505800621 12/03/2019

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1 Stylesheet Version v1.2 EPAS ID: PAT5847450

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

CONVEYING PARTY DATA

| Name | Execution Date |
|-------------------|----------------|
| SALWAN D. SADDAWI | 03/21/2018 |
| ADRIAN L. HARDING | 03/22/2018 |

RECEIVING PARTY DATA

| Name: | ROLLS-ROYCE PLC | | |
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| City: | LONDON | | |
| State/Country: | GREAT BRITAIN | | |
| Postal Code: | SW1E 6AT | | |

PROPERTY NUMBERS Total: 1

| Property Type | Number | | |
|---------------------|----------|--|--|
| Application Number: | 16284107 | | |

CORRESPONDENCE DATA

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| ATTORNEY DOCKET NUMBER: | 16482-36 (6619-US) |
|-------------------------|--------------------|
| NAME OF SUBMITTER: | MICHAEL E. HUSSEY |
| SIGNATURE: | /mh/ |
| DATE SIGNED: | 12/03/2019 |

Total Attachments: 3

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PATENT REEL: 051163 FRAME: 0928 505800621

ASSIGNMENT (BEING FILED FOR DUAL PURPOSE UNDER 37 CFR 1.63(e)) For Application with Filing Date on or after September 16, 2012

ASSIGNMENT

| (1-8) | Insert Legal Name(s |) of | SADDAWI, Salwan D | |
|-------|---|--------------------------|---|---|
| | Inventor(s) | | HARDING, Adrian L | |
| | | | ar (\$1.00) and other good and valuable consideration paid to each of the undersigned, the receipt and veledged, each undersigned agrees to assign, and hereby does assign, transfer and set over to | _ |
| (9) | Insert Name of Assig | gnee | ROLLS-ROYCE plc | |
| (10) | (10) Insert Address of Assignee | | 62 Buckingham Gate, London, SW1E 6AT, Great Britain | _ |
| (11) | for the United States of Ameri provisional, non-provisional, Patent, extensions, reissues an Insert Identification | ca as defi livisional | and Assignee's heirs, successors, assigns and legal representatives, the entire right, title and interest ined in 35 U.S.C. §100, in the invention, and in all applications for patent including any and all continuation, international, confirmation, substitute and reissue application(s), and all Letters ination certificates that may be granted on the invention known as COOLANT AIRFLOW ASSEMBLY PARTICULATE FILTER WITH PANELS IN S | |
| | such as Title, Case Number, or Foreign Application Number | | 6619 NJR | _ |
| | | (Atto | rney Docket No16482-36 (6619-US)) | _ |
| (12) | Alternative Identification for | (12) | U.S. Application Number 16/284,107 | _ |
| | filed applications | filed | February 25, 2019 | |

- 1) Each undersigned agrees to execute all papers necessary in connection with any application and/or patent for the invention and also to execute separate assignments in connection with such applications and patents as the Assignee may deem necessary.
- 2) Each undersigned agrees to execute all papers necessary in connection with any interference which may be declared concerning any application or patents for the invention and to cooperate with the Assignee in every way possible in obtaining evidence and going forward with such interference.
- 3) Each undersigned agrees to execute all papers and documents and perform any act which may be necessary in connection with claims or provisions of the International Convention for Protection of Industrial Property or similar agreements.
- 4) Each undersigned agrees to perform all affirmative acts which may be necessary to obtain, maintain or confirm by reissue or reexamination a grant of a valid United States patent to the Assignee.
- 5) Each undersigned authorizes and requests the Commissioner of the U.S. Patent and Trademark Office and other issuing authorities to issue any and all patents resulting from said application(s) to the said Assignee, as Assignee of the entire interest, and covenants that he has full right to convey the entire interest herein assigned, and that he has not executed, and will not execute, any agreement(s) in conflict herewith, and agrees that this assignment is binding on Assignor and Assignor's heirs, successors, assigns and legal representatives.
- 6) Each undersigned hereby grants the Assignee's agent the power to insert on this assignment any further identification that may be necessary or desirable in order to comply with the rules of the United States Patent and Trademark Office for recordation of this document.

PATENT REEL: 051163 FRAME: 0929

(13) Declaration

As an above named inventor, I hereby declare that:

I believe I am the original inventor or an original joint inventor of a claimed invention (or claimed design) in the above-identified application for which this declaration is being submitted.

The application was made or authorized to be made by me.

I have reviewed and understand the contents of the above-identified application, including the claims, and am aware of the duty to disclose to the Office all information known to me to be material to patentability as defined in 37 CFR \$1.56.

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.

In witness whereof, executed by the undersigned on the date opposite the undersigned name.

| Inventor | | | | |
|-------------|----------------|--------------------|---|------------|
| (Print name | | | | |
| Date | 21/March /2018 | Inventor Signature | Dodoues | (SEAL) |
| | | | a) a Notary Public if within the U.S. ed before at least two witnesses who | |
| Date 21 | MARCH 2018 | Witness | ROSHEN JAY JASWANTLAL | 13/3 |
| Date ? | L1 March 2018 | Witness | AWTHORY RAWLINGON | eml Dethis |

(13) Declaration

As an above named inventor, I hereby declare that:

I believe I am the original inventor or an original joint inventor of a claimed invention (or claimed design) in the above-identified application for which this declaration is being submitted.

The application was made or authorized to be made by me.

I have reviewed and understand the contents of the above-identified application, including the claims, and am aware of the duty to disclose to the Office all information known to me to be material to patentability as defined in 37 CFR $\S1.56$.

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.

In witness whereof, executed by the undersigned on the date opposite the undersigned name.

| Invent | or | | | | | | |
|--------|------------------------|---------------------------------|-------------------------------------|--|--|--|-----------------------------|
| (Print | name) | HARD | ING, Adrian | L | A 11 | | |
| Date | 22 | MARCH | 2018 | Inventor Signatur | · Ita | w J | (SEAL) |
| Consi | This as al if outsi | signment shou ide the U.S.A. | old preferably l If neither, the | be signed before: on it should be sig | (a) a Notary Public ned before at least to | if within the U.S.A. (wo witnesses who als | (b) a U.S. so sign here: |
| Date | 22_ | MARCI | 12018 | Witness | Moval: | I: Weley. | |
| Date | 22 | MARCH | 2018 | Witness | Aug | ALEX W | ION)G |

PATENT REEL: 051163 FRAME: 0931

RECORDED: 12/03/2019