PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1 Stylesheet Version v1.2 EPAS ID: PAT4743713

| SUBMISSION TYPE: | NEW ASSIGNMENT |
|-----------------------|----------------|
| NATURE OF CONVEYANCE: | ASSIGNMENT |

CONVEYING PARTY DATA

| Name | Execution Date |
|---------------------|----------------|
| MICHAEL C. BRADFORD | 12/18/2017 |

RECEIVING PARTY DATA

| Name: | TENNECO AUTOMOTIVE OPERATING COMPANY INC. | |
|-----------------|-------------------------------------------|--|
| Street Address: | 500 NORTH FIELD DRIVE | |
| City: | LAKE FOREST | |
| State/Country: | ILLINOIS | |
| Postal Code: | 60045 | |

PROPERTY NUMBERS Total: 1

| Property Type | Number |
|---------------------|----------|
| Application Number: | 15848390 |

CORRESPONDENCE DATA

Fax Number:

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.

Phone: 313-528-4882

Email:docket@b2iplaw.comCorrespondent Name:BEJIN BIENEMAN PLCAddress Line 1:300 RIVER PLACE

Address Line 2: SUITE 1650

Address Line 4: DETROIT, MICHIGAN 48207

| ATTORNEY DOCKET NUMBER: IN-15-1077(01259-0004) | | |
|-------------------------------------------------------|--------------------------|--|
| NAME OF SUBMITTER: CHRISTOPHER M. FRANCIS | | |
| SIGNATURE: | /Christopher M. Francis/ | |
| DATE SIGNED: | 12/20/2017 | |

Total Attachments: 1

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PATENT 504696991 REEL: 044447 FRAME: 0470

RECORDED: 12/20/2017

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|-----------------------------------------|----------------------------------------|
| Attorney Docket Number | IN-15-1077(01259-0004) |

ASSIGNMENT AND DECLARATION (37 C.F.R. 1.63) FOR UTILITY, PROVISIONAL OR DESIGN APPLICATION USING AN APPLICATION DATA SHEET (37 C.F.R. 1.76)

| tine or machine | 3131EM INCLUDING OXTGEN SEPAKATION DEVICE | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|--|--|
| This declaration is directed to: | | | |
| The attached application, or United States application or PCT international application number filed on (I hereby authorize the insertion of the application filing date and number into this form when they become known.) | | | |
| The above-identified application was made or authorized to be made by me. | | | |
| I hereby state that I have reviewed and understand the contents of the specification in the above-identified application, including the claims. | | | |
| I believe that I am the or | iginal inventor or an original joint inventor of a claimed invention in the application. | | |
| I am aware of the duty to disclose information which is material to patentability as defined in 37 C.F.R. 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the national or PCT international filing date of the continuation-in-part application. | | | |
| Pursuant to my employment agreement heretofore made, by contractual obligation, and/or for other good and valuable consideration, the receipt of which I hereby acknowledge, I do sell, assign, transfer, and set over unto TENNECO AUTOMOTIVE OPERATING COMPANY INC., organized and existing by virtue of the laws of the State of Delaware, having its principal place of business at 500 North Field Drive, Lake Forest, Illinois 60045, hereinafter referred to as the ASSIGNEE, its successors, assigns or other legal representatives, the entire right, title and interest, U.S. and foreign, in and to the inventions and discoveries in the above-identified invention including the right of the ASSIGNEE, its successors, assigns or other legal representatives to make applications and to receive Letters Patent for the inventions and discoveries in any and all countries, entities, and intergovernmental organizations, in its or their own name or names, or in my name, at its or their election (and I hereby authorize the ASSIGNEE or ASSIGNEE's attorney to insert the serial/application number and filing date of the application to receive Letters Patent herein: Application No. 15/848,390 Filing Date December 20, 2017 , and I hereby sell, assign, transfer, and set over to the ASSIGNEE, its successors, assigns, or other legal representatives, all rights of priority, including any provisional applications, in and to the inventions and discoveries in any and all countries, entities, and intergovernmental organizations including all applications claiming benefit of the filing date hereof, continuations, continuations-in-part, divisionals, reexaminations, and reissue applications. | | | |
| And I hereby agree for myself, my heirs, successors, assigns, or other legal representatives to execute any and all papers, including applications for Letters Patent of any and all kinds and in any and all countries, entities, and intergovernmental organizations, and to perform any and all acts which the ASSIGNEE, its successors, assigns or other legal representatives may deem necessary to secure thereto the rights herein sold, assigned, and set over. | | | |
| And I hereby represent and warrant that I have not granted any rights inconsistent with the rights granted herein. | | | |
| I hereby acknowledge that any willful false statement made in this declaration is punishable under 18 U.S.C. 1001 by fine or imprisonment of not more than five (5) years, or both. | | | |
| LEGAL NAME OF INV | | | |
| | C. Bradford Date: 12/10/2017 Nowl C. Bradford | | |
| Note: An Application Data Sheet (PTO/AIA/14 or equivalent), including naming the entire inventive entity, must accompany this form. Use an additional declaration form for each additional inventor. | | | |

PATENT REEL: 044447 FRAME: 0471