

## PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1  
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EPAS ID: PAT3433993

<b>SUBMISSION TYPE:</b>	NEW ASSIGNMENT		
<b>NATURE OF CONVEYANCE:</b>	INTELLECTUAL PROPERTY SECURITY AGREEMENT		
<b>CONVEYING PARTY DATA</b>			
<b>Name</b>			<b>Execution Date</b>
ALUNG TECHNOLOGIES, INC.			05/04/2015
<b>RECEIVING PARTY DATA</b>			
<b>Name:</b>	EPONGE LLC		
<b>Street Address:</b>	1031 PETIT COURT		
<b>City:</b>	MARCO ISLAND		
<b>State/Country:</b>	FLORIDA		
<b>Postal Code:</b>	34145		
<b>PROPERTY NUMBERS Total: 4</b>			
<b>Property Type</b>	<b>Number</b>		
<b>Patent Number:</b>	8585968		
<b>Patent Number:</b>	8393181		
<b>Patent Number:</b>	7927544		
<b>Patent Number:</b>	8647569		
<b>CORRESPONDENCE DATA</b>			
<b>Fax Number:</b>	(412)562-1041		
<i>Correspondence will be sent to the e-mail address first; if that is unsuccessful, it will be sent using a fax number, if provided; if that is unsuccessful, it will be sent via US Mail.</i>			
<b>Phone:</b>	412-562-1622		
<b>Email:</b>	vicki.cremonese@bipc.com		
<b>Correspondent Name:</b>	DUANE A. STEWART III		
<b>Address Line 1:</b>	301 GRANT STREET		
<b>Address Line 2:</b>	20TH FLOOR		
<b>Address Line 4:</b>	PITTSBURGH, PENNSYLVANIA 15219		
<b>ATTORNEY DOCKET NUMBER:</b>	0076707-000001		
<b>NAME OF SUBMITTER:</b>	DUANE A. STEWART III		
<b>SIGNATURE:</b>	/Duane A. Stewart III/		
<b>DATE SIGNED:</b>	07/10/2015		
<b>Total Attachments: 9</b>			
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## INTELLECTUAL PROPERTY SECURITY AGREEMENT

THIS INTELLECTUAL PROPERTY SECURITY AGREEMENT (as may be amended, supplemented or otherwise modified from time to time, this "IP Security Agreement"), dated May 4, 2015, is made by ALung Technologies, Inc., a Pennsylvania corporation (the "Grantor"), in favor of Eponge LLC ("Eponge"), as collateral agent (the "Agent") for the Lenders (as defined below).

WHEREAS, Grantor has entered into a Security Agreement dated as of May 4, 2015, (as may be amended, supplemented or otherwise modified from time to time, the "Security Agreement"), with Eponge, as Agent, and the lenders party thereto (the "Lenders"). Capitalized terms used herein and not otherwise defined are used herein as defined in the Security Agreement.

WHEREAS, under the terms of the Security Agreement, Grantor granted a security interest in certain intellectual property of Grantor to the Agent for the benefit of the Lenders.

NOW, THEREFORE, for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, Grantor agrees as follows:

Section 1. Grant of Security. Grantor hereby grants to the Agent for the ratable benefit of the Lenders a security interest in and to all of Grantor's right, title and interest in and to the following (the "Collateral"):

(a) (i) trademarks and service marks, all registrations and recordings thereof and all applications in connection therewith, and all trademark licenses, and (A) all renewals thereof, (B) all products, proceeds, income, royalties, damages and payments now or hereafter due or payable under or with respect to any of the foregoing, including, without limitation, damages and payments for past, present and future infringements of any of the foregoing, (C) all goodwill of the Grantor's business symbolized by the foregoing and connected therewith and (D) the right to sue for past, present and future infringements of any of the foregoing; (ii) copyrights, whether or not the underlying works of authorship have been published, all registrations and recordings thereof and all applications in connection therewith, and (A) all renewals thereof, (B) all products, proceeds, income, royalties, damages and payments now or hereafter due or payable under or with respect to any of the foregoing, including, without limitation, damages and payments for past, present and future infringements of any of the foregoing, (C) all goodwill of the Grantor's business symbolized by the foregoing and connected therewith and (D) the right to sue for past, present and future infringements of any of the foregoing; and (iii) patents and patent applications, and all patent licenses, and (A) all renewals thereof, (B) all products and proceeds, income, royalties, damages and payments now or hereafter due or payable under or with respect to any of the foregoing, including, without limitation, damages and payments for past, present and future infringements of any of the foregoing, (C) all goodwill of the Grantor's business symbolized by the foregoing and connected therewith and (D) the right to sue for past, present and future infringements of any of the foregoing;

(b) wherein a non-limiting list of Collateral is set forth on Exhibit A hereto (the "Intellectual Property").

Section 2. Submission to Jurisdiction. The Grantor hereby irrevocably consents to the exclusive jurisdiction of any state or federal court in the Commonwealth of Pennsylvania; provided that nothing contained in this IP Security Agreement will prevent a Lender from bringing any action, enforcing any award or judgment or exercising any rights against the Grantor individually, against any security or against any property of the Grantor within any other county, state or other foreign or domestic jurisdiction. The Collateral Agent and the Grantor agree that the venue provided above is the most convenient forum for both the Lenders and the Grantor. The Grantor waives any objection to venue and any objection based on a more convenient forum in any action instituted under this Agreement.

Section 3. Waiver of Jury Trial. EACH OF THE GRANTOR AND THE LENDERS IRREVOCABLY WAIVES ANY AND ALL RIGHT IT MAY HAVE TO A TRIAL BY JURY IN ANY ACTION, PROCEEDING OR CLAIM OF ANY NATURE RELATING TO THIS AGREEMENT, ANY DOCUMENTS EXECUTED IN CONNECTION WITH THIS AGREEMENT OR ANY TRANSACTION CONTEMPLATED IN ANY OF SUCH DOCUMENTS. THE GRANTOR AND THE LENDERS ACKNOWLEDGE THAT THE FOREGOING WAIVER IS KNOWING AND VOLUNTARY.

Section 4. Recordation. Grantor authorizes and requests that the Commissioner of Patents and Trademarks and any other applicable government officer, in any jurisdiction where the Intellectual Property exists record this IP Security Agreement.

Section 5. Execution in Counterparts. This IP Security Agreement may be executed in any number of counterparts, each of which when so executed shall be deemed to be an original and all of which when so executed shall be deemed to be an original and all of which taken together shall constitute one and the same agreement.

Section 6. Conflict Provision. This IP Security Agreement has been entered into in conjunction with the provisions of the Security Agreement and that certain Secured Subordinate Convertible Note Purchase Agreement, dated as of May 4, 2015, by and among the Grantor and the Lenders (the "Note Agreement"). The rights and remedies of each party hereto with respect to the security interest granted herein are without prejudice to, and are in addition to those set forth in the Security Agreement and the Note Agreement, all terms and provisions of which are incorporated herein by reference. In the event that any provisions of this IP Security Agreement are in conflict with the Security Agreement or the Note Agreement, the provisions of the Security Agreement and the Note Agreement shall govern.

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IN WITNESS WHEREOF, Grantor has caused this IP Security Agreement to be duly executed and delivered by its manager thereunto duly authorized as of the date first above written.

ALung Technologies, Inc.

By:  \_\_\_\_\_

Exhibit A

Intellectual Property Matters

2. Owned Intellectual Property

US Issued Patents: Owned by ALung

Patent	Issued	Expire	Title
4,846,791	07/11/1989	Expired	Multilumen catheter
4,911,689	03/27/1990	Expired	Percutaneous oxygenator
5,122,113	06/16/1992	Expired	Inflatable percutaneous oxygenator
5,207,640	05/04/1993	Expired	Method of anesthetizing a patient
5,219,326	06/15/1993	Expired	Inflatable percutaneous oxygenator
5,271,743	12/21/1993	Expired	System to optimize the transfer of gas through membranes
5,376,069	12/27/1994	Expired	Inflatable percutaneous oxygenator with internal support
8,585,968	11/19/2013	10/29/29	Method and System for Purging Moisture from an Oxygenator
8,393,181	3/12/2013	9/7/31	Atraumatic Fiber Guide

U.S. Issued Patents: Jointly Owned by ALung and Medtronic

Patent	Issued	Expire	Title
4,986,809	01/22/1990	Expired	Percutaneous oxygenator-CIP
5,501,663	03/26/1996	Expired	Inflatable percutaneous oxygenator with transverse hollow fibers

U.S. Patents Pending: Owned by ALung

Application #	Filed	Status	Title
None			

Foreign Issued Patents: Owned by ALung

Patent	Issued	Expire	Title
2,773,573	11/25/14	9/19/30	Method and System for Purging Moisture from an Oxygenator - Canada
2010313658	3/19/14	9/19/30	Method and System for Purging Moisture from an Oxygenator - Australia
102575811	4/9/14	9/19/30	Method and System for Purging Moisture from an Oxygenator - China

Foreign Patents Pending: Owned by ALung

Application #	Filed	Status	Title
PCT/US10/049 511	9/20/10	Nat'l Phase	Method and System for Purging Moisture from an Oxygenator-PCI
10827306.1	3/30/12	Pending	Method and System for Purging Moisture from an Oxygenator -- Europe
2012-536821	3/21/12	Granted	Method and System for Purging Moisture from an Oxygenator -- Japan
3344/CHENP/ 2012	4/16/12	Pending	Method and System for Purging Moisture from an Oxygenator -- India

U.S. Patents: Jointly Owned by ALung and the University of Pittsburgh

Patent #	Issued	Expire	Title
7927544	4/19/11	4/21/26	Paracorporeal Respiratory Assist Lung
8647569	2/11/14	4/21/26	Paracorporeal Respiratory Assist Lung - Divisional

Foreign Patents: Jointly Owned by ALung and the University of Pittsburgh

Patent #	Issued	Expire	Title
PCT/US06/15 0000	4/21/06( filed)	Nat'l Phase	Paracorporeal Respiratory Assist Lung -- PCT
4710069	4/1/11	4/21/26	Paracorporeal Respiratory Assist Lung-Japan
2006242663 011	12/19/2	4/21/26	Paracorporeal Respiratory Assist Lung-Australia
1,888,211	1/8/14	4/21/26	Paracorporeal Respiratory Assist Lung (Parent) - EU
1,888,211	1/8/14	4/21/26	Paracorporeal Respiratory Assist Lung (Parent) - United Kingdom
1,888,211	1/8/14	4/21/26	Paracorporeal Respiratory Assist Lung (Parent) - Switzerland
1,888,211	1/8/14	4/21/26	Paracorporeal Respiratory Assist Lung (Parent) - Germany
1,888,211	1/8/14	4/21/26	Paracorporeal Respiratory Assist Lung (Parent)

1,888,211	1/8/14	4/21/26	- Spain Paracorporeal Respiratory Assist Lung (Parent)
1,888,211	1/8/14	4/21/26	- France Paracorporeal Respiratory Assist Lung (Parent)
1,888,211	1/8/14	4/21/26	- Italy Paracorporeal Respiratory Assist Lung (Parent)
1,888,211	1/8/14	4/21/26	- Netherlands Paracorporeal Respiratory Assist Lung (Parent)
1,888,211	1/8/14	4/21/26	- Sweden Paracorporeal Respiratory Assist Lung (Parent)
1,888,211	1/8/14	4/21/26	- Turkey Paracorporeal Respiratory Assist Lung (Parent)
2,295,133	6/18/14	4/21/26	- EU Paracorporeal Respiratory Assist Lung (Divisional)
2,295,133	6/18/14	4/21/26	- United Kingdom Paracorporeal Respiratory Assist Lung (Divisional)
2,295,133	6/18/14	4/21/26	- Switzerland Paracorporeal Respiratory Assist Lung (Divisional)
2,295,133	6/18/14	4/21/26	- Germany Paracorporeal Respiratory Assist Lung (Divisional)
2,295,133	6/18/14	4/21/26	- Spain Paracorporeal Respiratory Assist Lung (Divisional)
2,295,133	6/18/14	4/21/26	- France Paracorporeal Respiratory Assist Lung (Divisional)
2,295,133	6/18/14	4/21/26	- Italy Paracorporeal Respiratory Assist Lung (Divisional)
2,295,133	6/18/14	4/21/26	- Netherlands Paracorporeal Respiratory Assist Lung (Divisional)
2,295,133	6/18/14	4/21/26	- Sweden Paracorporeal Respiratory Assist Lung (Divisional)
2,295,133	6/18/14	4/21/26	- Turkey Paracorporeal Respiratory Assist Lung (Divisional)



**Foreign Patents Pending: Jointly Owned by ALung and the University of Pittsburgh**

Application/Pub #	Filed	Status	Title
2,605,259	4/21/06	Pending	Paracorporeal Respiratory Assist Lung--Canada
200680019791.6	4/21/06	Abandoned	Paracorporeal Respiratory Assist Lung--China
4472/KOLNP/2007	4/21/06	Pending	Paracorporeal Respiratory Assist Lung--India
201310065932X	3/1/13	Pending	Paracorporeal Respiratory Assist Lung--China

**U.S. Trademarks Issued**

Registration #	Issued	Status	Title
2,944,813	4/26/05	Registered	ALung (name)
2,929,699	3/1/05	Abandoned	Design Only (Swirling Circles)
3,911,641	1/25/11	Registered	Hemolung (name)
3,971,308	5/31/11	Registered	ALung (name) and Design
4,280,968	1/22/13	Supplemental Registry	Respiratory Dialysis

**U.S. Trademarks Pending**

Application #	Filed	Status	Title
85,842,272	2/6/2013	Pending	ActivMix
86/604,178	4/21/2015	Pending	ALung (name)

**Foreign Trademarks Issued**

Registration #	Issued	Status	Title
003926813	9/05/05	Registered	ALung Hattler Catheter -- European Community
3351384	1/18/05	Abandoned	Design Only (Swirling Circles) -- European Community
008597437	3/29/10	Registered	ALung (name) -- European Community
5415588	6/03/11	Registered	ALung (name) -- Japan
1333175	7/05/10	Registered	ALung (name) -- Australia
1898310		Registered	ALung (name) -- India
008532293	3/01/10	Registered	Hemolung (name) -- European Community
5364100	10/29/10	Registered	Hemolung (name) -- Japan
1320919	01/18/10	Registered	Hemolung (name) -- Australia
7704719	11/28/10	Registered	Hemolung (name) -- China
011578036	11/30/13	Registered	ActivMix -- European Community
847,074	3/26/13	Registered	Hemolung (name) - Canada
1547874	2/6/2013	Registered	ActivMix - Australia

### Foreign Trademarks Pending

Application #	Filed	Status	Title
Awaiting	4/9/13	Pending	ActivMix -- Canada
7704619	09/17/09	Allowed	Hemolung (name) -- China
1864329	09/18/09	Allowed	Hemolung (name) -- India
7859602	11/25/09	Not Allowed	ALung (name) -- China
1460663	11/26/09	Allowed	ALung (name) -- Canada
11148293	08/29/12	Abandoned	Respiratory Dialysis -- European Community
Awaiting	09/04/12	Pending	Respiratory Dialysis -- India
2012-72573	09/07/12	Allowed	Respiratory Dialysis -- Japan
Awaiting	09/18/12	Pending	Respiratory Dialysis -- China
Awaiting	08/30/12	Abandoned	Respiratory Dialysis -- Australia
Awaiting	08/28/12	Abandoned	Respiratory Dialysis -- Canada

## 2. Intellectual Property Licensed to the Company

### U.S. Issued Patents: Licensed

Patent	Issued	Expire	Title
4,583,969*	04/22/1986	Expired	Apparatus and method for in vivo extrapulmonary blood gas exchange
4,850,958*	07/25/1989	Expired	Apparatus for extrapulmonary blood gas exchange
5,098,376*	03/24/1992	Expired	Apparatus and methods for furling and introducing an extrapulmonary blood gas exchange device
5,125,902*	06/30/1992	Expired	Sheath/obturator to facilitate insertion of medical devices into a patient's venous system
5,388,770*	08/16/1994	Expired	Gas Permeable Thrombo-Resistant Coatings and Methods of Manufacture
5,262,451*	11/16/1993	Expired	Multifunctional thrombo-resistant coating and methods of manufacture
5,342,693*	08/30/1994	Expired	Multifunctional thrombo-resistant coating and methods of manufacture
5,650,234*	7/27/97	Expired	Electrophilic Polyethylene Oxides For The Modification of Polysaccharides, Polypeptides (Proteins) and Surfaces (TRC Heparin Coating)
5,463,010*	10/31/1995	Expired	Hydroxycyclosiloxane Membrane Prepared by Plasma Polymerization Process
5,830,370**	11/3/1998	11/3/2015	Mass and thermal transfer means for use in heart lung machines

5,900,142**	5/4/1999	Expired	dialyzers and other applications Mass and thermal transfer means for use in heart lung machines, dialyzers, and other applications
7,763,097***	07/27/2010	06/08/2027	Devices, Systems, and Methods for Reducing the Concentration of a Chemical Entity in Fluids
8,043,411***	10/25/2011	06/08/2027	Devices, Systems, and Methods for Reducing the Concentration of a Chemical Entity in Fluids -- Cont.
8,323,379***	12/4/2012	6/8/2027	Devices, Systems, and Methods for Reducing the Concentration of a Chemical Entity in Fluids - CIP

\* Licensed from Bioset, Inc.;

\*\* Licensed from Maloney & Buckberg

\*\*\*Licensed from University of Pittsburgh

#### US Patents Pending—Licensed

Application #	Filed	Status	Title
14/405,038***	6/15/13	Pending	Devices, Systems, and Methods for Reducing the Concentration of Carbon Dioxide in Blood

\*\*\*Licensed from University of Pittsburgh

#### Foreign Patents Pending: Licensed from University of Pittsburgh

Application #	Filed	Status	Title
PCT/US2013/046042	6/15/13	Pending	Devices, Systems, and Methods for Reducing the Concentration of Carbon Dioxide in Blood
13733175.7	6/15/13	Pending	Devices, Systems, and Methods for Reducing the Concentration of Carbon Dioxide in Blood - EU