US00D879809S

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

(10) **Patent No.: US D879,809 S**
(45) **Date of Patent: ** Mar. 31, 2020**

(54) **DISPLAY PANEL WITH CHANGEABLE GRAPHICAL USER INTERFACE**

(71) Applicant: **Ethicon LLC**, Guaynabo, PR (US)

(72) Inventors: **Jason L. Harris**, Lebanon, OH (US); **Frederick E. Shelton, IV**, Hillsboro, OH (US); **Douglas E. Withers**, Cincinnati, OH (US); **Christopher J. Hess**, Blue Ash, OH (US)

(73) Assignee: **Ethicon LLC**, Guaynabo, PR (US)

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

(21) Appl. No.: **29/608,238**

(22) Filed: **Jun. 20, 2017**

(51) **LOC (12) Cl.** **14-04**

(52) **U.S. Cl.**
USPC **D14/486**; D14/494

(58) **Field of Classification Search**
USPC D14/485–495; D20/10, 11, 22–33, 39, D20/40; D5/20, 26, 30, 40, 63–65
(Continued)

(56) **References Cited**

U.S. PATENT DOCUMENTS

66,052 A 6/1867 Smith
662,587 A 11/1900 Blake
(Continued)

FOREIGN PATENT DOCUMENTS

AU 2011218702 B2 6/2013
AU 2012200178 B2 7/2013
(Continued)

OTHER PUBLICATIONS

Schellhammer et al., "Poly-Lactic-Acid for Coating of Endovascular Stents: Preliminary Results in Canine Experimental Av-Fistulae," Mat.-wiss. u. Werkstofftech., 32, pp. 193-199 (2001).
(Continued)

Primary Examiner — Cathron C Brooks
Assistant Examiner — Ian F Whitmore

(57) **CLAIM**

The ornamental design for a display panel with changeable graphical user interface, as shown and described.

DESCRIPTION

FIG. **1** is a front view of a display panel with changeable graphical user interface showing a first image in a sequence according to a first embodiment of our new design;

FIG. **2** is a front view of a second image in the sequence of the first embodiment;

FIG. **3** is a front view of a third image in the sequence of the first embodiment;

FIG. **4** is a front view of a fourth image in the sequence of the first embodiment;

FIG. **5** is a front view of a display panel with changeable graphical user interface showing a first image in a sequence according to a second embodiment of our new design;

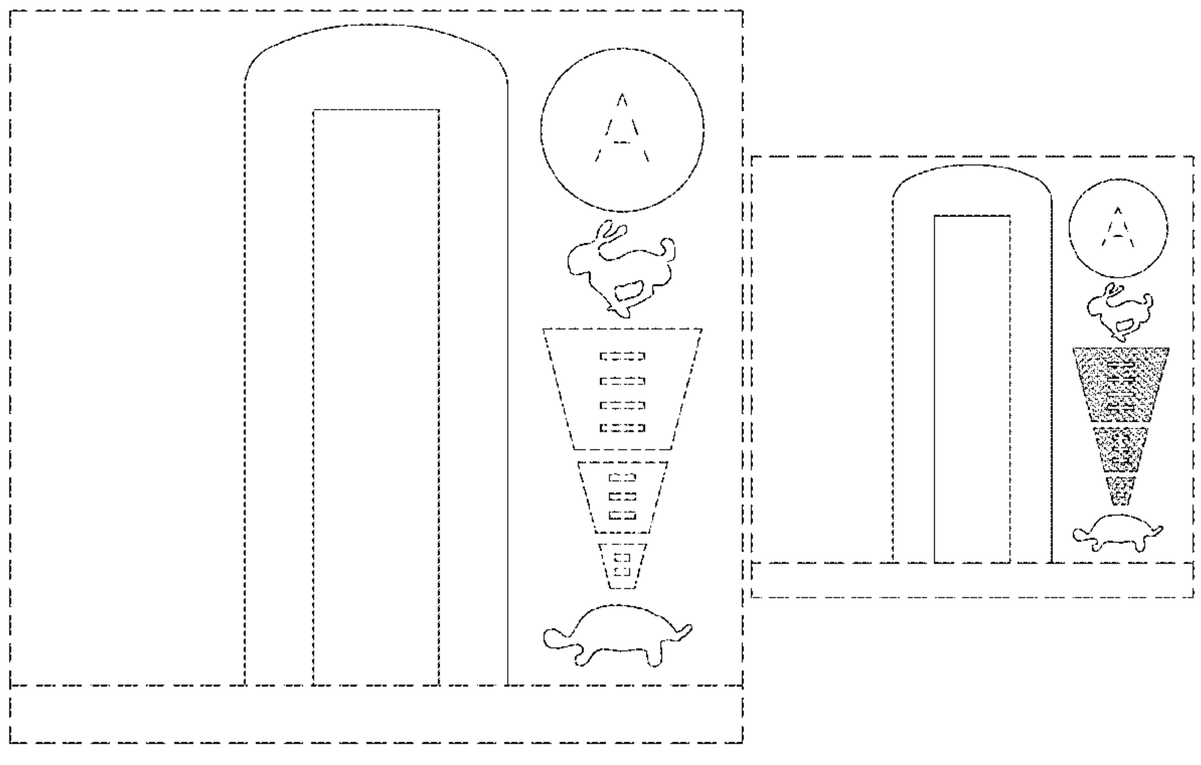
FIG. **6** is a front view of a second image in the sequence of the second embodiment;

FIG. **7** is a front view of a third image in the sequence of the second embodiment; and,

FIG. **8** is a front view of a fourth image in the sequence of the second embodiment.

In all figures, the outermost broken-line square illustrates the perimeter of a portion of a display panel, and defines the bounds of the claimed design. The remaining broken lines illustrate portions of a graphical user interface. The broken lines form no part of the claimed design. Further, the appearance of the display panel with changeable graphical user interface sequentially transitions between the images shown in FIGS. **1-4** and FIGS. **5-8**. The process or period in which one image transitions to another forms no part of the claimed design.

1 Claim, 5 Drawing Sheets



(58) **Field of Classification Search**
CPC G06F 3/048–04897; G06F 3/147; G06F 19/3456; A61B 2017/00017; A61B 17/04; A61B 17/32; A61B 17/1626; A61B 34/00; A61B 34/25; A61B 34/70; A61M 5/003
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

670,748	A	3/1901	Weddeler
719,487	A	2/1903	Minor
804,229	A	11/1905	Hutchinson
951,393	A	3/1910	Hahn
1,188,721	A	6/1916	Bittner
1,306,107	A	6/1919	Elliott
1,314,601	A	9/1919	McCaskey
1,677,337	A	7/1928	Grove
1,794,907	A	3/1931	Kelly
1,849,427	A	3/1932	Hook
1,944,116	A	1/1934	Stratman
1,954,048	A	4/1934	Jeffrey et al.
2,037,727	A	4/1936	La Chapelle
2,132,295	A	10/1938	Hawkins
2,161,632	A	6/1939	Nattenheimer
D120,434	S	5/1940	Gold
2,211,117	A	8/1940	Hess
2,214,870	A	9/1940	West
2,224,882	A	12/1940	Peck
2,318,379	A	5/1943	Davis et al.
2,329,440	A	9/1943	La Place
2,377,581	A	6/1945	Shaffrey
2,406,389	A	8/1946	Lee
2,441,096	A	5/1948	Happe
2,448,741	A	9/1948	Scott et al.
2,450,527	A	10/1948	Smith
2,507,872	A	5/1950	Unsinger
2,526,902	A	10/1950	Rublee
2,527,256	A	10/1950	Jackson
2,578,686	A	12/1951	Fish
2,638,901	A	5/1953	Sugarbaker
2,674,149	A	4/1954	Benson
2,701,489	A	2/1955	Osborn
2,711,461	A	6/1955	Happe
2,742,955	A	4/1956	Dominguez
2,804,848	A	9/1957	O'Farrell et al.
2,808,482	A	10/1957	Zanichkowsky et al.
2,853,074	A	9/1958	Olson
2,887,004	A	5/1959	Stewart
2,957,353	A	10/1960	Lewis
2,959,974	A	11/1960	Emrick
3,032,769	A	5/1962	Palmer
3,060,972	A	10/1962	Sheldon
3,075,062	A	1/1963	Iaccarino
3,078,465	A	2/1963	Bobrov
3,079,606	A	3/1963	Bobrov et al.
3,080,564	A	3/1963	Strekopitov et al.
3,166,072	A	1/1965	Sullivan, Jr.
3,180,236	A	4/1965	Beckett
3,196,869	A	7/1965	Scholl
3,204,731	A	9/1965	Bent et al.
3,266,494	A	8/1966	Brownrigg et al.
3,269,630	A	8/1966	Fleischer
3,269,631	A	8/1966	Takaro
3,275,211	A	9/1966	Hirsch et al.
3,317,103	A	5/1967	Cullen et al.
3,317,105	A	5/1967	Astafjev et al.
3,357,296	A	12/1967	Lefever
3,359,978	A	12/1967	Smith, Jr.
3,377,893	A	4/1968	Short
3,480,193	A	11/1969	Ralston
3,490,675	A	1/1970	Green et al.
3,494,533	A	2/1970	Green et al.
3,499,591	A	3/1970	Green
3,503,396	A	3/1970	Pierie et al.
3,509,629	A	5/1970	Kidokoro
3,551,987	A	1/1971	Wilkinson
3,568,675	A	3/1971	Harvey
3,572,159	A	3/1971	Tschanz
3,583,393	A	6/1971	Takahashi
3,589,589	A	6/1971	Akopov
3,598,943	A	8/1971	Barrett
3,608,549	A	9/1971	Merrill
3,618,842	A	11/1971	Bryan
3,638,652	A	2/1972	Kelley
3,640,317	A	2/1972	Panfili
3,643,851	A	2/1972	Green et al.
3,650,453	A	3/1972	Smith, Jr.
3,661,666	A	5/1972	Foster et al.
3,662,939	A	5/1972	Bryan
3,688,966	A	9/1972	Perkins et al.
3,695,646	A	10/1972	Mommsen
3,709,221	A	1/1973	Riely
3,717,294	A	2/1973	Green
3,726,755	A	4/1973	Shannon
3,727,904	A	4/1973	Gabbey
3,734,207	A	5/1973	Fishbein
3,740,994	A	6/1973	De Carlo, Jr.
3,744,495	A	7/1973	Johnson
3,746,002	A	7/1973	Haller
3,747,603	A	7/1973	Adler
3,747,692	A	7/1973	Davidson
3,751,902	A	8/1973	Kingsbury et al.
3,752,161	A	8/1973	Bent
3,799,151	A	3/1974	Fukaumi et al.
3,808,452	A	4/1974	Hutchinson
3,815,476	A	6/1974	Green et al.
3,819,100	A	6/1974	Noiles et al.
3,821,919	A	7/1974	Knohl
3,836,171	A	9/1974	Hayashi et al.
3,837,555	A	9/1974	Green
3,841,474	A	10/1974	Maier
3,851,196	A	11/1974	Hinds
3,863,639	A	2/1975	Kleaveland
3,883,624	A	5/1975	McKenzie et al.
3,885,491	A	5/1975	Curtis
3,892,228	A	7/1975	Mitsui
3,894,174	A	7/1975	Cartun
3,902,247	A	9/1975	Fleer et al.
3,940,844	A	3/1976	Colby et al.
3,944,163	A	3/1976	Hayashi et al.
3,950,686	A	4/1976	Randall
3,952,747	A	4/1976	Kimmell, Jr.
3,955,581	A	5/1976	Spasiano et al.
3,959,879	A	6/1976	Sellers
RE28,932	E	8/1976	Noiles et al.
3,972,734	A	8/1976	King
3,981,051	A	9/1976	Brumlik
4,025,216	A	5/1977	Hives
4,027,746	A	6/1977	Kine
4,034,143	A	7/1977	Sweet
4,038,987	A	8/1977	Komiya
4,054,108	A	10/1977	Gill
4,060,089	A	11/1977	Noiles
4,066,133	A	1/1978	Voss
4,085,337	A	4/1978	Moeller
4,100,820	A	7/1978	Evett
4,106,446	A	8/1978	Yamada et al.
4,106,620	A	8/1978	Brimmer et al.
4,108,211	A	8/1978	Tanaka
4,111,206	A	9/1978	Vishnevsky et al.
4,127,227	A	11/1978	Green
4,129,059	A	12/1978	Van Eck
4,132,146	A	1/1979	Uhlig
4,135,517	A	1/1979	Reale
4,154,122	A	5/1979	Severin
4,169,990	A	10/1979	Lerdman
4,180,285	A	12/1979	Reneau
4,185,701	A	1/1980	Boys
4,190,042	A	2/1980	Sinnreich
4,198,734	A	4/1980	Brumlik
4,198,982	A	4/1980	Fortner et al.
4,207,898	A	6/1980	Becht
4,213,562	A	7/1980	Garrett et al.
4,226,242	A	10/1980	Jarvik

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,239,431	A	12/1980	Davini
4,241,861	A	12/1980	Fleischer
4,244,372	A	1/1981	Kapitanov et al.
4,250,436	A	2/1981	Weissman
4,261,244	A	4/1981	Becht et al.
4,272,002	A	6/1981	Moshofsky
4,272,662	A	6/1981	Simpson
4,274,304	A	6/1981	Curtiss
4,274,398	A	6/1981	Scott, Jr.
4,275,813	A	6/1981	Noiles
4,278,091	A	7/1981	Borzone
4,289,131	A	9/1981	Mueller
4,289,133	A	9/1981	Rothfuss
4,290,542	A	9/1981	Fedotov et al.
D261,356	S	10/1981	Robinson
4,293,604	A	10/1981	Campbell
4,296,654	A	10/1981	Mercer
4,296,881	A	10/1981	Lee
4,304,236	A	12/1981	Conta et al.
4,305,539	A	12/1981	Korolkov et al.
4,312,363	A	1/1982	Rothfuss et al.
4,312,685	A	1/1982	Riedl
4,317,451	A	3/1982	Cerwin et al.
4,319,576	A	3/1982	Rothfuss
4,321,002	A	3/1982	Froehlich
4,321,746	A	3/1982	Grinage
4,328,839	A	5/1982	Lyons et al.
4,331,277	A	5/1982	Green
4,340,331	A	7/1982	Savino
4,347,450	A	8/1982	Colligan
4,348,603	A	9/1982	Huber
4,349,028	A	9/1982	Green
4,350,151	A	9/1982	Scott
4,353,371	A	10/1982	Cosman
4,357,940	A	11/1982	Muller
4,361,057	A	11/1982	Kochera
4,366,544	A	12/1982	Shima et al.
4,369,013	A	1/1983	Abildgaard et al.
4,373,147	A	2/1983	Carlson, Jr.
4,376,380	A	3/1983	Burgess
4,379,457	A	4/1983	Gravener et al.
4,380,312	A	4/1983	Landrus
4,382,326	A	5/1983	Rabuse
4,383,634	A	5/1983	Green
4,393,728	A	7/1983	Larson et al.
4,394,613	A	7/1983	Cole
4,396,139	A	8/1983	Hall et al.
4,397,311	A	8/1983	Kanshin et al.
4,402,445	A	9/1983	Green
4,406,621	A	9/1983	Bailey
4,408,692	A	10/1983	Sigel et al.
4,409,057	A	10/1983	Molenda et al.
4,415,112	A	11/1983	Green
4,416,276	A	11/1983	Newton et al.
4,417,890	A	11/1983	Dennehey et al.
4,423,456	A	12/1983	Zaidenweber
4,428,376	A	1/1984	Mericle
4,429,695	A	2/1984	Green
4,430,997	A	2/1984	DiGiovanni et al.
4,434,796	A	3/1984	Karapetian et al.
4,438,659	A	3/1984	Desplats
4,442,964	A	4/1984	Becht
4,448,194	A	5/1984	DiGiovanni et al.
4,451,743	A	5/1984	Suzuki et al.
4,452,376	A	6/1984	Klieman et al.
4,454,887	A	6/1984	Kruger
4,461,305	A	7/1984	Cibley
4,467,805	A	8/1984	Fukuda
4,468,597	A	8/1984	Baumard et al.
4,469,481	A	9/1984	Kobayashi
4,470,414	A	9/1984	Imagawa et al.
4,471,780	A	9/1984	Menges et al.
4,471,781	A	9/1984	Di Giovanni et al.
4,473,077	A	9/1984	Noiles et al.
4,475,679	A	10/1984	Fleury, Jr.
4,478,220	A	10/1984	Di Giovanni et al.
4,480,641	A	11/1984	Failla et al.
4,485,816	A	12/1984	Krumme
4,485,817	A	12/1984	Swiggett
4,486,928	A	12/1984	Tucker et al.
4,488,523	A	12/1984	Shichman
4,489,875	A	12/1984	Crawford et al.
4,493,983	A	1/1985	Taggert
4,494,057	A	1/1985	Hotta
4,499,895	A	2/1985	Takayama
4,500,024	A	2/1985	DiGiovanni et al.
D278,081	S	3/1985	Green
4,503,842	A	3/1985	Takayama
4,505,272	A	3/1985	Utyamyshev et al.
4,505,273	A	3/1985	Braun et al.
4,505,414	A	3/1985	Filipi
4,506,671	A	3/1985	Green
4,512,038	A	4/1985	Alexander et al.
4,520,817	A	6/1985	Green
4,522,327	A	6/1985	Korthoff et al.
4,526,174	A	7/1985	Froehlich
4,527,724	A	7/1985	Chow et al.
4,530,357	A	7/1985	Pawloski et al.
4,530,453	A	7/1985	Green
4,531,522	A	7/1985	Bedi et al.
4,532,927	A	8/1985	Miksza, Jr.
4,540,202	A	9/1985	Amphoux et al.
4,548,202	A	10/1985	Duncan
4,556,058	A	12/1985	Green
4,560,915	A	12/1985	Soultanian
4,565,109	A	1/1986	Tsay
4,565,189	A	1/1986	Mabuchi
4,566,620	A	1/1986	Green et al.
4,569,346	A	2/1986	Poirier
4,569,469	A	2/1986	Mongeon et al.
4,571,213	A	2/1986	Ishimoto
4,573,468	A	3/1986	Conta et al.
4,573,469	A	3/1986	Golden et al.
4,573,622	A	3/1986	Green et al.
4,576,165	A	3/1986	Green et al.
4,576,167	A	3/1986	Noiles
4,580,712	A	4/1986	Green
4,585,153	A	4/1986	Failla et al.
4,586,501	A	5/1986	Claracq
4,586,502	A	5/1986	Bedi et al.
4,589,416	A	5/1986	Green
4,589,582	A	5/1986	Bilotti
4,589,870	A	5/1986	Citrin et al.
4,591,085	A	5/1986	Di Giovanni
RE32,214	E	7/1986	Schramm
4,597,753	A	7/1986	Turley
4,600,037	A	7/1986	Hatten
4,604,786	A	8/1986	Howie, Jr.
4,605,001	A	8/1986	Rothfuss et al.
4,605,004	A	8/1986	Di Giovanni et al.
4,606,343	A	8/1986	Conta et al.
4,607,636	A	8/1986	Kula et al.
4,607,638	A	8/1986	Crainich
4,608,981	A	9/1986	Rothfuss et al.
4,610,250	A	9/1986	Green
4,610,383	A	9/1986	Rothfuss et al.
4,612,933	A	9/1986	Brinkerhoff et al.
D286,180	S	10/1986	Korthoff
D286,442	S	10/1986	Korthoff et al.
4,617,893	A	10/1986	Donner et al.
4,617,914	A	10/1986	Ueda
4,619,262	A	10/1986	Taylor
4,619,391	A	10/1986	Sharkany et al.
D287,278	S	12/1986	Spreckelmeier
4,628,459	A	12/1986	Shinohara et al.
4,628,636	A	12/1986	Folger
4,629,107	A	12/1986	Fedotov et al.
4,632,290	A	12/1986	Green et al.
4,633,861	A	1/1987	Chow et al.
4,633,874	A	1/1987	Chow et al.
4,634,419	A	1/1987	Kreizman et al.
4,635,638	A	1/1987	Weintraub et al.
4,641,076	A	2/1987	Linden
4,642,618	A	2/1987	Johnson et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,643,173	A	2/1987	Bell et al.
4,643,731	A	2/1987	Eckenhoff
4,646,722	A	3/1987	Silverstein et al.
4,646,745	A	3/1987	Noiles
4,652,820	A	3/1987	Maresca
4,654,028	A	3/1987	Suma
4,655,222	A	4/1987	Florez et al.
4,662,555	A	5/1987	Thornton
4,663,874	A	5/1987	Sano et al.
4,664,305	A	5/1987	Blake, III et al.
4,665,916	A	5/1987	Green
4,667,674	A	5/1987	Korthoff et al.
4,669,647	A	6/1987	Storace
4,671,278	A	6/1987	Chin
4,671,280	A	6/1987	Dorband et al.
4,671,445	A	6/1987	Barker et al.
4,672,964	A	6/1987	Dee et al.
4,675,944	A	6/1987	Wells
4,676,245	A	6/1987	Fukuda
4,679,460	A	7/1987	Yoshigai
4,679,719	A	7/1987	Kramer
4,684,051	A	8/1987	Akopov et al.
4,688,555	A	8/1987	Wardle
4,691,703	A	9/1987	Auth et al.
4,693,248	A	9/1987	Failla
4,698,579	A	10/1987	Richter et al.
4,700,703	A	10/1987	Resnick et al.
4,705,038	A	11/1987	Sjostrom et al.
4,708,141	A	11/1987	Inoue et al.
4,709,120	A	11/1987	Pearson
4,715,520	A	12/1987	Roehr, Jr. et al.
4,719,917	A	1/1988	Barrows et al.
4,721,099	A	1/1988	Chikama
4,724,840	A	2/1988	McVay et al.
4,727,308	A	2/1988	Huljak et al.
4,728,020	A	3/1988	Green et al.
4,728,876	A	3/1988	Mongeon et al.
4,729,260	A	3/1988	Dudden
4,730,726	A	3/1988	Holzwarth
4,741,336	A	5/1988	Failla et al.
4,743,214	A	5/1988	Tai-Cheng
4,744,363	A	5/1988	Hasson
4,747,820	A	5/1988	Hornlein et al.
4,750,902	A	6/1988	Wuchinich et al.
4,752,024	A	6/1988	Green et al.
4,754,909	A	7/1988	Barker et al.
4,761,326	A	8/1988	Barnes et al.
4,763,669	A	8/1988	Jaeger
4,767,044	A	8/1988	Green
D297,764	S	9/1988	Hunt et al.
4,773,420	A	9/1988	Green
4,777,780	A	10/1988	Holzwarth
4,781,186	A	11/1988	Simpson et al.
4,784,137	A	11/1988	Kulik et al.
4,787,387	A	11/1988	Burbank, III et al.
4,788,485	A	11/1988	Kawagishi et al.
D298,967	S	12/1988	Hunt
4,790,225	A	12/1988	Moody et al.
4,790,314	A	12/1988	Weaver
4,805,617	A	2/1989	Bedi et al.
4,805,823	A	2/1989	Rothfuss
4,807,628	A	2/1989	Peters et al.
4,809,695	A	3/1989	Gwathmey et al.
4,815,460	A	3/1989	Porat et al.
4,817,643	A	4/1989	Olson
4,817,847	A	4/1989	Redtenbacher et al.
4,819,853	A	4/1989	Green
4,821,939	A	4/1989	Green
4,827,911	A	5/1989	Broadwin et al.
4,828,542	A	5/1989	Hermann
4,828,944	A	5/1989	Yabe et al.
4,830,855	A	5/1989	Stewart
4,832,158	A	5/1989	Farrar et al.
4,833,937	A	5/1989	Nagano
4,834,720	A	5/1989	Blinkhorn
4,838,859	A	6/1989	Strassmann
4,844,068	A	7/1989	Arata et al.
4,848,637	A	7/1989	Pruitt
4,856,078	A	8/1989	Konopka
4,860,644	A	8/1989	Kohl et al.
4,862,891	A	9/1989	Smith
4,863,423	A	9/1989	Wallace
4,865,030	A	9/1989	Polyak
4,868,530	A	9/1989	Ahs
4,869,414	A	9/1989	Green et al.
4,869,415	A	9/1989	Fox
4,873,977	A	10/1989	Avant et al.
4,875,486	A	10/1989	Rapoport et al.
4,880,015	A	11/1989	Nierman
4,890,613	A	1/1990	Golden et al.
4,892,244	A	1/1990	Fox et al.
4,893,622	A	1/1990	Green et al.
4,894,051	A	1/1990	Shiber
4,896,584	A	1/1990	Stoll et al.
4,896,678	A	1/1990	Ogawa
4,900,303	A	2/1990	Lemelson
4,903,697	A	2/1990	Resnick et al.
4,909,789	A	3/1990	Taguchi et al.
4,915,100	A	4/1990	Green
4,919,679	A	4/1990	Averill et al.
4,921,479	A	5/1990	Grayzel
4,925,082	A	5/1990	Kim
4,928,699	A	5/1990	Sasai
4,930,503	A	6/1990	Pruitt
4,930,674	A	6/1990	Barak
4,931,047	A	6/1990	Broadwin et al.
4,931,737	A	6/1990	Hishiki
4,932,960	A	6/1990	Green et al.
4,933,800	A	6/1990	Yang
4,933,843	A	6/1990	Scheller et al.
D309,350	S	7/1990	Sutherland et al.
4,938,408	A	7/1990	Bedi et al.
4,941,623	A	7/1990	Pruitt
4,943,182	A	7/1990	Hoblingre
4,944,443	A	7/1990	Oddsen et al.
4,946,067	A	8/1990	Kelsall
4,948,327	A	8/1990	Crupi, Jr.
4,949,707	A	8/1990	Levahn et al.
4,951,860	A	8/1990	Peters et al.
4,951,861	A	8/1990	Schulze et al.
4,955,959	A	9/1990	Tompkins et al.
4,957,212	A	9/1990	Duck et al.
4,962,877	A	10/1990	Hervas
4,964,559	A	10/1990	Deniega et al.
4,964,863	A	10/1990	Kanshin et al.
4,965,709	A	10/1990	Ngo
4,973,274	A	11/1990	Hirukawa
4,973,302	A	11/1990	Armour et al.
4,978,049	A	12/1990	Green
4,978,333	A	12/1990	Broadwin et al.
4,979,952	A	12/1990	Kubota et al.
4,984,564	A	1/1991	Yuen
4,986,808	A	1/1991	Broadwin et al.
4,987,049	A	1/1991	Komamura et al.
4,988,334	A	1/1991	Hornlein et al.
4,995,877	A	2/1991	Ams et al.
4,995,959	A	2/1991	Metzner
4,996,975	A	3/1991	Nakamura
5,002,543	A	3/1991	Bradshaw et al.
5,002,553	A	3/1991	Shiber
5,005,754	A	4/1991	Van Overloop
5,009,661	A	4/1991	Michelson
5,012,411	A	4/1991	Policastro et al.
5,014,898	A	5/1991	Heidrich
5,014,899	A	5/1991	Presty et al.
5,015,227	A	5/1991	Broadwin et al.
5,018,515	A	5/1991	Gilman
5,018,657	A	5/1991	Pedlick et al.
5,024,652	A	6/1991	Dumenek et al.
5,024,671	A	6/1991	Tu et al.
5,025,559	A	6/1991	McCullough
5,027,834	A	7/1991	Pruitt
5,030,226	A	7/1991	Green et al.
5,031,814	A	7/1991	Tompkins et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,035,040	A	7/1991	Kerrigan et al.
5,038,109	A	8/1991	Goble et al.
5,038,247	A	8/1991	Kelley et al.
5,040,715	A	8/1991	Green et al.
5,042,707	A	8/1991	Taheri
5,061,269	A	10/1991	Muller
5,062,491	A	11/1991	Takeshima et al.
5,062,563	A	11/1991	Green et al.
5,065,929	A	11/1991	Schulze et al.
5,071,052	A	12/1991	Rodak et al.
5,071,430	A	12/1991	de Salis et al.
5,074,454	A	12/1991	Peters
5,077,506	A	12/1991	Krause
5,079,006	A	1/1992	Urquhart
5,080,556	A	1/1992	Carreno
5,083,695	A	1/1992	Foslien et al.
5,084,057	A	1/1992	Green et al.
5,088,979	A	2/1992	Filipi et al.
5,088,997	A	2/1992	Delahuerga et al.
5,089,606	A	2/1992	Cole et al.
5,094,247	A	3/1992	Hernandez et al.
5,098,004	A	3/1992	Kerrigan
5,098,360	A	3/1992	Hirota
5,100,042	A	3/1992	Gravener et al.
5,100,420	A	3/1992	Green et al.
5,104,025	A	4/1992	Main et al.
5,104,397	A	4/1992	Vasconcelos et al.
5,104,400	A	4/1992	Berguer et al.
5,106,008	A	4/1992	Tompkins et al.
5,108,368	A	4/1992	Hammerslag et al.
5,109,722	A	5/1992	Hufnagle et al.
5,111,987	A	5/1992	Moeinzadeh et al.
5,116,349	A	5/1992	Aranyi
D327,323	S	6/1992	Hunt
5,119,009	A	6/1992	McCaleb et al.
5,122,156	A	6/1992	Granger et al.
5,124,990	A	6/1992	Williamson
5,129,570	A	7/1992	Schulze et al.
5,137,198	A	8/1992	Nobis et al.
5,139,513	A	8/1992	Segato
5,141,144	A	8/1992	Foslien et al.
5,142,932	A	9/1992	Moya et al.
5,155,941	A	10/1992	Takahashi et al.
5,156,315	A	10/1992	Green et al.
5,156,609	A	10/1992	Nakao et al.
5,156,614	A	10/1992	Green et al.
5,158,567	A	10/1992	Green
D330,699	S	11/1992	Gill
5,163,598	A	11/1992	Peters et al.
5,168,605	A	12/1992	Bartlett
5,170,925	A	12/1992	Madden et al.
5,171,247	A	12/1992	Hughett et al.
5,171,249	A	12/1992	Stefanchik et al.
5,171,253	A	12/1992	Klieman
5,173,053	A	12/1992	Swanson et al.
5,173,133	A	12/1992	Morin et al.
5,176,677	A	1/1993	Wuchinich
5,176,688	A	1/1993	Narayan et al.
5,187,422	A	2/1993	Izenbaard et al.
5,188,102	A	2/1993	Idemoto et al.
5,188,111	A	2/1993	Yates et al.
5,190,517	A	3/1993	Zieve et al.
5,190,544	A	3/1993	Chapman et al.
5,190,560	A	3/1993	Woods et al.
5,190,657	A	3/1993	Heagle et al.
5,192,288	A	3/1993	Thompson et al.
5,193,731	A	3/1993	Aranyi
5,195,505	A	3/1993	Josefsen
5,195,968	A	3/1993	Lundquist et al.
5,197,648	A	3/1993	Gingold
5,197,649	A	3/1993	Bessler et al.
5,197,966	A	3/1993	Sommerkamp
5,197,970	A	3/1993	Green et al.
5,200,280	A	4/1993	Karasa
5,201,750	A	4/1993	Hocherl et al.
5,205,459	A	4/1993	Brinkerhoff et al.
5,207,672	A	5/1993	Roth et al.
5,207,697	A	5/1993	Carusillo et al.
5,209,747	A	5/1993	Knoepfler
5,209,756	A	5/1993	Seedhom et al.
5,211,649	A	5/1993	Kohler et al.
5,211,655	A	5/1993	Hasson
5,217,457	A	6/1993	Delahuerga et al.
5,217,478	A	6/1993	Rexroth
5,219,111	A	6/1993	Bilotti et al.
5,220,269	A	6/1993	Chen et al.
5,221,036	A	6/1993	Takase
5,221,281	A	6/1993	Klicek
5,222,945	A	6/1993	Basnight
5,222,963	A	6/1993	Brinkerhoff et al.
5,222,975	A	6/1993	Crainich
5,222,976	A	6/1993	Yoon
5,223,675	A	6/1993	Taft
D338,729	S	8/1993	Sprecklemeier et al.
5,234,447	A	8/1993	Kaster et al.
5,236,269	A	8/1993	Handy
5,236,424	A	8/1993	Imran
5,236,440	A	8/1993	Hlavacek
5,239,981	A	8/1993	Anapliotis
5,240,163	A	8/1993	Stein et al.
5,242,457	A	9/1993	Akopov et al.
5,244,462	A	9/1993	Delahuerga et al.
5,246,156	A	9/1993	Rothfuss et al.
5,246,443	A	9/1993	Mai
5,253,793	A	10/1993	Green et al.
5,258,007	A	11/1993	Spetzler et al.
5,258,008	A	11/1993	Wilk
5,258,009	A	11/1993	Conners
5,258,010	A	11/1993	Green et al.
5,258,012	A	11/1993	Luscombe et al.
5,259,366	A	11/1993	Reydel et al.
5,259,835	A	11/1993	Clark et al.
5,260,637	A	11/1993	Pizzi
5,261,135	A	11/1993	Mitchell
5,261,877	A	11/1993	Fine et al.
5,261,922	A	11/1993	Hood
5,263,629	A	11/1993	Trumbull et al.
5,263,937	A	11/1993	Shipp
5,263,973	A	11/1993	Cook
5,264,218	A	11/1993	Rogozinski
5,268,622	A	12/1993	Philipp
5,271,543	A	12/1993	Grant et al.
5,271,544	A	12/1993	Fox et al.
RE34,519	E	1/1994	Fox et al.
5,275,322	A	1/1994	Brinkerhoff et al.
5,275,323	A	1/1994	Schulze et al.
5,275,608	A	1/1994	Forman et al.
5,279,416	A	1/1994	Malec et al.
5,281,216	A	1/1994	Klicek
5,282,806	A	2/1994	Haber et al.
5,282,829	A	2/1994	Hermes
5,284,128	A	2/1994	Hart
5,285,381	A	2/1994	Iskarous et al.
5,285,945	A	2/1994	Brinkerhoff et al.
5,286,253	A	2/1994	Fucci
5,289,963	A	3/1994	McGarry et al.
5,290,271	A	3/1994	Jernberg
5,290,310	A	3/1994	Makower et al.
5,292,053	A	3/1994	Bilotti et al.
5,293,024	A	3/1994	Sugahara et al.
5,297,714	A	3/1994	Kramer
5,304,204	A	4/1994	Bregen
D347,474	S	5/1994	Olson
5,307,976	A	5/1994	Olson et al.
5,308,576	A	5/1994	Green et al.
5,309,387	A	5/1994	Mod et al.
5,309,927	A	5/1994	Welch
5,312,023	A	5/1994	Green et al.
5,312,024	A	5/1994	Grant et al.
5,312,329	A	5/1994	Beaty et al.
5,313,935	A	5/1994	Kortenbach et al.
5,313,967	A	5/1994	Lieber et al.
5,314,424	A	5/1994	Nicholas
5,314,445	A	5/1994	Heidmueller nee Degwitz et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,314,466	A	5/1994	Stern et al.
5,318,221	A	6/1994	Green et al.
5,320,627	A	6/1994	Sorensen et al.
D348,930	S	7/1994	Olson
5,326,013	A	7/1994	Green et al.
5,329,923	A	7/1994	Lundquist
5,330,487	A	7/1994	Thornton et al.
5,330,502	A	7/1994	Hassler et al.
5,331,971	A	7/1994	Bales et al.
5,332,142	A	7/1994	Robinson et al.
5,333,422	A	8/1994	Warren et al.
5,333,772	A	8/1994	Rothfuss et al.
5,333,773	A	8/1994	Main et al.
5,334,183	A	8/1994	Wuchinich
5,336,130	A	8/1994	Ray
5,336,229	A	8/1994	Noda
5,336,232	A	8/1994	Green et al.
5,339,799	A	8/1994	Kami et al.
5,341,724	A	8/1994	Vatel
5,341,807	A	8/1994	Nardella
5,341,810	A	8/1994	Dardel
5,342,380	A	8/1994	Hood
5,342,381	A	8/1994	Tidemand
5,342,385	A	8/1994	Norelli et al.
5,342,395	A	8/1994	Jarrett et al.
5,342,396	A	8/1994	Cook
5,343,382	A	8/1994	Hale et al.
5,343,391	A	8/1994	Mushabac
5,344,059	A	9/1994	Green et al.
5,344,060	A	9/1994	Gravener et al.
5,344,454	A	9/1994	Clarke et al.
5,346,504	A	9/1994	Ortiz et al.
5,348,259	A	9/1994	Blanco et al.
5,350,355	A	9/1994	Sklar
5,350,388	A	9/1994	Epstein
5,350,391	A	9/1994	Iacovelli
5,350,400	A	9/1994	Esposito et al.
5,352,229	A	10/1994	Goble et al.
5,352,235	A	10/1994	Koros et al.
5,352,238	A	10/1994	Green et al.
5,354,250	A	10/1994	Christensen
5,354,303	A	10/1994	Spaeth et al.
5,356,006	A	10/1994	Alpern et al.
5,356,064	A	10/1994	Green et al.
5,358,506	A	10/1994	Green et al.
5,358,510	A	10/1994	Luscombe et al.
5,359,231	A	10/1994	Flowers et al.
D352,780	S	11/1994	Glaeser et al.
5,359,993	A	11/1994	Slater et al.
5,360,305	A	11/1994	Kerrigan
5,360,428	A	11/1994	Hutchinson, Jr.
5,361,902	A	11/1994	Abidin et al.
5,364,001	A	11/1994	Bryan
5,364,002	A	11/1994	Green et al.
5,364,003	A	11/1994	Williamson, IV
5,366,133	A	11/1994	Geiste
5,366,134	A	11/1994	Green et al.
5,366,479	A	11/1994	McGarry et al.
5,368,015	A	11/1994	Wilk
5,368,592	A	11/1994	Stern et al.
5,369,565	A	11/1994	Chen et al.
5,370,645	A	12/1994	Klicek et al.
5,372,124	A	12/1994	Takayama et al.
5,372,596	A	12/1994	Klicek et al.
5,372,602	A	12/1994	Burke
5,374,277	A	12/1994	Hassler
5,375,588	A	12/1994	Yoon
5,376,095	A	12/1994	Ortiz
5,379,933	A	1/1995	Green et al.
5,381,649	A	1/1995	Webb
5,381,782	A	1/1995	DeLaRama et al.
5,381,943	A	1/1995	Allen et al.
5,382,247	A	1/1995	Cimino et al.
5,383,460	A	1/1995	Jang et al.
5,383,880	A	1/1995	Hooven
5,383,881	A	1/1995	Green et al.
5,383,882	A	1/1995	Buess et al.
5,383,888	A	1/1995	Zvenyatsky et al.
5,383,895	A	1/1995	Holmes et al.
5,388,568	A	2/1995	van der Heide
5,389,098	A	2/1995	Tsuruta et al.
5,389,102	A	2/1995	Green et al.
5,389,104	A	2/1995	Hahnen et al.
5,391,180	A	2/1995	Tovey et al.
5,392,979	A	2/1995	Green et al.
5,395,030	A	3/1995	Kuramoto et al.
5,395,033	A	3/1995	Byrne et al.
5,395,034	A	3/1995	Allen et al.
5,395,312	A	3/1995	Desai
5,395,384	A	3/1995	Duthoit et al.
5,397,046	A	3/1995	Savage et al.
5,397,324	A	3/1995	Carroll et al.
5,400,267	A	3/1995	Denen et al.
5,403,276	A	4/1995	Schechter et al.
5,403,312	A	4/1995	Yates et al.
5,404,106	A	4/1995	Matsuda
5,404,870	A	4/1995	Brinkerhoff et al.
5,404,960	A	4/1995	Wada et al.
5,405,072	A	4/1995	Zlock et al.
5,405,073	A	4/1995	Porter
5,405,344	A	4/1995	Williamson et al.
5,405,360	A	4/1995	Tovey
5,407,293	A	4/1995	Crainich
5,408,409	A	4/1995	Glassman et al.
5,409,498	A	4/1995	Braddock et al.
5,409,703	A	4/1995	McAnalley et al.
D357,981	S	5/1995	Green et al.
5,411,481	A	5/1995	Allen et al.
5,411,508	A	5/1995	Bessler et al.
5,413,107	A	5/1995	Oakley et al.
5,413,267	A	5/1995	Solyntjes et al.
5,413,268	A	5/1995	Green et al.
5,413,272	A	5/1995	Green et al.
5,413,573	A	5/1995	Koivukangas
5,415,334	A	5/1995	Williamson et al.
5,415,335	A	5/1995	Knodell, Jr.
5,417,203	A	5/1995	Tovey et al.
5,417,361	A	5/1995	Williamson, IV
5,419,766	A	5/1995	Chang et al.
5,421,829	A	6/1995	Olichney et al.
5,422,567	A	6/1995	Matsunaga
5,423,471	A	6/1995	Mastri et al.
5,423,809	A	6/1995	Klicek
5,423,835	A	6/1995	Green et al.
5,425,745	A	6/1995	Green et al.
5,427,298	A	6/1995	Tegtmeier
5,431,322	A	7/1995	Green et al.
5,431,323	A	7/1995	Smith et al.
5,431,654	A	7/1995	Nic
5,431,668	A	7/1995	Burbank, III et al.
5,433,721	A	7/1995	Hooven et al.
5,437,681	A	8/1995	Meade et al.
5,438,302	A	8/1995	Goble
5,438,997	A	8/1995	Sieben et al.
5,439,155	A	8/1995	Viola
5,439,156	A	8/1995	Grant et al.
5,439,479	A	8/1995	Shichman et al.
5,441,191	A	8/1995	Linden
5,441,193	A	8/1995	Gravener
5,441,483	A	8/1995	Avitall
5,441,494	A	8/1995	Ortiz
5,443,197	A	8/1995	Malis et al.
5,443,463	A	8/1995	Stern et al.
5,444,113	A	8/1995	Sinclair et al.
5,445,155	A	8/1995	Sieben
5,445,304	A	8/1995	Plyley et al.
5,445,604	A	8/1995	Lang
5,445,644	A	8/1995	Pietrafitta et al.
5,446,646	A	8/1995	Miyazaki
5,447,265	A	9/1995	Vidal et al.
5,447,417	A	9/1995	Kuhl et al.
5,447,513	A	9/1995	Davison et al.
5,449,355	A	9/1995	Rhum et al.
5,449,365	A	9/1995	Green et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,449,370	A	9/1995	Vaitekunas
5,452,836	A	9/1995	Huitema et al.
5,452,837	A	9/1995	Wlliamson, IV et al.
5,454,378	A	10/1995	Palmer et al.
5,454,822	A	10/1995	Schob et al.
5,454,827	A	10/1995	Aust et al.
5,456,401	A	10/1995	Green et al.
5,456,917	A	10/1995	Wise et al.
5,458,279	A	10/1995	Plyley
5,458,579	A	10/1995	Chodorow et al.
5,462,215	A	10/1995	Viola et al.
5,464,013	A	11/1995	Lemelson
5,464,144	A	11/1995	Guy et al.
5,464,300	A	11/1995	Crainich
5,465,819	A	11/1995	Weilant et al.
5,465,894	A	11/1995	Clark et al.
5,465,895	A	11/1995	Knodel et al.
5,465,896	A	11/1995	Allen et al.
5,466,020	A	11/1995	Page et al.
5,467,911	A	11/1995	Tsuruta et al.
5,468,253	A	11/1995	Bezwada et al.
5,470,006	A	11/1995	Rodak
5,470,007	A	11/1995	Plyley et al.
5,470,008	A	11/1995	Rodak
5,470,009	A	11/1995	Rodak
5,470,010	A	11/1995	Rothfuss et al.
5,471,129	A	11/1995	Mann
5,472,132	A	12/1995	Savage et al.
5,472,442	A	12/1995	Klicek
5,473,204	A	12/1995	Temple
5,474,057	A	12/1995	Makower et al.
5,474,223	A	12/1995	Viola et al.
5,474,566	A	12/1995	Alesi et al.
5,474,570	A	12/1995	Kockerling et al.
5,476,206	A	12/1995	Green et al.
5,476,479	A	12/1995	Green et al.
5,476,481	A	12/1995	Schondorf
5,478,003	A	12/1995	Green et al.
5,478,354	A	12/1995	Tovey et al.
5,480,089	A	1/1996	Blewett
5,480,409	A	1/1996	Riza
5,482,197	A	1/1996	Green et al.
5,483,952	A	1/1996	Aranyi
5,484,095	A	1/1996	Green et al.
5,484,398	A	1/1996	Stoddard
5,484,451	A	1/1996	Akopov et al.
5,485,947	A	1/1996	Olson et al.
5,485,952	A	1/1996	Fontayne
5,487,499	A	1/1996	Sorrentino et al.
5,487,500	A	1/1996	Knodel et al.
5,489,058	A	2/1996	Plyley et al.
5,489,256	A	2/1996	Adair
5,489,290	A	2/1996	Furnish
5,490,819	A	2/1996	Nicholas et al.
5,492,671	A	2/1996	Krafft
5,496,312	A	3/1996	Klicek
5,496,317	A	3/1996	Goble et al.
5,497,933	A	3/1996	DeFonzo et al.
5,498,164	A	3/1996	Ward et al.
5,498,838	A	3/1996	Furman
5,501,654	A	3/1996	Failla et al.
5,503,320	A	4/1996	Webster et al.
5,503,635	A	4/1996	Sauer et al.
5,503,638	A	4/1996	Cooper et al.
5,505,363	A	4/1996	Green et al.
5,507,425	A	4/1996	Ziglioli
5,507,426	A	4/1996	Young et al.
5,509,596	A	4/1996	Green et al.
5,509,916	A	4/1996	Taylor
5,511,564	A	4/1996	Wilk
5,514,129	A	5/1996	Smith
5,514,149	A	5/1996	Green et al.
5,514,157	A	5/1996	Nicholas et al.
5,518,163	A	5/1996	Hooven
5,518,164	A	5/1996	Hooven
5,520,609	A	5/1996	Moll et al.
5,520,634	A	5/1996	Fox et al.
5,520,678	A	5/1996	Heckele et al.
5,520,700	A	5/1996	Beyar et al.
5,522,817	A	6/1996	Sander et al.
5,522,831	A	6/1996	Sleister et al.
5,527,264	A	6/1996	Moll et al.
5,527,320	A	6/1996	Carruthers et al.
5,529,235	A	6/1996	Boiarski et al.
D372,086	S	7/1996	Grasso et al.
5,531,305	A	7/1996	Roberts et al.
5,531,744	A	7/1996	Nardella et al.
5,531,856	A	7/1996	Moll et al.
5,533,521	A	7/1996	Granger
5,533,581	A	7/1996	Barth et al.
5,533,661	A	7/1996	Main et al.
5,535,934	A	7/1996	Boiarski et al.
5,535,935	A	7/1996	Vidal et al.
5,535,937	A	7/1996	Boiarski et al.
5,540,375	A	7/1996	Bolanos et al.
5,540,705	A	7/1996	Meade et al.
5,541,376	A	7/1996	Ladtkow et al.
5,541,489	A	7/1996	Dunstan
5,542,594	A	8/1996	McKean et al.
5,542,949	A	8/1996	Yoon
5,543,119	A	8/1996	Sutter et al.
5,543,695	A	8/1996	Culp et al.
5,544,802	A	8/1996	Crainich
5,547,117	A	8/1996	Hamblin et al.
5,549,583	A	8/1996	Sanford et al.
5,549,621	A	8/1996	Bessler et al.
5,549,627	A	8/1996	Kieturakis
5,549,628	A	8/1996	Cooper et al.
5,549,637	A	8/1996	Crainich
5,551,622	A	9/1996	Yoon
5,553,624	A	9/1996	Francese et al.
5,553,675	A	9/1996	Pitzen et al.
5,553,765	A	9/1996	Knodel et al.
5,554,148	A	9/1996	Aebischer et al.
5,554,169	A	9/1996	Green et al.
5,556,020	A	9/1996	Hou
5,556,416	A	9/1996	Clark et al.
5,558,533	A	9/1996	Hashizawa et al.
5,558,665	A	9/1996	Kieturakis
5,558,671	A	9/1996	Yates
5,560,530	A	10/1996	Bolanos et al.
5,560,532	A	10/1996	DeFonzo et al.
5,561,881	A	10/1996	Klinger et al.
5,562,239	A	10/1996	Boiarski et al.
5,562,241	A	10/1996	Knodel et al.
5,562,682	A	10/1996	Oberlin et al.
5,562,690	A	10/1996	Green et al.
5,562,701	A	10/1996	Huitema et al.
5,562,702	A	10/1996	Huitema et al.
5,563,481	A	10/1996	Krause
5,564,615	A	10/1996	Bishop et al.
5,569,161	A	10/1996	Ebling et al.
5,569,270	A	10/1996	Weng
5,569,284	A	10/1996	Young et al.
5,571,090	A	11/1996	Sherts
5,571,100	A	11/1996	Goble et al.
5,571,116	A	11/1996	Bolanos et al.
5,571,285	A	11/1996	Chow et al.
5,571,488	A	11/1996	Beerstecher et al.
5,573,169	A	11/1996	Green et al.
5,573,543	A	11/1996	Akopov et al.
5,574,431	A	11/1996	McKeown et al.
5,575,054	A	11/1996	Klinzing et al.
5,575,789	A	11/1996	Bell et al.
5,575,799	A	11/1996	Bolanos et al.
5,575,803	A	11/1996	Cooper et al.
5,575,805	A	11/1996	Li
5,577,654	A	11/1996	Bishop
5,578,052	A	11/1996	Koros et al.
5,579,978	A	12/1996	Green et al.
5,580,067	A	12/1996	Hamblin et al.
5,582,611	A	12/1996	Tsuruta et al.
5,582,617	A	12/1996	Klieman et al.
5,582,907	A	12/1996	Pall

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,583,114 A 12/1996 Barrows et al.
5,584,425 A 12/1996 Savage et al.
5,586,711 A 12/1996 Plyley et al.
5,588,579 A 12/1996 Schnut et al.
5,588,580 A 12/1996 Paul et al.
5,588,581 A 12/1996 Conlon et al.
5,591,170 A 1/1997 Spievack et al.
5,591,187 A 1/1997 Dekel
5,597,107 A 1/1997 Knodel et al.
5,599,151 A 2/1997 Daum et al.
5,599,279 A 2/1997 Slotman et al.
5,599,344 A 2/1997 Paterson
5,599,350 A 2/1997 Schulze et al.
5,599,852 A 2/1997 Scopelianos et al.
5,601,224 A 2/1997 Bishop et al.
5,601,573 A 2/1997 Fogelberg et al.
5,601,604 A 2/1997 Vincent
5,602,449 A 2/1997 Krause et al.
5,603,443 A 2/1997 Clark et al.
5,605,272 A 2/1997 Witt et al.
5,605,273 A 2/1997 Hamblin et al.
5,607,094 A 3/1997 Clark et al.
5,607,095 A 3/1997 Smith et al.
5,607,433 A 3/1997 Polla et al.
5,607,450 A 3/1997 Zvenyatsky et al.
5,607,474 A 3/1997 Athanasiou et al.
5,609,285 A 3/1997 Grant et al.
5,609,601 A 3/1997 Kolesa et al.
5,611,709 A 3/1997 McAnulty
5,613,499 A 3/1997 Palmer et al.
5,613,937 A 3/1997 Garrison et al.
5,613,966 A 3/1997 Makower et al.
5,614,887 A 3/1997 Buchbinder
5,615,820 A 4/1997 Viola
5,618,294 A 4/1997 Aust et al.
5,618,303 A 4/1997 Marlow et al.
5,618,307 A 4/1997 Donlon et al.
5,619,992 A 4/1997 Guthrie et al.
5,620,289 A 4/1997 Curry
5,620,326 A 4/1997 Younker
5,620,452 A 4/1997 Yoon
5,624,398 A 4/1997 Smith et al.
5,624,452 A 4/1997 Yates
5,626,587 A 5/1997 Bishop et al.
5,626,595 A 5/1997 Sklar et al.
5,628,446 A 5/1997 Geiste et al.
5,628,743 A 5/1997 Cimino
5,628,745 A 5/1997 Bek
5,630,539 A 5/1997 Plyley et al.
5,630,540 A 5/1997 Blewett
5,630,541 A 5/1997 Williamson, IV et al.
5,630,782 A 5/1997 Adair
5,632,432 A 5/1997 Schulze et al.
5,632,433 A 5/1997 Grant et al.
5,633,374 A 5/1997 Humphrey et al.
5,634,584 A 6/1997 Okorocha et al.
5,636,779 A 6/1997 Palmer
5,636,780 A 6/1997 Green et al.
5,638,582 A 6/1997 Klatt et al.
5,639,008 A 6/1997 Gallagher et al.
D381,077 S 7/1997 Hunt
5,643,291 A 7/1997 Pier et al.
5,643,293 A 7/1997 Kogasaka et al.
5,643,294 A 7/1997 Tovey et al.
5,643,319 A 7/1997 Green et al.
5,645,209 A 7/1997 Green et al.
5,647,526 A 7/1997 Green et al.
5,647,869 A 7/1997 Goble et al.
5,649,937 A 7/1997 Bito et al.
5,649,956 A 7/1997 Jensen et al.
5,651,491 A 7/1997 Heaton et al.
5,651,762 A 7/1997 Bridges
5,651,821 A 7/1997 Uchida
5,653,373 A 8/1997 Green et al.
5,653,374 A 8/1997 Young et al.
5,653,677 A 8/1997 Okada et al.
5,653,721 A 8/1997 Knodel et al.
5,653,748 A 8/1997 Strecker
5,655,698 A 8/1997 Yoon
5,657,417 A 8/1997 Di Troia
5,657,429 A 8/1997 Wang et al.
5,657,921 A 8/1997 Young et al.
5,658,238 A 8/1997 Suzuki et al.
5,658,281 A 8/1997 Heard
5,658,298 A 8/1997 Vincent et al.
5,658,300 A 8/1997 Bito et al.
5,658,307 A 8/1997 Exconde
5,662,258 A 9/1997 Knodel et al.
5,662,260 A 9/1997 Yoon
5,662,662 A 9/1997 Bishop et al.
5,662,667 A 9/1997 Knodel
5,665,085 A 9/1997 Nardella
5,667,517 A 9/1997 Hooven
5,667,526 A 9/1997 Levin
5,667,527 A 9/1997 Cook
5,669,544 A 9/1997 Schulze et al.
5,669,904 A 9/1997 Platt, Jr. et al.
5,669,907 A 9/1997 Platt, Jr. et al.
5,669,918 A 9/1997 Balazs et al.
5,673,840 A 10/1997 Schulze et al.
5,673,841 A 10/1997 Schulze et al.
5,673,842 A 10/1997 Bittner et al.
5,674,286 A 10/1997 D'Alessio et al.
5,678,748 A 10/1997 Plyley et al.
5,680,981 A 10/1997 Mililli et al.
5,680,982 A 10/1997 Schulze et al.
5,680,983 A 10/1997 Plyley et al.
5,681,341 A 10/1997 Lunsford et al.
5,683,349 A 11/1997 Makower et al.
5,685,474 A 11/1997 Seeber
5,686,090 A 11/1997 Schilder et al.
5,688,270 A 11/1997 Yates et al.
5,690,269 A 11/1997 Bolanos et al.
5,692,668 A 12/1997 Schulze et al.
5,693,020 A 12/1997 Rauh
5,693,042 A 12/1997 Boiarski et al.
5,693,051 A 12/1997 Schulze et al.
5,695,494 A 12/1997 Becker
5,695,502 A 12/1997 Pier et al.
5,695,504 A 12/1997 Gifford, III et al.
5,695,524 A 12/1997 Kelley et al.
5,697,542 A 12/1997 Knodel et al.
5,697,543 A 12/1997 Burdorff
5,697,909 A 12/1997 Eggers et al.
5,697,943 A 12/1997 Sauer et al.
5,700,270 A 12/1997 Peyser et al.
5,700,276 A 12/1997 Benecke
5,702,387 A 12/1997 Arts et al.
5,702,408 A 12/1997 Wales et al.
5,702,409 A 12/1997 Rayburn et al.
5,704,087 A 1/1998 Strub
5,704,534 A 1/1998 Huitema et al.
5,706,997 A 1/1998 Green et al.
5,706,998 A 1/1998 Plyley et al.
5,707,392 A 1/1998 Kortenbach
5,709,334 A 1/1998 Sorrentino et al.
5,709,335 A 1/1998 Heck
5,709,680 A 1/1998 Yates et al.
5,709,706 A 1/1998 Kienzle et al.
5,711,472 A 1/1998 Bryan
5,712,460 A 1/1998 Carr et al.
5,713,128 A 2/1998 Schrenk et al.
5,713,505 A 2/1998 Huitema
5,713,895 A 2/1998 Lontine et al.
5,713,896 A 2/1998 Nardella
5,713,920 A 2/1998 Bezwada et al.
5,715,604 A 2/1998 Lanzoni
5,715,987 A 2/1998 Kelley et al.
5,715,988 A 2/1998 Palmer
5,716,366 A 2/1998 Yates
5,718,359 A 2/1998 Palmer et al.
5,718,360 A 2/1998 Green et al.
5,718,548 A 2/1998 Cotellessa
5,718,714 A 2/1998 Livneh

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,720,744 A 2/1998 Eggleston et al.
D393,067 S 3/1998 Geary et al.
5,724,025 A 3/1998 Tavori
5,725,536 A 3/1998 Oberlin et al.
5,725,554 A 3/1998 Simon et al.
5,728,110 A 3/1998 Vidal et al.
5,728,113 A 3/1998 Sherts
5,728,121 A 3/1998 Bimbo et al.
5,730,758 A 3/1998 Allgeyer
5,732,821 A 3/1998 Stone et al.
5,732,871 A 3/1998 Clark et al.
5,732,872 A 3/1998 Bolduc et al.
5,733,308 A 3/1998 Daugherty et al.
5,735,445 A 4/1998 Vidal et al.
5,735,848 A 4/1998 Yates et al.
5,735,874 A 4/1998 Measamer et al.
5,738,474 A 4/1998 Blewett
5,738,629 A 4/1998 Moll et al.
5,738,648 A 4/1998 Lands et al.
5,741,271 A 4/1998 Nakao et al.
5,743,456 A 4/1998 Jones et al.
5,747,953 A 5/1998 Philipp
5,749,889 A 5/1998 Bacich et al.
5,749,893 A 5/1998 Vidal et al.
5,749,896 A 5/1998 Cook
5,749,968 A 5/1998 Melanson et al.
5,752,644 A 5/1998 Bolanos et al.
5,752,965 A 5/1998 Francis et al.
5,752,970 A 5/1998 Yoon
5,755,717 A 5/1998 Yates et al.
5,758,814 A 6/1998 Gallagher et al.
5,762,255 A 6/1998 Chrisman et al.
5,762,256 A 6/1998 Mastri et al.
5,766,188 A 6/1998 Igaki
5,766,205 A 6/1998 Zvenyatsky et al.
5,769,303 A 6/1998 Knodel et al.
5,769,748 A 6/1998 Eyerly et al.
5,769,791 A 6/1998 Benaron et al.
5,769,892 A 6/1998 Kingwell
5,772,379 A 6/1998 Evensen
5,772,578 A 6/1998 Heimberger et al.
5,772,659 A 6/1998 Becker et al.
5,773,991 A 6/1998 Chen
5,776,130 A 7/1998 Buysse et al.
5,778,939 A 7/1998 Hok-Yin
5,779,130 A 7/1998 Alesi et al.
5,779,131 A 7/1998 Knodel et al.
5,779,132 A 7/1998 Knodel et al.
5,782,396 A 7/1998 Mastri et al.
5,782,397 A 7/1998 Koukline
5,782,748 A 7/1998 Palmer et al.
5,782,749 A 7/1998 Riza
5,782,859 A 7/1998 Nicholas et al.
5,784,934 A 7/1998 Izumisawa
5,785,232 A 7/1998 Vidal et al.
5,785,647 A 7/1998 Tompkins et al.
5,787,897 A 8/1998 Kieturakis
5,791,231 A 8/1998 Cohn et al.
5,792,135 A 8/1998 Madhani et al.
5,792,162 A 8/1998 Jolly et al.
5,792,165 A 8/1998 Klieman et al.
5,792,573 A 8/1998 Pitzen et al.
5,794,834 A 8/1998 Hamblin et al.
5,796,188 A 8/1998 Bays
5,797,536 A 8/1998 Smith et al.
5,797,537 A 8/1998 Oberlin et al.
5,797,538 A 8/1998 Heaton et al.
5,797,637 A 8/1998 Ervin
5,797,906 A 8/1998 Rhum et al.
5,797,927 A 8/1998 Yoon
5,797,941 A 8/1998 Schulze et al.
5,797,959 A 8/1998 Castro et al.
5,799,857 A 9/1998 Robertson et al.
5,800,379 A 9/1998 Edwards
5,800,423 A 9/1998 Jensen
5,804,726 A 9/1998 Geib et al.
5,804,936 A 9/1998 Brodsky et al.
5,806,676 A 9/1998 Wasgien
5,807,376 A 9/1998 Viola et al.
5,807,378 A 9/1998 Jensen et al.
5,807,393 A 9/1998 Williamson, IV et al.
5,809,441 A 9/1998 McKee
5,810,721 A 9/1998 Mueller et al.
5,810,811 A 9/1998 Yates et al.
5,810,846 A 9/1998 Virnich et al.
5,810,855 A 9/1998 Rayburn et al.
5,813,813 A 9/1998 Daum et al.
5,814,055 A 9/1998 Knodel et al.
5,814,057 A 9/1998 Oi et al.
5,816,471 A 10/1998 Plyley et al.
5,817,084 A 10/1998 Jensen
5,817,091 A 10/1998 Nardella et al.
5,817,093 A 10/1998 Williamson, IV et al.
5,817,109 A 10/1998 McGarry et al.
5,817,119 A 10/1998 Klieman et al.
5,820,009 A 10/1998 Melling et al.
5,823,066 A 10/1998 Huitema et al.
5,824,333 A 10/1998 Scopelianos et al.
5,826,776 A 10/1998 Schulze et al.
5,827,271 A 10/1998 Buysse et al.
5,827,298 A 10/1998 Hart et al.
5,829,662 A 11/1998 Allen et al.
5,830,598 A 11/1998 Patterson
5,833,690 A 11/1998 Yates et al.
5,833,695 A 11/1998 Yoon
5,833,696 A 11/1998 Whitfield et al.
5,836,503 A 11/1998 Ehrenfels et al.
5,836,960 A 11/1998 Kolesa et al.
5,839,369 A 11/1998 Chatterjee et al.
5,839,639 A 11/1998 Sauer et al.
5,841,284 A 11/1998 Takahashi
5,843,021 A 12/1998 Edwards et al.
5,843,096 A 12/1998 Igaki et al.
5,843,097 A 12/1998 Mayenberger et al.
5,843,122 A 12/1998 Riza
5,843,132 A 12/1998 Ilvento
5,843,169 A 12/1998 Taheri
5,846,254 A 12/1998 Schulze et al.
5,847,566 A 12/1998 Marritt et al.
5,849,011 A 12/1998 Jones et al.
5,849,020 A 12/1998 Long et al.
5,849,023 A 12/1998 Mericle
5,851,179 A 12/1998 Ritson et al.
5,851,212 A 12/1998 Zirps et al.
5,853,366 A 12/1998 Dowlatshahi
5,855,311 A 1/1999 Hamblin et al.
5,855,583 A 1/1999 Wang et al.
5,860,581 A 1/1999 Robertson et al.
5,860,975 A 1/1999 Goble et al.
5,865,361 A 2/1999 Milliman et al.
5,865,638 A 2/1999 Trafton
5,868,361 A 2/1999 Rinderer
5,868,760 A 2/1999 McGuckin, Jr.
5,868,790 A 2/1999 Vincent et al.
5,871,135 A 2/1999 Williamson, IV et al.
5,873,885 A 2/1999 Weidenbenner
5,876,401 A 3/1999 Schulze et al.
5,878,193 A 3/1999 Wang et al.
5,878,607 A 3/1999 Nunes et al.
5,878,937 A 3/1999 Green et al.
5,878,938 A 3/1999 Bittner et al.
5,881,777 A 3/1999 Bassi et al.
5,891,094 A 4/1999 Masterson et al.
5,891,160 A 4/1999 Williamson, IV et al.
5,891,558 A 4/1999 Bell et al.
5,893,506 A 4/1999 Powell
5,893,835 A 4/1999 Witt et al.
5,893,878 A 4/1999 Pierce
5,894,979 A 4/1999 Powell
5,897,552 A 4/1999 Edwards et al.
5,897,562 A 4/1999 Bolanos et al.
5,899,824 A 5/1999 Kurtz et al.
5,899,914 A 5/1999 Zirps et al.
5,901,895 A 5/1999 Heaton et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,902,312	A	5/1999	Frater et al.
5,903,117	A	5/1999	Gregory
5,904,647	A	5/1999	Ouchi
5,904,693	A	5/1999	Dicesare et al.
5,904,702	A	5/1999	Ek et al.
5,906,577	A	5/1999	Beane et al.
5,906,625	A	5/1999	Bito et al.
5,907,211	A	5/1999	Hall et al.
5,908,402	A	6/1999	Blythe
5,908,427	A	6/1999	McKean et al.
5,909,062	A	6/1999	Krietzman
5,911,353	A	6/1999	Bolanos et al.
5,915,616	A	6/1999	Viola et al.
5,916,225	A	6/1999	Kugel
5,918,791	A	7/1999	Sorrentino et al.
5,919,198	A	7/1999	Graves, Jr. et al.
5,921,956	A	7/1999	Grinberg et al.
5,924,864	A	7/1999	Loge et al.
5,928,137	A	7/1999	Green
5,928,256	A	7/1999	Riza
5,931,847	A	8/1999	Bittner et al.
5,931,853	A	8/1999	McEwen et al.
5,937,951	A	8/1999	Izuchukwu et al.
5,938,667	A	8/1999	Peyser et al.
5,941,442	A	8/1999	Geiste et al.
5,941,890	A	8/1999	Voegele et al.
5,944,172	A	8/1999	Hannula
5,944,715	A	8/1999	Goble et al.
5,946,978	A	9/1999	Yamashita
5,947,984	A	9/1999	Whipple
5,947,996	A	9/1999	Logeman
5,948,030	A	9/1999	Miller et al.
5,948,429	A	9/1999	Bell et al.
5,951,301	A	9/1999	Younker
5,951,516	A	9/1999	Bunyan
5,951,552	A	9/1999	Long et al.
5,951,574	A	9/1999	Stefanchik et al.
5,951,575	A	9/1999	Bolduc et al.
5,951,581	A	9/1999	Saadat et al.
5,954,259	A	9/1999	Viola et al.
5,964,394	A	10/1999	Robertson
5,964,774	A	10/1999	McKean et al.
5,966,126	A	10/1999	Szabo
5,971,916	A	10/1999	Koren
5,973,221	A	10/1999	Collyer et al.
D416,089	S	11/1999	Barton et al.
5,976,122	A	11/1999	Madhani et al.
5,977,746	A	11/1999	Hershberger et al.
5,980,248	A	11/1999	Kusakabe et al.
5,984,949	A	11/1999	Levin
5,988,479	A	11/1999	Palmer
5,990,379	A	11/1999	Gregory
5,993,466	A	11/1999	Yoon
5,997,528	A	12/1999	Bisch et al.
5,997,552	A	12/1999	Person et al.
6,001,108	A	12/1999	Wang et al.
6,003,517	A	12/1999	Sheffield et al.
6,004,319	A	12/1999	Goble et al.
6,004,335	A	12/1999	Vaitekunas et al.
6,007,521	A	12/1999	Bidwell et al.
6,010,054	A	1/2000	Johnson et al.
6,010,513	A	1/2000	Tormala et al.
6,010,520	A	1/2000	Pattison
6,012,494	A	1/2000	Balazs
6,013,076	A	1/2000	Goble et al.
6,015,406	A	1/2000	Goble et al.
6,015,417	A	1/2000	Reynolds, Jr.
6,017,322	A	1/2000	Snoke et al.
6,017,354	A	1/2000	Culp et al.
6,017,356	A	1/2000	Frederick et al.
6,018,227	A	1/2000	Kumar et al.
6,019,745	A	2/2000	Gray
6,022,352	A	2/2000	Vandewalle
6,023,641	A	2/2000	Thompson
6,024,708	A	2/2000	Bales et al.
6,024,741	A	2/2000	Williamson, IV et al.
6,024,748	A	2/2000	Manzo et al.
6,024,750	A	2/2000	Mastri et al.
6,024,764	A	2/2000	Schroeppel
6,027,501	A	2/2000	Goble et al.
6,030,384	A	2/2000	Nezhat
6,032,849	A	3/2000	Mastri et al.
6,033,105	A	3/2000	Barker et al.
6,033,378	A	3/2000	Lundquist et al.
6,033,399	A	3/2000	Gines
6,033,427	A	3/2000	Lee
6,036,641	A	3/2000	Taylor et al.
6,036,667	A	3/2000	Manna et al.
6,037,724	A	3/2000	Buss et al.
6,037,927	A	3/2000	Rosenberg
6,039,733	A	3/2000	Buysse et al.
6,039,734	A	3/2000	Goble
6,042,601	A	3/2000	Smith
6,042,607	A	3/2000	Williamson, IV et al.
6,043,626	A	3/2000	Snyder et al.
6,045,560	A	4/2000	McKean et al.
6,047,861	A	4/2000	Vidal et al.
6,049,145	A	4/2000	Austin et al.
6,050,172	A	4/2000	Corves et al.
6,050,472	A	4/2000	Shibata
6,050,989	A	4/2000	Fox et al.
6,050,990	A	4/2000	Tankovich et al.
6,050,996	A	4/2000	Schmaltz et al.
6,053,390	A	4/2000	Green et al.
6,053,899	A	4/2000	Slanda et al.
6,053,922	A	4/2000	Krause et al.
6,054,142	A	4/2000	Li et al.
RE36,720	E	5/2000	Green et al.
6,056,735	A	5/2000	Okada et al.
6,056,746	A	5/2000	Goble et al.
6,059,806	A	5/2000	Hoegerle
6,062,360	A	5/2000	Shields
6,063,020	A	5/2000	Jones et al.
6,063,025	A	5/2000	Bridges et al.
6,063,050	A	5/2000	Manna et al.
6,063,095	A	5/2000	Wang et al.
6,063,097	A	5/2000	Oi et al.
6,063,098	A	5/2000	Houser et al.
6,065,679	A	5/2000	Levie et al.
6,065,919	A	5/2000	Peck
6,066,132	A	5/2000	Chen et al.
6,066,151	A	5/2000	Miyawaki et al.
6,068,627	A	5/2000	Orszulak et al.
6,071,233	A	6/2000	Ishikawa et al.
6,074,386	A	6/2000	Goble et al.
6,074,401	A	6/2000	Gardiner et al.
6,077,280	A	6/2000	Fossum
6,077,286	A	6/2000	Cuschieri et al.
6,077,290	A	6/2000	Marini
6,079,606	A	6/2000	Milliman et al.
6,080,181	A	6/2000	Jensen et al.
6,082,577	A	7/2000	Coates et al.
6,083,191	A	7/2000	Rose
6,083,223	A	7/2000	Baker
6,083,234	A	7/2000	Nicholas et al.
6,083,242	A	7/2000	Cook
6,086,544	A	7/2000	Hibner et al.
6,086,600	A	7/2000	Kortenbach
6,090,106	A	7/2000	Goble et al.
6,093,186	A	7/2000	Goble
6,099,537	A	8/2000	Sugai et al.
6,099,551	A	8/2000	Gabbay
6,102,271	A	8/2000	Longo et al.
6,104,162	A	8/2000	Sainsbury et al.
6,104,304	A	8/2000	Clark et al.
6,106,511	A	8/2000	Jensen
6,109,500	A	8/2000	Alli et al.
6,110,187	A	8/2000	Donlon
6,113,618	A	9/2000	Nic
6,117,148	A	9/2000	Ravo et al.
6,117,158	A	9/2000	Measamer et al.
6,119,913	A	9/2000	Adams et al.
6,120,433	A	9/2000	Mizuno et al.
6,120,462	A	9/2000	Hibner et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,123,241	A	9/2000	Walter et al.	
6,123,701	A	9/2000	Nezhat	
H1904	H	10/2000	Yates et al.	
6,126,058	A	10/2000	Adams et al.	
6,126,359	A	10/2000	Dittrich et al.	
6,126,670	A	10/2000	Walker et al.	
6,131,789	A	10/2000	Schulze et al.	
6,131,790	A	10/2000	Piraka	
6,132,368	A	10/2000	Cooper	
6,134,962	A	10/2000	Sugitani	
6,139,546	A	10/2000	Koenig et al.	
6,142,149	A	11/2000	Steen	
6,142,933	A	11/2000	Longo et al.	
6,147,135	A	11/2000	Yuan et al.	
6,149,660	A	11/2000	Laufer et al.	
6,151,323	A	11/2000	O'Connell et al.	
6,152,935	A	11/2000	Kammerer et al.	
6,155,473	A	12/2000	Tompkins et al.	
6,156,056	A	12/2000	Kearns et al.	
6,157,169	A	12/2000	Lee	
6,159,146	A	12/2000	El Gazayerli	
6,159,200	A	12/2000	Verdura et al.	
6,159,224	A	12/2000	Yoon	
6,162,208	A	12/2000	Hipps	
6,162,220	A	12/2000	Nezhat	
6,162,537	A	12/2000	Martin et al.	
6,165,175	A	12/2000	Wampler et al.	
6,165,184	A	12/2000	Verdura et al.	
6,165,188	A	12/2000	Saadat et al.	
6,167,185	A	12/2000	Smiley et al.	
6,168,605	B1	1/2001	Measamer et al.	
6,171,305	B1	1/2001	Sherman	
6,171,316	B1	1/2001	Kovac et al.	
6,171,330	B1	1/2001	Benchetrit	
6,173,074	B1	1/2001	Russo	
6,174,308	B1	1/2001	Goble et al.	
6,174,309	B1	1/2001	Wrublewski et al.	
6,174,318	B1	1/2001	Bates et al.	
6,175,290	B1	1/2001	Forsythe et al.	
6,179,195	B1	1/2001	Adams et al.	
6,179,776	B1	1/2001	Adams et al.	
6,181,105	B1	1/2001	Cutolo et al.	
6,182,673	B1	2/2001	Kindermann et al.	
6,185,356	B1	2/2001	Parker et al.	
6,186,142	B1	2/2001	Schmidt et al.	
6,187,003	B1	2/2001	Buysse et al.	
6,190,386	B1	2/2001	Rydell	
6,193,129	B1	2/2001	Bittner et al.	
6,197,042	B1	3/2001	Ginn et al.	
6,200,330	B1	3/2001	Benderev et al.	
6,202,914	B1	3/2001	Geiste et al.	
6,206,894	B1	3/2001	Thompson et al.	
6,206,897	B1	3/2001	Jamiolkowski et al.	
6,206,903	B1	3/2001	Ramans	
6,206,904	B1	3/2001	Ouchi	
6,209,414	B1	4/2001	Uneme	
6,210,403	B1	4/2001	Klicek	
6,213,999	B1	4/2001	Platt, Jr. et al.	
6,214,028	B1	4/2001	Yoon et al.	
6,220,368	B1	4/2001	Ark et al.	
6,221,007	B1	4/2001	Green	
6,221,023	B1	4/2001	Matsuba et al.	
6,223,100	B1	4/2001	Green	
6,223,835	B1	5/2001	Habedank et al.	
6,224,617	B1	5/2001	Saadat et al.	
6,228,080	B1	5/2001	Gines	
6,228,081	B1	5/2001	Goble	
6,228,083	B1	5/2001	Lands et al.	
6,228,084	B1	5/2001	Kirwan, Jr.	
6,228,089	B1	5/2001	Wahrburg	
6,228,098	B1	5/2001	Kayan et al.	
6,231,565	B1	5/2001	Tovey et al.	
6,234,178	B1	5/2001	Goble et al.	
6,237,604	B1	5/2001	Burnside et al.	
6,238,384	B1	5/2001	Peer	
6,241,139	B1	6/2001	Milliman et al.	
6,241,140	B1	6/2001	Adams et al.	
6,241,723	B1	6/2001	Heim et al.	
6,245,084	B1	6/2001	Mark et al.	
6,248,116	B1	6/2001	Chevillon et al.	
6,248,117	B1	6/2001	Blatter	
6,249,076	B1	6/2001	Madden et al.	
6,249,105	B1	6/2001	Andrews et al.	
6,250,532	B1	6/2001	Green et al.	
6,251,485	B1	6/2001	Harris et al.	
D445,745	S *	7/2001	Norman	D12/192
6,254,534	B1	7/2001	Butler et al.	
6,254,619	B1	7/2001	Garabet et al.	
6,254,642	B1	7/2001	Taylor	
6,258,107	B1	7/2001	Balazs et al.	
6,261,286	B1	7/2001	Goble et al.	
6,261,679	B1	7/2001	Chen et al.	
6,264,086	B1	7/2001	McGuckin, Jr.	
6,264,087	B1	7/2001	Whitman	
6,264,617	B1	7/2001	Bales et al.	
6,270,508	B1	8/2001	Klieman et al.	
6,270,916	B1	8/2001	Sink et al.	
6,273,876	B1	8/2001	Klima et al.	
6,273,897	B1	8/2001	Dalessandro et al.	
6,277,114	B1	8/2001	Bullivant et al.	
6,280,407	B1	8/2001	Manna et al.	
6,283,981	B1	9/2001	Beaupre	
6,293,927	B1	9/2001	McGuckin, Jr.	
6,293,942	B1	9/2001	Goble et al.	
6,296,640	B1	10/2001	Wampler et al.	
6,302,311	B1	10/2001	Adams et al.	
6,302,743	B1	10/2001	Chiu et al.	
6,305,891	B1	10/2001	Burlingame	
6,306,134	B1	10/2001	Goble et al.	
6,306,149	B1	10/2001	Meade	
6,306,424	B1	10/2001	Vyakamam et al.	
6,309,397	B1	10/2001	Julian et al.	
6,309,400	B2	10/2001	Beaupre	
6,309,403	B1	10/2001	Minor et al.	
6,312,435	B1	11/2001	Wallace et al.	
6,315,184	B1	11/2001	Whitman	
6,319,510	B1	11/2001	Yates	
6,320,123	B1	11/2001	Reimers	
6,322,494	B1	11/2001	Bullivant et al.	
6,324,339	B1	11/2001	Hudson et al.	
6,325,799	B1	12/2001	Goble	
6,325,805	B1	12/2001	Ogilvie et al.	
6,325,810	B1	12/2001	Hamilton et al.	
6,328,498	B1	12/2001	Mersch	
6,330,965	B1	12/2001	Milliman et al.	
6,331,181	B1	12/2001	Tierney et al.	
6,331,761	B1	12/2001	Kumar et al.	
6,333,029	B1	12/2001	Vyakarnam et al.	
6,334,860	B1	1/2002	Dorn	
6,334,861	B1	1/2002	Chandler et al.	
6,336,926	B1	1/2002	Goble	
6,338,737	B1	1/2002	Toledano	
6,343,731	B1	2/2002	Adams et al.	
6,346,077	B1	2/2002	Taylor et al.	
6,348,061	B1	2/2002	Whitman	
D454,951	S	3/2002	Bon	
6,352,503	B1	3/2002	Matsui et al.	
6,352,532	B1	3/2002	Kramer et al.	
6,355,699	B1	3/2002	Vyakamam et al.	
6,356,072	B1	3/2002	Chass	
6,358,224	B1	3/2002	Tims et al.	
6,358,263	B2	3/2002	Mark et al.	
6,358,459	B1	3/2002	Ziegler et al.	
6,364,877	B1	4/2002	Goble et al.	
6,364,888	B1	4/2002	Niemeyer et al.	
6,366,441	B1	4/2002	Ozawa et al.	
6,370,981	B2	4/2002	Watarai	
6,371,114	B1	4/2002	Schmidt et al.	
6,373,152	B1	4/2002	Wang et al.	
6,377,011	B1	4/2002	Ben-Ur	
6,383,201	B1	5/2002	Dong	
6,387,092	B1	5/2002	Burnside et al.	
6,387,113	B1	5/2002	Hawkins et al.	
6,387,114	B2	5/2002	Adams	

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,391,038	B2	5/2002	Vargas et al.	
6,392,854	B1	5/2002	O'Gorman	
6,394,998	B1	5/2002	Wallace et al.	
6,398,779	B1	6/2002	Buysse et al.	
6,398,781	B1	6/2002	Goble et al.	
6,398,797	B2	6/2002	Bombard et al.	
6,402,766	B2	6/2002	Bowman et al.	
6,406,440	B1	6/2002	Stefanchik	
6,406,472	B1	6/2002	Jensen	
6,409,724	B1	6/2002	Penny et al.	
H2037	H	7/2002	Yates et al.	
6,412,639	B1	7/2002	Hickey	
6,413,274	B1	7/2002	Pedros	
6,415,542	B1	7/2002	Bates et al.	
6,416,486	B1	7/2002	Wampler	
6,416,509	B1	7/2002	Goble et al.	
6,419,695	B1	7/2002	Gabbay	
6,423,079	B1	7/2002	Blake, III	
6,424,885	B1	7/2002	Niemeyer et al.	
RE37,814	E	8/2002	Allgeyer	
6,428,070	B1	8/2002	Takanashi et al.	
6,428,487	B1	8/2002	Burdorff et al.	
6,429,611	B1	8/2002	Li	
6,430,298	B1	8/2002	Kettl et al.	
6,432,065	B1	8/2002	Burdorff et al.	
6,436,097	B1	8/2002	Nardella	
6,436,107	B1	8/2002	Wang et al.	
6,436,110	B2	8/2002	Bowman et al.	
6,436,115	B1	8/2002	Beaupre	
6,436,122	B1	8/2002	Frank et al.	
6,439,439	B1	8/2002	Rickard et al.	
6,439,446	B1	8/2002	Perry et al.	
6,440,146	B2	8/2002	Nicholas et al.	
6,441,577	B2	8/2002	Blumenkranz et al.	
D462,758	S	9/2002	Epstein et al.	
6,443,973	B1	9/2002	Whitman	
6,445,530	B1	9/2002	Baker	
6,447,518	B1	9/2002	Krause et al.	
6,447,523	B1	9/2002	Middleman et al.	
6,447,799	B1	9/2002	Ullman	
6,447,864	B2	9/2002	Johnson et al.	
6,450,391	B1	9/2002	Kayan et al.	
6,450,989	B2	9/2002	Dubrul et al.	
6,454,781	B1	9/2002	Witt et al.	
6,457,625	B1	10/2002	Tormala et al.	
6,458,077	B1	10/2002	Boebel et al.	
6,458,147	B1	10/2002	Cruise et al.	
6,460,627	B1	10/2002	Below et al.	
6,468,275	B1	10/2002	Wampler et al.	
6,468,286	B2	10/2002	Mastri et al.	
6,471,106	B1	10/2002	Reining	
6,471,659	B2	10/2002	Eggers et al.	
6,478,210	B2	11/2002	Adams et al.	
6,482,200	B2	11/2002	Shippert	
6,482,217	B1	11/2002	Pintor et al.	
6,485,490	B2	11/2002	Wampler et al.	
6,485,503	B2	11/2002	Jacobs et al.	
6,485,667	B1	11/2002	Tan	
6,486,286	B1	11/2002	McGall et al.	
6,488,196	B1	12/2002	Fenton, Jr.	
6,488,197	B1	12/2002	Whitman	
6,488,659	B1	12/2002	Rosenman	
6,491,201	B1	12/2002	Whitman	
6,491,690	B1	12/2002	Goble et al.	
6,491,701	B2	12/2002	Tierney et al.	
6,492,785	B1	12/2002	Kasten et al.	
6,494,882	B1	12/2002	Lebouitz et al.	
6,494,885	B1	12/2002	Dhindsa	
6,494,888	B1	12/2002	Laufer et al.	
6,494,896	B1	12/2002	D'Alessio et al.	
6,498,480	B1	12/2002	Manara	
6,500,176	B1	12/2002	Truckai et al.	
6,500,194	B2	12/2002	Benderev et al.	
6,503,139	B2	1/2003	Coral	
6,503,257	B2	1/2003	Grant et al.	
6,503,259	B2	1/2003	Huxel et al.	
6,505,768	B2	1/2003	Whitman	
6,506,197	B1	1/2003	Rollero et al.	
6,510,854	B2	1/2003	Goble	
6,511,468	B1	1/2003	Cragg et al.	
6,512,360	B1	1/2003	Goto et al.	
6,514,252	B2	2/2003	Nezhat et al.	
6,516,073	B1	2/2003	Schulz et al.	
6,517,528	B1	2/2003	Pantages et al.	
6,517,535	B2	2/2003	Edwards	
6,517,565	B1	2/2003	Whitman et al.	
6,517,566	B1	2/2003	Hovland et al.	
6,520,971	B1	2/2003	Perry et al.	
6,520,972	B2	2/2003	Peters	
6,522,101	B2	2/2003	Malackowski	
6,524,180	B1	2/2003	Simms et al.	
6,525,499	B2	2/2003	Naganuma	
6,527,782	B2	3/2003	Hogg et al.	
6,527,785	B2	3/2003	Sancoff et al.	
6,530,942	B2	3/2003	Fogarty et al.	
6,532,958	B1	3/2003	Buan et al.	
6,533,157	B1	3/2003	Whitman	
6,533,723	B1	3/2003	Lockery et al.	
6,533,784	B2	3/2003	Truckai et al.	
6,535,764	B2	3/2003	Imran et al.	
6,539,297	B2	3/2003	Weiberle et al.	
D473,239	S *	4/2003	Cockerill	D14/489
6,539,816	B2	4/2003	Kogiso et al.	
6,543,456	B1	4/2003	Freeman	
6,545,384	B1	4/2003	Pelrine et al.	
6,547,786	B1	4/2003	Goble	
6,550,546	B2	4/2003	Thurler et al.	
6,551,333	B2	4/2003	Kuhns et al.	
6,554,861	B2	4/2003	Knox et al.	
6,555,770	B2	4/2003	Kawase	
6,558,378	B2	5/2003	Sherman et al.	
6,558,379	B1	5/2003	Batchelor et al.	
6,558,429	B2	5/2003	Taylor	
6,561,187	B2	5/2003	Schmidt et al.	
6,565,560	B1	5/2003	Goble et al.	
6,566,619	B2	5/2003	Gillman et al.	
6,569,085	B2	5/2003	Kortenbach et al.	
6,569,171	B2	5/2003	DeGuillebon et al.	
6,578,751	B2	6/2003	Hartwick	
6,582,364	B2	6/2003	Butler et al.	
6,582,427	B1	6/2003	Goble et al.	
6,582,441	B1	6/2003	He et al.	
6,583,533	B2	6/2003	Pelrine et al.	
6,585,144	B2	7/2003	Adams et al.	
6,585,664	B2	7/2003	Burdorff et al.	
6,586,898	B2	7/2003	King et al.	
6,587,750	B2	7/2003	Gerbi et al.	
6,588,277	B2	7/2003	Giordano et al.	
6,588,643	B2	7/2003	Bolduc et al.	
6,588,931	B2	7/2003	Betzner et al.	
6,589,118	B1	7/2003	Soma et al.	
6,589,164	B1	7/2003	Flaherty	
6,592,538	B1	7/2003	Hotchkiss et al.	
6,592,597	B2	7/2003	Grant et al.	
6,594,552	B1	7/2003	Nowlin et al.	
6,596,296	B1	7/2003	Nelson et al.	
6,596,304	B1	7/2003	Bayon et al.	
6,596,432	B2	7/2003	Kawakami et al.	
6,599,295	B1	7/2003	Tornier et al.	
6,599,323	B2	7/2003	Melican et al.	
D478,665	S	8/2003	Isaacs et al.	
D478,986	S	8/2003	Johnston et al.	
6,601,749	B2	8/2003	Sullivan et al.	
6,602,252	B2	8/2003	Mollenauer	
6,602,262	B2	8/2003	Griego et al.	
6,603,050	B2	8/2003	Heaton	
6,605,078	B2	8/2003	Adams	
6,605,669	B2	8/2003	Awokola et al.	
6,605,911	B1	8/2003	Klesing	
6,607,475	B2	8/2003	Doyle et al.	
6,611,793	B1	8/2003	Burnside et al.	
6,613,069	B2	9/2003	Boyd et al.	
6,616,686	B2	9/2003	Coleman et al.	
6,619,529	B2	9/2003	Green et al.	

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,620,111	B2	9/2003	Stephens et al.
6,620,161	B2	9/2003	Schulze et al.
6,620,166	B1	9/2003	Wenstrom, Jr. et al.
6,625,517	B1	9/2003	Bogdanov et al.
6,626,834	B2	9/2003	Dunne et al.
H2086	H	10/2003	Amsler
6,629,630	B2	10/2003	Adams
6,629,974	B2	10/2003	Penny et al.
6,629,988	B2	10/2003	Weadock
6,635,838	B1	10/2003	Kornelson
6,636,412	B2	10/2003	Smith
6,638,108	B2	10/2003	Tachi
6,638,285	B2	10/2003	Gabbay
6,638,297	B1	10/2003	Huitema
RE38,335	E	11/2003	Aust et al.
6,641,528	B2	11/2003	Torii
6,644,532	B2	11/2003	Green et al.
6,645,201	B1	11/2003	Utley et al.
6,646,307	B1	11/2003	Yu et al.
6,648,816	B2	11/2003	Irion et al.
6,648,901	B2	11/2003	Fleischman et al.
6,652,595	B1	11/2003	Nicolo
D484,243	S	12/2003	Ryan et al.
D484,595	S	12/2003	Ryan et al.
D484,596	S	12/2003	Ryan et al.
6,656,177	B2	12/2003	Truckai et al.
6,656,193	B2	12/2003	Grant et al.
6,659,940	B2	12/2003	Adler
6,660,008	B1	12/2003	Foerster et al.
6,663,623	B1	12/2003	Oyama et al.
6,663,641	B1	12/2003	Kovac et al.
6,666,854	B1	12/2003	Lange
6,666,875	B1	12/2003	Sakurai et al.
6,667,825	B2	12/2003	Lu et al.
6,669,073	B2	12/2003	Milliman et al.
6,670,806	B2	12/2003	Wendt et al.
6,671,185	B2	12/2003	Duval
D484,977	S	1/2004	Ryan et al.
6,676,660	B2	1/2004	Wampler et al.
6,677,687	B2	1/2004	Ho et al.
6,679,269	B2	1/2004	Swanson
6,679,410	B2	1/2004	Wursch et al.
6,681,978	B2	1/2004	Geiste et al.
6,681,979	B2	1/2004	Whitman
6,682,527	B2	1/2004	Strut
6,682,528	B2	1/2004	Frazier et al.
6,682,544	B2	1/2004	Mastri et al.
6,685,698	B2	2/2004	Morley et al.
6,685,727	B2	2/2004	Fisher et al.
6,689,153	B1	2/2004	Skiba
6,692,507	B2	2/2004	Pugsley et al.
6,692,692	B2	2/2004	Stetzel
6,695,198	B2	2/2004	Adams et al.
6,695,199	B2	2/2004	Whitman
6,695,774	B2	2/2004	Hale et al.
6,695,849	B2	2/2004	Michelson
6,696,814	B2	2/2004	Henderson et al.
6,697,048	B2	2/2004	Rosenberg et al.
6,698,643	B2	3/2004	Whitman
6,699,177	B1	3/2004	Wang et al.
6,699,214	B2	3/2004	Gellman
6,699,235	B2	3/2004	Wallace et al.
6,704,210	B1	3/2004	Myers
6,705,503	B1	3/2004	Pedicini et al.
6,709,445	B2	3/2004	Boebel et al.
6,712,773	B1	3/2004	Viola
6,716,223	B2	4/2004	Leopold et al.
6,716,232	B1	4/2004	Vidal et al.
6,716,233	B1	4/2004	Whitman
6,720,734	B2	4/2004	Norris
6,722,550	B1	4/2004	Ricordi et al.
6,722,552	B2	4/2004	Fenton, Jr.
6,723,087	B2	4/2004	O'Neill et al.
6,723,091	B2	4/2004	Goble et al.
6,723,109	B2	4/2004	Solingen
6,726,697	B2	4/2004	Nicholas et al.
6,726,706	B2	4/2004	Dominguez
6,729,119	B2	5/2004	Schnipke et al.
6,736,825	B2	5/2004	Blatter et al.
6,736,854	B2	5/2004	Vadurro et al.
6,740,030	B2	5/2004	Martone et al.
6,743,230	B2	6/2004	Lutze et al.
6,744,385	B2	6/2004	Kazuya et al.
6,747,121	B2	6/2004	Gogolewski
6,747,300	B2	6/2004	Nadd et al.
6,749,560	B1	6/2004	Konstorum et al.
6,749,600	B1	6/2004	Levy
6,752,768	B2	6/2004	Burdorff et al.
6,752,816	B2	6/2004	Culp et al.
6,754,959	B1	6/2004	Guiette, III et al.
6,755,195	B1	6/2004	Lemke et al.
6,755,338	B2	6/2004	Hahnen et al.
6,755,843	B2	6/2004	Chung et al.
6,756,705	B2	6/2004	Pulford, Jr.
6,758,846	B2	7/2004	Goble et al.
6,761,685	B2	7/2004	Adams et al.
6,762,339	B1	7/2004	Klun et al.
6,764,445	B2	7/2004	Ramans et al.
6,766,957	B2	7/2004	Matsuura et al.
6,767,352	B2	7/2004	Field et al.
6,767,356	B2	7/2004	Kanner et al.
6,769,590	B2	8/2004	Vresh et al.
6,769,594	B2	8/2004	Orban, III
6,770,027	B2	8/2004	Banik et al.
6,770,070	B1	8/2004	Balbierz
6,770,072	B1	8/2004	Truckai et al.
6,773,409	B2	8/2004	Truckai et al.
6,773,438	B1	8/2004	Knodel et al.
6,775,575	B2	8/2004	Bommannan et al.
6,777,838	B2	8/2004	Miekka et al.
6,780,151	B2	8/2004	Grabover et al.
6,780,180	B1	8/2004	Goble et al.
6,783,524	B2	8/2004	Anderson et al.
6,786,382	B1	9/2004	Hoffman
6,786,864	B2	9/2004	Matsuura et al.
6,786,896	B1	9/2004	Madhani et al.
6,788,018	B1	9/2004	Blumenkranz
6,790,173	B2	9/2004	Saadat et al.
6,793,652	B1	9/2004	Whitman et al.
6,793,661	B2	9/2004	Hamilton et al.
6,793,663	B2	9/2004	Kneifel et al.
6,793,669	B2	9/2004	Nakamura et al.
6,796,921	B1	9/2004	Buck et al.
6,799,669	B2	10/2004	Fukumura et al.
6,802,822	B1	10/2004	Dodge
6,802,843	B2	10/2004	Truckai et al.
6,802,844	B2	10/2004	Ferree
6,805,273	B2	10/2004	Bilotti et al.
6,806,808	B1	10/2004	Watters et al.
6,808,525	B2	10/2004	Latterell et al.
6,810,359	B2	10/2004	Sakaguchi
6,814,154	B2	11/2004	Chou
6,814,741	B2	11/2004	Bowman et al.
6,817,508	B1	11/2004	Racenet et al.
6,817,509	B2	11/2004	Geiste et al.
6,817,974	B2	11/2004	Cooper et al.
6,818,018	B1	11/2004	Sawhney
6,820,791	B2	11/2004	Adams
6,821,273	B2	11/2004	Mollenauer
6,821,282	B2	11/2004	Perry et al.
6,821,284	B2	11/2004	Sturtz et al.
6,827,246	B2	12/2004	Sullivan et al.
6,827,712	B2	12/2004	Tovey et al.
6,827,725	B2	12/2004	Batchelor et al.
6,828,902	B2	12/2004	Casden
6,830,174	B2	12/2004	Hillstead et al.
6,831,629	B2	12/2004	Nishino et al.
6,832,998	B2	12/2004	Goble
6,834,001	B2	12/2004	Myono
6,835,173	B2	12/2004	Couvillon, Jr.
6,835,199	B2	12/2004	McGuckin, Jr. et al.
6,835,336	B2	12/2004	Watt
6,836,611	B2	12/2004	Popovic et al.
6,837,846	B2	1/2005	Jaffe et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,837,883 B2 1/2005 Moll et al.
6,838,493 B2 1/2005 Williams et al.
6,840,423 B2 1/2005 Adams et al.
6,841,967 B2 1/2005 Kim et al.
6,843,403 B2 1/2005 Whitman
6,843,789 B2 1/2005 Goble
6,843,793 B2 1/2005 Brock et al.
6,846,307 B2 1/2005 Whitman et al.
6,846,308 B2 1/2005 Whitman et al.
6,846,309 B2 1/2005 Whitman et al.
6,847,190 B2 1/2005 Schaefer et al.
6,849,071 B2 2/2005 Whitman et al.
6,850,817 B1 2/2005 Green
6,852,122 B2 2/2005 Rush
6,852,330 B2 2/2005 Bowman et al.
6,853,879 B2 2/2005 Sunaoshi
6,858,005 B2 2/2005 Ohline et al.
6,859,882 B2 2/2005 Fung
RE38,708 E 3/2005 Bolanos et al.
D502,994 S 3/2005 Blake, III
6,861,142 B1 3/2005 Wilkie et al.
6,861,954 B2 3/2005 Levin
6,863,668 B2 3/2005 Gillespie et al.
6,863,694 B1 3/2005 Boyce et al.
6,863,924 B2 3/2005 Ranganathan et al.
6,866,178 B2 3/2005 Adams et al.
6,866,668 B2 3/2005 Giannetti et al.
6,866,671 B2 3/2005 Tierney et al.
6,867,248 B1 3/2005 Martin et al.
6,869,430 B2 3/2005 Balbierz et al.
6,869,435 B2 3/2005 Blake, III
6,872,214 B2 3/2005 Sonnenschein et al.
6,874,669 B2 4/2005 Adams et al.
6,877,647 B2 4/2005 Green et al.
6,878,106 B1 4/2005 Herrmann
6,884,392 B2 4/2005 Malkin et al.
6,884,428 B2 4/2005 Binette et al.
6,886,730 B2 5/2005 Fujisawa et al.
6,887,710 B2 5/2005 Call et al.
6,889,116 B2 5/2005 Jinno
6,893,435 B2 5/2005 Goble
6,894,140 B2 5/2005 Roby
6,895,176 B2 5/2005 Archer et al.
6,899,538 B2 5/2005 Matoba
6,899,593 B1 5/2005 Moeller et al.
6,905,057 B2 6/2005 Swayze et al.
6,905,497 B2 6/2005 Truckai et al.
6,905,498 B2 6/2005 Hooven
6,908,472 B2 6/2005 Wiener et al.
6,911,033 B2 6/2005 de Guillebon et al.
6,911,916 B1 6/2005 Wang et al.
6,913,579 B2 7/2005 Truckai et al.
6,913,608 B2 7/2005 Liddicoat et al.
6,913,613 B2 7/2005 Schwarz et al.
6,921,397 B2 7/2005 Corcoran et al.
6,921,412 B1 7/2005 Black et al.
6,923,093 B2 8/2005 Ullah
6,923,803 B2 8/2005 Goble
6,923,819 B2 8/2005 Meade et al.
6,925,849 B2 8/2005 Jairam
6,926,716 B2 8/2005 Baker et al.
6,928,902 B1 8/2005 Eyssallenne
6,929,641 B2 8/2005 Goble et al.
6,929,644 B2 8/2005 Truckai et al.
6,931,830 B2 8/2005 Liao
6,932,218 B2 8/2005 Kosann et al.
6,932,810 B2 8/2005 Ryan
6,936,042 B2 8/2005 Wallace et al.
6,936,948 B2 8/2005 Bell et al.
D509,297 S 9/2005 Wells
D509,589 S 9/2005 Wells
6,938,706 B2 9/2005 Ng
6,939,358 B2 9/2005 Palacios et al.
6,942,662 B2 9/2005 Goble et al.
6,942,674 B2 9/2005 Belef et al.
6,945,444 B2 9/2005 Gresham et al.
6,945,981 B2 9/2005 Donofrio et al.
6,951,562 B2 10/2005 Zwirnmann
6,953,138 B1 10/2005 Dworak et al.
6,953,139 B2 10/2005 Milliman et al.
6,953,461 B2 10/2005 McClurken et al.
6,957,758 B2 10/2005 Aranyi
6,958,035 B2 10/2005 Friedman et al.
6,959,851 B2 11/2005 Heinrich
6,959,852 B2 11/2005 Shelton, IV et al.
6,960,107 B1 11/2005 Schaub et al.
6,960,163 B2 11/2005 Ewers et al.
6,960,220 B2 11/2005 Marino et al.
6,962,587 B2 11/2005 Johnson et al.
6,963,792 B1 11/2005 Green
6,964,363 B2 11/2005 Wales et al.
6,966,907 B2 11/2005 Goble
6,966,909 B2 11/2005 Marshall et al.
6,968,908 B2 11/2005 Tokunaga et al.
6,969,385 B2 11/2005 Moreyra
6,969,395 B2 11/2005 Eskuri
6,971,988 B2 12/2005 Orban, III
6,972,199 B2 12/2005 Lebouitz et al.
6,974,435 B2 12/2005 Daw et al.
6,974,462 B2 12/2005 Sater
6,978,921 B2 12/2005 Shelton, IV et al.
6,978,922 B2 12/2005 Bilotti et al.
6,981,628 B2 1/2006 Wales
6,981,941 B2 1/2006 Whitman et al.
6,981,978 B2 1/2006 Gannoe
6,984,203 B2 1/2006 Tartaglia et al.
6,984,231 B2 1/2006 Goble et al.
6,986,451 B1 1/2006 Mastri et al.
6,988,649 B2 1/2006 Shelton, IV et al.
6,988,650 B2 1/2006 Schwemberger et al.
6,989,034 B2 1/2006 Hammer et al.
6,990,731 B2 1/2006 Haytayan
6,990,796 B2 1/2006 Schnipke et al.
6,993,200 B2 1/2006 Tastl et al.
6,993,413 B2 1/2006 Sunaoshi
6,994,708 B2 2/2006 Manzo
6,995,729 B2 2/2006 Govari et al.
6,996,433 B2 2/2006 Burbank et al.
6,997,931 B2 2/2006 Sauer et al.
6,997,935 B2 2/2006 Anderson et al.
6,998,736 B2 2/2006 Lee et al.
6,998,816 B2 2/2006 Wieck et al.
7,000,818 B2 2/2006 Shelton, IV et al.
7,000,819 B2 2/2006 Swayze et al.
7,000,911 B2 2/2006 McCormick et al.
7,001,380 B2 2/2006 Goble
7,001,408 B2 2/2006 Knodel et al.
7,004,174 B2 2/2006 Eggers et al.
7,007,176 B2 2/2006 Goodfellow et al.
7,008,433 B2 3/2006 Voellmicke et al.
7,008,435 B2 3/2006 Cummins
7,009,039 B2 3/2006 Yayon et al.
7,011,657 B2 3/2006 Truckai et al.
7,014,640 B2 3/2006 Kemppainen et al.
7,018,357 B2 3/2006 Emmons
7,018,390 B2 3/2006 Turovskiy et al.
7,021,669 B1 4/2006 Lindermeir et al.
7,022,131 B1 4/2006 Derowe et al.
7,023,159 B2 4/2006 Gorti et al.
7,025,064 B2 4/2006 Wang et al.
7,025,732 B2 4/2006 Thompson et al.
7,025,743 B2 4/2006 Mann et al.
7,025,774 B2 4/2006 Freeman et al.
7,025,775 B2 4/2006 Gadberry et al.
7,028,570 B2 4/2006 Ohta et al.
7,029,435 B2 4/2006 Nakao
7,029,439 B2 4/2006 Roberts et al.
7,030,904 B2 4/2006 Adair et al.
7,032,798 B2 4/2006 Whitman et al.
7,032,799 B2 4/2006 Viola et al.
7,033,356 B2 4/2006 Latterell et al.
7,035,716 B2 4/2006 Harris et al.
7,035,762 B2 4/2006 Menard et al.
7,036,680 B1 5/2006 Flannery

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,037,314 B2 5/2006 Armstrong
7,037,344 B2 5/2006 Kagan et al.
7,041,088 B2 5/2006 Nawrocki et al.
7,041,102 B2 5/2006 Truckai et al.
7,041,868 B2 5/2006 Greene et al.
7,043,852 B2 5/2006 Hayashida et al.
7,044,350 B2 5/2006 Kameyama et al.
7,044,352 B2 5/2006 Shelton, IV et al.
7,044,353 B2 5/2006 Mastri et al.
7,046,082 B2 5/2006 Komiya et al.
7,048,165 B2 5/2006 Haramiishi
7,048,687 B1 5/2006 Reuss et al.
7,048,745 B2 5/2006 Tierney et al.
7,052,454 B2 5/2006 Taylor
7,052,494 B2 5/2006 Goble et al.
7,052,499 B2 5/2006 Steger et al.
7,055,730 B2 6/2006 Ehrenfels et al.
7,055,731 B2 6/2006 Shelton, IV et al.
7,056,284 B2 6/2006 Martone et al.
7,056,330 B2 6/2006 Gayton
7,059,331 B2 6/2006 Adams et al.
7,059,508 B2 6/2006 Shelton, IV et al.
7,063,671 B2 6/2006 Couvillon, Jr.
7,063,712 B2 6/2006 Vargas et al.
7,064,509 B1 6/2006 Fu et al.
7,066,879 B2 6/2006 Fowler et al.
7,066,944 B2 6/2006 Laufer
7,067,038 B2 6/2006 Trokhan et al.
7,070,083 B2 7/2006 Jankowski
7,070,559 B2 7/2006 Adams et al.
7,070,597 B2 7/2006 Truckai et al.
7,071,287 B2 7/2006 Rhine et al.
7,075,770 B1 7/2006 Smith
7,077,856 B2 7/2006 Whitman
7,080,769 B2 7/2006 Vresh et al.
7,081,114 B2 7/2006 Rashidi
7,083,073 B2 8/2006 Yoshie et al.
7,083,075 B2 8/2006 Swayze et al.
7,083,571 B2 8/2006 Wang et al.
7,083,615 B2 8/2006 Peterson et al.
7,083,619 B2 8/2006 Truckai et al.
7,083,620 B2 8/2006 Jahns et al.
7,083,626 B2 8/2006 Hart et al.
7,086,267 B2 8/2006 Dworak et al.
7,087,049 B2 8/2006 Nowlin et al.
7,087,054 B2 8/2006 Truckai et al.
7,087,071 B2 8/2006 Nicholas et al.
7,090,637 B2 8/2006 Danitz et al.
7,090,673 B2 8/2006 Dycus et al.
7,090,683 B2 8/2006 Brock et al.
7,090,684 B2 8/2006 McGuckin, Jr. et al.
7,091,412 B2 8/2006 Wang et al.
7,093,492 B2 8/2006 Treiber et al.
7,094,202 B2 8/2006 Nobis et al.
7,094,247 B2 8/2006 Monassevitch et al.
7,094,916 B2 8/2006 DeLuca et al.
7,096,972 B2 8/2006 Orozco, Jr.
7,097,089 B2 8/2006 Marczyk
7,097,644 B2 8/2006 Long
7,097,650 B2 8/2006 Weller et al.
7,098,794 B2 8/2006 Lindsay et al.
7,100,949 B2 9/2006 Williams et al.
7,101,187 B1 9/2006 Deconinck et al.
7,101,371 B2 9/2006 Dycus et al.
7,101,394 B2 9/2006 Hamm et al.
7,104,741 B2 9/2006 Krohn
7,108,695 B2 9/2006 Witt et al.
7,108,701 B2 9/2006 Evens et al.
7,108,709 B2 9/2006 Cummins
7,111,768 B2 9/2006 Cummins et al.
7,111,769 B2 9/2006 Wales et al.
7,112,214 B2 9/2006 Peterson et al.
RE39,358 E 10/2006 Goble
7,114,642 B2 10/2006 Whitman
7,116,100 B1 10/2006 Mock et al.
7,118,020 B2 10/2006 Lee et al.
7,118,528 B1 10/2006 Piskun
7,118,563 B2 10/2006 Weckwerth et al.
7,118,582 B1 10/2006 Wang et al.
7,119,534 B2 10/2006 Butzmann
7,121,446 B2 10/2006 Arad et al.
7,121,773 B2 10/2006 Mikiya et al.
7,122,028 B2 10/2006 Looper et al.
7,125,403 B2 10/2006 Julian et al.
7,125,409 B2 10/2006 Truckai et al.
7,126,303 B2 10/2006 Farritor et al.
7,126,879 B2 10/2006 Snyder
7,128,253 B2 10/2006 Mastri et al.
7,128,254 B2 10/2006 Shelton, IV et al.
7,128,748 B2 10/2006 Mooradian et al.
7,131,445 B2 11/2006 Amoah
7,133,601 B2 11/2006 Phillips et al.
7,134,364 B2 11/2006 Kageler et al.
7,134,587 B2 11/2006 Schwemberger et al.
7,135,027 B2 11/2006 Delmotte
7,137,980 B2 11/2006 Buysse et al.
7,137,981 B2 11/2006 Long
7,139,016 B2 11/2006 Squilla et al.
7,140,527 B2 11/2006 Ehrenfels et al.
7,140,528 B2 11/2006 Shelton, IV
7,141,055 B2 11/2006 Abrams et al.
7,143,923 B2 12/2006 Shelton, IV et al.
7,143,924 B2 12/2006 Scirica et al.
7,143,925 B2 12/2006 Shelton, IV et al.
7,143,926 B2 12/2006 Shelton, IV et al.
7,146,191 B2 12/2006 Kerner et al.
7,147,138 B2 12/2006 Shelton, IV
7,147,139 B2 12/2006 Schwemberger et al.
7,147,140 B2 12/2006 Wukusick et al.
7,147,637 B2 12/2006 Goble
7,147,648 B2 12/2006 Un
7,147,650 B2 12/2006 Lee
7,150,748 B2 12/2006 Ebbutt et al.
7,153,300 B2 12/2006 Goble
7,153,314 B2 12/2006 Laufer et al.
7,155,316 B2 12/2006 Sutherland et al.
7,156,863 B2 1/2007 Sonnenschein et al.
7,159,750 B2 1/2007 Racenet et al.
7,160,296 B2 1/2007 Pearson et al.
7,160,299 B2 1/2007 Baily
7,161,036 B2 1/2007 Oikawa et al.
7,161,580 B2 1/2007 Bailey et al.
7,162,758 B2 1/2007 Skinner
7,163,563 B2 1/2007 Schwartz et al.
7,166,133 B2 1/2007 Evans et al.
7,168,604 B2 1/2007 Milliman et al.
7,170,910 B2 1/2007 Chen et al.
7,171,279 B2 1/2007 Buckingham et al.
7,172,104 B2 2/2007 Scirica et al.
7,172,593 B2 2/2007 Trieu et al.
7,172,615 B2 2/2007 Morriss et al.
7,174,636 B2 2/2007 Lowe
7,177,533 B2 2/2007 McFarlin et al.
7,179,223 B2 2/2007 Motoki et al.
7,179,267 B2 2/2007 Nolan et al.
7,182,239 B1 2/2007 Myers
7,182,763 B2 2/2007 Nardella
7,183,737 B2 2/2007 Kitagawa
7,187,960 B2 3/2007 Abreu
7,188,758 B2 3/2007 Viola et al.
7,189,207 B2 3/2007 Viola
7,190,147 B2 3/2007 Gileff et al.
7,193,199 B2 3/2007 Jang
7,195,627 B2 3/2007 Amoah et al.
7,196,911 B2 3/2007 Takano et al.
D541,418 S 4/2007 Schechter et al.
7,199,537 B2 4/2007 Okamura et al.
7,202,576 B1 4/2007 Dechene et al.
7,202,653 B2 4/2007 Pai
7,204,404 B2 4/2007 Nguyen et al.
7,204,835 B2 4/2007 Latterell et al.
7,207,233 B2 4/2007 Wadge
7,207,471 B2 4/2007 Heinrich et al.
7,207,472 B2 4/2007 Wukusick et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,207,556 B2 4/2007 Saitoh et al.
7,208,005 B2 4/2007 Frecker et al.
7,210,609 B2 5/2007 Leiboff et al.
7,211,081 B2 5/2007 Goble
7,211,084 B2 5/2007 Goble et al.
7,211,092 B2 5/2007 Hughett
7,211,979 B2 5/2007 Khatib et al.
7,213,736 B2 5/2007 Wales et al.
7,214,224 B2 5/2007 Goble
7,215,517 B2 5/2007 Takamatsu
7,217,285 B2 5/2007 Vargas et al.
7,220,260 B2 5/2007 Fleming et al.
7,220,272 B2 5/2007 Weadock
7,225,959 B2 6/2007 Patton et al.
7,225,963 B2 6/2007 Scirica
7,225,964 B2 6/2007 Mastri et al.
7,226,450 B2 6/2007 Athanasiou et al.
7,228,505 B2 6/2007 Shimazu et al.
7,229,408 B2 6/2007 Douglas et al.
7,234,624 B2 6/2007 Gresham et al.
7,235,072 B2 6/2007 Sartor et al.
7,235,089 B1 6/2007 McGuckin, Jr.
7,235,302 B2 6/2007 Jing et al.
7,237,708 B1 7/2007 Guy et al.
7,238,195 B2 7/2007 Viola
7,238,901 B2 7/2007 Kim et al.
7,239,657 B1 7/2007 Gunnarsson
7,241,288 B2 7/2007 Braun
7,241,289 B2 7/2007 Braun
7,246,734 B2 7/2007 Shelton, IV
7,247,161 B2 7/2007 Johnston et al.
7,249,267 B2 7/2007 Chapuis
7,252,641 B2 8/2007 Thompson et al.
7,252,660 B2 8/2007 Kunz
7,255,012 B2 8/2007 Hedtke
7,255,696 B2 8/2007 Goble et al.
7,256,695 B2 8/2007 Hamel et al.
7,258,262 B2 8/2007 Mastri et al.
7,258,546 B2 8/2007 Beier et al.
7,260,431 B2 8/2007 Libbus et al.
7,265,374 B2 9/2007 Lee et al.
7,267,677 B2 9/2007 Johnson et al.
7,267,679 B2 9/2007 McGuckin, Jr. et al.
7,272,002 B2 9/2007 Drapeau
7,273,483 B2 9/2007 Wiener et al.
D552,623 S 10/2007 Vong et al.
7,275,674 B2 10/2007 Racenet et al.
7,276,044 B2 10/2007 Ferry et al.
7,276,068 B2 10/2007 Johnson et al.
7,278,562 B2 10/2007 Mastri et al.
7,278,563 B1 10/2007 Green
7,278,949 B2 10/2007 Bader
7,278,994 B2 10/2007 Goble
7,282,048 B2 10/2007 Goble et al.
7,283,096 B2 10/2007 Geisheimer et al.
7,286,850 B2 10/2007 Frielink et al.
7,287,682 B1 10/2007 Ezzat et al.
7,289,139 B2 10/2007 Amling et al.
7,293,685 B2 11/2007 Ehrenfels et al.
7,295,893 B2 11/2007 Sunaoshi
7,295,907 B2 11/2007 Lu et al.
7,296,722 B2 11/2007 Ivanko
7,296,724 B2 11/2007 Green et al.
7,297,149 B2 11/2007 Vitali et al.
7,300,373 B2 11/2007 Jinno et al.
7,300,431 B2 11/2007 Dubrovsky
7,300,450 B2 11/2007 Vleugels et al.
7,303,106 B2 12/2007 Milliman et al.
7,303,107 B2 12/2007 Milliman et al.
7,303,108 B2 12/2007 Shelton, IV
7,303,502 B2 12/2007 Thompson
7,303,556 B2 12/2007 Metzger
7,306,597 B2 12/2007 Manzo
7,308,998 B2 12/2007 Mastri et al.
7,311,238 B2 12/2007 Liu
7,313,430 B2 12/2007 Urquhart et al.
7,314,473 B2 1/2008 Jinno et al.
7,322,859 B2 1/2008 Evans
7,322,975 B2 1/2008 Goble et al.
7,322,994 B2 1/2008 Nicholas et al.
7,324,572 B2 1/2008 Chang
7,326,203 B2 2/2008 Papineau et al.
7,326,213 B2 2/2008 Benderev et al.
7,328,828 B2 2/2008 Ortiz
7,328,829 B2 2/2008 Arad et al.
7,330,004 B2 2/2008 DeJonge et al.
7,331,340 B2 2/2008 Barney
7,331,343 B2 2/2008 Schmidt et al.
7,331,403 B2 2/2008 Berry et al.
7,331,406 B2 2/2008 Wottreng, Jr. et al.
7,331,969 B1 2/2008 Inganas et al.
7,334,717 B2 2/2008 Rethy et al.
7,334,718 B2 2/2008 McAlister et al.
7,335,199 B2 2/2008 Goble et al.
7,335,401 B2 2/2008 Finke et al.
7,336,045 B2 2/2008 Clermonts
7,336,048 B2 2/2008 Lohr
7,336,184 B2 2/2008 Smith et al.
7,337,774 B2 3/2008 Webb
7,338,505 B2 3/2008 Belson
7,338,513 B2 3/2008 Lee et al.
7,341,554 B2 3/2008 Sekine et al.
7,341,555 B2 3/2008 Ootawara et al.
7,341,591 B2 3/2008 Grinberg
7,343,920 B2 3/2008 Toby et al.
7,344,532 B2 3/2008 Goble et al.
7,344,533 B2 3/2008 Pearson et al.
7,346,344 B2 3/2008 Fontaine
7,346,406 B2 3/2008 Brotto et al.
7,348,763 B1 3/2008 Reinhart et al.
7,348,875 B2 3/2008 Hughes et al.
RE40,237 E 4/2008 Bilotti et al.
7,351,258 B2 4/2008 Ricotta et al.
7,354,447 B2 4/2008 Shelton, IV et al.
7,354,502 B2 4/2008 Polat et al.
7,357,287 B2 4/2008 Shelton, IV et al.
7,357,806 B2 4/2008 Rivera et al.
7,361,168 B2 4/2008 Makower et al.
7,361,195 B2 4/2008 Schwartz et al.
7,362,062 B2 4/2008 Schneider et al.
7,364,060 B2 4/2008 Milliman
7,364,061 B2 4/2008 Swayze et al.
7,367,485 B2 5/2008 Shelton, IV et al.
7,368,124 B2 5/2008 Chun et al.
7,371,210 B2 5/2008 Brock et al.
7,371,403 B2 5/2008 McCarthy et al.
7,377,918 B2 5/2008 Amoah
7,377,928 B2 5/2008 Zubik et al.
RE40,388 E 6/2008 Gines
7,380,695 B2 6/2008 Doll et al.
7,380,696 B2 6/2008 Shelton, IV et al.
7,384,403 B2 6/2008 Sherman
7,384,417 B2 6/2008 Cucin
7,386,365 B2 6/2008 Nixon
7,386,730 B2 6/2008 Uchikubo
7,388,217 B2 6/2008 Buschbeck et al.
7,388,484 B2 6/2008 Hsu
7,391,173 B2 6/2008 Schena
7,394,190 B2 7/2008 Huang
7,396,356 B2 7/2008 Mollenauer
7,397,364 B2 7/2008 Govari
7,398,707 B2 7/2008 Morley et al.
7,398,907 B2 7/2008 Racenet et al.
7,398,908 B2 7/2008 Holsten et al.
7,400,107 B2 7/2008 Schneider et al.
7,400,752 B2 7/2008 Zacharias
7,401,000 B2 7/2008 Nakamura
7,401,721 B2 7/2008 Holsten et al.
7,404,449 B2 7/2008 Bermingham et al.
7,404,508 B2 7/2008 Smith et al.
7,404,509 B2 7/2008 Ortiz et al.
7,404,822 B2 7/2008 Viart et al.
7,407,074 B2 8/2008 Ortiz et al.
7,407,075 B2 8/2008 Holsten et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,407,076 B2 8/2008 Racenet et al.
7,407,077 B2 8/2008 Ortiz et al.
7,407,078 B2 8/2008 Shelton, IV et al.
7,408,310 B2 8/2008 Hong et al.
7,410,085 B2 8/2008 Wolf et al.
7,410,086 B2 8/2008 Ortiz et al.
7,410,483 B2 8/2008 Danitz et al.
7,413,563 B2 8/2008 Corcoran et al.
7,416,101 B2 8/2008 Shelton, IV et al.
7,418,078 B2 8/2008 Blanz et al.
RE40,514 E 9/2008 Mastri et al.
7,419,080 B2 9/2008 Smith et al.
7,419,081 B2 9/2008 Ehrenfels et al.
7,419,321 B2 9/2008 Tereschouk
7,419,495 B2 9/2008 Menn et al.
7,422,136 B1 9/2008 Marczyk
7,422,138 B2 9/2008 Bilotti et al.
7,422,139 B2 9/2008 Shelton, IV et al.
7,424,965 B2 9/2008 Racenet et al.
7,427,607 B2 9/2008 Suzuki
D578,644 S 10/2008 Shumer et al.
7,430,772 B2 10/2008 Van Es
7,431,188 B1 10/2008 Marczyk
7,431,189 B2 10/2008 Shelton, IV et al.
7,431,230 B2 10/2008 McPherson et al.
7,431,694 B2 10/2008 Stefanchik et al.
7,431,730 B2 10/2008 Viola
7,434,715 B2 10/2008 Shelton, IV et al.
7,434,717 B2 10/2008 Shelton, IV et al.
7,435,249 B2 10/2008 Buysse et al.
7,438,209 B1 10/2008 Hess et al.
7,438,718 B2 10/2008 Milliman et al.
7,439,354 B2 10/2008 Lenges et al.
7,441,684 B2 10/2008 Shelton, IV et al.
7,441,685 B1 10/2008 Boudreaux
7,442,201 B2 10/2008 Pugsley et al.
7,443,547 B2 10/2008 Moreno et al.
7,448,525 B2 11/2008 Shelton, IV et al.
7,450,010 B1 11/2008 Gravelle et al.
7,451,904 B2 11/2008 Shelton, IV
7,455,208 B2 11/2008 Wales et al.
7,455,676 B2 11/2008 Holsten et al.
7,455,682 B2 11/2008 Viola
D582,934 S 12/2008 Byeon
7,461,767 B2 12/2008 Viola et al.
7,462,187 B2 12/2008 Johnston et al.
7,464,845 B2 12/2008 Chou
7,464,846 B2 12/2008 Shelton, IV et al.
7,464,847 B2 12/2008 Viola et al.
7,464,848 B2 12/2008 Green et al.
7,464,849 B2 12/2008 Shelton, IV et al.
7,467,740 B2 12/2008 Shelton, IV et al.
7,467,849 B2 12/2008 Silverbrook et al.
7,472,814 B2 1/2009 Mastri et al.
7,472,815 B2 1/2009 Shelton, IV et al.
7,472,816 B2 1/2009 Holsten et al.
7,473,221 B2 1/2009 Ewers et al.
7,473,253 B2 1/2009 Dycus et al.
7,473,263 B2 1/2009 Johnston et al.
7,476,237 B2 1/2009 Taniguchi et al.
7,479,608 B2 1/2009 Smith
7,481,347 B2 1/2009 Roy
7,481,348 B2 1/2009 Marczyk
7,481,349 B2 1/2009 Holsten et al.
7,481,824 B2 1/2009 Boudreaux et al.
7,485,124 B2 2/2009 Kuhns et al.
7,485,133 B2 2/2009 Cannon et al.
7,485,142 B2 2/2009 Milo
7,487,899 B2 2/2009 Shelton, IV et al.
7,489,055 B2 2/2009 Jeong et al.
7,490,749 B2 2/2009 Schall et al.
7,491,232 B2 2/2009 Bolduc et al.
7,494,039 B2 2/2009 Racenet et al.
7,494,499 B2 2/2009 Nagase et al.
7,494,501 B2 2/2009 Ahlberg et al.
7,500,979 B2 3/2009 Hueil et al.
7,501,198 B2 3/2009 Barley et al.
7,503,474 B2 3/2009 Hillstead et al.
7,506,790 B2 3/2009 Shelton, IV
7,506,791 B2 3/2009 Omaits et al.
7,507,202 B2 3/2009 Schoellhorn
7,510,107 B2 3/2009 Timm et al.
7,510,534 B2 3/2009 Burdorff et al.
7,510,566 B2 3/2009 Jacobs et al.
7,513,407 B1 4/2009 Chang
7,513,408 B2 4/2009 Shelton, IV et al.
7,517,356 B2 4/2009 Heinrich
7,524,320 B2 4/2009 Tierney et al.
7,527,632 B2 5/2009 Houghton et al.
7,530,984 B2 5/2009 Sonnenschein et al.
7,530,985 B2 5/2009 Takemoto et al.
7,533,906 B2 5/2009 Luettgen et al.
7,534,259 B2 5/2009 Lashinski et al.
7,540,867 B2 6/2009 Jinno et al.
7,540,872 B2 6/2009 Schechter et al.
7,542,807 B2 6/2009 Bertolero et al.
7,543,730 B1 6/2009 Marczyk
7,546,939 B2 6/2009 Adams et al.
7,546,940 B2 6/2009 Milliman et al.
7,547,287 B2 6/2009 Boecker et al.
7,547,312 B2 6/2009 Bauman et al.
7,549,563 B2 6/2009 Mather et al.
7,549,564 B2 6/2009 Boudreaux
7,549,998 B2 6/2009 Braun
7,552,854 B2 6/2009 Wixey et al.
7,553,173 B2 6/2009 Kowalick
7,553,275 B2 6/2009 Padget et al.
7,554,343 B2 6/2009 Bromfield
7,556,185 B2 7/2009 Viola
7,556,186 B2 7/2009 Milliman
7,556,647 B2 7/2009 Drews et al.
7,559,449 B2 7/2009 Viola
7,559,450 B2 7/2009 Wales et al.
7,559,452 B2 7/2009 Wales et al.
7,559,937 B2 7/2009 de la Torre et al.
7,561,637 B2 7/2009 Jonsson et al.
7,562,910 B2 7/2009 Kertesz et al.
7,563,269 B2 7/2009 Hashiguchi
7,563,862 B2 7/2009 Sieg et al.
7,565,993 B2 7/2009 Milliman et al.
7,566,300 B2 7/2009 Devierre et al.
7,567,045 B2 7/2009 Fristedt
7,568,603 B2 8/2009 Shelton, IV et al.
7,568,604 B2 8/2009 Ehrenfels et al.
7,568,619 B2 8/2009 Todd et al.
7,575,144 B2 8/2009 Ortiz et al.
7,578,825 B2 8/2009 Huebner
D600,712 S 9/2009 LaManna et al.
7,583,063 B2 9/2009 Dooley
7,584,880 B2 9/2009 Racenet et al.
7,586,289 B2 9/2009 Andruk et al.
7,588,174 B2 9/2009 Holsten et al.
7,588,175 B2 9/2009 Timm et al.
7,588,176 B2 9/2009 Timm et al.
7,588,177 B2 9/2009 Racenet
7,591,783 B2 9/2009 Boulais et al.
7,591,818 B2 9/2009 Bertolero et al.
7,593,766 B2 9/2009 Faber et al.
7,597,229 B2 10/2009 Boudreaux et al.
7,597,230 B2 10/2009 Racenet et al.
7,597,693 B2 10/2009 Garrison
7,597,699 B2 10/2009 Rogers
7,598,972 B2 10/2009 Tomita
7,600,663 B2 10/2009 Green
7,604,118 B2 10/2009 Iio et al.
7,604,150 B2 10/2009 Boudreaux
7,604,151 B2 10/2009 Hess et al.
7,604,668 B2 10/2009 Farnsworth et al.
7,607,557 B2 10/2009 Shelton, IV et al.
7,608,091 B2 10/2009 Goldfarb et al.
D604,325 S 11/2009 Ebeling et al.
7,611,038 B2 11/2009 Racenet et al.
7,611,474 B2 11/2009 Hibner et al.
7,615,003 B2 11/2009 Stefanchik et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,615,067	B2	11/2009	Lee et al.	
7,617,961	B2	11/2009	Viola	
D605,201	S *	12/2009	Lorenz	D14/488
D607,010	S	12/2009	Kocmick	
7,624,902	B2	12/2009	Marczyk et al.	
7,624,903	B2	12/2009	Green et al.	
7,625,370	B2	12/2009	Hart et al.	
7,630,841	B2	12/2009	Comisky et al.	
7,631,793	B2	12/2009	Rethy et al.	
7,631,794	B2	12/2009	Rethy et al.	
7,635,074	B2	12/2009	Olson et al.	
7,635,922	B2	12/2009	Becker	
7,637,409	B2	12/2009	Marczyk	
7,637,410	B2	12/2009	Marczyk	
7,638,958	B2	12/2009	Philipp et al.	
7,641,091	B2	1/2010	Olson et al.	
7,641,092	B2	1/2010	Kruszynski et al.	
7,641,093	B2	1/2010	Doll et al.	
7,641,095	B2	1/2010	Viola	
7,641,671	B2	1/2010	Crainich	
7,644,783	B2	1/2010	Roberts et al.	
7,644,848	B2	1/2010	Swayze et al.	
7,645,230	B2	1/2010	Mikkaichi et al.	
7,648,055	B2	1/2010	Marczyk	
7,648,457	B2	1/2010	Stefanchik et al.	
7,648,519	B2	1/2010	Lee et al.	
7,650,185	B2	1/2010	Maile et al.	
7,651,017	B2	1/2010	Ortiz et al.	
7,651,498	B2	1/2010	Shifrin et al.	
7,654,431	B2	2/2010	Hueil et al.	
7,655,004	B2	2/2010	Long	
7,655,288	B2	2/2010	Bauman et al.	
7,655,584	B2	2/2010	Biran et al.	
7,656,131	B2	2/2010	Embrey et al.	
7,658,311	B2	2/2010	Boudreaux	
7,658,312	B2	2/2010	Vidal et al.	
7,658,705	B2	2/2010	Melvin et al.	
7,659,219	B2	2/2010	Biran et al.	
7,662,161	B2	2/2010	Briganti et al.	
7,665,646	B2	2/2010	Prommersberger	
7,665,647	B2	2/2010	Shelton, IV et al.	
7,669,746	B2	3/2010	Shelton, IV	
7,669,747	B2	3/2010	Weisenburgh, II et al.	
7,670,334	B2	3/2010	Hueil et al.	
7,673,780	B2	3/2010	Shelton, IV et al.	
7,673,781	B2	3/2010	Swayze et al.	
7,673,782	B2	3/2010	Hess et al.	
7,673,783	B2	3/2010	Morgan et al.	
7,674,253	B2	3/2010	Fisher et al.	
7,674,255	B2	3/2010	Braun	
7,674,263	B2	3/2010	Ryan	
7,674,270	B2	3/2010	Layer	
7,682,307	B2	3/2010	Danitz et al.	
7,682,367	B2	3/2010	Shah et al.	
7,682,686	B2	3/2010	Curro et al.	
7,686,201	B2	3/2010	Csiky	
7,686,804	B2	3/2010	Johnson et al.	
7,686,826	B2	3/2010	Lee et al.	
7,688,028	B2	3/2010	Phillips et al.	
7,691,098	B2	4/2010	Wallace et al.	
7,691,103	B2	4/2010	Fernandez et al.	
7,691,106	B2	4/2010	Schenberger et al.	
7,694,864	B2	4/2010	Okada et al.	
7,694,865	B2	4/2010	Scirica	
7,695,485	B2	4/2010	Whitman et al.	
7,695,493	B2	4/2010	Saadat et al.	
7,699,204	B2	4/2010	Viola	
7,699,835	B2	4/2010	Lee et al.	
7,699,844	B2	4/2010	Utley et al.	
7,699,846	B2	4/2010	Ryan	
7,699,856	B2	4/2010	Van Wyk et al.	
7,699,859	B2	4/2010	Bombard et al.	
7,699,860	B2	4/2010	Huitema et al.	
7,699,868	B2	4/2010	Frank et al.	
7,703,653	B2	4/2010	Shah et al.	
7,705,559	B2	4/2010	Powell et al.	
7,708,180	B2	5/2010	Murray et al.	
7,708,181	B2	5/2010	Cole et al.	
7,708,182	B2	5/2010	Viola	
7,708,758	B2	5/2010	Lee et al.	
7,712,182	B2	5/2010	Zeiler et al.	
7,713,190	B2	5/2010	Brock et al.	
7,714,239	B2	5/2010	Smith	
7,714,334	B2	5/2010	Lin	
7,717,312	B2	5/2010	Beetel	
7,717,313	B2	5/2010	Criscuolo et al.	
7,717,846	B2	5/2010	Zirps et al.	
7,717,873	B2	5/2010	Swick	
7,717,915	B2	5/2010	Miyazawa	
7,717,926	B2	5/2010	Whitfield et al.	
7,718,180	B2	5/2010	Karp	
7,718,556	B2	5/2010	Matsuda et al.	
7,721,930	B2	5/2010	McKenna et al.	
7,721,931	B2	5/2010	Shelton, IV et al.	
7,721,933	B2	5/2010	Ehrenfels et al.	
7,721,934	B2	5/2010	Shelton, IV et al.	
7,721,936	B2	5/2010	Shalton, IV et al.	
7,722,527	B2	5/2010	Bouchier et al.	
7,722,607	B2	5/2010	Dumbauld et al.	
7,722,610	B2	5/2010	Viola et al.	
7,725,214	B2	5/2010	Diolaiti	
7,726,171	B2	6/2010	Langlotz et al.	
7,726,537	B2	6/2010	Olson et al.	
7,726,538	B2	6/2010	Holsten et al.	
7,726,539	B2	6/2010	Holsten et al.	
7,727,954	B2	6/2010	McKay	
7,728,553	B2	6/2010	Carrier et al.	
7,729,742	B2	6/2010	Govari	
7,731,072	B2	6/2010	Timm et al.	
7,731,073	B2	6/2010	Wixey et al.	
7,731,724	B2	6/2010	Huitema et al.	
7,735,703	B2	6/2010	Morgan et al.	
7,736,254	B2	6/2010	Schena	
7,736,306	B2	6/2010	Brustad et al.	
7,736,374	B2	6/2010	Vaughan et al.	
7,738,971	B2	6/2010	Swayze et al.	
7,740,159	B2	6/2010	Shelton, IV et al.	
7,742,036	B2	6/2010	Grant et al.	
7,743,960	B2	6/2010	Whitman et al.	
7,744,624	B2	6/2010	Bettuchi	
7,744,627	B2	6/2010	Orban, III et al.	
7,744,628	B2	6/2010	Viola	
7,747,146	B2	6/2010	Milano et al.	
7,748,587	B2	7/2010	Haramiishi et al.	
7,748,632	B2	7/2010	Coleman et al.	
7,749,204	B2	7/2010	Dhanaraj et al.	
7,751,870	B2	7/2010	Whitman	
7,753,245	B2	7/2010	Boudreaux et al.	
7,753,246	B2	7/2010	Scirica	
7,753,904	B2	7/2010	Shelton, IV et al.	
7,757,924	B2	7/2010	Gerbi et al.	
7,758,594	B2	7/2010	Lamson et al.	
7,758,612	B2	7/2010	Shipp	
7,762,462	B2	7/2010	Gelbman	
7,762,998	B2	7/2010	Birk et al.	
7,766,207	B2	8/2010	Mather et al.	
7,766,209	B2	8/2010	Baxter, III et al.	
7,766,210	B2	8/2010	Shelton, IV et al.	
7,766,821	B2	8/2010	Brunnen et al.	
7,766,894	B2	8/2010	Weitzner et al.	
7,770,658	B2	8/2010	Ito et al.	
7,770,773	B2	8/2010	Whitman et al.	
7,770,774	B2	8/2010	Mastri et al.	
7,770,775	B2	8/2010	Shelton, IV et al.	
7,770,776	B2	8/2010	Chen et al.	
7,771,396	B2	8/2010	Stefanchik et al.	
7,772,720	B2	8/2010	McGee et al.	
7,772,725	B2	8/2010	Siman-Tov	
7,775,972	B2	8/2010	Brock et al.	
7,776,037	B2	8/2010	Odom	
7,776,060	B2	8/2010	Mooradian et al.	
7,776,065	B2	8/2010	Griffiths et al.	
7,778,004	B2	8/2010	Nerheim et al.	
7,779,737	B2	8/2010	Newman, Jr. et al.	

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,780,054 B2 8/2010 Wales
7,780,055 B2 8/2010 Scirica et al.
7,780,309 B2 8/2010 McMillan et al.
7,780,663 B2 8/2010 Yates et al.
7,780,685 B2 8/2010 Hunt et al.
7,784,662 B2 8/2010 Wales et al.
7,784,663 B2 8/2010 Shelton, IV
7,787,256 B2 8/2010 Chan et al.
7,789,283 B2 9/2010 Shah
7,789,875 B2 9/2010 Brock et al.
7,789,883 B2 9/2010 Takashino et al.
7,789,889 B2 9/2010 Zubik et al.
7,793,812 B2 9/2010 Moore et al.
7,794,475 B2 9/2010 Hess et al.
7,798,386 B2 9/2010 Schall et al.
7,799,039 B2 9/2010 Shelton, IV et al.
7,799,044 B2 9/2010 Johnston et al.
7,799,965 B2 9/2010 Patel et al.
7,803,151 B2 9/2010 Whitman
7,806,871 B2 10/2010 Li et al.
7,806,891 B2 10/2010 Nowlin et al.
7,810,690 B2 10/2010 Bilotti et al.
7,810,691 B2 10/2010 Boyden et al.
7,810,692 B2 10/2010 Hall et al.
7,810,693 B2 10/2010 Broehl et al.
7,811,275 B2 10/2010 Birk et al.
7,814,816 B2 10/2010 Alberti et al.
7,815,092 B2 10/2010 Whitman et al.
7,815,565 B2 10/2010 Stefanchik et al.
7,815,662 B2 10/2010 Spivey et al.
7,819,296 B2 10/2010 Hueil et al.
7,819,297 B2 10/2010 Doll et al.
7,819,298 B2 10/2010 Hall et al.
7,819,299 B2 10/2010 Shelton, IV et al.
7,819,799 B2 10/2010 Merril et al.
7,819,884 B2 10/2010 Lee et al.
7,819,886 B2 10/2010 Whitfield et al.
7,823,592 B2 11/2010 Bettuchi et al.
7,823,760 B2 11/2010 Zemlok et al.
7,824,401 B2 11/2010 Manzo et al.
7,824,422 B2 11/2010 Benchetrit
7,824,426 B2 11/2010 Racenet et al.
7,828,189 B2 11/2010 Holsten et al.
7,828,794 B2 11/2010 Sartor
7,828,808 B2 11/2010 Hinman et al.
7,831,292 B2 11/2010 Quaid et al.
7,832,408 B2 11/2010 Shelton, IV et al.
7,832,611 B2 11/2010 Boyden et al.
7,832,612 B2 11/2010 Baxter, III et al.
7,833,234 B2 11/2010 Bailly et al.
7,835,823 B2 11/2010 Sillman et al.
7,836,400 B2 11/2010 May et al.
7,837,079 B2 11/2010 Holsten et al.
7,837,080 B2 11/2010 Schwemberger
7,837,081 B2 11/2010 Holsten et al.
7,837,425 B2 11/2010 Saeki et al.
7,837,685 B2 11/2010 Weinberg et al.
7,837,687 B2 11/2010 Harp
7,837,694 B2 11/2010 Tethrake et al.
7,838,789 B2 11/2010 Stoffers et al.
7,839,109 B2 11/2010 Carmen, Jr. et al.
7,841,503 B2 11/2010 Sonnenschein et al.
7,842,025 B2 11/2010 Coleman et al.
7,842,028 B2 11/2010 Lee
7,843,158 B2 11/2010 Prisco
7,845,533 B2 12/2010 Marczyk et al.
7,845,534 B2 12/2010 Viola et al.
7,845,535 B2 12/2010 Scircia
7,845,536 B2 12/2010 Viola et al.
7,845,537 B2 12/2010 Shelton, IV et al.
7,846,085 B2 12/2010 Silverman et al.
7,846,149 B2 12/2010 Jankowski
7,848,066 B2 12/2010 Yanagishima
7,850,623 B2 12/2010 Griffin et al.
7,850,642 B2 12/2010 Moll et al.
7,850,982 B2 12/2010 Stopek et al.
7,854,735 B2 12/2010 Houser et al.
7,854,736 B2 12/2010 Ryan
7,857,183 B2 12/2010 Shelton, IV
7,857,184 B2 12/2010 Viola
7,857,185 B2 12/2010 Swayze et al.
7,857,186 B2 12/2010 Baxter, III et al.
7,857,813 B2 12/2010 Schmitz et al.
7,861,906 B2 1/2011 Doll et al.
7,862,502 B2 1/2011 Pool et al.
7,862,546 B2 1/2011 Conlon et al.
7,862,579 B2 1/2011 Ortiz et al.
7,866,525 B2 1/2011 Scirica
7,866,527 B2 1/2011 Hall et al.
7,866,528 B2 1/2011 Olson et al.
7,870,989 B2 1/2011 Viola et al.
7,871,418 B2 1/2011 Thompson et al.
7,871,440 B2 1/2011 Schwartz et al.
7,875,055 B2 1/2011 Cichocki, Jr.
7,879,063 B2 2/2011 Khosravi
7,879,070 B2 2/2011 Ortiz et al.
7,883,461 B2 2/2011 Albrecht et al.
7,883,465 B2 2/2011 Donofrio et al.
7,886,951 B2 2/2011 Hessler
7,886,952 B2 2/2011 Scirica et al.
7,887,530 B2 2/2011 Zemlok et al.
7,887,535 B2 2/2011 Lands et al.
7,887,536 B2 2/2011 Johnson et al.
7,887,563 B2 2/2011 Cummins
7,891,531 B1 2/2011 Ward
7,891,532 B2 2/2011 Mastri et al.
7,892,200 B2 2/2011 Birk et al.
7,892,245 B2 2/2011 Liddicoat et al.
7,893,586 B2 2/2011 West et al.
7,896,214 B2 3/2011 Farascioni
7,896,215 B2 3/2011 Adams et al.
7,896,869 B2 3/2011 DiSilvestro et al.
7,896,877 B2 3/2011 Hall et al.
7,896,895 B2 3/2011 Boudreaux et al.
7,896,897 B2 3/2011 Gresham et al.
7,898,198 B2 3/2011 Murphree
7,900,805 B2 3/2011 Shelton, IV et al.
7,900,806 B2 3/2011 Chen et al.
7,901,381 B2 3/2011 Birk et al.
7,905,380 B2 3/2011 Shelton, IV et al.
7,905,381 B2 3/2011 Baxter, III et al.
7,905,881 B2 3/2011 Masuda et al.
7,905,889 B2 3/2011 Catanese, III et al.
7,905,890 B2 3/2011 Whitfield et al.
7,905,902 B2 3/2011 Huitema et al.
7,909,039 B2 3/2011 Hur
7,909,191 B2 3/2011 Baker et al.
7,909,220 B2 3/2011 Viola
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.
7,914,521 B2 3/2011 Wang et al.
7,914,543 B2 3/2011 Roth et al.
7,914,551 B2 3/2011 Ortiz et al.
7,918,230 B2 4/2011 Whitman et al.
7,918,376 B1 4/2011 Knodel et al.
7,918,377 B2 4/2011 Measamer et al.
7,918,845 B2 4/2011 Saadat et al.
7,918,848 B2 4/2011 Lau et al.
7,918,861 B2 4/2011 Brock et al.
7,918,867 B2 4/2011 Dana et al.
7,922,061 B2 4/2011 Shelton, IV et al.
7,922,063 B2 4/2011 Zemlok et al.
7,922,743 B2 4/2011 Heinrich et al.
7,923,144 B2 4/2011 Kohn et al.
7,926,691 B2 4/2011 Viola et al.
7,927,328 B2 4/2011 Orszulak et al.
7,928,281 B2 4/2011 Augustine
7,930,040 B1 4/2011 Kelsch et al.
7,930,065 B2 4/2011 Larkin et al.
7,931,660 B2 4/2011 Aranyi et al.
7,931,695 B2 4/2011 Ringeisen
7,931,877 B2 4/2011 Steffens et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

7,934,630 B2 5/2011 Shelton, IV et al.
7,934,631 B2 5/2011 Balbierz et al.
7,934,896 B2 5/2011 Schnier
7,935,130 B2 5/2011 Williams
7,935,773 B2 5/2011 Hadba et al.
7,936,142 B2 5/2011 Otsuka et al.
7,938,307 B2 5/2011 Bettuchi
7,941,865 B2 5/2011 Seman, Jr. et al.
7,942,303 B2 5/2011 Shah
7,942,890 B2 5/2011 D'Agostino et al.
7,944,175 B2 5/2011 Mori et al.
7,945,792 B2 5/2011 Cherpantier
7,945,798 B2 5/2011 Carlson et al.
7,946,453 B2 5/2011 Voegele et al.
7,947,011 B2 5/2011 Birk et al.
7,950,560 B2 5/2011 Zemlok et al.
7,950,561 B2 5/2011 Aranyi
7,951,071 B2 5/2011 Whitman et al.
7,951,166 B2 5/2011 Orban, III et al.
7,954,682 B2 6/2011 Giordano et al.
7,954,684 B2 6/2011 Boudreaux
7,954,685 B2 6/2011 Viola
7,954,686 B2 6/2011 Baxter, III et al.
7,954,687 B2 6/2011 Zemlok et al.
7,955,253 B2 6/2011 Ewers et al.
7,955,257 B2 6/2011 Frasier et al.
7,955,322 B2 6/2011 Devengenzo et al.
7,955,327 B2 6/2011 Sartor
7,955,380 B2 6/2011 Chu et al.
7,959,050 B2 6/2011 Smith et al.
7,959,051 B2 6/2011 Smith et al.
7,959,052 B2 6/2011 Sonnenschein et al.
7,963,432 B2 6/2011 Knodel et al.
7,963,433 B2 6/2011 Whitman et al.
7,963,913 B2 6/2011 Devengenzo et al.
7,963,963 B2 6/2011 Francischelli et al.
7,963,964 B2 6/2011 Santilli et al.
7,964,206 B2 6/2011 Suokas et al.
7,966,236 B2 6/2011 Noriega et al.
7,966,269 B2 6/2011 Bauer et al.
7,966,799 B2 6/2011 Morgan et al.
7,967,178 B2 6/2011 Scirica et al.
7,967,179 B2 6/2011 Olson et al.
7,967,180 B2 6/2011 Scirica
7,967,181 B2 6/2011 Viola et al.
7,967,791 B2 6/2011 Franer et al.
7,967,839 B2 6/2011 Flock et al.
7,972,298 B2 7/2011 Wallace et al.
7,972,315 B2 7/2011 Birk et al.
7,976,213 B2 7/2011 Bertolotti et al.
7,976,563 B2 7/2011 Summerer
7,979,137 B2 7/2011 Tracey et al.
7,980,443 B2 7/2011 Scheib et al.
7,981,132 B2 7/2011 Dubrul et al.
7,987,405 B2 7/2011 Turner et al.
7,988,015 B2 8/2011 Mason, II et al.
7,988,026 B2 8/2011 Knodel et al.
7,988,027 B2 8/2011 Olson et al.
7,988,028 B2 8/2011 Farascioni et al.
7,988,779 B2 8/2011 Disalvo et al.
7,992,757 B2 8/2011 Wheeler et al.
7,993,360 B2 8/2011 Hacker et al.
7,994,670 B2 8/2011 Ji
7,997,054 B2 8/2011 Bertsch et al.
7,997,468 B2 8/2011 Farascioni
7,997,469 B2 8/2011 Olson et al.
8,002,696 B2 8/2011 Suzuki
8,002,784 B2 8/2011 Jinno et al.
8,002,785 B2 8/2011 Weiss et al.
8,002,795 B2 8/2011 Beetel
8,006,365 B2 8/2011 Levin et al.
8,006,885 B2 8/2011 Marczyk
8,006,889 B2 8/2011 Adams et al.
8,007,370 B2 8/2011 Hirsch et al.
8,007,465 B2 8/2011 Birk et al.
8,007,479 B2 8/2011 Birk et al.
8,007,511 B2 8/2011 Brock et al.
8,007,513 B2 8/2011 Nalagatla et al.
8,008,598 B2 8/2011 Whitman et al.
8,011,550 B2 9/2011 Aranyi et al.
8,011,551 B2 9/2011 Marczyk et al.
8,011,553 B2 9/2011 Mastri et al.
8,011,555 B2 9/2011 Tarinelli et al.
8,012,170 B2 9/2011 Whitman et al.
8,016,176 B2 9/2011 Kasvikis et al.
8,016,177 B2 9/2011 Bettuchi et al.
8,016,178 B2 9/2011 Olson et al.
8,016,849 B2 9/2011 Wenchell
8,016,855 B2 9/2011 Whitman et al.
8,016,858 B2 9/2011 Whitman
8,016,881 B2 9/2011 Furst
8,020,742 B2 9/2011 Marczyk
8,020,743 B2 9/2011 Shelton, IV
8,021,375 B2 9/2011 Aldrich et al.
8,025,199 B2 9/2011 Whitman et al.
8,025,896 B2 9/2011 Malaviya et al.
8,028,882 B2 10/2011 Viola
8,028,883 B2 10/2011 Stopek
8,028,884 B2 10/2011 Sniffin et al.
8,028,885 B2 10/2011 Smith et al.
8,029,510 B2 10/2011 Hoegerle
8,031,069 B2 10/2011 Cohn et al.
8,033,438 B2 10/2011 Scirica
8,033,439 B2 10/2011 Racenet et al.
8,033,440 B2 10/2011 Wenchell et al.
8,034,077 B2 10/2011 Smith et al.
8,034,337 B2 10/2011 Simard
8,034,363 B2 10/2011 Li et al.
8,035,487 B2 10/2011 Malackowski
8,037,591 B2 10/2011 Spivey et al.
8,038,045 B2 10/2011 Bettuchi et al.
8,038,046 B2 10/2011 Smith et al.
8,038,686 B2 10/2011 Huitema et al.
8,043,207 B2 10/2011 Adams
8,043,328 B2 10/2011 Hahnen et al.
8,044,536 B2 10/2011 Nguyen et al.
8,044,604 B2 10/2011 Hagino et al.
8,047,236 B2 11/2011 Perry
8,048,503 B2 11/2011 Farnsworth et al.
8,052,636 B2 11/2011 Moll et al.
8,056,787 B2 11/2011 Boudreaux et al.
8,056,788 B2 11/2011 Mastri et al.
8,056,789 B1 11/2011 White et al.
8,057,508 B2 11/2011 Shelton, IV
8,058,771 B2 11/2011 Giordano et al.
8,060,250 B2 11/2011 Reiland et al.
8,061,014 B2 11/2011 Smith et al.
8,061,576 B2 11/2011 Cappola
8,062,236 B2 11/2011 Soltz
8,062,330 B2 11/2011 Prommersberger et al.
8,063,619 B2 11/2011 Zhu et al.
8,066,158 B2 11/2011 Vogel et al.
8,066,166 B2 11/2011 Demmy et al.
8,066,167 B2 11/2011 Measamer et al.
8,066,168 B2 11/2011 Vidal et al.
8,066,720 B2 11/2011 Knodel et al.
D650,074 S 12/2011 Hunt et al.
D650,789 S 12/2011 Arnold
8,070,033 B2 12/2011 Milliman et al.
8,070,034 B1 12/2011 Knodel
8,070,035 B2 12/2011 Holsten et al.
8,070,743 B2 12/2011 Kagan et al.
8,074,858 B2 12/2011 Marczyk
8,074,861 B2 12/2011 Ehrenfels et al.
8,075,476 B2 12/2011 Vargas
8,075,571 B2 12/2011 Vitali et al.
8,079,950 B2 12/2011 Stern et al.
8,079,989 B2 12/2011 Birk et al.
8,080,004 B2 12/2011 Downey et al.
8,083,118 B2 12/2011 Milliman et al.
8,083,119 B2 12/2011 Prommersberger
8,083,120 B2 12/2011 Shelton, IV et al.
8,084,001 B2 12/2011 Burns et al.
8,084,969 B2 12/2011 David et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

8,085,013 B2 12/2011 Wei et al.
8,087,562 B1 1/2012 Manoux et al.
8,087,563 B2 1/2012 Milliman et al.
8,089,509 B2 1/2012 Chatenever et al.
8,091,753 B2 1/2012 Viola
8,091,756 B2 1/2012 Viola
8,092,443 B2 1/2012 Bischoff
8,092,932 B2 1/2012 Phillips et al.
8,093,572 B2 1/2012 Kuduvalli
8,096,458 B2 1/2012 Hessler
8,096,459 B2 1/2012 Ortiz et al.
8,097,017 B2 1/2012 Viola
8,100,310 B2 1/2012 Zemlok
8,100,824 B2 1/2012 Hegeman et al.
8,100,872 B2 1/2012 Patel
8,102,138 B2 1/2012 Sekine et al.
8,102,278 B2 1/2012 Deck et al.
8,105,350 B2 1/2012 Lee et al.
8,107,925 B2 1/2012 Natsuno et al.
8,108,033 B2 1/2012 Drew et al.
8,108,072 B2 1/2012 Zhao et al.
8,109,426 B2 2/2012 Milliman et al.
8,110,208 B1 2/2012 Hen
8,113,405 B2 2/2012 Milliman
8,113,408 B2 2/2012 Wenchell et al.
8,113,410 B2 2/2012 Hall et al.
8,114,017 B2 2/2012 Bacher
8,114,100 B2 2/2012 Smith et al.
8,118,206 B2 2/2012 Zand et al.
8,118,207 B2 2/2012 Racenet et al.
8,120,301 B2 2/2012 Goldberg et al.
8,122,128 B2 2/2012 Burke, II et al.
8,123,103 B2 2/2012 Milliman
8,123,523 B2 2/2012 Carron et al.
8,123,766 B2 2/2012 Bauman et al.
8,123,767 B2 2/2012 Bauman et al.
8,125,168 B2 2/2012 Johnson et al.
8,127,975 B2 3/2012 Olson et al.
8,127,976 B2 3/2012 Scirica et al.
8,128,624 B2 3/2012 Couture et al.
8,128,643 B2 3/2012 Aranyi et al.
8,128,645 B2 3/2012 Sonnenschein et al.
8,128,662 B2 3/2012 Altarac et al.
8,132,703 B2 3/2012 Milliman et al.
8,132,705 B2 3/2012 Viola et al.
8,132,706 B2 3/2012 Marczyk et al.
8,133,500 B2 3/2012 Ringeisen et al.
8,134,306 B2 3/2012 Drader et al.
8,136,711 B2 3/2012 Beardsley et al.
8,136,712 B2 3/2012 Zingman
8,136,713 B2 3/2012 Hathaway et al.
8,137,339 B2 3/2012 Jinno et al.
8,140,417 B2 3/2012 Shibata
8,141,762 B2 3/2012 Bedi et al.
8,141,763 B2 3/2012 Milliman
8,142,200 B2 3/2012 Crunkilton et al.
8,142,425 B2 3/2012 Eggers
8,142,461 B2 3/2012 Houser et al.
8,142,515 B2 3/2012 Therin et al.
8,143,520 B2 3/2012 Cutler
8,146,790 B2 4/2012 Milliman
8,147,421 B2 4/2012 Farquhar et al.
8,147,456 B2 4/2012 Fisher et al.
8,147,485 B2 4/2012 Wham et al.
8,152,041 B2 4/2012 Kostrzewski
8,152,756 B2 4/2012 Webster et al.
8,154,239 B2 4/2012 Katsuki et al.
8,157,145 B2 4/2012 Shelton, IV et al.
8,157,148 B2 4/2012 Scirica
8,157,151 B2 4/2012 Ingmanson et al.
8,157,152 B2 4/2012 Holsten et al.
8,157,153 B2 4/2012 Shelton, IV et al.
8,157,793 B2 4/2012 Omori et al.
8,161,977 B2 4/2012 Shelton, IV et al.
8,162,138 B2 4/2012 Bettenhausen et al.
8,162,197 B2 4/2012 Mastri et al.
8,162,668 B2 4/2012 Toly
8,162,933 B2 4/2012 Francischelli et al.
8,162,965 B2 4/2012 Reschke et al.
8,167,185 B2 5/2012 Shelton, IV et al.
8,167,622 B2 5/2012 Zhou
8,167,895 B2 5/2012 D'Agostino et al.
8,167,898 B1 5/2012 Schaller et al.
8,170,241 B2 5/2012 Roe et al.
8,172,004 B2 5/2012 Ho
8,172,120 B2 5/2012 Boyden et al.
8,172,122 B2 5/2012 Kasvikis et al.
8,172,124 B2 5/2012 Shelton, IV et al.
8,177,776 B2 5/2012 Humayun et al.
8,177,797 B2 5/2012 Shimoji et al.
8,179,705 B2 5/2012 Chapuis
8,180,458 B2 5/2012 Kane et al.
8,181,839 B2 5/2012 Beetel
8,181,840 B2 5/2012 Milliman
8,182,422 B2 5/2012 Bayer et al.
8,182,444 B2 5/2012 Uber, III et al.
8,183,807 B2 5/2012 Tsai et al.
8,186,555 B2 5/2012 Shelton, IV et al.
8,186,556 B2 5/2012 Viola
8,186,558 B2 5/2012 Sapienza
8,186,560 B2 5/2012 Hess et al.
8,191,752 B2 6/2012 Scirica
8,192,350 B2 6/2012 Ortiz et al.
8,192,460 B2 6/2012 Orban, III et al.
8,192,651 B2 6/2012 Young et al.
8,196,795 B2 6/2012 Moore et al.
8,196,796 B2 6/2012 Shelton, IV et al.
8,197,501 B2 6/2012 Shadeck et al.
8,197,502 B2 6/2012 Smith et al.
8,197,837 B2 6/2012 Jamiolkowski et al.
8,201,720 B2 6/2012 Hessler
8,201,721 B2 6/2012 Zemlok et al.
8,202,549 B2 6/2012 Stucky et al.
8,205,779 B2 6/2012 Ma et al.
8,205,780 B2 6/2012 Sorrentino et al.
8,205,781 B2 6/2012 Baxter, III et al.
8,210,411 B2 7/2012 Yates et al.
8,210,414 B2 7/2012 Bettuchi et al.
8,210,415 B2 7/2012 Ward
8,210,416 B2 7/2012 Milliman et al.
8,210,721 B2 7/2012 Chen et al.
8,211,125 B2 7/2012 Spivey
8,214,019 B2 7/2012 Govari et al.
8,215,531 B2 7/2012 Shelton, IV et al.
8,215,532 B2 7/2012 Marczyk
8,215,533 B2 7/2012 Viola et al.
8,220,468 B2 7/2012 Cooper et al.
8,220,688 B2 7/2012 Laurent et al.
8,220,690 B2 7/2012 Hess et al.
8,221,424 B2 7/2012 Cha
8,221,433 B2 7/2012 Lozier et al.
8,225,799 B2 7/2012 Bettuchi
8,225,979 B2 7/2012 Farascioni et al.
8,226,553 B2 7/2012 Shelton, IV et al.
8,226,635 B2 7/2012 Petrie et al.
8,226,675 B2 7/2012 Houser et al.
8,226,715 B2 7/2012 Hwang et al.
8,227,946 B2 7/2012 Kim
8,228,020 B2 7/2012 Shin et al.
8,228,048 B2 7/2012 Spencer
8,229,549 B2 7/2012 Whitman et al.
8,231,040 B2 7/2012 Zemlok et al.
8,231,042 B2 7/2012 Hessler et al.
8,231,043 B2 7/2012 Tarinelli et al.
8,235,272 B2 8/2012 Nicholas et al.
8,236,010 B2 8/2012 Ortiz et al.
8,236,011 B2 8/2012 Harris et al.
8,236,020 B2 8/2012 Smith et al.
8,237,388 B2 8/2012 Jinno et al.
8,240,537 B2 8/2012 Marczyk
8,241,271 B2 8/2012 Millman et al.
8,241,284 B2 8/2012 Dycus et al.
8,241,308 B2 8/2012 Kortenbach et al.
8,241,322 B2 8/2012 Whitman et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

8,245,594 B2 8/2012 Rogers et al.
8,245,898 B2 8/2012 Smith et al.
8,245,899 B2 8/2012 Swensgard et al.
8,245,900 B2 8/2012 Scirica
8,245,901 B2 8/2012 Stopek
8,246,608 B2 8/2012 Omori et al.
8,246,637 B2 8/2012 Viola et al.
8,256,654 B2 9/2012 Bettuchi et al.
8,256,655 B2 9/2012 Sniffin et al.
8,256,656 B2 9/2012 Milliman et al.
8,257,251 B2 9/2012 Shelton, IV et al.
8,257,356 B2 9/2012 Bleich et al.
8,257,386 B2 9/2012 Lee et al.
8,257,391 B2 9/2012 Orban, III et al.
8,257,634 B2 9/2012 Scirica
8,258,745 B2 9/2012 Smith et al.
8,262,560 B2 9/2012 Whitman
8,262,655 B2 9/2012 Ghabrial et al.
8,267,300 B2 9/2012 Boudreaux
8,267,924 B2 9/2012 Zemlok et al.
8,267,946 B2 9/2012 Whitfield et al.
8,267,951 B2 9/2012 Whayne et al.
8,269,121 B2 9/2012 Smith
8,272,553 B2 9/2012 Mastri et al.
8,272,554 B2 9/2012 Whitman et al.
8,272,918 B2 9/2012 Lam
8,273,404 B2 9/2012 Dave et al.
8,276,801 B2 10/2012 Zemlok et al.
8,276,802 B2 10/2012 Kostrzewski
8,277,473 B2 10/2012 Sunaoshi et al.
8,281,446 B2 10/2012 Moskovich
8,281,973 B2 10/2012 Wenchell et al.
8,281,974 B2 10/2012 Hessler et al.
8,282,654 B2 10/2012 Ferrari et al.
8,285,367 B2 10/2012 Hyde et al.
8,286,723 B2 10/2012 Puzio et al.
8,286,845 B2 10/2012 Perry et al.
8,286,846 B2 10/2012 Smith et al.
8,286,847 B2 10/2012 Taylor
8,287,487 B2 10/2012 Estes
8,287,522 B2 10/2012 Moses et al.
8,287,561 B2 10/2012 Nunez et al.
8,288,984 B2 10/2012 Yang
8,289,403 B2 10/2012 Dobashi et al.
8,292,147 B2 10/2012 Viola
8,292,148 B2 10/2012 Viola
8,292,150 B2 10/2012 Bryant
8,292,151 B2 10/2012 Viola
8,292,152 B2 10/2012 Milliman et al.
8,292,155 B2 10/2012 Shelton, IV et al.
8,292,157 B2 10/2012 Smith et al.
8,292,158 B2 10/2012 Sapienza
8,292,801 B2 10/2012 Dejima et al.
8,292,888 B2 10/2012 Whitman
8,294,399 B2 10/2012 Suzuki et al.
8,298,161 B2 10/2012 Vargas
8,298,189 B2 10/2012 Fisher et al.
8,298,233 B2 10/2012 Mueller
8,298,677 B2 10/2012 Wiesner et al.
8,302,323 B2 11/2012 Fortier et al.
8,308,040 B2 11/2012 Huang et al.
8,308,041 B2 11/2012 Kostrzewski
8,308,042 B2 11/2012 Aranyi
8,308,043 B2 11/2012 Bindra et al.
8,308,046 B2 11/2012 Prommersberger
8,308,659 B2 11/2012 Scheibe et al.
8,308,725 B2 11/2012 Bell et al.
8,310,188 B2 11/2012 Nakai
8,313,496 B2 11/2012 Sauer et al.
8,313,499 B2 11/2012 Magnusson et al.
8,313,509 B2 11/2012 Kostrzewski
8,317,070 B2 11/2012 Hueil et al.
8,317,071 B1 11/2012 Knodel
8,317,074 B2 11/2012 Ortiz et al.
8,317,437 B2 11/2012 Merkley et al.
8,317,744 B2 11/2012 Kirschenman
8,317,790 B2 11/2012 Bell et al.
8,319,002 B2 11/2012 Daniels et al.
8,322,455 B2 12/2012 Shelton, IV et al.
8,322,589 B2 12/2012 Boudreaux
8,322,590 B2 12/2012 Patel et al.
8,322,901 B2 12/2012 Michelotti
8,323,789 B2 12/2012 Rozhin et al.
8,328,061 B2 12/2012 Kasvikis
8,328,062 B2 12/2012 Viola
8,328,063 B2 12/2012 Milliman et al.
8,328,064 B2 12/2012 Racenet et al.
8,328,802 B2 12/2012 Deville et al.
8,328,823 B2 12/2012 Aranyi et al.
8,333,313 B2 12/2012 Boudreaux et al.
8,333,691 B2 12/2012 Schaaf
8,333,764 B2 12/2012 Francischelli et al.
8,333,779 B2 12/2012 Smith et al.
8,334,468 B2 12/2012 Palmer et al.
8,336,753 B2 12/2012 Olson et al.
8,336,754 B2 12/2012 Cappola et al.
8,342,377 B2 1/2013 Milliman et al.
8,342,378 B2 1/2013 Marczyk et al.
8,342,379 B2 1/2013 Whitman et al.
8,343,150 B2 1/2013 Artale
8,347,978 B2 1/2013 Forster et al.
8,348,118 B2 1/2013 Segura
8,348,123 B2 1/2013 Scirica et al.
8,348,124 B2 1/2013 Scirica
8,348,125 B2 1/2013 Viola et al.
8,348,126 B2 1/2013 Olson et al.
8,348,127 B2 1/2013 Marczyk
8,348,129 B2 1/2013 Bedi et al.
8,348,130 B2 1/2013 Shah et al.
8,348,131 B2 1/2013 Omaits et al.
8,348,837 B2 1/2013 Wenchell
8,348,959 B2 1/2013 Wolford et al.
8,348,972 B2 1/2013 Soltz et al.
8,349,987 B2 1/2013 Kapiamba et al.
8,352,004 B2 1/2013 Mannheimer et al.
8,353,437 B2 1/2013 Boudreaux
8,353,438 B2 1/2013 Baxter, III et al.
8,353,439 B2 1/2013 Baxter, III et al.
8,356,740 B1 1/2013 Knodel
8,357,144 B2 1/2013 Whitman et al.
8,357,158 B2 1/2013 McKenna et al.
8,357,161 B2 1/2013 Mueller
8,359,174 B2 1/2013 Nakashima et al.
8,360,296 B2 1/2013 Zingman
8,360,297 B2 1/2013 Shelton, IV et al.
8,360,298 B2 1/2013 Farascioni et al.
8,360,299 B2 1/2013 Zemlok et al.
8,361,501 B2 1/2013 DiTizio et al.
D676,866 S 2/2013 Chaudhri
8,365,973 B1 2/2013 White et al.
8,365,975 B1 2/2013 Manoux et al.
8,365,976 B2 2/2013 Hess et al.
8,366,559 B2 2/2013 Papenfuss et al.
8,366,719 B2 2/2013 Markey et al.
8,366,787 B2 2/2013 Brown et al.
8,369,056 B2 2/2013 Senriuchi et al.
8,371,393 B2 2/2013 Higuchi et al.
8,371,491 B2 2/2013 Huitema et al.
8,371,492 B2 2/2013 Aranyi et al.
8,371,493 B2 2/2013 Aranyi et al.
8,371,494 B2 2/2013 Racenet et al.
8,372,094 B2 2/2013 Bettuchi et al.
8,376,865 B2 2/2013 Forster et al.
8,377,029 B2 2/2013 Nagao et al.
8,377,044 B2 2/2013 Coe et al.
8,382,773 B2 2/2013 Whitfield et al.
8,382,790 B2 2/2013 Uenohara et al.
D677,273 S * 3/2013 Randall D14/492
8,387,848 B2 3/2013 Johnson et al.
8,388,633 B2 3/2013 Rousseau et al.
8,389,588 B2 3/2013 Ringeisen et al.
8,393,513 B2 3/2013 Jankowski
8,393,514 B2 3/2013 Shelton, IV et al.
8,393,516 B2 3/2013 Kostrzewski

(56) **References Cited**

U.S. PATENT DOCUMENTS

8,397,832 B2 3/2013 Blickle et al.
8,397,971 B2 3/2013 Yates et al.
8,397,973 B1 3/2013 Hansen
8,398,633 B2 3/2013 Mueller
8,398,669 B2 3/2013 Kim
8,398,673 B2 3/2013 Hinchliffe et al.
8,398,674 B2 3/2013 Prestel
8,400,851 B2 3/2013 Byun
8,403,138 B2 3/2013 Weisshaupt et al.
8,403,196 B2 3/2013 Beardsley et al.
8,403,198 B2 3/2013 Sorrentino et al.
8,403,832 B2 3/2013 Cunningham et al.
8,403,945 B2 3/2013 Whitfield et al.
8,403,946 B2 3/2013 Whitfield et al.
8,403,950 B2 3/2013 Palmer et al.
8,408,439 B2 4/2013 Huang et al.
8,408,442 B2 4/2013 Racenet et al.
8,409,079 B2 4/2013 Okamoto et al.
8,409,174 B2 4/2013 Omori
8,409,175 B2 4/2013 Lee et al.
8,409,222 B2 4/2013 Whitfield et al.
8,409,223 B2 4/2013 Sorrentino et al.
8,411,500 B2 4/2013 Gapihan et al.
8,413,661 B2 4/2013 Rousseau et al.
8,413,870 B2 4/2013 Pastorelli et al.
8,413,871 B2 4/2013 Racenet et al.
8,413,872 B2 4/2013 Patel
8,414,577 B2 4/2013 Boudreaux et al.
8,414,598 B2 4/2013 Brock et al.
8,418,073 B2 4/2013 Mohr et al.
8,418,906 B2 4/2013 Farascioni et al.
8,418,907 B2 4/2013 Johnson et al.
8,418,908 B1 4/2013 Beardsley
8,418,909 B2 4/2013 Kostrzewski
8,419,635 B2 4/2013 Shelton, IV et al.
8,419,717 B2 4/2013 Diolaiti et al.
8,419,747 B2 4/2013 Hinman et al.
8,419,754 B2 4/2013 Laby et al.
8,423,182 B2 4/2013 Robinson et al.
8,424,737 B2 4/2013 Scirica
8,424,739 B2 4/2013 Racenet et al.
8,424,740 B2 4/2013 Shelton, IV et al.
8,424,741 B2 4/2013 McGuckin, Jr. et al.
8,425,600 B2 4/2013 Maxwell
8,427,430 B2 4/2013 Lee et al.
8,430,292 B2 4/2013 Patel et al.
8,430,892 B2 4/2013 Bindra et al.
8,430,898 B2 4/2013 Wiener et al.
8,435,257 B2 5/2013 Smith et al.
8,439,246 B1 5/2013 Knodel
8,444,036 B2 5/2013 Shelton, IV
8,444,037 B2 5/2013 Nicholas et al.
8,444,549 B2 5/2013 Viola et al.
8,449,536 B2 5/2013 Selig
8,449,560 B2 5/2013 Roth et al.
8,453,904 B2 6/2013 Eskaros et al.
8,453,906 B2 6/2013 Huang et al.
8,453,907 B2 6/2013 Laurent et al.
8,453,908 B2 6/2013 Bedi et al.
8,453,912 B2 6/2013 Mastri et al.
8,453,914 B2 6/2013 Laurent et al.
8,454,495 B2 6/2013 Kawano et al.
8,454,551 B2 6/2013 Allen et al.
8,454,628 B2 6/2013 Smith et al.
8,454,640 B2 6/2013 Johnston et al.
8,457,757 B2 6/2013 Cauller et al.
8,459,520 B2 6/2013 Giordano et al.
8,459,521 B2 6/2013 Zemlok et al.
8,459,524 B2 6/2013 Pribanic et al.
8,459,525 B2 6/2013 Yates et al.
8,464,922 B2 6/2013 Marczyk
8,464,923 B2 6/2013 Shelton, IV
8,464,924 B2 6/2013 Gresham et al.
8,464,925 B2 6/2013 Hull et al.
8,465,475 B2 6/2013 Isbell, Jr.
8,465,502 B2 6/2013 Zergiebel
8,465,515 B2 6/2013 Drew et al.
8,469,254 B2 6/2013 Czernik et al.
8,469,946 B2 6/2013 Sugita
8,469,973 B2 6/2013 Meade et al.
8,470,355 B2 6/2013 Skalla et al.
D686,240 S * 7/2013 Lin D14/488
8,474,677 B2 7/2013 Woodard, Jr. et al.
8,475,453 B2 7/2013 Marczyk et al.
8,475,454 B1 7/2013 Alshemari
8,475,474 B2 7/2013 Bombard et al.
8,479,968 B2 7/2013 Hodgkinson et al.
8,479,969 B2 7/2013 Shelton, IV
8,480,703 B2 7/2013 Nicholas et al.
8,483,509 B2 7/2013 Matsuzaka
8,485,412 B2 7/2013 Shelton, IV et al.
8,485,413 B2 7/2013 Scheib et al.
8,485,970 B2 7/2013 Widenhouse et al.
8,487,199 B2 7/2013 Palmer et al.
8,487,487 B2 7/2013 Dietz et al.
8,490,851 B2 7/2013 Blier et al.
8,490,853 B2 7/2013 Criscuolo et al.
8,491,581 B2 7/2013 Deville et al.
8,491,603 B2 7/2013 Yeung et al.
8,496,153 B2 7/2013 Demmy et al.
8,496,154 B2 7/2013 Marczyk et al.
8,496,156 B2 7/2013 Sniffin et al.
8,496,683 B2 7/2013 Prommersberger et al.
8,499,992 B2 8/2013 Whitman et al.
8,499,993 B2 8/2013 Shelton, IV et al.
8,500,721 B2 8/2013 Jinno
8,500,762 B2 8/2013 Sholev et al.
8,502,091 B2 8/2013 Palmer et al.
8,505,799 B2 8/2013 Viola et al.
8,505,801 B2 8/2013 Ehrenfels et al.
8,506,555 B2 8/2013 Ruiz Morales
8,506,557 B2 8/2013 Zemlok et al.
8,506,580 B2 8/2013 Zergiebel et al.
8,506,581 B2 8/2013 Wingardner, III et al.
8,511,308 B2 8/2013 Hecox et al.
8,512,359 B2 8/2013 Whitman et al.
8,512,402 B2 8/2013 Marczyk et al.
8,517,239 B2 8/2013 Scheib et al.
8,517,241 B2 8/2013 Nicholas et al.
8,517,243 B2 8/2013 Giordano et al.
8,517,244 B2 8/2013 Shelton, IV et al.
8,518,024 B2 8/2013 Williams et al.
8,521,273 B2 8/2013 Kliman
8,523,042 B2 9/2013 Masiakos et al.
8,523,043 B2 9/2013 Ullrich et al.
8,523,881 B2 9/2013 Cabin et al.
8,523,900 B2 9/2013 Jinno et al.
8,529,588 B2 9/2013 Ahlberg et al.
8,529,600 B2 9/2013 Woodard, Jr. et al.
8,529,819 B2 9/2013 Ostapoff et al.
8,532,747 B2 9/2013 Nock et al.
8,534,527 B2 9/2013 Brendel et al.
8,534,528 B2 9/2013 Shelton, IV
8,535,304 B2 9/2013 Sklar et al.
8,535,340 B2 9/2013 Allen
8,539,866 B2 9/2013 Nayak et al.
8,540,128 B2 9/2013 Shelton, IV et al.
8,540,129 B2 9/2013 Baxter, III et al.
8,540,130 B2 9/2013 Moore et al.
8,540,131 B2 9/2013 Swayze
8,540,133 B2 9/2013 Bedi et al.
8,540,733 B2 9/2013 Whitman et al.
8,540,735 B2 9/2013 Mitelberg et al.
8,550,984 B2 10/2013 Takemoto
8,551,076 B2 10/2013 Duval et al.
8,555,660 B2 10/2013 Takenaka et al.
8,556,151 B2 10/2013 Viola
8,556,918 B2 10/2013 Bauman et al.
8,556,935 B1 10/2013 Knodel et al.
8,560,147 B2 10/2013 Taylor et al.
8,561,617 B2 10/2013 Lindh et al.
8,561,870 B2 10/2013 Baxter, III et al.
8,561,871 B2 10/2013 Rajappa et al.
8,561,873 B2 10/2013 Ingmanson et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

8,562,598 B2 10/2013 Falkenstein et al.
8,567,656 B2 10/2013 Shelton, IV et al.
8,568,416 B2 10/2013 Schmitz et al.
8,568,425 B2 10/2013 Ross et al.
D692,916 S 11/2013 Granchi et al.
8,573,459 B2 11/2013 Smith et al.
8,573,461 B2 11/2013 Shelton, IV et al.
8,573,462 B2 11/2013 Smith et al.
8,573,465 B2 11/2013 Shelton, IV
8,574,199 B2 11/2013 von Bulow et al.
8,574,263 B2 11/2013 Mueller
8,575,880 B2 11/2013 Grantz
8,575,895 B2 11/2013 Garrastacho et al.
8,579,176 B2 11/2013 Smith et al.
8,579,178 B2 11/2013 Holsten et al.
8,579,897 B2 11/2013 Vakharia et al.
8,579,937 B2 11/2013 Gresham
8,584,919 B2 11/2013 Hueil et al.
8,584,920 B2 11/2013 Hodgkinson
8,584,921 B2 11/2013 Scirica
8,585,583 B2 11/2013 Sakaguchi et al.
8,585,721 B2 11/2013 Kirsch
8,590,760 B2 11/2013 Cummins et al.
8,590,762 B2 11/2013 Hess et al.
8,590,764 B2 11/2013 Hartwick et al.
8,596,515 B2 12/2013 Okoniewski
8,597,745 B2 12/2013 Farnsworth et al.
8,599,450 B2 12/2013 Kubo et al.
8,602,287 B2 12/2013 Yates et al.
8,602,288 B2 12/2013 Shelton, IV et al.
8,603,077 B2 12/2013 Cooper et al.
8,603,089 B2 12/2013 Viola
8,603,110 B2 12/2013 Maruyama et al.
8,603,135 B2 12/2013 Mueller
8,608,043 B2 12/2013 Scirica
8,608,044 B2 12/2013 Hueil et al.
8,608,045 B2 12/2013 Smith et al.
8,608,046 B2 12/2013 Laurent et al.
8,608,745 B2 12/2013 Guzman et al.
8,613,383 B2 12/2013 Beckman et al.
8,616,427 B2 12/2013 Viola
8,616,431 B2 12/2013 Timm et al.
8,622,274 B2 1/2014 Yates et al.
8,622,275 B2 1/2014 Baxter, III et al.
8,627,993 B2 1/2014 Smith et al.
8,627,994 B2 1/2014 Zemlok et al.
8,627,995 B2 1/2014 Smith et al.
8,628,518 B2 1/2014 Blumenkranz et al.
8,628,544 B2 1/2014 Farascioni
8,628,545 B2 1/2014 Cabrera et al.
8,631,987 B2 1/2014 Shelton, IV et al.
8,631,992 B1 1/2014 Hausen et al.
8,631,993 B2 1/2014 Kostrzewski
8,632,462 B2 1/2014 Yoo et al.
8,632,525 B2 1/2014 Kerr et al.
8,632,535 B2 1/2014 Shelton, IV et al.
8,632,539 B2 1/2014 Twomey et al.
8,632,563 B2 1/2014 Nagase et al.
8,636,187 B2 1/2014 Hueil et al.
8,636,190 B2 1/2014 Zemlok et al.
8,636,191 B2 1/2014 Meagher
8,636,193 B2 1/2014 Whitman et al.
8,636,736 B2 1/2014 Yates et al.
8,636,766 B2 1/2014 Milliman et al.
8,639,936 B2 1/2014 Hu et al.
8,640,788 B2 2/2014 Dachs, II et al.
8,646,674 B2 2/2014 Schulte et al.
8,647,258 B2 2/2014 Aranyi et al.
8,652,120 B2 2/2014 Giordano et al.
8,652,151 B2 2/2014 Lehman et al.
8,657,174 B2 2/2014 Yates et al.
8,657,175 B2 2/2014 Sonnenschein et al.
8,657,176 B2 2/2014 Shelton, IV et al.
8,657,177 B2 2/2014 Scirica et al.
8,657,178 B2 2/2014 Hueil et al.
8,657,482 B2 2/2014 Malackowski et al.
8,657,808 B2 2/2014 McPherson
8,657,814 B2 2/2014 Werneth et al.
8,657,821 B2 2/2014 Palermo
D701,238 S 3/2014 Lai et al.
8,662,370 B2 3/2014 Takei
8,663,106 B2 3/2014 Stivoric et al.
8,663,192 B2 3/2014 Hester et al.
8,663,245 B2 3/2014 Francischelli et al.
8,663,262 B2 3/2014 Smith et al.
8,663,270 B2 3/2014 Donnigan et al.
8,664,792 B2 3/2014 Rebsdorf
8,668,129 B2 3/2014 Olson
8,668,130 B2 3/2014 Hess et al.
8,672,206 B2 3/2014 Aranyi et al.
8,672,207 B2 3/2014 Shelton, IV et al.
8,672,208 B2 3/2014 Hess et al.
8,672,922 B2 3/2014 Loh et al.
8,672,935 B2 3/2014 Okada et al.
8,672,951 B2 3/2014 Smith et al.
8,673,210 B2 3/2014 Deshays
8,675,820 B2 3/2014 Baic et al.
8,678,263 B2 3/2014 Viola
8,678,994 B2 3/2014 Sonnenschein et al.
8,679,093 B2 3/2014 Farra
8,679,098 B2 3/2014 Hart
8,679,137 B2 3/2014 Bauman et al.
8,679,154 B2 3/2014 Smith et al.
8,679,156 B2 3/2014 Smith et al.
8,679,454 B2 3/2014 Guire et al.
8,684,248 B2 4/2014 Milliman
8,684,249 B2 4/2014 Racenet et al.
8,684,250 B2 4/2014 Bettuchi et al.
8,684,253 B2 4/2014 Giordano et al.
8,684,962 B2 4/2014 Kirschenman et al.
8,685,004 B2 4/2014 Zemlock et al.
8,685,020 B2 4/2014 Weizman et al.
8,690,893 B2 4/2014 Deitch et al.
8,695,866 B2 4/2014 Leimbach et al.
8,696,665 B2 4/2014 Hunt et al.
8,701,958 B2 4/2014 Shelton, IV et al.
8,701,959 B2 4/2014 Shah
8,708,210 B2 4/2014 Zemlok et al.
8,708,211 B2 4/2014 Zemlok et al.
8,708,213 B2 4/2014 Shelton, IV et al.
8,714,352 B2 5/2014 Farascioni et al.
8,714,429 B2 5/2014 Demmy
8,714,430 B2 5/2014 Natarajan et al.
8,715,256 B2 5/2014 Greener
8,715,302 B2 5/2014 Ibrahim et al.
8,720,766 B2 5/2014 Hess et al.
8,721,630 B2 5/2014 Ortiz et al.
8,721,666 B2 5/2014 Schroeder et al.
8,727,197 B2 5/2014 Hess et al.
8,727,199 B2 5/2014 Wenchell
8,727,200 B2 5/2014 Roy
8,727,961 B2 5/2014 Ziv
8,728,099 B2 5/2014 Cohn et al.
8,728,119 B2 5/2014 Cummins
8,733,470 B2 5/2014 Matthias et al.
8,733,612 B2 5/2014 Ma
8,733,613 B2 5/2014 Huitema et al.
8,733,614 B2 5/2014 Ross et al.
8,734,336 B2 5/2014 Bonadio et al.
8,734,359 B2 5/2014 Ibanez et al.
8,734,478 B2 5/2014 Widenhouse et al.
8,739,033 B2 5/2014 Rosenberg
8,739,417 B2 6/2014 Tokunaga et al.
8,740,034 B2 6/2014 Morgan et al.
8,740,037 B2 6/2014 Shelton, IV et al.
8,740,038 B2 6/2014 Shelton, IV et al.
8,740,987 B2 6/2014 Geremakis et al.
8,746,529 B2 6/2014 Shelton, IV et al.
8,746,530 B2 6/2014 Giordano et al.
8,746,533 B2 6/2014 Whitman et al.
8,746,535 B2 6/2014 Shelton, IV et al.
8,747,238 B2 6/2014 Shelton, IV et al.
8,747,441 B2 6/2014 Konieczynski et al.
8,752,264 B2 6/2014 Ackley et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

8,752,699 B2 6/2014 Morgan et al.
8,752,747 B2 6/2014 Shelton, IV
8,752,748 B2 6/2014 Whitman et al.
8,752,749 B2 6/2014 Moore et al.
8,753,664 B2 6/2014 Dao et al.
8,757,287 B2 6/2014 Mak et al.
8,757,465 B2 6/2014 Woodard, Jr. et al.
8,758,235 B2 6/2014 Jaworek
8,758,366 B2 6/2014 McLean et al.
8,758,391 B2 6/2014 Swayze et al.
8,758,438 B2 6/2014 Boyce et al.
8,763,875 B2 7/2014 Morgan et al.
8,763,877 B2 7/2014 Schall et al.
8,763,879 B2 7/2014 Shelton, IV et al.
8,764,732 B2 7/2014 Hartwell
8,770,458 B2 7/2014 Scirica
8,770,459 B2 7/2014 Racenet et al.
8,770,460 B2 7/2014 Belzer
8,771,169 B2 7/2014 Whitman et al.
8,771,260 B2 7/2014 Conlon et al.
8,777,004 B2 7/2014 Shelton, IV et al.
8,777,082 B2 7/2014 Scirica
8,777,083 B2 7/2014 Racenet et al.
8,777,898 B2 7/2014 Suon et al.
8,783,541 B2 7/2014 Shelton, IV et al.
8,783,542 B2 7/2014 Riestenberg et al.
8,783,543 B2 7/2014 Shelton, IV et al.
8,784,304 B2 7/2014 Mikkaichi et al.
8,784,404 B2 7/2014 Doyle et al.
8,784,415 B2 7/2014 Malackowski et al.
8,789,737 B2 7/2014 Hodgkinson et al.
8,789,739 B2 7/2014 Swensgard
8,789,740 B2 7/2014 Baxter, III et al.
8,789,741 B2 7/2014 Baxter, III et al.
8,790,658 B2 7/2014 Cigarini et al.
8,790,684 B2 7/2014 Dave et al.
D711,905 S * 8/2014 Morrison D14/486
8,794,496 B2 8/2014 Scirica
8,794,497 B2 8/2014 Zingman
8,795,276 B2 8/2014 Dietz et al.
8,795,308 B2 8/2014 Valin
8,795,324 B2 8/2014 Kawai et al.
8,796,995 B2 8/2014 Cunanan et al.
8,800,681 B2 8/2014 Rousson et al.
8,800,837 B2 8/2014 Zemlok
8,800,838 B2 8/2014 Shelton, IV
8,800,839 B2 8/2014 Beetel
8,800,840 B2 8/2014 Jankowski
8,800,841 B2 8/2014 Ellerhorst et al.
8,801,710 B2 8/2014 Ullrich et al.
8,801,734 B2 8/2014 Shelton, IV et al.
8,801,735 B2 8/2014 Shelton, IV et al.
8,801,752 B2 8/2014 Fortier et al.
8,801,801 B2 8/2014 Datta et al.
8,806,973 B2 8/2014 Ross et al.
8,807,414 B2 8/2014 Ross et al.
8,808,161 B2 8/2014 Gregg et al.
8,808,164 B2 8/2014 Hoffman et al.
8,808,274 B2 8/2014 Hartwell
8,808,294 B2 8/2014 Fox et al.
8,808,308 B2 8/2014 Boukhny et al.
8,808,311 B2 8/2014 Heinrich et al.
8,808,325 B2 8/2014 Hess et al.
8,810,197 B2 8/2014 Juergens
8,811,017 B2 8/2014 Fujii et al.
8,813,866 B2 8/2014 Suzuki
8,814,024 B2 8/2014 Woodard, Jr. et al.
8,814,025 B2 8/2014 Miller et al.
8,814,836 B2 8/2014 Ignon et al.
8,818,523 B2 8/2014 Olson et al.
8,820,603 B2 9/2014 Shelton, IV et al.
8,820,605 B2 9/2014 Shelton, IV
8,820,606 B2 9/2014 Hodgkinson
8,820,607 B2 9/2014 Marczyk
8,820,608 B2 9/2014 Miyamoto
8,821,514 B2 9/2014 Aranyi
8,822,934 B2 9/2014 Sayeh et al.
8,825,164 B2 9/2014 Tweden et al.
8,827,133 B2 9/2014 Shelton, IV et al.
8,827,134 B2 9/2014 Viola et al.
8,827,903 B2 9/2014 Shelton, IV et al.
8,833,219 B2 9/2014 Pierce
8,833,630 B2 9/2014 Milliman
8,833,632 B2 9/2014 Swensgard
8,834,353 B2 9/2014 Dejima et al.
8,834,498 B2 9/2014 Byrum et al.
8,834,518 B2 9/2014 Faller et al.
8,840,003 B2 9/2014 Morgan et al.
8,840,603 B2 9/2014 Shelton, IV et al.
8,840,609 B2 9/2014 Stuebe
8,840,876 B2 9/2014 Eemeta et al.
8,844,789 B2 9/2014 Shelton, IV et al.
8,844,790 B2 9/2014 Demmy et al.
8,851,215 B2 10/2014 Goto
8,851,354 B2 10/2014 Swensgard et al.
8,852,174 B2 10/2014 Burbank
8,852,185 B2 10/2014 Twomey
8,852,199 B2 10/2014 Deslauriers et al.
8,852,218 B2 10/2014 Hughett, Sr. et al.
8,857,693 B2 10/2014 Schuckmann et al.
8,857,694 B2 10/2014 Shelton, IV et al.
8,858,538 B2 10/2014 Belson et al.
8,858,571 B2 10/2014 Shelton, IV et al.
8,858,590 B2 10/2014 Shelton, IV et al.
8,864,007 B2 10/2014 Widenhouse et al.
8,864,009 B2 10/2014 Shelton, IV et al.
8,864,010 B2 10/2014 Williams
8,870,050 B2 10/2014 Hodgkinson
8,870,912 B2 10/2014 Brisson et al.
8,875,971 B2 11/2014 Hall et al.
8,875,972 B2 11/2014 Weisenburgh, II et al.
8,876,857 B2 11/2014 Burbank
8,876,858 B2 11/2014 Braun
8,887,979 B2 11/2014 Mastri et al.
8,888,688 B2 11/2014 Julian et al.
8,888,695 B2 11/2014 Piskun et al.
8,888,792 B2 11/2014 Harris et al.
8,888,809 B2 11/2014 Davison et al.
8,893,946 B2 11/2014 Boudreaux et al.
8,893,949 B2 11/2014 Shelton, IV et al.
8,894,647 B2 11/2014 Beardsley et al.
8,894,654 B2 11/2014 Anderson
8,899,460 B2 12/2014 Wojcicki
8,899,461 B2 12/2014 Farascioni
8,899,462 B2 12/2014 Kostrzewski et al.
8,899,463 B2 12/2014 Schall et al.
8,899,464 B2 12/2014 Hueil et al.
8,899,465 B2 12/2014 Shelton, IV et al.
8,899,466 B2 12/2014 Baxter, III et al.
8,900,267 B2 12/2014 Woolfson et al.
8,905,287 B2 12/2014 Racenet et al.
8,905,977 B2 12/2014 Shelton et al.
8,910,846 B2 12/2014 Viola
8,911,426 B2 12/2014 Coppeta et al.
8,911,448 B2 12/2014 Stein
8,911,460 B2 12/2014 Neurohr et al.
8,911,471 B2 12/2014 Spivey et al.
8,920,433 B2 12/2014 Barrier et al.
8,920,435 B2 12/2014 Smith et al.
8,920,438 B2 12/2014 Aranyi et al.
8,920,443 B2 12/2014 Hiles et al.
8,920,444 B2 12/2014 Hiles et al.
8,922,163 B2 12/2014 Macdonald
8,925,782 B2 1/2015 Shelton, IV
8,925,783 B2 1/2015 Zemlok et al.
8,925,788 B2 1/2015 Hess et al.
8,926,506 B2 1/2015 Widenhouse et al.
8,926,598 B2 1/2015 Mollere et al.
8,931,576 B2 1/2015 Iwata
8,931,679 B2 1/2015 Kostrzewski
8,931,680 B2 1/2015 Milliman
8,931,682 B2 1/2015 Timm et al.
8,936,614 B2 1/2015 Allen, IV
8,939,343 B2 1/2015 Milliman et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

8,939,344 B2 1/2015 Olson et al.
8,945,163 B2 2/2015 Voegele et al.
8,955,732 B2 2/2015 Zemlok et al.
8,956,342 B1 2/2015 Russo et al.
8,956,390 B2 2/2015 Shah et al.
8,958,860 B2 2/2015 Banerjee et al.
8,960,519 B2 2/2015 Whitman et al.
8,960,520 B2 2/2015 McCuen
8,960,521 B2 2/2015 Kostrzewski
8,961,191 B2 2/2015 Hanshew
8,961,504 B2 2/2015 Hoarau et al.
8,963,714 B2 2/2015 Medhal et al.
D725,674 S 3/2015 Jung et al.
8,967,443 B2 3/2015 McCuen
8,967,444 B2 3/2015 Beetel
8,967,446 B2 3/2015 Beardsley et al.
8,967,448 B2 3/2015 Carter et al.
8,968,276 B2 3/2015 Zemlok et al.
8,968,308 B2 3/2015 Homer et al.
8,968,312 B2 3/2015 Marczyk et al.
8,968,337 B2 3/2015 Whitfield et al.
8,968,340 B2 3/2015 Chowaniec et al.
8,968,355 B2 3/2015 Malkowski et al.
8,968,358 B2 3/2015 Reschke
8,970,507 B2 3/2015 Holbein et al.
8,973,803 B2 3/2015 Hall et al.
8,973,804 B2 3/2015 Hess et al.
8,973,805 B2 3/2015 Scirica et al.
8,974,440 B2 3/2015 Farritor et al.
8,974,932 B2 3/2015 McGahan et al.
8,978,954 B2 3/2015 Shelton, IV et al.
8,978,955 B2 3/2015 Aronhalt et al.
8,978,956 B2 3/2015 Schell et al.
8,979,843 B2 3/2015 Timm et al.
8,979,890 B2 3/2015 Boudreaux
8,982,195 B2 3/2015 Claus et al.
8,985,429 B2 3/2015 Balek et al.
8,986,302 B2 3/2015 Aldridge et al.
8,991,676 B2 3/2015 Hess et al.
8,991,677 B2 3/2015 Moore et al.
8,991,678 B2 3/2015 Wellman et al.
8,992,042 B2 3/2015 Eichenholz
8,992,422 B2 3/2015 Spivey et al.
8,992,565 B2 3/2015 Brisson et al.
8,996,165 B2 3/2015 Wang et al.
8,998,058 B2 4/2015 Moore et al.
8,998,059 B2 4/2015 Smith et al.
8,998,060 B2 4/2015 Bruewer et al.
8,998,061 B2 4/2015 Williams et al.
8,998,939 B2 4/2015 Price et al.
9,000,720 B2 4/2015 Stulen et al.
9,002,518 B2 4/2015 Manzo et al.
9,004,339 B1 4/2015 Park
9,005,230 B2 4/2015 Yates et al.
9,005,238 B2 4/2015 DeSantis et al.
9,005,243 B2 4/2015 Stopek et al.
9,010,606 B2 4/2015 Aranyi et al.
9,010,608 B2 4/2015 Casasanta, Jr. et al.
9,010,611 B2 4/2015 Ross et al.
9,011,439 B2 4/2015 Shalaby et al.
9,011,471 B2 4/2015 Timm et al.
9,016,539 B2 4/2015 Kostrzewski et al.
9,016,540 B2 4/2015 Whitman et al.
9,016,541 B2 4/2015 Viola et al.
9,016,542 B2 4/2015 Shelton, IV et al.
9,016,545 B2 4/2015 Aranyi et al.
9,017,331 B2 4/2015 Fox
9,017,355 B2 4/2015 Smith et al.
9,017,369 B2 4/2015 Renger et al.
9,017,371 B2 4/2015 Whitman et al.
9,021,684 B2 5/2015 Lenker et al.
9,023,014 B2 5/2015 Chowaniec et al.
9,023,069 B2 5/2015 Kasvikis et al.
9,023,071 B2 5/2015 Miller et al.
9,026,347 B2 5/2015 Gadh et al.
9,027,817 B2 5/2015 Milliman et al.
9,028,494 B2 5/2015 Shelton, IV et al.
9,028,495 B2 5/2015 Mueller et al.
9,028,519 B2 5/2015 Yates et al.
9,030,169 B2 5/2015 Christensen et al.
9,033,203 B2 5/2015 Woodard, Jr. et al.
9,033,204 B2 5/2015 Shelton, IV et al.
9,034,505 B2 5/2015 Detry et al.
9,038,881 B1 5/2015 Schaller et al.
9,039,690 B2 5/2015 Kersten et al.
9,039,694 B2 5/2015 Ross et al.
9,039,720 B2 5/2015 Madan
9,043,027 B2 5/2015 Durant et al.
9,044,227 B2 6/2015 Shelton, IV et al.
9,044,228 B2 6/2015 Woodard, Jr. et al.
9,044,229 B2 6/2015 Scheib et al.
9,044,230 B2 6/2015 Morgan et al.
9,044,241 B2 6/2015 Barner et al.
9,044,261 B2 6/2015 Houser
9,044,281 B2 6/2015 Pool et al.
9,050,083 B2 6/2015 Yates et al.
9,050,084 B2 6/2015 Schmid et al.
9,050,100 B2 6/2015 Yates et al.
9,050,120 B2 6/2015 Swarup et al.
9,050,123 B2 6/2015 Krause et al.
9,050,176 B2 6/2015 Datta et al.
9,055,941 B2 6/2015 Schmid et al.
9,055,942 B2 6/2015 Balbierz et al.
9,055,943 B2 6/2015 Zemlok et al.
9,055,944 B2 6/2015 Hodgkinson et al.
9,055,961 B2 6/2015 Manzo et al.
9,060,770 B2 6/2015 Shelton, IV et al.
9,060,776 B2 6/2015 Yates et al.
9,060,794 B2 6/2015 Kang et al.
9,060,894 B2 6/2015 Wubbeling
9,061,392 B2 6/2015 Forgues et al.
9,072,515 B2 7/2015 Hall et al.
9,072,523 B2 7/2015 Houser et al.
9,072,535 B2 7/2015 Shelton, IV et al.
9,072,536 B2 7/2015 Shelton, IV et al.
9,078,653 B2 7/2015 Leimbach et al.
9,084,601 B2 7/2015 Moore et al.
9,084,602 B2 7/2015 Gleiman
9,086,875 B2 7/2015 Harrat et al.
9,089,326 B2 7/2015 Krumanaker et al.
9,089,330 B2 7/2015 Widenhouse et al.
9,089,352 B2 7/2015 Jeong
9,089,360 B2 7/2015 Messerly et al.
9,091,588 B2 7/2015 Lefler
D736,792 S 8/2015 Brinda et al.
9,095,339 B2 8/2015 Moore et al.
9,095,346 B2 8/2015 Houser et al.
9,095,362 B2 8/2015 Dachs, II et al.
9,095,367 B2 8/2015 Olson et al.
9,096,033 B2 8/2015 Holop et al.
9,099,863 B2 8/2015 Smith et al.
9,099,877 B2 8/2015 Banos et al.
9,101,358 B2 8/2015 Kerr et al.
9,101,385 B2 8/2015 Shelton, IV et al.
9,101,475 B2 8/2015 Wei et al.
9,107,663 B2 8/2015 Swensgard
9,107,690 B2 8/2015 Bales, Jr. et al.
9,110,587 B2 8/2015 Kim et al.
9,113,862 B2 8/2015 Morgan et al.
9,113,864 B2 8/2015 Morgan et al.
9,113,865 B2 8/2015 Shelton, IV et al.
9,113,868 B2 8/2015 Felder et al.
9,113,873 B2 8/2015 Marczyk et al.
9,113,874 B2 8/2015 Shelton, IV et al.
9,113,876 B2 8/2015 Zemlok et al.
9,113,879 B2 8/2015 Felder et al.
9,113,880 B2 8/2015 Zemlok et al.
9,113,881 B2 8/2015 Scirica
9,113,883 B2 8/2015 Aronhalt et al.
9,113,884 B2 8/2015 Shelton, IV et al.
9,113,887 B2 8/2015 Behnke, II et al.
9,119,615 B2 9/2015 Felder et al.
9,119,657 B2 9/2015 Shelton, IV et al.
9,119,898 B2 9/2015 Bayon et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

9,119,957 B2 9/2015 Gantz et al.
9,123,286 B2 9/2015 Park
9,124,097 B2 9/2015 Cruz
9,125,654 B2 9/2015 Aronhalt et al.
9,125,662 B2 9/2015 Shelton, IV
9,126,317 B2 9/2015 Lawton et al.
9,131,835 B2 9/2015 Widenhouse et al.
9,131,940 B2 9/2015 Huitema et al.
9,131,950 B2 9/2015 Matthew
9,131,957 B2 9/2015 Skarbnik et al.
9,138,225 B2 9/2015 Huang et al.
9,138,226 B2 9/2015 Racenet et al.
9,144,455 B2 9/2015 Kennedy et al.
D741,882 S 10/2015 Shmilov et al.
9,149,274 B2 10/2015 Spivey et al.
9,149,324 B2 10/2015 Huang et al.
9,149,325 B2 10/2015 Worrell et al.
9,153,994 B2 10/2015 Wood et al.
9,161,753 B2 10/2015 Prior
9,161,769 B2 10/2015 Stoddard et al.
9,161,803 B2 10/2015 Yates et al.
9,161,807 B2 10/2015 Garrison
9,168,038 B2 10/2015 Shelton, IV et al.
9,168,039 B1 10/2015 Knodel
9,168,042 B2 10/2015 Milliman
9,168,054 B2 10/2015 Turner et al.
9,168,144 B2 10/2015 Rivin et al.
9,179,911 B2 11/2015 Morgan et al.
9,179,912 B2 11/2015 Yates et al.
9,182,244 B2 11/2015 Luke et al.
9,186,046 B2 11/2015 Ramamurthy et al.
9,186,137 B2 11/2015 Farascioni et al.
9,186,140 B2 11/2015 Hiles et al.
9,186,142 B2 11/2015 Fanelli et al.
9,186,143 B2 11/2015 Timm et al.
9,186,148 B2 11/2015 Felder et al.
9,186,221 B2 11/2015 Burbank
9,192,380 B2 11/2015 (Tarinelli) Racenet et al.
9,192,384 B2 11/2015 Bettuchi
9,192,430 B2 11/2015 Rachlin et al.
9,192,434 B2 11/2015 Twomey et al.
9,193,045 B2 11/2015 Saur et al.
9,197,079 B2 11/2015 Yip et al.
D744,528 S 12/2015 Agrawal
9,198,642 B2 12/2015 Storz
9,198,644 B2 12/2015 Balek et al.
9,198,661 B2 12/2015 Swensgard
9,198,662 B2 12/2015 Barton et al.
9,198,683 B2 12/2015 Friedman et al.
9,204,830 B2 12/2015 Zand et al.
9,204,877 B2 12/2015 Whitman et al.
9,204,878 B2 12/2015 Hall et al.
9,204,879 B2 12/2015 Shelton, IV
9,204,880 B2 12/2015 Baxter, III et al.
9,204,923 B2 12/2015 Manzo et al.
9,204,924 B2 12/2015 Marczyk et al.
9,211,120 B2 12/2015 Scheib et al.
9,211,121 B2 12/2015 Hall et al.
9,211,122 B2 12/2015 Hagerty et al.
9,216,013 B2 12/2015 Scirica et al.
9,216,019 B2 12/2015 Schmid et al.
9,216,020 B2 12/2015 Zhang et al.
9,216,030 B2 12/2015 Fan et al.
9,216,062 B2 12/2015 Duque et al.
9,220,500 B2 12/2015 Swayze et al.
9,220,501 B2 12/2015 Baxter, III et al.
9,220,502 B2 12/2015 Zemlok et al.
9,220,508 B2 12/2015 Dannaher
9,220,559 B2 12/2015 Worrell et al.
9,220,570 B2 12/2015 Kim et al.
D746,854 S 1/2016 Shardlow et al.
9,226,750 B2 1/2016 Weir et al.
9,226,751 B2 1/2016 Shelton, IV et al.
9,226,754 B2 1/2016 D'Agostino et al.
9,226,761 B2 1/2016 Burbank
9,226,767 B2 1/2016 Stulen et al.
9,232,941 B2 1/2016 Mandakolathur Vasudevan et al.
9,232,945 B2 1/2016 Zingman
9,232,979 B2 1/2016 Parihar et al.
9,233,610 B2 1/2016 Kim et al.
9,237,891 B2 1/2016 Shelton, IV
9,237,892 B2 1/2016 Hodgkinson
9,237,895 B2 1/2016 McCarthy et al.
9,237,900 B2 1/2016 Boudreaux et al.
9,237,921 B2 1/2016 Messerly et al.
9,239,064 B2 1/2016 Helbig et al.
9,240,740 B2 1/2016 Zeng et al.
9,241,711 B2 1/2016 Ivanko
9,241,712 B2 1/2016 Zemlok et al.
9,241,714 B2 1/2016 Timm et al.
9,241,716 B2 1/2016 Whitman
9,241,731 B2 1/2016 Boudreaux et al.
9,244,524 B2 1/2016 Inoue et al.
D748,668 S 2/2016 Kim et al.
D749,623 S 2/2016 Gray et al.
D750,122 S 2/2016 Shardlow et al.
D750,129 S 2/2016 Kwon
9,254,131 B2 2/2016 Soltz et al.
9,259,274 B2 2/2016 Prisco
9,259,275 B2 2/2016 Burbank
9,261,172 B2 2/2016 Solomon et al.
9,265,500 B2 2/2016 Sorrentino et al.
9,265,516 B2 2/2016 Casey et al.
9,265,585 B2 2/2016 Wingardner et al.
9,271,718 B2 3/2016 Milad et al.
9,271,727 B2 3/2016 McGuckin, Jr. et al.
9,271,753 B2 3/2016 Butler et al.
9,271,799 B2 3/2016 Shelton, IV et al.
9,272,406 B2 3/2016 Aronhalt et al.
9,274,095 B2 3/2016 Humayun et al.
9,277,919 B2 3/2016 Timmer et al.
9,277,922 B2 3/2016 Carter et al.
9,282,962 B2 3/2016 Schmid et al.
9,282,963 B2 3/2016 Bryant
9,282,966 B2 3/2016 Shelton, IV et al.
9,282,974 B2 3/2016 Shelton, IV
9,283,028 B2 3/2016 Johnson
9,283,045 B2 3/2016 Rhee et al.
9,283,054 B2 3/2016 Morgan et al.
9,289,206 B2 3/2016 Hess et al.
9,289,207 B2 3/2016 Shelton, IV
9,289,210 B2 3/2016 Baxter, III et al.
9,289,211 B2 3/2016 Williams et al.
9,289,212 B2 3/2016 Shelton, IV et al.
9,289,225 B2 3/2016 Shelton, IV et al.
9,289,256 B2 3/2016 Shelton, IV et al.
9,293,757 B2 3/2016 Toussaint et al.
9,295,464 B2 3/2016 Shelton, IV et al.
9,295,465 B2 3/2016 Farascioni
9,295,466 B2 3/2016 Hodgkinson et al.
9,295,467 B2 3/2016 Scirica
9,295,468 B2 3/2016 Heinrich et al.
9,295,514 B2 3/2016 Shelton, IV et al.
9,295,522 B2 3/2016 Kostrzewski
9,295,784 B2 3/2016 Eggert et al.
9,301,691 B2 4/2016 Hufnagel et al.
9,301,752 B2 4/2016 Mandakolathur Vasudevan et al.
9,301,753 B2 4/2016 Aldridge et al.
9,301,755 B2 4/2016 Shelton, IV et al.
9,301,759 B2 4/2016 Spivey et al.
9,307,965 B2 4/2016 Ming et al.
9,307,986 B2 4/2016 Hall et al.
9,307,987 B2 4/2016 Swensgard et al.
9,307,988 B2 4/2016 Shelton, IV
9,307,989 B2 4/2016 Shelton, IV et al.
9,307,994 B2 4/2016 Gresham et al.
9,308,009 B2 4/2016 Madan et al.
9,308,011 B2 4/2016 Chao et al.
9,308,646 B2 4/2016 Lim et al.
9,313,915 B2 4/2016 Niu et al.
9,314,246 B2 4/2016 Shelton, IV et al.
9,314,247 B2 4/2016 Shelton, IV et al.
9,314,261 B2 4/2016 Bales, Jr. et al.
9,314,908 B2 4/2016 Tanimoto et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

9,320,518 B2 4/2016 Henderson et al.
9,320,520 B2 4/2016 Shelton, IV et al.
9,320,521 B2 4/2016 Shelton, IV et al.
9,320,523 B2 4/2016 Shelton, IV et al.
9,325,516 B2 4/2016 Pera et al.
D755,196 S 5/2016 Meyers et al.
D756,373 S 5/2016 Raskin et al.
D756,377 S 5/2016 Connolly et al.
D757,028 S 5/2016 Goldenberg et al.
9,326,767 B2 5/2016 Koch, Jr. et al.
9,326,768 B2 5/2016 Shelton, IV
9,326,769 B2 5/2016 Shelton, IV et al.
9,326,770 B2 5/2016 Shelton, IV et al.
9,326,771 B2 5/2016 Baxter, III et al.
9,326,788 B2 5/2016 Batross et al.
9,326,812 B2 5/2016 Waaler et al.
9,331,721 B2 5/2016 Martinez Nuevo et al.
9,332,890 B2 5/2016 Ozawa
9,332,974 B2 5/2016 Henderson et al.
9,332,984 B2 5/2016 Weaner et al.
9,332,987 B2 5/2016 Leimbach et al.
9,333,040 B2 5/2016 Shellenberger et al.
9,333,082 B2 5/2016 Wei et al.
9,337,668 B2 5/2016 Yip
9,339,226 B2 5/2016 van der Walt et al.
9,345,477 B2 5/2016 Anim et al.
9,345,479 B2 5/2016 (Tarinelli) Racenet et al.
9,345,480 B2 5/2016 Hessler et al.
9,345,481 B2 5/2016 Hall et al.
9,351,726 B2 5/2016 Leimbach et al.
9,351,727 B2 5/2016 Leimbach et al.
9,351,728 B2 5/2016 Sniffin et al.
9,351,730 B2 5/2016 Schmid et al.
9,351,731 B2 5/2016 Carter et al.
9,351,732 B2 5/2016 Hodgkinson
D758,433 S 6/2016 Lee et al.
D759,063 S 6/2016 Chen
9,358,003 B2 6/2016 Hall et al.
9,358,005 B2 6/2016 Shelton, IV et al.
9,358,015 B2 6/2016 Sorrentino et al.
9,358,031 B2 6/2016 Manzo
9,364,217 B2 6/2016 Kostrzewski et al.
9,364,219 B2 6/2016 Olson et al.
9,364,220 B2 6/2016 Williams
9,364,226 B2 6/2016 Zemlok et al.
9,364,229 B2 6/2016 D'Agostino et al.
9,364,230 B2 6/2016 Shelton, IV et al.
9,364,231 B2 6/2016 Wenchell
9,364,233 B2 6/2016 Alexander, III et al.
9,364,279 B2 6/2016 Houser et al.
9,368,991 B2 6/2016 Qahouq
9,370,341 B2 6/2016 Ceniccola et al.
9,370,358 B2 6/2016 Shelton, IV et al.
9,370,364 B2 6/2016 Smith et al.
9,375,206 B2 6/2016 Vidal et al.
9,375,230 B2 6/2016 Ross et al.
9,375,232 B2 6/2016 Hunt et al.
9,375,255 B2 6/2016 Houser et al.
D761,309 S 7/2016 Lee et al.
9,381,058 B2 7/2016 Houser et al.
9,386,983 B2 7/2016 Swensgard et al.
9,386,984 B2 7/2016 Aronhalt et al.
9,386,985 B2 7/2016 Koch, Jr. et al.
9,386,988 B2 7/2016 Baxter, III et al.
9,387,003 B2 7/2016 Kaercher et al.
9,393,015 B2 7/2016 Laurent et al.
9,393,017 B2 7/2016 Flanagan et al.
9,393,018 B2 7/2016 Wang et al.
9,398,911 B2 7/2016 Auld
D763,277 S 8/2016 Ahmed et al.
D764,498 S 8/2016 Capela et al.
9,402,604 B2 8/2016 Williams et al.
9,402,626 B2 8/2016 Ortiz et al.
9,402,627 B2 8/2016 Stevenson et al.
9,402,629 B2 8/2016 Ehrenfels et al.
9,408,604 B2 8/2016 Shelton, IV et al.
9,408,606 B2 8/2016 Shelton, IV
9,408,622 B2 8/2016 Stulen et al.
9,411,370 B2 8/2016 Benni et al.
9,413,128 B2 8/2016 Tien et al.
9,414,838 B2 8/2016 Shelton, IV et al.
9,414,849 B2 8/2016 Nagashimada
9,414,880 B2 8/2016 Monson et al.
9,420,967 B2 8/2016 Zand et al.
9,421,003 B2 8/2016 Williams et al.
9,421,014 B2 8/2016 Ingmanson et al.
9,421,030 B2 8/2016 Cole et al.
9,421,060 B2 8/2016 Monson et al.
9,421,062 B2 8/2016 Houser et al.
9,427,223 B2 8/2016 Park et al.
9,427,231 B2 8/2016 Racenet et al.
D767,624 S 9/2016 Lee et al.
9,433,411 B2 9/2016 Racenet et al.
9,433,419 B2 9/2016 Gonzalez et al.
9,433,420 B2 9/2016 Hodgkinson
9,439,649 B2 9/2016 Shelton, IV et al.
9,439,650 B2 9/2016 McGuckin, Jr. et al.
9,439,651 B2 9/2016 Smith et al.
9,439,668 B2 9/2016 Timm et al.
9,445,808 B2 9/2016 Woodard, Jr. et al.
9,445,813 B2 9/2016 Shelton, IV et al.
9,445,817 B2 9/2016 Bettuchi
9,446,226 B2 9/2016 Zilberman
9,451,938 B2 9/2016 Overes et al.
9,451,958 B2 9/2016 Shelton, IV et al.
D768,152 S 10/2016 Gutierrez et al.
D768,156 S 10/2016 Frincke
D769,315 S 10/2016 Scotti
D769,930 S 10/2016 Agrawal
9,461,340 B2 10/2016 Li et al.
9,463,040 B2 10/2016 Jeong et al.
9,463,260 B2 10/2016 Stopek
9,468,438 B2 10/2016 Baber et al.
9,468,447 B2 10/2016 Aman et al.
9,470,297 B2 10/2016 Aranyi et al.
9,471,969 B2 10/2016 Zeng et al.
9,474,506 B2 10/2016 Magnin et al.
9,474,523 B2 10/2016 Meade et al.
9,474,540 B2 10/2016 Stokes et al.
9,475,180 B2 10/2016 Eshleman et al.
D770,476 S 11/2016 Jitkoff et al.
D770,515 S 11/2016 Cho et al.
D771,116 S 11/2016 Dellinger et al.
D772,905 S * 11/2016 Ingenlath D14/486
9,480,476 B2 11/2016 Aldridge et al.
9,480,492 B2 11/2016 Aranyi et al.
9,483,095 B2 11/2016 Tran et al.
9,486,186 B2 11/2016 Fiebig et al.
9,486,213 B2 11/2016 Altman et al.
9,486,214 B2 11/2016 Shelton, IV
9,486,302 B2 11/2016 Boey et al.
9,488,197 B2 11/2016 Wi
9,492,146 B2 11/2016 Kostrzewski et al.
9,492,167 B2 11/2016 Shelton, IV et al.
9,492,170 B2 11/2016 Bear et al.
9,492,189 B2 11/2016 Williams et al.
9,492,192 B2 11/2016 To et al.
9,498,213 B2 11/2016 Marczyk et al.
9,498,219 B2 11/2016 Moore et al.
9,504,483 B2 11/2016 Houser et al.
9,504,521 B2 11/2016 Deutmeyer et al.
D774,547 S 12/2016 Capela et al.
D775,336 S 12/2016 Shelton, IV et al.
9,510,827 B2 12/2016 Kostrzewski
9,510,828 B2 12/2016 Yates et al.
9,510,830 B2 12/2016 Shelton, IV et al.
9,510,846 B2 12/2016 Sholev et al.
9,510,895 B2 12/2016 Houser et al.
9,510,925 B2 12/2016 Hotter et al.
9,517,063 B2 12/2016 Swayze et al.
9,517,068 B2 12/2016 Shelton, IV et al.
9,521,996 B2 12/2016 Armstrong
9,522,029 B2 12/2016 Yates et al.
9,526,481 B2 12/2016 Storz et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

9,526,499	B2		12/2016	Kostrzewski et al.
9,526,563	B2		12/2016	Twomey
9,526,564	B2		12/2016	Rusin
D776,683	S		1/2017	Gobinski et al.
D777,773	S		1/2017	Shi
9,532,783	B2		1/2017	Swayze et al.
9,539,726	B2		1/2017	Simaan et al.
9,545,253	B2		1/2017	Worrell et al.
9,545,258	B2		1/2017	Smith et al.
9,549,732	B2		1/2017	Yates et al.
9,549,735	B2		1/2017	Shelton, IV et al.
9,554,794	B2		1/2017	Baber et al.
9,554,796	B2		1/2017	Kostrzewski
9,554,812	B2		1/2017	Inkpen et al.
9,559,624	B2		1/2017	Philipp
9,561,013	B2		2/2017	Tsuchiya
9,561,030	B2		2/2017	Zhang et al.
9,561,031	B2		2/2017	Heinrich et al.
9,561,032	B2		2/2017	Shelton, IV et al.
9,561,038	B2		2/2017	Shelton, IV et al.
9,561,045	B2		2/2017	Hinman et al.
9,566,061	B2		2/2017	Aronhalt et al.
9,566,062	B2		2/2017	Boudreaux
9,566,065	B2		2/2017	Knodel
9,566,067	B2		2/2017	Milliman et al.
9,572,574	B2		2/2017	Shelton, IV et al.
9,572,577	B2		2/2017	Lloyd et al.
9,572,592	B2		2/2017	Price et al.
9,574,644	B2		2/2017	Parihar
9,579,088	B2		2/2017	Farritor et al.
D780,803	S	*	3/2017	Gill D14/489
D781,879	S		3/2017	Butcher et al.
D782,530	S		3/2017	Paek et al.
9,585,550	B2		3/2017	Abel et al.
9,585,657	B2		3/2017	Shelton, IV et al.
9,585,658	B2		3/2017	Shelton, IV
9,585,659	B2		3/2017	Viola et al.
9,585,660	B2		3/2017	Laurent et al.
9,585,662	B2		3/2017	Shelton, IV et al.
9,585,663	B2		3/2017	Shelton, IV et al.
9,585,672	B2		3/2017	Bastia
9,590,433	B2		3/2017	Li
9,592,050	B2		3/2017	Schmid et al.
9,592,052	B2		3/2017	Shelton, IV
9,592,053	B2		3/2017	Shelton, IV et al.
9,592,054	B2		3/2017	Schmid et al.
9,597,073	B2		3/2017	Sorrentino et al.
9,597,075	B2		3/2017	Shelton, IV et al.
9,597,080	B2		3/2017	Milliman et al.
9,597,104	B2		3/2017	Nicholas et al.
9,597,143	B2		3/2017	Madan et al.
9,603,595	B2		3/2017	Shelton, IV et al.
9,603,598	B2		3/2017	Shelton, IV et al.
9,603,599	B2		3/2017	Miller et al.
9,603,991	B2		3/2017	Shelton, IV et al.
D783,658	S		4/2017	Hurst et al.
9,610,080	B2		4/2017	Whitfield et al.
9,614,258	B2		4/2017	Takahashi et al.
9,615,826	B2		4/2017	Shelton, IV et al.
9,622,745	B2		4/2017	Ingmanson et al.
9,629,623	B2		4/2017	Lytle, IV et al.
9,629,626	B2		4/2017	Soltz et al.
9,629,627	B2		4/2017	Kostrzewski et al.
9,629,628	B2		4/2017	Aranyi
9,629,629	B2		4/2017	Leimbach et al.
9,629,652	B2		4/2017	Mumaw et al.
9,629,814	B2		4/2017	Widenhouse et al.
D786,280	S		5/2017	Ma
D786,896	S		5/2017	Kim et al.
D787,547	S	*	5/2017	Basargin D14/488
D788,123	S		5/2017	Shan et al.
D788,140	S		5/2017	Hemsley et al.
9,636,111	B2		5/2017	Wenchell
9,636,850	B2		5/2017	Stopek (Nee Prommersberger) et al.
9,641,122	B2		5/2017	Romanowich et al.
9,642,620	B2		5/2017	Baxter, III et al.
9,649,096	B2		5/2017	Sholev
9,649,110	B2		5/2017	Parihar et al.
9,649,111	B2		5/2017	Shelton, IV et al.
9,655,613	B2		5/2017	Schaller
9,655,614	B2		5/2017	Swensgard et al.
9,655,615	B2		5/2017	Knodel et al.
9,655,616	B2		5/2017	Aranyi
9,655,624	B2		5/2017	Shelton, IV et al.
9,662,108	B2		5/2017	Williams
9,662,110	B2		5/2017	Huang et al.
9,662,116	B2		5/2017	Smith et al.
9,662,131	B2		5/2017	Omori et al.
D788,792	S		6/2017	Alessandri et al.
D789,384	S		6/2017	Lin et al.
D790,570	S		6/2017	Butcher et al.
9,668,728	B2		6/2017	Williams et al.
9,668,729	B2		6/2017	Williams et al.
9,668,732	B2		6/2017	Patel et al.
9,668,733	B2		6/2017	Williams
9,668,734	B2		6/2017	Kostrzewski et al.
9,675,344	B2		6/2017	Combrowski et al.
9,675,351	B2		6/2017	Hodgkinson et al.
9,675,355	B2		6/2017	Shelton, IV et al.
9,675,372	B2		6/2017	Laurent et al.
9,675,375	B2		6/2017	Houser et al.
9,675,405	B2		6/2017	Trees et al.
9,675,819	B2		6/2017	Dunbar et al.
9,681,870	B2		6/2017	Baxter, III et al.
9,681,873	B2		6/2017	Smith et al.
9,681,884	B2		6/2017	Clem et al.
9,687,230	B2		6/2017	Leimbach et al.
9,687,231	B2		6/2017	Baxter, III et al.
9,687,232	B2		6/2017	Shelton, IV et al.
9,687,233	B2		6/2017	Fernandez et al.
9,687,236	B2		6/2017	Leimbach et al.
9,687,237	B2		6/2017	Schmid et al.
9,687,253	B2		6/2017	Detry et al.
9,689,466	B2		6/2017	Kanai et al.
9,690,362	B2		6/2017	Leimbach et al.
9,693,772	B2		7/2017	Ingmanson et al.
9,693,774	B2		7/2017	Gettinger et al.
9,693,777	B2		7/2017	Schellin et al.
9,700,309	B2		7/2017	Jaworek et al.
9,700,310	B2		7/2017	Morgan et al.
9,700,312	B2		7/2017	Kostrzewski et al.
9,700,317	B2		7/2017	Aronhalt et al.
9,700,318	B2		7/2017	Scirica et al.
9,700,319	B2		7/2017	Motooka et al.
9,700,320	B2		7/2017	Dinardo et al.
9,700,321	B2		7/2017	Shelton, IV et al.
9,706,981	B2		7/2017	Nicholas et al.
9,706,991	B2		7/2017	Hess et al.
9,706,993	B2		7/2017	Hessler et al.
9,707,005	B2		7/2017	Strobl et al.
9,707,026	B2		7/2017	Malackowski et al.
9,707,043	B2		7/2017	Bozung
9,707,684	B2		7/2017	Ruiz Morales et al.
9,713,468	B2		7/2017	Harris et al.
9,713,470	B2		7/2017	Scirica et al.
9,713,474	B2		7/2017	Lorenz
9,717,497	B2		8/2017	Zerkle et al.
9,717,498	B2		8/2017	Aranyi et al.
9,722,236	B2		8/2017	Sathrum
9,724,091	B2		8/2017	Shelton, IV et al.
9,724,092	B2		8/2017	Baxter, III et al.
9,724,094	B2		8/2017	Baber
9,724,096	B2		8/2017	Thompson et al.
9,724,098	B2		8/2017	Baxter, III et al.
9,724,118	B2		8/2017	Schulte et al.
9,724,163	B2		8/2017	Orban
9,730,692	B2		8/2017	Shelton, IV et al.
9,730,695	B2		8/2017	Leimbach et al.
9,730,697	B2		8/2017	Morgan et al.
9,730,717	B2		8/2017	Katsuki et al.
9,731,410	B2		8/2017	Hirabayashi et al.
9,733,663	B2		8/2017	Leimbach et al.
9,737,297	B2		8/2017	Racenet et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

9,737,301	B2		8/2017	Baber et al.
9,737,302	B2		8/2017	Shelton, IV et al.
9,737,303	B2		8/2017	Shelton, IV et al.
9,737,365	B2		8/2017	Hegeman et al.
9,743,927	B2		8/2017	Whitman
9,743,928	B2		8/2017	Shelton, IV et al.
9,743,929	B2		8/2017	Leimbach et al.
D798,319	S	*	9/2017	Bergstrand D14/486
9,750,498	B2		9/2017	Timm et al.
9,750,499	B2		9/2017	Leimbach et al.
9,750,501	B2		9/2017	Shelton, IV et al.
9,750,502	B2		9/2017	Scirica et al.
9,750,639	B2		9/2017	Barnes et al.
9,757,123	B2		9/2017	Giordano et al.
9,757,124	B2		9/2017	Schellin et al.
9,757,126	B2		9/2017	Cappola
9,757,128	B2		9/2017	Baber et al.
9,757,129	B2		9/2017	Williams
9,757,130	B2		9/2017	Shelton, IV
9,763,662	B2		9/2017	Shelton, IV et al.
9,763,668	B2		9/2017	Whitfield et al.
9,770,245	B2		9/2017	Swayze et al.
9,770,274	B2		9/2017	Pool et al.
D798,886	S		10/2017	Prophete et al.
D800,742	S		10/2017	Rhodes
D800,744	S		10/2017	Jitkoff et al.
D800,766	S		10/2017	Park et al.
D800,904	S		10/2017	Leimbach et al.
9,775,608	B2		10/2017	Aronhalt et al.
9,775,609	B2		10/2017	Shelton, IV et al.
9,775,610	B2		10/2017	Nicholas et al.
9,775,611	B2		10/2017	Kostrzewski
9,775,613	B2		10/2017	Shelton, IV et al.
9,775,614	B2		10/2017	Shelton, IV et al.
9,775,618	B2		10/2017	Bettuchi et al.
9,775,635	B2		10/2017	Takei
9,782,169	B2		10/2017	Kimsey et al.
9,782,170	B2		10/2017	Zemlok et al.
9,782,180	B2		10/2017	Smith et al.
9,782,193	B2		10/2017	Thistle
9,782,214	B2		10/2017	Houser et al.
9,788,834	B2		10/2017	Schmid et al.
9,788,835	B2		10/2017	Morgan et al.
9,788,836	B2		10/2017	Overmyer et al.
9,788,847	B2		10/2017	Jinno
9,788,851	B2		10/2017	Dannaher et al.
9,788,902	B2		10/2017	Inoue et al.
9,795,379	B2		10/2017	Leimbach et al.
9,795,380	B2		10/2017	Shelton, IV et al.
9,795,381	B2		10/2017	Shelton, IV
9,795,382	B2		10/2017	Shelton, IV
9,795,383	B2		10/2017	Aldridge et al.
9,795,384	B2		10/2017	Weaner et al.
9,797,486	B2		10/2017	Zergiebel et al.
9,801,626	B2		10/2017	Parihar et al.
9,801,627	B2		10/2017	Harris et al.
9,801,628	B2		10/2017	Harris et al.
9,801,634	B2		10/2017	Shelton, IV et al.
9,802,033	B2		10/2017	Hibner et al.
9,804,618	B2		10/2017	Leimbach et al.
D803,234	S		11/2017	Day et al.
D803,235	S		11/2017	Markson et al.
D803,850	S		11/2017	Chang et al.
9,808,244	B2		11/2017	Leimbach et al.
9,808,246	B2		11/2017	Shelton, IV et al.
9,808,247	B2		11/2017	Shelton, IV et al.
9,808,249	B2		11/2017	Shelton, IV
9,814,460	B2		11/2017	Kimsey et al.
9,814,462	B2		11/2017	Woodard, Jr. et al.
9,814,463	B2		11/2017	Williams et al.
9,814,530	B2		11/2017	Weir et al.
9,814,561	B2		11/2017	Forsell
9,820,445	B2		11/2017	Simpson et al.
9,820,737	B2		11/2017	Beardsley et al.
9,820,738	B2		11/2017	Lytle, IV et al.
9,820,741	B2		11/2017	Kostrzewski
9,820,768	B2		11/2017	Gee et al.
9,825,455	B2		11/2017	Sandhu et al.
9,826,976	B2		11/2017	Parihar et al.
9,826,977	B2		11/2017	Leimbach et al.
9,826,978	B2		11/2017	Shelton, IV et al.
9,829,698	B2		11/2017	Haraguchi et al.
D806,108	S		12/2017	Day
9,833,236	B2		12/2017	Shelton, IV et al.
9,833,238	B2		12/2017	Baxter, III et al.
9,833,239	B2		12/2017	Yates et al.
9,833,241	B2		12/2017	Huitema et al.
9,833,242	B2		12/2017	Baxter, III et al.
9,839,420	B2		12/2017	Shelton, IV et al.
9,839,421	B2		12/2017	Zerkle et al.
9,839,422	B2		12/2017	Schellin et al.
9,839,423	B2		12/2017	Vendely et al.
9,839,427	B2		12/2017	Swayze et al.
9,839,428	B2		12/2017	Baxter, III et al.
9,839,429	B2		12/2017	Weisenburgh, II et al.
9,839,480	B2		12/2017	Pribanic et al.
9,844,368	B2		12/2017	Boudreaux et al.
9,844,369	B2		12/2017	Huitema et al.
9,844,372	B2		12/2017	Shelton, IV et al.
9,844,373	B2		12/2017	Swayze et al.
9,844,374	B2		12/2017	Lytle, IV et al.
9,844,375	B2		12/2017	Overmyer et al.
9,844,376	B2		12/2017	Baxter, III et al.
9,844,379	B2		12/2017	Shelton, IV et al.
9,848,871	B2		12/2017	Harris et al.
9,848,873	B2		12/2017	Shelton, IV
9,848,875	B2		12/2017	Aronhalt et al.
9,848,877	B2		12/2017	Shelton, IV et al.
9,855,039	B2		1/2018	Racenet et al.
9,855,040	B2		1/2018	Kostrzewski
9,855,662	B2		1/2018	Ruiz Morales et al.
9,861,261	B2		1/2018	Shahinian
9,861,359	B2		1/2018	Shelton, IV et al.
9,861,361	B2		1/2018	Aronhalt et al.
9,861,382	B2		1/2018	Smith et al.
9,867,612	B2		1/2018	Parihar et al.
9,867,618	B2		1/2018	Hall et al.
9,867,620	B2		1/2018	Fischvogt et al.
9,868,198	B2		1/2018	Nicholas et al.
9,872,682	B2		1/2018	Hess et al.
9,872,683	B2		1/2018	Hopkins et al.
9,872,684	B2		1/2018	Hall et al.
9,877,721	B2		1/2018	Schellin et al.
9,877,723	B2		1/2018	Hall et al.
D810,099	S		2/2018	Riedel
9,883,843	B2		2/2018	Garlow
9,883,860	B2		2/2018	Leimbach et al.
9,883,861	B2		2/2018	Shelton, IV et al.
9,884,456	B2		2/2018	Schellin et al.
9,888,919	B2		2/2018	Leimbach et al.
9,888,921	B2		2/2018	Williams et al.
9,888,924	B2		2/2018	Ebersole et al.
9,889,230	B2		2/2018	Bennett et al.
9,895,147	B2		2/2018	Shelton, IV
9,895,148	B2		2/2018	Shelton, IV et al.
9,895,813	B2		2/2018	Blumenkranz et al.
9,901,339	B2		2/2018	Farascioni
9,901,341	B2		2/2018	Kostrzewski
9,901,342	B2		2/2018	Shelton, IV et al.
9,901,344	B2		2/2018	Moore et al.
9,901,345	B2		2/2018	Moore et al.
9,901,346	B2		2/2018	Moore et al.
9,901,412	B2		2/2018	Lathrop et al.
D813,899	S		3/2018	Erant et al.
9,907,456	B2		3/2018	Miyoshi
9,907,553	B2		3/2018	Cole et al.
9,907,600	B2		3/2018	Stulen et al.
9,907,620	B2		3/2018	Shelton, IV et al.
9,913,642	B2		3/2018	Leimbach et al.
9,913,644	B2		3/2018	McCuen
9,913,646	B2		3/2018	Shelton, IV
9,913,647	B2		3/2018	Weisenburgh, II et al.
9,913,648	B2		3/2018	Shelton, IV et al.
9,913,694	B2		3/2018	Brisson

(56) **References Cited**

U.S. PATENT DOCUMENTS

9,913,733 B2 3/2018 Piron et al.
9,918,704 B2 3/2018 Shelton, IV et al.
9,918,714 B2 3/2018 Gibbons, Jr.
9,918,715 B2 3/2018 Menn
9,918,716 B2 3/2018 Baxter, III et al.
9,918,717 B2 3/2018 Czemik
9,924,941 B2 3/2018 Burbank
9,924,942 B2 3/2018 Swayze et al.
9,924,944 B2 3/2018 Shelton, IV et al.
9,924,945 B2 3/2018 Zheng et al.
9,924,946 B2 3/2018 Vendely et al.
9,924,947 B2 3/2018 Shelton, IV et al.
9,924,961 B2 3/2018 Shelton, IV et al.
9,931,106 B2 4/2018 Au et al.
9,931,116 B2 4/2018 Racenet et al.
9,931,118 B2 4/2018 Shelton, IV et al.
9,936,949 B2 4/2018 Measamer et al.
9,936,950 B2 4/2018 Shelton, IV et al.
9,936,951 B2 4/2018 Hufnagel et al.
9,936,954 B2 4/2018 Shelton, IV et al.
9,937,626 B2 4/2018 Rockrohr
9,943,309 B2 4/2018 Shelton, IV et al.
9,943,310 B2 4/2018 Harris et al.
9,943,312 B2 4/2018 Posada et al.
D819,072 S 5/2018 Clediere
9,955,965 B2 5/2018 Chen et al.
9,955,966 B2 5/2018 Zergiebel
9,962,158 B2 5/2018 Hall et al.
9,962,159 B2 5/2018 Heinrich et al.
9,962,161 B2 5/2018 Scheib et al.
9,968,354 B2 5/2018 Shelton, IV et al.
9,968,355 B2 5/2018 Shelton, IV et al.
9,968,356 B2 5/2018 Shelton, IV et al.
9,968,397 B2 5/2018 Taylor et al.
9,974,529 B2 5/2018 Shelton, IV et al.
9,974,538 B2 5/2018 Baxter, III et al.
9,974,539 B2 5/2018 Yates et al.
9,974,541 B2 5/2018 Calderoni
9,974,542 B2 5/2018 Hodgkinson
9,980,713 B2 5/2018 Aronhalt et al.
9,980,724 B2 5/2018 Farascioni et al.
9,980,729 B2 5/2018 Moore et al.
9,980,769 B2 5/2018 Trees et al.
D819,680 S 6/2018 Nguyen
D819,682 S 6/2018 Howard et al.
D819,684 S 6/2018 Dart
D820,307 S 6/2018 Jian et al.
D820,867 S 6/2018 Dickens et al.
9,987,000 B2 6/2018 Shelton, IV et al.
9,987,003 B2 6/2018 Timm et al.
9,987,006 B2 6/2018 Morgan et al.
9,987,095 B2 6/2018 Chowaniec et al.
9,987,099 B2 6/2018 Chen et al.
9,993,248 B2 6/2018 Shelton, IV et al.
9,993,258 B2 6/2018 Shelton, IV et al.
9,999,408 B2 6/2018 Boudreaux et al.
9,999,423 B2 6/2018 Schuckmann et al.
9,999,426 B2 6/2018 Moore et al.
9,999,431 B2 6/2018 Shelton, IV et al.
9,999,472 B2 6/2018 Weir et al.
10,004,497 B2 6/2018 Overmyer et al.
10,004,498 B2 6/2018 Morgan et al.
10,004,500 B2 6/2018 Shelton, IV et al.
10,004,501 B2 6/2018 Shelton, IV et al.
10,004,505 B2 6/2018 Moore et al.
10,004,506 B2 6/2018 Shelton, IV et al.
D822,206 S 7/2018 Shelton, IV et al.
10,010,322 B2 7/2018 Shelton, IV et al.
10,010,324 B2 7/2018 Huitema et al.
10,013,049 B2 7/2018 Leimbach et al.
10,016,199 B2 7/2018 Baber et al.
10,022,125 B2 7/2018 (Prommersberger) Stopek
10,024,407 B2 7/2018 Aranyi et al.
10,028,742 B2 7/2018 Shelton, IV et al.
10,028,743 B2 7/2018 Shelton, IV et al.
10,028,744 B2 7/2018 Shelton, IV et al.
10,028,761 B2 7/2018 Leimbach et al.
10,029,125 B2 7/2018 Shapiro et al.
10,034,668 B2 7/2018 Ebner
D826,405 S 8/2018 Shelton, IV et al.
10,039,440 B2 8/2018 Fenech et al.
10,039,529 B2 8/2018 Kerr et al.
10,039,532 B2 8/2018 Srinivas et al.
10,039,545 B2 8/2018 Sadowski et al.
10,041,822 B2 8/2018 Zemlok
10,045,769 B2 8/2018 Aronhalt et al.
10,045,776 B2 8/2018 Shelton, IV et al.
10,045,778 B2 8/2018 Yates et al.
10,045,779 B2 8/2018 Savage et al.
10,045,781 B2 8/2018 Cropper et al.
10,052,044 B2 8/2018 Shelton, IV et al.
10,052,099 B2 8/2018 Morgan et al.
10,052,100 B2 8/2018 Morgan et al.
10,052,102 B2 8/2018 Baxter, III et al.
10,052,104 B2 8/2018 Shelton, IV et al.
10,052,164 B2 8/2018 Overmyer
10,058,317 B2 8/2018 Fan et al.
10,058,327 B2 8/2018 Weisenburgh, II et al.
10,058,395 B2 8/2018 Devengenzo et al.
10,058,963 B2 8/2018 Shelton, IV et al.
10,064,620 B2 9/2018 Gettinger et al.
10,064,621 B2 9/2018 Kerr et al.
10,064,624 B2 9/2018 Shelton, IV et al.
10,064,639 B2 9/2018 Ishida et al.
10,064,649 B2 9/2018 Golebieski et al.
10,064,688 B2 9/2018 Shelton, IV et al.
10,070,861 B2 9/2018 Spivey et al.
10,070,863 B2 9/2018 Swayze et al.
10,071,452 B2 9/2018 Shelton, IV et al.
10,076,325 B2 9/2018 Huang et al.
10,076,326 B2 9/2018 Yates et al.
10,076,340 B2 9/2018 Belagali et al.
D831,209 S 10/2018 Huitema et al.
D831,676 S 10/2018 Park et al.
D832,301 S 10/2018 Smith
10,085,624 B2 10/2018 Isoda et al.
10,085,728 B2 10/2018 Jogasaki et al.
10,085,748 B2 10/2018 Morgan et al.
10,085,749 B2 10/2018 Cappola et al.
10,085,751 B2 10/2018 Overmyer et al.
10,085,754 B2 10/2018 Sniffin et al.
10,085,806 B2 10/2018 Hagn et al.
10,092,292 B2 10/2018 Boudreaux et al.
10,098,635 B2 10/2018 Burbank
10,098,636 B2 10/2018 Shelton, IV et al.
10,098,638 B2 10/2018 Viola et al.
10,098,640 B2 10/2018 Bertolero et al.
10,098,642 B2 10/2018 Baxter, III et al.
10,099,303 B2 10/2018 Yoshida et al.
10,105,128 B2 10/2018 Cooper et al.
10,105,136 B2 10/2018 Yates et al.
10,105,139 B2 10/2018 Yates et al.
10,105,140 B2 10/2018 Malinouskas et al.
10,106,932 B2 10/2018 Anderson et al.
10,111,657 B2 10/2018 McCuen
10,111,679 B2 10/2018 Baber et al.
10,111,698 B2 10/2018 Scheib et al.
10,111,702 B2 10/2018 Kostrzewski
10,117,649 B2 11/2018 Baxter, III et al.
10,117,652 B2 11/2018 Schmid et al.
10,117,653 B2 11/2018 Leimbach et al.
10,117,654 B2 11/2018 Ingmanson et al.
10,123,798 B2 11/2018 Baxter, III et al.
10,124,493 B2 11/2018 Rothfuss et al.
10,130,352 B2 11/2018 Widenhouse et al.
10,130,359 B2 11/2018 Hess et al.
10,130,361 B2 11/2018 Yates et al.
10,130,363 B2 11/2018 Huitema et al.
10,130,366 B2 11/2018 Shelton, IV et al.
10,130,367 B2 11/2018 Cappola et al.
10,130,738 B2 11/2018 Shelton, IV et al.
10,130,830 B2 11/2018 Miret Carceller et al.
10,133,248 B2 11/2018 Fitzsimmons et al.
10,135,242 B2 11/2018 Baber et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

10,136,887	B2	11/2018	Shelton, IV et al.	
10,136,889	B2	11/2018	Shelton, IV et al.	
10,136,890	B2	11/2018	Shelton, IV et al.	
10,136,891	B2	11/2018	Shelton, IV et al.	
D835,659	S	12/2018	Anzures et al.	
D836,124	S	12/2018	Fan	
10,143,474	B2	12/2018	Bucciaglia et al.	
10,149,679	B2	12/2018	Shelton, IV et al.	
10,149,680	B2	12/2018	Parihar et al.	
10,149,682	B2	12/2018	Shelton, IV et al.	
10,149,683	B2	12/2018	Smith et al.	
10,149,712	B2	12/2018	Manwaring et al.	
10,154,841	B2	12/2018	Weaner et al.	
10,159,482	B2	12/2018	Swayze et al.	
10,159,483	B2	12/2018	Beckman et al.	
10,163,589	B2	12/2018	Zergiebel et al.	
D837,244	S	1/2019	Kuo et al.	
D837,245	S	1/2019	Kuo et al.	
10,166,025	B2	1/2019	Leimbach et al.	
10,166,026	B2	1/2019	Shelton, IV et al.	
10,172,611	B2	1/2019	Shelton, IV et al.	
10,172,615	B2	1/2019	Marczyk et al.	
10,172,616	B2	1/2019	Murray et al.	
10,172,617	B2	1/2019	Shelton, IV et al.	
10,172,619	B2	1/2019	Harris et al.	
10,172,620	B2	1/2019	Harris et al.	
10,172,636	B2	1/2019	Stulen et al.	
10,175,127	B2	1/2019	Collins et al.	
10,178,992	B2	1/2019	Wise et al.	
10,180,463	B2	1/2019	Beckman et al.	
10,182,813	B2	1/2019	Leimbach et al.	
10,182,816	B2	1/2019	Shelton, IV et al.	
10,182,818	B2	1/2019	Hensel et al.	
10,182,819	B2	1/2019	Shelton, IV	
10,188,385	B2	1/2019	Kerr et al.	
10,188,393	B2	1/2019	Smith et al.	
10,188,394	B2	1/2019	Shelton, IV et al.	
D839,900	S *	2/2019	Gan	D14/486
D841,667	S	2/2019	Coren	
10,194,904	B2	2/2019	Viola et al.	
10,194,910	B2	2/2019	Shelton, IV et al.	
10,194,913	B2	2/2019	Nalagatla et al.	
10,194,976	B2	2/2019	Boudreaux	
10,201,348	B2	2/2019	Scheib et al.	
10,201,349	B2	2/2019	Leimbach et al.	
10,201,363	B2	2/2019	Shelton, IV	
10,201,364	B2	2/2019	Leimbach et al.	
10,201,365	B2	2/2019	Boudreaux et al.	
10,201,381	B2	2/2019	Zergiebel et al.	
10,206,605	B2	2/2019	Shelton, IV et al.	
10,206,676	B2	2/2019	Shelton, IV	
10,206,677	B2	2/2019	Harris et al.	
10,206,678	B2	2/2019	Shelton, IV et al.	
10,211,586	B2	2/2019	Adams et al.	
10,213,198	B2	2/2019	Aronhalt et al.	
10,213,201	B2	2/2019	Shelton, IV et al.	
10,213,202	B2	2/2019	Flanagan et al.	
10,213,203	B2	2/2019	Swayze et al.	
10,213,262	B2	2/2019	Shelton, IV et al.	
D842,328	S	3/2019	Jian et al.	
10,219,832	B2	3/2019	Bagwell et al.	
10,220,522	B2	3/2019	Rockrohr	
10,226,239	B2	3/2019	Nicholas et al.	
10,226,249	B2	3/2019	Jaworek et al.	
10,226,250	B2	3/2019	Beckman et al.	
10,226,251	B2	3/2019	Scheib et al.	
10,226,274	B2	3/2019	Worrell et al.	
10,231,634	B2	3/2019	Zand et al.	
10,231,653	B2	3/2019	Bohm et al.	
10,231,734	B2	3/2019	Thompson et al.	
10,231,794	B2	3/2019	Shelton, IV et al.	
10,238,385	B2	3/2019	Yates et al.	
10,238,386	B2	3/2019	Overmyer et al.	
10,238,387	B2	3/2019	Yates et al.	
10,238,389	B2	3/2019	Yates et al.	
10,238,390	B2	3/2019	Harris et al.	
10,238,391	B2	3/2019	Leimbach et al.	
D844,666	S	4/2019	Espeleta et al.	
D844,667	S	4/2019	Espeleta et al.	
D845,342	S	4/2019	Espeleta et al.	
10,245,027	B2	4/2019	Shelton, IV et al.	
10,245,028	B2	4/2019	Shelton, IV et al.	
10,245,029	B2	4/2019	Hunter et al.	
10,245,030	B2	4/2019	Hunter et al.	
10,245,032	B2	4/2019	Shelton, IV	
10,245,033	B2	4/2019	Overmyer et al.	
10,245,034	B2	4/2019	Shelton, IV et al.	
10,245,035	B2	4/2019	Swayze et al.	
10,245,058	B2	4/2019	Omori et al.	
10,251,648	B2	4/2019	Harris et al.	
10,251,649	B2	4/2019	Schellin et al.	
10,251,725	B2	4/2019	Valentine et al.	
10,258,322	B2	4/2019	Fanton et al.	
10,258,330	B2	4/2019	Shelton, IV et al.	
10,258,331	B2	4/2019	Shelton, IV et al.	
10,258,332	B2	4/2019	Schmid et al.	
10,258,333	B2	4/2019	Shelton, IV et al.	
10,258,336	B2	4/2019	Baxter, III et al.	
10,258,418	B2	4/2019	Shelton, IV et al.	
10,264,797	B2	4/2019	Zhang et al.	
10,265,065	B2	4/2019	Shelton, IV et al.	
10,265,067	B2	4/2019	Yates et al.	
10,265,068	B2	4/2019	Harris et al.	
10,265,072	B2	4/2019	Shelton, IV et al.	
10,265,073	B2	4/2019	Scheib et al.	
10,265,074	B2	4/2019	Shelton, IV et al.	
10,265,090	B2	4/2019	Ingmanson et al.	
10,271,844	B2	4/2019	Valentine et al.	
10,271,845	B2	4/2019	Shelton, IV	
10,271,846	B2	4/2019	Shelton, IV et al.	
10,271,849	B2	4/2019	Vendely et al.	
10,271,851	B2	4/2019	Shelton, IV et al.	
D847,989	S	5/2019	Shelton, IV et al.	
D848,473	S	5/2019	Zhu et al.	
D849,046	S	5/2019	Kuo et al.	
10,278,696	B2	5/2019	Gurumurthy et al.	
10,278,697	B2	5/2019	Shelton, IV et al.	
10,278,702	B2	5/2019	Shelton, IV et al.	
10,278,703	B2	5/2019	Nativ et al.	
10,278,707	B2	5/2019	Thompson et al.	
10,278,722	B2	5/2019	Shelton, IV et al.	
10,278,780	B2	5/2019	Shelton, IV	
10,285,694	B2	5/2019	Viola et al.	
10,285,695	B2	5/2019	Jaworek et al.	
10,285,699	B2	5/2019	Vendely et al.	
10,285,705	B2	5/2019	Shelton, IV et al.	
10,292,701	B2	5/2019	Scheib et al.	
10,292,704	B2	5/2019	Harris et al.	
10,292,707	B2	5/2019	Shelton, IV et al.	
10,293,100	B2	5/2019	Shelton, IV et al.	
10,293,553	B2	5/2019	Racenet et al.	
10,299,787	B2	5/2019	Shelton, IV	
10,299,788	B2	5/2019	Heinrich et al.	
10,299,792	B2	5/2019	Huitema et al.	
10,299,817	B2	5/2019	Shelton, IV et al.	
10,299,818	B2	5/2019	Riva	
10,299,878	B2	5/2019	Shelton, IV et al.	
D850,617	S	6/2019	Shelton, IV et al.	
D851,676	S	6/2019	Foss et al.	
D851,762	S	6/2019	Shelton, IV et al.	
10,307,159	B2	6/2019	Harris et al.	
10,307,160	B2	6/2019	Vendely et al.	
10,307,163	B2	6/2019	Moore et al.	
10,307,170	B2 *	6/2019	Parfett	A61B 17/1626
10,307,202	B2	6/2019	Smith et al.	
10,314,577	B2	6/2019	Laurent et al.	
10,314,582	B2	6/2019	Shelton, IV et al.	
10,314,587	B2	6/2019	Harris et al.	
10,314,588	B2	6/2019	Turner et al.	
10,314,589	B2	6/2019	Shelton, IV et al.	
10,314,590	B2	6/2019	Shelton, IV et al.	
10,321,907	B2	6/2019	Shelton, IV et al.	
10,321,909	B2	6/2019	Shelton, IV et al.	
10,321,927	B2	6/2019	Hinman	

(56) **References Cited**

U.S. PATENT DOCUMENTS

10,327,743 B2 6/2019 St. Goar et al.
10,327,764 B2 6/2019 Harris et al.
10,327,765 B2 6/2019 Timm et al.
10,327,767 B2 6/2019 Shelton, IV et al.
10,327,769 B2 6/2019 Overmyer et al.
10,327,776 B2 6/2019 Harris et al.
10,327,777 B2 6/2019 Harris et al.
D854,032 S * 7/2019 Jones D14/486
D854,151 S 7/2019 Shelton, IV et al.
10,335,144 B2 7/2019 Shelton, IV et al.
10,335,145 B2 7/2019 Harris et al.
10,335,147 B2 7/2019 Rector et al.
10,335,148 B2 7/2019 Shelton, IV et al.
10,335,149 B2 7/2019 Baxter, III et al.
10,335,150 B2 7/2019 Shelton, IV
10,335,151 B2 7/2019 Shelton, IV et al.
10,337,148 B2 7/2019 Rouse et al.
10,342,533 B2 7/2019 Shelton, IV et al.
10,342,535 B2 7/2019 Scheib et al.
10,342,541 B2 7/2019 Shelton, IV et al.
10,342,543 B2 7/2019 Shelton, IV et al.
10,342,623 B2 7/2019 Huelman et al.
10,349,939 B2 7/2019 Shelton, IV et al.
10,357,246 B2 7/2019 Shelton, IV et al.
10,357,247 B2 7/2019 Shelton, IV et al.
10,357,248 B2 7/2019 Dalessandro et al.
10,357,252 B2 7/2019 Harris et al.
10,363,031 B2 7/2019 Alexander, III et al.
10,363,033 B2 7/2019 Timm et al.
10,363,036 B2 7/2019 Yates et al.
10,363,037 B2 7/2019 Aronhalt et al.
10,363,045 B2 7/2019 Whitfield et al.
D855,634 S * 8/2019 Kim D14/485
D856,359 S * 8/2019 Huang D14/486
10,368,838 B2 8/2019 Williams et al.
10,368,861 B2 8/2019 Baxter, III et al.
10,368,863 B2 8/2019 Timm et al.
10,368,864 B2 * 8/2019 Harris A61B 17/068
10,368,865 B2 8/2019 Harris et al.
10,368,867 B2 8/2019 Harris et al.
10,368,892 B2 8/2019 Stulen et al.
10,376,262 B2 8/2019 Zemlok et al.
10,376,263 B2 8/2019 Morgan et al.
10,383,626 B2 8/2019 Soltz
10,383,628 B2 8/2019 Kang et al.
10,383,629 B2 8/2019 Ross et al.
10,383,630 B2 8/2019 Shelton, IV et al.
10,383,633 B2 8/2019 Shelton, IV et al.
10,383,634 B2 8/2019 Shelton, IV et al.
10,390,823 B2 8/2019 Shelton, IV et al.
10,390,825 B2 8/2019 Shelton, IV et al.
10,390,828 B2 8/2019 Vendely et al.
10,390,829 B2 8/2019 Eckert et al.
10,390,830 B2 8/2019 Schulz
10,390,841 B2 8/2019 Shelton, IV et al.
10,390,897 B2 8/2019 Kostrzewski
10,398,433 B2 9/2019 Boudreaux et al.
10,398,434 B2 9/2019 Shelton, IV et al.
10,398,436 B2 9/2019 Shelton, IV et al.
10,405,854 B2 9/2019 Schmid et al.
10,405,857 B2 9/2019 Shelton, IV et al.
10,405,859 B2 9/2019 Harris et al.
10,405,863 B2 9/2019 Wise et al.
10,405,914 B2 9/2019 Manwaring et al.
10,405,932 B2 9/2019 Overmyer
10,413,291 B2 9/2019 Worthington et al.
10,413,293 B2 9/2019 Shelton, IV et al.
10,413,294 B2 9/2019 Shelton, IV et al.
10,413,297 B2 9/2019 Harris et al.
10,413,370 B2 9/2019 Yates et al.
10,413,373 B2 9/2019 Yates et al.
10,420,548 B2 9/2019 Whitman et al.
10,420,549 B2 9/2019 Yates et al.
10,420,550 B2 9/2019 Shelton, IV
10,420,552 B2 9/2019 Shelton, IV et al.
10,420,553 B2 9/2019 Shelton, IV et al.
10,420,555 B2 9/2019 Shelton, IV et al.
10,420,558 B2 9/2019 Nalagatla et al.
10,420,559 B2 9/2019 Marczyk et al.
10,420,560 B2 9/2019 Shelton, IV et al.
10,420,561 B2 9/2019 Shelton, IV et al.
10,420,577 B2 9/2019 Chowaniec et al.
10,426,463 B2 10/2019 Shelton, IV et al.
10,426,467 B2 10/2019 Miller et al.
10,426,468 B2 10/2019 Contini et al.
10,426,469 B2 10/2019 Shelton, IV et al.
10,426,471 B2 10/2019 Shelton, IV et al.
10,426,476 B2 10/2019 Harris et al.
10,426,477 B2 10/2019 Harris et al.
10,426,478 B2 10/2019 Shelton, IV et al.
10,426,481 B2 10/2019 Aronhalt et al.
10,433,837 B2 10/2019 Worthington et al.
10,433,839 B2 10/2019 Scheib et al.
10,433,840 B2 10/2019 Shelton, IV et al.
10,433,844 B2 10/2019 Shelton, IV et al.
10,433,845 B2 10/2019 Baxter, III et al.
10,433,846 B2 10/2019 Vendely et al.
10,433,849 B2 10/2019 Shelton, IV et al.
10,433,918 B2 10/2019 Shelton, IV et al.
10,441,279 B2 10/2019 Shelton, IV et al.
10,441,280 B2 10/2019 Timm et al.
10,441,281 B2 10/2019 Shelton, IV et al.
10,441,285 B2 10/2019 Shelton, IV et al.
10,441,286 B2 10/2019 Shelton, IV et al.
10,441,345 B2 10/2019 Aldridge et al.
10,441,369 B2 10/2019 Shelton, IV et al.
10,448,948 B2 10/2019 Shelton, IV et al.
10,448,950 B2 10/2019 Shelton, IV et al.
10,448,952 B2 10/2019 Shelton, IV et al.
2001/0000531 A1 4/2001 Casscells et al.
2001/0025183 A1 9/2001 Shahidi
2001/0025184 A1 9/2001 Messerly
2002/0014510 A1 2/2002 Richter et al.
2002/0022810 A1 2/2002 Urich
2002/0022836 A1 2/2002 Goble et al.
2002/0022861 A1 2/2002 Jacobs et al.
2002/0029032 A1 3/2002 Arkin
2002/0029036 A1 3/2002 Goble et al.
2002/0042620 A1 4/2002 Julian et al.
2002/0087048 A1 7/2002 Brock et al.
2002/0091374 A1 7/2002 Cooper
2002/0095175 A1 7/2002 Brock et al.
2002/0103494 A1 8/2002 Pacey
2002/0116063 A1 8/2002 Giannetti et al.
2002/0117534 A1 8/2002 Green et al.
2002/0127265 A1 9/2002 Bowman et al.
2002/0128633 A1 9/2002 Brock et al.
2002/0134811 A1 9/2002 Napier et al.
2002/0135474 A1 9/2002 Sylliassen
2002/0143340 A1 10/2002 Kaneko
2002/0158593 A1 10/2002 Henderson et al.
2002/0185514 A1 12/2002 Adams et al.
2002/0188170 A1 12/2002 Santamore et al.
2002/0188287 A1 12/2002 Zvuloni et al.
2003/0009193 A1 1/2003 Corsaro
2003/0011245 A1 1/2003 Fiebig
2003/0045835 A1 3/2003 Anderson et al.
2003/0066858 A1 4/2003 Holgersson
2003/0078647 A1 4/2003 Vallana et al.
2003/0083648 A1 5/2003 Wang et al.
2003/0084983 A1 5/2003 Rangachari et al.
2003/0093103 A1 5/2003 Malackowski et al.
2003/0094356 A1 5/2003 Waldron
2003/0096158 A1 5/2003 Takano et al.
2003/0114851 A1 6/2003 Truckai et al.
2003/0139741 A1 7/2003 Goble et al.
2003/0149406 A1 8/2003 Martineau et al.
2003/0153908 A1 8/2003 Goble et al.
2003/0153968 A1 8/2003 Geis et al.
2003/0163085 A1 8/2003 Tanner et al.
2003/0181900 A1 9/2003 Long
2003/0190584 A1 10/2003 Heasley
2003/0195387 A1 10/2003 Kortenbach et al.
2003/0205029 A1 11/2003 Chapolini et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2003/0212005 A1 11/2003 Petito et al.
2003/0216732 A1 11/2003 Truckai et al.
2003/0236505 A1 12/2003 Bonadio et al.
2004/0006335 A1 1/2004 Garrison
2004/0006340 A1 1/2004 Latterell et al.
2004/0007608 A1 1/2004 Ehrenfels et al.
2004/0024457 A1 2/2004 Boyce et al.
2004/0028502 A1 2/2004 Cummins
2004/0030333 A1 2/2004 Goble
2004/0034357 A1 2/2004 Beane et al.
2004/0044295 A1 3/2004 Reinert et al.
2004/0044364 A1 3/2004 DeVries et al.
2004/0049121 A1 3/2004 Yaron
2004/0049172 A1 3/2004 Root et al.
2004/0059362 A1 3/2004 Knodel et al.
2004/0068161 A1 4/2004 Couvillon
2004/0068224 A1 4/2004 Couvillon et al.
2004/0068307 A1 4/2004 Goble
2004/0070369 A1 4/2004 Sakakibara
2004/0073222 A1 4/2004 Koseki
2004/0078037 A1 4/2004 Batchelor et al.
2004/0082952 A1 4/2004 Dycus et al.
2004/0085180 A1 5/2004 Juang
2004/0093024 A1 5/2004 Lousararian et al.
2004/0098040 A1 5/2004 Taniguchi
2004/0101822 A1 5/2004 Wiesner et al.
2004/0102783 A1 5/2004 Sutterlin et al.
2004/0108357 A1 6/2004 Milliman et al.
2004/0110439 A1 6/2004 Chaikof et al.
2004/0115022 A1 6/2004 Albertson et al.
2004/0116952 A1 6/2004 Sakurai et al.
2004/0119185 A1 6/2004 Chen
2004/0122419 A1 6/2004 Neuberger
2004/0122423 A1 6/2004 Dycus et al.
2004/0133095 A1 7/2004 Dunki-Jacobs et al.
2004/0133189 A1 7/2004 Sakurai
2004/0143297 A1 7/2004 Ramsey
2004/0147909 A1 7/2004 Johnston et al.
2004/0153100 A1 8/2004 Ahlberg et al.
2004/0158261 A1 8/2004 Vu
2004/0164123 A1 8/2004 Racenet et al.
2004/0166169 A1 8/2004 Malaviya et al.
2004/0167572 A1 8/2004 Roth et al.
2004/0181219 A1 9/2004 Goble et al.
2004/0193189 A1 9/2004 Kortenbach et al.
2004/0197367 A1 10/2004 Rezania et al.
2004/0199181 A1 10/2004 Knodel et al.
2004/0204735 A1 10/2004 Shiroff et al.
2004/0218451 A1 11/2004 Said et al.
2004/0222268 A1 11/2004 Bilotti et al.
2004/0225186 A1 11/2004 Horne et al.
2004/0232201 A1 11/2004 Wenchell et al.
2004/0236352 A1 11/2004 Wang et al.
2004/0243147 A1 12/2004 Lipow
2004/0243151 A1 12/2004 Demmy et al.
2004/0243163 A1 12/2004 Casiano et al.
2004/0247415 A1 12/2004 Mangone
2004/0249366 A1 12/2004 Kunz
2004/0254455 A1 12/2004 Iddan
2004/0254566 A1 12/2004 Plicchi et al.
2004/0254590 A1 12/2004 Hoffman et al.
2004/0260315 A1 12/2004 Dell et al.
2004/0267310 A1 12/2004 Racenet et al.
2005/0010158 A1 1/2005 Brugger et al.
2005/0010213 A1 1/2005 Stad et al.
2005/0021078 A1 1/2005 Vleugels et al.
2005/0032511 A1 2/2005 Malone et al.
2005/0033352 A1 2/2005 Zepf et al.
2005/0051163 A1 3/2005 Deem et al.
2005/0054946 A1 3/2005 Krzyzanowski
2005/0057225 A1 3/2005 Marquet
2005/0058890 A1 3/2005 Brazell et al.
2005/0059997 A1 3/2005 Bauman et al.
2005/0070929 A1 3/2005 Dalessandro et al.
2005/0075561 A1 4/2005 Golden
2005/0080342 A1 4/2005 Gilreath et al.
2005/0085693 A1 4/2005 Belson et al.
2005/0090817 A1 4/2005 Phan
2005/0096683 A1 5/2005 Ellins et al.
2005/0116673 A1 6/2005 Carl et al.
2005/0124855 A1 6/2005 Jaffe et al.
2005/0125897 A1 6/2005 Wyslucha et al.
2005/0130682 A1 6/2005 Takara et al.
2005/0131173 A1 6/2005 McDaniel et al.
2005/0131211 A1 6/2005 Bayley et al.
2005/0131390 A1 6/2005 Heinrich et al.
2005/0131436 A1 6/2005 Johnston et al.
2005/0131457 A1 6/2005 Douglas et al.
2005/0137454 A1 6/2005 Saadat et al.
2005/0137455 A1 6/2005 Ewers et al.
2005/0139636 A1 6/2005 Schwemberger et al.
2005/0143759 A1 6/2005 Kelly
2005/0143769 A1 6/2005 White et al.
2005/0145671 A1 7/2005 Viola
2005/0150928 A1 7/2005 Kameyama et al.
2005/0154258 A1 7/2005 Tartaglia et al.
2005/0154406 A1 7/2005 Bombard et al.
2005/0159778 A1 7/2005 Heinrich et al.
2005/0165419 A1 7/2005 Sauer et al.
2005/0169974 A1 8/2005 Tenerz et al.
2005/0171522 A1 8/2005 Christopherson
2005/0177176 A1 8/2005 Gerbi et al.
2005/0177181 A1 8/2005 Kagan et al.
2005/0177249 A1 8/2005 Kladakis et al.
2005/0182298 A1 8/2005 Ikeda et al.
2005/0184121 A1 8/2005 Heinrich
2005/0186240 A1 8/2005 Ringeisen et al.
2005/0187545 A1 8/2005 Hooven et al.
2005/0203550 A1 9/2005 Laufer et al.
2005/0209614 A1 9/2005 Fenter et al.
2005/0216055 A1 9/2005 Scirica et al.
2005/0222587 A1 10/2005 Jinno et al.
2005/0222611 A1 10/2005 Weitkamp
2005/0222616 A1 10/2005 Rethy et al.
2005/0222665 A1 10/2005 Aranyi
2005/0228224 A1 10/2005 Okada et al.
2005/0228446 A1 10/2005 Mooradian et al.
2005/0230453 A1 10/2005 Viola
2005/0240178 A1 10/2005 Morley et al.
2005/0245965 A1 11/2005 Orban, III et al.
2005/0246881 A1 11/2005 Kelly et al.
2005/0251063 A1 11/2005 Basude
2005/0256452 A1 11/2005 DeMarchi et al.
2005/0261676 A1 11/2005 Hall et al.
2005/0263563 A1 12/2005 Racenet et al.
2005/0267455 A1 12/2005 Eggers et al.
2005/0274034 A1 12/2005 Hayashida et al.
2005/0283188 A1 12/2005 Loshakove et al.
2006/0008787 A1 1/2006 Hayman et al.
2006/0015009 A1 1/2006 Jaffe et al.
2006/0020258 A1 1/2006 Strauss et al.
2006/0020336 A1 1/2006 Liddicoat
2006/0025812 A1 2/2006 Shelton
2006/0041188 A1 2/2006 Dirusso et al.
2006/0047275 A1 3/2006 Goble
2006/0049229 A1 3/2006 Milliman et al.
2006/0052824 A1 3/2006 Ransick et al.
2006/0052825 A1 3/2006 Ransick et al.
2006/0064086 A1 3/2006 Odom
2006/0079735 A1 4/2006 Martone et al.
2006/0079879 A1 4/2006 Faller et al.
2006/0086032 A1 4/2006 Valencic et al.
2006/0087746 A1 4/2006 Lipow
2006/0089535 A1 4/2006 Raz et al.
2006/0097699 A1 5/2006 Kamenoff
2006/0100643 A1 5/2006 Laufer et al.
2006/0100649 A1 5/2006 Hart
2006/0111711 A1 5/2006 Goble
2006/0111723 A1 5/2006 Chapolini et al.
2006/0116634 A1 6/2006 Shachar
2006/0142772 A1 6/2006 Ralph et al.
2006/0154546 A1 7/2006 Murphy et al.
2006/0161050 A1 7/2006 Butler et al.
2006/0161185 A1 7/2006 Saadat et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2006/0167471 A1 7/2006 Phillips
2006/0173470 A1 8/2006 Oray et al.
2006/0176031 A1 8/2006 Forman et al.
2006/0178556 A1 8/2006 Hasser et al.
2006/0180633 A1 8/2006 Emmons
2006/0180634 A1 8/2006 Shelton et al.
2006/0185682 A1 8/2006 Marczyk
2006/0199999 A1 9/2006 Ikeda et al.
2006/0201989 A1 9/2006 Ojeda
2006/0206100 A1 9/2006 Eskridge et al.
2006/0217729 A1 9/2006 Eskridge et al.
2006/0235368 A1 10/2006 Oz
2006/0241666 A1 10/2006 Briggs et al.
2006/0244460 A1 11/2006 Weaver
2006/0252990 A1 11/2006 Kubach
2006/0252993 A1 11/2006 Freed et al.
2006/0258904 A1 11/2006 Stefanchik et al.
2006/0259073 A1 11/2006 Miyamoto et al.
2006/0261763 A1 11/2006 Iott et al.
2006/0263444 A1 11/2006 Ming et al.
2006/0264831 A1 11/2006 Skwarek et al.
2006/0264929 A1 11/2006 Goble et al.
2006/0271042 A1 11/2006 Latterell et al.
2006/0271102 A1 11/2006 Bosshard et al.
2006/0282064 A1 12/2006 Shimizu et al.
2006/0284730 A1 12/2006 Schmid et al.
2006/0287576 A1 12/2006 Tsuji et al.
2006/0289602 A1 12/2006 Wales et al.
2006/0291981 A1 12/2006 Viola et al.
2007/0010702 A1 1/2007 Wang et al.
2007/0010838 A1 1/2007 Shelton et al.
2007/0016235 A1 1/2007 Tanaka et al.
2007/0026039 A1 2/2007 Drumheller et al.
2007/0026040 A1 2/2007 Crawley et al.
2007/0027468 A1 2/2007 Wales et al.
2007/0027551 A1 2/2007 Farnsworth et al.
2007/0043387 A1 2/2007 Vargas et al.
2007/0049951 A1 3/2007 Menn
2007/0049966 A1 3/2007 Bonadio et al.
2007/0051375 A1 3/2007 Milliman
2007/0055228 A1 3/2007 Berg et al.
2007/0073341 A1 3/2007 Smith et al.
2007/0073389 A1 3/2007 Bolduc et al.
2007/0078328 A1 4/2007 Ozaki et al.
2007/0078484 A1 4/2007 Talarico et al.
2007/0084897 A1 4/2007 Shelton et al.
2007/0088376 A1 4/2007 Zacharias
2007/0090788 A1 4/2007 Hansford et al.
2007/0093869 A1 4/2007 Bloom et al.
2007/0102472 A1 5/2007 Shelton
2007/0106113 A1 5/2007 Ravo
2007/0106317 A1 5/2007 Shelton et al.
2007/0134251 A1 6/2007 Ashkenazi et al.
2007/0135686 A1 6/2007 Pruitt et al.
2007/0135803 A1 6/2007 Belson
2007/0152612 A1 7/2007 Chen et al.
2007/0155010 A1 7/2007 Farnsworth et al.
2007/0170225 A1 7/2007 Shelton et al.
2007/0173687 A1 7/2007 Shima et al.
2007/0173813 A1 7/2007 Odom
2007/0175950 A1 8/2007 Shelton et al.
2007/0175951 A1 8/2007 Shelton et al.
2007/0175955 A1 8/2007 Shelton et al.
2007/0179477 A1 8/2007 Danger
2007/0185545 A1 8/2007 Duke
2007/0190110 A1 8/2007 Pameijer et al.
2007/0191868 A1 8/2007 Theroux et al.
2007/0194079 A1 8/2007 Hueil et al.
2007/0194082 A1 8/2007 Morgan et al.
2007/0197954 A1 8/2007 Keenan
2007/0198039 A1 8/2007 Jones et al.
2007/0203510 A1 8/2007 Bettuchi
2007/0207010 A1 9/2007 Caspi
2007/0208359 A1 9/2007 Hoffman
2007/0208375 A1 9/2007 Nishizawa et al.
2007/0213750 A1 9/2007 Weadock
2007/0225562 A1 9/2007 Spivey et al.
2007/0233163 A1 10/2007 Bombard et al.
2007/0243227 A1 10/2007 Gertner
2007/0244471 A1 10/2007 Malackowski
2007/0246505 A1 10/2007 Pace-Floridia et al.
2007/0262592 A1 11/2007 Hwang et al.
2007/0275035 A1 11/2007 Herman et al.
2007/0276409 A1 11/2007 Ortiz et al.
2007/0279011 A1 12/2007 Jones et al.
2007/0286892 A1 12/2007 Herzberg et al.
2007/0296286 A1 12/2007 Avenell
2008/0003196 A1 1/2008 Jonn et al.
2008/0015598 A1 1/2008 Prommersberger
2008/0021486 A1 1/2008 Oyola et al.
2008/0029570 A1 2/2008 Shelton et al.
2008/0029573 A1 2/2008 Shelton et al.
2008/0029574 A1 2/2008 Shelton et al.
2008/0029575 A1 2/2008 Shelton et al.
2008/0030170 A1 2/2008 Dacquay et al.
2008/0042861 A1 2/2008 Dacquay et al.
2008/0051833 A1 2/2008 Gramuglia et al.
2008/0064921 A1 3/2008 Larkin et al.
2008/0065153 A1 3/2008 Allard et al.
2008/0071328 A1 3/2008 Haubrich et al.
2008/0078802 A1 4/2008 Hess et al.
2008/0082114 A1 4/2008 McKenna et al.
2008/0082125 A1 4/2008 Murray et al.
2008/0082126 A1 4/2008 Murray et al.
2008/0083807 A1 4/2008 Beardsley et al.
2008/0085296 A1 4/2008 Powell et al.
2008/0086078 A1 4/2008 Powell et al.
2008/0091072 A1 4/2008 Omori et al.
2008/0108443 A1 5/2008 Jinno et al.
2008/0114250 A1 5/2008 Urbano et al.
2008/0125634 A1 5/2008 Ryan et al.
2008/0125749 A1 5/2008 Olson
2008/0128469 A1 6/2008 Dalessandro et al.
2008/0129253 A1 6/2008 Shiue et al.
2008/0135600 A1 6/2008 Hiranuma et al.
2008/0140115 A1 6/2008 Stopek
2008/0140159 A1 6/2008 Bornhoft et al.
2008/0154299 A1 6/2008 Livneh
2008/0154335 A1 6/2008 Thrope et al.
2008/0169328 A1 7/2008 Shelton
2008/0169332 A1 7/2008 Shelton et al.
2008/0169333 A1 7/2008 Shelton et al.
2008/0172087 A1 7/2008 Fuchs et al.
2008/0190989 A1 8/2008 Crews et al.
2008/0196253 A1 8/2008 Ezra et al.
2008/0196419 A1 8/2008 Dube
2008/0197167 A1 8/2008 Viola et al.
2008/0200755 A1 8/2008 Bakos
2008/0200762 A1 8/2008 Stokes et al.
2008/0200835 A1 8/2008 Monson et al.
2008/0200911 A1 8/2008 Long
2008/0200933 A1 8/2008 Bakos et al.
2008/0200934 A1 8/2008 Fox
2008/0216504 A1* 9/2008 Kim B67D 1/0005 62/338
2008/0234709 A1 9/2008 Houser
2008/0242939 A1 10/2008 Johnston
2008/0249536 A1 10/2008 Stahler et al.
2008/0249608 A1 10/2008 Dave
2008/0255413 A1 10/2008 Zemlok et al.
2008/0262654 A1 10/2008 Omori et al.
2008/0269596 A1 10/2008 Revie et al.
2008/0281171 A1 11/2008 Fennell et al.
2008/0287944 A1 11/2008 Pearson et al.
2008/0293910 A1 11/2008 Kapiamba et al.
2008/0294179 A1 11/2008 Balbierz et al.
2008/0296346 A1 12/2008 Shelton, IV et al.
2008/0297287 A1 12/2008 Shachar et al.
2008/0308602 A1 12/2008 Timm et al.
2008/0308603 A1 12/2008 Shelton et al.
2008/0312687 A1 12/2008 Blier
2008/0315829 A1 12/2008 Jones et al.
2009/0001121 A1 1/2009 Hess et al.
2009/0001130 A1 1/2009 Hess et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2009/0004455 A1 1/2009 Gravagna et al.
2009/0005809 A1 1/2009 Hess et al.
2009/0012534 A1 1/2009 Madhani et al.
2009/0015195 A1 1/2009 Loth-Krausser
2009/0020958 A1 1/2009 Soul
2009/0048583 A1 2/2009 Williams et al.
2009/0048589 A1 2/2009 Takashino et al.
2009/0076506 A1 3/2009 Baker
2009/0078736 A1 3/2009 Van Lue
2009/0081313 A1 3/2009 Aghion et al.
2009/0088659 A1 4/2009 Graham et al.
2009/0090763 A1 4/2009 Zemlok et al.
2009/0092651 A1 4/2009 Shah et al.
2009/0099579 A1 4/2009 Nentwick et al.
2009/0099876 A1 4/2009 Whitman
2009/0112234 A1 4/2009 Crainich et al.
2009/0118762 A1 5/2009 Crainch et al.
2009/0119011 A1 5/2009 Kondo et al.
2009/0131819 A1 5/2009 Ritchie et al.
2009/0132400 A1 5/2009 Conway
2009/0143855 A1 6/2009 Weber et al.
2009/0149871 A9 6/2009 Kagan et al.
2009/0171147 A1 7/2009 Lee et al.
2009/0177226 A1 7/2009 Reinprecht et al.
2009/0181290 A1 7/2009 Baldwin et al.
2009/0188964 A1 7/2009 Orlov
2009/0192534 A1 7/2009 Ortiz et al.
2009/0198272 A1 8/2009 Kerver et al.
2009/0204108 A1 8/2009 Steffen
2009/0204109 A1 8/2009 Grove et al.
2009/0206125 A1 8/2009 Huitema et al.
2009/0206126 A1 8/2009 Huitema et al.
2009/0206131 A1 8/2009 Weisenburgh, II et al.
2009/0206133 A1 8/2009 Morgan et al.
2009/0206137 A1 8/2009 Hall et al.
2009/0206139 A1 8/2009 Hall et al.
2009/0206141 A1 8/2009 Huitema et al.
2009/0206142 A1 8/2009 Huitema et al.
2009/0221993 A1 9/2009 Sohi et al.
2009/0227834 A1 9/2009 Nakamoto et al.
2009/0234273 A1 9/2009 Intoccia et al.
2009/0242610 A1 10/2009 Shelton, IV et al.
2009/0247368 A1 10/2009 Chiang
2009/0247901 A1 10/2009 Zimmer
2009/0253959 A1 10/2009 Yoshie et al.
2009/0255974 A1 10/2009 Viola
2009/0262078 A1 10/2009 Pizzi
2009/0270895 A1 10/2009 Churchill et al.
2009/0290016 A1 11/2009 Suda
2009/0292283 A1 11/2009 Odom
2009/0306639 A1 12/2009 Nevo et al.
2009/0308907 A1 12/2009 Nalagatla et al.
2009/0318557 A1 12/2009 Stockel
2010/0005035 A1 1/2010 Carpenter et al.
2010/0012703 A1 1/2010 Calabrese et al.
2010/0016888 A1 1/2010 Calabrese et al.
2010/0017715 A1 1/2010 Balassanian
2010/0023024 A1 1/2010 Zeiner et al.
2010/0030233 A1 2/2010 Whitman et al.
2010/0036370 A1 2/2010 Mirel et al.
2010/0051668 A1 3/2010 Milliman et al.
2010/0057118 A1 3/2010 Dietz et al.
2010/0065604 A1 3/2010 Weng
2010/0069942 A1 3/2010 Shelton, IV
2010/0076483 A1 3/2010 Imuta
2010/0076489 A1 3/2010 Stopek et al.
2010/0081883 A1 4/2010 Murray et al.
2010/0094340 A1 4/2010 Stopek et al.
2010/0100123 A1 4/2010 Bennett
2010/0100124 A1 4/2010 Calabrese et al.
2010/0116519 A1 5/2010 Gareis
2010/0122339 A1 5/2010 Boccacci
2010/0133317 A1 6/2010 Shelton, IV et al.
2010/0137990 A1 6/2010 Apatsidis et al.
2010/0145146 A1 6/2010 Melder
2010/0147921 A1 6/2010 Olson
2010/0147922 A1 6/2010 Olson
2010/0179022 A1 7/2010 Shirokoshi
2010/0180711 A1 7/2010 Kilibarda et al.
2010/0191262 A1 7/2010 Harris et al.
2010/0191292 A1 7/2010 DeMeo et al.
2010/0193566 A1 8/2010 Scheib et al.
2010/0204717 A1 8/2010 Knodel
2010/0204721 A1 8/2010 Young et al.
2010/0217281 A1 8/2010 Matsuoka et al.
2010/0222901 A1 9/2010 Swayze et al.
2010/0241137 A1 9/2010 Doyle et al.
2010/0249497 A1 9/2010 Peine et al.
2010/0249947 A1 9/2010 Lesh et al.
2010/0256675 A1 10/2010 Romans
2010/0258327 A1 10/2010 Esenwein et al.
2010/0267662 A1 10/2010 Fielder et al.
2010/0274160 A1 10/2010 Yachi et al.
2010/0292540 A1 11/2010 Hess et al.
2010/0298636 A1 11/2010 Castro et al.
2010/0312261 A1 12/2010 Suzuki et al.
2010/0318085 A1 12/2010 Austin et al.
2010/0331856 A1 12/2010 Carlson et al.
2011/0006101 A1 1/2011 Hall et al.
2011/0011916 A1 1/2011 Levine
2011/0016960 A1 1/2011 Debrailly
2011/0021871 A1 1/2011 Berkelaar
2011/0022032 A1 1/2011 Zemlok et al.
2011/0024477 A1 2/2011 Hall
2011/0024478 A1 2/2011 Shelton, IV
2011/0025311 A1 2/2011 Chauvin et al.
2011/0036891 A1 2/2011 Zemlok et al.
2011/0046667 A1 2/2011 Culligan et al.
2011/0060363 A1 3/2011 Hess et al.
2011/0066156 A1 3/2011 McGahan et al.
2011/0082538 A1 4/2011 Dahlgren et al.
2011/0087276 A1 4/2011 Bedi et al.
2011/0088921 A1 4/2011 Forgues et al.
2011/0091515 A1 4/2011 Zilberman et al.
2011/0095064 A1 4/2011 Taylor et al.
2011/0101069 A1 5/2011 Bombard et al.
2011/0101794 A1 5/2011 Schroeder et al.
2011/0112517 A1 5/2011 Peine et al.
2011/0112530 A1 5/2011 Keller
2011/0114697 A1 5/2011 Baxter, III et al.
2011/0121049 A1 5/2011 Malinouskas et al.
2011/0125176 A1 5/2011 Yates et al.
2011/0127945 A1 6/2011 Yoneda
2011/0129706 A1 6/2011 Takahashi et al.
2011/0144764 A1 6/2011 Bagga et al.
2011/0147433 A1 6/2011 Shelton, IV et al.
2011/0160725 A1 6/2011 Kabaya et al.
2011/0163146 A1 7/2011 Ortiz et al.
2011/0172495 A1 7/2011 Armstrong
2011/0174861 A1 7/2011 Shelton, IV et al.
2011/0192882 A1 8/2011 Hess et al.
2011/0199225 A1 8/2011 Touchberry et al.
2011/0218400 A1 9/2011 Ma et al.
2011/0218550 A1 9/2011 Ma
2011/0230713 A1 9/2011 Kleemann et al.
2011/0238044 A1 9/2011 Main et al.
2011/0241597 A1 10/2011 Zhu et al.
2011/0271186 A1 11/2011 Owens
2011/0275901 A1 11/2011 Shelton, IV
2011/0276083 A1 11/2011 Shelton, IV et al.
2011/0278343 A1 11/2011 Knodel et al.
2011/0279268 A1 11/2011 Konishi et al.
2011/0290856 A1 12/2011 Shelton, IV et al.
2011/0293690 A1 12/2011 Griffin et al.
2011/0295295 A1 12/2011 Shelton, IV et al.
2011/0313894 A1 12/2011 Dye et al.
2011/0315413 A1 12/2011 Fisher et al.
2012/0004636 A1 1/2012 Lo
2012/0007442 A1 1/2012 Rhodes et al.
2012/0016239 A1 1/2012 Barthe et al.
2012/0016413 A1 1/2012 Timm et al.
2012/0016467 A1 1/2012 Chen et al.
2012/0029272 A1 2/2012 Shelton, IV et al.
2012/0033360 A1 2/2012 Hsu

(56) **References Cited**

U.S. PATENT DOCUMENTS

2012/0059286 A1 3/2012 Hastings et al.
2012/0064483 A1 3/2012 Lint et al.
2012/0074200 A1 3/2012 Schmid et al.
2012/0078244 A1 3/2012 Worrell et al.
2012/0080336 A1 4/2012 Shelton, IV et al.
2012/0080344 A1 4/2012 Shelton, IV
2012/0080478 A1 4/2012 Morgan et al.
2012/0080498 A1 4/2012 Shelton, IV et al.
2012/0086276 A1 4/2012 Sawyers
2012/0095458 A1 4/2012 Cybulski et al.
2012/0109186 A1 5/2012 Parrott et al.
2012/0116261 A1 5/2012 Mumaw et al.
2012/0116262 A1 5/2012 Houser et al.
2012/0116265 A1 5/2012 Houser et al.
2012/0116266 A1 5/2012 Houser et al.
2012/0118595 A1 5/2012 Pellenc
2012/0123463 A1 5/2012 Jacobs
2012/0125792 A1 5/2012 Cassivi
2012/0130217 A1 5/2012 Kauphusman et al.
2012/0132286 A1 5/2012 Lim et al.
2012/0171539 A1 7/2012 Rejman et al.
2012/0175398 A1 7/2012 Sandborn et al.
2012/0197272 A1 8/2012 Oray et al.
2012/0211542 A1 8/2012 Racenet
2012/0234895 A1 9/2012 O'Connor et al.
2012/0234897 A1 9/2012 Shelton, IV et al.
2012/0239068 A1 9/2012 Morris et al.
2012/0248169 A1 10/2012 Widenhouse et al.
2012/0251861 A1 10/2012 Liang et al.
2012/0253328 A1 10/2012 Cunningham et al.
2012/0283707 A1 11/2012 Giordano et al.
2012/0289979 A1 11/2012 Eskaros et al.
2012/0292367 A1 11/2012 Morgan et al.
2012/0298722 A1 11/2012 Hess et al.
2012/0303002 A1 11/2012 Chowaniec et al.
2013/0006227 A1 1/2013 Takashino
2013/0008937 A1 1/2013 Viola
2013/0012983 A1 1/2013 Kleyman
2013/0018400 A1 1/2013 Milton et al.
2013/0020375 A1 1/2013 Shelton, IV et al.
2013/0020376 A1 1/2013 Shelton, IV et al.
2013/0023861 A1 1/2013 Shelton, IV et al.
2013/0023910 A1 1/2013 Solomon et al.
2013/0026208 A1 1/2013 Shelton, IV et al.
2013/0026210 A1 1/2013 Shelton, IV et al.
2013/0030462 A1 1/2013 Keating et al.
2013/0041292 A1 2/2013 Cunningham
2013/0057162 A1 3/2013 Pollischansky
2013/0068816 A1 3/2013 Mandakolathur Vasudevan et al.
2013/0087597 A1 4/2013 Shelton, IV et al.
2013/0090534 A1 4/2013 Burns et al.
2013/0096568 A1 4/2013 Justis
2013/0098970 A1 4/2013 Racenet et al.
2013/0105552 A1 5/2013 Weir et al.
2013/0106352 A1 5/2013 Nagamine
2013/0116669 A1 5/2013 Shelton, IV et al.
2013/0123816 A1 5/2013 Hodgkinson et al.
2013/0126202 A1 5/2013 Oomori et al.
2013/0131476 A1 5/2013 Siu et al.
2013/0131651 A1 5/2013 Strobl et al.
2013/0136969 A1 5/2013 Yasui et al.
2013/0153641 A1 6/2013 Shelton, IV et al.
2013/0158390 A1 6/2013 Tan et al.
2013/0162198 A1 6/2013 Yokota et al.
2013/0169217 A1 7/2013 Watanabe et al.
2013/0172878 A1 7/2013 Smith
2013/0175317 A1 7/2013 Yates et al.
2013/0214025 A1 8/2013 Zemlok et al.
2013/0233906 A1 9/2013 Hess et al.
2013/0238021 A1 9/2013 Gross et al.
2013/0245704 A1 9/2013 Koltz et al.
2013/0248578 A1 9/2013 Arteaga Gonzalez
2013/0253480 A1 9/2013 Kimball et al.
2013/0256373 A1 10/2013 Schmid et al.
2013/0256380 A1 10/2013 Schmid et al.
2013/0267978 A1 10/2013 Trissel
2013/0270322 A1 10/2013 Scheib et al.
2013/0277410 A1 10/2013 Fernandez et al.
2013/0306704 A1 11/2013 Balbierz et al.
2013/0317753 A1 11/2013 Kamen et al.
2013/0324982 A1 12/2013 Smith et al.
2013/0327552 A1 12/2013 Loveless et al.
2013/0333910 A1 12/2013 Tanimoto et al.
2013/0334280 A1 12/2013 Krehel et al.
2013/0334283 A1 12/2013 Swayze et al.
2013/0334285 A1 12/2013 Swayze et al.
2013/0341374 A1 12/2013 Shelton, IV et al.
2014/0001231 A1 1/2014 Shelton, IV et al.
2014/0001234 A1 1/2014 Shelton, IV et al.
2014/0005640 A1 1/2014 Shelton, IV et al.
2014/0005678 A1 1/2014 Shelton, IV et al.
2014/0005702 A1 1/2014 Timm et al.
2014/0005718 A1 1/2014 Shelton, IV et al.
2014/0012289 A1 1/2014 Snow et al.
2014/0012299 A1 1/2014 Stoddard et al.
2014/0014705 A1 1/2014 Baxter, III
2014/0018832 A1 1/2014 Shelton, IV
2014/0039549 A1 2/2014 Belsky et al.
2014/0048580 A1 2/2014 Merchant et al.
2014/0081176 A1 3/2014 Hassan
2014/0094681 A1 4/2014 Valentine et al.
2014/0100558 A1 4/2014 Schmitz et al.
2014/0107640 A1 4/2014 Yates et al.
2014/0110456 A1 4/2014 Taylor
2014/0115229 A1 4/2014 Kothamasu et al.
2014/0131418 A1 5/2014 Kostrzewski
2014/0135832 A1 5/2014 Park et al.
2014/0151433 A1 6/2014 Shelton, IV et al.
2014/0158747 A1 6/2014 Measamer et al.
2014/0166723 A1 6/2014 Beardsley et al.
2014/0166724 A1 6/2014 Schellin et al.
2014/0166725 A1 6/2014 Schellin et al.
2014/0166726 A1 6/2014 Schellin et al.
2014/0175147 A1 6/2014 Manoux et al.
2014/0175150 A1 6/2014 Shelton, IV et al.
2014/0175152 A1 6/2014 Hess et al.
2014/0181710 A1 6/2014 Baalu et al.
2014/0188091 A1 7/2014 Vidal et al.
2014/0188159 A1 7/2014 Steege
2014/0207124 A1 7/2014 Aldridge et al.
2014/0207125 A1 7/2014 Applegate et al.
2014/0209658 A1 7/2014 Skalla et al.
2014/0224857 A1 8/2014 Schmid
2014/0228867 A1 8/2014 Thomas et al.
2014/0230595 A1 8/2014 Butt et al.
2014/0239047 A1 8/2014 Hodgkinson et al.
2014/0243865 A1 8/2014 Swayze et al.
2014/0246475 A1 9/2014 Hall et al.
2014/0248167 A1 9/2014 Sugimoto et al.
2014/0249557 A1 9/2014 Koch, Jr. et al.
2014/0249573 A1 9/2014 Arav
2014/0252061 A1 9/2014 Estrella et al.
2014/0263541 A1 9/2014 Leimbach et al.
2014/0263552 A1 9/2014 Hall et al.
2014/0263554 A1 9/2014 Leimbach et al.
2014/0263558 A1 9/2014 Hausen et al.
2014/0276730 A1 9/2014 Boudreaux et al.
2014/0284371 A1 9/2014 Morgan et al.
2014/0288460 A1 9/2014 Ouyang et al.
2014/0291379 A1 10/2014 Schellin et al.
2014/0291383 A1 10/2014 Spivey et al.
2014/0299648 A1 10/2014 Shelton, IV et al.
2014/0303645 A1 10/2014 Morgan et al.
2014/0303660 A1 10/2014 Boyden et al.
2014/0330161 A1 11/2014 Swayze et al.
2014/0330298 A1 11/2014 Arshonsky et al.
2014/0330579 A1 11/2014 Cashman et al.
2014/0367445 A1 12/2014 Ingmanson et al.
2014/0374130 A1 12/2014 Nakamura et al.
2014/0378950 A1 12/2014 Chiu
2015/0002089 A1 1/2015 Rejman et al.
2015/0008248 A1 1/2015 Giordano et al.
2015/0038961 A1 2/2015 Clark et al.
2015/0053737 A1 2/2015 Leimbach et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2015/0053742 A1 2/2015 Shelton, IV et al.
2015/0053743 A1 2/2015 Yates et al.
2015/0053746 A1 2/2015 Shelton, IV et al.
2015/0053748 A1 2/2015 Yates et al.
2015/0060518 A1 3/2015 Shelton, IV et al.
2015/0060519 A1 3/2015 Shelton, IV et al.
2015/0060520 A1 3/2015 Shelton, IV et al.
2015/0060521 A1 3/2015 Weisenburgh, II et al.
2015/0066000 A1 3/2015 An et al.
2015/0076208 A1 3/2015 Shelton, IV
2015/0076209 A1 3/2015 Shelton, IV et al.
2015/0076210 A1 3/2015 Shelton, IV et al.
2015/0076212 A1 3/2015 Shelton, IV
2015/0080868 A1 3/2015 Kerr
2015/0083781 A1 3/2015 Giordano et al.
2015/0083782 A1 3/2015 Scheib et al.
2015/0088547 A1 3/2015 Balram et al.
2015/0090760 A1 4/2015 Giordano et al.
2015/0090761 A1 4/2015 Giordano et al.
2015/0090762 A1 4/2015 Giordano et al.
2015/0122870 A1 5/2015 Zemlok et al.
2015/0134077 A1 5/2015 Shelton, IV et al.
2015/0150620 A1 6/2015 Miyamoto et al.
2015/0173749 A1 6/2015 Shelton, IV et al.
2015/0173756 A1 6/2015 Baxter, III et al.
2015/0173789 A1 6/2015 Baxter, III et al.
2015/0182220 A1 7/2015 Yates et al.
2015/0196295 A1 7/2015 Shelton, IV et al.
2015/0196296 A1 7/2015 Swayze et al.
2015/0196299 A1 7/2015 Swayze et al.
2015/0196348 A1 7/2015 Yates et al.
2015/0201918 A1 7/2015 Kumar et al.
2015/0201932 A1 7/2015 Swayze et al.
2015/0201936 A1 7/2015 Swayze et al.
2015/0201937 A1 7/2015 Swayze et al.
2015/0201938 A1 7/2015 Swayze et al.
2015/0201939 A1 7/2015 Swayze et al.
2015/0201940 A1 7/2015 Swayze et al.
2015/0201941 A1 7/2015 Swayze et al.
2015/0222212 A1 8/2015 Iwata
2015/0223868 A1 8/2015 Brandt et al.
2015/0231409 A1 8/2015 Racenet et al.
2015/0238118 A1 8/2015 Legassey et al.
2015/0272557 A1 10/2015 Overmyer et al.
2015/0272571 A1 10/2015 Leimbach et al.
2015/0272580 A1 10/2015 Leimbach et al.
2015/0272582 A1 10/2015 Leimbach et al.
2015/0273671 A1 10/2015 Totsu
2015/0297200 A1 10/2015 Fitzsimmons et al.
2015/0297222 A1 10/2015 Huitema et al.
2015/0297223 A1 10/2015 Huitema et al.
2015/0297225 A1 10/2015 Huitema et al.
2015/0297228 A1 10/2015 Huitema et al.
2015/0297229 A1 10/2015 Schellin et al.
2015/0297233 A1 10/2015 Huitema et al.
2015/0297234 A1 10/2015 Schellin et al.
2015/0297235 A1 10/2015 Harris et al.
2015/0302539 A1 10/2015 Mazar et al.
2015/0303417 A1 10/2015 Koeder et al.
2015/0313594 A1 11/2015 Shelton, IV et al.
2015/0319821 A1* 11/2015 Yoshida G06F 3/0321 315/152
2015/0324317 A1 11/2015 Collins et al.
2015/0327864 A1 11/2015 Hodgkinson et al.
2015/0336249 A1 11/2015 Iwata et al.
2015/0352699 A1 12/2015 Sakai et al.
2015/0366585 A1 12/2015 Lemay et al.
2015/0372265 A1 12/2015 Morisaku et al.
2015/0374361 A1 12/2015 Gettinger et al.
2015/0374369 A1 12/2015 Yates et al.
2015/0374371 A1 12/2015 Richard et al.
2015/0374372 A1 12/2015 Zergiebel et al.
2015/0374378 A1 12/2015 Giordano et al.
2016/0000430 A1 1/2016 Ming et al.
2016/0000431 A1 1/2016 Giordano et al.
2016/0000437 A1 1/2016 Giordano et al.
2016/0000438 A1 1/2016 Swayze et al.
2016/0000442 A1 1/2016 Shelton, IV
2016/0000452 A1 1/2016 Yates et al.
2016/0000453 A1 1/2016 Yates et al.
2016/0023342 A1 1/2016 Koenig et al.
2016/0030042 A1 2/2016 Heinrich et al.
2016/0058443 A1 3/2016 Yates et al.
2016/0066913 A1 3/2016 Swayze et al.
2016/0069449 A1 3/2016 Kanai et al.
2016/0074040 A1 3/2016 Widenhouse et al.
2016/0074103 A1 3/2016 Sartor
2016/0082161 A1 3/2016 Zilberman et al.
2016/0089137 A1 3/2016 Hess et al.
2016/0089198 A1 3/2016 Arya et al.
2016/0095585 A1 4/2016 Zergiebel et al.
2016/0106431 A1 4/2016 Shelton, IV et al.
2016/0113653 A1 4/2016 Zingman
2016/0120544 A1 5/2016 Shelton, IV et al.
2016/0120545 A1 5/2016 Shelton, IV et al.
2016/0135835 A1 5/2016 Onuma
2016/0166248 A1 6/2016 Deville et al.
2016/0166256 A1 6/2016 Baxter, III et al.
2016/0174974 A1 6/2016 Schmid et al.
2016/0183939 A1 6/2016 Shelton, IV et al.
2016/0183943 A1 6/2016 Shelton, IV
2016/0183944 A1 6/2016 Swensgard et al.
2016/0192916 A1 7/2016 Shelton, IV et al.
2016/0192917 A1 7/2016 Shelton, IV et al.
2016/0192918 A1 7/2016 Shelton, IV et al.
2016/0192960 A1 7/2016 Bueno et al.
2016/0192977 A1 7/2016 Manwaring et al.
2016/0199063 A1 7/2016 Mandakolathur Vasudevan et al.
2016/0199089 A1 7/2016 Hess et al.
2016/0199956 A1 7/2016 Shelton, IV et al.
2016/0206310 A1 7/2016 Shelton, IV
2016/0206314 A1 7/2016 Scheib et al.
2016/0220266 A1 8/2016 Shelton, IV et al.
2016/0235404 A1 8/2016 Shelton, IV
2016/0235405 A1 8/2016 Shelton, IV et al.
2016/0235409 A1 8/2016 Shelton, IV et al.
2016/0235467 A1 8/2016 Godara et al.
2016/0235494 A1 8/2016 Shelton, IV et al.
2016/0242782 A1 8/2016 Shelton, IV et al.
2016/0242783 A1 8/2016 Shelton, IV et al.
2016/0249910 A1 9/2016 Shelton, IV et al.
2016/0249922 A1 9/2016 Morgan et al.
2016/0256071 A1 9/2016 Shelton, IV et al.
2016/0256154 A1 9/2016 Shelton, IV et al.
2016/0256159 A1 9/2016 Pinjala et al.
2016/0256160 A1 9/2016 Shelton, IV et al.
2016/0256229 A1 9/2016 Morgan et al.
2016/0262745 A1 9/2016 Morgan et al.
2016/0262746 A1 9/2016 Shelton, IV et al.
2016/0262921 A1 9/2016 Balbierz et al.
2016/0270780 A1 9/2016 Hall et al.
2016/0278765 A1 9/2016 Shelton, IV et al.
2016/0278771 A1 9/2016 Shelton, IV et al.
2016/0287279 A1 10/2016 Bovay et al.
2016/0310143 A1 10/2016 Bettuchi
2016/0345976 A1 12/2016 Gonzalez et al.
2016/0346034 A1 12/2016 Arya et al.
2016/0354088 A1 12/2016 Cabrera et al.
2016/0367122 A1 12/2016 Ichimura et al.
2016/0374672 A1 12/2016 Bear et al.
2016/0374675 A1 12/2016 Shelton, IV et al.
2016/0374678 A1 12/2016 Becerra et al.
2017/0007236 A1 1/2017 Shelton, IV et al.
2017/0007237 A1 1/2017 Yates et al.
2017/0007243 A1 1/2017 Shelton, IV et al.
2017/0007244 A1 1/2017 Shelton, IV et al.
2017/0007245 A1 1/2017 Shelton, IV et al.
2017/0007247 A1 1/2017 Shelton, IV et al.
2017/0007248 A1 1/2017 Shelton, IV et al.
2017/0007249 A1 1/2017 Shelton, IV et al.
2017/0007250 A1 1/2017 Shelton, IV et al.
2017/0007251 A1 1/2017 Yates et al.
2017/0007347 A1 1/2017 Jaworek et al.
2017/0014125 A1 1/2017 Shelton, IV et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2017/0027572 A1 2/2017 Nalagatla et al.
2017/0027573 A1 2/2017 Nalagatla et al.
2017/0049444 A1 2/2017 Schellin et al.
2017/0049447 A1 2/2017 Barton et al.
2017/0049448 A1 2/2017 Widenhouse et al.
2017/0055986 A1 3/2017 Harris et al.
2017/0055999 A1 3/2017 Baxter, III et al.
2017/0056000 A1 3/2017 Nalagatla et al.
2017/0056002 A1 3/2017 Nalagatla et al.
2017/0056005 A1 3/2017 Shelton, IV et al.
2017/0056006 A1 3/2017 Shelton, IV et al.
2017/0079642 A1 3/2017 Overmyer et al.
2017/0086827 A1 3/2017 Vendely et al.
2017/0086829 A1 3/2017 Vendely et al.
2017/0086830 A1 3/2017 Yates et al.
2017/0086831 A1 3/2017 Shelton, IV et al.
2017/0086832 A1 3/2017 Harris et al.
2017/0086836 A1 3/2017 Harris et al.
2017/0086838 A1 3/2017 Harris et al.
2017/0086842 A1 3/2017 Shelton, IV et al.
2017/0086843 A1 3/2017 Vendely et al.
2017/0086844 A1 3/2017 Vendely et al.
2017/0095250 A1 4/2017 Kostrzewski et al.
2017/0105733 A1 4/2017 Scheib et al.
2017/0119388 A1 5/2017 Kostrzewski
2017/0119390 A1 5/2017 Schellin et al.
2017/0119397 A1 5/2017 Harris et al.
2017/0135697 A1 5/2017 Mozdzierz et al.
2017/0143335 A1 5/2017 Gupta et al.
2017/0150965 A1 6/2017 Williams
2017/0150983 A1 6/2017 Ingmanson et al.
2017/0172382 A1 6/2017 Nir et al.
2017/0172550 A1 6/2017 Mukherjee et al.
2017/0172662 A1 6/2017 Panescu et al.
2017/0172672 A1 6/2017 Bailey et al.
2017/0182211 A1 6/2017 Raxworthy et al.
2017/0196558 A1 7/2017 Morgan et al.
2017/0196561 A1 7/2017 Shelton, IV et al.
2017/0196562 A1 7/2017 Shelton, IV et al.
2017/0196637 A1 7/2017 Shelton, IV et al.
2017/0196648 A1 7/2017 Ward et al.
2017/0196649 A1 7/2017 Yates et al.
2017/0202571 A1 7/2017 Shelton, IV et al.
2017/0202596 A1 7/2017 Shelton, IV et al.
2017/0202770 A1 7/2017 Friedrich et al.
2017/0209145 A1 7/2017 Swayze et al.
2017/0209146 A1 7/2017 Yates et al.
2017/0209226 A1 7/2017 Overmyer et al.
2017/0215881 A1 8/2017 Shelton, IV et al.
2017/0215943 A1 8/2017 Allen, IV
2017/0224331 A1 8/2017 Worthington et al.
2017/0224332 A1 8/2017 Hunter et al.
2017/0224334 A1 8/2017 Worthington et al.
2017/0224335 A1 8/2017 Weaner et al.
2017/0224339 A1 8/2017 Huang et al.
2017/0224343 A1 8/2017 Baxter, III et al.
2017/0231627 A1 8/2017 Shelton, IV et al.
2017/0231628 A1 8/2017 Shelton, IV et al.
2017/0238928 A1 8/2017 Morgan et al.
2017/0238929 A1 8/2017 Yates et al.
2017/0245854 A1 8/2017 Zemlok et al.
2017/0245952 A1 8/2017 Shelton, IV et al.
2017/0249431 A1 8/2017 Shelton, IV et al.
2017/0253181 A1* 9/2017 Choi B60Q 9/008
2017/0258469 A1 9/2017 Shelton, IV et al.
2017/0265856 A1 9/2017 Shelton, IV et al.
2017/0281155 A1 10/2017 Shelton, IV et al.
2017/0281164 A1 10/2017 Harris et al.
2017/0281166 A1 10/2017 Morgan et al.
2017/0281167 A1 10/2017 Shelton, IV et al.
2017/0281169 A1 10/2017 Harris et al.
2017/0281171 A1 10/2017 Shelton, IV et al.
2017/0281173 A1 10/2017 Shelton, IV et al.
2017/0281174 A1 10/2017 Harris et al.
2017/0281179 A1 10/2017 Shelton, IV et al.
2017/0281183 A1 10/2017 Miller et al.
2017/0281184 A1 10/2017 Shelton, IV et al.
2017/0281185 A1 10/2017 Miller et al.
2017/0281186 A1 10/2017 Shelton, IV et al.
2017/0281187 A1 10/2017 Shelton, IV et al.
2017/0281189 A1 10/2017 Nalagatla et al.
2017/0290584 A1 10/2017 Jasemian et al.
2017/0290585 A1 10/2017 Shelton, IV et al.
2017/0296169 A1 10/2017 Yates et al.
2017/0296170 A1 10/2017 Shelton, IV et al.
2017/0296173 A1 10/2017 Shelton, IV et al.
2017/0296177 A1 10/2017 Harris et al.
2017/0296179 A1 10/2017 Shelton, IV et al.
2017/0296185 A1 10/2017 Swensgard et al.
2017/0296189 A1 10/2017 Vendely et al.
2017/0296213 A1 10/2017 Swensgard et al.
2017/0311944 A1 11/2017 Morgan et al.
2017/0311949 A1 11/2017 Shelton, IV
2017/0311950 A1 11/2017 Shelton, IV et al.
2017/0312041 A1 11/2017 Giordano et al.
2017/0312042 A1 11/2017 Giordano et al.
2017/0319201 A1 11/2017 Morgan et al.
2017/0319207 A1 11/2017 Shelton, IV et al.
2017/0319209 A1 11/2017 Morgan et al.
2017/0325813 A1 11/2017 Aranyi et al.
2017/0333034 A1 11/2017 Morgan et al.
2017/0333035 A1 11/2017 Morgan et al.
2017/0333070 A1 11/2017 Laurent et al.
2017/0348010 A1 12/2017 Chiang
2017/0348043 A1 12/2017 Wang et al.
2017/0354413 A1 12/2017 Chen et al.
2017/0354415 A1 12/2017 Casasanta, Jr. et al.
2017/0358052 A1 12/2017 Yuan
2017/0360439 A1 12/2017 Chen et al.
2017/0360441 A1 12/2017 Sgroi
2017/0360442 A1 12/2017 Shelton, IV et al.
2017/0367695 A1 12/2017 Shelton, IV et al.
2017/0367696 A1 12/2017 Shelton, IV et al.
2017/0367697 A1 12/2017 Shelton, IV et al.
2017/0367698 A1 12/2017 Shelton, IV et al.
2017/0367699 A1 12/2017 Shelton, IV et al.
2017/0367700 A1 12/2017 Leimbach et al.
2017/0367991 A1 12/2017 Widenhouse et al.
2018/0000483 A1 1/2018 Leimbach et al.
2018/0000545 A1 1/2018 Giordano et al.
2018/0008270 A1 1/2018 Moore et al.
2018/0008271 A1 1/2018 Moore et al.
2018/0008356 A1 1/2018 Giordano et al.
2018/0008357 A1 1/2018 Giordano et al.
2018/0028184 A1 2/2018 Shelton, IV et al.
2018/0028185 A1 2/2018 Shelton, IV et al.
2018/0042611 A1 2/2018 Swayze et al.
2018/0049824 A1 2/2018 Harris et al.
2018/0049883 A1 2/2018 Moskowitz et al.
2018/0055513 A1 3/2018 Shelton, IV et al.
2018/0055524 A1 3/2018 Shelton, IV et al.
2018/0055525 A1 3/2018 Shelton, IV et al.
2018/0055526 A1 3/2018 Shelton, IV et al.
2018/0064437 A1 3/2018 Yates et al.
2018/0064440 A1 3/2018 Shelton, IV et al.
2018/0064441 A1 3/2018 Shelton, IV et al.
2018/0064442 A1 3/2018 Shelton, IV et al.
2018/0064443 A1 3/2018 Shelton, IV et al.
2018/0070939 A1 3/2018 Giordano et al.
2018/0070942 A1 3/2018 Shelton, IV et al.
2018/0078248 A1 3/2018 Swayze et al.
2018/0078268 A1 3/2018 Messerly et al.
2018/0085116 A1 3/2018 Yates et al.
2018/0085117 A1 3/2018 Shelton, IV et al.
2018/0103953 A1 4/2018 Shelton, IV et al.
2018/0103955 A1 4/2018 Shelton, IV et al.
2018/0110516 A1 4/2018 Baxter, III et al.
2018/0110518 A1 4/2018 Overmyer et al.
2018/0110519 A1 4/2018 Lytle, IV et al.
2018/0110520 A1 4/2018 Shelton, IV et al.
2018/0110521 A1 4/2018 Shelton, IV et al.
2018/0110522 A1 4/2018 Shelton, IV et al.
2018/0110523 A1 4/2018 Shelton, IV
2018/0110574 A1 4/2018 Shelton, IV et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2018/0110575 A1 4/2018 Shelton, IV et al.
2018/0114591 A1 4/2018 Pribanic et al.
2018/0116658 A1 5/2018 Aronhaft, IV et al.
2018/0116662 A1 5/2018 Shelton, IV et al.
2018/0116665 A1 5/2018 Hall et al.
2018/0125481 A1 5/2018 Yates et al.
2018/0125484 A1 5/2018 Kostrzewski
2018/0125487 A1 5/2018 Beardsley
2018/0125488 A1 5/2018 Morgan et al.
2018/0125489 A1 5/2018 Leimbach et al.
2018/0125590 A1 5/2018 Giordano et al.
2018/0126504 A1 5/2018 Shelton, IV et al.
2018/0132845 A1 5/2018 Schmid et al.
2018/0132849 A1 5/2018 Miller et al.
2018/0132850 A1 5/2018 Leimbach et al.
2018/0132851 A1 5/2018 Hall et al.
2018/0132926 A1 5/2018 Asher et al.
2018/0132952 A1 5/2018 Spivey et al.
2018/0133856 A1 5/2018 Shelton, IV et al.
2018/0140299 A1 5/2018 Weaner et al.
2018/0140368 A1 5/2018 Shelton, IV et al.
2018/0146960 A1 5/2018 Shelton, IV et al.
2018/0153542 A1 6/2018 Shelton, IV et al.
2018/0161034 A1 6/2018 Scheib et al.
2018/0168575 A1 6/2018 Simms et al.
2018/0168576 A1 6/2018 Hunter et al.
2018/0168577 A1 6/2018 Aronhalt et al.
2018/0168578 A1 6/2018 Aronhalt et al.
2018/0168579 A1 6/2018 Aronhalt et al.
2018/0168580 A1 6/2018 Hunter et al.
2018/0168581 A1 6/2018 Hunter et al.
2018/0168582 A1 6/2018 Swayze et al.
2018/0168583 A1 6/2018 Hunter et al.
2018/0168584 A1 6/2018 Harris et al.
2018/0168585 A1 6/2018 Shelton, IV et al.
2018/0168586 A1 6/2018 Shelton, IV et al.
2018/0168589 A1 6/2018 Swayze et al.
2018/0168590 A1 6/2018 Overmyer et al.
2018/0168591 A1 6/2018 Swayze et al.
2018/0168592 A1 6/2018 Overmyer et al.
2018/0168593 A1 6/2018 Overmyer et al.
2018/0168594 A1 6/2018 Shelton, IV et al.
2018/0168595 A1 6/2018 Overmyer et al.
2018/0168596 A1 6/2018 Beckman et al.
2018/0168597 A1 6/2018 Fanelli et al.
2018/0168598 A1 6/2018 Shelton, IV et al.
2018/0168599 A1 6/2018 Bakos et al.
2018/0168600 A1 6/2018 Shelton, IV et al.
2018/0168601 A1 6/2018 Bakos et al.
2018/0168602 A1 6/2018 Bakos et al.
2018/0168603 A1 6/2018 Morgan et al.
2018/0168604 A1 6/2018 Shelton, IV et al.
2018/0168605 A1 6/2018 Baber et al.
2018/0168606 A1 6/2018 Shelton, IV et al.
2018/0168607 A1 6/2018 Shelton, IV et al.
2018/0168608 A1 6/2018 Shelton, IV et al.
2018/0168609 A1 6/2018 Fanelli et al.
2018/0168610 A1 6/2018 Shelton, IV et al.
2018/0168611 A1 6/2018 Shelton, IV et al.
2018/0168613 A1 6/2018 Shelton, IV et al.
2018/0168614 A1 6/2018 Shelton, IV et al.
2018/0168615 A1 6/2018 Shelton, IV et al.
2018/0168616 A1 6/2018 Shelton, IV et al.
2018/0168617 A1 6/2018 Shelton, IV et al.
2018/0168618 A1 6/2018 Scott et al.
2018/0168619 A1 6/2018 Scott et al.
2018/0168620 A1 6/2018 Huang et al.
2018/0168621 A1 6/2018 Shelton, IV et al.
2018/0168623 A1 6/2018 Simms et al.
2018/0168624 A1 6/2018 Shelton, IV et al.
2018/0168625 A1 6/2018 Posada et al.
2018/0168626 A1 6/2018 Shelton, IV et al.
2018/0168627 A1 6/2018 Weaner et al.
2018/0168628 A1 6/2018 Hunter et al.
2018/0168629 A1 6/2018 Shelton, IV et al.
2018/0168630 A1 6/2018 Shelton, IV et al.
2018/0168631 A1 6/2018 Harris et al.
2018/0168632 A1 6/2018 Harris et al.
2018/0168633 A1 6/2018 Shelton, IV et al.
2018/0168634 A1 6/2018 Harris et al.
2018/0168635 A1 6/2018 Shelton, IV et al.
2018/0168636 A1 6/2018 Shelton, IV et al.
2018/0168637 A1 6/2018 Harris et al.
2018/0168638 A1 6/2018 Harris et al.
2018/0168639 A1 6/2018 Shelton, IV et al.
2018/0168640 A1 6/2018 Shelton, IV et al.
2018/0168641 A1 6/2018 Harris et al.
2018/0168642 A1 6/2018 Shelton, IV et al.
2018/0168643 A1 6/2018 Shelton, IV et al.
2018/0168644 A1 6/2018 Shelton, IV et al.
2018/0168645 A1 6/2018 Shelton, IV et al.
2018/0168646 A1 6/2018 Shelton, IV et al.
2018/0168647 A1 6/2018 Shelton, IV et al.
2018/0168648 A1 6/2018 Shelton, IV et al.
2018/0168649 A1 6/2018 Shelton, IV et al.
2018/0168650 A1 6/2018 Shelton, IV et al.
2018/0168651 A1 6/2018 Shelton, IV et al.
2018/0199940 A1 7/2018 Zergiebel et al.
2018/0206843 A1 7/2018 Yates et al.
2018/0206906 A1 7/2018 Moua et al.
2018/0214147 A1 8/2018 Merchant et al.
2018/0221046 A1 8/2018 Demmy et al.
2018/0221050 A1 8/2018 Kostrzewski et al.
2018/0228490 A1 8/2018 Richard et al.
2018/0242962 A1 8/2018 Walen et al.
2018/0250001 A1 9/2018 Aronhalt et al.
2018/0250020 A1 9/2018 Carusillo
2018/0256184 A1 9/2018 Shelton, IV et al.
2018/0271520 A1 9/2018 Shelton, IV et al.
2018/0273597 A1 9/2018 Stimson
2018/0280020 A1 10/2018 Hess et al.
2018/0286274 A1 10/2018 Kamiguchi et al.
2018/0289369 A1 10/2018 Shelton, IV et al.
2018/0296211 A1 10/2018 Timm et al.
2018/0296215 A1 10/2018 Baxter, III et al.
2018/0296216 A1 10/2018 Shelton, IV et al.
2018/0296217 A1 10/2018 Moore et al.
2018/0303481 A1 10/2018 Shelton, IV et al.
2018/0303482 A1 10/2018 Shelton, IV et al.
2018/0310931 A1 11/2018 Hall et al.
2018/0311002 A1 11/2018 Giordano et al.
2018/0317907 A1 11/2018 Kostrzewski
2018/0317916 A1 11/2018 Wixey
2018/0317917 A1 11/2018 Huang et al.
2018/0317918 A1 11/2018 Shelton, IV
2018/0317919 A1 11/2018 Shelton, IV et al.
2018/0325528 A1 11/2018 Windolf et al.
2018/0333155 A1 11/2018 Hall et al.
2018/0333169 A1 11/2018 Leimbach et al.
2018/0344319 A1 12/2018 Shelton, IV et al.
2018/0353170 A1 12/2018 Overmyer et al.
2018/0353176 A1 12/2018 Shelton, IV et al.
2018/0353177 A1 12/2018 Shelton, IV et al.
2018/0353178 A1 12/2018 Shelton, IV et al.
2018/0353179 A1 12/2018 Shelton, IV et al.
2018/0360443 A1 12/2018 Shelton, IV et al.
2018/0360445 A1 12/2018 Shelton, IV et al.
2018/0360446 A1 12/2018 Shelton, IV et al.
2018/0360447 A1 12/2018 Shelton, IV et al.
2018/0360448 A1* 12/2018 Harris A61B 17/07207
2018/0360449 A1 12/2018 Shelton, IV et al.
2018/0360450 A1 12/2018 Shelton, IV et al.
2018/0360452 A1 12/2018 Shelton, IV et al.
2018/0360454 A1 12/2018 Shelton, IV et al.
2018/0360455 A1 12/2018 Shelton, IV et al.
2018/0360456 A1 12/2018 Shelton, IV et al.
2018/0360471 A1 12/2018 Parfett et al.
2018/0360472 A1 12/2018 Harris et al.
2018/0360473 A1 12/2018 Shelton, IV et al.
2018/0360549 A1 12/2018 Hares et al.
2018/0368822 A1 12/2018 Shelton, IV et al.
2018/0368833 A1 12/2018 Shelton, IV et al.
2018/0368837 A1 12/2018 Morgan et al.
2018/0368838 A1 12/2018 Shelton, IV et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2018/0368839 A1 12/2018 Shelton, IV et al.
2018/0368840 A1 12/2018 Shelton, IV et al.
2018/0368841 A1 12/2018 Shelton, IV et al.
2018/0368842 A1 12/2018 Shelton, IV et al.
2018/0368843 A1 12/2018 Shelton, IV et al.
2018/0368844 A1 12/2018 Bakos et al.
2018/0368845 A1 12/2018 Bakos et al.
2018/0368846 A1 12/2018 Shelton, IV et al.
2018/0368847 A1 12/2018 Shelton, IV et al.
2019/0000446 A1 1/2019 Shelton, IV et al.
2019/0000448 A1 1/2019 Shelton, IV et al.
2019/0000450 A1 1/2019 Shelton, IV et al.
2019/0000454 A1 1/2019 Swayze et al.
2019/0000456 A1 1/2019 Shelton, IV et al.
2019/0000457 A1 1/2019 Shelton, IV et al.
2019/0000458 A1 1/2019 Shelton, IV et al.
2019/0000459 A1 1/2019 Shelton, IV et al.
2019/0000460 A1 1/2019 Shelton, IV et al.
2019/0000461 A1 1/2019 Shelton, IV et al.
2019/0000462 A1 1/2019 Shelton, IV et al.
2019/0000463 A1 1/2019 Shelton, IV et al.
2019/0000464 A1 1/2019 Shelton, IV et al.
2019/0000465 A1 1/2019 Shelton, IV et al.
2019/0000466 A1 1/2019 Shelton, IV et al.
2019/0000467 A1 1/2019 Shelton, IV et al.
2019/0000468 A1 1/2019 Adams et al.
2019/0000469 A1 1/2019 Shelton, IV et al.
2019/0000470 A1 1/2019 Yates et al.
2019/0000471 A1 1/2019 Shelton, IV et al.
2019/0000472 A1 1/2019 Shelton, IV et al.
2019/0000473 A1 1/2019 Shelton, IV et al.
2019/0000474 A1 1/2019 Shelton, IV et al.
2019/0000475 A1 1/2019 Shelton, IV et al.
2019/0000476 A1 1/2019 Shelton, IV et al.
2019/0000477 A1 1/2019 Shelton, IV et al.
2019/0000478 A1 1/2019 Messerly et al.
2019/0000479 A1 1/2019 Harris et al.
2019/0000525 A1 1/2019 Messerly et al.
2019/0000528 A1 1/2019 Yates et al.
2019/0000530 A1 1/2019 Yates et al.
2019/0000531 A1 1/2019 Messerly et al.
2019/0000534 A1 1/2019 Messerly et al.
2019/0000538 A1 1/2019 Widenhouse et al.
2019/0000555 A1 1/2019 Schings et al.
2019/0000565 A1 1/2019 Shelton, IV et al.
2019/0003292 A1 1/2019 Balan et al.
2019/0008509 A1 1/2019 Shelton, IV et al.
2019/0008511 A1 1/2019 Kerr et al.
2019/0015096 A1 1/2019 Shelton, IV et al.
2019/0015102 A1 1/2019 Baber et al.
2019/0015165 A1 1/2019 Giordano et al.
2019/0029675 A1 1/2019 Yates et al.
2019/0029676 A1 1/2019 Yates et al.
2019/0029677 A1 1/2019 Yates et al.
2019/0029678 A1 1/2019 Shelton, IV et al.
2019/0029681 A1 1/2019 Swayze et al.
2019/0029682 A1 1/2019 Huitema et al.
2019/0029701 A1 1/2019 Shelton, IV et al.
2019/0033955 A1 1/2019 Leimbach et al.
2019/0038279 A1 2/2019 Shelton, IV et al.
2019/0038281 A1 2/2019 Shelton, IV et al.
2019/0038282 A1 2/2019 Shelton, IV et al.
2019/0038283 A1 2/2019 Shelton, IV et al.
2019/0038292 A1 2/2019 Zhang
2019/0038371 A1 2/2019 Wixey et al.
2019/0046181 A1 2/2019 McCuen
2019/0046187 A1 2/2019 Yates et al.
2019/0059886 A1 2/2019 Shelton, IV et al.
2019/0090870 A1 3/2019 Shelton, IV et al.
2019/0090871 A1 3/2019 Shelton, IV et al.
2019/0091183 A1 3/2019 Tomat et al.
2019/0099177 A1 4/2019 Yates et al.
2019/0099178 A1 4/2019 Leimbach et al.
2019/0099179 A1 4/2019 Leimbach et al.
2019/0099180 A1 4/2019 Leimbach et al.
2019/0099181 A1 4/2019 Shelton, IV et al.
2019/0099182 A1 4/2019 Bakos et al.
2019/0099183 A1 4/2019 Leimbach et al.
2019/0099184 A1 4/2019 Setser et al.
2019/0099224 A1 4/2019 Leimbach et al.
2019/0099229 A1 4/2019 Spivey et al.
2019/0102930 A1 4/2019 Leimbach et al.
2019/0105035 A1 4/2019 Shelton, IV et al.
2019/0105036 A1 4/2019 Morgan et al.
2019/0105037 A1 4/2019 Morgan et al.
2019/0105038 A1 4/2019 Schmid et al.
2019/0105039 A1 4/2019 Morgan et al.
2019/0105043 A1 4/2019 Jaworek et al.
2019/0105044 A1 4/2019 Shelton, IV et al.
2019/0105049 A1 4/2019 Moore et al.
2019/0110791 A1 4/2019 Shelton, IV et al.
2019/0110792 A1 4/2019 Shelton, IV et al.
2019/0110793 A1 4/2019 Parihar et al.
2019/0117216 A1 4/2019 Overmyer et al.
2019/0117217 A1 4/2019 Overmyer et al.
2019/0117222 A1 4/2019 Shelton, IV et al.
2019/0117224 A1 4/2019 Setser et al.
2019/0117225 A1 4/2019 Moore et al.
2019/0125343 A1 5/2019 Wise et al.
2019/0125344 A1 5/2019 DiNardo et al.
2019/0125345 A1 5/2019 Baber et al.
2019/0125365 A1 5/2019 Parfett et al.
2019/0125380 A1 5/2019 Hunter et al.
2019/0125475 A1 5/2019 Wise et al.
2019/0133585 A1 5/2019 Smith et al.
2019/0142421 A1 5/2019 Shelton, IV
2019/0183490 A1 6/2019 Shelton, IV et al.
2019/0183491 A1 6/2019 Shelton, IV et al.
2019/0183492 A1 6/2019 Shelton, IV et al.
2019/0183493 A1 6/2019 Shelton, IV et al.
2019/0183494 A1 6/2019 Shelton, IV et al.
2019/0183495 A1 6/2019 Shelton, IV et al.
2019/0183496 A1 6/2019 Shelton, IV et al.
2019/0183497 A1 6/2019 Shelton, IV et al.
2019/0183498 A1 6/2019 Shelton, IV et al.
2019/0183499 A1 6/2019 Shelton, IV et al.
2019/0183500 A1 6/2019 Shelton, IV et al.
2019/0183501 A1 6/2019 Shelton, IV et al.
2019/0183502 A1 6/2019 Shelton, IV et al.
2019/0183503 A1 6/2019 Shelton, IV et al.
2019/0183504 A1 6/2019 Shelton, IV et al.
2019/0183505 A1 6/2019 Vendely et al.
2019/0183592 A1 6/2019 Shelton, IV et al.
2019/0183594 A1 6/2019 Shelton, IV et al.
2019/0183597 A1 6/2019 Shelton, IV et al.
2019/0192137 A1 6/2019 Shelton, IV et al.
2019/0192138 A1 6/2019 Shelton, IV et al.
2019/0192141 A1 6/2019 Shelton, IV et al.
2019/0192144 A1 6/2019 Parfett et al.
2019/0192145 A1 6/2019 Shelton, IV et al.
2019/0192146 A1 6/2019 Widenhouse et al.
2019/0192147 A1 6/2019 Shelton, IV et al.
2019/0192148 A1 6/2019 Shelton, IV et al.
2019/0192149 A1 6/2019 Shelton, IV et al.
2019/0192150 A1 6/2019 Widenhouse et al.
2019/0192151 A1 6/2019 Shelton, IV et al.
2019/0192152 A1 6/2019 Morgan et al.
2019/0192153 A1 6/2019 Shelton, IV et al.
2019/0192154 A1 6/2019 Shelton, IV et al.
2019/0192155 A1 6/2019 Shelton, IV et al.
2019/0192156 A1 6/2019 Simms et al.
2019/0192157 A1 6/2019 Scott et al.
2019/0192158 A1 6/2019 Scott et al.
2019/0192159 A1 6/2019 Simms et al.
2019/0192227 A1 6/2019 Shelton, IV et al.
2019/0192235 A1 6/2019 Harris et al.
2019/0192236 A1 6/2019 Shelton, IV et al.
2019/0200895 A1 7/2019 Shelton, IV et al.
2019/0200991 A1 7/2019 Moore et al.
2019/0200992 A1 7/2019 Moore et al.
2019/0200993 A1 7/2019 Moore et al.
2019/0200994 A1 7/2019 Moore et al.
2019/0209164 A1 7/2019 Timm et al.
2019/0209165 A1 7/2019 Timm et al.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2019/0209171	A1	7/2019	Shelton, IV et al.
2019/0209172	A1	7/2019	Shelton, IV et al.
2019/0209247	A1	7/2019	Giordano et al.
2019/0209248	A1	7/2019	Giordano et al.
2019/0209249	A1	7/2019	Giordano et al.
2019/0209250	A1	7/2019	Giordano et al.
2019/0216558	A1	7/2019	Giordano et al.
2019/0223865	A1	7/2019	Shelton, IV et al.
2019/0223871	A1	7/2019	Moore et al.
2019/0261991	A1	8/2019	Beckman et al.
2019/0267403	A1	8/2019	Li et al.
2019/0269400	A1	9/2019	Mandakolathur Vasudevan et al.
2019/0269402	A1	9/2019	Murray et al.
2019/0269403	A1	9/2019	Baxter, III et al.
2019/0269407	A1	9/2019	Swensgard et al.
2019/0290263	A1	9/2019	Morgan et al.
2019/0290264	A1	9/2019	Morgan et al.
2019/0290265	A1	9/2019	Shelton, IV et al.
2019/0290274	A1	9/2019	Shelton, IV

FOREIGN PATENT DOCUMENTS

CA	1015829	A	8/1977
CA	1125615	A	6/1982
CA	2520413	A1	3/2007
CA	2725181	A1	11/2007
CA	2851239	A1	11/2007
CA	2664874	A1	11/2009
CA	2813230	A1	4/2012
CA	2940510	A1	8/2015
CN	1163558	A	10/1997
CN	2488482	Y	5/2002
CN	1634601	A	7/2005
CN	2716900	Y	8/2005
CN	2738962	Y	11/2005
CN	1777406	A	5/2006
CN	2796654	Y	7/2006
CN	2868212	Y	2/2007
CN	200942099	Y	9/2007
CN	200984209	Y	12/2007
CN	200991269	Y	12/2007
CN	201001747	Y	1/2008
CN	101143105	A	3/2008
CN	201029899	Y	3/2008
CN	101378791	A	3/2009
CN	101522120	A	9/2009
CN	101669833	A	3/2010
CN	101721236	A	6/2010
CN	101828940	A	9/2010
CN	101873834	A	10/2010
CN	201719298	U	1/2011
CN	102038532	A	5/2011
CN	201879759	U	6/2011
CN	201949071	U	8/2011
CN	102217963	A	10/2011
CN	101779977	B	12/2011
CN	101912284	B	7/2012
CN	102125450	B	7/2012
CN	202313537	U	7/2012
CN	202397539	U	8/2012
CN	202426586	U	9/2012
CN	202489990	U	10/2012
CN	102228387	B	11/2012
CN	102835977	A	12/2012
CN	202568350	U	12/2012
CN	103690212	A	4/2014
CN	203564285	U	4/2014
CN	203564287	U	4/2014
CN	203597997	U	5/2014
CN	103829981	A	6/2014
CN	103829983	A	6/2014
CN	103908313	A	7/2014
CN	203693685	U	7/2014
CN	203736251	U	7/2014
CN	103981635	A	8/2014
CN	203815517	U	9/2014
CN	102783741	B	10/2014
CN	102973300	B	10/2014
CN	104337556	A	2/2015
CN	204158440	U	2/2015
CN	204158441	U	2/2015
CN	102469995	B	3/2015
CN	204636451	U	9/2015
CN	103860225	B	3/2016
CN	103750872	B	5/2016
DE	273689	C	5/1914
DE	1775926	A	1/1972
DE	3036217	A1	4/1982
DE	3210466	A1	9/1983
DE	3709067	A1	9/1988
DE	19534043	A1	3/1997
DE	19851291	A1	1/2000
DE	19924311	A1	11/2000
DE	20016423	U1	2/2001
DE	20112837	U1	10/2001
DE	20121753	U1	4/2003
DE	202004012389	U1	9/2004
DE	10314072	A1	10/2004
DE	102004014011	A1	10/2005
DE	102004063606	A1	7/2006
DE	202007003114	U1	6/2007
DE	102010013150	A1	9/2011
EP	0000756	A1	2/1979
EP	0122046	A1	10/1984
EP	0129442	B1	11/1987
EP	0255631	A1	2/1988
EP	0169044	B1	6/1991
EP	0541950	A1	5/1993
EP	0548998	A1	6/1993
EP	0594148	A1	4/1994
EP	0646357	A1	4/1995
EP	0505036	B1	5/1995
EP	0669104	A1	8/1995
EP	0705571	A1	4/1996
EP	0528478	B1	5/1996
EP	0770355	A1	5/1997
EP	0625335	B1	11/1997
EP	0879742	A1	11/1998
EP	0650701	B1	3/1999
EP	0923907	A1	6/1999
EP	0484677	B2	7/2000
EP	1034747	A1	9/2000
EP	1034748	A1	9/2000
EP	0726632	B1	10/2000
EP	1053719	A1	11/2000
EP	1055399	A1	11/2000
EP	1055400	A1	11/2000
EP	1080694	A1	3/2001
EP	1090592	A1	4/2001
EP	1095627	A1	5/2001
EP	0806914	B1	9/2001
EP	1234587	A1	8/2002
EP	1284120	A1	2/2003
EP	0717967	B1	5/2003
EP	0869742	B1	5/2003
EP	1374788	A1	1/2004
EP	1407719	A2	4/2004
EP	0996378	B1	6/2004
EP	1157666	B1	9/2005
EP	0880338	B1	10/2005
EP	1158917	B1	11/2005
EP	1344498	B1	11/2005
EP	1330989	B1	12/2005
EP	1632191	A2	3/2006
EP	1082944	B1	5/2006
EP	1253866	B1	7/2006
EP	1723914	A1	11/2006
EP	1285633	B1	12/2006
EP	1011494	B1	1/2007
EP	1767163	A1	3/2007
EP	1837041	A1	9/2007
EP	0922435	B1	10/2007
EP	1599146	B1	10/2007
EP	1330201	B1	6/2008

(56) **References Cited**

FOREIGN PATENT DOCUMENTS

EP	2039302	A2	3/2009
EP	1719461	B1	6/2009
EP	2116196	A2	11/2009
EP	1769754	B1	6/2010
EP	2236096	A1	10/2010
EP	1627605	B1	12/2010
EP	2316345	A1	5/2011
EP	1962711	B1	2/2012
EP	2486862	A2	8/2012
EP	2486868	A2	8/2012
EP	2517638	A1	10/2012
EP	2606812	A1	6/2013
EP	2649948	A1	10/2013
EP	2649949	A1	10/2013
EP	2668910	A2	12/2013
EP	2687164	A2	1/2014
EP	2713902	A1	4/2014
EP	2743042	A2	6/2014
EP	2764827	A2	8/2014
EP	2777524	A2	9/2014
EP	2842500	A1	3/2015
EP	2853220	A1	4/2015
EP	2298220	B1	6/2016
EP	2510891	B1	6/2016
EP	3031404	A1	6/2016
EP	3047806	A1	7/2016
EP	3078334	A1	10/2016
EP	2364651	B1	11/2016
EP	2747235	B1	11/2016
EP	2789299	B1	5/2017
EP	3225190	A2	10/2017
EP	3363378	A1	8/2018
FR	459743	A	11/1913
FR	999646	A	2/1952
FR	1112936	A	3/1956
FR	2598905	A1	11/1987
FR	2689749	B1	7/1994
FR	2765794	A1	1/1999
FR	2815842	A1	5/2002
GB	939929	A	10/1963
GB	1210522	A	10/1970
GB	1217159	A	12/1970
GB	1339394	A	12/1973
GB	2024012	A	1/1980
GB	2109241	A	6/1983
GB	2090534	B	6/1984
GB	2272159	A	5/1994
GB	2336214	A	10/1999
GB	2509523	A	7/2014
GR	930100110	A	11/1993
JP	S4711908	Y1	5/1972
JP	S5033988	U	4/1975
JP	S56112235	A	9/1981
JP	S60113007	A	6/1985
JP	S62170011	U	10/1987
JP	S63270040	A	11/1988
JP	H0129503	B2	6/1989
JP	H0378514	U	8/1991
JP	H0385009	U	8/1991
JP	H04215747	A	8/1992
JP	H04131860	U	12/1992
JP	H0584252	A	4/1993
JP	H05123325	A	5/1993
JP	H05226945	A	9/1993
JP	H0630945	A	2/1994
JP	H06237937	A	8/1994
JP	H06327684	A	11/1994
JP	H079622	U	2/1995
JP	H07124166	A	5/1995
JP	H07163573	A	6/1995
JP	H07255735	A	10/1995
JP	H07285089	A	10/1995
JP	H0833642	A	2/1996
JP	H08164141	A	6/1996
JP	H08182684	A	7/1996
JP	H08507708	A	8/1996
JP	H08229050	A	9/1996
JP	H08289895	A	11/1996
JP	H09-323068	A	12/1997
JP	H10118090	A	5/1998
JP	H10-200699	A	7/1998
JP	H10296660	A	11/1998
JP	2000014632	A	1/2000
JP	2000033071	A	2/2000
JP	2000112002	A	4/2000
JP	2000166932	A	6/2000
JP	2000171730	A	6/2000
JP	2000271141	A	10/2000
JP	2000287987	A	10/2000
JP	2000325303	A	11/2000
JP	2001087272	A	4/2001
JP	2001514541	A	9/2001
JP	2001276091	A	10/2001
JP	2002051974	A	2/2002
JP	2002054903	A	2/2002
JP	2002085415	A	3/2002
JP	2002143078	A	5/2002
JP	2002153481	A	5/2002
JP	2002528161	A	9/2002
JP	2002314298	A	10/2002
JP	2003135473	A	5/2003
JP	2003521301	A	7/2003
JP	3442423	B2	9/2003
JP	2003300416	A	10/2003
JP	2004147701	A	5/2004
JP	2004162035	A	6/2004
JP	2004229976	A	8/2004
JP	2005013573	A	1/2005
JP	2005080702	A	3/2005
JP	2005131163	A	5/2005
JP	2005131164	A	5/2005
JP	2005131173	A	5/2005
JP	2005131211	A	5/2005
JP	2005131212	A	5/2005
JP	2005137423	A	6/2005
JP	2005187954	A	7/2005
JP	2005211455	A	8/2005
JP	2005328882	A	12/2005
JP	2005335432	A	12/2005
JP	2005342267	A	12/2005
JP	3791856	B2	6/2006
JP	2006187649	A	7/2006
JP	2006218228	A	8/2006
JP	2006281405	A	10/2006
JP	2006346445	A	12/2006
JP	2008220032	A	9/2008
JP	2009507526	A	2/2009
JP	2009189838	A	8/2009
JP	2009189846	A	8/2009
JP	2009207260	A	9/2009
JP	2009226028	A	10/2009
JP	2009538684	A	11/2009
JP	2009539420	A	11/2009
JP	2010069307	A	4/2010
JP	2010069310	A	4/2010
JP	2010098844	A	4/2010
JP	2010214128	A	9/2010
JP	2011072574	A	4/2011
JP	4722849	B2	7/2011
JP	2011524199	A	9/2011
JP	2012143283	A	8/2012
JP	2012145767	A	8/2012
JP	2012232121	A	11/2012
JP	5154710	B1	2/2013
JP	2014121599	A	7/2014
JP	2016512057	A	4/2016
KR	20100110134	A	10/2010
KR	20110003229	A	1/2011
RU	1814161	C	5/1993
RU	2008830	C1	3/1994
RU	2052979	C1	1/1996
RU	2066128	C1	9/1996
RU	2069981	C1	12/1996
RU	2098025	C1	12/1997

(56) **References Cited**

FOREIGN PATENT DOCUMENTS

RU	2104671	C1	2/1998
RU	2110965	C1	5/1998
RU	2141279	C1	11/1999
RU	2144791	C1	1/2000
RU	2161450	C1	1/2001
RU	2181566	C2	4/2002
RU	2187249	C2	8/2002
RU	32984	U1	10/2003
RU	2225170	C2	3/2004
RU	42750	U1	12/2004
RU	61114	U1	2/2007
RU	61122	U1	2/2007
SU	189517	A	1/1967
SU	297156	A	5/1971
SU	328636	A	9/1972
SU	511939	A1	4/1976
SU	674747	A1	7/1979
SU	728848	A1	4/1980
SU	1009439	A	4/1983
SU	1271497	A1	11/1986
SU	1333319	A2	8/1987
SU	1377052	A1	2/1988
SU	1377053	A1	2/1988
SU	1443874	A1	12/1988
SU	1509051	A1	9/1989
SU	1561964	A1	5/1990
SU	1708312	A1	1/1992
SU	1722476	A1	3/1992
SU	1752361	A1	8/1992
SU	1814161	A1	5/1993
WO	WO-9315648	A1	8/1993
WO	WO-9420030	A1	9/1994
WO	WO-9517855	A1	7/1995
WO	WO-9520360	A1	8/1995
WO	WO-9623448	A1	8/1996
WO	WO-9635464	A1	11/1996
WO	WO-9639086	A1	12/1996
WO	WO-9639088	A1	12/1996
WO	WO-9724073	A1	7/1997
WO	WO-9734533	A1	9/1997
WO	WO-9903407	A1	1/1999
WO	WO-9903409	A1	1/1999
WO	WO-9948430	A1	9/1999
WO	WO-0024322	A1	5/2000
WO	WO-0024330	A1	5/2000
WO	WO-0053112	A2	9/2000
WO	WO-0057796	A1	10/2000
WO	WO-0105702	A1	1/2001
WO	WO-0154594	A1	8/2001
WO	WO-0158371	A1	8/2001
WO	WO-0162164	A2	8/2001
WO	WO-0162169	A2	8/2001
WO	WO-0191646	A1	12/2001
WO	WO-0219932	A1	3/2002
WO	WO-0226143	A1	4/2002
WO	WO-0236028	A1	5/2002
WO	WO-02065933	A2	8/2002
WO	WO-03055402	A1	7/2003
WO	WO-03094747	A1	11/2003
WO	WO-03079909	A3	3/2004
WO	WO-2004019803	A1	3/2004
WO	WO-2004032783	A1	4/2004
WO	WO-2004047626	A1	6/2004
WO	WO-2004047653	A2	6/2004
WO	WO-2004056277	A1	7/2004
WO	WO-2004078050	A2	9/2004
WO	WO-2004078051	A2	9/2004
WO	WO-2004096015	A2	11/2004
WO	WO-2006044581	A2	4/2006
WO	WO-2006051252	A1	5/2006
WO	WO-2006059067	A1	6/2006
WO	WO-2006073581	A2	7/2006
WO	WO-2006085389	A1	8/2006
WO	WO-2007015971	A2	2/2007
WO	WO-2007074430	A1	7/2007
WO	WO-2007129121	A1	11/2007
WO	WO-2007137304	A2	11/2007
WO	WO-2007142625	A2	12/2007
WO	WO-2008021969	A2	2/2008
WO	WO-2008061566	A1	5/2008
WO	WO-2008089404	A2	7/2008
WO	WO-2009005969	A2	1/2009
WO	WO-2009067649	A2	5/2009
WO	WO-2009091497	A2	7/2009
WO	WO-2010126129	A1	11/2010
WO	WO-2010134913	A1	11/2010
WO	WO-2011008672	A2	1/2011
WO	WO-2011044343	A2	4/2011
WO	WO-2012006306	A2	1/2012
WO	WO-2012013577	A1	2/2012
WO	WO-2012044606	A2	4/2012
WO	WO-2012061725	A1	5/2012
WO	WO-2012072133	A1	6/2012
WO	WO-2012166503	A1	12/2012
WO	WO-2013087092	A1	6/2013
WO	WO-2013151888	A1	10/2013
WO	WO-2014004209	A2	1/2014
WO	WO-2014113438	A1	7/2014
WO	WO-2015032797	A1	3/2015
WO	WO-2015138760	A1	9/2015
WO	WO-2015187107	A1	12/2015
WO	WO-2016057225	A1	4/2016

OTHER PUBLICATIONS

Miyata et al., "Biomolecule-Sensitive Hydrogels," Advanced Drug Delivery Reviews, 54 (2002) pp. 79-98.

Jeong et al., "Thermosensitive Sol-Gel Reversible Hydrogels," Advanced Drug Delivery Reviews, 54 (2002) pp. 37-51.

Covidien Brochure, "Endo GIA™ Ultra Universal Stapler," (2010), 2 pages.

Qiu et al., "Environment-Sensitive Hydrogels for Drug Delivery," Advanced Drug Delivery Reviews, 53 (2001) pp. 321-339.

Hoffman, "Hydrogels for Biomedical Applications," Advanced Drug Delivery Reviews, 43 (2002) pp. 3-12.

Peppas, "Physiologically Responsive Hydrogels," Journal of Bioactive and Compatible Polymers, vol. 6 (Jul. 1991) pp. 241-246.

Peppas, Editor "Hydrogels in Medicine and Pharmacy," vol. I, Fundamentals, CRC Press, 1986.

Young, "Microcellular foams via phase separation," Journal of Vacuum Science & Technology A 4(3), (May/Jun. 1986).

Ebara, "Carbohydrate-Derived Hydrogels and Microgels," Engineered Carbohydrate-Based Materials for Biomedical Applications: Polymers, Surfaes, Dendrimers, Nanoparticles, and Hydrogels, Edited by Ravin Narain, 2011, pp. 337-345.

D. Tuite, Ed., "Get The Lowdown On Ultracapacitors," Nov. 15, 2007; [online] URL: http://electronicdesign.com/Articles/Print.cfm?ArticleID=17465, accessed Jan. 15, 2008 (5 pages).

Datasheet for Panasonic TK Relays Ultra Low Profile 2 A Polarized Relay, Copyright Matsushita Electric Works, Ltd. (Known of at least as early as Aug. 17, 2010), 5 pages.

B.R. Coolman, DVM, MS et al., "Comparison of Skin Staples Wth Sutures for Anastomosis of the Small Intestine in Dogs," Abstract; http://www.blackwell-synergy.com/doi/abs/10.1053/jvet.2000.7539?cookieSet=1&journalCode=vsu which redirects to http://www3.interscience.wiley.com.journal/119040681/abstract?CRETRY=1&SRETRY=0; [online] accessed: Sep. 22, 2008 (2 pages).

Disclosed Anonymously, "Motor-Driven Surgical Stapler Improvements," Research Disclosure Database No. 526041, Published: Feb. 2008.

Van Meer et al., "A Disposable Plastic Compact Wrist for Smart Minimally Invasive Surgical Tools," LAAS/CNRS (Aug. 2005).

Breedveld et al., "A New, Easily Miniaturized Sterrable Endoscope," IEEE Engineering in Medicine and Biology Magazine (Nov./Dec. 2005).

ASTM procedure D2240-00, "Standard Test Method for Rubber Property-Durometer Hardness," (Published Aug. 2000).

ASTM procedure D2240-05, "Standard Test Method for Rubber Property-Durometer Hardness," (Published Apr. 2010).

(56) **References Cited**

OTHER PUBLICATIONS

Solorio et al., "Gelatin Microspheres Crosslinked with Genipin for Local Delivery of Growth Factors," J. Tissue Eng. Regen. Med. (2010), 4(7): pp. 514-523.
Pitt et al., "Attachment of Hyaluronan to Metallic Surfaces," J. Biomed. Mater. Res. 68A: pp. 95-106, 2004.
Covidien iDrive™ Ultra in Service Reference Card, "iDrive™ Ultra Powered Stapling Device," (4 pages).
Covidien iDrive™ Ultra Powered Stapling System ibrochure, "The Power of iDrive™ Ultra Powered Stapling System and Tri-Staple™ Technology," (23 pages).
Covidien "iDrive™ Ultra Powered Stapling System, A Guide for Surgeons," (6 pages).
Covidien "iDrive™ Ultra Powered Stapling System, Cleaning and Sterilization Guide," (2 pages).
"Indian Standard: Automotive Vehicles—Brakes and Braking Systems (IS 11852-1:2001)", Mar. 1, 2001.
Covidien Brochure "iDrive™ Ultra Powered Stapling System," (6 pages).
Allegro MicroSystems, LLC, Automotive Full Bridge MOSFET Driver, A3941-DS, Rev. 5, 21 pages, http://www.allegromicro.com/~/media/Files/Datasheets/A3941-Datasheet.ashx?la=en.
Data Sheet of LM4F230H5QR, 2007.
Covidien Brochure, "Endo GIA™ Reloads with Tri-Staple™ Technology," (2010), 1 page.
Covidien Brochure, "Endo GIA™ Reloads with Tri-Staple™ Technology and Endo GIA™ Ultra Universal Staplers," (2010), 2 pages.
Covidien Brochure, "Endo GIA™ Curved Tip Reload with Tri-Staple™ Technology," (2012), 2 pages.
Covidien Brochure, "Endo GIA™ Reloads with Tri-Staple™ Technology," (2010), 2 pages.
http://ninpgan.net/publications/51-100/89.pdf; 2004, Ning Pan, On Uniqueness of Fibrous Materials, Design & Nature II. Eds: Colins, M. and Brebbia, C. WIT Press, Boston, 493-504.
Seils et al., Covidien Summary: Clinical Study "UCONN Biodynamics: Final Report on Results," (2 pages).
Byrne et al., "Molecular Imprinting Within Hydrogels," Advanced Drug Delivery Reviews, 54 (2002) pp. 149-161.
Fast, Versatile Blackfin Processors Handle Advanced RFID Reader Applications; Analog Dialogue: vol. 40—Sep. 2006; http://www.analog.com/library/analogDialogue/archives/40-09/rfid.pdf; Wayback Machine to Feb. 15, 2012.
Chen et al., "Elastomeric Biomaterials for Tissue Engineering," Progress in Polymer Science 38 (2013), pp. 584-671.
Matsuda, "Thermodynamics of Formation of Porous Polymeric Membrane from Solutions," Polymer Journal, vol. 23, No. 5, pp. 435-444 (1991).
Covidien Brochure, "Endo GIA™ Black Reload with Tri-Staple™ Technology," (2012), 2 pages.
"Biomedical Coatings," Fort Wayne Metals, Research Products Corporation, obtained online at www.fwmetals.com on Jun. 21, 2010 (1 page).
The Sodem Aseptic Battery Transfer Kit, Sodem Systems, 2000, 3 pages.
C.C. Thompson et al., "Peroral Endoscopic Reduction of Dilated Gastrojejunal Anastomosis After Roux-en-Y Gastric Bypass: A Possible New Option for Patients with Weight Regain," Surg Endosc (2006) vol. 20., pp. 1744-1748.
Serial Communication Protocol; Michael Lemmon Feb. 1, 2009; http://www3.nd.edu/~lemmon/courses/ee224/web-manual/web-manual/lab12/node2.html; Wayback Machine to Apr. 29, 2012.
Lyon et al. "The Relationship Between Current Load and Temperature for Quasi-Steady State and Transient Conditions," SPIE—International Society for Optical Engineering. Proceedings, vol. 4020, (pp. 62-70), Mar. 30, 2000.
Anonymous: "Sense & Control Application Note Current Sensing Using Linear Hall Sensors," Feb. 3, 2009, pp. 1-18. Retrieved from the Internet: URL: http://www.infineon.com/dgdl/Current_Sensing_Rev.1.1.pdf?fileId=db3a304332d040720132d939503e5f17 [retrieved on Oct. 18, 2016].
Mouser Electronics, "LM317M 3-Terminal Adjustable Regulator with Overcurrent/Overtemperature Self Protection", Mar. 31, 2014 (Mar. 31, 2014), XP0555246104, Retrieved from the Internet: URL: http://www.mouser.com/ds/2/405/lm317m-440423.pdf, pp. 1-8.
Mouser Electronics, "LM317 3-Terminal Adjustable Regulator with Overcurrent/Overtemperature Self Protection", Sep. 30, 2016 (Sep. 30, 2016), XP0555246104, Retrieved from the Internet: URL: http://www.mouser.com/ds/2/405/lm317m-440423.pdf, pp. 1-9.
Cuper et al., "The Use of Near-Infrared Light for Safe and Effective Visualization of Subsurface Blood Vessels to Facilitate Blood Withdrawal in Children," Medical Engineering & Physics, vol. 35, No. 4, pp. 433-440 (2013).
Yan et al, Comparison of the effects of Mg—6Zn and Ti—3Al—2.5V alloys on TGF-β/TNF-αVEGF/b-FGF in the healing of the intestinal track in vivo, Biomed. Mater. 9 (2014), 11 pages.
Pellicer et al. "On the biodegradability, mechanical behavior, and cytocompatibility of amorphous Mg72Zn23Ca5 and crystalline Mg70Zn23Ca5Pd2 alloys as temporary implant materials," J Biomed Mater Res Part A ,2013:101A:502-517.
Anonymous, Analog Devices Wiki, Chapter 11: The Current Mirror, Aug. 20, 2017, 22 pages. https://wiki.analog.com/university/courses/electronics/text/chapter-11?rev=1503222341.
Yan et al., "Comparison of the effects of Mg—6Zn and titanium on intestinal tract in vivo," J Mater Sci: Mater Med (2013), 11 pages.
Brar et al., "Investigation of the mechanical and degradation properties of Mg—Sr and Mg—Zn—Sr alloys for use as potential biodegradable implant materials," J. Mech. Behavior of Biomed. Mater. 7 (2012) pp. 87-95.
Texas Instruments: "Current Recirculation and Decay Modes," Application Report SLVA321—Mar. 2009; Retrieved from the Internet: URL:http://www.ti.com/lit/an/slva321/slva321 [retrieved on Apr. 25, 2017], 7 pages.
Qiu Li Loh et al.: "Three-Dimensional Scaffolds for Tissue Engineering Applications: Role of Porosity and Pore Size", Tissue Engineering Part B-Reviews, vol. 19, No. 6, Dec. 1, 2013, pp. 485-502.
Gao et al., "Mechanical Signature Enhancement of Response Vibrations in the Time Lag Domain," Fifth International Congress on Sound and Vibration, Dec. 15-18, 1997, pp. 1-8.
Trendafilova et al., "Vibration-based Methods for Structural and Machinery Fault Diagnosis Based on Nonlinear Dynamics Tools," In: Fault Diagnosis in Robotic and Industrial Systems, IConcept Press LTD, 2012, pp. 1-29.
Youtube.com; video by Fibran (retrieved from URL https://www.youtube.com/watch?v=vN2Qjt51gFQ); (Year: 2018).
"Foot and Ankle: Core Knowledge in Orthopaedics"; by DiGiovanni MD, Elsevier; (p. 27, left column, heading "Materials for Soft Orthoses", 7th bullet point); (Year: 2007).
Lee, Youbok, "Antenna Circuit Design for RFID Applications," 2003, pp. 1-50, DS00710C, Microchip Technology Inc., Available: http://ww1.microchip.com/downloads/en/AppNotes/00710c.pdf.
Kawamura, Atsuo, et al. "Wireless Transmission of Power and Information Through One High-Frequency Resonant AC Link Inverter for Robot Manipulator Applications," Journal, May/Jun. 1996, pp. 503-508, vol. 32, No. 3, IEEE Transactions on Industry Applications.
Honda HS1332AT and ATD Model Info, powerequipment.honda.com [online], published on or before Mar. 22, 2016, [retrieved on May 31, 2019], retrieved from the Internet [URL: https://powerequipment.honda.com/snowblowers/models/hss1332at-hss1332atd] (Year: 2016).
Slow Safety Sign, shutterstock.com [online], published on or before May 9, 2017, [retrieved on May 31, 2019], retrieved from the https://www.shutterstock.com/image-victor/slow-safety-sign-twodimensional-turtle-symbolizing- . . . (Year: 2017).
Warning Sign Beveled Buttons, by Peter, flarestock.com [online], published on or before Jan. 1, 2017, [retrieved on Jun. 4, 2019], retrieved from the Internet [URL: https://www.flarestock.com/stock-images/warning-sign-beveled-buttons/70257] (Year: 2017).
Arrow Sign Icon Next Button, by Blan-k, shutterstock.com [online], published on or before Aug. 6, 2014, [retrieved on Jun. 4, 2019], retrieved from the Internet [URL:https://www.shutterstock.com/de/

(56) **References Cited**

OTHER PUBLICATIONS

image-vector/arrow-sign-icon-next-button-navigation-207700303?irgwc=1&utm . . .] (Year: 2014).
Elite Icons, by smart/icons, iconfinder.com [online], published on Aug. 18, 2016, [retrieved on Jun. 4, 2019], retrieved from the Internet [URL: https://www.iconfinder.com/iconsets/elite] (Year: 2016).
"Tutorial overview of inductively coupled RFID Systems," UPM, May 2003, pp. 1-7, UPM Rafsec,<http://cdn.mobiusconsulting.com/papers/rfidsystems.pdf>.
Schroeter, John, "Demystifying UHF Gen 2 RFID, HF RFID," Online Article, Jun. 2, 2008, pp. 1-3, <https://www.edn.com/design/industrial-contro1/4019123/Demystifying-UHF-Gen-2-RFID-HF-RFID>.
Adeeb, et al.. "An Inductive Link-Based Wireless Power Transfer System for Biomedical Applications," Research Article, Nov. 14, 2011, pp. 1-12, vol. 2012. Article ID 879294, Hindawi Publishing Corporation.
"Pushing Pixels (GIF)", published on dribble.com, 2013.
"Sodium stearate C18H35NaO2", Chemspider Search and Share Chemistry, Royal Society of Chemistry, pp. 1-3, 2015, http://www.chemspider.com/Chemical-Structure.12639.html, accessed May 23, 2016.
NF Monographs: Sodium Stearate, U.S. Pharmacopeia, http://www.pharmacopeia.cn/v29240/usp29nf24s0_m77360.html, accessed May 23, 2016.
Fischer, Martin H, "Colloid-Chemical Studies on Soaps", The Chemical Engineer, pp. 184-193, Aug. 1919.
V.K. Ahluwalia and Madhuri Goyal, A Textbook of Organic Chemistry, Section 19.11.3, p. 356, 2000.
A.V. Kasture and S.G. Wadodkar, Pharmaceutical Chemistry-II: Second Year Diploma in Pharmacy, Nirali Prakashan, p. 339, 2007.

* cited by examiner

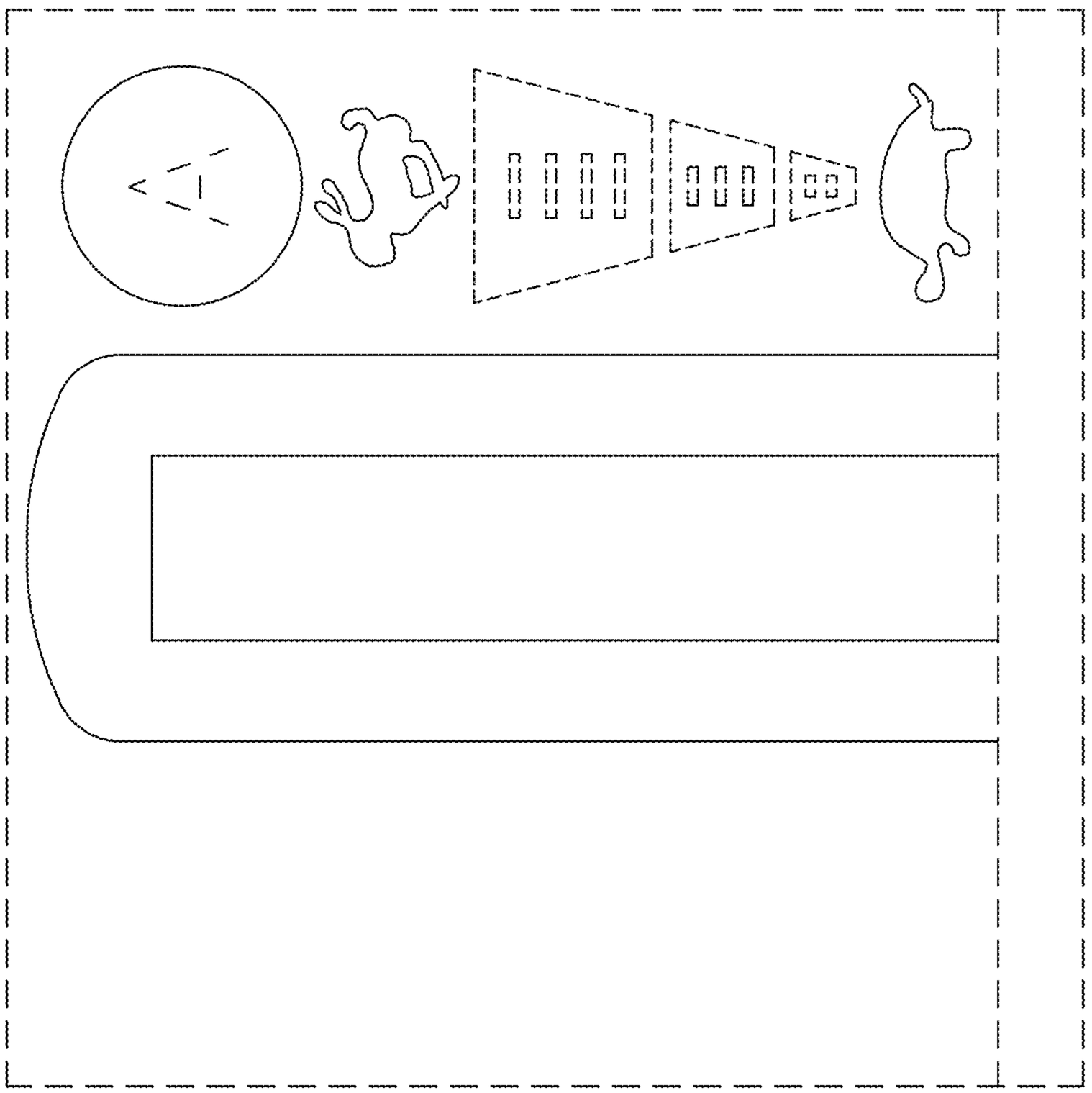


FIG. 1

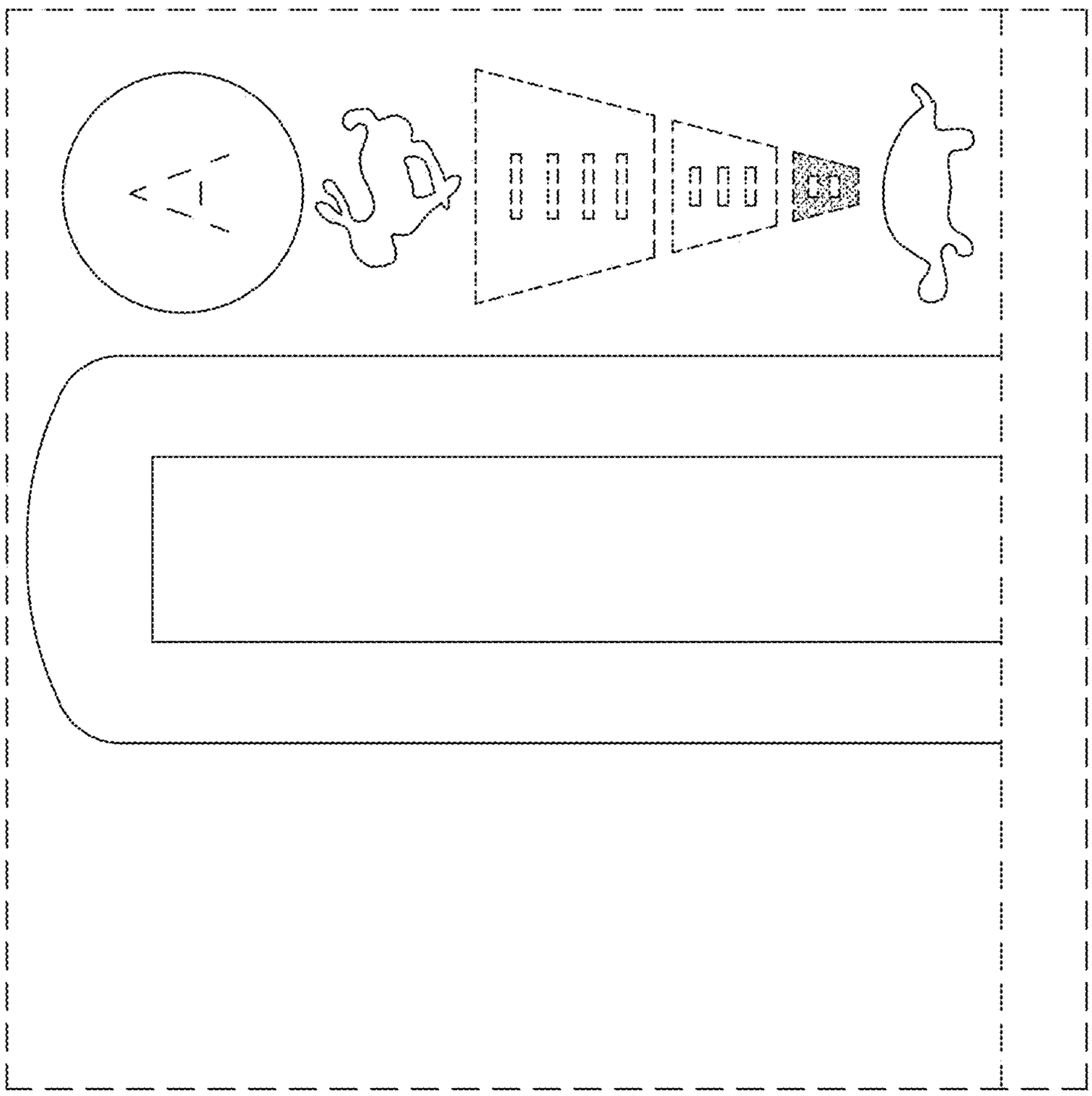


FIG. 2

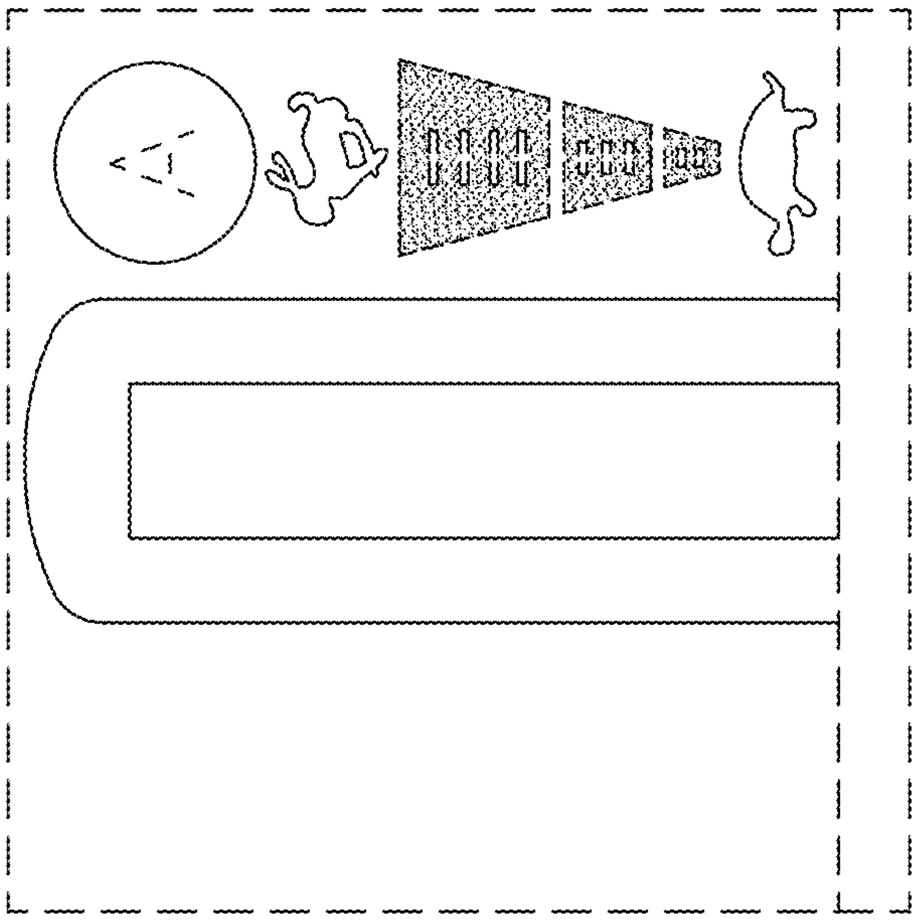


FIG. 4

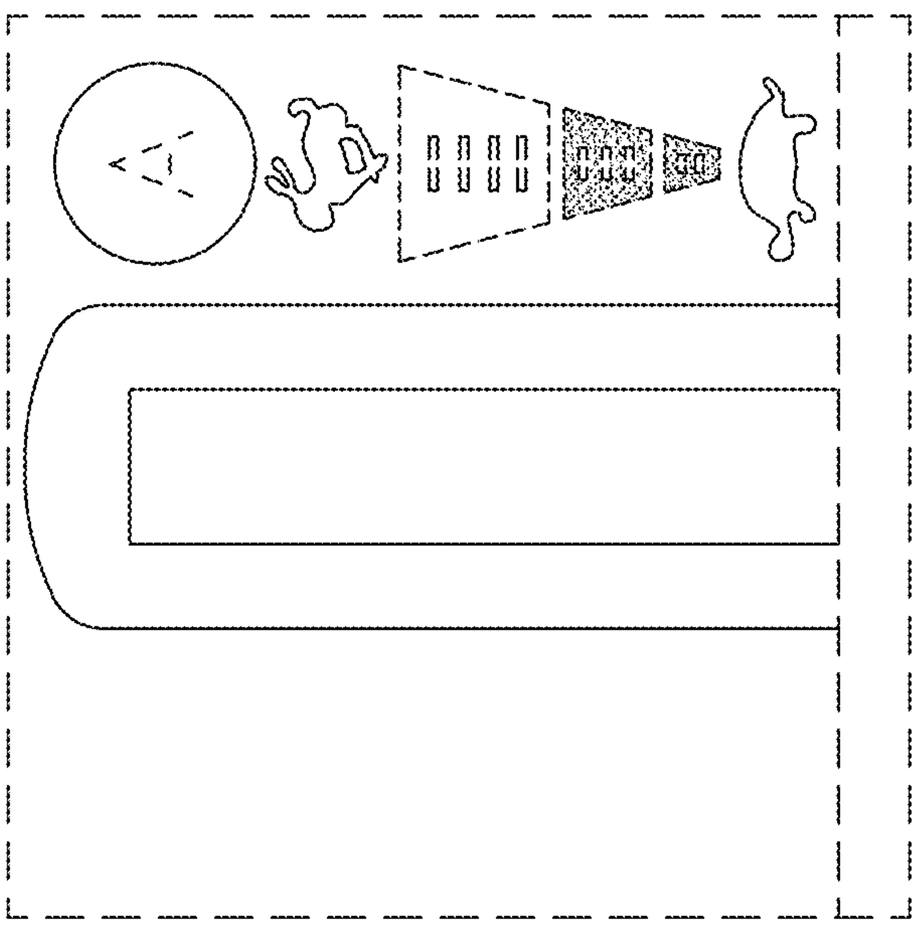


FIG. 3

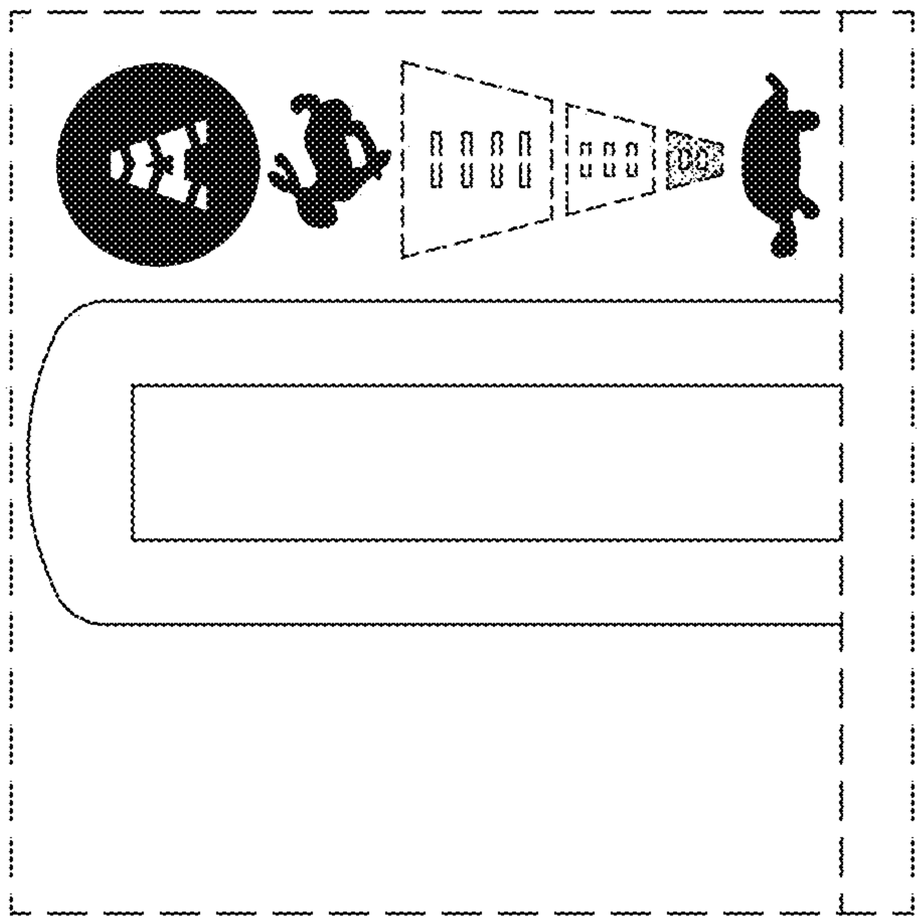


FIG. 4

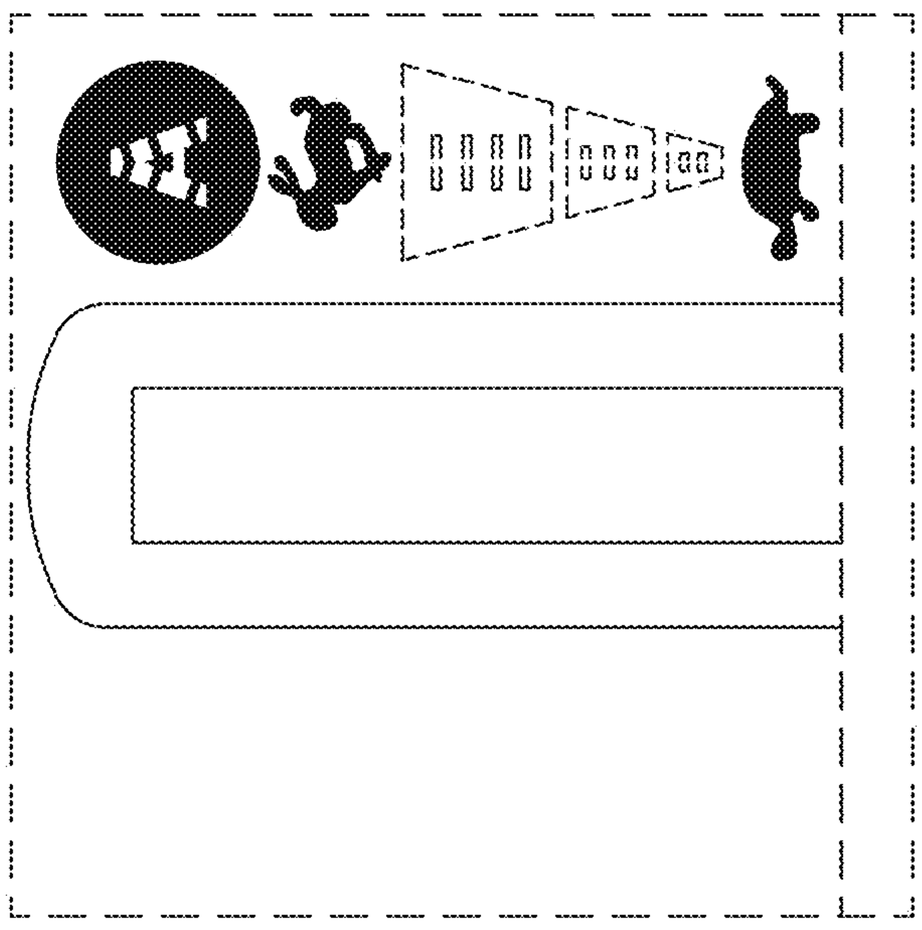


FIG. 5

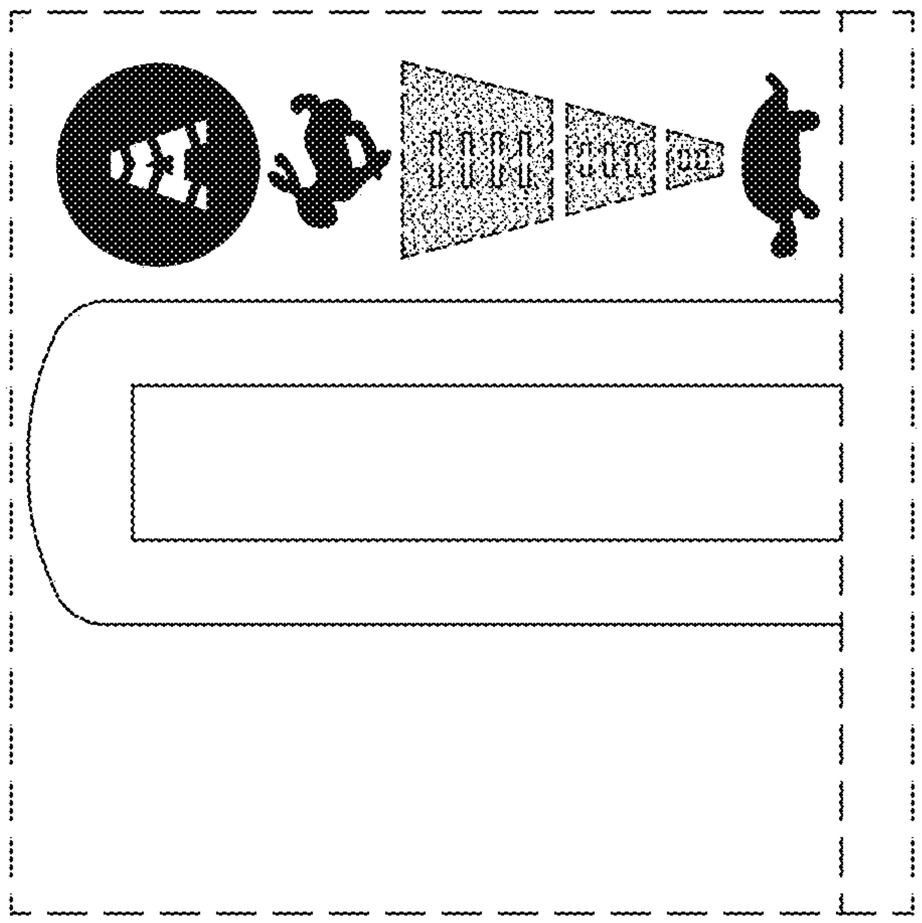


FIG. 8

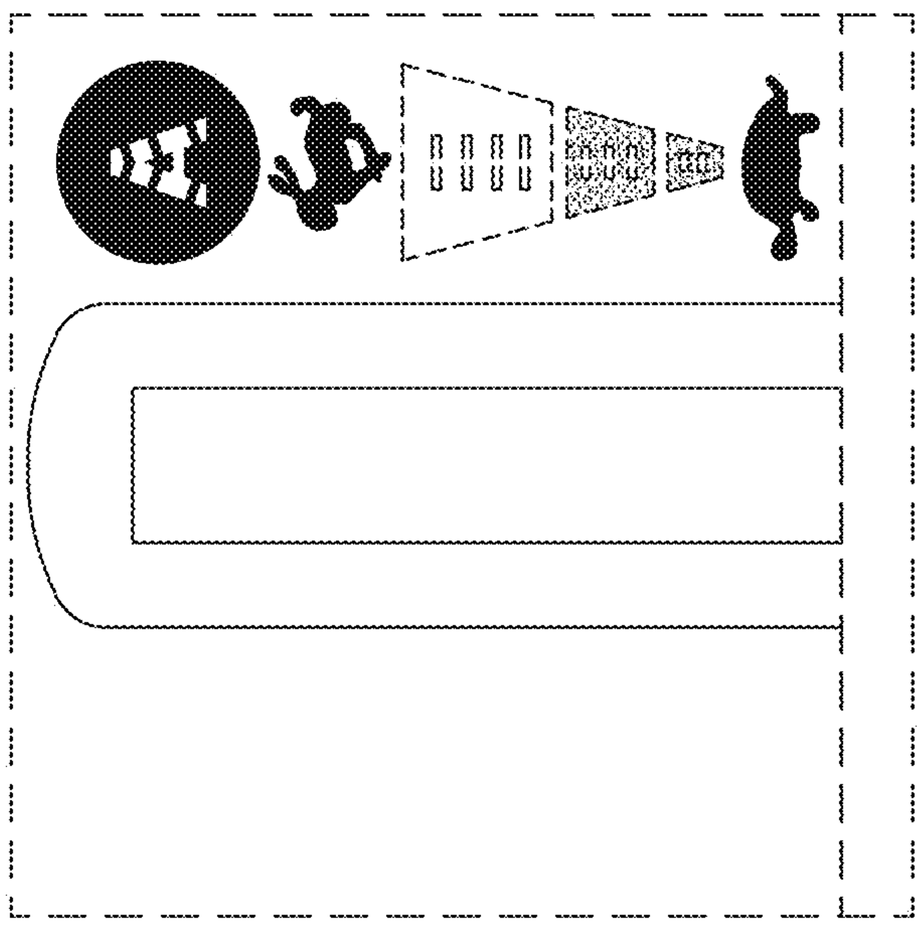


FIG. 7