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- (54) **PUMP**
- (71) Applicant: **Insera Therapeutics, Inc.**, Sacramento, CA (US)
- (72) Inventors: **Vallabh Janardhan**, Dallas, TX (US); **Vikram Janardhan**, Sacramento, CA (US)
- (73) Assignee: **Insera Therapeutics, Inc.**, Sacramento, CA (US)
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F04B 1/005; F04D 13/06; F04D 29/22;
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See application file for complete search history.

References Cited

U.S. PATENT DOCUMENTS

4,930,997 A	6/1990	Bennett	
D333,664 S *	3/1993	Carroll	D15/7
5,419,774 A	5/1995	Willard et al.	
5,622,867 A	4/1997	Livesey et al.	
5,827,229 A	10/1998	Auth et al.	
5,919,614 A	7/1999	Livesey et al.	

D413,123 S *	8/1999	Leonhard	D15/7
6,022,747 A	2/2000	Gherson et al.	
6,062,215 A	5/2000	Leiningner et al.	
6,071,267 A	6/2000	Zamierowski	
6,115,860 A	9/2000	Vralik	
6,145,143 A	11/2000	Hicks et al.	
6,163,908 A	12/2000	Vralik	

(Continued)

FOREIGN PATENT DOCUMENTS

EP	0 777 504	10/1998
EP	0 853 950	10/2002

(Continued)

OTHER PUBLICATIONS

Neale, "Medtronic's Riptide System Cleared for Thrombus Aspiration in Acute Stroke", tctMD / the heart beat, Jan. 16, 2018.

(Continued)

Primary Examiner — Khawaja Anwar

(74) *Attorney, Agent, or Firm* — Knobbe Martens Olson & Bear, LLP

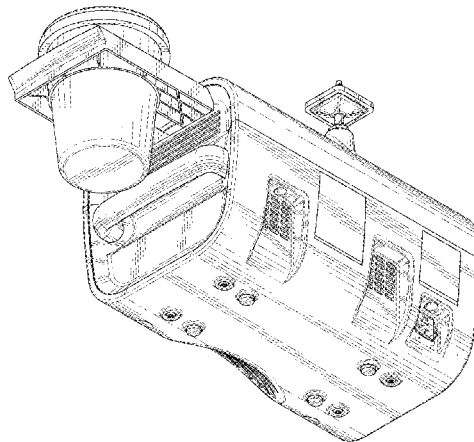
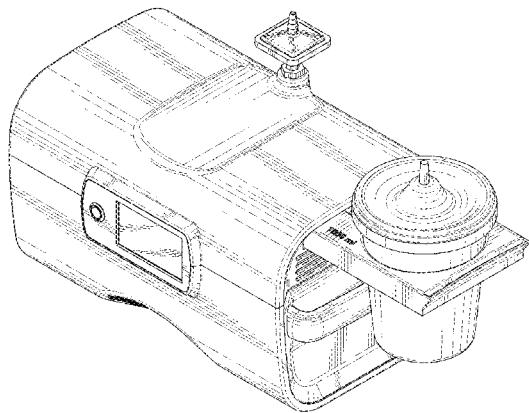
(57) **CLAIM**

The ornamental design for a pump, as shown and described.

DESCRIPTION

FIG. 1 is a front, left, and top perspective view of a pump; FIG. 2 is a back, right, and bottom perspective view of the pump of FIG. 1; FIG. 3 is a front elevational view of the pump of FIG. 1; FIG. 4 is a back elevational view of the pump of FIG. 1; FIG. 5 is a top plan view of the pump of FIG. 1; FIG. 6 is a bottom plan view of the pump of FIG. 1; FIG. 7 is a right elevational view of the pump of FIG. 1; and, FIG. 8 is a left elevational view of the pump of FIG. 1.

1 Claim, 7 Drawing Sheets



(56)

References Cited

U.S. PATENT DOCUMENTS

6,183,488	B1	2/2001	Ross et al.		9,445,831	B2	9/2016	Mark	
6,221,669	B1	4/2001	Livesey et al.		9,446,189	B2	9/2016	Rimsa et al.	
D445,804	S *	7/2001	Tsai	D15/7	9,526,865	B2	12/2016	Quick	
6,306,163	B1	10/2001	Fitz		9,532,792	B2	1/2017	Galdonik et al.	
6,353,950	B1	3/2002	Bartlett et al.		9,532,863	B2	1/2017	Hayzlett	
6,358,260	B1	3/2002	Ross et al.		9,549,805	B2	1/2017	Hayzlett et al.	
6,387,065	B1	5/2002	Tumey		9,554,805	B2	1/2017	Tompkins et al.	
6,425,905	B1	7/2002	Guimaraes et al.		9,561,129	B2	2/2017	Ross et al.	
6,468,237	B1	10/2002	Lina		9,566,089	B2	2/2017	Webb et al.	
6,517,513	B1	2/2003	Covington et al.		9,594,004	B2	3/2017	Fry et al.	
6,547,756	B1	4/2003	Greter et al.		9,615,832	B2	4/2017	Bose et al.	
6,663,644	B1	12/2003	Ross et al.		9,615,951	B2	4/2017	Bennett et al.	
6,673,028	B1	1/2004	Argenta et al.		D785,679	S *	5/2017	Hartung	D15/7
6,827,701	B2	12/2004	MacMahon et al.		D786,939	S *	5/2017	Nelson	D15/7
6,904,631	B2	6/2005	Vralik et al.		9,655,633	B2	5/2017	Leynov et al.	
7,004,915	B2	2/2006	Boynton et al.		9,662,129	B2	5/2017	Galdonik et al.	
D520,023	S *	5/2006	Goto	D15/7	9,675,358	B2	6/2017	Wagner et al.	
7,108,683	B2	9/2006	Zamierowski		D795,420	S	8/2017	Rimsa et al.	
7,144,390	B1	12/2006	Hannigan et al.		9,737,455	B2	8/2017	Argenta et al.	
7,198,046	B1	4/2007	Argenta et al.		9,775,621	B2	10/2017	Tompkins et al.	
7,216,651	B2	5/2007	Argenta et al.		D810,145	S *	2/2018	Sinico	D15/7
7,276,052	B2	10/2007	Kobayashi et al.		9,883,854	B2	2/2018	Mak	
7,300,429	B2	11/2007	Fitzgerald et al.		9,883,877	B2	2/2018	Look	
7,311,700	B2	12/2007	Guimaraes et al.		9,913,705	B2	3/2018	Hayzlett et al.	
D573,609	S *	7/2008	Bilger	D15/7	9,913,936	B2	3/2018	Look et al.	
7,410,491	B2	8/2008	Hopkins et al.		9,915,674	B2	3/2018	Zordan	
7,410,602	B2	8/2008	Davey et al.		9,943,321	B2	4/2018	Nita	
7,514,075	B2	4/2009	Hedrick et al.		9,999,710	B2	6/2018	Ross et al.	
D604,746	S *	11/2009	Nishido	D15/7	D822,718	S *	7/2018	Hartung	D15/7
7,645,291	B2	1/2010	Ross et al.		10,022,214	B2	7/2018	Hayzlett	
7,658,746	B2	2/2010	Ross et al.		D826,282	S *	8/2018	Mead	D15/7
7,666,161	B2	2/2010	Nash et al.		D826,283	S *	8/2018	Mead	D15/7
7,717,853	B2	5/2010	Nita		10,058,339	B2	8/2018	Galdonik et al.	
7,918,822	B2	4/2011	Kumar et al.		10,076,318	B2	9/2018	Argenta et al.	
7,931,651	B2	4/2011	Webb et al.		D838,746	S *	1/2019	Gan	D15/7
7,931,659	B2	4/2011	Bose et al.		D838,747	S *	1/2019	Gan	D15/7
8,070,735	B2	12/2011	Koch et al.		2003/0004537	A1	1/2003	Boyle et al.	
8,070,764	B2	12/2011	Ross et al.		2003/0069549	A1	4/2003	MacMahon et al.	
8,070,791	B2	12/2011	Ferrera et al.		2003/0139255	A1	7/2003	Lina	
8,105,580	B2	1/2012	Fraser et al.		2005/0085769	A1	4/2005	MacMahon et al.	
8,163,276	B2	4/2012	Hedrick et al.		2005/0124969	A1	6/2005	Fitzgerald et al.	
8,235,955	B2	8/2012	Blott et al.		2006/0058837	A1	3/2006	Bose et al.	
8,267,960	B2	9/2012	Argenta et al.		2007/0038100	A1	2/2007	Nita	
8,333,796	B2	12/2012	Tompkins et al.		2007/0129652	A1	6/2007	Nita	
8,366,620	B2	2/2013	Nita		2007/0135832	A1	6/2007	Wholey et al.	
8,366,735	B2	2/2013	Bose et al.		2007/0239261	A1	10/2007	Bose et al.	
8,377,016	B2	2/2013	Argenta et al.		2008/0015478	A1	1/2008	Bose	
8,425,549	B2	4/2013	Lenker et al.		2008/0051708	A1	2/2008	Kumar et al.	
8,454,603	B2	6/2013	Webb et al.		2008/0147110	A1	6/2008	Wijeratne	
8,460,312	B2	6/2013	Bose et al.		2008/0319355	A1	12/2008	Nita	
8,465,467	B2	6/2013	Gao		2009/0030400	A1	1/2009	Bose et al.	
8,591,453	B2	11/2013	Stubkjaer et al.		2009/0318892	A1	12/2009	Aboytes et al.	
8,632,498	B2	1/2014	Rimsa et al.		2010/0114017	A1	5/2010	Lenker et al.	
8,758,315	B2	6/2014	Chen et al.		2010/0191178	A1	7/2010	Ross et al.	
D710,003	S	7/2014	Rimsa et al.		2010/0204672	A1	8/2010	Lockhart et al.	
8,764,794	B2	7/2014	Argenta et al.		2010/0217276	A1	8/2010	Garrison et al.	
8,795,244	B2	8/2014	Randolph et al.		2010/0280434	A1	11/2010	Raney et al.	
D712,933	S *	9/2014	DeOreo	D15/7	2011/0160621	A1	6/2011	Nita	
8,834,520	B2	9/2014	Argenta et al.		2011/0160761	A1	6/2011	Ferrera et al.	
8,911,487	B2	12/2014	Bennett et al.		2011/0184454	A1	7/2011	Barry et al.	
8,920,402	B2	12/2014	Nash et al.		2011/0264133	A1	10/2011	Hanlon et al.	
8,932,320	B1	1/2015	Janardhan et al.		2011/0313328	A1	12/2011	Nita	
8,932,321	B1	1/2015	Janardhan et al.		2011/0319927	A1	12/2011	Nita	
9,023,273	B2	5/2015	Kibalo		2012/0078140	A1	3/2012	Nita	
9,050,136	B2	6/2015	Webb et al.		2012/0078285	A1	3/2012	Griffin	
D737,431	S	8/2015	Rimsa et al.		2012/0150147	A1	6/2012	Leynov et al.	
9,095,326	B2	8/2015	Ritchie et al.		2012/0310367	A1	12/2012	Connor	
9,119,656	B2	9/2015	Bose et al.		2012/0330196	A1	12/2012	Nita	
9,125,731	B2	9/2015	Ross et al.		2013/0121970	A1	5/2013	Owens et al.	
9,186,151	B2	11/2015	Tompkins et al.		2013/0201316	A1	8/2013	Binder et al.	
9,289,193	B2	3/2016	Argenta et al.		2014/0128907	A1	5/2014	Hui et al.	
9,314,568	B2	4/2016	Gurtner et al.		2014/0180377	A1	6/2014	Bose et al.	
9,333,024	B2	5/2016	Woloszko et al.		2014/0276897	A1	9/2014	Rockley et al.	
9,370,611	B2	6/2016	Ross et al.		2015/0032120	A1	1/2015	Janardhan et al.	
9,375,513	B2	6/2016	Sun et al.		2015/0032121	A1	1/2015	Janardhan et al.	
					2015/0196304	A1	7/2015	Rabkin et al.	
					2015/0202338	A1	7/2015	Kibalo	
					2015/0320911	A1	11/2015	Sun et al.	
					2015/0359666	A1	12/2015	Zacharias	

(56) **References Cited**

U.S. PATENT DOCUMENTS

2016/0058614	A1	3/2016	Ross et al.
2016/0128869	A1	5/2016	Zacharias
2016/0166265	A1	6/2016	Nita
2016/0166352	A1	6/2016	Rimsa et al.
2016/0193429	A1	7/2016	Gurtner et al.
2016/0244722	A1	8/2016	Wang et al.
2016/0271295	A1	9/2016	Sun et al.
2017/0021072	A1	1/2017	Forsell
2017/0105743	A1	4/2017	Vale et al.
2017/0112562	A1	4/2017	Woloszko et al.
2017/0112981	A1	4/2017	Friedman et al.
2017/0147765	A1	5/2017	Mehta
2017/0151032	A1	6/2017	Loisel
2017/0172581	A1	6/2017	Bose et al.
2017/0173227	A1	6/2017	Jessop et al.
2017/0212014	A1	7/2017	Fry et al.
2017/0215902	A1	8/2017	Leynov et al.
2017/0296422	A1	10/2017	Park et al.
2017/0340797	A1	11/2017	Raman et al.
2017/0360450	A1	12/2017	Tompkins et al.
2017/0367857	A1	12/2017	Bennett et al.
2018/0000510	A1	1/2018	Nash et al.
2018/0057787	A1	3/2018	Friedman et al.
2018/0085136	A1	3/2018	Janardhan et al.
2018/0153675	A1	6/2018	Hayzlett et al.
2018/0153760	A1	6/2018	Rosen et al.
2018/0185130	A1	7/2018	Janardhan et al.
2018/0197633	A1	7/2018	Mehta
2018/0228502	A1	8/2018	Shaffer et al.
2018/0242989	A1	8/2018	Nita
2018/0263642	A1	9/2018	Nita
2018/0263646	A1	9/2018	Loisel
2018/0296317	A1	10/2018	Hayzlett et al.
2018/0303498	A1	10/2018	Galdonik et al.
2018/0338770	A1	11/2018	Mogi et al.
2018/0339130	A1	11/2018	Ogle
2018/0353194	A1	12/2018	Shaffer et al.
2018/0353644	A1	12/2018	Sun et al.
2018/0368965	A1	12/2018	Janardhan et al.
2019/0008626	A1	1/2019	Janardhan et al.
2019/0008627	A1	1/2019	Janardhan et al.

FOREIGN PATENT DOCUMENTS

WO	WO 2012/057881	5/2012
WO	WO 2014/151209	9/2014
WO	WO 2015/157330	10/2015
WO	WO 2016/018448	2/2016
WO	WO 2017/142874	8/2017

OTHER PUBLICATIONS

Penumbra System, Science of Aspiration The Penumbra System Approach, 2016.

Powerex, "Medical Dry Rotary Vane Vacuum", Retrieved from the internet Mar. 27, 2017, <URL: http://www.powerexinc.com/article/image_18200000000197>.

Simon et al., "Exploring the efficacy of cyclic vs static aspiration in a cerebral thrombectomy model: an initial proof of concepts study", *J NeuroIntervent Surg.*, 2014, vol. 6, pp. 677-683.

U.S. Appl. No. 11/859,272, filed Sep. 21, 2007 (U.S. Pat. No. 9,034,007, May 19, 2015), Distal Embolic Protection Devices and Methods for their Use.

U.S. Appl. No. 14/709,794, filed May 12, 2015, Distal Embolic Protection Devices and Methods for their Use.

U.S. Appl. No. 13/952,982, filed Jul. 29, 2013 (U.S. Pat. No. 8,679,150, Mar. 25, 2014), Shape-set Textile Structure Based Mechanical Thrombectomy Methods.

U.S. Appl. No. 14/012,161, filed Aug. 28, 2013 (U.S. Pat. No. 9,179,931, Nov. 10, 2015), Shape-set Textile Structure Based Mechanical Thrombectomy Systems.

U.S. Appl. No. 14/926,636, filed Oct. 29, 2015 (U.S. Pat. No. 9,750,524, Sep. 5, 2017), Shape-set Textile Structure Based Mechanical Thrombectomy Systems.

U.S. Appl. No. 15/693,816, filed Sep. 1, 2017, Woven Vascular Device End Treatments.

U.S. Appl. No. 13/953,556, filed Jul. 29, 2013 (U.S. Pat. No. 8,690,907, Apr. 8, 2014), Vascular Treatment Methods.

U.S. Appl. No. 13/953,681, filed Jul. 29, 2013 (U.S. Pat. No. 8,715,315, May 6, 2014), Vascular Treatment Systems.

U.S. Appl. No. 14/012,474, filed Aug. 28, 2013, (U.S. Pat. No. 8,747,432, Jun. 10, 2014), Woven Vascular Treatment Devices.

U.S. Appl. No. 14/012,481, filed Aug. 28, 2013, (U.S. Pat. No. 8,721,676, May 13, 2014), Slotted Vascular Treatment Devices.

U.S. Appl. No. 14/012,348, filed Aug. 28, 2013, (U.S. Pat. No. 8,783,151, Jul. 22, 2014), Methods of Manufacturing Vascular Treatment Devices.

U.S. Appl. No. 14/167,132, filed Jan. 29, 2014, (U.S. Pat. No. 8,895,891, Nov. 25, 2014), Methods of Cutting Tubular Devices.

U.S. Appl. No. 14/088,797, filed Nov. 25, 2013, (U.S. Pat. No. 8,753,371, Jun. 17, 2014), Woven Vascular Treatment Systems.

U.S. Appl. No. 14/551,337, filed Nov. 24, 2014, (U.S. Pat. No. 9,592,068, Mar. 14, 2017), Free End Vascular Treatment Systems.

U.S. Appl. No. 15/457,089, filed Mar. 13, 2017, Vascular Treatment Devices.

U.S. Appl. No. 13/953,540, filed Jul. 29, 2013, (U.S. Pat. No. 8,715,314, May 6, 2014), Vascular Treatment Measurement Methods.

U.S. Appl. No. 14/012,866, filed Aug. 28, 2013, (U.S. Pat. No. 8,845,678, Sep. 30, 2014), Two-Way Shape Memory Vascular Treatment Methods.

U.S. Appl. No. 14/012,862, filed Aug. 28, 2013, (U.S. Pat. No. 8,733,618, May 27, 2014), Methods of Coupling Parts of Vascular Treatment Systems.

U.S. Appl. No. 14/012,904, filed Aug. 28, 2013, (U.S. Pat. No. 8,789,452, Jul. 29, 2014), Methods of Manufacturing Woven Vascular Treatment Devices.

U.S. Appl. No. 14/012,913, filed Aug. 28, 2013, (U.S. Pat. No. 9,179,995, Nov. 10, 2015), Methods of Manufacturing Slotted Vascular Treatment Devices.

U.S. Appl. No. 14/012,903, filed Aug. 28, 2013, (U.S. Pat. No. 8,870,901, Oct. 28, 2014), Two-Way Shape Memory Vascular Treatment Systems.

U.S. Appl. No. 14/013,411, filed Aug. 29, 2013, (U.S. Pat. No. 8,728,116, May 20, 2014), Slotted Catheters.

U.S. Appl. No. 14/013,376, filed Aug. 29, 2013, (U.S. Pat. No. 8,735,777, May 27, 2014), Heat Treatment Systems.

U.S. Appl. No. 14/013,421, filed Aug. 29, 2013, Laser Cutting Systems.

U.S. Appl. No. 14/013,448, filed Aug. 29, 2013, Woven Vascular Device End Treatments.

U.S. Appl. No. 14/013,588, filed Aug. 29, 2013, (U.S. Pat. No. 8,852,227, Oct. 7, 2014), Woven Radiopaque Patterns.

U.S. Appl. No. 14/013,530, filed Aug. 29, 2013, (U.S. Pat. No. 8,715,316, May 6, 2014), Offset Vascular Treatment Devices.

U.S. Appl. No. 14/132,493, filed Dec. 18, 2013, (U.S. Pat. No. 8,721,677, May 13, 2014), Variably-Shaped Vascular Devices.

U.S. Appl. No. 14/093,796, filed Dec. 2, 2013, (U.S. Pat. No. 8,715,317, May 6, 2014), Flow Diverting Devices.

U.S. Appl. No. 14/093,831, filed Dec. 2, 2013, (U.S. Pat. No. 8,728,117, May 20, 2014), Flow Disrupting Devices.

U.S. Appl. No. 14/093,810, filed Dec. 2, 2013, (U.S. Pat. No. 8,870,910, Oct. 28, 2014), Methods of Decoupling Joints.

U.S. Appl. No. 14/254,271, filed Apr. 16, 2014, (U.S. Pat. No. 8,932,320, Jan. 13, 2015), Methods of Aspirating Thrombi.

U.S. Appl. No. 14/260,655, filed Apr. 24, 2014, (U.S. Pat. No. 8,832,321, Jan. 13, 2015), Aspiration Systems.

U.S. Appl. No. 14/167,118, filed Jan. 29, 2014, (U.S. Pat. No. 8,845,679, Sep. 30, 2014), Variable Porosity Flow Diverting Devices.

U.S. Appl. No. 14/167,138, filed Jan. 29, 2014, (U.S. Pat. No. 8,863,631, Oct. 21, 2014), Methods of Manufacturing Flow Diverting Devices.

U.S. Appl. No. 14/258,424, filed Apr. 22, 2014, (U.S. Pat. No. 8,910,555, Dec. 16, 2014), Non-Cylindrical Mandrels.

(56)

References Cited

OTHER PUBLICATIONS

U.S. Appl. No. 14/224,605, filed Mar. 25, 2014, (U.S. Pat. No. 8,828,045, Sep. 9, 2014), Balloon Catheters.
U.S. Appl. No. 14/224,599, filed Mar. 25, 2014, (U.S. Pat. No. 8,813,247, Aug. 26, 2014), Methods for Modifying Hypotubes.
U.S. Appl. No. 14/224,551, filed Mar. 25, 2014, (U.S. Pat. No. 8,859,934, Oct. 14, 2014), Methods for Slag Removal.
U.S. Appl. No. 14/224,637, filed Mar. 25, 2014, Variably Heat-Treated Tubular Devices.
U.S. Appl. No. 14/224,719, filed Mar. 25, 2014, (U.S. Pat. No. 8,866,049, Oct. 21, 2014), Methods of Selectively Heat Treating Tubular Devices.
U.S. Appl. No. 14/225,055, filed Mar. 25, 2014, Reversibly Coupled Joints.
U.S. Appl. No. 14/269,594, filed May 5, 2014, Aspiration Catheters.
U.S. Appl. No. 14/258,504, filed Apr. 22, 2014, (U.S. Pat. No. 8,882,797, Nov. 11, 2014), Methods of Embolic Filtering.
U.S. Appl. No. 14/224,817, filed Mar. 25, 2014, (U.S. Pat. No. 8,790,365, Jul. 29, 2014), Fistula Flow Disruptor Methods.
U.S. Appl. No. 14/167,147, filed Jan. 29, 2014, (U.S. Pat. No. 8,869,670, Oct. 28, 2014), Methods of Manufacturing Variable Porosity Devices.
U.S. Appl. No. 14/167,204, filed Jan. 29, 2014, (U.S. Pat. No. 8,813,625, Aug. 26, 2014), Methods of Manufacturing Variable Porosity Flow Diverting Devices.
U.S. Appl. No. 14/258,857, filed Apr. 22, 2014, (U.S. Pat. No. 8,904,914, Dec. 9, 2014), Methods of Using Non-Cylindrical Mandrels.
U.S. Appl. No. 14/224,593, filed Mar. 25, 2014, (U.S. Pat. No. 8,872,068, Oct. 28, 2014), Devices for Modifying Hypotubes.
U.S. Appl. No. 14/224,576, filed Mar. 25, 2014, (U.S. Pat. No. 8,803,030, Aug. 12, 2014), Devices for Slag Removal.
U.S. Appl. No. 14/224,787, filed Mar. 25, 2014, (U.S. Pat. No. 8,795,330, Aug. 5, 2014), Fistula Flow Disruptors.
U.S. Appl. No. 14/224,775, filed Mar. 25, 2014, (U.S. Pat. No. 8,784,446, Jul. 22, 2014), Circumferentially Offset Variable Porosity Devices.

U.S. Appl. No. 14/926,980, filed Oct. 29, 2015, (U.S. Pat. No. 9,833,251, Dec. 5, 2017), Variably Bulbous Vascular Treatment Devices.

U.S. Appl. No. 15/829,416, filed Dec. 1, 2017, Aspiration and Mechanical Thrombectomy Methods.

U.S. Appl. No. 14/848,079, filed Sep. 8, 2015, (U.S. Pat. No. 9,314,324, Apr. 19, 2016), Vascular Treatment Devices and Methods.

U.S. Appl. No. 15/085,083, filed Mar. 30, 2016, (U.S. Pat. No. 9,901,435, Feb. 27, 2018), Longitudinally Variable Vascular Treatment Devices.

U.S. Appl. No. 15/903,587, filed Feb. 23, 2018, Thrombus Aspiration Facilitation Systems.

U.S. Appl. No. 16/126,651, filed Sep. 10, 2018, Thrombus Aspiration Using an Operator-Selectable Suction Pattern.

U.S. Appl. No. 16/126,627, filed Sep. 10, 2018, Thrombus Aspiration with Different Intensity Levels.

U.S. Appl. No. 16/239,903, filed Jan. 4, 2019, Methods of Treating a Thrombus in an Artery Using Cyclical Aspiration Patterns.

U.S. Appl. No. 16/239,888, filed Jan. 4, 2019, Methods of Treating a Thrombus in a Vein Using Cyclical Aspiration Patterns.

U.S. Appl. No. 16/239,894, filed Jan. 4, 2019, Devices for Inhibiting Distal Drift of Flow Diverting Stents.

U.S. Appl. No. 16/103,410, filed Aug. 14, 2018, Aspiration Devices and Methods.

U.S. Appl. No. 16/241,256, filed Jan. 7, 2019, Methods of Treating Brain Bleeds Using Cyclical Aspiration Patterns.

U.S. Appl. No. 16/241,611, filed Jan. 7, 2019, Methods of Treating Intracerebral Hemorrhages Using Cyclical Aspiration Patterns.

U.S. Appl. No. 16/241,639, filed Jan. 7, 2019, Systems for Aspirating Thrombus During Neurosurgical Procedures.

U.S. Appl. No. 16/241,219, filed Jan. 7, 2019, Multilayer Devices for Inhibiting Distal Migration of Flow Diverting Stents.

U.S. Appl. No. 29/634,405, filed Jan. 22, 2018, Pump.

U.S. Appl. No. 29/678,622, filed Jan. 30, 2019, Pump.

U.S. Appl. No. 29/678,632, filed Jan. 30, 2019, Pump.

* cited by examiner

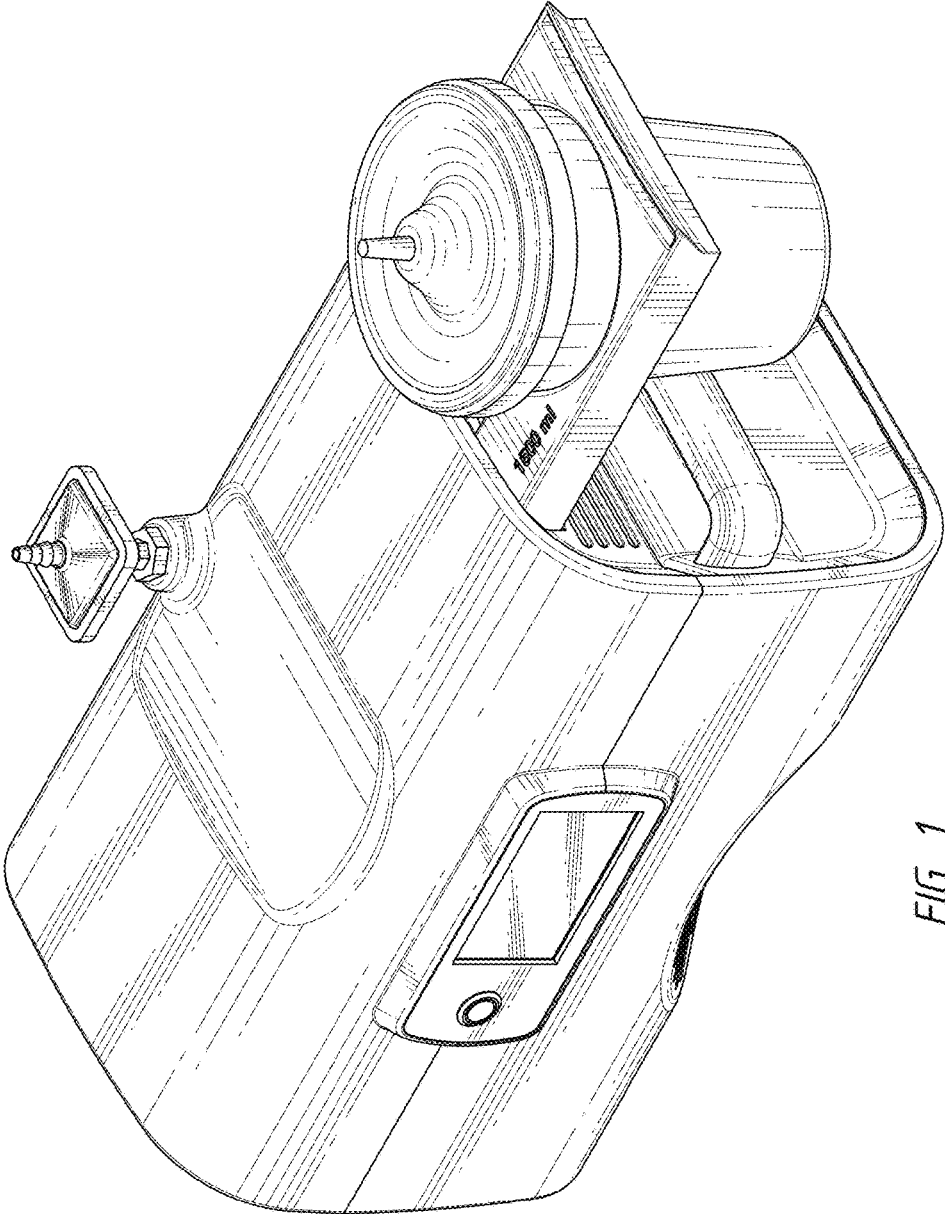


FIG. 1

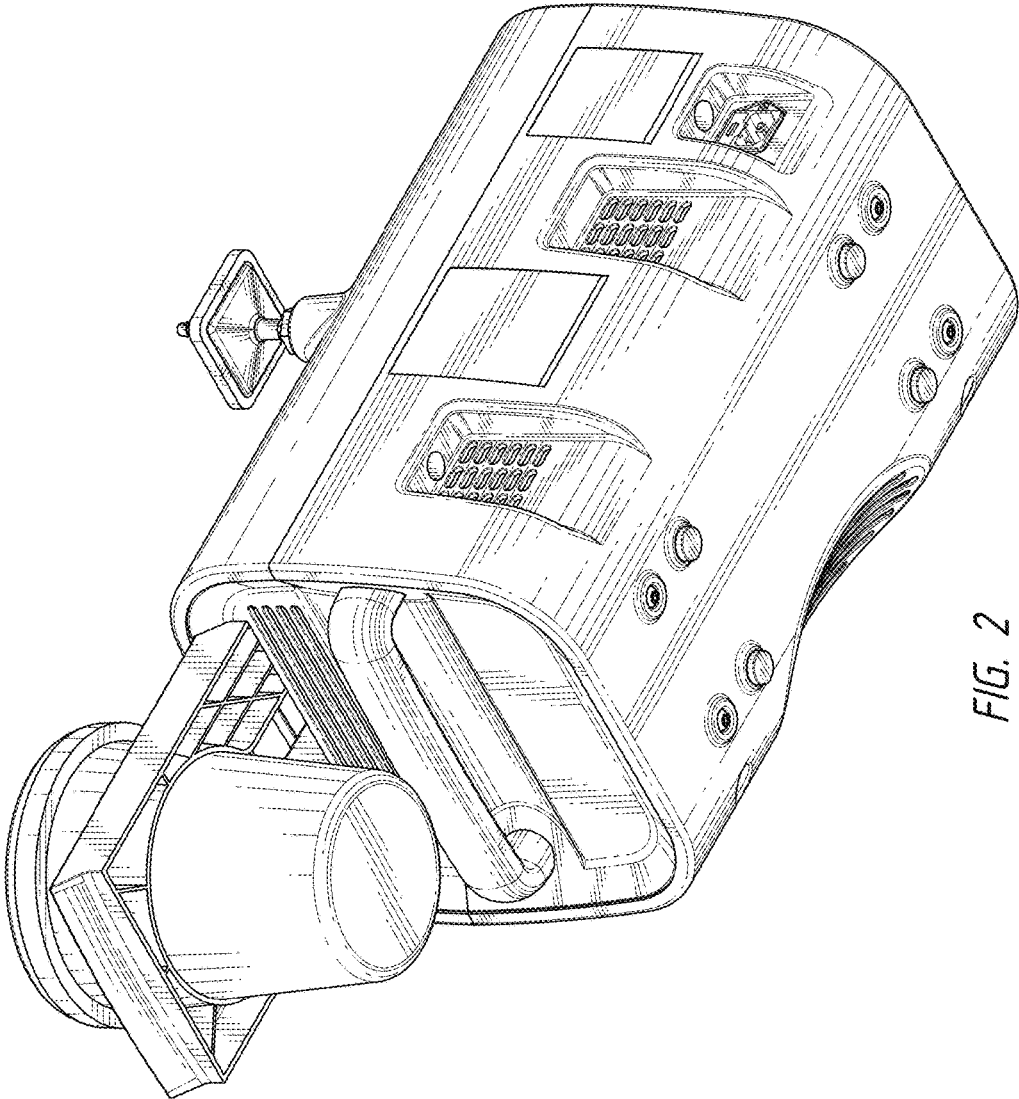


FIG. 2

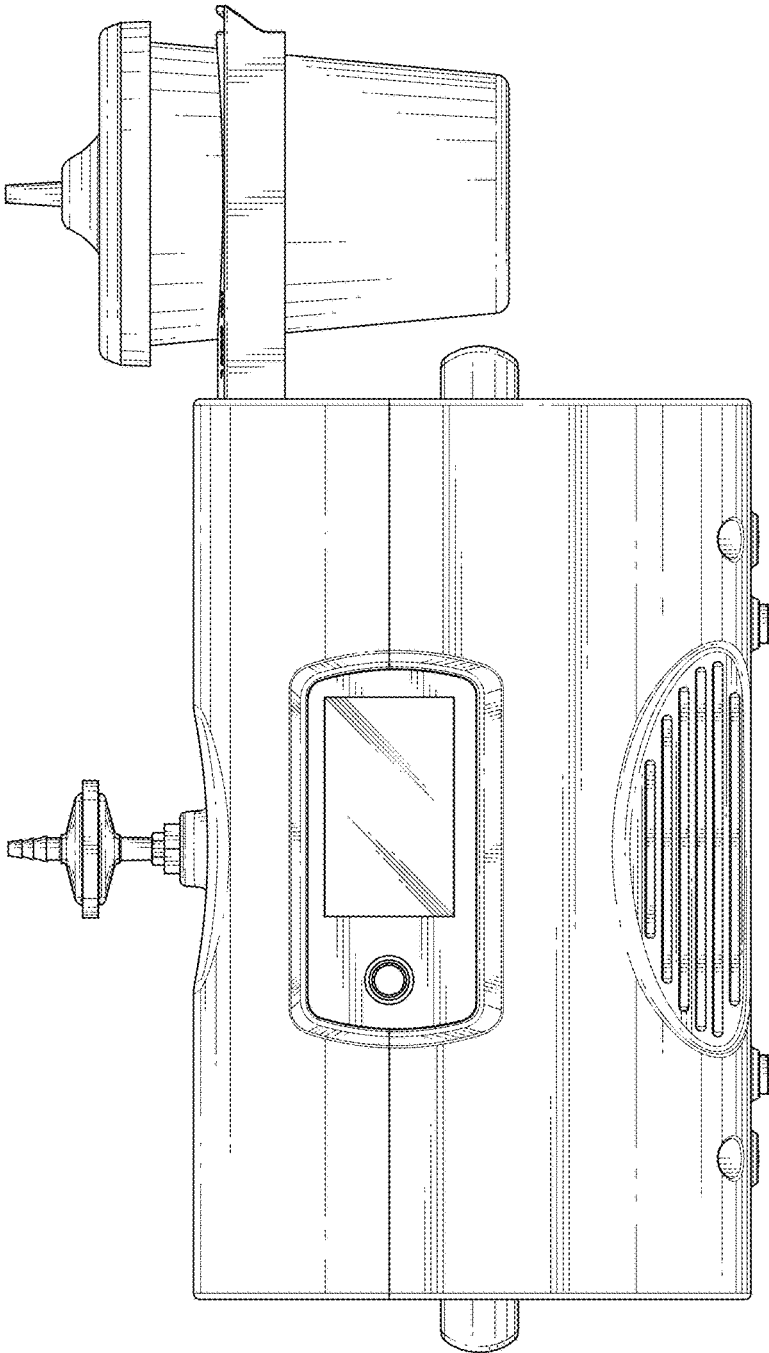


FIG. 3

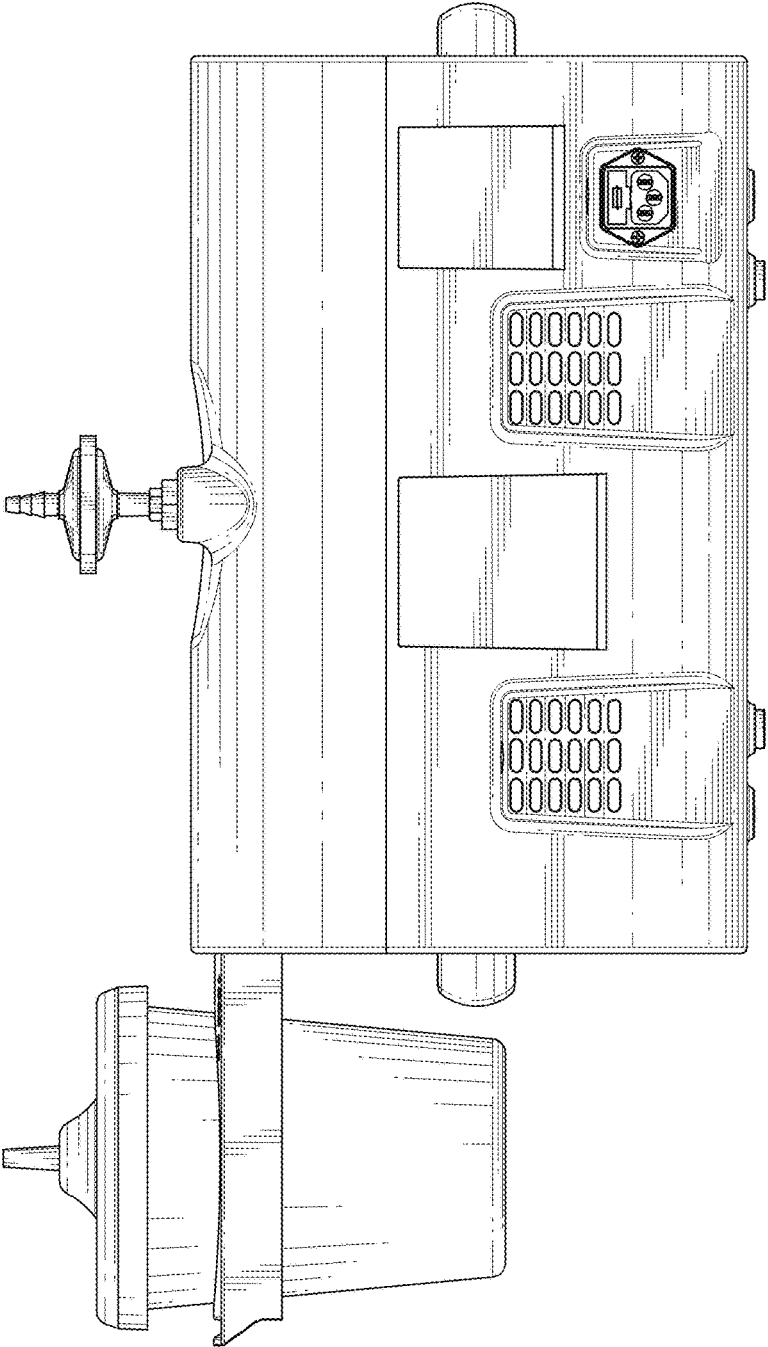


FIG. 4

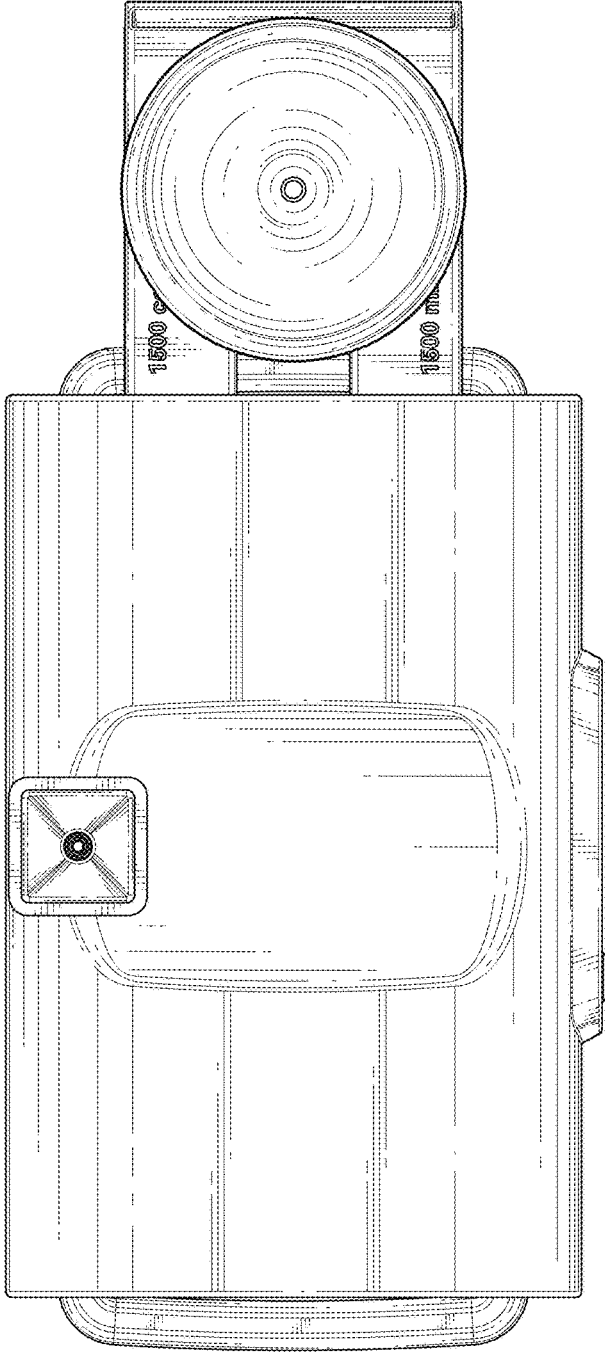


FIG. 5

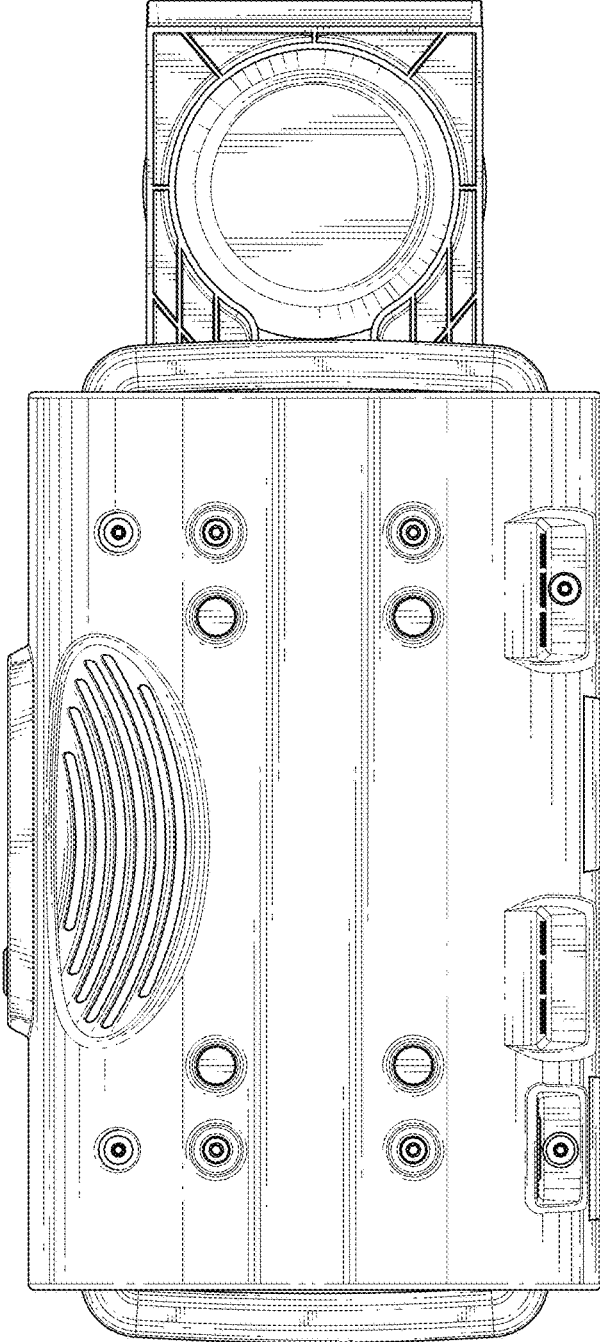


FIG. 6

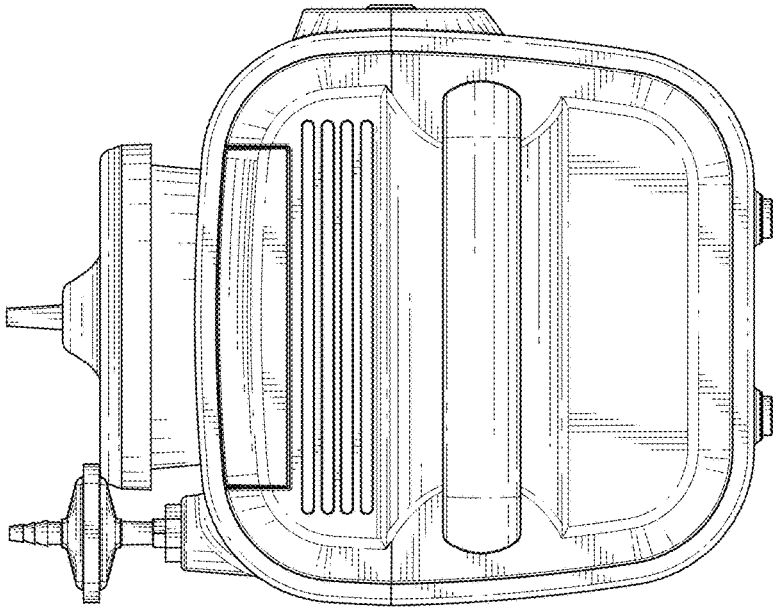


FIG. 7

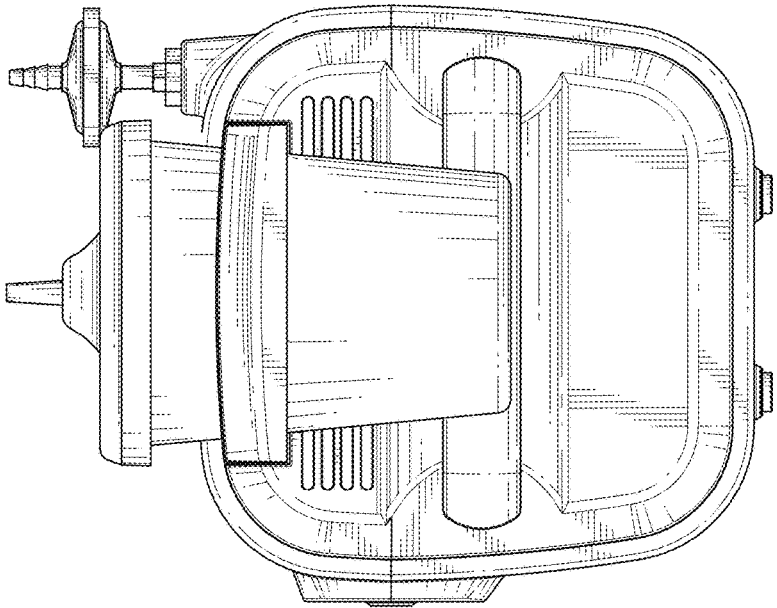


FIG. 8