



US00D829903S

(12) **United States Design Patent** (10) **Patent No.:** **US D829,903 S**  
**Aranyi et al.** (45) **Date of Patent:** **\*\* Oct. 2, 2018**

(54) **SHIPPING WEDGE**

FOREIGN PATENT DOCUMENTS

(71) Applicant: **Covidien LP**, Mansfield, MA (US)

AU 198654765 9/1986  
CA 2773414 A1 11/2012

(72) Inventors: **Ernie Aranyi**, Easton, CT (US); **Tom Hessler**, Bethel, CT (US)

(Continued)

(73) Assignee: **Covidien LP**, Mansfield, MA (US)

OTHER PUBLICATIONS

(\*\*) Term: **15 Years**

ECHELON Surgical Stapling, announced Aug. 3, 2015 [online], [site visited Jan. 3, 2017]. Available from internet, URL: <<http://www.ethicon.com/healthcare-professionals/products/staplers/endocutters/echelon-flex-gst-system>>.\*

(21) Appl. No.: **29/550,821**

(Continued)

(22) Filed: **Jan. 7, 2016**

**Related U.S. Application Data**

*Primary Examiner* — Keli L. Hill  
*Assistant Examiner* — Karra S Johnson

(63) Continuation of application No. 14/812,143, filed on Jul. 29, 2015.

(51) **LOC (11) Cl.** ..... **24-02**

(57) **CLAIM**

The ornamental design for a shipping wedge, as shown and described.

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

USPC ..... **D24/140**

(58) **Field of Classification Search**

**DESCRIPTION**

USPC ..... D24/128, 135, 136, 152, 176, 231, 133, D24/146, 180, 110.5, 140, 155, 171, D24/110.1, 106, 137, 112, 145, 147, 148; D29/108; D28/91.2; 128/848  
CPC ..... A61B 17/072; A61B 17/56; A61B 17/36; A61B 17/10; A61B 17/068; B25C 5/11; B25C 5/10

See application file for complete search history.

FIG. 1 is a front, perspective view of a shipping wedge; FIG. 2 is a top view of the shipping wedge of FIG. 1; FIG. 3 is a right side view of the shipping wedge of FIG. 1; FIG. 4 is a left side view of the shipping wedge of FIG. 1; FIG. 5 is a bottom side view of the shipping wedge of FIG. 1; FIG. 6 is a rear end view of the shipping wedge of FIG. 1; FIG. 7 is a front end view of the shipping wedge of FIG. 1; and, FIG. 8 is a back, perspective view of the shipping wedge of FIG. 1, attached to a staple cartridge.

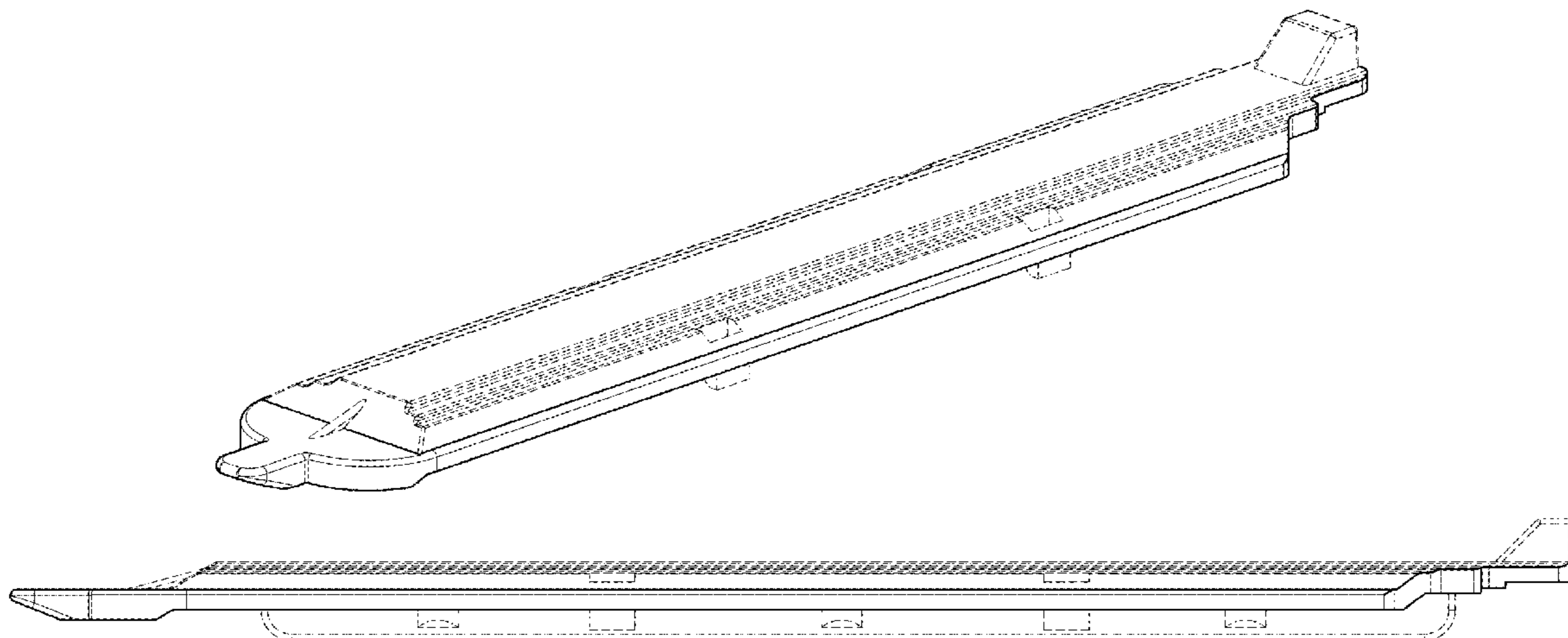
(56) **References Cited**

**U.S. PATENT DOCUMENTS**

D123,786 S \* 12/1940 Reens ..... D11/156  
3,079,606 A 3/1963 Bobrov et al.  
3,098,232 A \* 7/1963 Brown ..... A61B 17/0682  
2/907  
3,490,675 A 1/1970 Green et al.  
3,499,591 A 3/1970 Green  
(Continued)

The dashed broken lines are included for the purpose of illustrating environment and portions of the shipping wedge that form no part of the claimed design. The dot-dash broken lines define the bounds of the claimed design and form no part thereof.

**1 Claim, 5 Drawing Sheets**



(56)

References Cited

U.S. PATENT DOCUMENTS

3,517,670 A *	6/1970	Speelman .....	A61B 5/150022 30/348	5,330,486 A	7/1994	Wilk
3,777,538 A	12/1973	Weatherly et al.		5,332,142 A	7/1994	Robinson et al.
3,882,854 A	5/1975	Hulka et al.		5,336,232 A	8/1994	Green et al.
4,027,510 A	6/1977	Hiltebrandt		5,344,061 A	9/1994	Crainich
4,086,926 A	5/1978	Green et al.		5,352,238 A	10/1994	Green et al.
4,127,227 A *	11/1978	Green .....	A61B 17/0684 227/19	5,356,064 A	10/1994	Green et al.
4,241,861 A	12/1980	Fleischer		5,358,506 A	10/1994	Green et al.
4,244,372 A	1/1981	Kapitanov et al.		5,364,001 A	11/1994	Bryan
D264,378 S *	5/1982	Thomas .....	D24/147	5,364,002 A	11/1994	Green et al.
4,429,695 A	2/1984	Green		5,364,003 A *	11/1994	Williamson, IV ... A61B 17/072 227/178.1
4,505,414 A	3/1985	Filipi		5,366,133 A	11/1994	Geiste
4,520,817 A	6/1985	Green		5,376,095 A	12/1994	Ortiz
4,589,413 A	5/1986	Malyshev et al.		5,379,933 A	1/1995	Green et al.
4,596,351 A	6/1986	Fedotov et al.		5,381,943 A	1/1995	Allen et al.
4,602,634 A	7/1986	Barkley		5,382,255 A	1/1995	Castro et al.
4,605,001 A	8/1986	Rothfuss et al.		5,383,880 A	1/1995	Hooven
4,608,981 A	9/1986	Rothfuss et al.		5,389,098 A	2/1995	Tsuruta et al.
4,610,383 A	9/1986	Rothfuss et al.		5,395,033 A	3/1995	Byrne et al.
4,633,861 A	1/1987	Chow et al.		5,395,034 A	3/1995	Allen et al.
4,633,874 A	1/1987	Chow et al.		5,397,046 A	3/1995	Savage et al.
4,671,445 A	6/1987	Barker et al.		5,397,324 A	3/1995	Carroll et al.
4,700,703 A	10/1987	Resnick et al.		5,403,312 A	4/1995	Yates et al.
4,703,887 A	11/1987	Clanton et al.		5,405,072 A	4/1995	Zlock et al.
4,728,020 A	3/1988	Green et al.		5,407,293 A	4/1995	Crainich
4,752,024 A	6/1988	Green et al.		5,413,268 A	5/1995	Green et al.
4,784,137 A	11/1988	Kulik et al.		5,415,334 A	5/1995	Williamson et al.
D298,967 S *	12/1988	Hunt .....	D24/145	5,415,335 A	5/1995	Knodell, Jr.
4,863,088 A	9/1989	Redmond et al.		5,417,361 A	5/1995	Williamson, IV
4,869,415 A	9/1989	Fox		5,423,471 A	6/1995	Mastri et al.
4,892,244 A	1/1990	Fox et al.		5,425,745 A	6/1995	Green et al.
4,955,959 A	9/1990	Tompkins et al.		5,431,322 A	7/1995	Green et al.
4,978,049 A	12/1990	Green		5,431,323 A	7/1995	Smith et al.
4,991,764 A	2/1991	Mericle		5,433,721 A	7/1995	Hooven et al.
5,014,899 A	5/1991	Presty et al.		5,441,193 A	8/1995	Gravener
5,031,814 A	7/1991	Tompkins et al.		5,445,304 A	8/1995	Plyley et al.
5,040,715 A	8/1991	Green et al.		5,447,265 A	9/1995	Vidal et al.
D320,272 S *	9/1991	Green .....	D24/145	5,452,837 A	9/1995	Williamson, IV et al.
5,065,929 A	11/1991	Schulze et al.		5,456,401 A	10/1995	Green et al.
5,071,430 A	12/1991	de Salis et al.		5,464,300 A	11/1995	Crainich
5,074,454 A	12/1991	Peters		5,465,895 A	11/1995	Knodel et al.
5,083,695 A	1/1992	Foslien et al.		5,467,911 A	11/1995	Tsuruta et al.
5,084,057 A	1/1992	Green et al.		5,470,007 A	11/1995	Plyley et al.
5,106,008 A	4/1992	Tompkins et al.		5,470,010 A	11/1995	Rothfuss et al.
D326,323 S *	5/1992	Hunt .....	D24/145	5,472,132 A	12/1995	Savage et al.
5,111,987 A	5/1992	Moeinzadeh et al.		5,474,566 A	12/1995	Alesi et al.
5,129,570 A	7/1992	Schulze et al.		5,476,206 A	12/1995	Green et al.
5,141,144 A	8/1992	Foslien et al.		5,478,003 A	12/1995	Green et al.
5,156,315 A	10/1992	Green et al.		5,480,089 A	1/1996	Blewett
5,156,614 A	10/1992	Green et al.		5,482,197 A	1/1996	Green et al.
5,163,943 A	11/1992	Mohiuddin et al.		5,484,095 A	1/1996	Green et al.
5,170,925 A	12/1992	Madden et al.		5,484,451 A	1/1996	Akopov et al.
5,171,247 A	12/1992	Hughett et al.		5,485,947 A	1/1996	Olson et al.
5,173,133 A	12/1992	Morin et al.		5,485,952 A	1/1996	Fontayne
5,180,092 A	1/1993	Crainich		5,486,185 A	1/1996	Freitas et al.
5,188,274 A	2/1993	Moeinzadeh et al.		5,487,499 A	1/1996	Sorrentino et al.
5,220,928 A	6/1993	Oddsens et al.		5,487,500 A	1/1996	Knodel et al.
5,221,036 A	6/1993	Takase		5,489,058 A	2/1996	Plyley et al.
5,242,457 A	9/1993	Akopov et al.		5,490,856 A	2/1996	Person et al.
5,246,156 A	9/1993	Rothfuss et al.		5,497,933 A	3/1996	DeFonzo et al.
5,253,793 A	10/1993	Green et al.		5,501,689 A	3/1996	Green et al.
5,258,010 A *	11/1993	Green .....	A61B 17/0682 227/176.1	5,505,363 A	4/1996	Green et al.
5,263,629 A	11/1993	Trumbull et al.		5,507,426 A	4/1996	Young et al.
RE34,519 E	1/1994	Fox et al.		5,518,163 A	5/1996	Hooven
5,275,323 A	1/1994	Schulze et al.		5,518,164 A	5/1996	Hooven
5,282,807 A	2/1994	Knoepfler		5,529,235 A	6/1996	Boiarski et al.
5,289,963 A	3/1994	McGarry et al.		5,531,744 A	7/1996	Nardella et al.
5,307,976 A	5/1994	Olson et al.		5,535,934 A	7/1996	Boiarski et al.
5,308,576 A	5/1994	Green et al.		5,535,935 A	7/1996	Vidal et al.
5,312,023 A	5/1994	Green et al.		5,535,937 A	7/1996	Boiarski et al.
5,318,221 A	6/1994	Green et al.		5,540,375 A	7/1996	Bolanos et al.
5,326,013 A	7/1994	Green et al.		5,542,594 A	8/1996	McKean et al.
5,328,077 A	7/1994	Lou		5,549,628 A	8/1996	Cooper et al.
				5,551,622 A	9/1996	Yoon
				5,553,765 A	9/1996	Knodel et al.
				5,554,164 A	9/1996	Wilson et al.
				5,554,169 A	9/1996	Green et al.
				5,560,530 A	10/1996	Bolanos et al.
				5,560,532 A	10/1996	DeFonzo et al.

(56)

References Cited

U.S. PATENT DOCUMENTS

5,562,239 A	10/1996	Boiarski et al.	5,769,303 A	6/1998	Knodel et al.
5,562,241 A	10/1996	Knodel et al.	5,769,892 A	6/1998	Kingwell
5,562,682 A	10/1996	Oberlin et al.	5,772,099 A	6/1998	Gravener
5,562,701 A	10/1996	Huitema et al.	5,772,673 A	6/1998	Cuny et al.
5,564,615 A	10/1996	Bishop et al.	5,779,130 A	7/1998	Alesi et al.
5,571,116 A	11/1996	Bolanos et al.	5,779,131 A	7/1998	Knodel et al.
5,573,169 A	11/1996	Green et al.	5,779,132 A	7/1998	Knodel et al.
5,573,543 A	11/1996	Akopov et al.	5,782,396 A	7/1998	Mastri et al.
5,575,799 A	11/1996	Bolanos et al.	5,782,397 A	7/1998	Koukline
5,575,803 A	11/1996	Cooper et al.	5,782,834 A	7/1998	Lucey et al.
5,577,654 A	11/1996	Bishop	5,785,232 A	7/1998	Vidal et al.
5,584,425 A	12/1996	Savage et al.	5,797,536 A	8/1998	Smith et al.
5,586,711 A	12/1996	Plyley et al.	5,797,537 A	8/1998	Oberlin et al.
5,588,580 A	12/1996	Paul et al.	5,797,538 A	8/1998	Heaton et al.
5,588,581 A	12/1996	Conlon et al.	5,810,811 A	9/1998	Yates et al.
5,597,107 A	1/1997	Knodel et al.	5,810,855 A	9/1998	Rayburn et al.
5,601,224 A	2/1997	Bishop et al.	5,814,055 A	9/1998	Knodel et al.
5,607,095 A	3/1997	Smith et al.	5,814,057 A	9/1998	Oi et al.
5,615,820 A	4/1997	Viola	5,816,471 A	10/1998	Plyley et al.
5,618,291 A	4/1997	Thompson et al.	5,817,109 A	10/1998	McGarry et al.
5,624,452 A	4/1997	Yates	5,820,009 A	10/1998	Melling et al.
5,626,587 A	5/1997	Bishop et al.	5,823,066 A	10/1998	Huitema et al.
5,628,446 A	5/1997	Geiste et al.	5,826,776 A	10/1998	Schulze et al.
5,630,539 A	5/1997	Plyley et al.	5,829,662 A	11/1998	Allen et al.
5,630,540 A	5/1997	Blewett	5,833,695 A	11/1998	Yoon
5,630,541 A	5/1997	Williamson, IV et al.	5,836,147 A	11/1998	Schnipke
5,632,432 A	5/1997	Schulze et al.	5,862,972 A	1/1999	Green et al.
5,634,584 A	6/1997	Okorochoa et al.	5,865,361 A	2/1999	Milliman et al.
5,636,780 A	6/1997	Green et al.	5,871,135 A	2/1999	Williamson, IV et al.
5,645,209 A	7/1997	Green et al.	5,873,873 A	2/1999	Smith et al.
5,647,526 A	7/1997	Green et al.	5,878,938 A	3/1999	Bittner et al.
5,651,491 A	7/1997	Heaton et al.	5,893,506 A	4/1999	Powell
5,653,373 A	8/1997	Green et al.	5,894,979 A	4/1999	Powell
5,653,374 A	8/1997	Young et al.	5,897,562 A	4/1999	Bolanos et al.
5,653,721 A	8/1997	Knodel et al.	5,901,895 A	5/1999	Heaton et al.
5,655,698 A	8/1997	Yoon	5,911,352 A	6/1999	Racenet et al.
5,657,921 A	8/1997	Young et al.	5,911,353 A	6/1999	Bolanos et al.
5,658,300 A	8/1997	Bito et al.	5,918,791 A	7/1999	Sorrentino et al.
5,662,258 A	9/1997	Knodel et al.	5,919,198 A	7/1999	Graves, Jr. et al.
5,662,259 A	9/1997	Yoon	5,922,001 A	7/1999	Yoon
5,662,260 A	9/1997	Yoon	D413,261 S *	8/1999	Yerich ..... D11/143
5,662,662 A	9/1997	Bishop et al.	5,931,847 A	8/1999	Bittner et al.
5,662,666 A	9/1997	Onuki et al.	5,941,442 A	8/1999	Geiste et al.
5,665,085 A	9/1997	Nardella	5,954,259 A	9/1999	Viola et al.
5,667,517 A	9/1997	Hooven	5,964,774 A	10/1999	McKean et al.
5,669,544 A	9/1997	Schulze et al.	5,980,510 A	11/1999	Tsonton et al.
5,673,840 A	10/1997	Schulze et al.	5,988,479 A	11/1999	Palmer
5,673,841 A	10/1997	Schulze et al.	6,004,335 A	12/1999	Vaitekunas et al.
5,673,842 A	10/1997	Bittner et al.	6,010,054 A	1/2000	Johnson et al.
5,676,674 A	10/1997	Bolanos et al.	6,032,849 A	3/2000	Mastri et al.
5,680,981 A	10/1997	Mililli et al.	6,045,560 A	4/2000	McKean et al.
5,680,982 A	10/1997	Schulze et al.	6,063,097 A	5/2000	Oi et al.
5,680,983 A	10/1997	Plyley et al.	6,079,606 A	6/2000	Milliman et al.
5,690,269 A	11/1997	Bolanos et al.	6,099,551 A	8/2000	Gabbay
5,692,668 A	12/1997	Schulze et al.	6,109,500 A	8/2000	Alli et al.
5,697,542 A	12/1997	Knodel et al.	6,131,789 A	10/2000	Schulze et al.
5,702,409 A	12/1997	Rayburn et al.	6,131,790 A	10/2000	Piraka
5,704,534 A	1/1998	Huitema et al.	6,155,473 A	12/2000	Tompkins et al.
5,706,997 A	1/1998	Green et al.	6,197,017 B1	3/2001	Brock et al.
5,709,334 A	1/1998	Sorrentino et al.	6,202,914 B1	3/2001	Geiste et al.
5,711,472 A	1/1998	Bryan	6,241,139 B1	6/2001	Milliman et al.
5,713,505 A	2/1998	Huitema	6,250,532 B1	6/2001	Green et al.
5,715,988 A	2/1998	Palmer	6,264,086 B1	7/2001	McGuckin, Jr.
5,716,366 A	2/1998	Yates	6,264,087 B1	7/2001	Whitman
5,718,359 A	2/1998	Palmer et al.	6,279,809 B1	8/2001	Nicolo
5,725,536 A	3/1998	Oberlin et al.	6,315,183 B1	11/2001	Piraka
5,725,554 A	3/1998	Simon et al.	6,315,184 B1	11/2001	Whitman
5,728,110 A	3/1998	Vidal et al.	6,325,810 B1	12/2001	Hamilton et al.
5,732,806 A	3/1998	Foshee et al.	6,330,965 B1	12/2001	Milliman et al.
5,735,848 A	4/1998	Yates et al.	6,391,038 B2	5/2002	Vargas et al.
5,743,456 A	4/1998	Jones et al.	6,398,797 B2	6/2002	Bombard et al.
5,749,893 A	5/1998	Vidal et al.	6,436,097 B1	8/2002	Nardella
5,752,644 A	5/1998	Bolanos et al.	6,439,446 B1	8/2002	Perry et al.
5,762,255 A	6/1998	Chrisman et al.	6,443,973 B1	9/2002	Whitman
5,762,256 A	6/1998	Mastri et al.	6,478,804 B2	11/2002	Vargas et al.
			6,488,196 B1	12/2002	Fenton, Jr.
			6,503,257 B2	1/2003	Grant et al.
			6,505,768 B2	1/2003	Whitman
			6,544,274 B2	4/2003	Danitz et al.

(56)

References Cited

U.S. PATENT DOCUMENTS

6,554,844 B2	4/2003	Lee et al.	7,287,682 B1	10/2007	Ezzat et al.
6,565,554 B1	5/2003	Niemeyer	7,293,685 B2	11/2007	Ehrenfels et al.
6,587,750 B2	7/2003	Gerbi et al.	7,296,722 B2	11/2007	Ivanko
6,592,597 B2	7/2003	Grant et al.	7,296,724 B2	11/2007	Green et al.
6,594,552 B1	7/2003	Nowlin et al.	7,296,772 B2	11/2007	Wang
6,602,252 B2	8/2003	Mollenauer	7,300,444 B1	11/2007	Nielsen et al.
6,619,529 B2	9/2003	Green et al.	7,303,107 B2	12/2007	Milliman et al.
D480,808 S	10/2003	Wells et al.	7,303,108 B2	12/2007	Shelton, IV
6,644,532 B2	11/2003	Green et al.	7,308,998 B2	12/2007	Mastri et al.
6,656,193 B2	12/2003	Grant et al.	7,326,232 B2	2/2008	Viola et al.
6,669,073 B2	12/2003	Milliman et al.	7,328,828 B2	2/2008	Ortiz et al.
6,681,978 B2	1/2004	Geiste et al.	7,328,829 B2	2/2008	Arad et al.
6,698,643 B2	3/2004	Whitman	7,334,717 B2	2/2008	Rethy et al.
6,716,232 B1	4/2004	Vidal et al.	7,354,447 B2	4/2008	Shelton, IV et al.
6,722,552 B2	4/2004	Fenton, Jr.	7,357,287 B2	4/2008	Shelton, IV et al.
6,755,338 B2	6/2004	Hahnen et al.	7,364,061 B2	4/2008	Swayze et al.
6,783,524 B2	8/2004	Anderson et al.	7,367,485 B2	5/2008	Shelton, IV et al.
6,786,382 B1	9/2004	Hoffman	7,377,928 B2	5/2008	Zubik et al.
6,817,509 B2	11/2004	Geiste et al.	7,380,695 B2	6/2008	Doll et al.
6,830,174 B2	12/2004	Hillstead et al.	7,380,696 B2	6/2008	Shelton, IV et al.
6,835,199 B2	12/2004	McGuckin, Jr. et al.	7,396,356 B2	7/2008	Mollenauer
6,843,403 B2	1/2005	Whitman	7,398,907 B2	7/2008	Racenet et al.
RE38,708 E	3/2005	Bolanos et al.	7,399,310 B2	7/2008	Edoga et al.
6,877,647 B2	4/2005	Green et al.	7,401,720 B1	7/2008	Durrani
6,889,116 B2	5/2005	Jinno	7,401,721 B2	7/2008	Holsten et al.
6,905,057 B2	6/2005	Swayze et al.	7,404,508 B2	7/2008	Smith et al.
6,945,444 B2	9/2005	Gresham et al.	7,404,509 B2	7/2008	Ortiz et al.
6,953,138 B1	10/2005	Dworak et al.	7,407,074 B2	8/2008	Ortiz et al.
6,953,139 B2	10/2005	Milliman et al.	7,407,075 B2	8/2008	Holsten et al.
6,959,852 B2	11/2005	Shelton, IV et al.	7,407,077 B2	8/2008	Ortiz et al.
6,962,594 B1	11/2005	Thevenet	7,407,078 B2	8/2008	Shelton, IV et al.
6,964,363 B2	11/2005	Wales et al.	7,416,101 B2	8/2008	Shelton, IV et al.
6,978,921 B2	12/2005	Shelton, IV et al.	7,419,080 B2	9/2008	Smith et al.
6,981,628 B2	1/2006	Wales	7,419,081 B2	9/2008	Ehrenfels et al.
6,986,451 B1	1/2006	Mastri et al.	7,419,495 B2	9/2008	Menn et al.
6,988,649 B2	1/2006	Shelton, IV et al.	7,422,139 B2	9/2008	Shelton, IV et al.
6,991,627 B2	1/2006	Madhani et al.	7,424,965 B2	9/2008	Racenet et al.
6,994,714 B2	2/2006	Vargas et al.	7,431,189 B2	10/2008	Shelton, IV et al.
7,000,818 B2	2/2006	Shelton, IV et al.	7,431,730 B2	10/2008	Viola
7,000,819 B2	2/2006	Swayze et al.	7,434,715 B2	10/2008	Shelton, IV et al.
7,032,799 B2 *	4/2006	Viola ..... A61B 17/07207 227/175.1	7,434,717 B2	10/2008	Shelton, IV et al.
7,044,352 B2	5/2006	Shelton, IV et al.	7,438,208 B2	10/2008	Larson
7,044,353 B2	5/2006	Mastri et al.	7,438,209 B1	10/2008	Hess et al.
7,055,730 B2	6/2006	Ehrenfels et al.	7,441,684 B2	10/2008	Shelton, IV et al.
7,055,731 B2	6/2006	Shelton, IV et al.	7,441,685 B1	10/2008	Boudreaux
7,059,508 B2	6/2006	Shelton, IV et al.	7,448,525 B2	11/2008	Shelton, IV et al.
7,070,083 B2	7/2006	Jankowski	7,451,904 B2	11/2008	Shelton, IV
7,083,075 B2	8/2006	Swayze et al.	7,455,208 B2	11/2008	Wales et al.
7,097,089 B2	8/2006	Marczyk	7,455,676 B2	11/2008	Holsten et al.
7,111,769 B2	9/2006	Wales et al.	7,458,494 B2	12/2008	Matsutani et al.
7,114,642 B2	10/2006	Whitman	7,461,767 B2	12/2008	Viola et al.
7,121,446 B2	10/2006	Arad et al.	7,462,185 B1	12/2008	Knodel
7,128,253 B2	10/2006	Mastri et al.	7,464,846 B2	12/2008	Shelton, IV et al.
7,128,254 B2	10/2006	Shelton, IV et al.	7,464,847 B2	12/2008	Viola et al.
7,140,527 B2	11/2006	Ehrenfels et al.	7,464,848 B2	12/2008	Green et al.
7,140,528 B2	11/2006	Shelton, IV	7,464,849 B2	12/2008	Shelton, IV et al.
7,143,923 B2	12/2006	Shelton, IV et al.	7,467,740 B2	12/2008	Shelton, IV et al.
7,143,924 B2	12/2006	Scirica et al.	7,472,814 B2	1/2009	Mastri et al.
7,143,925 B2	12/2006	Shelton, IV et al.	7,472,815 B2	1/2009	Shelton, IV et al.
7,143,926 B2	12/2006	Shelton, IV et al.	7,472,816 B2	1/2009	Holsten et al.
7,147,138 B2	12/2006	Shelton, IV	7,473,258 B2	1/2009	Clauson et al.
7,159,750 B2	1/2007	Racenet et al.	7,481,347 B2	1/2009	Roy
7,168,604 B2	1/2007	Milliman et al.	7,481,348 B2	1/2009	Marczyk
7,172,104 B2	2/2007	Scirica et al.	7,481,349 B2	1/2009	Holsten et al.
7,188,758 B2	3/2007	Viola et al.	7,481,824 B2	1/2009	Boudreaux et al.
7,207,471 B2	4/2007	Heinrich et al.	7,487,899 B2	2/2009	Shelton, IV et al.
7,213,736 B2	5/2007	Wales et al.	7,490,749 B2	2/2009	Schall et al.
7,225,963 B2	6/2007	Scirica	7,494,039 B2	2/2009	Racenet et al.
7,225,964 B2	6/2007	Mastri et al.	7,500,979 B2	3/2009	Hueil et al.
7,238,195 B2	7/2007	Viola	7,503,474 B2	3/2009	Hillstead et al.
7,246,734 B2	7/2007	Shelton, IV	7,506,790 B2	3/2009	Shelton, IV
7,258,262 B2	8/2007	Mastri et al.	7,506,791 B2	3/2009	Omaits et al.
7,278,562 B2	10/2007	Mastri et al.	7,510,107 B2	3/2009	Timm et al.
7,278,563 B1	10/2007	Green	7,513,408 B2	4/2009	Shelton, IV et al.
			7,517,356 B2	4/2009	Heinrich
			7,537,602 B2	5/2009	Whitman
			7,543,729 B2	6/2009	Ivanko
			7,543,730 B1	6/2009	Marczyk
			7,543,731 B2	6/2009	Green et al.

(56)

References Cited

U.S. PATENT DOCUMENTS

7,552,854 B2	6/2009	Wixey et al.	7,757,925 B2	7/2010	Viola et al.
7,556,185 B2	7/2009	Viola	7,762,445 B2	7/2010	Heinrich et al.
7,556,186 B2	7/2009	Milliman	D621,815 S *	8/2010	Sakai ..... D14/214
7,559,450 B2	7/2009	Wales et al.	7,766,209 B2	8/2010	Baxter, III et al.
7,559,452 B2	7/2009	Wales et al.	7,766,210 B2	8/2010	Shelton, IV et al.
7,559,453 B2	7/2009	Heinrich et al.	7,766,924 B1	8/2010	Bombard et al.
7,559,937 B2	7/2009	de la Torre et al.	7,766,928 B2	8/2010	Ezzat et al.
7,565,993 B2	7/2009	Milliman et al.	7,770,774 B2	8/2010	Mastri et al.
7,568,603 B2	8/2009	Shelton, IV et al.	7,770,775 B2	8/2010	Shelton, IV et al.
7,568,604 B2	8/2009	Ehrenfels et al.	7,776,060 B2	8/2010	Mooradian et al.
7,571,845 B2	8/2009	Viola	7,780,055 B2	8/2010	Scirica et al.
7,575,144 B2	8/2009	Ortiz et al.	7,784,662 B2	8/2010	Wales et al.
7,584,880 B2	9/2009	Racenet et al.	7,789,283 B2	9/2010	Shah
7,588,174 B2	9/2009	Holsten et al.	7,789,889 B2	9/2010	Zubik et al.
7,588,175 B2	9/2009	Timm et al.	7,793,812 B2	9/2010	Moore et al.
7,588,176 B2	9/2009	Timm et al.	7,793,814 B2	9/2010	Racenet et al.
7,588,177 B2	9/2009	Racenet	7,794,475 B2	9/2010	Hess et al.
7,597,229 B2	10/2009	Boudreaux et al.	7,798,385 B2	9/2010	Boyden et al.
7,597,230 B2	10/2009	Racenet et al.	7,798,386 B2	9/2010	Schall et al.
7,600,663 B2	10/2009	Green	7,799,039 B2	9/2010	Shelton, IV et al.
7,604,150 B2	10/2009	Boudreaux	7,810,690 B2	10/2010	Bilotti et al.
7,604,151 B2	10/2009	Hess et al.	7,810,692 B2	10/2010	Hall et al.
7,607,557 B2	10/2009	Shelton, IV et al.	7,810,693 B2	10/2010	Broehl et al.
7,611,038 B2	11/2009	Racenet et al.	7,815,090 B2	10/2010	Marczyk
7,617,961 B2	11/2009	Viola	7,815,091 B2	10/2010	Marczyk
D605,762 S *	12/2009	Nalagatla ..... D24/145	7,815,092 B2	10/2010	Whitman et al.
7,624,902 B2	12/2009	Marczyk et al.	7,819,296 B2	10/2010	Hueil et al.
7,624,903 B2	12/2009	Green et al.	7,819,297 B2	10/2010	Doll et al.
7,631,793 B2	12/2009	Rethy et al.	7,819,298 B2	10/2010	Hall et al.
7,631,794 B2	12/2009	Rethy et al.	7,819,299 B2	10/2010	Shelton, IV et al.
7,635,073 B2	12/2009	Heinrich	7,819,796 B2	10/2010	Blake et al.
7,635,074 B2	12/2009	Olson et al.	7,823,760 B2	11/2010	Zemlok et al.
7,635,373 B2	12/2009	Ortiz	7,823,761 B2	11/2010	Boyden et al.
7,637,409 B2	12/2009	Marczyk	7,824,426 B2	11/2010	Racenet et al.
7,637,410 B2	12/2009	Marczyk	7,828,186 B2	11/2010	Wales
7,641,091 B2	1/2010	Olson et al.	7,828,187 B2	11/2010	Green et al.
7,641,095 B2	1/2010	Viola	7,828,188 B2	11/2010	Jankowski
7,644,848 B2	1/2010	Swayze et al.	7,828,189 B2	11/2010	Holsten et al.
7,648,055 B2	1/2010	Marczyk	7,832,408 B2	11/2010	Shelton, IV et al.
7,651,017 B2	1/2010	Ortiz et al.	7,832,611 B2	11/2010	Boyden et al.
7,654,431 B2	2/2010	Hueil et al.	7,832,612 B2	11/2010	Baxter, III et al.
7,658,311 B2	2/2010	Boudreaux	7,837,079 B2	11/2010	Holsten et al.
7,658,312 B2 *	2/2010	Vidal ..... A61B 17/07207 227/175.1	7,837,081 B2	11/2010	Holsten et al.
7,665,646 B2	2/2010	Prommersberger	7,841,503 B2	11/2010	Sonnenschein et al.
7,665,647 B2	2/2010	Shelton, IV et al.	7,845,533 B2	12/2010	Marczyk et al.
7,669,746 B2	3/2010	Shelton, IV	7,845,534 B2	12/2010	Viola et al.
7,670,334 B2	3/2010	Hueil et al.	7,845,535 B2	12/2010	Scirica
7,673,780 B2	3/2010	Shelton, IV et al.	7,845,537 B2	12/2010	Shelton, IV et al.
7,673,781 B2	3/2010	Swayze et al.	7,845,538 B2	12/2010	Whitman
7,673,782 B2	3/2010	Hess et al.	7,850,703 B2	12/2010	Bombard et al.
7,673,783 B2	3/2010	Morgan et al.	7,857,183 B2	12/2010	Shelton, IV
7,678,121 B1	3/2010	Knodel	7,857,184 B2	12/2010	Viola
7,681,772 B2	3/2010	Green et al.	7,857,185 B2	12/2010	Swayze et al.
7,682,367 B2	3/2010	Shah et al.	7,857,186 B2	12/2010	Baxter, III et al.
7,682,368 B1	3/2010	Bombard et al.	7,861,906 B2	1/2011	Doll et al.
7,690,547 B2	4/2010	Racenet et al.	7,861,907 B2	1/2011	Green et al.
7,694,865 B2	4/2010	Scirica	7,866,524 B2	1/2011	Krehel
7,699,205 B2	4/2010	Ivanko	7,866,525 B2	1/2011	Scirica
7,703,653 B2	4/2010	Shah et al.	7,866,526 B2	1/2011	Green et al.
7,721,931 B2	5/2010	Shelton, IV et al.	7,866,527 B2	1/2011	Hall et al.
7,721,933 B2	5/2010	Ehrenfels et al.	7,866,528 B2	1/2011	Olson et al.
7,721,935 B2	5/2010	Racenet et al.	7,870,989 B2	1/2011	Viola et al.
7,726,537 B2	6/2010	Olson et al.	7,886,952 B2	2/2011	Scirica et al.
7,726,538 B2	6/2010	Holsten et al.	7,891,532 B2	2/2011	Mastri et al.
7,726,539 B2	6/2010	Holsten et al.	7,891,533 B2	2/2011	Green et al.
7,731,072 B2	6/2010	Timm et al.	7,891,534 B2	2/2011	Wenchell et al.
7,735,703 B2	6/2010	Morgan et al.	7,896,214 B2	3/2011	Farascioni
7,740,159 B2	6/2010	Shelton, IV et al.	7,900,805 B2	3/2011	Shelton, IV et al.
7,740,160 B2	6/2010	Viola	7,901,416 B2	3/2011	Nolan et al.
7,743,960 B2	6/2010	Whitman et al.	7,905,380 B2	3/2011	Shelton, IV et al.
7,744,628 B2	6/2010	Viola	7,905,381 B2	3/2011	Baxter, III et al.
7,753,245 B2	7/2010	Boudreaux et al.	7,909,039 B2	3/2011	Hur
7,753,248 B2	7/2010	Viola	7,909,220 B2	3/2011	Viola
7,757,924 B2	7/2010	Gerbi et al.	7,909,221 B2	3/2011	Viola et al.
			7,909,224 B2	3/2011	Prommersberger
			7,913,891 B2	3/2011	Doll et al.
			7,913,893 B2	3/2011	Mastri et al.
			7,914,543 B2	3/2011	Roth et al.
			7,918,230 B2	4/2011	Whitman et al.

(56)

References Cited

U.S. PATENT DOCUMENTS

7,922,061 B2	4/2011	Shelton, IV et al.	8,083,120 B2	12/2011	Shelton, IV et al.
7,922,063 B2	4/2011	Zemlok et al.	8,087,563 B2	1/2012	Milliman et al.
7,922,064 B2	4/2011	Boyden et al.	8,091,753 B2	1/2012	Viola
7,926,691 B2	4/2011	Viola et al.	8,091,754 B2	1/2012	Ehrenfels et al.
7,926,692 B2	4/2011	Racenet et al.	8,091,756 B2	1/2012	Viola
7,934,628 B2	5/2011	Wenchell et al.	8,092,493 B2	1/2012	Marczyk
7,934,630 B2	5/2011	Shelton, IV et al.	8,096,459 B2	1/2012	Ortiz et al.
7,934,631 B2	5/2011	Balbierz et al.	8,096,460 B2	1/2012	Blier et al.
7,942,300 B2	5/2011	Rethy et al.	8,100,309 B2	1/2012	Marczyk
7,942,303 B2	5/2011	Shah	8,100,310 B2	1/2012	Zemlok
7,950,560 B2	5/2011	Zemlok et al.	8,102,008 B2	1/2012	Wells
7,950,561 B2	5/2011	Aranyi	8,113,406 B2	2/2012	Holsten et al.
7,950,562 B2	5/2011	Beardsley et al.	8,113,407 B2	2/2012	Holsten et al.
7,954,682 B2	6/2011	Giordano et al.	8,113,408 B2	2/2012	Wenchell et al.
7,954,683 B1	6/2011	Knodel et al.	8,113,409 B2	2/2012	Cohen et al.
7,954,684 B2	6/2011	Boudreaux	8,113,410 B2	2/2012	Hall et al.
7,954,685 B2	6/2011	Viola	8,123,101 B2	2/2012	Racenet et al.
7,954,686 B2	6/2011	Baxter, III et al.	8,127,975 B2	3/2012	Olson et al.
7,954,687 B2	6/2011	Zemlok et al.	8,127,976 B2	3/2012	Scirica et al.
7,959,051 B2	6/2011	Smith et al.	8,132,703 B2	3/2012	Milliman et al.
7,963,431 B2	6/2011	Scirica	8,132,705 B2	3/2012	Viola et al.
7,963,432 B2	6/2011	Knodel et al.	8,132,706 B2	3/2012	Marczyk et al.
7,963,433 B2	6/2011	Whitman et al.	8,136,713 B2	3/2012	Hathaway et al.
7,967,178 B2	6/2011	Scirica et al.	8,141,762 B2	3/2012	Bedi et al.
7,967,179 B2	6/2011	Olson et al.	8,152,041 B2	4/2012	Kostrzewski
7,967,180 B2	6/2011	Scirica	8,157,148 B2	4/2012	Scirica
7,975,894 B2	7/2011	Boyden et al.	8,157,150 B2	4/2012	Viola et al.
7,980,443 B2	7/2011	Scheib et al.	8,157,151 B2	4/2012	Ingmanson et al.
7,988,026 B2	8/2011	Knodel et al.	8,157,152 B2	4/2012	Holsten et al.
7,988,027 B2	8/2011	Olson et al.	8,162,197 B2	4/2012	Mastri et al.
7,988,028 B2	8/2011	Farascioni et al.	8,167,185 B2	5/2012	Shelton, IV et al.
7,992,758 B2	8/2011	Whitman et al.	8,167,186 B2	5/2012	Racenet et al.
7,997,468 B2	8/2011	Farascioni	8,172,121 B2	5/2012	Krehel
7,997,469 B2	8/2011	Olson et al.	8,172,124 B2	5/2012	Shelton, IV et al.
8,002,795 B2	8/2011	Beetel	8,181,837 B2	5/2012	Roy
8,006,885 B2	8/2011	Marczyk	8,186,555 B2	5/2012	Shelton, IV et al.
8,006,887 B2	8/2011	Marczyk	8,186,557 B2	5/2012	Cohen et al.
8,007,505 B2	8/2011	Weller et al.	8,186,558 B2	5/2012	Sapienza
8,007,513 B2	8/2011	Nalagatla et al.	8,186,559 B1	5/2012	Whitman
8,011,550 B2	9/2011	Aranyi et al.	8,186,560 B2	5/2012	Hess et al.
8,011,551 B2	9/2011	Marczyk et al.	8,193,044 B2	6/2012	Kenneth
8,011,552 B2	9/2011	Ivanko	8,196,795 B2	6/2012	Moore et al.
8,011,553 B2	9/2011	Mastri et al.	8,196,796 B2	6/2012	Shelton, IV et al.
8,011,555 B2	9/2011	Tarinelli et al.	8,201,721 B2	6/2012	Zemlok et al.
8,012,170 B2	9/2011	Whitman et al.	8,205,619 B2	6/2012	Shah et al.
8,015,976 B2	9/2011	Shah	8,205,780 B2	6/2012	Sorrentino et al.
8,016,177 B2	9/2011	Bettuchi et al.	8,205,781 B2	6/2012	Baxter, III et al.
8,016,178 B2	9/2011	Olson et al.	8,210,412 B2	7/2012	Marczyk
8,020,742 B2	9/2011	Marczyk	8,210,416 B2	7/2012	Milliman et al.
8,020,743 B2	9/2011	Shelton, IV	8,216,236 B2	7/2012	Heinrich et al.
D647,078 S *	10/2011	Mori ..... D14/214	8,220,688 B2	7/2012	Laurent et al.
8,028,882 B2	10/2011	Viola	8,220,690 B2	7/2012	Hess et al.
8,028,883 B2	10/2011	Stopek	8,225,979 B2	7/2012	Farascioni et al.
8,028,884 B2	10/2011	Sniffin et al.	8,231,040 B2	7/2012	Zemlok et al.
8,033,438 B2	10/2011	Scirica	8,231,041 B2	7/2012	Marczyk et al.
8,033,440 B2	10/2011	Wenchell et al.	D666,059 S *	8/2012	Mayer ..... D7/543
8,033,441 B2	10/2011	Marczyk	8,235,272 B2	8/2012	Nicholas et al.
8,033,442 B2	10/2011	Racenet et al.	8,235,273 B2	8/2012	Olson et al.
8,034,077 B2	10/2011	Smith et al.	8,235,274 B2	8/2012	Cappola
8,038,044 B2	10/2011	Viola	8,236,010 B2	8/2012	Ortiz et al.
8,038,045 B2	10/2011	Bettuchi et al.	8,240,536 B2	8/2012	Marczyk
8,052,024 B2	11/2011	Viola et al.	8,240,537 B2	8/2012	Marczyk
8,056,787 B2	11/2011	Boudreaux et al.	8,241,322 B2	8/2012	Whitman et al.
8,056,788 B2	11/2011	Mastri et al.	8,245,897 B2	8/2012	Tzakis et al.
8,056,791 B2	11/2011	Whitman	8,245,898 B2	8/2012	Smith et al.
8,061,577 B2	11/2011	Racenet et al.	8,245,899 B2	8/2012	Swensgard et al.
8,066,166 B2	11/2011	Demmy et al.	8,245,931 B2	8/2012	Shigeta
8,070,033 B2	12/2011	Milliman et al.	8,252,009 B2	8/2012	Weller et al.
8,070,034 B1	12/2011	Knodel	8,256,653 B2	9/2012	Farascioni
8,070,035 B2	12/2011	Holsten et al.	8,256,654 B2	9/2012	Bettuchi et al.
8,074,858 B2	12/2011	Marczyk	8,256,655 B2	9/2012	Sniffin et al.
8,074,859 B2	12/2011	Kostrzewski	8,256,656 B2	9/2012	Milliman et al.
8,074,862 B2	12/2011	Shah	8,267,300 B2	9/2012	Boudreaux
8,083,118 B2	12/2011	Milliman et al.	8,272,551 B2	9/2012	Knodel et al.
8,083,119 B2	12/2011	Prommersberger	8,272,553 B2	9/2012	Mastri et al.
			8,272,554 B2	9/2012	Whitman et al.
			8,276,594 B2	10/2012	Shah
			8,276,801 B2	10/2012	Zemlok et al.
			8,281,973 B2	10/2012	Wenchell et al.

(56)

## References Cited

## U.S. PATENT DOCUMENTS

8,286,847 B2	10/2012	Taylor	8,408,439 B2	4/2013	Huang et al.
8,286,848 B2	10/2012	Wenchell et al.	8,408,440 B2	4/2013	Olson et al.
8,286,850 B2	10/2012	Viola	8,408,442 B2	4/2013	Racenet et al.
8,292,146 B2	10/2012	Holsten et al.	8,413,868 B2	4/2013	Cappola
8,292,147 B2	10/2012	Viola	8,413,869 B2	4/2013	Heinrich
8,292,148 B2	10/2012	Viola	8,413,871 B2	4/2013	Racenet et al.
8,292,149 B2	10/2012	Ivanko	8,418,904 B2	4/2013	Wenchell et al.
8,292,150 B2	10/2012	Bryant	8,418,905 B2	4/2013	Milliman
8,292,151 B2	10/2012	Viola	8,418,906 B2	4/2013	Farascioni et al.
8,292,152 B2	10/2012	Milliman et al.	8,418,907 B2	4/2013	Johnson et al.
8,292,153 B2	10/2012	Jankowski	8,418,908 B1	4/2013	Beardsley
8,292,154 B2	10/2012	Marczyk	8,419,768 B2	4/2013	Marczyk
8,292,155 B2	10/2012	Shelton, IV et al.	8,424,735 B2	4/2013	Viola et al.
8,292,156 B2	10/2012	Kostrzewski	8,424,736 B2	4/2013	Scirica et al.
8,292,158 B2	10/2012	Sapienza	8,424,737 B2	4/2013	Scirica
8,308,040 B2	11/2012	Huang et al.	8,424,739 B2	4/2013	Racenet et al.
8,308,041 B2	11/2012	Kostrzewski	8,424,740 B2	4/2013	Shelton, IV et al.
8,308,042 B2	11/2012	Aranyi	8,439,244 B2	5/2013	Holcomb et al.
8,308,043 B2	11/2012	Bindra et al.	8,439,245 B2	5/2013	Knodel et al.
8,308,044 B2	11/2012	Viola	8,439,246 B1	5/2013	Knodel
8,308,046 B2	11/2012	Prommersberger	8,444,036 B2	5/2013	Shelton, IV
8,308,757 B2	11/2012	Hillstead et al.	8,444,037 B2	5/2013	Nicholas et al.
8,317,070 B2	11/2012	Hueil et al.	8,444,038 B2	5/2013	Farascioni et al.
8,317,071 B1	11/2012	Knodel	8,448,832 B2	5/2013	Viola et al.
8,322,455 B2	12/2012	Shelton, IV et al.	8,453,652 B2	6/2013	Stopek
8,322,589 B2	12/2012	Boudreaux	8,453,905 B2	6/2013	Holcomb et al.
8,328,061 B2	12/2012	Kasvikis	8,453,906 B2	6/2013	Huang et al.
8,328,065 B2	12/2012	Shah	8,453,907 B2	6/2013	Laurent et al.
8,333,313 B2	12/2012	Boudreaux et al.	8,453,908 B2	6/2013	Bedi et al.
8,336,751 B2	12/2012	Scirica	8,453,909 B2	6/2013	Olson et al.
8,336,753 B2	12/2012	Olson et al.	8,453,910 B2	6/2013	Bettuchi et al.
8,336,754 B2	12/2012	Cappola et al.	8,453,912 B2	6/2013	Mastri et al.
8,342,377 B2	1/2013	Milliman et al.	8,453,913 B2	6/2013	Milliman
8,342,378 B2	1/2013	Marczyk et al.	8,453,914 B2	6/2013	Laurent et al.
8,342,379 B2	1/2013	Whitman et al.	8,454,628 B2	6/2013	Smith et al.
8,342,380 B2	1/2013	Viola	8,459,520 B2	6/2013	Giordano et al.
8,348,123 B2	1/2013	Scirica et al.	8,459,521 B2	6/2013	Zemlok et al.
8,348,124 B2	1/2013	Scirica	8,459,522 B2	6/2013	Marczyk
8,348,125 B2	1/2013	Viola et al.	8,459,523 B2	6/2013	Whitman
8,348,126 B2	1/2013	Olson et al.	8,459,524 B2	6/2013	Pribanic et al.
8,348,127 B2	1/2013	Marczyk	8,459,525 B2	6/2013	Yates et al.
8,348,129 B2	1/2013	Bedi et al.	8,464,922 B2	6/2013	Marczyk
8,348,130 B2	1/2013	Shah et al.	8,464,923 B2	6/2013	Shelton, IV
8,348,131 B2	1/2013	Omaits et al.	8,469,252 B2	6/2013	Holcomb et al.
8,353,437 B2	1/2013	Boudreaux	8,469,254 B2	6/2013	Czernik et al.
8,353,440 B2	1/2013	Whitman et al.	8,474,677 B2	7/2013	Woodard, Jr. et al.
8,356,740 B1	1/2013	Knodel	8,479,967 B2	7/2013	Marczyk
8,357,174 B2	1/2013	Roth et al.	8,479,968 B2	7/2013	Hodgkinson et al.
8,360,294 B2	1/2013	Scirica	8,479,969 B2	7/2013	Shelton, IV
8,360,297 B2	1/2013	Shelton, IV et al.	8,485,412 B2	7/2013	Shelton, IV et al.
8,360,298 B2	1/2013	Farascioni et al.	8,490,852 B2	7/2013	Viola
8,360,299 B2	1/2013	Zemlok et al.	8,496,152 B2	7/2013	Viola
8,365,971 B1	2/2013	Knodel	8,496,154 B2	7/2013	Marczyk et al.
8,365,972 B2	2/2013	Aranyi et al.	8,496,156 B2	7/2013	Sniffin et al.
8,365,973 B1	2/2013	White et al.	8,496,683 B2	7/2013	Prommersberger et al.
8,365,976 B2	2/2013	Hess et al.	8,499,993 B2	8/2013	Shelton, IV et al.
8,371,491 B2	2/2013	Huitema et al.	8,505,799 B2	8/2013	Viola et al.
8,371,492 B2	2/2013	Aranyi et al.	8,505,802 B2	8/2013	Viola et al.
8,371,493 B2	2/2013	Aranyi et al.	8,511,575 B2	8/2013	Cok
8,381,828 B2	2/2013	Whitman et al.	8,512,359 B2	8/2013	Whitman et al.
8,381,961 B2	2/2013	Holsten et al.	8,512,402 B2	8/2013	Marczyk et al.
8,387,848 B2	3/2013	Johnson et al.	8,517,240 B1	8/2013	Mata et al.
8,387,849 B2	3/2013	Buesseler et al.	8,517,241 B2	8/2013	Nicholas et al.
8,387,850 B2	3/2013	Hathaway et al.	8,517,243 B2	8/2013	Giordano et al.
8,388,652 B2	3/2013	Viola	8,517,244 B2	8/2013	Shelton, IV et al.
8,393,513 B2	3/2013	Jankowski	8,523,041 B2	9/2013	Ishitsuki et al.
8,393,514 B2	3/2013	Shelton, IV et al.	8,523,042 B2	9/2013	Masiakos et al.
8,393,516 B2	3/2013	Kostrzewski	8,523,043 B2	9/2013	Ullrich et al.
8,397,971 B2	3/2013	Yates et al.	8,534,528 B2	9/2013	Shelton, IV
8,397,972 B2	3/2013	Kostrzewski	8,540,128 B2	9/2013	Shelton, IV et al.
8,403,195 B2	3/2013	Beardsley et al.	8,540,129 B2	9/2013	Baxter, III et al.
8,403,196 B2	3/2013	Beardsley et al.	8,540,130 B2	9/2013	Moore et al.
8,403,197 B2	3/2013	Vidal et al.	8,540,131 B2	9/2013	Swayze
8,403,198 B2	3/2013	Sorrentino et al.	8,540,733 B2	9/2013	Whitman et al.
8,403,956 B1	3/2013	Thompson et al.	8,544,711 B2	10/2013	Ma et al.
			8,550,325 B2	10/2013	Cohen et al.
			8,556,151 B2	10/2013	Viola
			8,561,870 B2	10/2013	Baxter, III et al.
			8,561,873 B2	10/2013	Ingmanson et al.

(56)

References Cited

U.S. PATENT DOCUMENTS

8,561,874 B2	10/2013	Scirica	8,800,840 B2	8/2014	Jankowski
8,567,656 B2	10/2013	Shelton, IV et al.	8,800,841 B2	8/2014	Ellerhorst et al.
8,573,461 B2	11/2013	Shelton, IV et al.	8,808,311 B2	8/2014	Heinrich et al.
8,573,463 B2	11/2013	Scirica et al.	8,814,024 B2	8/2014	Woodard, Jr. et al.
8,573,465 B2	11/2013	Shelton, IV	8,814,025 B2	8/2014	Miller et al.
8,579,176 B2	11/2013	Smith et al.	8,818,006 B2 *	8/2014	Yamauchi ..... H04N 5/642 381/152
8,579,177 B2	11/2013	Beetel	8,820,603 B2	9/2014	Shelton, IV et al.
8,584,919 B2	11/2013	Hueil et al.	8,820,605 B2	9/2014	Shelton, IV
8,584,920 B2	11/2013	Hodgkinson	8,820,607 B2	9/2014	Marczyk
8,590,762 B2	11/2013	Hess et al.	8,827,133 B2	9/2014	Shelton, IV et al.
8,596,515 B2	12/2013	Okoniewski	8,827,134 B2	9/2014	Viola et al.
8,602,288 B2	12/2013	Shelton, IV et al.	8,833,632 B2	9/2014	Swensgard
8,608,045 B2	12/2013	Smith et al.	8,840,003 B2	9/2014	Morgan et al.
8,608,046 B2	12/2013	Laurent et al.	8,840,603 B2	9/2014	Shelton, IV et al.
8,608,047 B2	12/2013	Holsten et al.	8,851,355 B2	10/2014	Aranyi et al.
8,613,383 B2	12/2013	Beckman et al.	8,956,390 B2 *	2/2015	Shah ..... A61B 17/07207 606/213
8,613,384 B2	12/2013	Pastorelli et al.	8,973,805 B2 *	3/2015	Scirica ..... A61B 17/105 227/180.1
8,616,427 B2	12/2013	Viola	9,016,546 B2	4/2015	Demmy et al.
8,616,430 B2	12/2013	(Prommersberger) Stopek et al.	9,027,817 B2	5/2015	Milliman et al.
8,627,994 B2	1/2014	Zemlok et al.	9,186,137 B2 *	11/2015	Farascioni ..... A61B 17/072
8,628,544 B2	1/2014	Farascioni	9,271,060 B2 *	2/2016	Kim ..... H04R 1/00
8,631,988 B2	1/2014	Viola	9,522,004 B2 *	12/2016	Demmy ..... A61B 17/068
8,631,989 B2	1/2014	Aranyi et al.	9,861,363 B2 *	1/2018	Chen ..... A61B 17/07207
8,631,991 B2	1/2014	Cropper et al.	9,924,944 B2 *	3/2018	Shelton, IV ..... A61B 17/072
8,632,525 B2	1/2014	Kerr et al.	2004/0108357 A1	6/2004	Milliman et al.
8,632,535 B2	1/2014	Shelton, IV et al.	2004/0199180 A1	10/2004	Knodel et al.
8,636,187 B2	1/2014	Hueil et al.	2004/0199181 A1	10/2004	Knodel et al.
8,636,190 B2	1/2014	Zemlok et al.	2004/0232201 A1	11/2004	Wenchell et al.
8,636,192 B2	1/2014	Farascioni et al.	2004/0243151 A1	12/2004	Demmy et al.
8,636,762 B2	1/2014	Whitman et al.	2004/0267310 A1	12/2004	Racenet et al.
8,636,766 B2	1/2014	Milliman et al.	2005/0103819 A1	5/2005	Racenet et al.
8,640,940 B2	2/2014	Ohdaira	2005/0116008 A1 *	6/2005	Thornton ..... A61B 17/0684 227/176.1
8,657,174 B2	2/2014	Yates et al.	2005/0216055 A1	9/2005	Scirica et al.
8,657,177 B2	2/2014	Scirica et al.	2006/0049229 A1	3/2006	Milliman et al.
8,657,178 B2	2/2014	Hueil et al.	2006/0180634 A1	8/2006	Shelton et al.
8,662,371 B2	3/2014	Viola	2006/0289602 A1	12/2006	Wales et al.
8,668,129 B2	3/2014	Olson	2007/0073341 A1	3/2007	Smith et al.
8,672,206 B2	3/2014	Aranyi et al.	2007/0084897 A1	4/2007	Shelton et al.
8,672,208 B2	3/2014	Hess et al.	2007/0102472 A1	5/2007	Shelton
8,672,209 B2	3/2014	Crainich	2007/0106317 A1	5/2007	Shelton et al.
8,678,263 B2	3/2014	Viola	2007/0119901 A1	5/2007	Ehrenfels et al.
8,678,990 B2	3/2014	Wazer et al.	2007/0145096 A1	6/2007	Viola et al.
8,679,155 B2	3/2014	Knodel et al.	2007/0170225 A1	7/2007	Shelton et al.
8,684,247 B2	4/2014	Scirica et al.	2007/0175950 A1	8/2007	Shelton et al.
8,684,249 B2	4/2014	Racenet et al.	2007/0175951 A1	8/2007	Shelton et al.
8,690,039 B2	4/2014	Beardsley et al.	2007/0175955 A1	8/2007	Shelton et al.
8,695,865 B2	4/2014	Smith et al.	2007/0179528 A1	8/2007	Soltz et al.
8,695,866 B2	4/2014	Leimbach et al.	2007/0187453 A1 *	8/2007	Smith ..... A61B 17/07207 227/175.1
8,701,958 B2	4/2014	Shelton, IV et al.	2007/0194079 A1	8/2007	Hueil et al.
8,701,959 B2	4/2014	Shah	2007/0194082 A1	8/2007	Morgan et al.
8,701,961 B2	4/2014	Ivanko	2008/0029570 A1	2/2008	Shelton et al.
8,708,213 B2	4/2014	Shelton, IV et al.	2008/0029573 A1	2/2008	Shelton et al.
8,714,352 B2 *	5/2014	Farascioni ..... A61B 17/072 206/340	2008/0029574 A1	2/2008	Shelton et al.
8,714,429 B2	5/2014	Demmy	2008/0029575 A1	2/2008	Shelton et al.
8,715,277 B2	5/2014	Weizman	2008/0078802 A1	4/2008	Hess et al.
8,720,766 B2	5/2014	Hess et al.	2008/0110961 A1	5/2008	Voegele et al.
8,721,630 B2	5/2014	Ortiz et al.	2008/0169328 A1	7/2008	Shelton
8,727,197 B2	5/2014	Hess et al.	2008/0169332 A1	7/2008	Shelton et al.
8,727,200 B2	5/2014	Roy	2008/0169333 A1	7/2008	Shelton et al.
8,733,612 B2	5/2014	Ma	2008/0287987 A1	11/2008	Boyden et al.
8,740,034 B2	6/2014	Morgan et al.	2008/0296346 A1	12/2008	Shelton, IV et al.
8,740,039 B2	6/2014	Farascioni	2008/0308602 A1	12/2008	Timm et al.
8,757,465 B2	6/2014	Woodard, Jr. et al.	2008/0308603 A1	12/2008	Shelton et al.
8,758,391 B2	6/2014	Swayze et al.	2009/0001121 A1	1/2009	Hess et al.
8,763,877 B2	7/2014	Schall et al.	2009/0001130 A1	1/2009	Hess et al.
8,763,879 B2	7/2014	Shelton, IV et al.	2009/0090763 A1	4/2009	Zemlok et al.
8,770,458 B2	7/2014	Scirica	2009/0090766 A1	4/2009	Knodel
8,777,082 B2	7/2014	Scirica	2009/0242610 A1	10/2009	Shelton, IV et al.
8,783,541 B2	7/2014	Shelton, IV et al.	2009/0255974 A1	10/2009	Viola
8,783,542 B2	7/2014	Riestedberg et al.	2009/0272787 A1	11/2009	Scirica
8,789,737 B2	7/2014	Hodgkinson et al.	2009/0277949 A1	11/2009	Viola et al.
8,789,738 B2	7/2014	Knodel et al.	2009/0283568 A1	11/2009	Racenet et al.
8,789,739 B2	7/2014	Swensgard	2009/0308907 A1	12/2009	Nalagatla et al.
8,800,838 B2	8/2014	Shelton, IV	2010/0012703 A1	1/2010	Calabrese et al.



(56)

## References Cited

## U.S. PATENT DOCUMENTS

2010/0069942 A1	3/2010	Shelton, IV	2012/0193399 A1	8/2012	Holcomb et al.
2010/0127041 A1	5/2010	Morgan et al.	2012/0199632 A1	8/2012	Spivey et al.
2010/0133317 A1	6/2010	Shelton, IV et al.	2012/0211542 A1	8/2012	Racenet
2010/0147921 A1	6/2010	Olson	2012/0223121 A1	9/2012	Viola et al.
2010/0147922 A1	6/2010	Olson	2012/0223123 A1	9/2012	Baxter, III et al.
2010/0155453 A1	6/2010	Bombard et al.	2012/0228358 A1	9/2012	Zemlok et al.
2010/0193566 A1	8/2010	Scheib et al.	2012/0234893 A1	9/2012	Schuckmann et al.
2010/0224668 A1	9/2010	Fontayne et al.	2012/0234895 A1	9/2012	O'Connor et al.
2010/0249802 A1	9/2010	May et al.	2012/0234897 A1	9/2012	Shelton, IV et al.
2010/0252611 A1	10/2010	Ezzat et al.	2012/0234899 A1	9/2012	Scheib et al.
2010/0305552 A1	12/2010	Shelton, IV et al.	2012/0239009 A1	9/2012	Mollere et al.
2011/0006099 A1	1/2011	Hall et al.	2012/0241491 A1	9/2012	Aldridge et al.
2011/0006101 A1	1/2011	Hall et al.	2012/0241492 A1	9/2012	Shelton, IV et al.
2011/0017801 A1	1/2011	Zemlok et al.	2012/0241493 A1	9/2012	Baxter, III et al.
2011/0024477 A1	2/2011	Hall	2012/0241496 A1	9/2012	Mandakolathur Vasudevan et al.
2011/0024478 A1	2/2011	Shelton, IV	2012/0241497 A1	9/2012	Mandakolathur Vasudevan et al.
2011/0036891 A1	2/2011	Zemlok et al.	2012/0241498 A1	9/2012	Gonzalez et al.
2011/0068148 A1	3/2011	Hall et al.	2012/0241499 A1	9/2012	Baxter, III et al.
2011/0087276 A1	4/2011	Bedi et al.	2012/0241500 A1	9/2012	Timmer et al.
2011/0101069 A1	5/2011	Bombard et al.	2012/0241501 A1	9/2012	Swayze et al.
2011/0108603 A1	5/2011	Racenet et al.	2012/0241502 A1	9/2012	Aldridge et al.
2011/0114702 A1	5/2011	Farascioni	2012/0241503 A1	9/2012	Baxter, III et al.
2011/0121049 A1	5/2011	Malinouskas et al.	2012/0241504 A1	9/2012	Soltz et al.
2011/0132961 A1	6/2011	Whitman et al.	2012/0241505 A1	9/2012	Alexander, III et al.
2011/0132964 A1	6/2011	Weisenburgh, II et al.	2012/0248169 A1	10/2012	Widenhouse et al.
2011/0139851 A1	6/2011	McCuen	2012/0248170 A1	10/2012	Marczyk
2011/0147433 A1	6/2011	Shelton, IV et al.	2012/0255986 A1	10/2012	Petty et al.
2011/0155781 A1	6/2011	Swensgard et al.	2012/0286021 A1	11/2012	Kostrzewski
2011/0155787 A1	6/2011	Baxter, III et al.	2012/0286022 A1	11/2012	Olson et al.
2011/0163146 A1	7/2011	Ortiz et al.	2012/0292369 A1	11/2012	Munro, III et al.
2011/0163149 A1	7/2011	Viola	2012/0298719 A1	11/2012	Shelton, IV et al.
2011/0192881 A1	8/2011	Balbierz et al.	2012/0298722 A1	11/2012	Hess et al.
2011/0192882 A1	8/2011	Hess et al.	2012/0312858 A1	12/2012	Patankar et al.
2011/0192883 A1	8/2011	Whitman et al.	2012/0312859 A1	12/2012	Gupta et al.
2011/0204119 A1	8/2011	McCuen	2012/0312860 A1	12/2012	Ming et al.
2011/0278343 A1	11/2011	Knodel et al.	2012/0312861 A1	12/2012	Gurumurthy et al.
2011/0288573 A1	11/2011	Yates et al.	2012/0318842 A1	12/2012	Anim et al.
2011/0290851 A1	12/2011	Shelton, IV	2012/0318843 A1	12/2012	Henderson et al.
2011/0290853 A1	12/2011	Shelton, IV et al.	2012/0318844 A1	12/2012	Shelton, IV et al.
2011/0290854 A1	12/2011	Timm et al.	2013/0008937 A1	1/2013	Viola
2011/0290855 A1	12/2011	Moore et al.	2013/0012983 A1	1/2013	Kleyman
2011/0290856 A1	12/2011	Shelton, IV et al.	2013/0015231 A1	1/2013	Kostrzewski
2012/0016362 A1	1/2012	Heinrich et al.	2013/0020375 A1	1/2013	Shelton, IV et al.
2012/0037683 A1	2/2012	Lee	2013/0020376 A1	1/2013	Shelton, IV et al.
2012/0053406 A1	3/2012	Conlon et al.	2013/0026208 A1	1/2013	Shelton, IV et al.
2012/0061446 A1	3/2012	Knodel et al.	2013/0026210 A1	1/2013	Shelton, IV et al.
2012/0061450 A1	3/2012	Kostrzewski	2013/0032626 A1	2/2013	Smith et al.
2012/0074196 A1	3/2012	Shelton, IV et al.	2013/0037594 A1	2/2013	Dhakad et al.
2012/0074200 A1	3/2012	Schmid et al.	2013/0037595 A1	2/2013	Gupta et al.
2012/0080474 A1	4/2012	Farascioni	2013/0037596 A1	2/2013	Bear et al.
2012/0080475 A1	4/2012	Smith et al.	2013/0037597 A1	2/2013	Katre et al.
2012/0080478 A1	4/2012	Morgan et al.	2013/0037598 A1	2/2013	Marczyk
2012/0080479 A1	4/2012	Shelton, IV	2013/0041406 A1	2/2013	Bear et al.
2012/0080481 A1	4/2012	Widenhouse et al.	2013/0048697 A1	2/2013	Shelton, IV et al.
2012/0080482 A1	4/2012	Schall et al.	2013/0056518 A1	3/2013	Swensgard
2012/0080484 A1	4/2012	Morgan et al.	2013/0056521 A1	3/2013	Swensgard
2012/0080485 A1	4/2012	Woodard, Jr. et al.	2013/0062391 A1	3/2013	Boudreaux et al.
2012/0080486 A1	4/2012	Woodard, Jr. et al.	2013/0062393 A1	3/2013	Bruewer et al.
2012/0080488 A1	4/2012	Shelton, IV et al.	2013/0062394 A1	3/2013	Smith et al.
2012/0080489 A1	4/2012	Shelton, IV et al.	2013/0068815 A1	3/2013	Bruewer et al.
2012/0080490 A1	4/2012	Shelton, IV et al.	2013/0068816 A1	3/2013	Mandakolathur Vasudevan et al.
2012/0080491 A1	4/2012	Shelton, IV et al.	2013/0068818 A1	3/2013	Kasvikis
2012/0080493 A1	4/2012	Shelton, IV et al.	2013/0068821 A1	3/2013	Huitema et al.
2012/0080494 A1	4/2012	Thompson et al.	2013/0075443 A1	3/2013	Giordano et al.
2012/0080495 A1	4/2012	Holcomb et al.	2013/0075444 A1	3/2013	Cappola et al.
2012/0080498 A1	4/2012	Shelton, IV et al.	2013/0075445 A1	3/2013	Balek et al.
2012/0080499 A1	4/2012	Schall et al.	2013/0075446 A1	3/2013	Wang et al.
2012/0080502 A1	4/2012	Morgan et al.	2013/0075447 A1	3/2013	Weisenburgh, II et al.
2012/0091183 A1	4/2012	Manoux et al.	2013/0075448 A1	3/2013	Schmid et al.
2012/0100200 A1	4/2012	Belcheva et al.	2013/0075449 A1	3/2013	Schmid et al.
2012/0138659 A1	6/2012	Marczyk et al.	2013/0075450 A1	3/2013	Schmid et al.
2012/0175399 A1	7/2012	Shelton et al.	2013/0075451 A1	3/2013	Balek et al.
2012/0181322 A1	7/2012	Whitman et al.	2013/0082086 A1	4/2013	Hueil et al.
2012/0187179 A1	7/2012	Gleiman	2013/0087597 A1	4/2013	Shelton, IV et al.
2012/0193394 A1	8/2012	Holcomb et al.	2013/0087599 A1	4/2013	Krumanaker et al.
			2013/0087600 A1	4/2013	Scirica
			2013/0087601 A1	4/2013	Farascioni
			2013/0087602 A1	4/2013	Olson et al.
			2013/0087603 A1	4/2013	Viola

(56)

References Cited

U.S. PATENT DOCUMENTS

2013/0092717 A1	4/2013	Marczyk et al.	2014/0246478 A1	9/2014	Baber et al.
2013/0098964 A1	4/2013	Smith et al.	2014/0246479 A1	9/2014	Baber et al.
2013/0098965 A1	4/2013	Kostrzewski et al.	2014/0252062 A1	9/2014	Mozdzierz
2013/0098966 A1	4/2013	Kostrzewski et al.	2014/0252064 A1	9/2014	Mozdzierz et al.
2013/0098970 A1	4/2013	Racenet et al.	2014/0252065 A1*	9/2014	Hessler ..... A61B 17/0682 227/176.1
2013/0105545 A1	5/2013	Burbank	2014/0263537 A1	9/2014	Leimbach et al.
2013/0105548 A1	5/2013	Hodgkinson et al.	2014/0263539 A1	9/2014	Leimbach et al.
2013/0105552 A1	5/2013	Weir et al.	2014/0263540 A1	9/2014	Covach et al.
2013/0105553 A1	5/2013	(Tarinelli) Racenet et al.	2014/0263541 A1	9/2014	Leimbach et al.
2013/0112730 A1	5/2013	Whitman et al.	2014/0263542 A1	9/2014	Leimbach et al.
2013/0112732 A1	5/2013	Aranyi et al.	2014/0263543 A1	9/2014	Leimbach et al.
2013/0112733 A1	5/2013	Aranyi et al.	2014/0263544 A1	9/2014	Ranucci et al.
2013/0119109 A1	5/2013	Farascioni et al.	2014/0263546 A1	9/2014	Aranyi
2013/0126581 A1	5/2013	Yates et al.	2014/0263550 A1	9/2014	Aranyi et al.
2013/0126582 A1	5/2013	Shelton, IV et al.	2014/0263551 A1	9/2014	Hall et al.
2013/0126586 A1	5/2013	Zhang et al.	2014/0263552 A1	9/2014	Hall et al.
2013/0140343 A1	6/2013	Knodel	2014/0263553 A1	9/2014	Leimbach et al.
2013/0144333 A1	6/2013	Viola	2014/0263554 A1	9/2014	Leimbach et al.
2013/0146641 A1	6/2013	Shelton, IV et al.	2014/0263555 A1	9/2014	Hufnagel et al.
2013/0146642 A1	6/2013	Shelton, IV et al.	2014/0263557 A1*	9/2014	Schaller ..... A61B 17/0644 227/176.1
2013/0146643 A1	6/2013	Schmid et al.	2014/0263558 A1	9/2014	Hausen et al.
2013/0153636 A1	6/2013	Shelton, IV et al.	2014/0263562 A1	9/2014	Patel et al.
2013/0153641 A1	6/2013	Shelton, IV et al.	2014/0263564 A1	9/2014	Leimbach et al.
2013/0161374 A1	6/2013	Swayze et al.	2014/0263565 A1	9/2014	Lytte, IV et al.
2013/0168431 A1	7/2013	Zemlok et al.	2014/0263566 A1	9/2014	Williams et al.
2013/0175316 A1	7/2013	Thompson et al.	2014/0263570 A1	9/2014	Hopkins et al.
2013/0193188 A1	8/2013	Shelton, IV et al.	2014/0284371 A1	9/2014	Morgan et al.
2013/0277410 A1	10/2013	Fernandez et al.	2014/0284372 A1	9/2014	Kostrzewski
2013/0334280 A1	12/2013	Krehel et al.	2014/0291379 A1	10/2014	Schellin et al.
2013/0334281 A1	12/2013	Williams	2014/0291380 A1	10/2014	Weaner et al.
2014/0001232 A1	1/2014	Cappola et al.	2014/0291383 A1	10/2014	Spivey et al.
2014/0001233 A1	1/2014	Cappola et al.	2014/0303668 A1	10/2014	Nicholas et al.
2014/0014704 A1	1/2014	Onukuri et al.	2014/0309665 A1	10/2014	Parihar et al.
2014/0014707 A1	1/2014	Onukuri et al.	2014/0332578 A1	11/2014	Fernandez et al.
2014/0021242 A1	1/2014	Hodgkinson et al.	2014/0339286 A1	11/2014	Motooka et al.
2014/0025046 A1	1/2014	Williams et al.	2014/0353358 A1	12/2014	Shelton, IV et al.
2014/0027492 A1	1/2014	Williams	2014/0367445 A1	12/2014	Ingmanson et al.
2014/0029779 A1*	1/2014	Yamauchi ..... H04N 5/642 381/333	2014/0367446 A1	12/2014	Ingmanson et al.
2014/0048580 A1	2/2014	Merchant et al.	2014/0367448 A1	12/2014	Cappola
2014/0061280 A1	3/2014	Ingmanson et al.	2015/0048143 A1	2/2015	Scheib et al.
2014/0076955 A1	3/2014	Lorenz	2015/0053740 A1	2/2015	Shelton, IV
2014/0103092 A1	4/2014	Kostrzewski et al.	2015/0053742 A1	2/2015	Shelton, IV et al.
2014/0110453 A1	4/2014	Wingardner et al.	2015/0053744 A1	2/2015	Swayze et al.
2014/0110455 A1	4/2014	Ingmanson et al.	2015/0053749 A1	2/2015	Shelton, IV et al.
2014/0131418 A1	5/2014	Kostrzewski	2015/0054753 A1	2/2015	Morgan et al.
2014/0131419 A1	5/2014	Bettuchi	2015/0060517 A1	3/2015	Williams
2014/0138423 A1	5/2014	Whitfield et al.	2015/0076205 A1	3/2015	Zergiebel
2014/0151431 A1	6/2014	Hodgkinson et al.	2015/0076211 A1	3/2015	Irka et al.
2014/0166720 A1	6/2014	Chowaniec et al.	2015/0080912 A1	3/2015	Sapre
2014/0166721 A1	6/2014	Stevenson et al.	2015/0133996 A1	5/2015	Shelton, IV et al.
2014/0166724 A1	6/2014	Schellin et al.	2015/0134076 A1	5/2015	Shelton, IV et al.
2014/0166725 A1	6/2014	Schellin et al.	2015/0157321 A1	6/2015	Zergiebel et al.
2014/0166726 A1	6/2014	Schellin et al.	2015/0173744 A1	6/2015	Shelton, IV et al.
2014/0175146 A1	6/2014	Knodel	2015/0173745 A1	6/2015	Baxter, III et al.
2014/0175150 A1	6/2014	Shelton, IV et al.	2015/0173746 A1	6/2015	Baxter, III et al.
2014/0203061 A1	7/2014	Hodgkinson	2015/0173747 A1	6/2015	Baxter, III et al.
2014/0203062 A1	7/2014	Viola	2015/0173748 A1	6/2015	Marczyk et al.
2014/0203063 A1	7/2014	Hessler et al.	2015/0173749 A1	6/2015	Shelton, IV et al.
2014/0239036 A1	8/2014	Zerkle et al.	2015/0173750 A1	6/2015	Shelton, IV et al.
2014/0239037 A1	8/2014	Boudreaux et al.	2015/0173755 A1	6/2015	Baxter, III et al.
2014/0239038 A1	8/2014	Leimbach et al.	2015/0173756 A1	6/2015	Baxter, III et al.
2014/0239040 A1	8/2014	Fanelli et al.	2015/0173760 A1	6/2015	Shelton, IV et al.
2014/0239041 A1	8/2014	Zerkle et al.	2015/0173761 A1	6/2015	Shelton, IV et al.
2014/0239042 A1	8/2014	Simms et al.	2015/0173762 A1	6/2015	Shelton, IV et al.
2014/0239043 A1	8/2014	Simms et al.	2015/0265275 A1*	9/2015	Chen ..... A61B 17/07207 227/175.3
2014/0239044 A1	8/2014	Hoffman	2016/0106427 A1*	4/2016	Shelton, IV ..... A61B 17/07207 227/180.1
2014/0239047 A1	8/2014	Hodgkinson et al.	2017/0086936 A1*	3/2017	Shelton, IV ..... A61B 90/06
2014/0246471 A1	9/2014	Jaworek et al.	2017/0189023 A1*	7/2017	Yan ..... A61B 17/072
2014/0246472 A1	9/2014	Kimsey et al.	2017/0215880 A1*	8/2017	Davanzo Castillo ..... A61B 17/07207
2014/0246473 A1	9/2014	Auld	2017/0265864 A1*	9/2017	Hessler ..... A61B 17/0682
2014/0246474 A1	9/2014	Hall et al.	2017/0281175 A1*	10/2017	Robinson ..... A61B 17/07207
2014/0246475 A1	9/2014	Hall et al.	2017/0354413 A1*	12/2017	Chen ..... A61B 17/07207
2014/0246476 A1	9/2014	Hall et al.			
2014/0246477 A1	9/2014	Koch, Jr. et al.			

(56)

References Cited

U.S. PATENT DOCUMENTS

FOREIGN PATENT DOCUMENTS

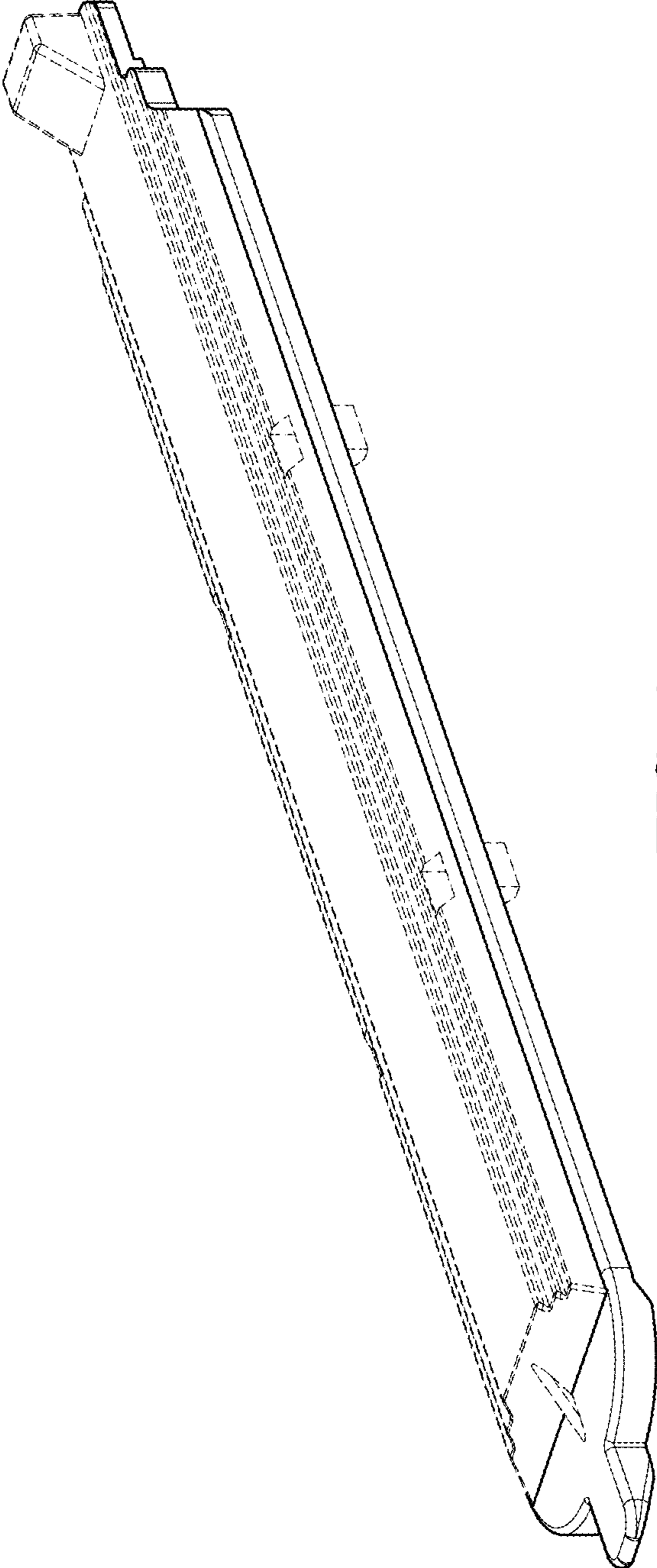
DE 2744824 A1 4/1978  
 DE 2903159 A1 7/1980  
 DE 3114135 A1 10/1982  
 DE 4213426 A1 10/1992  
 DE 4300307 A1 7/1994  
 EP 0041022 A1 12/1981  
 EP 0136950 A2 4/1985  
 EP 0140552 A2 5/1985  
 EP 0156774 A2 10/1985  
 EP 0213817 A1 3/1987  
 EP 0216532 A1 4/1987  
 EP 0220029 A1 4/1987  
 EP 0273468 A2 7/1988  
 EP 0324166 A2 7/1989  
 EP 0324635 A1 7/1989  
 EP 0324637 A1 7/1989  
 EP 0324638 A1 7/1989  
 EP 0365153 A1 4/1990  
 EP 0369324 A1 5/1990  
 EP 0373762 A1 6/1990  
 EP 0380025 A2 8/1990  
 EP 0399701 A1 11/1990  
 EP 0449394 A2 10/1991  
 EP 0484677 A1 5/1992  
 EP 0489436 A1 6/1992  
 EP 0503662 A1 9/1992  
 EP 0514139 A2 11/1992  
 EP 0536903 A2 4/1993  
 EP 0537572 A2 4/1993  
 EP 0539762 A1 5/1993  
 EP 0545029 A1 6/1993  
 EP 0552050 A2 7/1993  
 EP 0552423 A2 7/1993  
 EP 0579038 A1 1/1994  
 EP 0589306 A2 3/1994  
 EP 0591946 A1 4/1994  
 EP 0592243 A2 4/1994  
 EP 0593920 A1 4/1994  
 EP 0598202 A1 5/1994  
 EP 0598579 A1 5/1994  
 EP 0600182 A2 6/1994  
 EP 0621006 A1 10/1994  
 EP 0621009 A1 10/1994  
 EP 0648476 A1 4/1995  
 EP 0656188 A2 6/1995  
 EP 0666057 A2 8/1995

EP 0705571 A1 4/1996  
 EP 0760230 A1 3/1997  
 EP 1952769 A2 8/2008  
 EP 2090253 A2 8/2009  
 EP 2090254 A1 8/2009  
 EP 2165663 A2 3/2010  
 EP 2529672 A2 12/2012  
 EP 2583630 A2 4/2013  
 EP 2586382 A2 5/2013  
 EP 2954854 A2 12/2015  
 FR 391239 A 10/1908  
 FR 2542188 A1 9/1984  
 FR 2660851 A1 10/1991  
 FR 2681775 A1 4/1993  
 GB 1352554 A 5/1974  
 GB 1452185 A 10/1976  
 GB 1555455 A 11/1979  
 GB 2048685 A 12/1980  
 GB 2070499 A 9/1981  
 GB 2141066 A 12/1984  
 GB 2165559 A 4/1986  
 JP 51-149985 12/1976  
 JP 2001-87272 4/2001  
 JP 2017023861 A \* 2/2017 ..... A61B 17/07207  
 SU 359146 A1 4/1979  
 SU 728848 A1 4/1980  
 SU 980703 A1 12/1982  
 SU 990220 A1 1/1983  
 WO 08302247 7/1983  
 WO 89/10094 A1 11/1989  
 WO 9210976 A1 7/1992  
 WO 9308754 A1 5/1993  
 WO 9314706 A1 8/1993  
 WO 2004/032760 A2 4/2004  
 WO 2009071070 A2 6/2009  
 WO 2011/007351 A1 1/2011  
 WO 2014110564 A1 7/2014

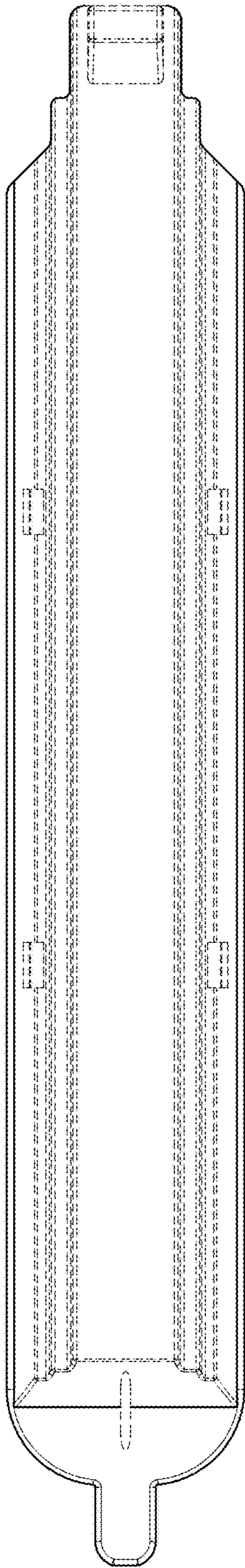
OTHER PUBLICATIONS

Staple Loading Unit, announced Jul. 30, 2016 [online], [site visited Jan. 3, 2017]. Available from internet, URL: <<http://allmedtech.com/stlounbsegia.html>>.\*  
 Medtronic Surgical Stapling, announced Oct. 16, 2015 [online], [site visited Jan. 3, 2017]. Available from internet, URL: <<http://www.medtronic.com/covidien/products/surgical-stapling>>.\*  
 European Search Report dated Jul. 13, 2016, issued in EP Application No. 16157301.9.

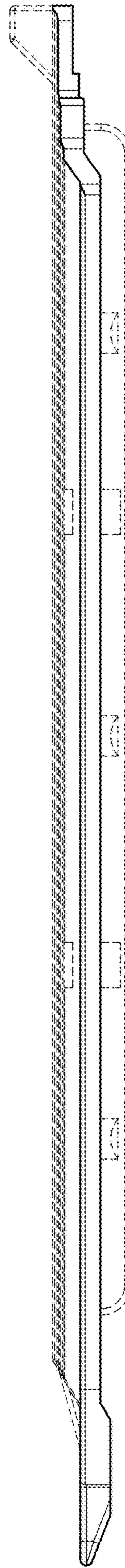
\* cited by examiner



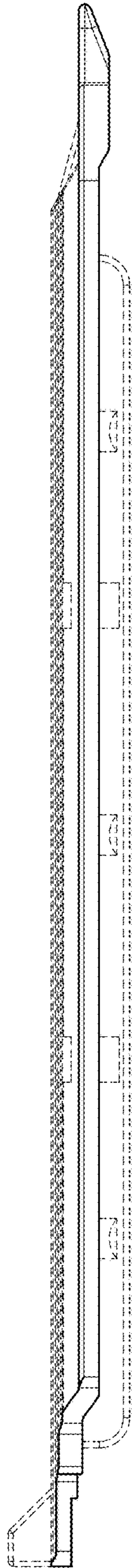
**FIG. 1**



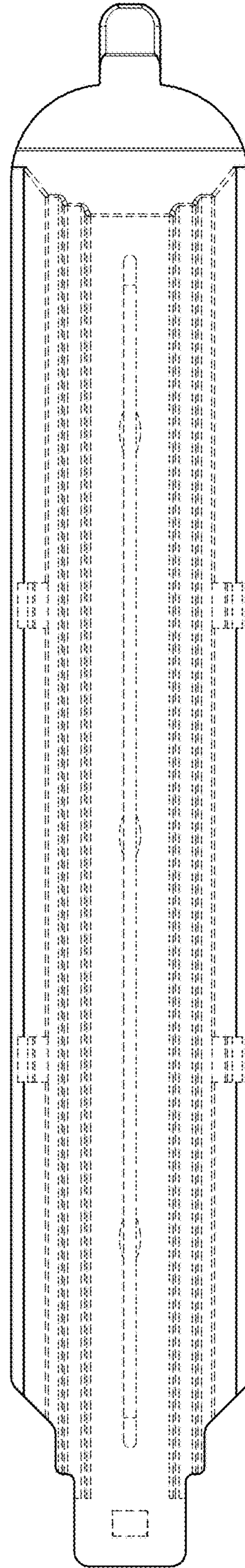
**FIG. 2**



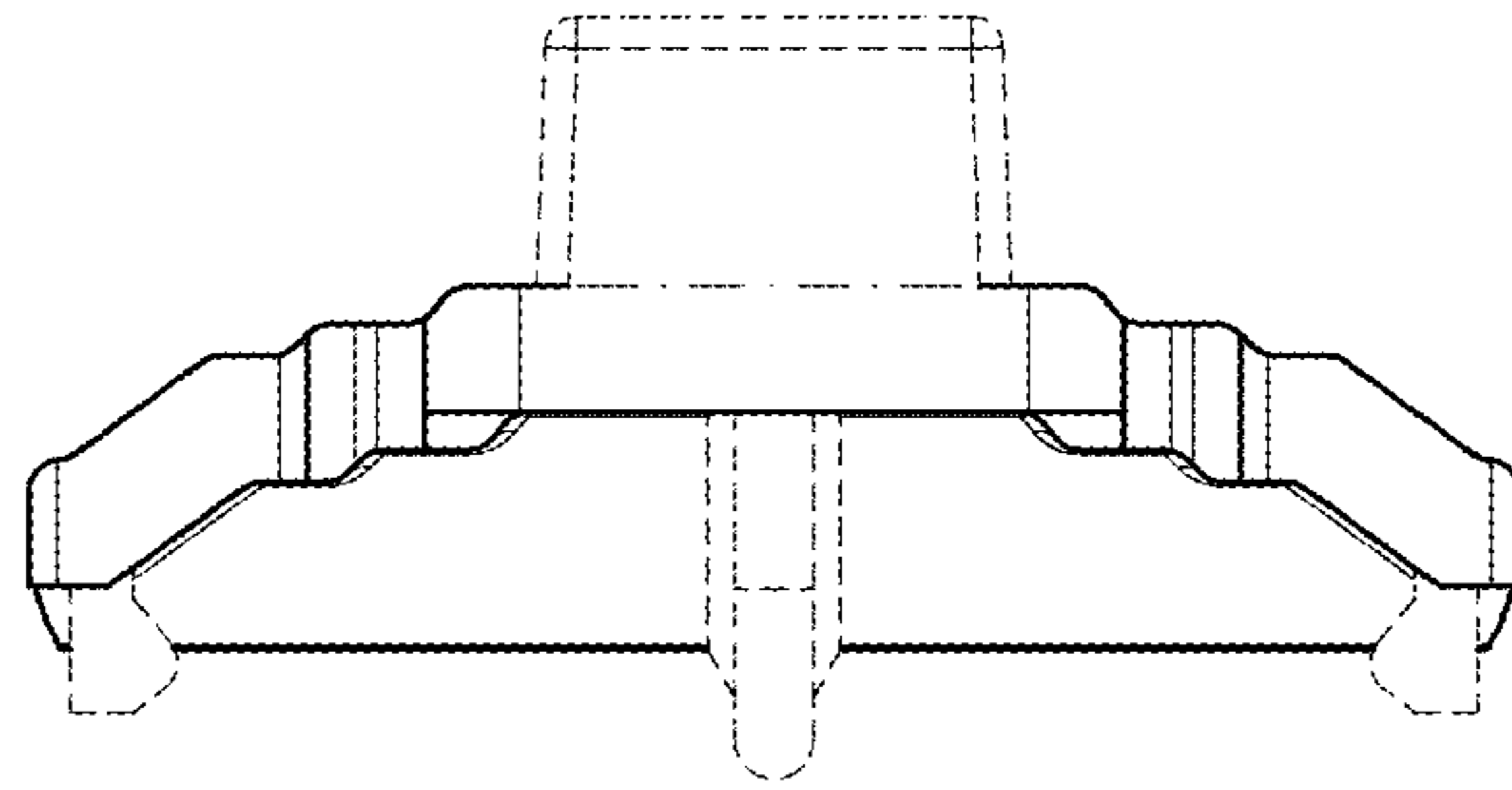
**FIG. 3**



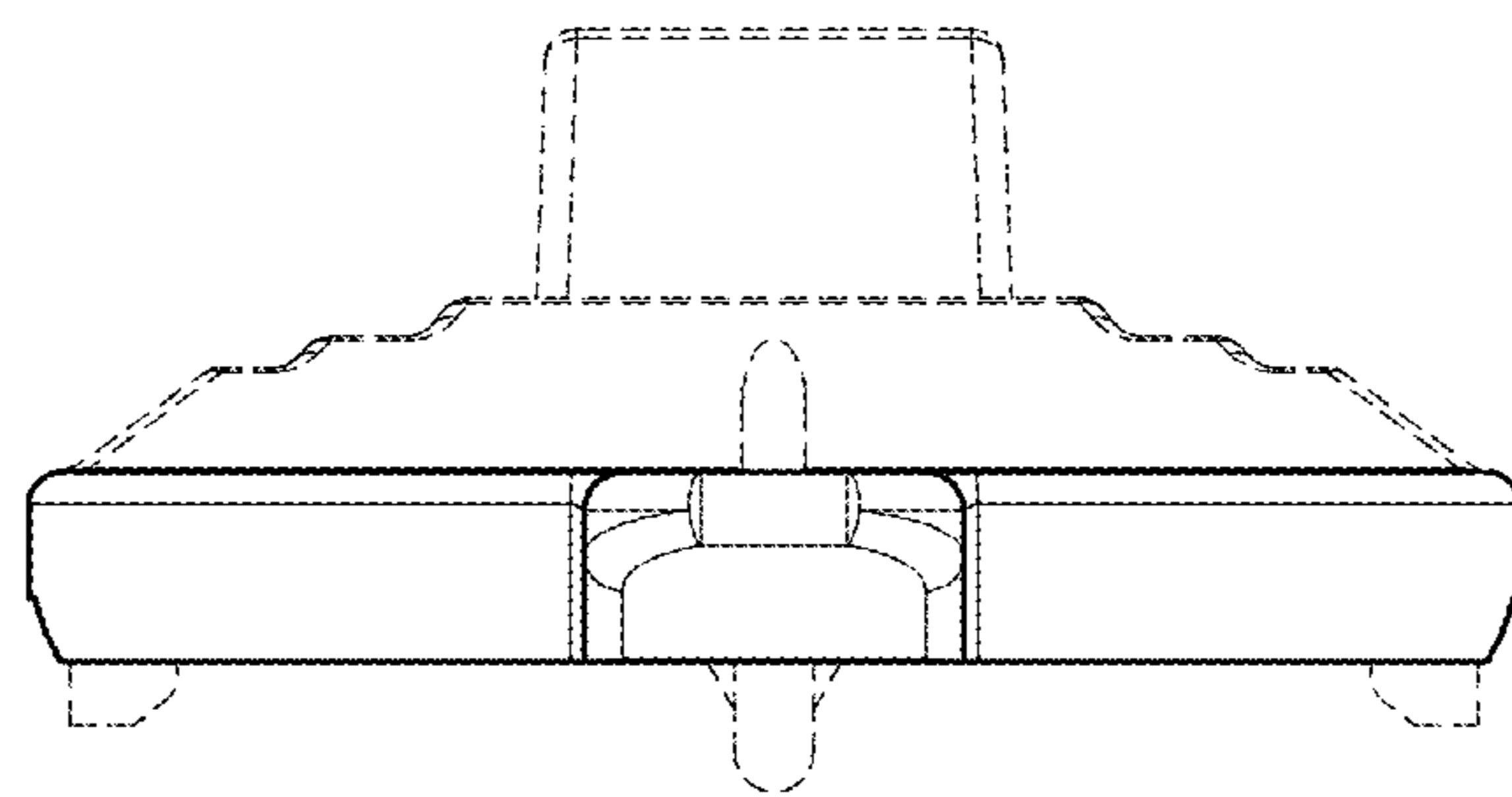
**FIG. 4**



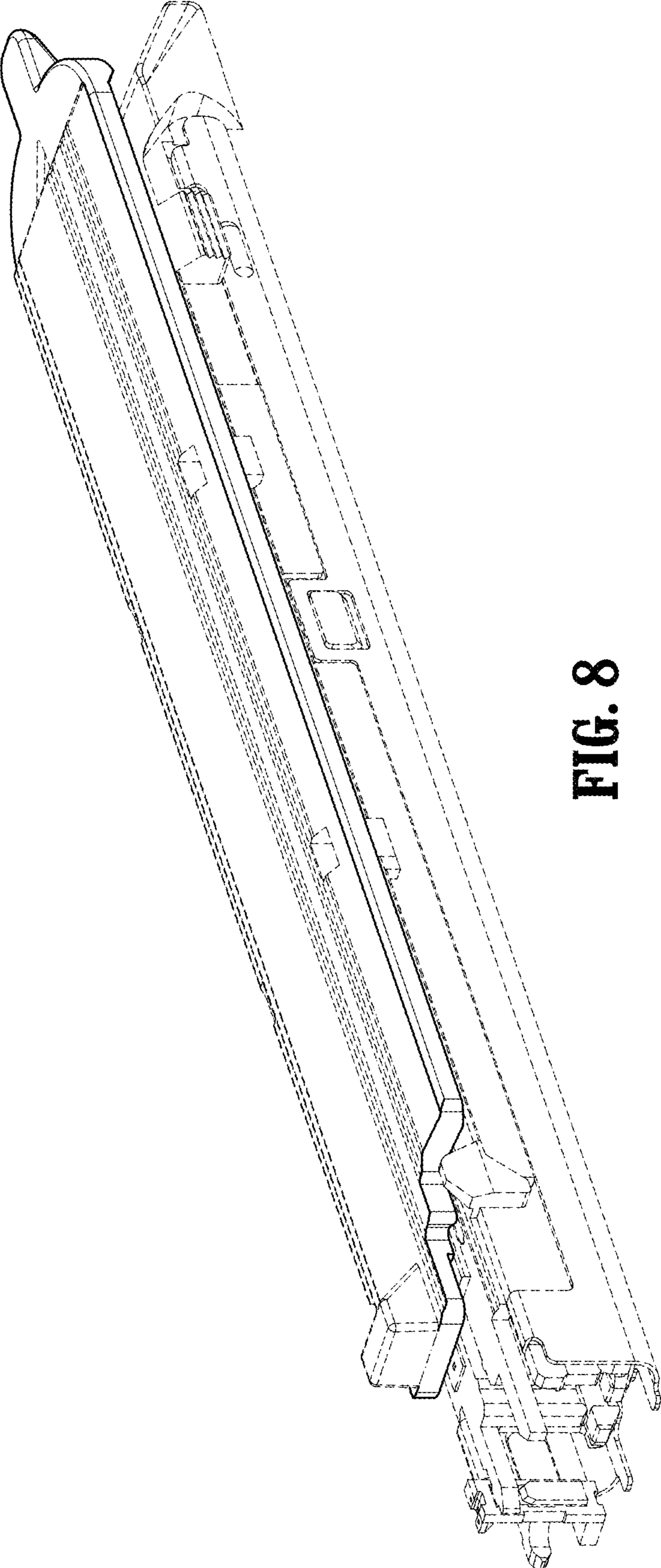
**FIG. 5**



**FIG. 6**



**FIG. 7**



**FIG. 8**