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On behalf of **Imperative Care, Inc.**

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

IMPERATIVE CARE, INC.,
Petitioner,

v.

INARI MEDICAL INC.,
Patent Owner.

Case No. IPR2025-01021
Patent No. 11,969,333

**PETITIONER'S REPLY TO PATENT OWNER'S
RESPONSE**

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Exhibit No.	Description
1001	U.S. Patent No. 11,969,333 (“the ’333 patent”)
1002	’333 Patent Prosecution History
1003	Expert Declaration of Troy Thornton
1004	Resume of Troy Thornton
1005	U.S. Patent No. 8,734,374 B2 to Aklog et al. (“Aklog”)
1006	U.S. Patent Publication No. 2015/0173782 A1 to Garrison et al. (“Garrison”)
1007	WIPO Publication No. WO 2006/124307 A2 to Goff et al. (“Goff”)
1008	U.S. Patent Publication No. 2003/0116731 A1 to Hartley (“Hartley”)
1009	U.S. Patent No. 6,776,770 B2 to Trerotola (“Trerotola”)
1010	U.S. Patent Publication No. 2010/0042118 A1 to Garrison et al.
1011	U.S. Patent No. 8,535,283 B2 to Heaton et al. (“Heaton”)
1012	U.S. Patent Publication No. 2017/0043066 A1 to Laub (“Laub”)
1013	U.S. Patent Publication US 2003/0225379 A1 to Schaffer et al. (“Schaffer”)
1014	U.S. Patent No. 5,938,645 to Gordon (“Gordon”)
1015	U.S. Patent Publication No. 2014/0296868 A1 to Garrison et al.
1016	U.S. Patent No. 7,998,104 B2 to Chang (“Chang”)
1017	U.S. Patent No. 8,157,760 B2 to Criado et al. (“Criado”)
1018	U.S. Patent No. 6,481,439 B1 to Lewis et al. (“Lewis”)

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1019	U.S. Patent No. 8,075,510 B2 to Aklog et al.
1020	WIPO Publication No. WO 2018/019829 A1 to Brady et al. (“Brady”)
1021	U.S. Patent Application No. 16/117,519 (the “519 application”)
1022	Expert Declaration of Dr. Aquilla S. Turk, III, DO
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1024	Shani, Jacob M.D., et al., Mechanical Manipulation of Thrombus: Coronary Thrombectomy, Intracoronary Clot Displacement, and Transcatheter Aspiration, 72 Am. J. Cardiol. 116G-118G (1993)
1025	Bose, A et al., The Penumbra System: A Mechanical Device for the Treatment of Acute Stroke due to Thromboembolism, 29 Am. J. Neuroradiol. 1409-1413 (Aug. 2008)
1026	Turk, Aquilla S. et al., Initial clinical experience with the ADAPT technique: A direct aspiration first pass technique for stroke thrombectomy, 6 J. NeuroIntervent. Surg. 231-237 (2014)
1027	Turk, Aquilla S. et al., ADAPT FAST study: a direct aspiration first pass technique for acute stroke thrombectomy, 6 J. NeuroIntervent. Surg. 260-264 (2014)
1028	April 24, 2024 Letter from Inari to Imperative Care
1029	Turk, Aquilla S. et al., Aspiration thrombectomy versus stent retriever thrombectomy as first-line approach for large vessel occlusion (COMPASS): a multicentre, randomized, open label, blinded outcome, non-inferiority trial, 393 Lancet 998-1008 (March 2019)
1030	Save, Jeffrey L., Time is Brain – Quantified, American Heart Association Journals, available at http://www.stokeaha.org (2005).

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1031	U.S. Patent No. 9,980,813 B1 to Eller (“Eller”)
1032	US 2018/0064453 A1 (“Garrison II”)
1033	US 2005/0054995 A1 (“Barzell”)
1034	Decision Granting Institution of <i>Inter Partes</i> Review for U.S. Patent No. 11,697,011 (Paper 7) in <i>Imperative Care, Inc. v. Inari Medical, Inc.</i> , IPR2024-01157 (P.T.A.B. Jan. 23, 2025)
1035	Decision Granting Institution of <i>Inter Partes</i> Review for U.S. Patent No. 11,697,012 (Paper 6) in <i>Imperative Care, Inc. v. Inari Medical, Inc.</i> , IPR2025-00156 (P.T.A.B. Apr. 22, 2025)
1036	U.S. Patent No. 12,109,384 B2 to Merritt et al.
1037	Patent Owner’s Exhibit 2002 filed in <i>Imperative Care, Inc. v. Inari Medical, Inc.</i> , IPR2025-00289 (P.T.A.B.)
1038	Indigo Aspiration System-Penumbra Engine Pump and Canister, 510(k) No. K180105 (Mar. 8, 2018) (“Indigo Aspiration System”)
1039	AXS Universal Aspiration Set Brochure (2017)
1040	VacLok Negative Pressure Syringe Brochure
1041	O. Nikoubashman et al., Under Pressure: Comparison of Aspiration Techniques for Endovascular Mechanical Thrombectomy, 39 Am. J. Neuroradiol. 905-909 (May 2018) (“Nikoubashman”)
1042	Inari’s Supplemental Infringement Contentions (without claim charts) from <i>Inari Medical, Inc. v. Imperative Care, Inc.</i> , No. 24-cv-3117 (N.D. Cal.) (served February 7, 2025)

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1043	Inari's Notice of Motion and Motion for Leave to File Third Amended Complaint (Dkt. #88) in <i>Inari Medical, Inc. v. Imperative Care, Inc.</i> , 24-cv-03117-EKL (N.D. Cal.) (filed March 5, 2025)
1044	Case Management & Scheduling Order (Dkt. #54) in <i>Inari Medical, Inc. v. Imperative Care, Inc.</i> , 24-cv-03117-EKL (N.D. Cal.) (issued December 19, 2024)
1045	Decision Denying Institution of <i>Inter Partes</i> Review for U.S. Patent No. 11,744,691 (Paper 10) in <i>Imperative Care, Inc. v. Inari Medical, Inc.</i> , IPR2024-01257 (P.T.A.B. Feb. 7, 2025)
1046	U.S. Patent No. 7,984,730 B2 to Ziv et al.
1047	Imperative Care's Opposition to Inari's Motion for Leave to File Third Amended Complaint (Dkt. #98) in <i>Inari Medical, Inc. v. Imperative Care, Inc.</i> , 24-cv-03117-EKL (N.D. Cal.) (filed March 26, 2025)
1048	Imperative Care's Notice of Motion and Motion to Stay Pending <i>Inter Partes</i> Review (Dkt. #100) in <i>Inari Medical, Inc. v. Imperative Care, Inc.</i> , 24-cv-03117-EKL (N.D. Cal.) (filed April 2, 2025)
1049	Ahmed Pasha et al., Successful Management of Acute Massive Pulmonary Embolism Using Angiovac Suction Catheter Technique in a Hemodynamically Unstable Patient, 15 Cardiovasc. Revasc. Med. 240-243 (2014)
1050	Certified File History of U.S. Patent Application 10/371,190 (Schaffer File History)
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1053	Decision Referring the Petition to the Board (Paper 9) in <i>Imperative Care, Inc. v. Inari Medical, Inc.</i> , IPR2025-00728 (P.T.A.B. July 31, 2025)
1054	Decision Granting Institution of <i>Inter Partes</i> Review for U.S. Patent No. 11,554,005 (Paper 10) in <i>Imperative Care, Inc. v. Inari Medical, Inc.</i> , IPR2025-00289 (P.T.A.B. June 18, 2025)
1055	Order Denying Motion for Preliminary Injunction (Dkt. #136) in <i>Inari Medical, Inc. v. Imperative Care, Inc.</i> , 24-cv-03117-EKL (N.D. Cal.) (issued September 29, 2025)
1056	Joint Stipulation to Continue the Stay of Litigation Pending IPR Decisions and Vacate Upcoming Case Management Conference (Dkt. #139) in <i>Inari Medical, Inc. v. Imperative Care, Inc.</i> , 24-cv-03117-EKL (N.D. Cal.) (filed January 21, 2026)
1057	Order Granting Joint Stipulation to Continue the Stay of Litigation Pending IPR Decisions and Vacate Upcoming Case Management Conference (Dkt. #140) in <i>Inari Medical, Inc. v. Imperative Care, Inc.</i> , 24-cv-03117-EKL (N.D. Cal.) (issued January 21, 2026)
1058	Final Written Decision Determining All Challenged Claims Unpatentable (Paper 33) in <i>Imperative Care, Inc. v. Inari Medical, Inc.</i> , IPR2025-00156 (P.T.A.B. Apr. 7, 2026)
1059	RESERVED
1060	Decision Granting Institution of <i>Inter Partes</i> Review for U.S. Patent No. 11,974,910 (Paper 15) in <i>Imperative Care, Inc. v. Inari Medical, Inc.</i> , IPR2025-01025 (P.T.A.B. December 11, 2025)

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Exhibit No.	Description
1061	Notice of Decisions on Institution of <i>Inter Partes</i> Review for U.S. Patent No. 12,016,580 (Paper 11) in <i>Imperative Care, Inc. v. Inari Medical, Inc.</i> , IPR2025-01264 (P.T.A.B. December 11, 2025)
1062	U.S. Patent No. 11,432,835 B2 to Shaffer et al. (“Pons”)
1063	Deposition Transcript of PO’s Expert Brian Brown dated May 13, 2026
1064	Redacted Deposition Transcript of PO’s Expert Brian Brown dated August 27, 2024 in <i>Inari Medical, Inc. v. Imperative Care, Inc.</i> , 24-cv-03117-EKL (N.D. Cal.)
1065	Deposition Transcript of PO’s Expert Dr. Christopher Morris dated May 4, 2026
1066	Deposition Transcript of PO’s Expert Dr. Paul Zalesky in IPR2025-00289 dated November 7, 2025
1067	Supplemental Expert Declaration of Troy Thornton
1068	Penumbra, Optimizing Direct Aspiration (May 2013)
1069	Gibbs, et al., Temporary Stent as a bail-out device during percutaneous transluminal coronary angioplasty: preliminary clinical experience, 71 British Heart J., 372-377 (1994)
1070	Edwards Lifesciences, Fogarty® Occlusion Catheters (product brochure) http://web.archive.org/web/20150228193218/http://www.edwards.com/products/vascular/atraumaticocclusion/pages/occlusioncatheter.aspx
1071	U.S. Patent No. 5,030,201
1072	U.S. Patent No. 8,657,867
1073	U.S. Patent No. 8,721,714
1074	Redacted Deposition Transcript of Troy Thornton dated September 30, 2024 in <i>Inari Medical, Inc. v. Imperative Care, Inc.</i> , 24-cv-03117-EKL (N.D. Cal.)

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1075	MitraClip Clip Delivery System Instructions for Use (2013)
1076	FDA Summary of Safety and Effectiveness Data (SSED) for the MitraClip Clip Delivery System (2013)
1077	Troy Thornton and Liz McDermott, MitraClip System Design and History of Development, published as Ch. 7 in Percutaneous Mitral Leaflet Repair (1st ed. 2012)
1078	James I. Fann et al., Beating Heart Catheter-Based Edge-to-Edge Mitral Valve Procedure in a Porcine Model Efficacy and Healing Response, 110 Circulation, 988-993 (2004)
1079	U.S. Patent Publication No. 2004/0092962 A1
1080	U.S. Patent Publication No. 2003/0130721 A1
1081	U.S. Patent Publication No. 2010/0145434 A1
1082	U.S. Patent No. 11,638,585

I. INTRODUCTION

The Board has instituted IPRs challenging PO's '333, '910, and '580 patents, which claim methods or components for (1) closing a valve in an aspiration system and activating a pressure source to build-up vacuum pressure in the system, and (2) opening the valve to release the built-up vacuum pressure to aspirate a blood clot like a pulmonary embolism ("PE") or deep vein thrombosis ("DVT"). (Paper 15; Exs. 1060-1061.) The Board preliminarily found that Garrison, Laub, and Aklog are reasonably likely to render the '333 patent claims unpatentable.

A U.S. district court similarly determined that Petitioner raised a substantial question of validity regarding PO's '910 patent, which shares a specification with the '333 Patent, based on Garrison and Laub. (Ex. 1055, 17-22.) In reaching its decision, the district court adopted the opinions of Petitioner's expert, Mr. Thornton, and disregarded the opinions of PO's expert, Mr. Brown. (*Id.*) PO has identified no reasons for the Board to revise its preliminary decision or disagree with the district court's conclusions.

PO's arguments fail for two consistent reasons: (1) PO ignores prior art disclosures that negate its arguments, and (2) PO improperly relies on unclaimed and undescribed features to distinguish the prior art.

For example, PO argues that Laub, Aklog, and Garrison describe only "centrifugal/positive displacement pumps" and that such pumps are incompatible

with Garrison's method of closing a valve to build-up pressure in an aspiration system. (POR, 38-39.) But PO ignores that Laub, Aklog, and Garrison broadly incorporate any "form of pump known in the art" and "any commercially available pump." (Ex. 1006, [0006], [0134]; Ex. 1012, [0041]; Ex. 1005, 12:10.) PO further ignores the evidence of known aspiration pumps, like Brady (Ex. 1020), Pons (Ex. 1062), Penumbra (Ex. 1 j068), and Medala (Ex. 1039), that were compatible with valves for building up pressure.

Moreover, PO cannot distinguish the prior art based on pump differences because the '333 patent does not claim or describe specific pumps. Instead, the '333 patent describes using "a pump (e.g., an electric pump coupled to a vacuum chamber)" to perform the claimed methods. (Ex. 1001, 7:36-38.) The patent contains no further description of acceptable pumps and never warns against using "centrifugal/positive displacement pumps." Laub/Aklog/Garrison have commensurate descriptions and, therefore, disclose the claimed aspiration source.

As another example, PO argues that Laub and Aklog require continuous aspiration to reinfuse blood into the patient, making their systems incompatible with Garrison's valve. (POR, 55; *see also id.*, 44-48.) But as explained in the Institution Decision, "Laub and Aklog do not require continuous aspiration—their systems can run continuously or intermittently." (Paper 15, 36 (citing Ex. 1005, 12:6-9).) Likewise, Laub and Aklog describe blood reinfusion as an optional embodiment, not

a requirement. (*See e.g.*, Ex. 1012, [0007] (describing reinfusion embodiment).)

And even for embodiments that include blood reinfusion, the reinfusion occurs during aspiration. (Ex. 1063, 182:11-183:2.) Thus, building up vacuum pressure *before* aspiration, as Garrison teaches, would not inhibit continuous blood reinfusion.

PO also cannot distinguish the prior art based on blood reinfusion because the '333 patent does not claim or describe specific pumps or methods for blood reinfusion. Rather, the '333 patent describes using a generic “pump” to return blood just as in Garrison/Laub/Aklog. The '333 patent never warns that specific pumps could damage the blood or that blood could stagnate within the pump. Garrison/Laub/Aklog describe using the same components identified in the '333 patent to perform the claimed methods and, thus, disclose the claim limitations.

PO also argues, for the first time, that the claimed methods had unexpected results. PO's expert asserts that he was “personally surprised” by how the “quick burst of pre-charged vacuum” generated by PO's commercial device removed clot. (POR, 65.) However, PO cites no evidence to support his conclusory testimony. Moreover, PO fails to establish a nexus between the alleged “quick burst” and the challenged claims. PO's expert conceded in deposition that the “quick burst” requires the user to open the valve quickly. Yet, the claims do not require this method step. Rather, the claims require merely closing a valve to build up pressure

and opening the valve to release pressure. Thus, even if the expert testimony were supported, the testimony does not evidence unexpected results.

For the reasons presented below, Petitioner respectfully requests a final written decision finding the challenged claims unpatentable.

II. GROUNDS 1A/2A/3A/4A – CLAIMS 1-10, 13-29, 32-38 ARE OBVIOUS IN VIEW OF LAUB, AKLOG, AND GARRISON

PO raises arguments regarding only Grounds 1A, 2A, 3A, and 4A. Grounds 1A and 2A demonstrate that a POSITA would have found it obvious to combine Garrison's valve with Laub's or Aklog's aspiration systems to build up/release vacuum pressure. (Petition, §VI.) Grounds 3A and 4A demonstrate that a POSITA would have found it obvious to use, or optimize, Garrison's aspiration system to treat PE or DVT based on Laub or Aklog. (*Id.*) The Board preliminarily found that the evidence supported both obviousness rationales in the Institution Decision. (Paper 15, 30-31.)

A. Garrison Discloses Building Up Vacuum Pressure In A Clot Canister

The Board preliminarily found that Garrison discloses closing a valve to build up vacuum pressure in a clot canister 3418 and opening the valve to apply the vacuum pressure to the aspiration catheter 2030:

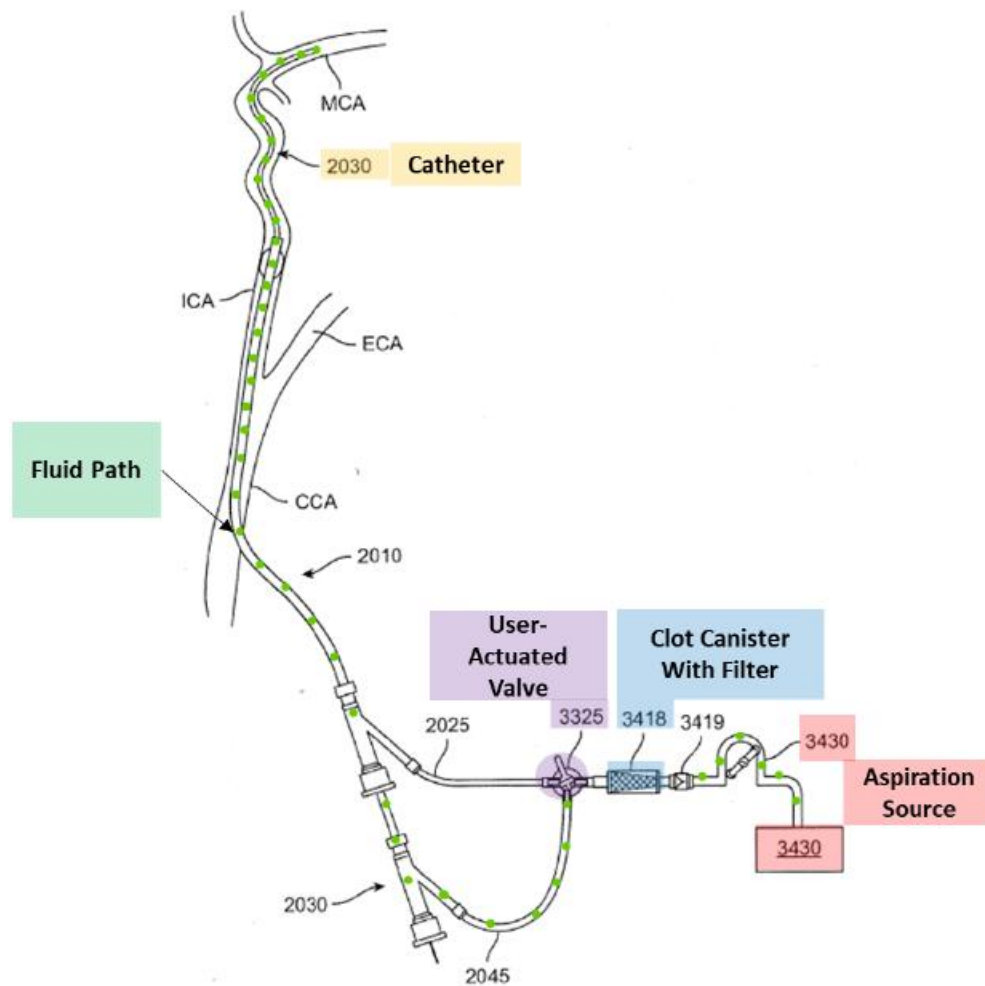


FIG. 34

(Paper 15, 30; Ex. 1006, [0131]-[0134], Fig. 34; Petition, 36-42.) PO identifies no new evidence that undermines the Board’s preliminary finding.

Instead, PO repeats its POPR argument that Petitioner conflates “disparate” embodiments in Garrison’s Figure 34 and paragraph 134. (POR, 3, 36.) The Board preliminarily rejected this argument for several reasons. (Paper 15, 31-32.) For example, the description of Figure 34 begins in paragraph 132 and immediately precedes the paragraph-134 description of closing/opening a valve to build

up/release pressure. (*Id.*; Ex. 1006, [0132]-[0134].) These descriptions are not disparate but are part of a short specification section titled “Exemplary Embodiments of Aspiration and Flow Control,” which explains that the described features may be combined across embodiments. (Paper 15, 31-32; Ex. 1006, [0130], [0134].) Paragraph 134 also references components found in Figure 34, including a pressure source, flow controller, flow lines, and catheter. (*Id.*) Thus, a POSITA would have understood the method described in paragraph 134 applies to Figure 34. (Ex. 1003, ¶¶104-105.)

Additionally, PO’s experts disagree that the embodiments are “disparate.” PO’s expert, Mr. Brown, testified that Figure 34’s aspiration source would build up vacuum in the components distal to the valve when the valve is closed, regardless of whether the aspiration source is a pump or syringe. (Ex. 1063, 163:13-164:4; *see also* Ex. 1064, 96:14-99:13 (testifying Garrison is “configured to generate vacuum pressure while the fluid control device is in the closed position” and apply the vacuum to the catheter when the fluid control device is opened).) Mr. Brown also confirmed that this method of generating vacuum pressure was well known before 2018. (Ex. 1064, 42:11-44:4.) PO’s other expert, Dr. Morris, and PO’s expert in related IPRs, Dr. Zalesky, similarly testified that Garrison discloses building up vacuum in Figure 34 while the valve is closed. (Ex. 1065, 150:9-152:10, 158:8-159:1; Ex. 1066, 128:5-129:13.) Thus, PO does not genuinely dispute that the

aspiration method in paragraph 134 applies to Figure 34, and that the method “generat[es] vacuum pressure within the clot canister” as claimed in the ’333 patent.

PO also repeats its argument that the method in paragraph 134 requires a **syringe** attached **directly** to a flow controller, while Figure 34 requires a **peristaltic** pump. (POR, 36-38.) The Board correctly rejected that paragraph 134 requires a syringe because “Garrison teaches, in the same paragraph where the cited ‘maximum level of aspiration in a rapid fashion’ appears, that several alternative aspiration sources may be used in its systems,” including a pump. (Paper 15, 33-34 (citing Ex. 1006, [0134]).) This same broad disclosure of aspiration sources also applies to Figure 34, which is never limited to a peristaltic pump. (Ex. 1006, [0134]; *see also id.*, [0135] (discouraging peristaltic pumps in some situations).) PO’s experts similarly confirmed that Figure 34 is not restricted to a peristaltic pump. (Ex. 1063, 152:13-22; Ex. 1065, 150:9-151:2; Ex. 1066, 114:4-115:19.)

Paragraph 134 also does not require a **direct** attachment between the aspiration source and flow controller. (Ex. 1006, [0134].) Paragraph 134 says that the aspiration source is “attached” to the syringe; not directly attached. (*Id.*) Garrison also discloses substituting a “flow controller” for the stopcock in Figure 34, which is **indirectly** attached to the aspiration source, and Figure 35 includes drafting lines to suggest that the flow controller may be indirectly attached to the aspiration source:

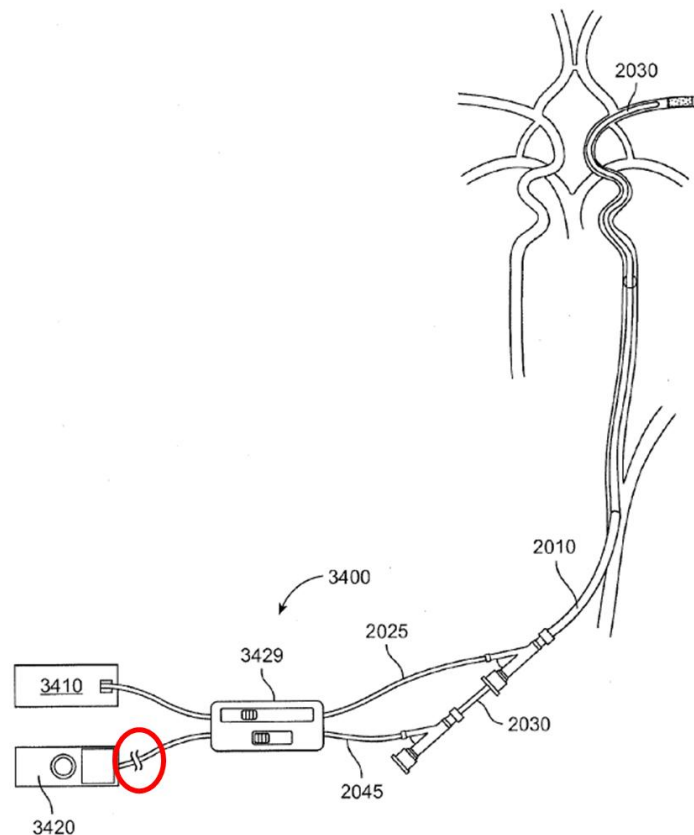


FIG. 35

(*Id.*, [0132]-[0133], Figs. 34-35.) Further, as PO's expert admitted, Garrison expressly discloses embodiments including a filter between the syringe and aspiration catheter. (Ex. 1063, 168:22-25; *see also* Ex. 1006, [0131], Fig. 33.) Thus, PO's additional argument that a POSITA would not use a syringe with a filter due to decreased aspiration ignores Garrison's disclosure.

B. Garrison's Valve Is Compatible With Prior-Art Aspiration Pumps

PO also argues that temporarily closing Garrison's valve to build up vacuum pressure would damage the pumps in Garrison, Laub, and Aklog and harm the

patient's blood. (POR, 35, 37-52.) PO's argument is unpersuasive for several reasons.

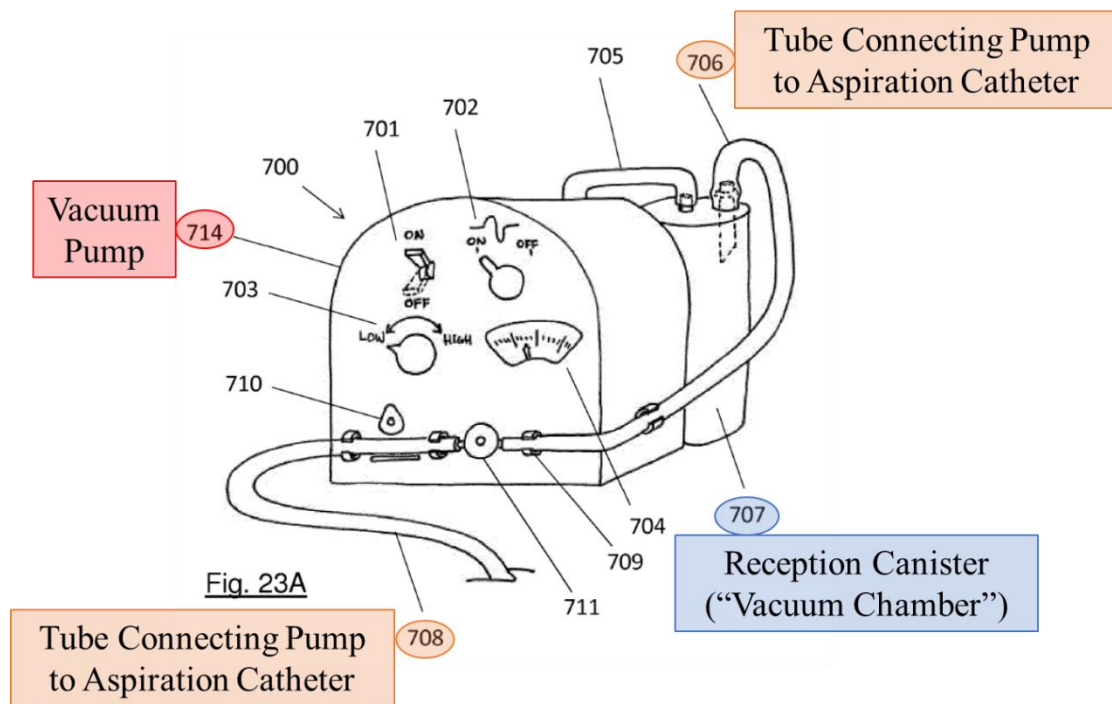
First, PO presumes that Garrison, Laub, and Aklog require "centrifugal/positive displacement pumps." (POR, 36-39.) This is not true. Each reference broadly discloses using known aspiration pumps without restriction to specific pumps. (*See e.g.*, Ex. 1006, [0006]; Ex. 1012, [0041]; Ex. 1005, 12:10.)

Second, PO ignores the prior-art aspiration pumps identified in the Petition and instead identifies three centrifugal pumps for cardiopulmonary bypass or laboratory procedures as allegedly illustrating the pumps in Garrison/Laub/Aklog. (Ex. 1067, ¶¶23-29; Ex. 2009, 6; Ex. 2010, 4; Ex. 2011, 20; Ex. 2012, 2.) Yet, PO presents no evidence that a POSITA would have used the bypass pumps for aspiration procedures and, therefore, fails to demonstrate that the pumps are relevant.

In fact, PO's evidence demonstrates that a POSITA would have known **not** to use these bypass pumps for aspiration. PO's expert admitted that none of the pumps are indicated for aspiration procedures. (Ex. 1063, 125:11-22, 134:22-135:16, 139:22-141:5, 141:19-142:13; *see also* Ex. 1067, ¶¶23-27.) He further admitted that the pump instructions expressly warn **against** such use. (Ex. 1063, 125:11-126:7, 134:22-137:13; Ex. 1067, ¶¶23-27.) He also admitted that a POSITA would have recognized that clots commonly clog the aspiration catheter during aspiration procedures (regardless of pump), which blocks continuous blood flow through the

pump. (Ex. 1063, 56:18-57:14, 127:5-9; Ex. 1067, ¶¶28-29.). PO concedes that a POSITA would have known that the bypass pumps should not be used “in the absence of flow.” (POR, 41-42; Ex. 2008, ¶71; Ex. 1063, 127:10-128:22; Ex. 1067, ¶¶28-29.) Thus, a POSITA would have known **not** to use the bypass pumps for aspiration procedures where clogs cause the pump to run dry. (*Id.*)

Instead of PO’s bypass pumps, a POSITA would have been motivated to use known aspiration pumps. (Petition, 57-58; Ex. 1067, ¶¶30-40.) For example, Brady discloses a vacuum pump that is “particularly suited to removing clot from cerebral arteries” and “pulmonary arteries in patients suffering from pulmonary embolism (PE).” (Ex. 1020, 1:13-17.) Brady’s vacuum pump 714 “may comprise a diaphragm or vane or piston pump, or a peristaltic pump, or other means of generating a negative pressure differential.” (*Id.*, 21:16-19, Fig. 23A.) When turned on, the pump “evacuates the canister 707 via tube 705, and thus a suction or aspiration force is transmitted through tubes 706 and 708”:

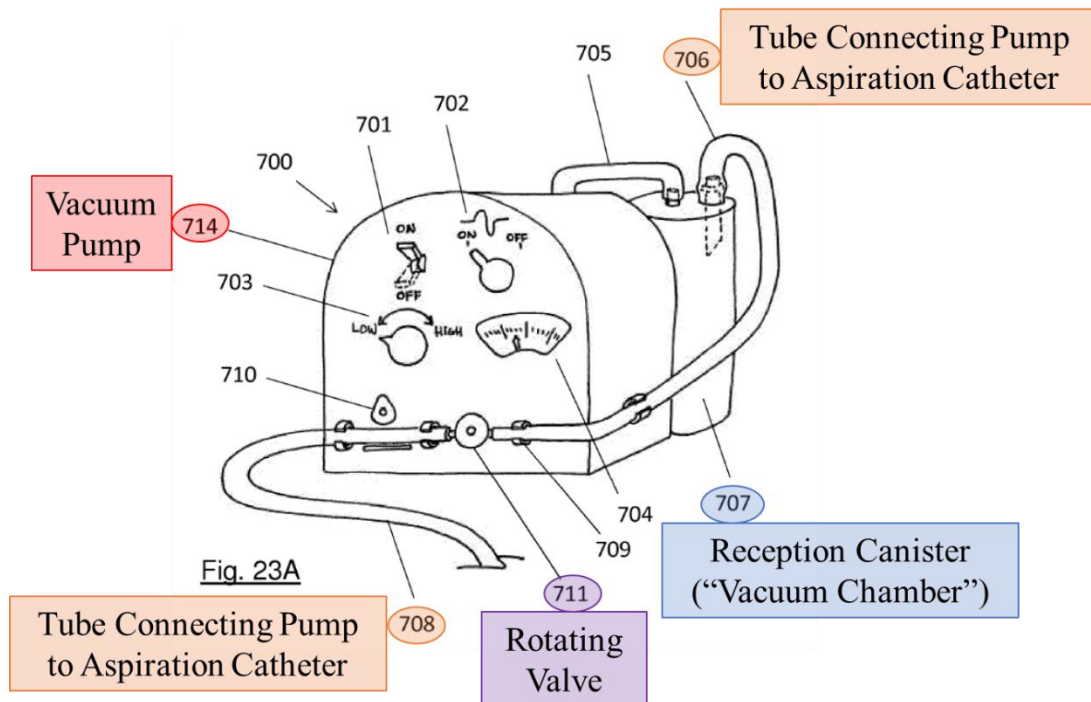


(*Id.*, 21:16-32, Fig. 23A; *see also id.*, 20:19-29, Fig. 19.)

Unlike the bypass pumps, Brady’s pump does not require continuous blood flow through the pump. (Ex. 1067, ¶34.) In fact, blood never flows through Brady’s pump because the canister 707 captures the blood. (*Id.*) Brady’s pump canister includes a “safety valve” to “prevent fluid or material entering tube 705 and damaging the pump.” (Ex. 1020, 21:21-22.) A POSITA would have understood that Brady’s pump could operate safely while a valve is closed to build up vacuum pressure and that the pump would not damage the blood collected in the canister. (Ex. 1067, ¶¶34-35.)

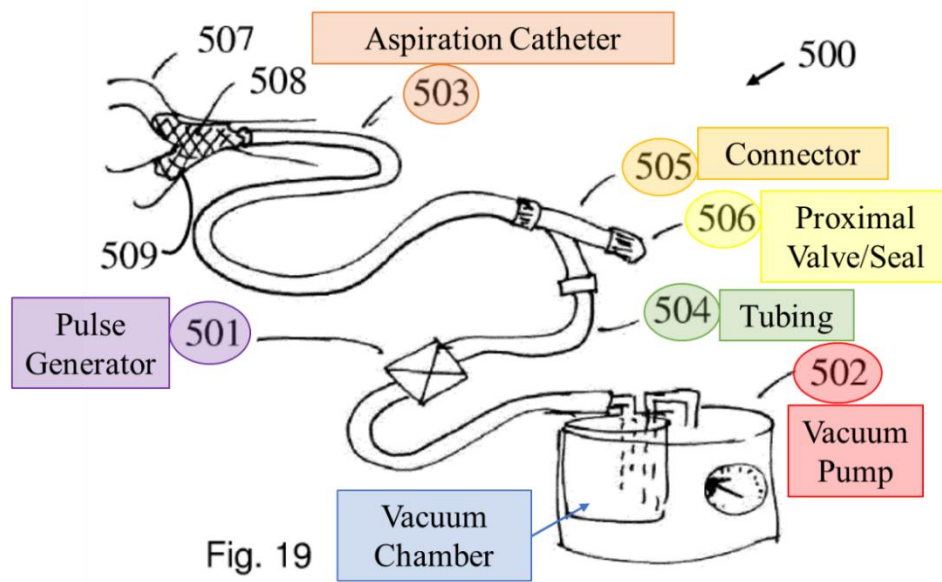
Indeed, Brady expressly discloses closing a valve while the pump is on to temporarily build up a rapid pulse of pressure that “may be beneficial for the retrieval

of stubborn clot material.” (Ex. 1020, 22:5-6.) Brady’s pump includes a rotating valve 711 that may be closed so that “tube 708 is no longer exposed to the vacuum within canister 707,” and then opened so that “a vacuum pulse may be delivered through tube 708”:



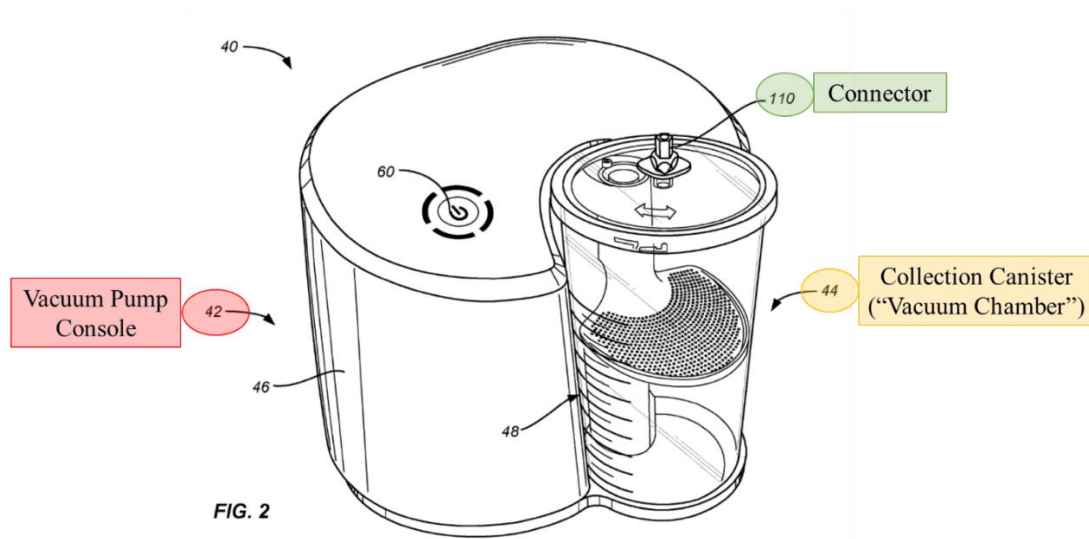
(*Id.*, 22:1-24, Figs. 23a, 24a-b.)

Brady’s Figure 19 similarly includes a pulse generator 501 that selectively compresses the tubing to build up pressure before releasing the pressure to create pulsing aspiration:



(*Id.*, 20:19-29, Fig. 19.) Brady’s pump is therefore compatible with closing/opening a valve to build up/release vacuum pressure to cause aspiration. (Ex. 1067, ¶¶34-35.)

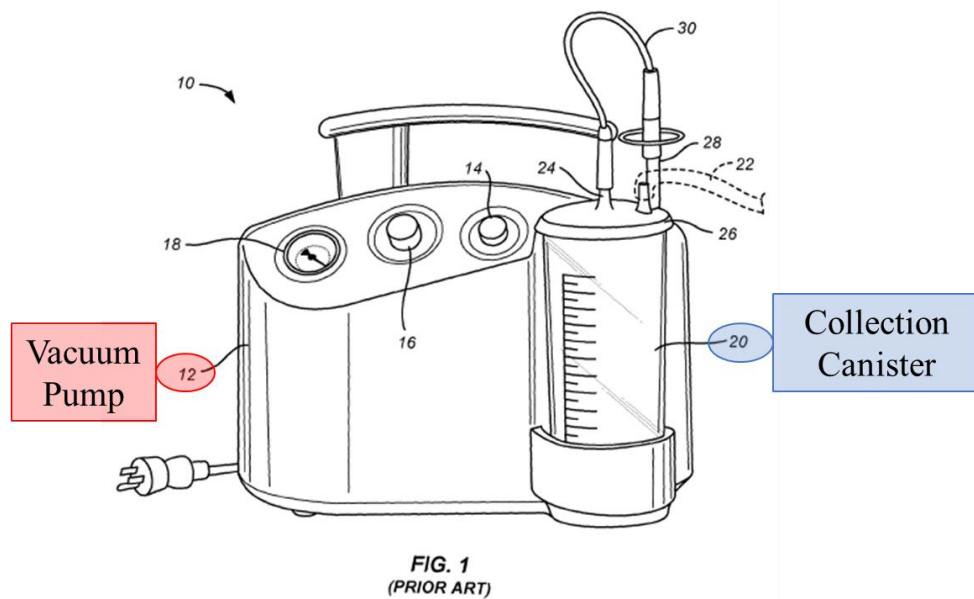
As another example, Pons discloses “improved vacuum systems including a vacuum console and a collection canister for use with mechanical thrombectomy systems.” (Ex. 1062, 2:56-58.) Pons’ console 42 includes a pump and collection canister 44:



(*Id.*, 6:27-33, Fig. 2.)

Blood does not flow through Pons’ pump. (Ex. 1067, ¶37.) Pons’ canister is designed so that “vacuum is drawn ... near the top of the canister” to “reduce[] the risk that clot or blood ... will flow into [] the vacuum port ... and interfere with operation of the vacuum console.” (Ex. 1062, 4:39-54; 7:55-59.) Thus, Pons’ pump is also compatible with closing/opening a valve to build up/release vacuum pressure to cause aspiration. (Ex. 1067, ¶37.)

Pons also describes the Penumbra Pump MAX, which similarly generates vacuum pressure in a canister, rather than moving blood through the pump:



(Ex. 1062, 1:64-2:13.) The Penumbra Pump MAX was commercially available before 2018:

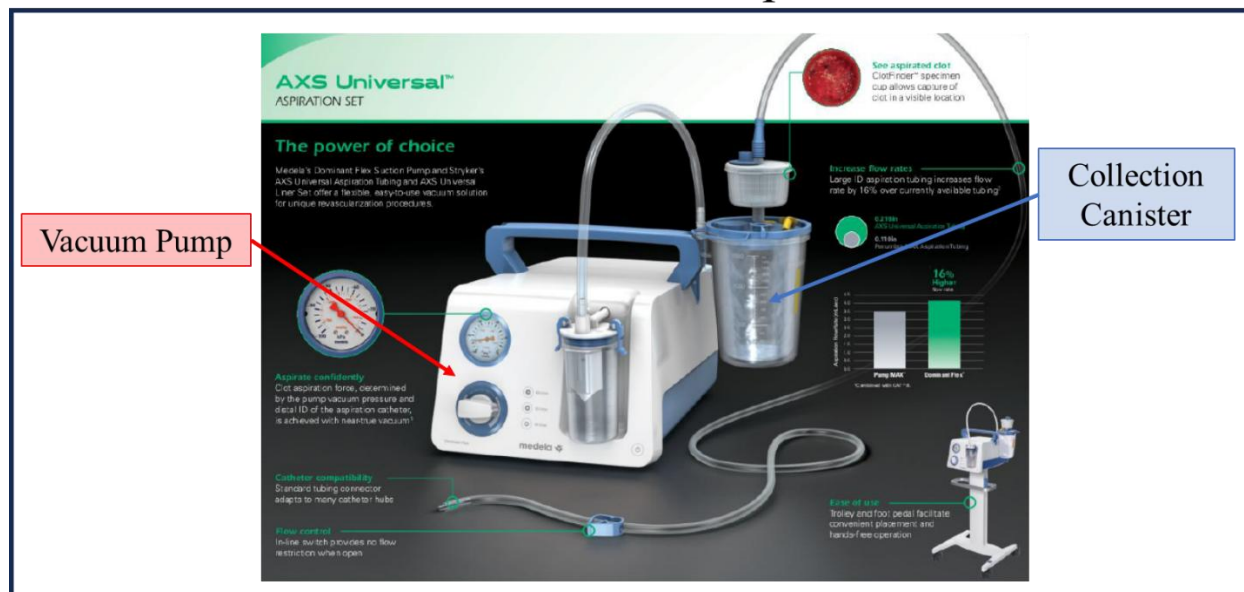
Penumbra Pump



(Ex. 1068.)

The Medela Dominant Flex aspiration pump was also commercially available before 2018 and generates vacuum pressure in a collection canister rather than moving blood through the pump:

Medela Pump



(Ex. 1039; Ex. 1067, ¶¶40.)

Thus, many prior-art aspiration pumps did not require continuous blood flow through the pump like the bypass pumps identified by PO. In fact, the prior-art aspiration pumps were designed to **prevent** blood flow through the pump. (Ex. 1067, ¶¶30-40.) A POSITA would have recognized that these aspiration pumps would have been compatible with Garrison's method of building up and releasing pressure by closing and opening a valve. (*Id.*)

Third, even if Garrison/Aklog/Laub were limited to “centrifugal/positive displacement pumps,” PO fails to show that Garrison’s valve would damage *all* such pumps so that a POSITA would have been discouraged from using them. PO’s expert hedges that the valve “would *likely* damage those systems,” or could “*potentially* damage[e] those pumps and systems.” (POR, 38; Ex. 2008, ¶86.) When pressed, PO’s expert conceded that there “may have been peristaltic pumps that could generate a vacuum” while a valve is closed in 2018. (Ex. 1063, 111:16-25.) Brady is one such pump. Brady expressly discloses using a peristaltic pump for aspiration with an on/off valve. (Ex. 1020, 21:16-19, Fig. 23A.) Thus, the evidence refutes PO’s contention that all “centrifugal/positive displacement pumps” would suffer damage from insufficient blood flow when combined with Garrison’s valve.

Fourth, PO ignores that a POSITA would have possessed the knowledge to select an appropriate pump to use with Garrison’s valve. (Ex. 1067, ¶41; Ex. 1063, 132:17-133:1 (PO’s expert testifying a POSITA “would have to select an electric pump that was compatible to be able to achieve the steps of Claim 1”).) The ’333 patent presumes that POSITAs possessed this knowledge. (Ex. 1001, 7:33-41.) The ’333 patent discloses that “the pressure source can be a pump” or “syringe.” (*Id.*) While the ’333 patent discusses syringes specifically, it never discusses appropriate pumps, instead presuming a POSITA could select a pump. (*Id.*) Because the ’333 patent does not disclose or claim a particular pump for performing the claimed

methods, PO cannot rely on the pump type to distinguish the prior art. *Smith & Nephew, Inc. v. Rea*, 721 F.3d 1371, 1380-81 (Fed. Cir. 2013) (“[A]n unclaimed and undisclosed feature ... cannot be the basis for finding [a] patent to be non-obvious over the prior art.”).

Garrison, Laub, and Aklog also presume that a POSITA would have possessed the knowledge to select an appropriate pump. (Ex. 1067, ¶43.) Each reference discloses using known and commercially available aspiration pumps and presumes that a POSITA could select the appropriate pump from the available options. (*Id.*; Ex. 1006, [0134]; Ex. 1005, 12:9-14; Ex. 1012, [0041].)

Thus, PO’s argument that Garrison’s valve would damage the pumps in Garrison, Laub, and Aklog and harm the patient’s blood is unpersuasive.

C. Garrison’s Valve Is Compatible With Blood Return

PO also repeats its POPR argument that Garrison’s method of temporarily closing a valve to build up pressure is incompatible with blood return. (POR, 44-52.) The Board preliminarily rejected this argument in the Institution Decision based on five observations. (Paper 15, 35-36.) PO fails to identify any errors in the Board’s analysis, and PO’s arguments are unpersuasive for many reasons.

First, PO presumes that Laub and Aklog require continuous blood return. (POR, 44.) Yet, both references describe blood return as one option (as do Garrison and the ’333 patent). For example, Laub discloses embodiments having a return

catheter to infuse blood back into the patient. (Ex. 1012, [0045].) While Laub explains that continuous blood return can permit greater flow rates, Laub does not disclose that greater flow rates are necessary to successfully aspirate clots or that blood return is necessary. (*Id.*) Similarly, Aklog discloses, “the systems and methods of the present invention *may* simultaneously reinfuse aspirated (i.e., removed) and filtered fluid.” (Ex. 1005, 5:19-22 (emphasis added); *see also id.*, 6:9-11 (“The suction and reinfusion of blood can occur, in an embodiment, continuously for a desired duration to minimize fluid loss in the patient.”).) Aklog does not require blood return.

Second, PO incorrectly argues that temporarily closing Garrison’s valve would damage the blood for the same reasons it would damage the pump. (POR 44-46.) As demonstrated above, these arguments are unpersuasive for many reasons, including because the available aspiration pumps collected blood in a canister and never exposed it to the pump. (*Supra* §II.B.)

Third, PO repeats its POPR argument that Garrison’s method is incompatible with blood return because the blood would be “static” while Garrison’s valve is closed. (POR, 47-49.) The Board preliminarily rejected this argument because Garrison’s method of building pressure is “a temporary step to enable a rapid burst of suction—without blood being withdrawn from the patient during this brief window.” (Paper 15, 36; *see also* Ex. 1006, [0134].) A POSITA would not have

expected any substantial thrombus formation during this temporary step. (Ex. 1067, ¶56.)

PO also argues that aspiration sources like a syringe where the blood remains “static” and is “exposed to air” are not suitable for blood return. (POR, 47-48.) This argument directly contradicts the ’333 patent. There, the preferred blood return method is to aspirate the blood into a syringe, where it is static, and then transfer the blood to another syringe before returning it to the patient. (Ex. 1001, 30:61-35:7.) PO therefore cannot credibly assert that “static” blood is unsuitable for reinfusion.

Thus, PO’s blood return arguments are unpersuasive.

D. The Claims Do Not Require The Valve To “Enable The Maximum Level of Aspiration”

Petitioner showed, and the Board preliminarily agreed, that a POSITA would have been motivated to incorporate Garrison’s valve into Laub’s or Aklog’s systems to “improve Laub’s or Aklog’s temporary aspiration power to aspirate PE’s more quickly, making Laub’s and Aklog’s systems safer and more effective.” (Petition, 38-41; Ex. 1006, [0134]; Paper 15, 30-31.) PO does not dispute, and its experts concede, that closing Garrison’s valve in Laub’s or Aklog’s aspiration systems would build-up vacuum pressure and that opening Garrisons’ valve quickly would cause a rapid burst of vacuum pressure that would improve aspiration. (Ex. 1063, 163:13-164:4; Ex. 1065, 150:9-152:10; *see also* Ex. 2016, ¶53.)

Rather than dispute Petitioner’s evidence, PO creates a strawman. PO focuses solely on the phrase “maximum level of aspiration,” repeatedly truncating Garrison’s full disclosure that the valve provides this aspiration “in a rapid fashion.” (POR, 53.) PO argues that syringes and pumps enable maximum levels of aspiration differently. (*Id.*, 53-54.) PO concludes, without support, that Garrison’s example of building up pressure with a valve and syringe (*see* Garrison’s paragraph 134) would not motivate a POSITA to build up pressure in a system having a pump. (*Id.*, 53-55.)

PO’s focus on the “*maximum* level of aspiration” is misguided. The challenged claims do not require generating a maximum level of aspiration; they require closing a valve to generate vacuum pressure and opening the valve to release the vacuum pressure. (Ex. 1001, claim 1; Ex. 1063, 94:25-95:10.) As explained in the Petition, the motivation for utilizing Garrison’s valve to generate vacuum pressure is to “improve Laub’s or Aklog’s temporary aspiration power to aspirate PE’s more quickly.” (Petition, 38-39.) PO does not dispute that closing Garrison’s valve would build-up vacuum pressure and opening the valve quickly would release a burst of pressure to improve aspiration so Petitioner’s motivation to combine remains un rebutted.

PO also argues that Garrison’s valve would “needlessly complicate” Laub’s and Aklog’s system. (POR, 57.) PO argues the added step of opening/closing a

valve while operating a pump would flummox a surgeon. (*Id.*) Yet, PO ignores that the '333 patent describes a more complicated procedure. Rather than simply turning on/off a pump, the '333 patent requires the POSITA to manually prime a syringe while operating the valve. (Ex. 1001, 8:4-20.) Further, if the initial aspiration is ineffective, the surgeon must disengage the syringe, empty it, and then reprime it to further aspirate. In contrast, a POSITA using a pump simply needs to turn the pump back on. For at least these reasons, PO has failed to show that Garrison's valve would complicate the assembly so much that it would outweigh the benefits of the valve. *See Intel Corp. v. Qualcomm Inc.*, 21 F.4th 784, 800 (Fed. Cir. 2021) (not necessary to show a combination is the "best option").

E. Laub and Aklog Do Not Require Continuous Aspiration

PO also argues that including Garrison's valve would prevent Laub and Aklog from continuously aspirating and reinfusing blood to the patient. (POR, 55-56.) Yet, as explained above, Laub and Aklog do not require blood reinfusion, let alone continuous aspiration/reinfusion. (*Supra* §II.C.) Laub explains that reinfusing blood continuously during aspiration *can* have some benefits, but it does not require such reinfusion. (Ex. 1012, [0045].) Likewise, Aklog explains that large catheters "*may* aspirate an unacceptable volume of blood" and that reinfusion is a potential solution, but it does not require reinfusion. (Ex. 1005, 7:23-25 (emphasis added).)

Further, even if continuous blood reinfusion were necessary, Garrison's valve would not interfere. PO's expert admitted that reinfusion would occur only *after* aspiration has been applied to the occlusion and blood is withdrawn from the patient. (Ex. 1063, 182:11-183:2.) Garrison discloses closing the valve *before* aspiration, generating the negative pressure, and then opening the valve to release the pressure and initiate aspiration. (Ex. 1006, [0134].) Once the valve is opened, the aspiration is continuous and the blood may be reinfused continuously. (Ex. 1067, ¶56.)

F. Grounds 3A/4A: POSITAs Would Have Been Motivated To Use Garrison's System For PE Or DVT

Petitioner also showed, and the Board preliminarily found, that a POSITA would have been motivated to use, or optimize, Garrison's aspiration system to treat PE or DVT based on Laub or Aklog. (Petition, 22-30, 64; Paper 15, 30-31.) Garrison's procedures and systems for aspirating clot from the cerebral vasculature are similar to Laub's and Aklog's procedures and systems for aspirating clots from the pulmonary or peripheral vasculature. (Petition, 22-30, 64.) The evidence reflects that POSITAs routinely optimized catheters for use in other parts of the vasculature, and that selecting appropriately sized catheters was standard practice. (*Id.*)

PO does not dispute that evidence. (*See* POR, 61-64.) Instead, PO repeats its argument that Garrison's aspiration method could not be used to treat PE or DVT

because it would be incompatible with blood return. (*Id.*) PO's blood return arguments fail for the reasons explained above. (*Supra* §II.C.)

III. PO FAILS TO ESTABLISH UNEXPECTED RESULTS

PO also fails to prove that the claimed methods resulted in unexpected results for several reasons.

First, “[f]or objective evidence of secondary considerations to be accorded substantial weight, its proponent must establish a nexus between the evidence and the merits of the *claimed invention*.” *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010) (quotation omitted). Here, PO is not entitled to a presumption of nexus because it does not show that PO's Flowtriever is coextensive with the '333 patent claims. *See, e.g., Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019) (holding that presumption of nexus applies only if PO proves that product “embodies the claimed features and is coextensive with them”); *In re Peterson*, 315 F.3d 1325, 1330-31 (Fed. Cir. 2003) (evidence of unexpected results must be reasonably commensurate with the claim scope).

Nor does PO present any evidence that the allegedly unexpected efficacy of the Flowtriever is “the direct result of the unique characteristics of the claimed invention” and not unclaimed features of the Flowtriever. *Fox Factory*, 944 F.3d at 1373-74 (quotation omitted). To the contrary, PO's expert, Dr. Morris, testified that the allegedly unexpected results were due to unclaimed features: (1) Flowtriever's

unconstricted catheter and (2) quickly opening the valve. (Ex. 1065, 191:22-192:22.) Dr. Morris admitted that slowly opening Flowtriever's valve would not produce the unexpected results. (*Id.*, 193:2-194:1.) Yet, the '333 patent does not claim an unconstricted catheter or quickly opening the valve. (Ex. 1001, Claims 1, 11.)

Further, "[w]here the offered secondary consideration actually results from something other than what is both claimed and *novel* in the claim, there is no nexus to the merits of the claimed invention," meaning that "there must be a nexus to some aspect of the claim not already in the prior art." *In re Kao*, 639 F.3d 1057, 1068–69 (Fed. Cir. 2011) (emphasis in original). PO argues that the allegedly unexpected efficacy of the Flowtreiver results from building up vacuum pressure with a valve closed and then opening the valve to release the vacuum. (POR, 64-65.) But Garrison expressly discloses those steps. (Ex. 1006, [0134]; Petition, 36-42.) Thus, PO has not shown "a nexus to some aspect of the claim not already in the prior art." *In re Kao*, 639 F.3d at 1068–69; *see also In re Li*, No. 2024-1209, 2025 WL 1040066, at *6 (Fed. Cir. Apr. 8, 2025) ("Because the features that applicants rely on to support their objective indicia arguments ... are recited in *Li*, the Board properly found no nexus between those features and any unexpected results.").

Second, "[u]nexpected results must be established by factual evidence. Mere argument or conclusory statements ... does not suffice." *Samsung Elecs. Co., Ltd. v.*

Huawei Techs. Co., Ltd, IPR2017-01472, 2018 WL 6519541, *17 (P.T.A.B. Dec. 10, 2018) (quotation omitted). PO relies exclusively on Dr. Morris' conclusory statement that he "was personally surprised that the generation of a quick burst of vacuum and rapid pressure equalization could so effectively remove a clot when treating a PE or DVT, oftentimes removing the clot intact." (POR, 65.) Dr. Morris' statement is unsupported by any data, testing, or other objective evidence comparing Flowtriever to any other devices/references. (See Ex. 2016, ¶¶84-85.) Thus, Dr. Morris' conclusory statement is not probative of nonobviousness. *Samsung Elecs.*, 2018 WL 6519541, at *17; *see also Equistar Chems., LP v. Exxonmobil Chem. Pats. Inc.*, IPR2017-01534, 2018 WL 6436749, at *18 (P.T.A.B. Dec. 7, 2018) (rejecting expert testimony on unexpected results because it was "not supported by any persuasive evidence or analysis").

Third, "evidence of unexpected results must establish that there is a difference between the results obtained and those of *the closest prior art*, and that the difference would not have been expected by one of ordinary skill in the art at the time of the invention." *Bristol-Myers Squibb Co. v. Teva Pharms. USA, Inc.*, 752 F.3d 967, 977 (Fed. Cir. 2014) (emphasis added). PO argues that Garrison is the closest prior art. (POR, 64.) But PO fails to explain why the results of a "quick burst of pre-charged vacuum" would be unexpected when Garrison discloses the method "enable[s] the maximum level of aspiration in a rapid fashion with one user."

(POR 64-65; Ex. 1006, [0134].) PO therefore fails to show that the claimed methods produce results unexpectedly different from Garrison.

IV. PETITIONER’S DEFINITION OF A POSITA IS CORRECT

PO incorrectly argues that Mr. Thornton’s testimony should be afforded no weight due to his POSITA definition. Mr. Thornton opines that a POSITA would be an engineer with 2-4 years of catheter design experience who would consult with a physician as necessary. (Ex. 1003, ¶¶35-36.) Mr. Thornton’s definition is based on real-world experience. He explains that during his career, he would “assign an engineer with the experience described” to “design catheters, sheaths, and related components such as hemostasis valves for use in cardiovascular procedures.” (*Id.*) The Board preliminarily found that Mr. Thornton’s POSITA definition is “reasonable and consistent with the prior art.” (Paper 15, 12.)

PO counters that a POSITA must have “industry experience in the mechanical thrombectomy industry or comparable industry experience.” (POR, 15-21.) Yet, PO never defines “comparable industry experience” and never explains why an engineer with years of catheter-design experience and access to physicians does not have it. (Ex. 2008, ¶30; Ex. 2016, ¶¶44-46.) Experience designing catheters for vascular procedures is comparable to mechanical thrombectomy experience. Mr. Thornton has explained, “[m]ost catheters have a lot of similarities” and therefore “catheter design experience would be beneficial in general for a person of skill in

the art.” (Ex. 2013, 44:21-24; *see also* Ex. 1063, 61:7-62:5 (PO’s expert agreeing that “[w]orking on catheters will assist you in developing other catheters relative to the construction of the catheter”).) Many of the references cited on the ’333 patent relate to other catheter-based procedures, not mechanical thrombectomy. (*See e.g.*, Exs. 1069-1073.)

PO fails to demonstrate any material distinction between the parties’ proposed POSITA definitions, much less a distinction that would warrant wholesale disregard of Mr. Thornton’s testimony. *See, e.g., TRW Auto. US LLC v. Magna Elecs. Inc.*, IPR2014-00266, 2014 WL 2965901, at *7 (P.T.A.B. June 26, 2014) (rejecting argument that petitioner’s POSITA definition “infect[ed] [the] entire obviousness analysis” because PO “d[id] not explain sufficiently ... *why* [petitioner’s] definition renders [it’s] obviousness analyses incorrect”).

V. PETITIONER’S EXPERTS ARE QUALIFIED AND CREDIBLE

Even if the Board adopts PO’s definition, PO fails to show that the Board should accord Mr. Thornton’s or Dr. Turk’s testimony little or no weight.

PO argues that Mr. Thornton does not qualify as a POSITA because he has not designed a thrombectomy catheter. (POR, 17-19.) However, Mr. Thornton has significant “comparable industry experience” to qualify him as a POSITA. (Ex. 1074, 59:20-61:10.) PO’s expert, Dr. Morris, explained that comparable industry experience requires “experience in clot, and mitigating the effects of clots.” (Ex.

1065, 205:17-206:21.) By 2018, Mr. Thornton had considerable experience designing products to avoid and mitigate clots. (Ex. 1067, ¶¶8-18.)

Additionally, Mr. Thornton had 30+ years of experience developing medical devices such as blood pumps and catheters “from small diameters to large diameters, used in multiple locations throughout the body.” (Ex. 1074, 59:20-61:10; Ex. 1003, ¶¶5-14.) Mr. Thornton also had considerable experience developing multi-lumen catheters with “more complex features” than what a “single lumen aspiration catheter would require.” (Ex. 2013, 47:13-23.) Additionally, the catheters Mr. Thornton developed required aspirating fluid or air through the catheter. (*Id.*, 47:24-49:23.) Accordingly, Mr. Thornton qualifies as a POSITA and an expert.

PO also argues that Dr. Turk’s testimony is irrelevant to Petitioner’s grounds because Dr. Turk did not opine on the challenged claims or prior art. (POR, 19-20.) That is incorrect. Dr. Turk provides testimony regarding the procedures used by POSITAs to aspirate clots from the body before 2018, and the real-world adaption of catheters for use across various parts of the vasculature. (Ex. 1022, ¶¶16-41; *see also* Ex. 2015, 36:15-37:1, 48:21-49:13, 51:2-53:4.)

For example, Dr. Turk testified that since the early 2010s, POSITAs have “place[d] a tube clamp on the tubing running from the aspiration catheter to the syringe or pump” to “create negative pressure in the tubing before removing the tube clamp,” “which increases the suction immediately applied to the clot.” (Ex. 1022,

¶23; *see also* Ex. 2015, 27:17-29:6.) This testimony is relevant to Petitioner’s invalidity grounds and was credited by the Board in the Institution Decision. (Paper 15, 34.) It is also undisputed. PO’s expert, Mr. Brown, confirmed that he witnessed this technique “[m]any times” before 2018. (Ex. 1064, 42:11-44:4.)

Dr. Turk also explained why cerebral clots are more challenging to treat and why a POSITA could adapt systems designed for cerebral clots to treat PE/DVT. (Ex. 1022, ¶¶33-37; *see also* Ex. 2015, 64:7-65:18.) Dr. Turk’s testimony is relevant to Petitioner’s invalidity grounds and particularly rebuts PO’s argument that a POSITA would have been discouraged from using or adapting Garrison’s aspiration system to treat PE/DVT. The Board similarly credited Dr. Turk’s testimony on these topics in the Institution Decision, and again, PO does not dispute them. (Paper 15, 29-31.)

VI. GROUNDS 1B-1D, 2B-2D, 3B-3D, 4B-4D

PO does not present any unique arguments for the additional grounds, or the other prior-art references. (POR, 66.) PO therefore fails to rebut Petitioner’s evidence that challenged claims 6-8, 11-12, 17, 25-27, 30-31, and 36 would have been obvious as explained in the Petition.

VII. CONCLUSION

Petitioner has established by a preponderance of the evidence that the challenged claims are unpatentable and, therefore, requests that the Board cancel the claims.

Dated: June 4, 2026

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CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that this **PETITIONER’S REPLY TO PATENT OWNER’S PRELIMINARY RESPONSE** contains 5,593 words according to the word-processing program used to prepare this paper. The foregoing word count complies with the 5,600-word type-volume limit specified by 37 C.F.R. § 42.24(a)(1).

Dated: June 4, 2026

By: /Joshua J. Stowell/
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CERTIFICATE OF SERVICE

I hereby certify that, pursuant to 37 C.F.R. § 42.6(e), a true and correct copy of
PETITIONER’S REPLY TO PATENT OWNER’S PRELIMINARY RESPONSE
is being served electronically on June 4, 2026, to the e-mail addresses shown below:

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