2	5/2006	Quijano et al.	7,955,375 B2	6/2011	Agnew
7,077,861 B2	7/2006	Spence	7,955,377 B2	6/2011	Melsheimer
7,101,395 B2	9/2006	Tremulis et al.	7,955,384 B2	6/2011	Rafiee et al.
7,101,396 B2	9/2006	Artof et al.	7,959,666 B2	6/2011	Salahieh et al.
7,137,184 B2	11/2006	Schreck	7,959,672 B2	6/2011	Salahieh et al.
7,172,625 B2	2/2007	Shu et al.	7,967,833 B2	6/2011	Sterman et al.
7,175,656 B2	2/2007	Khairkahan	7,967,857 B2	6/2011	Lane
7,198,646 B2	4/2007	Figulla et al.	7,981,151 B2	7/2011	Rowe
			7,981,153 B2	7/2011	Fogarty et al.
			7,992,567 B2	8/2011	Hirotsuka et al.
			7,993,393 B2	8/2011	Carpentier et al.
			8,002,825 B2	8/2011	Letac et al.

(56)

References Cited

U.S. PATENT DOCUMENTS

8,002,826 B2	8/2011	Seguin		8,267,988 B2	9/2012	Hamer et al.	
8,016,877 B2	9/2011	Seguin et al.		8,277,501 B2	10/2012	Chalekian et al.	
8,016,882 B2	9/2011	Macoviak et al.		8,287,591 B2	10/2012	Keidar et al.	
8,021,420 B2	9/2011	Dolan		8,298,280 B2	10/2012	Yadin et al.	
8,021,421 B2	9/2011	Fogarty et al.		8,303,653 B2	11/2012	Bonhoeffer et al.	
8,025,695 B2	9/2011	Fogarty et al.		8,308,798 B2	11/2012	Pintor et al.	
8,029,518 B2	10/2011	Goldfarb et al.		8,317,853 B2	11/2012	Agnew	
8,029,557 B2	10/2011	Sobrino-Serrano et al.		8,317,855 B2	11/2012	Gregorich et al.	
8,029,564 B2	10/2011	Johnson et al.		8,323,335 B2	12/2012	Rowe et al.	
8,034,104 B2	10/2011	Carpentier et al.		8,328,868 B2	12/2012	Paul et al.	
8,038,720 B2	10/2011	Wallace et al.		8,337,541 B2	12/2012	Quadri et al.	
8,043,360 B2	10/2011	McNamara et al.		8,343,174 B2	1/2013	Goldfarb et al.	
8,048,138 B2	11/2011	Sullivan et al.		8,343,213 B2	1/2013	Salahieh et al.	
8,048,140 B2	11/2011	Purdy		8,348,999 B2	1/2013	Kheradvar et al.	
8,048,153 B2	11/2011	Salahieh et al.		8,366,767 B2	2/2013	Zhang	
8,052,741 B2	11/2011	Bruszewski et al.		8,372,140 B2	2/2013	Hoffman et al.	
8,052,749 B2	11/2011	Salahieh et al.		8,377,119 B2	2/2013	Drews et al.	
8,057,493 B2	11/2011	Goldfarb et al.		8,398,708 B2	3/2013	Meiri et al.	
8,057,532 B2	11/2011	Hoffman		8,403,981 B2	3/2013	Forster et al.	
8,057,540 B2	11/2011	Letac et al.		8,403,983 B2	3/2013	Quadri et al.	
8,062,355 B2	11/2011	Figulla et al.		8,408,214 B2	4/2013	Spenser	
8,062,359 B2	11/2011	Marquez et al.		8,414,644 B2	4/2013	Quadri et al.	
8,070,708 B2	12/2011	Rottenberg et al.		8,425,593 B2	4/2013	Braido et al.	
8,070,800 B2	12/2011	Lock et al.		8,430,934 B2	4/2013	Das	
8,070,802 B2	12/2011	Lamphere et al.		8,444,689 B2	5/2013	Zhang	
8,070,804 B2	12/2011	Hyde et al.		8,449,599 B2	5/2013	Chau et al.	
8,075,611 B2	12/2011	Millwee et al.		8,449,625 B2	5/2013	Campbell et al.	
8,080,054 B2	12/2011	Rowe		8,454,686 B2	6/2013	Alkhatib	
8,083,793 B2	12/2011	Lane et al.		8,460,365 B2	6/2013	Haverkost et al.	
D652,927 S *	1/2012	Braido	A61F 2/91 D24/155	8,474,460 B2	7/2013	Barrett et al.	
D653,341 S *	1/2012	Braido	A61F 2/91 D24/155	8,500,821 B2	8/2013	Sobrino-Serrano et al.	
8,092,518 B2	1/2012	Schreck		8,512,400 B2	8/2013	Tran et al.	
8,092,520 B2	1/2012	Quadri		8,539,662 B2	9/2013	Stacchino et al.	
8,092,521 B2	1/2012	Figulla et al.		8,540,767 B2	9/2013	Zhang	
8,105,377 B2	1/2012	Liddicoat		8,545,544 B2	10/2013	Spenser et al.	
8,109,996 B2	2/2012	Stacchino et al.		8,551,160 B2	10/2013	Figulla et al.	
8,118,866 B2	2/2012	Herrmann et al.		8,551,161 B2	10/2013	Dolan	
8,133,270 B2	3/2012	Kheradvar et al.		8,562,672 B2	10/2013	Bonhoeffer et al.	
8,136,218 B2	3/2012	Millwee et al.		8,579,964 B2	11/2013	Lane et al.	
8,137,398 B2	3/2012	Tuval et al.		8,579,965 B2	11/2013	Bonhoeffer et al.	
8,142,492 B2	3/2012	Forster et al.		8,585,755 B2	11/2013	Chau et al.	
8,142,494 B2	3/2012	Rahdert et al.		8,585,756 B2	11/2013	Bonhoeffer et al.	
8,142,496 B2	3/2012	Berrekouw		8,591,460 B2	11/2013	Wilson et al.	
8,142,497 B2	3/2012	Friedman		8,591,570 B2	11/2013	Revuelta et al.	
8,147,504 B2	4/2012	Ino et al.		8,623,075 B2	1/2014	Murray, III et al.	
8,157,852 B2	4/2012	Bloom et al.		8,623,080 B2	1/2014	Fogarty et al.	
8,157,853 B2	4/2012	Laske et al.		8,626,570 B2	1/2014	Seguin	
8,157,860 B2	4/2012	McNamara et al.		8,628,569 B2	1/2014	Benichou et al.	
8,163,008 B2	4/2012	Wilson et al.		8,628,571 B1	1/2014	Hacohen et al.	
8,163,014 B2	4/2012	Lane et al.		8,652,203 B2	2/2014	Quadri et al.	
D660,433 S *	5/2012	Braido	A61F 2/91 D24/155	8,652,204 B2	2/2014	Quill et al.	
D660,967 S *	5/2012	Braido	A61F 2/91 D24/155	8,657,872 B2	2/2014	Seguin	
8,167,894 B2	5/2012	Miles et al.		8,663,322 B2	3/2014	Keranen	
8,167,932 B2	5/2012	Bourang et al.		8,673,020 B2	3/2014	Sobrino-Serrano et al.	
8,167,935 B2	5/2012	McGuckin, Jr. et al.		8,679,174 B2	3/2014	Ottma et al.	
8,172,896 B2	5/2012	McNamara et al.		8,685,086 B2	4/2014	Navia et al.	
8,172,898 B2	5/2012	Alferness et al.		8,696,742 B2	4/2014	Pintor et al.	
8,177,836 B2	5/2012	Lee et al.		8,728,155 B2	5/2014	Montorfano et al.	
8,182,528 B2	5/2012	Salahieh et al.		8,734,507 B2	5/2014	Keranen	
8,211,169 B2	7/2012	Lane et al.		8,747,460 B2	6/2014	Tuval et al.	
8,216,301 B2	7/2012	Bonhoeffer et al.		8,771,345 B2	7/2014	Tuval et al.	
8,221,492 B2	7/2012	Case et al.		8,784,472 B2	7/2014	Eidenschink	
8,221,493 B2	7/2012	Boyle et al.		8,784,479 B2	7/2014	Antonsson et al.	
8,226,710 B2	7/2012	Nguyen et al.		8,784,481 B2 *	7/2014	Alkhatib	A61F 2/2418 623/2.18
8,231,670 B2	7/2012	Salahieh et al.		8,795,355 B2	8/2014	Alkhatib	
8,236,045 B2	8/2012	Benichou et al.		8,795,356 B2	8/2014	Quadri et al.	
8,236,049 B2	8/2012	Rowe et al.		8,795,357 B2	8/2014	Yohanen et al.	
8,252,042 B2	8/2012	McNamara et al.		8,801,776 B2	8/2014	House et al.	
8,252,051 B2	8/2012	Chau et al.		8,808,366 B2	8/2014	Braido et al.	
8,252,052 B2	8/2012	Salahieh et al.		8,840,663 B2	9/2014	Salahieh et al.	
8,257,390 B2	9/2012	Carley et al.		8,840,664 B2	9/2014	Karapetian et al.	
				8,845,722 B2	9/2014	Gabbay	
				8,852,261 B2	10/2014	White	
				8,852,272 B2	10/2014	Gross et al.	
				8,870,948 B1	10/2014	Erzberger et al.	
				8,870,949 B2	10/2014	Rowe	
				8,870,950 B2	10/2014	Hacohen	
				8,876,800 B2	11/2014	Behan	

(56)

References Cited

U.S. PATENT DOCUMENTS

8,894,702 B2	11/2014	Quadri et al.	2002/0099436 A1	7/2002	Thornton et al.
8,900,294 B2	12/2014	Paniagua et al.	2002/0151970 A1	10/2002	Garrison et al.
8,900,295 B2	12/2014	Migliazza et al.	2002/0177894 A1	11/2002	Acosta et al.
8,906,083 B2	12/2014	Obermilier et al.	2003/0036791 A1	2/2003	Philipp et al.
8,911,455 B2	12/2014	Quadri et al.	2003/0060875 A1	3/2003	Wittens
8,911,489 B2	12/2014	Ben-Muvhar	2003/0069635 A1	4/2003	Cartledge et al.
8,911,493 B2	12/2014	Rowe et al.	2003/0074052 A1	4/2003	Besselink
8,932,343 B2	1/2015	Alkhatib et al.	2003/0083742 A1	5/2003	Spence et al.
8,961,595 B2	2/2015	Alkhatib	2003/0105519 A1	6/2003	Fasol et al.
8,979,922 B2	3/2015	Jayasinghe et al.	2003/0158578 A1	8/2003	Pantages et al.
8,986,370 B2	3/2015	Annest	2004/0010272 A1	1/2004	Manetakis et al.
8,986,373 B2	3/2015	Chau et al.	2004/0039414 A1	2/2004	Carley et al.
8,986,375 B2 *	3/2015	Garde A61F 2/2403 623/1.26	2004/0093060 A1	5/2004	Seguin et al.
8,992,599 B2	3/2015	Thubrikar et al.	2004/0122503 A1	6/2004	Campbell et al.
8,992,604 B2	3/2015	Gross et al.	2004/0122514 A1	6/2004	Fogarty et al.
8,992,608 B2	3/2015	Haug et al.	2004/0133267 A1	7/2004	Lane
8,998,982 B2	4/2015	Richter et al.	2004/0143315 A1	7/2004	Bruun et al.
9,005,273 B2	4/2015	Salahieh et al.	2004/0176839 A1	9/2004	Huynh et al.
9,011,527 B2	4/2015	Li et al.	2004/0186565 A1	9/2004	Schreck
9,017,399 B2	4/2015	Gross et al.	2004/0186566 A1	9/2004	Hindrichs et al.
D730,520 S *	5/2015	Braido D24/155	2004/0210244 A1	10/2004	Vargas et al.
D730,521 S *	5/2015	Braido D24/155	2004/0210304 A1	10/2004	Seguin et al.
9,023,100 B2	5/2015	Quadri et al.	2004/0220593 A1	11/2004	Greenhalgh
9,034,032 B2	5/2015	McLean et al.	2004/0225354 A1	11/2004	Allen et al.
9,034,033 B2	5/2015	McLean et al.	2004/0249433 A1	12/2004	Freitag
9,039,757 B2	5/2015	McLean et al.	2004/0260389 A1	12/2004	Case et al.
D732,666 S *	6/2015	Nguyen A61F 2/2412 D24/155	2004/0260394 A1	12/2004	Douk et al.
9,050,188 B2	6/2015	Schweich, Jr. et al.	2005/0004668 A1	1/2005	Aklog et al.
9,072,603 B2	7/2015	Tuval et al.	2005/0021056 A1	1/2005	St. Goar et al.
9,084,676 B2	7/2015	Chau et al.	2005/0038494 A1	2/2005	Eidenschink
9,125,738 B2	9/2015	Figulla et al.	2005/0055086 A1	3/2005	Stobie
9,125,740 B2	9/2015	Morriss et al.	2005/0075731 A1	4/2005	Artof et al.
9,132,006 B2	9/2015	Spenser et al.	2005/0080430 A1	4/2005	Wright, Jr. et al.
9,132,009 B2	9/2015	Hacohen et al.	2005/0137686 A1	6/2005	Salahieh et al.
9,138,312 B2	9/2015	Tuval et al.	2005/0137688 A1	6/2005	Salahieh et al.
9,155,619 B2	10/2015	Liu et al.	2005/0137689 A1	6/2005	Salahieh et al.
9,173,738 B2	11/2015	Murray, III et al.	2005/0137690 A1	6/2005	Salahieh et al.
9,220,594 B2	12/2015	Braido et al.	2005/0137695 A1	6/2005	Salahleh et al.
9,226,820 B2	1/2016	Braido et al.	2005/0137697 A1	6/2005	Salahieh et al.
9,226,839 B1	1/2016	Kariniemi et al.	2005/0143809 A1	6/2005	Salahieh et al.
9,232,995 B2	1/2016	Kovalsky et al.	2005/0154443 A1	7/2005	Linder et al.
9,241,790 B2	1/2016	Lane et al.	2005/0182483 A1	8/2005	Osborne et al.
9,241,791 B2	1/2016	Braido et al.	2005/0182486 A1	8/2005	Gabbay
9,241,794 B2	1/2016	Braido et al.	2005/0197695 A1	9/2005	Stacchino et al.
9,248,014 B2	2/2016	Lane et al.	2005/0203549 A1	9/2005	Realyvasquez
9,289,290 B2	3/2016	Alkhatib et al.	2005/0216079 A1	9/2005	MaCoviak
9,289,291 B2	3/2016	Gorman, III et al.	2005/0234508 A1	10/2005	Cummins et al.
9,295,550 B2	3/2016	Nguyen et al.	2005/0240200 A1	10/2005	Bergheim
9,295,552 B2	3/2016	McLean et al.	2005/0251251 A1	11/2005	Cribier
9,301,836 B2	4/2016	Buchbinder et al.	2005/0267573 A9	12/2005	Macoviak et al.
9,308,087 B2	4/2016	Lane et al.	2006/0004439 A1	1/2006	Spenser et al.
D755,384 S *	5/2016	Pesce D24/155	2006/0015171 A1	1/2006	Armstrong
9,326,852 B2	5/2016	Spenser	2006/0020327 A1	1/2006	Lashinski et al.
9,345,573 B2	5/2016	Nyuli et al.	2006/0020333 A1	1/2006	Lashinski et al.
9,387,078 B2	7/2016	Gross et al.	2006/0041189 A1	2/2006	Vancaillie
9,421,098 B2	8/2016	Gifford, III et al.	2006/0047297 A1	3/2006	Case
9,427,303 B2	8/2016	Liddy et al.	2006/0089627 A1	4/2006	Burnett et al.
9,427,316 B2	8/2016	Schweich, Jr. et al.	2006/0111773 A1	5/2006	Rittgers et al.
9,439,757 B2	9/2016	Wallace et al.	2006/0135964 A1	6/2006	Vesely
9,474,638 B2	10/2016	Robinson et al.	2006/0161250 A1	7/2006	Shaw
9,480,559 B2	11/2016	Vidlund et al.	2006/0178700 A1	8/2006	Quinn
9,498,314 B2	11/2016	Behan	2006/0178740 A1	8/2006	Stacchino et al.
9,498,332 B2	11/2016	Hacohen et al.	2006/0190036 A1	8/2006	Wendel et al.
9,532,870 B2	1/2017	Cooper et al.	2006/0190038 A1	8/2006	Carley et al.
9,554,897 B2	1/2017	Lane et al.	2006/0195183 A1	8/2006	Navia et al.
9,566,152 B2	2/2017	Schweich, Jr. et al.	2006/0195184 A1	8/2006	Lane et al.
9,629,716 B2	4/2017	Seguin	2006/0201519 A1	9/2006	Frazier et al.
9,681,952 B2	6/2017	Hacohen et al.	2006/0212111 A1	9/2006	Case et al.
9,717,591 B2	8/2017	Chau et al.	2006/0241656 A1	10/2006	Starksen et al.
9,743,932 B2	8/2017	Amplatz et al.	2006/0241748 A1	10/2006	Lee et al.
2001/0021872 A1	9/2001	Bailey et al.	2006/0247680 A1	11/2006	Amplatz et al.
2001/0056295 A1	12/2001	Solem	2006/0253191 A1	11/2006	Salahieh et al.
2002/0032481 A1	3/2002	Gabbay	2006/0259136 A1	11/2006	Nguyen et al.
			2006/0259137 A1	11/2006	Artof et al.
			2006/0271166 A1	11/2006	Thill et al.
			2006/0271171 A1	11/2006	McQuinn et al.
			2006/0287719 A1	12/2006	Rowe et al.
			2007/0016288 A1	1/2007	Gurskis et al.
			2007/0027528 A1	2/2007	Agnew

(56)

References Cited

U.S. PATENT DOCUMENTS

2007/0027549 A1	2/2007	Godin	2010/0179643 A1	7/2010	Shalev
2007/0038295 A1	2/2007	Case et al.	2010/0179648 A1	7/2010	Richter et al.
2007/0043435 A1	2/2007	Seguin et al.	2010/0179649 A1	7/2010	Richter et al.
2007/0055340 A1	3/2007	Pryor	2010/0217382 A1	8/2010	Chau et al.
2007/0112422 A1	5/2007	Dehdashtian	2010/0222810 A1	9/2010	DeBeer et al.
2007/0118151 A1	5/2007	Davidson	2010/0228285 A1	9/2010	Miles et al.
2007/0162103 A1	7/2007	Case et al.	2010/0234940 A1	9/2010	Dolan
2007/0162107 A1	7/2007	Haug et al.	2010/0249908 A1	9/2010	Chau et al.
2007/0162111 A1	7/2007	Fukamachi et al.	2010/0249917 A1	9/2010	Zhang
2007/0173932 A1	7/2007	Cali et al.	2010/0256737 A1*	10/2010	Pollock A61F 2/91 623/1.15
2007/0198077 A1	8/2007	Cully et al.	2010/0262232 A1	10/2010	Annest
2007/0198097 A1	8/2007	Zegdi	2010/0280603 A1	11/2010	Maisano et al.
2007/0213813 A1	9/2007	Von Segesser et al.	2010/0280606 A1	11/2010	Naor
2007/0225759 A1	9/2007	Thommen et al.	2010/0324595 A1	12/2010	Linder et al.
2007/0225760 A1	9/2007	Moszner et al.	2011/0004296 A1	1/2011	Lutter et al.
2007/0233186 A1	10/2007	Meng	2011/0015729 A1	1/2011	Jimenez et al.
2007/0233237 A1	10/2007	Krivoruchko	2011/0015731 A1	1/2011	Carpentier et al.
2007/0239272 A1	10/2007	Navia et al.	2011/0022165 A1	1/2011	Oba et al.
2007/0255400 A1	11/2007	Parravicini et al.	2011/0040374 A1	2/2011	Goetz et al.
2008/0004688 A1	1/2008	Spenser et al.	2011/0040375 A1	2/2011	Letac et al.
2008/0004697 A1	1/2008	Lichtenstein et al.	2011/0046662 A1	2/2011	Moszner et al.
2008/0051703 A1	2/2008	Thornton et al.	2011/0054466 A1	3/2011	Rothstein et al.
2008/0071363 A1	3/2008	Tuval et al.	2011/0054596 A1	3/2011	Taylor
2008/0071366 A1	3/2008	Tuval et al.	2011/0054598 A1	3/2011	Johnson
2008/0071369 A1	3/2008	Tuval et al.	2011/0071626 A1	3/2011	Wright et al.
2008/0077235 A1	3/2008	Kirson	2011/0077730 A1	3/2011	Fenster
2008/0082083 A1	4/2008	Forde et al.	2011/0082538 A1	4/2011	Dahlgren et al.
2008/0082166 A1	4/2008	Styrc et al.	2011/0087322 A1	4/2011	Letac et al.
2008/0086164 A1	4/2008	Rowe	2011/0093063 A1	4/2011	Schreck
2008/0086204 A1	4/2008	Rankin	2011/0098525 A1	4/2011	Kermode et al.
2008/0091261 A1	4/2008	Long et al.	2011/0106247 A1	5/2011	Miller et al.
2008/0097595 A1	4/2008	Gabbay	2011/0112625 A1	5/2011	Ben-Muvhar et al.
2008/0140003 A1	6/2008	Bei et al.	2011/0112632 A1	5/2011	Chau et al.
2008/0161910 A1	7/2008	Revuelta et al.	2011/0118830 A1	5/2011	Liddicoat et al.
2008/0167705 A1	7/2008	Agnew	2011/0125257 A1	5/2011	Seguin et al.
2008/0167714 A1	7/2008	St. Goar et al.	2011/0125258 A1	5/2011	Centola
2008/0188929 A1	8/2008	Schreck	2011/0137326 A1	6/2011	Bachman
2008/0195200 A1	8/2008	Vidlund et al.	2011/0137397 A1	6/2011	Chau et al.
2008/0208332 A1	8/2008	Lamphere et al.	2011/0137409 A1	6/2011	Yang et al.
2008/0221672 A1	9/2008	Lamphere et al.	2011/0137410 A1	6/2011	Hacohen
2008/0234814 A1	9/2008	Salahieh et al.	2011/0166636 A1	7/2011	Rowe
2008/0243245 A1	10/2008	Thambar et al.	2011/0172784 A1	7/2011	Richter et al.
2008/0255580 A1	10/2008	Hoffman et al.	2011/0178597 A9	7/2011	Navia et al.
2008/0262609 A1	10/2008	Gross et al.	2011/0184510 A1	7/2011	Maisano et al.
2008/0269879 A1	10/2008	Sathe et al.	2011/0190877 A1	8/2011	Lane et al.
2008/0281411 A1	11/2008	Berrekouw	2011/0190879 A1	8/2011	Bobo et al.
2008/0294234 A1	11/2008	Hartley et al.	2011/0202076 A1	8/2011	Richter
2009/0005863 A1	1/2009	Goetz et al.	2011/0208283 A1	8/2011	Rust
2009/0054969 A1	2/2009	Salahieh et al.	2011/0208293 A1	8/2011	Tabor
2009/0088836 A1	4/2009	Bishop et al.	2011/0208298 A1	8/2011	Tuval et al.
2009/0099650 A1	4/2009	Bolduc et al.	2011/0213461 A1	9/2011	Seguin et al.
2009/0112159 A1	4/2009	Slattery et al.	2011/0218619 A1	9/2011	Benichou et al.
2009/0171363 A1	7/2009	Chocron	2011/0218620 A1	9/2011	Meiri et al.
2009/0177278 A1	7/2009	Spence	2011/0224785 A1	9/2011	Hacohen
2009/0210052 A1	8/2009	Forster et al.	2011/0238159 A1	9/2011	Guyenot et al.
2009/0222081 A1	9/2009	Linder et al.	2011/0245911 A1	10/2011	Quill et al.
2009/0240320 A1	9/2009	Tuval et al.	2011/0245917 A1	10/2011	Savage et al.
2009/0248143 A1	10/2009	Laham	2011/0251675 A1	10/2011	Dwork
2009/0264994 A1	10/2009	Saadat	2011/0251676 A1	10/2011	Sweeney et al.
2009/0276040 A1	11/2009	Rowe et al.	2011/0251678 A1	10/2011	Eidenschink et al.
2009/0287304 A1	11/2009	Dahlgren et al.	2011/0251679 A1	10/2011	Wiemeyer
2009/0299449 A1	12/2009	Styrc	2011/0251680 A1	10/2011	Tran et al.
2009/0306768 A1	12/2009	Quadri	2011/0251682 A1	10/2011	Murray, III et al.
2009/0319037 A1	12/2009	Rowe et al.	2011/0251683 A1	10/2011	Tabor
2010/0023117 A1	1/2010	Yoganathan et al.	2011/0257721 A1	10/2011	Tabor
2010/0036479 A1	2/2010	Hill et al.	2011/0257729 A1	10/2011	Spenser
2010/0049313 A1	2/2010	Alon et al.	2011/0257736 A1	10/2011	Marquez et al.
2010/0076548 A1	3/2010	Konno	2011/0257737 A1	10/2011	Fogarty et al.
2010/0114299 A1	5/2010	Ben Muvhar et al.	2011/0264191 A1	10/2011	Rothstein
2010/0131054 A1	5/2010	Tuval et al.	2011/0264196 A1*	10/2011	Savage A61F 2/2418 623/1.26
2010/0137979 A1	6/2010	Tuval et al.	2011/0264198 A1	10/2011	Murray, III et al.
2010/0160958 A1	6/2010	Clark	2011/0264199 A1	10/2011	Tran et al.
2010/0161036 A1	6/2010	Pintor et al.	2011/0264200 A1	10/2011	Tran et al.
2010/0161042 A1	6/2010	Maisano et al.	2011/0264201 A1	10/2011	Yeung et al.
2010/0174363 A1	7/2010	Castro	2011/0264202 A1	10/2011	Murray, III et al.
			2011/0264203 A1	10/2011	Dwork et al.
			2011/0264206 A1	10/2011	Tabor

(56)

References Cited

U.S. PATENT DOCUMENTS

2011/0264208	A1	10/2011	Duffy et al.	2013/0211501	A1	8/2013	Buckley et al.
2011/0270276	A1	11/2011	Rothstein et al.	2013/0245742	A1	9/2013	Norris
2011/0271967	A1	11/2011	Mortier et al.	2013/0261737	A1	10/2013	Costello
2011/0282438	A1	11/2011	Drews et al.	2013/0289711	A1	10/2013	Liddy et al.
2011/0282439	A1	11/2011	Thill et al.	2013/0297013	A1	11/2013	Klima et al.
2011/0282440	A1	11/2011	Cao et al.	2013/0304197	A1	11/2013	Buchbinder et al.
2011/0283514	A1	11/2011	Fogarty et al.	2013/0304200	A1	11/2013	McLean et al.
2011/0288634	A1	11/2011	Tuval et al.	2013/0310928	A1	11/2013	Morriss et al.
2011/0295363	A1	12/2011	Girard et al.	2013/0325114	A1	12/2013	McLean et al.
2011/0301688	A1	12/2011	Dolan	2013/0331929	A1	12/2013	Mitra et al.
2011/0301698	A1	12/2011	Miller et al.	2014/0005778	A1	1/2014	Buchbinder et al.
2011/0301701	A1	12/2011	Padala et al.	2014/0018911	A1	1/2014	Zhou et al.
2011/0301702	A1	12/2011	Rust et al.	2014/0031928	A1	1/2014	Murphy et al.
2011/0313452	A1	12/2011	Carley et al.	2014/0046430	A1	2/2014	Shaw
2011/0313515	A1	12/2011	Quadri et al.	2014/0052237	A1	2/2014	Lane et al.
2011/0319989	A1	12/2011	Lane et al.	2014/0067054	A1	3/2014	Chau et al.
2011/0319991	A1	12/2011	Hariton et al.	2014/0081376	A1	3/2014	Burkart et al.
2012/0010694	A1	1/2012	Lutter et al.	2014/0106951	A1	4/2014	Brandon
2012/0022633	A1	1/2012	Olson et al.	2014/0120287	A1	5/2014	Jacoby et al.
2012/0022637	A1	1/2012	Ben-Muvhar	2014/0121763	A1	5/2014	Duffy et al.
2012/0022639	A1	1/2012	Hacohen et al.	2014/0135894	A1	5/2014	Norris et al.
2012/0022640	A1	1/2012	Gross et al.	2014/0135895	A1	5/2014	Andress et al.
2012/0035703	A1	2/2012	Lutter et al.	2014/0142681	A1	5/2014	Norris
2012/0035713	A1	2/2012	Lutter et al.	2014/0148891	A1	5/2014	Johnson
2012/0035722	A1	2/2012	Tuval	2014/0163690	A1	6/2014	White
2012/0041547	A1	2/2012	Duffy et al.	2014/0172069	A1	6/2014	Roeder et al.
2012/0041551	A1	2/2012	Spenser et al.	2014/0188210	A1	7/2014	Beard et al.
2012/0046738	A1	2/2012	Lau et al.	2014/0188221	A1	7/2014	Chung et al.
2012/0046742	A1	2/2012	Tuval et al.	2014/0194981	A1*	7/2014	Menk A61F 2/2418 623/2.17
2012/0053676	A1	3/2012	Ku et al.	2014/0194983	A1	7/2014	Kovalsky et al.
2012/0053682	A1	3/2012	Kovalsky et al.	2014/0207231	A1	7/2014	Hacohen et al.
2012/0053688	A1	3/2012	Fogarty et al.	2014/0214159	A1	7/2014	Vidlund et al.
2012/0059454	A1	3/2012	Millwee et al.	2014/0222136	A1	8/2014	Geist et al.
2012/0078353	A1	3/2012	Quadri et al.	2014/0249622	A1	9/2014	Carmi et al.
2012/0078357	A1	3/2012	Conklin	2014/0257461	A1	9/2014	Robinson et al.
2012/0083832	A1	4/2012	Delaloye et al.	2014/0257467	A1	9/2014	Lane et al.
2012/0083839	A1	4/2012	Letac et al.	2014/0257475	A1	9/2014	Gross et al.
2012/0083879	A1	4/2012	Eberhardt et al.	2014/0257476	A1	9/2014	Montorfano et al.
2012/0089223	A1	4/2012	Nguyen et al.	2014/0277358	A1	9/2014	Slazas
2012/0101570	A1	4/2012	Tuval et al.	2014/0277418	A1	9/2014	Miller
2012/0101571	A1	4/2012	Thambar et al.	2014/0277422	A1	9/2014	Ratz et al.
2012/0101572	A1	4/2012	Kovalsky et al.	2014/0277427	A1	9/2014	Ratz et al.
2012/0123511	A1	5/2012	Brown	2014/0296962	A1	10/2014	Cartledge et al.
2012/0123530	A1	5/2012	Carpentier et al.	2014/0296969	A1	10/2014	Tegels et al.
2012/0130473	A1	5/2012	Norris et al.	2014/0324164	A1	10/2014	Gross et al.
2012/0130474	A1	5/2012	Buckley	2014/0343670	A1*	11/2014	Bakis A61F 2/2436 623/2.11
2012/0130475	A1	5/2012	Shaw	2014/0358224	A1	12/2014	Tegels et al.
2012/0136434	A1	5/2012	Carpentier et al.	2014/0379065	A1	12/2014	Johnson et al.
2012/0150218	A1	6/2012	Sandgren et al.	2014/0379074	A1	12/2014	Spence et al.
2012/0165915	A1	6/2012	Melsheimer et al.	2014/0379076	A1	12/2014	Vidlund et al.
2012/0179244	A1	7/2012	Schankereli et al.	2015/0018944	A1*	1/2015	O'Connell A61F 2/2427 623/2.42
2012/0197292	A1	8/2012	Chin-Chen et al.	2015/0045880	A1	2/2015	Hacohen
2012/0283824	A1	11/2012	Lutter et al.	2015/0045881	A1	2/2015	Lim
2012/0290062	A1	11/2012	McNamara et al.	2015/0094802	A1	4/2015	Buchbinder et al.
2012/0296360	A1	11/2012	Norris et al.	2015/0119970	A1	4/2015	Nakayama et al.
2012/0310328	A1	12/2012	Olson et al.	2015/0127097	A1	5/2015	Neumann et al.
2012/0323316	A1	12/2012	Chau et al.	2015/0142103	A1	5/2015	Vidlund
2012/0330408	A1	12/2012	Hillukka et al.	2015/0157457	A1	6/2015	Hacohen
2013/0006347	A1	1/2013	McHugo	2015/0173896	A1	6/2015	Richter et al.
2013/0018450	A1	1/2013	Hunt	2015/0173897	A1	6/2015	Raanani et al.
2013/0018458	A1	1/2013	Yohanan et al.	2015/0216661	A1	8/2015	Hacohen et al.
2013/0035759	A1	2/2013	Gross et al.	2015/0272730	A1	10/2015	Melnick et al.
2013/0041204	A1	2/2013	Heilman et al.	2015/0320556	A1	11/2015	Levi et al.
2013/0041451	A1	2/2013	Patterson et al.	2015/0327994	A1	11/2015	Morriss et al.
2013/0046373	A1	2/2013	Cartledge et al.	2015/0328000	A1	11/2015	Ratz et al.
2013/0116780	A1	5/2013	Miller et al.	2015/0342736	A1	12/2015	Rabito et al.
2013/0123896	A1	5/2013	Bloss et al.	2015/0351906	A1	12/2015	Hammer et al.
2013/0123900	A1	5/2013	Eblacas et al.	2015/0359629	A1	12/2015	Ganesan et al.
2013/0150945	A1	6/2013	Crawford et al.	2016/0030171	A1	2/2016	Quijano et al.
2013/0150956	A1	6/2013	Yohanan et al.	2016/0095700	A1	4/2016	Righini
2013/0158647	A1	6/2013	Norris et al.	2016/0106539	A1	4/2016	Buchbinder et al.
2013/0166017	A1	6/2013	Cartledge et al.	2016/0113766	A1	4/2016	Ganesan et al.
2013/0166022	A1	6/2013	Conklin	2016/0213473	A1	7/2016	Hacohen et al.
2013/0172978	A1	7/2013	Vidiund et al.	2016/0220367	A1	8/2016	Barrett
2013/0172992	A1	7/2013	Gross et al.	2016/0242902	A1	8/2016	Morriss et al.
				2016/0270911	A1	9/2016	Ganesan et al.

(56)

References Cited

U.S. PATENT DOCUMENTS

2016/0296330	A1	10/2016	Hacohen
2016/0310268	A1	10/2016	Oba et al.
2016/0310274	A1	10/2016	Gross et al.
2016/0317301	A1	11/2016	Quadri et al.
2016/0324633	A1	11/2016	Gross et al.
2016/0324640	A1	11/2016	Gifford, III et al.
2016/0331526	A1	11/2016	Schweich, Jr. et al.
2016/0367360	A1	12/2016	Cartledge et al.
2016/0367368	A1	12/2016	Vidlund et al.
2017/0042678	A1	2/2017	Ganesan et al.
2017/0065407	A1	3/2017	Hacohen et al.
2017/0196688	A1	7/2017	Christianson et al.
2017/0196692	A1	7/2017	Kirk et al.
2017/0216026	A1	8/2017	Quill et al.
2017/0231760	A1	8/2017	Lane et al.
2017/0333187	A1	11/2017	Hariton et al.
2018/0153687	A1	6/2018	Hariton et al.

FOREIGN PATENT DOCUMENTS

WO	99/30647	A1	6/1999
WO	00/47139	A1	8/2000
WO	01/62189	A1	8/2001
WO	01/87190	A2	11/2001
WO	03/028558	A2	4/2003
WO	2004/108191	A1	12/2004
WO	2006/054930	A1	5/2006
WO	2006/070372	A2	7/2006
WO	2006089236	A1	8/2006
WO	2007059252	A1	5/2007
WO	2008013915	A3	1/2008
WO	2008/029296	A2	3/2008
WO	2008/070797	A2	6/2008
WO	2008/103722	A2	8/2008
WO	2009/033469	A1	3/2009
WO	2009/053497	A1	4/2009
WO	2009/091509	A1	7/2009
WO	2010/006627	A1	1/2010
WO	2010/073246	A2	7/2010
WO	2010/081033	A1	7/2010
WO	2011/069048	A2	6/2011
WO	2011/089601	A1	7/2011
WO	2011/106137	A1	9/2011
WO	2011/111047	A2	9/2011
WO	2011/137531	A1	11/2011
WO	2011/143263	A2	11/2011
WO	2011/154942	A2	12/2011
WO	2012/011108	A2	1/2012
WO	2012/024428	A2	2/2012
WO	2012/036740	A2	3/2012
WO	2012/127309	A1	9/2012
WO	2012/177942	A2	12/2012
WO	2013/021374	A2	2/2013
WO	2013/021375	A2	2/2013
WO	2013/021384	A1	2/2013
WO	2013/059747	A1	4/2013
WO	2013/078497	A1	6/2013
WO	2013/128436	A1	9/2013
WO	2014/022124	A1	2/2014
WO	2014/076696	A1	5/2014
WO	2014/115149	A2	7/2014
WO	2014/145338	A1	9/2014
WO	2014/164364	A1	10/2014
WO	2016/016899	A1	2/2015
WO	2015/173794	A1	11/2015
WO	2016/093877	A1	6/2016
WO	2016/125160	A1	8/2016

OTHER PUBLICATIONS

Dominique Himbert; Mitral Regurgitation and Stenosis from Bioprosthesis and Annuloplasty Failure: Transcatheter approaches and outcomes, 24 pages Oct. 28 2013.

Frank Langer et al.; "RING plus STRING: Papillary muscle repositioning as an adjunctive repair technique for ischemic mitral regurgitation" J Thorac Cardiovasc Surg 133:247-9, Jan. 2007.

Frank Langer et al., "RING+STRING: Successful repair technique for ischemic mitral regurgitation with severe leaflet tethering," Circulation 120[suppl 1]: S85-S91, Sep. 2009.

Georg Lutter, MD, et al; "Percutaneous Valve Replacement: Current State and Future Prospects", The Annals of Thoracic Surgery ; vol. 78, pp. 2199-2206; Dec. 2004.

Francesco Maisano (2015) TCR presentation re Cardiovalve.

Dusan Pavcnik, MD, PhD2, et al; "Development and Initial Experimental Evaluation of a Prosthetic Aortic Valve for Transcatheter Placement", Cardiovascular Radiology. Radiology Apr. 1992, vol. 183; pp. 151-154.

Giovanni Righini presentation EuroPCR May 2015 (Saturn)—(downloaded from: <https://www.pconline.com/Cases-resourcesimages/Resources/Course-videos-slides/2015/Cardiovascularinnovation-pipeline-Mitral-and-tricuspid-valve-interventions>).

An Office Action together dated Feb. 10, 2017, which issued during the prosecution of European Patent Application No. 12821522.5.

European Search Report dated Feb. 18, 2015, which issued during the prosecution of Applicant's European App No. 12821522.5.

European Search Report dated Jun. 29, 2017, which issued during the prosecution of Applicant's European App No. 11809374.9.

An Office Action dated Feb. 8, 2017, which issued during the prosecution of UK Patent Application No. 1613219.3.

An Office Action dated Jan. 30, 2015, which issued during the prosecution of UK Patent Application No. 1413474.6.

An Invitation to pay additional fees dated Jan. 2, 2018, which issued during the prosecution of Applicant's PCT/IL2017/050849.

Invitation to Pay Additional Fees dated Jun. 12, 2014 PCT/IL2014/050087.

An Invitation to pay additional fees dated Sep. 29, 2017, which issued during the prosecution of Applicant's PCT/IL2017/050873.

An International Preliminary Report on patentability dated Dec. 2, 2013, which issued during the prosecution of Applicant's PCT/IL11/00582.

An International Preliminary Report on patentability dated Sep. 11, 2012, which issued during the prosecution of Applicant's PCT/IL2011/000231.

An International Preliminary Report on patentability dated Feb. 11, 2014, which issued during the prosecution of Applicant's PCT/IL12/00292.

An International Preliminary Report on patentability dated Feb. 11, 2014, which issued during the prosecution of Applicant's PCT/IL12/00293.

An International Preliminary Report on Patentability dated May 19, 2015, which issued during the prosecution of Applicant's PCT/IL2013/050937.

An International Preliminary Report on Patentability dated Jul. 28, 2015, which issued during the prosecution of Applicant's PCT/IL2014/050087.

An International Preliminary Report on Patentability dated Jan. 31, 2017, which issued during the prosecution of Applicant's PCT/IL2015/050792.

An International Preliminary Report on Patentability dated Aug. 8, 2017, which issued during the prosecution of Applicant's PCT/IL2016/050125.

An International Search Report and a Written Opinion both dated Oct. 13, 2011 which issued during the prosecution of Applicant's PCT/IL11/00231.

An International Search Report and a Written Opinion both dated Dec. 5, 2011, which issued during the prosecution of Applicant's PCT/IL11/00582.

An International Search Report and a Written Opinion both dated Mar. 17, 2014 which issued during the prosecution of Applicant's PCT/IL2013/050937.

An International Search Report and a Written Opinion both dated Feb. 6, 2013, which issued during the prosecution of Applicant's PCT/IL12/00292.

An International Search Report and a Written Opinion both dated Feb. 6, 2013, which issued during the prosecution of Applicant's PCT/IL12/00293.

(56)

References Cited

OTHER PUBLICATIONS

An International Search Report and a Written Opinion both dated Sep. 4, 2014 which issued during the prosecution of Applicant's PCT/IL2014/050087.

An International Search Report and a Written Opinion both dated Oct. 27, 2015, which issued during the prosecution of Applicant's PCT/IL2015/050792.

An International Search Report and a Written Opinion both dated May 30, 2016, which issued during the prosecution of Applicant's PCT/IL2016/050125.

U.S. Appl. No. 61/283,819, filed Dec. 8, 2009.

U.S. Appl. No. 61/492,449, filed Jun. 2, 2011.

U.S. Appl. No. 61/515,372, filed Aug. 5, 2011.

U.S. Appl. No. 61/525,281, filed Aug. 19, 2011.

U.S. Appl. No. 61/537,276, filed Sep. 21, 2011.

U.S. Appl. No. 61/555,160, filed Nov. 3, 2011.

U.S. Appl. No. 61/588,892, filed Jan. 20, 2012.

U.S. Appl. No. 61/756,034, filed Jan. 24, 2013.

U.S. Appl. No. 61/756,049, filed Jan. 24, 2013.

U.S. Appl. No. 62/112,343, filed Feb. 5, 2015.

Saturn Project—a novel solution for transcatheter heart valve replacement specifically designed to address clinical therapeutic needs on mitral valve: Dec. 2016.

John G. Webb, et al., "Transcatheter Valve-in-Valve Implantation for Failed Bioprosthetic Heart Valves", *JCirculation*. Apr. 2010; 121: 1848-1857.

S. Willeke, et al. (1992), Detachable Shape-Memory Sewing Ring for Heart Valves. *Artificial Organs*, 16:294-297, 1992 (an abstract). USPTO RR dated Sep. 26, 2016 which issued during the prosecution of U.S. Appl. No. 14/763,004.

USPTO Supplemental NOA dated May 10, 2016 which issued during the prosecution of U.S. Appl. No. 14/237,258.

USPTO NOA mailed May 20, 2016 which issued during the prosecution of U.S. Appl. No. 14/237,258.

Corrected NOA dated Dec. 13, 2013 which issued during the prosecution of U.S. Appl. No. 13/675,119.

USPTO FOA dated Jan. 17, 2018 which issued during the prosecution of U.S. Appl. No. 14/763,004.

USPTO FOA dated Feb. 10, 2014 which issued during the prosecution of U.S. Appl. No. 13/033,852.

USPTO FOA dated Feb. 15, 2013 which issued during the prosecution of U.S. Appl. No. 12/840,463.

USPTO FOA dated Feb. 25, 2016 which issued during the prosecution of U.S. Appl. No. 14/522,987.

USPTO FOA dated Mar. 25, 2015 which issued during the prosecution of U.S. Appl. No. 12/840,463.

USPTO FOA dated Apr. 13, 2016 which issued during the prosecution of U.S. Appl. No. 14/626,267.

USPTO FOA dated May 23, 2014 which issued during the prosecution of U.S. Appl. No. 13/412,814.

USPTO FOA dated Jul. 18, 2013 which issued during the prosecution of U.S. Appl. No. 13/044,694.

USPTO FOA dated Jul. 23, 2013 which issued during the prosecution of U.S. Appl. No. 12/961,721.

USPTO Interview Summary dated Feb. 8, 2018 which issued during the prosecution of U.S. Appl. No. 15/213,791.

USPTO NFOA dated Jan. 5, 2018 which issued during the prosecution of U.S. Appl. No. 15/541,783.

USPTO NFOA dated Jan. 18, 2017 which issued during the prosecution of U.S. Appl. No. 14/626,267.

USPTO NFOA dated Jan. 21, 2016 which issued during the prosecution of U.S. Appl. No. 14/237,264.

USPTO NFOA dated Feb. 2, 2018 which issued during the prosecution of U.S. Appl. No. 15/329,920.

USPTO NFOA dated Feb. 6, 2013 which issued during the prosecution of U.S. Appl. No. 13/412,814.

USPTO NFOA dated Feb. 7, 2017 which issued during the prosecution of U.S. Appl. No. 14/689,608.

USPTO NFOA dated Feb. 7, 2018 which issued during the prosecution of U.S. Appl. No. 15/197,069.

USPTO NFOA dated May 29, 2012 which issued during the prosecution of U.S. Appl. No. 12/840,463.

USPTO NFOA dated Jun. 4, 2014 which issued during the prosecution of U.S. Appl. No. 12/840,463.

USPTO NFOA dated Jun. 17, 2014 which issued during the prosecution of U.S. Appl. No. 12/961,721.

USPTO NFOA dated Jun. 30, 2015 which issued during the prosecution of U.S. Appl. No. 14/522,987.

USPTO NFOA dated Jul. 1, 2016 which issued during the prosecution of U.S. Appl. No. 14/161,921.

USPTO NFOA dated Jul. 2, 2014 which issued during the prosecution of U.S. Appl. No. 13/811,308.

USPTO NFOA dated Jul. 3, 2014 which issued during the prosecution of U.S. Appl. No. 13/033,852.

USPTO NFOA dated Aug. 2, 2013 which issued during the prosecution of U.S. Appl. No. 13/033,852.

USPTO NFOA dated Sep. 12, 2013 which issued during the prosecution of U.S. Appl. No. 13/412,814.

USPTO NFOA dated Sep. 19, 2014 which issued during the prosecution of U.S. Appl. No. 13/044,694.

USPTO NFOA dated Oct. 23, 2017 which issued during the prosecution of U.S. Appl. No. 14/763,004.

USPTO NFOA dated Nov. 8, 2013 which issued during the prosecution of U.S. Appl. No. 12/840,463.

USPTO NFOA dated Nov. 23, 2013 which issued during the prosecution of U.S. Appl. No. 13/033,852.

USPTO NFOA dated Nov. 27, 2015 which issued during the prosecution of U.S. Appl. No. 14/626,267.

USPTO NFOA dated Nov. 28, 2012 which issued during the prosecution of U.S. Appl. No. 12/961,721.

USPTO NFOA dated Dec. 7, 2017 which issued during the prosecution of U.S. Appl. No. 15/213,791.

USPTO NFOA dated Dec. 10, 2015 which issued during the prosecution of U.S. Appl. No. 14/237,258.

USPTO NFOA dated Dec. 31, 2012 which issued during the prosecution of U.S. Appl. No. 13/044,694.

USPTO NOA mailed Feb. 11, 2015 which issued during the prosecution of U.S. Appl. No. 13/033,852.

USPTO NOA mailed Mar. 10, 2015 which issued during the prosecution of U.S. Appl. No. 13/811,308.

USPTO NOA mailed Apr. 8, 2016 which issued during the prosecution of U.S. Appl. No. 14/237,258.

USPTO NOA mailed May 5, 2015 which issued during the prosecution of U.S. Appl. No. 12/840,463.

USPTO NOA mailed Jul. 1, 2016 which issued during the prosecution of U.S. Appl. No. 14/442,541.

USPTO NOA mailed Aug. 15, 2014 which issued during the prosecution of U.S. Appl. No. 13/412,814.

USPTO NOA mailed Sep. 29, 2016 which issued during the prosecution of U.S. Appl. No. 14/442,541.

USPTO NOA mailed Oct. 16, 2013 which issued during the prosecution of U.S. Appl. No. 13/675,119.

USPTO RR dated Jan. 20, 2016 which issued during the prosecution of U.S. Appl. No. 14/161,921.

USPTO RR dated Feb. 3, 2014 which issued during the prosecution of U.S. Appl. No. 13/811,308.

USPTO RR dated Jul. 2, 2012 which issued during the prosecution of U.S. Appl. No. 13/033,852.

USPTO RR dated Aug. 13, 2012 which issued during the prosecution of U.S. Appl. No. 13/044,694.

USPTO RR dated Aug. 14, 2012 which issued during the prosecution of U.S. Appl. No. 12/961,721.

USPTO RR dated Aug. 28, 2015 which issued during the prosecution of U.S. Appl. No. 14/237,264.

* cited by examiner

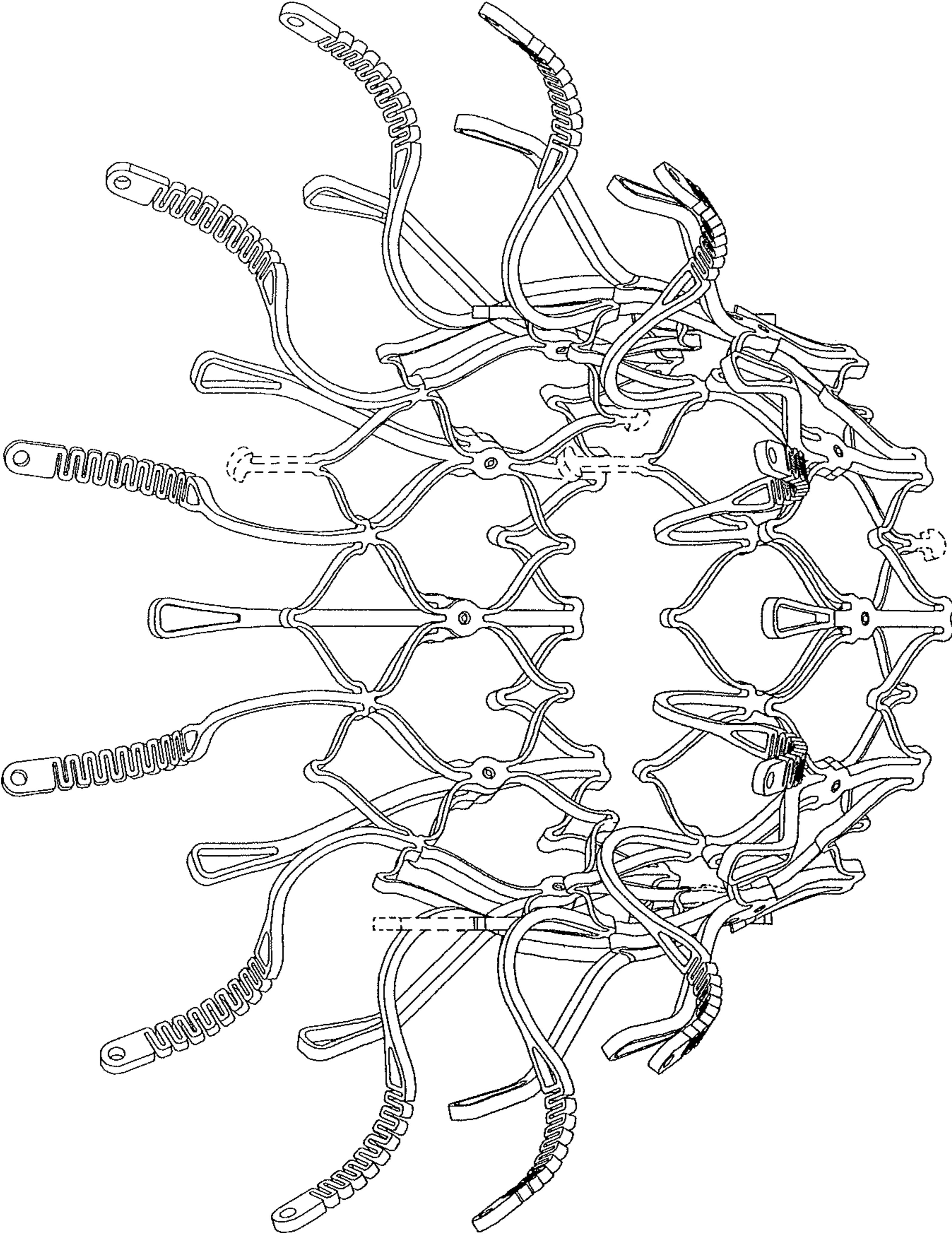


FIG. 1

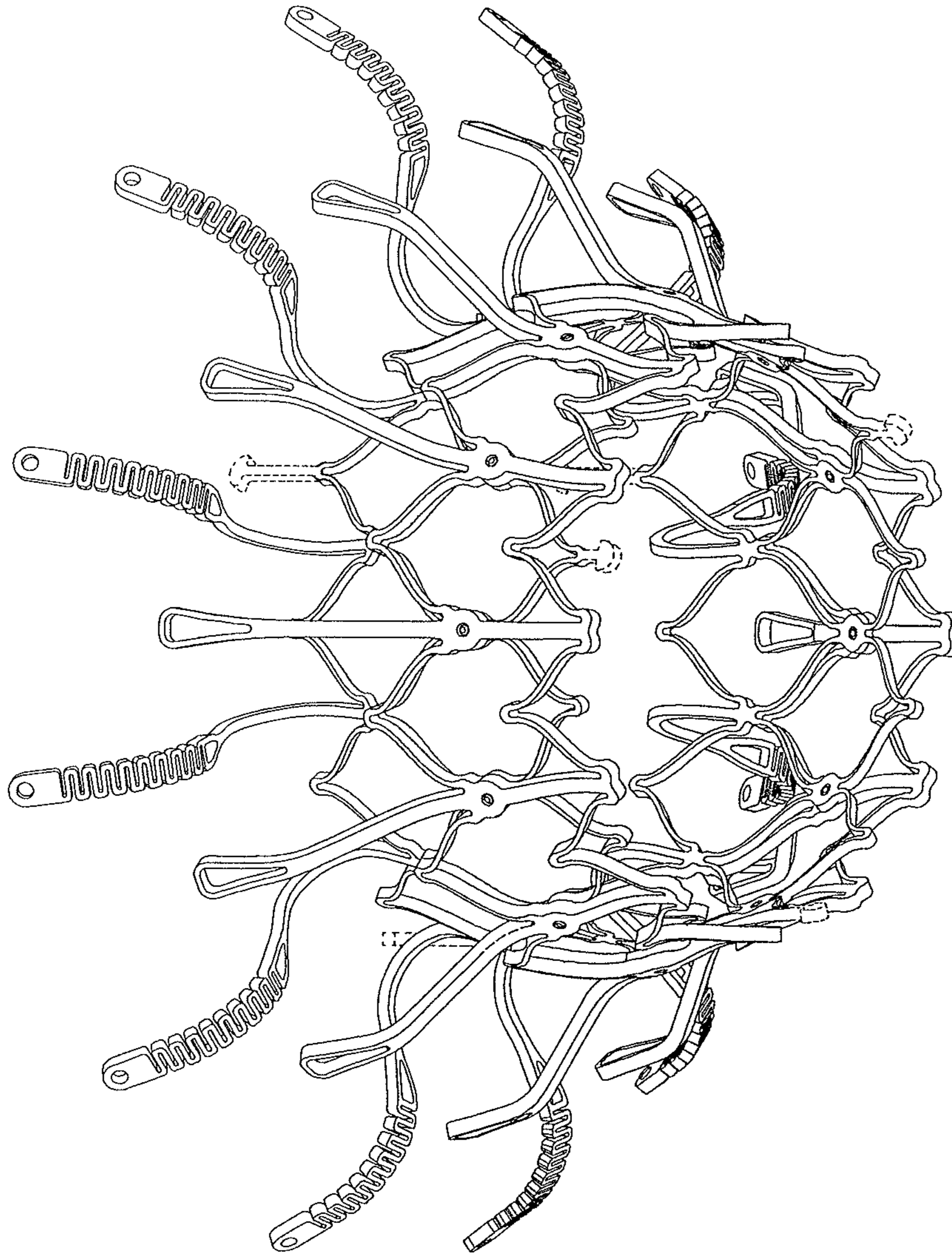


FIG. 2

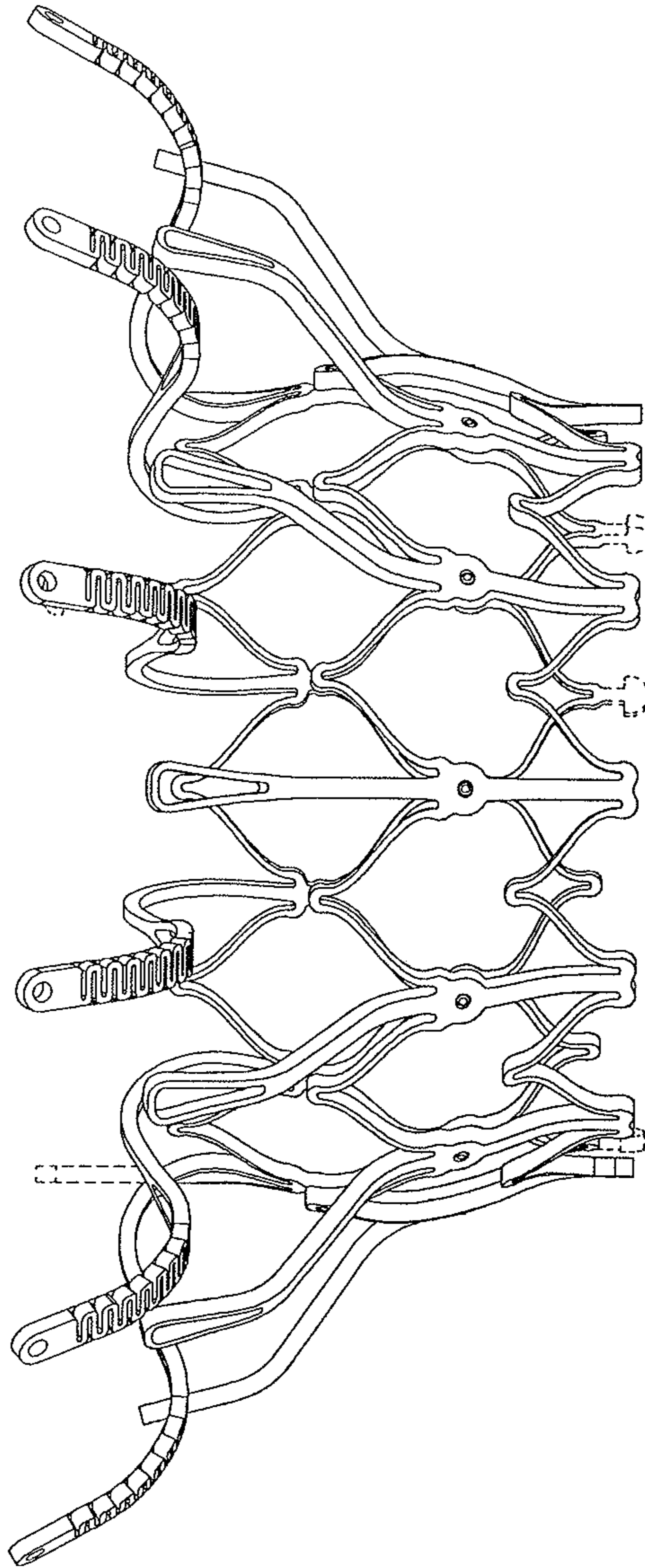


FIG. 3

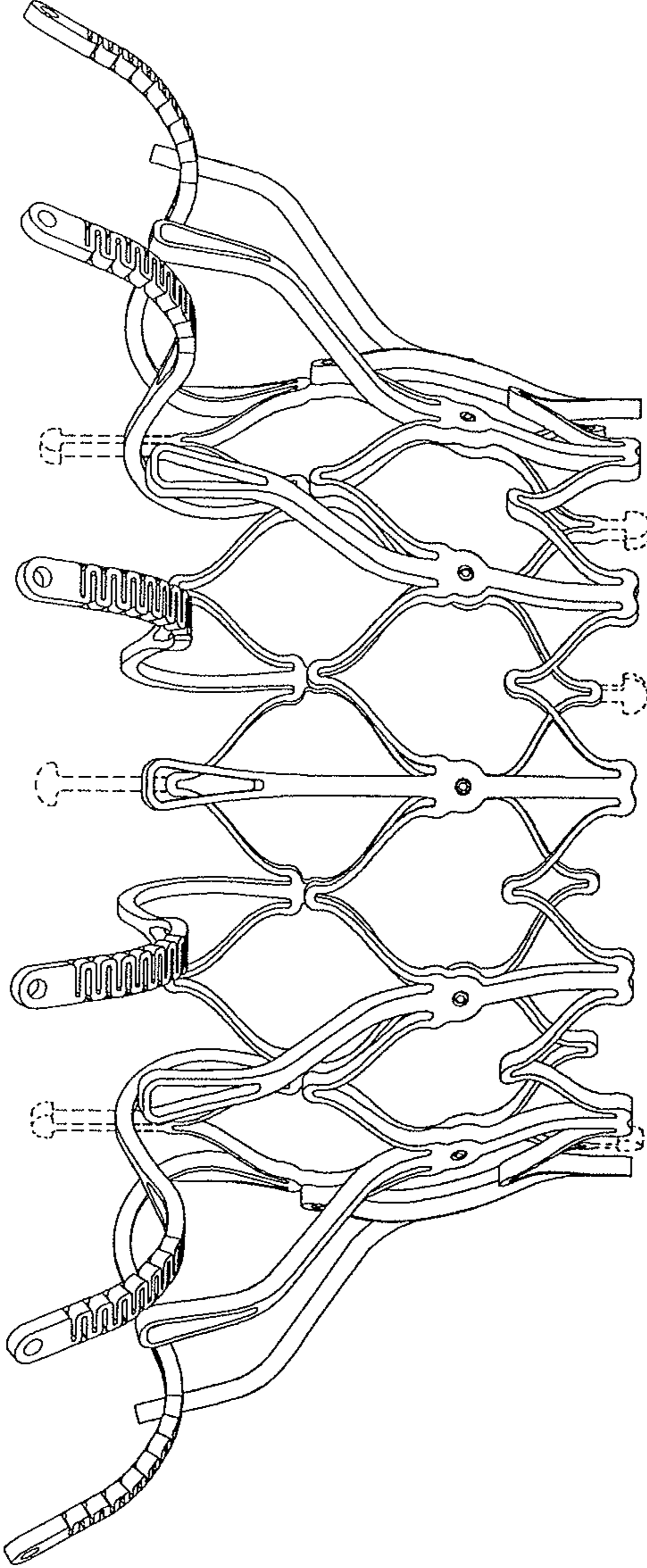


FIG. 4

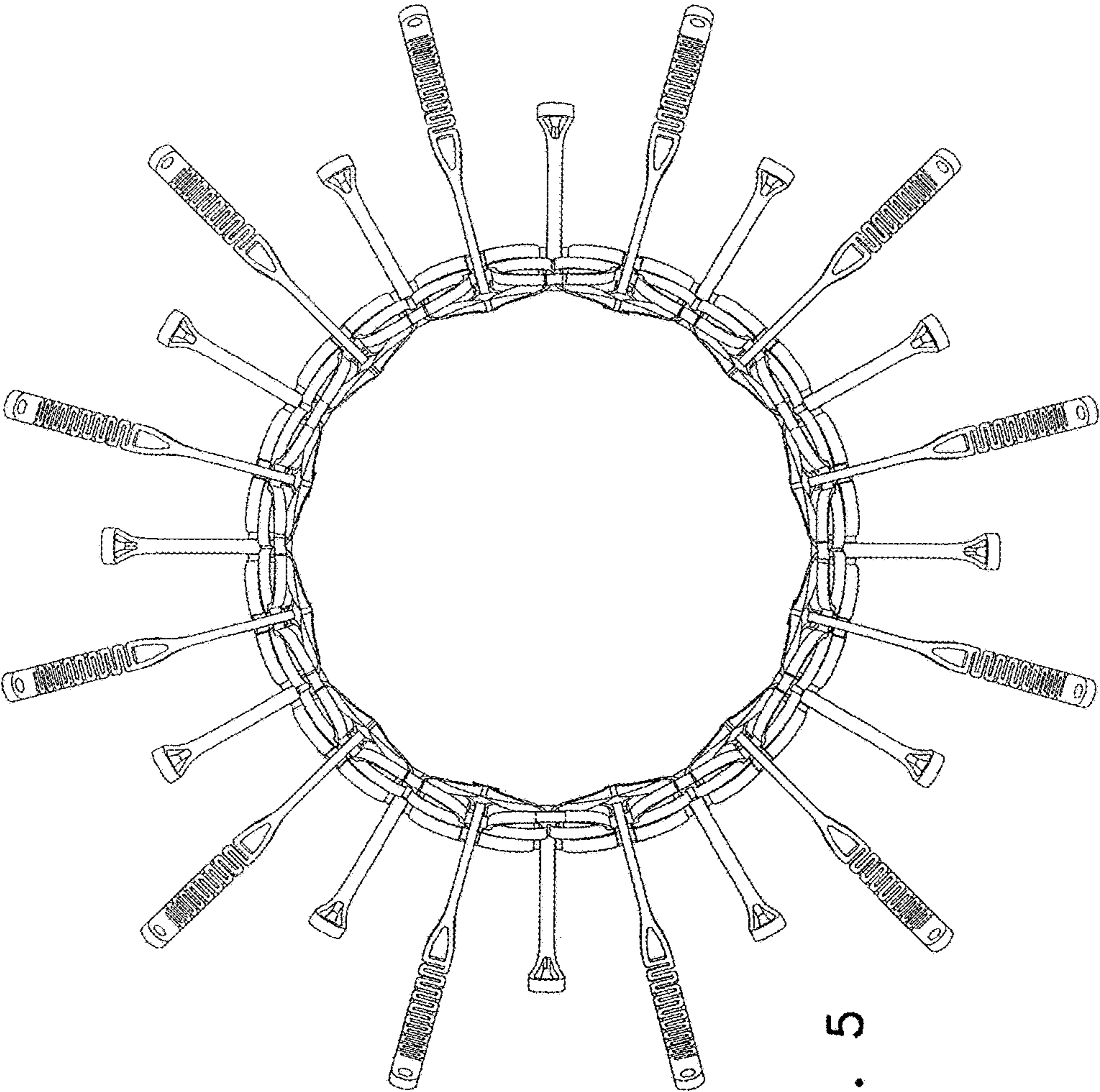


FIG. 5

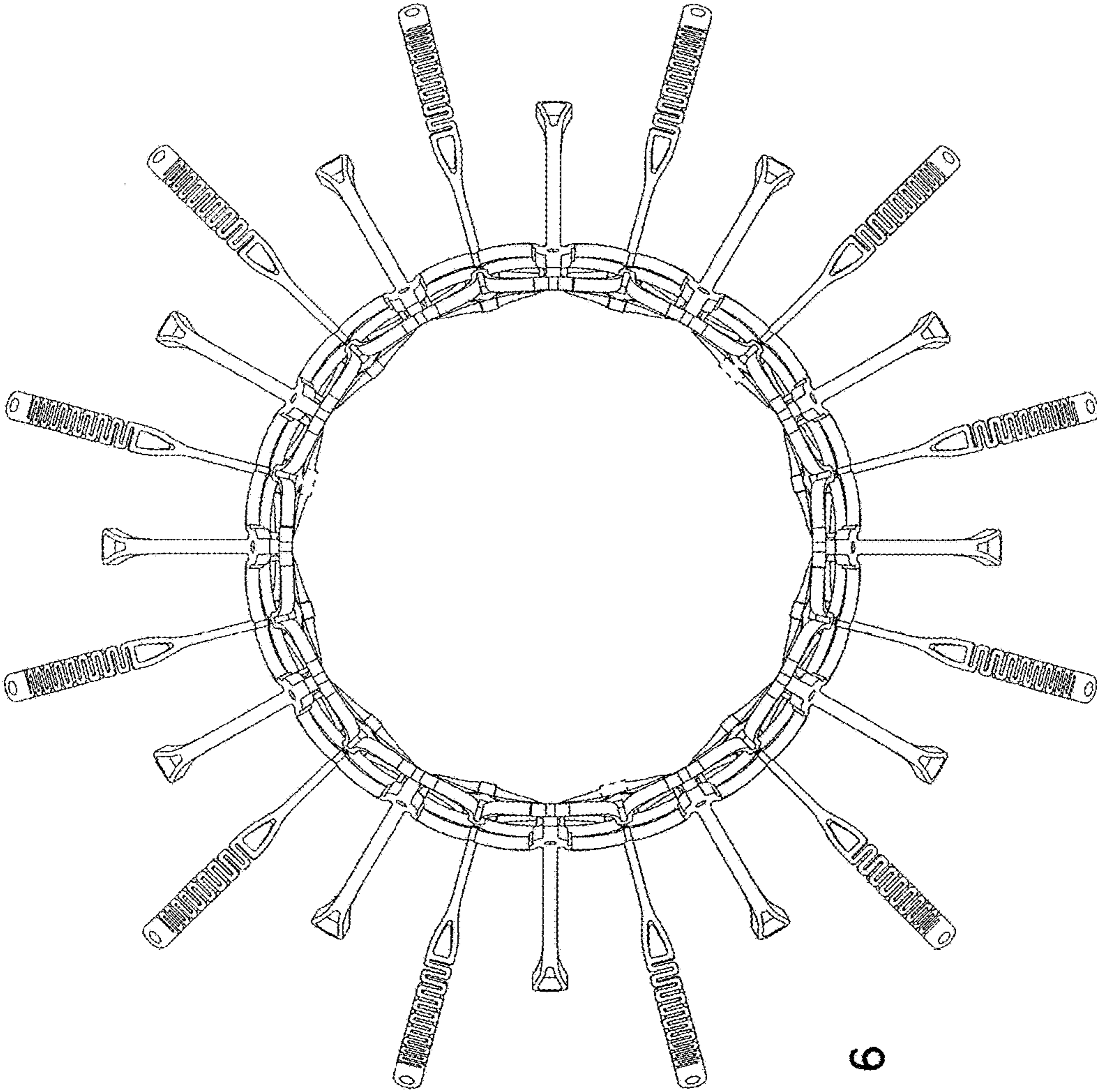


FIG. 6