504079253 11/02/2016

PATENT ASSIGNMENT COVER SHEET

Electronic Version v1.1 EPAS ID: PAT4125921 Stylesheet Version v1.2

SUBMISSION TYPE: NEW ASSIGNMENT NATURE OF CONVEYANCE: ASSIGNMENT

CONVEYING PARTY DATA

Name	Execution Date
Luca DI MARE	10/06/2016
Max E. RIFE	09/27/2016
Fernando BARBAROSSA	09/27/2016

RECEIVING PARTY DATA

Name:	Rolls-Royce Plc		
Street Address: 62 Buckingham Gate			
City:	London		
State/Country:	Great Britain		
Postal Code:	SW1E 6AT		

PROPERTY NUMBERS Total: 1

Property Type	Number
Application Number:	15341970

CORRESPONDENCE DATA

Fax Number: (703)836-2787

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: 703-836-6400 Email: email@oliff.com **Correspondent Name:** JAMES A. OLIFF Address Line 1: **OLIFF PLC**

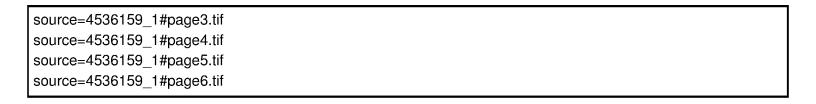
Address Line 2: P.O. BOX 320850

Address Line 4: ALEXANDRIA, VIRGINIA 22320-4850

ATTORNEY DOCKET NUMBER: 173720 NAME OF SUBMITTER: **CYNTHIA KLINE** /Cynthia Kline/ SIGNATURE: **DATE SIGNED:** 11/02/2016 This document serves as an Oath/Declaration (37 CFR 1.63).

Total Attachments: 6

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

ASSIGNMENT

Insert Legal Name(s) of

(1-8)	Inventor(s)	, 01	dl MARE, Luca; RIFE, Max E; BARBAROSSA, Fernando		
			r ($\$1.00$) and other good and valuable consideration paid to each of the undersigned, the receipt are dedged, each undersigned agrees to assign, and hereby does assign, transfer and set over to	ıd	
(9)	Insert Name of Assig	gnee	ROLLS-ROYCE plc		
(10)	Insert Address of As	ssignee	62 Buckingham Gate, London, SW1E 6AT, Great Britain		
(11)	for the United States of Ameri provisional, non-provisional, of Patent, extensions, reissues an Insert Identification	ca as defi livisional	and Assignee's heirs, successors, assigns and legal representatives, the entire right, title and interent 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 Gas Turbine Engine	:st	
	such as Title, Case Number, or Foreign		5989 SEV		
	Application Number	(Attor	rney Docket No)	
(12)	Alternative	(12)	U.S. Application Number 15/341,970		
	Identification for		· · · · · · · · · · · · · · · · · · ·		
	filed applications	filed	November 2, 2016		

- 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 firm of **Oliff plc** 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.

(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.

Invento	r		
(Print n	Luca di Mare		
Date	6 October 2016	Inventor Signature	Lill (SEAL)
Consu			a Notary Public if within the U.S.A. (b) a U.S. before at least two witnesses who also sign here:
Date	6 October 2016	Witness	Dr. T.O. Jelly, Cambridge University
			Dr. M. Chille, Combridge University
Date _	6 October 2016	Witness _	Dr. M. Chilla, Cambridge University

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)	inventor(s)		di MARE, Luca; RIFE, Max E; BARBAROSSA, Fernando			
				valuable consideration paid to each of the undersigned, the receipt and ses to assign, and hereby does assign, transfer and set over to		
(9)	Insert Name of Assi	gnee	ROLLS-ROYCE plc			
(10)	Insert Address of As	ssignee	62 Buckingham Gat	62 Buckingham Gate, London, SW1E 6AT, Great Britain		
(11)	for the United States of Ameri provisional, non-provisional, Patent, extensions, reissues an Insert Identification	ica as defi divisional	ned in 35 U.S.C. §100, in the continuation, international, o	ors, assigns and legal representatives, the entire right, title and interest invention, and in all applications for patent including any and all onfirmation, substitute and reissue application(s), and all Letters e granted on the invention known as		
	such as Title, Case Number, or Foreign Application Number	-	5989 SEV			
		(Attor	ncy Docket No. 1737)		
(12)	Alternative	(12)	U.S. Application Num	ber 15/341,970		
	Identification for					
	filed applications	filed	November 2, 2016			

- 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 firm of **Oliff pic** 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.

(13) Declaration

As an above named inventor, I hereby declare that:

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

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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 MAX E. RIFE				
(Print name)		1	Λ	
Date 27-SEPTEMBER-2016	Inventor Signature	Max M	/) ,	(SEAL)
This assignment should preferably be Consul if outside the U.S.A. If neither, then	e signed before: (a) a a it should be signed	i Notary Pu before at le	blic if within the U.S ast two witnesses wi	S.A. (b) a U.S. no also sign here:
Date 27 - SEPTEMBER- 2016	Witness AH	MAD	NAWAB	<u>A</u>
Date 27-SEPTEMBER-W	/ Gwitness	GAN	(n	\sim

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 Inventor(s)) of	di MARE, Luca; RIFE, Max E; BARBAROSSA, Fernando			
	In consideration of the sum of sufficiency of which are hereb	one dolla y a c knov	lar (\$1.00) and other good and valuable consideration paid to each of the undersigned, the reconcepts and undersigned agrees to assign, and hereby does assign, transfer and set over to	eipt and		
(9)	Insert Name of Assig	gnee	ROLLS-ROYCE plc			
(10)	Insert Address of As	signee	62 Buckingham Gate, London, SW1E 6AT, Great Britain			
(11)	for the United States of Ameri provisional, non-provisional, to Patent, extensions, reissues an Insert Identification	ca as def livisional	and Assignee's heirs, successors, assigns and legal representatives, the entire right, title and fined in 35 U.S.C. §100, in the invention, and in all applications for patent including any and al, continuation, international, confirmation, substitute and reissue application(s), and all Lette nination certificates that may be granted on the invention known as Gas Turbine Engine	all		
	such as Title, Case Number, or Foreign Application Number		5989 SEV			
		(Atto	orney Docket No. 173720			
(12)	Alternative	(12)	U.S. Application Number 15/341,970			
	Identification for filed applications	filed	November 2, 2016	·		
	1) Each undersigned ag	grees to	execute all papers necessary in connection with any application and/or p	patent		

- Each undersigned agrees to execute all papers necessary in connection with any application and/or patent
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In witness whereof, executed by the undersigned on the date opposite the undersigned name.

Investor FERNANCO SAMERAN	855M			
(Print name)				
Date 27/58/78/888/2016	Inventor Sign	sture disprayment of	Billione	SEAL)
This assignment should preferably be Consul if outside the U.S.A. If neither, then				
Date 27/367666/2016	Witness	YAWED CAKAG	<u>ne L</u>	: Careal
on language to		Association (Constitution of the	. «	Λ