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1. A. Name of conveying parties:		2. A. N	Name and address of receiving p	arty:		
 Adrian Lewis Thomas RAN John Harold 		e I	ROLLS-ROYCE PLC, 55 BUCKINGHAM G. LONDON SW1E 6AT GREAT BRITAIN			
B. Additional name(s) of conve	eying party(ies) attached?					
3. A. Nature of conveyance: Assignment	☐ Merger	В. 4	Additional name(s) & address(e □Yes	s) attached?		
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B. Execution Date: <u>(1) 12/2</u> (2) 12/23/2011 (3) 02/0						
4. A. Patent Application No. 13	4. A. Patent Application No. 13/404,320 B. Patent No.(s) Additional numbers attached? ☐ Yes ☒ No					
C. Title of Application: VAI	<u>NE</u>					
5. Name and address of party to wh	nom correspondence	6. Total	number of applications and par	ents involved: 1		
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James A. Oliff, Registration No Nicolas A. Brentlinger, Registra	. 27,075 ation No. 62,211					

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1. A. Name of conveying purties:	2. A. Nume and address of receiving purty:
 Adrian Lewis HARDING Thomas RANDLES John BROOKHOUSE 	ROLLS-ROYCE PLC 65 BUCKINGHAM GATE, LONDON SWIE 6AT, GREAT BRITAIN
 Additional name(s) of conveying party(ics) attached? Yes No 	
3. A. Nature of conveyance:	B. Additional name(s) & address(cs) attached? □Ycs 図 No
Security Agreement Change of Name	
4 A Patent Application No. 13/404,320	B. Patent No.(s) ached? ☐ Yes ⊠ No
C. Title of Application: VANE	
Name and address of party to whom correspondence concerning document should be mailed: Name: Issues A. Oliff	fotal number of applications and patients involved: 1 Please charge Deposit Account No. 15-0461 the total fee (37 CFR, 3.41) in the amount of \$40.00.
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James A. Oliff, Registration No. 27,075 Nicoles A. Brentlinger, Registration No. 62,211	Date: <u>February 24, 2012</u>

PATENT

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ASSIGNMENT

		(1)	Adrian Lewis HARDING	(4)	
(1-8)	Inserí	(2)		(5)	
·- =/	Name(s) of Inventor(s)	(3)		(6)	
		to eacl	n of the undersigned, each undersig	dollar (\$1.00) and other good and valuat gned agrees to assign, and hereby does as	ole consideration paid sign, transfer and set
(9)	Insert Name of	(9)	Rolls-Royce plc		
(10)	Assignee Insert Address of Assignee	(10)		WIE 6AT, Great Britain	
	Assignee	(herein the entiment	rafter designated as the Assignee) are right, title and interest for the Urion, and in all applications for paten	nd Assignee's heirs, successors, assigns and nited States of America as defined in 35 U. t including any and all provisional, non-prosubstitute and reissue application(s), and a tificates that may be granted on the invent	d legal representatives, .S.C. §100, in the ovisional, divisional, Il Letters Parent,
(11)	Insert	(11)	Vane		
	Identification such as Title, Case				
	Number, or Foreign Application Number	(Attor	ney Docket No. 15254	15)
	E	for wi	nich the undersigned has (have) exe	ecuted an application for patent in the Un	
,	•	on eve	on date herewith or 12/20/11, 12/23/1	1 &	
(12)	Insert Date of Signing of	(12)	00/09/10		
	Application			12/404 220	
(13)	Alternative Identification for	(13)		13/404,320	****
	filed applications	filed	02/24/12	, , , , , , , , , , , , , , , , , , , ,	
reexam Patents full rig and ag:	4) Each undersigned agnination a grant of a valid U 5) Each undersigned aut 6 of the United States result ht to convey the entire interess that this assignment is	ees to perf nited State horizes and ing from si- est herein binding or	es patent to the Assignee. If requests the Commissioner of the aid application(s) to the said Assigned, and that he has not except, and his heirs, successors, assets.	U.S. Patent and Trademark Office to iss nee, as Assignee of the entire interest, an uted, and will not execute, any agreement	ue any and all Letters d covenants that he has ts in conflict herewith, t any further
	In witness whereof, exe	cuted by t	he undersigned on the date(s) op	posite the undersigned name(s).	
Date	20 DELEMBER		Inventor Signature A L Harding	Allan	(SEAL)
Date			Inventor Signature T Randles		(SEAL)
Date			Inventor Signature J Brookhouse		(SEAL)
Date			Inventor Signature		(SEAL)
	m.t		he signed before: (a) a Notary Publ	lic if within the U.S.A. (b) a U.S. Consul	if outside the U.S.A. If
neithe	r, then it should be signed b	efore at le	ast two witnesses who also sign he	re:	1 1 20TH
Date	20 Teceme	25 20	Witness(es) for A L Harding	Startes	HULLINK DECEN
Date			Witness(es) for T Randles	<u> </u>	
Date			Witness(es) for J Brookhouse		
Date			Witness(es) for		
		·······		PATE	NT
				REEL: 027844	FRAME: 0787

ASSIGNMENT

			ZADOROZ IZIARZE I	•	
		(1)	Adrian Lewis HARDING	(4)	A
(1-8)	Insert	(2)	Thomas RANDLES	(5)	
	Name(s) of Inventor(s)	(3)	John BROOKHOUSE	(6)	
		to eac	h of the undersigned, each undersign	ollar (\$1.00) and other ed agrees to assign, and	good and valuable consideration paid i hereby does assign, transfer and set
(9)	Insert Name of Assignee	(9)	Rolls-Royce plc		1
(10)	Insert Address of Assignee		65 Buckingham Gate, London SW		
		the en invent	tice right ritle and interest for the Unit	ed States of America as including any and all pro- bstitute and reissue appl	ovisional, non-provisional, divisional, lication(s), and all Letters Patent,
(11)	Insert	(11)	Vane		
	Identification such as Title, Case				
	Number, or Foreign Application Number	(Atto	rney Docket No152545)
		for wh	en date herewith or	•	patent in the United States of America
(12)	Insert Date of		12/20/11, 12/23/11	&	
	Signing of Application	(12)	on <u>02/08/12</u>		44.74
(13)	Alternative	(13)	U.S. application Serial Number	13/404,320)
	Identification for filed applications	filed	02/24/12		
claims of reexami Patents full righ and agr	3) Each undersigned agree or provisions of the Internat 4) Each undersigned agree ination a grant of a valid Ur 5) Each undersigned auth of the United States resulting to convey the entire intercess that this assignment is the convey undersigned here.	es to exectional Content of the cont	I requests the Commissioner of the U	form any act which ma roperty or similar agree recessary to obtain, in S. Patent and Tradema e, as Assignee of the en d, and will not execute to and legal representat the power to insert on	ments. naintain or confirm by reissue or urk Office to issue any and all Letters tire interest, and covenants that he has , any agreements in conflict herewith, ives. this assignment any further
recorda	tion of this document.			vv v	a-ma(a)
Data	In witness whereof, exec	uted by II	ne undersigned on the date(s) oppo Inventor Signature	site the nunctsigned i	(SEAL)
Date		12/2	A L Harding	1011	(05.11)
Date	73 12/2	où!	Inventor Signature T Randles	Thy	(SEAL)
Date			Inventor Signature J Brookhouse		(SEAL)
Date			Inventor Signature		(SEAL)
ncither, Date	This assignment should per then it should be signed be	referably t fore at lea	st two witnesses who also sign here: Witness(es) for	if within the U.S.A. (b)	a U.S. Consul if outside the U.S.A. If
Date	12/21/2		A L Harding Witness(es) for T Randles	Le office	BALIN
Date	-1 c/ 52/ col	4	Witness(es) for	Ja	21 11
Dat-			J Brookhouse Witness(es) for	**************************************	
Date			Himesolesh ror		A. Barring and an annual an annual and an annual

PATENT REEL: 027844 FRAME: 0788

		ASSIGNMENT	(16		
		(1) Adrian Lewis HARDING (4)			
(1.8)	Insert Name(s)	(2) Thomas RANDLES (5)			
	of Inventor(s)	(3) John BROOKHOUSE (6) Froothouse 884 FeB 2012.			
		In consideration of the sum of one dollar (\$1,00) and other good and valuable consideration pai	id		
		to each of the undersigned, each undersigned agrees to assign, and hereby does assign, transfer and se over to	t .		
(9)	Insert Name of Assignee	(9) Rolls-Royce plc			
(10) Insert Address of					
	rangue	and the state of t			
	(hereinafter designated as the Assignee) and Assignee's heirs, successors, assigns and legal representation the entire right, title and interest for the United States of America as defined in 35 U.S.C. §100, in the invention, and in all applications for patent including any and all provisional, non-provisional, division continuation, international, confirmation, substitute and reissue application(s), and all Letters Patent, extensions, reissues and reexamination certificates that may be granted on the invention known as				
(11)	Insert Identification	(II) Vane	*****		
	such as Title, Case	The state of the s	-		
	Number, or Foreign Application Number	(Attorney Docker No. 152545)		
		for which the undersigned has (have) executed an application for patent in the United States of Americ on even date herewith or	a		
(12)	Insert Date of	12/20/11, 12/23/11 &			
	Signing of Application	(12) on			
(13)	Alternative	(13) U.S. application Scrial Number 13/404,320			
,,	Identification for filed applications	613) 5.6. application schar reminer 137 16 1,320			
reexami Patents full right and agri	tgnee in every way possible in 3) Each undersigned agrees or provisions of the Internation 4) Each undersigned agrees ination a grant of a valid Unit 5) Each undersigned author of the United States resulting at to convey the entire interest to that this assignment is bin 6) Each undersigned hereby	vision thereof, or any patent or reissue application based thereon, for the invention, and to cooperate with a obtaining evidence and going forward with such interference. It is to execute all papers and documents and perform any act which may be necessary in connection with some Convention for Protection of Industrial Property or similar agreements. It is to perform all affirmative acts which may be necessary to obtain, maintain or confirm by reissue or ted States patent to the Assignee. It is and requests the Commissioner of the U.S. Patent and Trademark Office to issue any and all Letters from said application(s) to the said Assignee, as Assignee of the entire interest, and covenants that he has a therein assigned, and that he has not executed, and will not execute, any agreements in conflict herewith, adding on him and his heirs, successors, assigns and legal representatives. If years the firm of OLIFF & BERRIDGE, PLC the power to insert on this assignment any further or desirable in order to comply with the rules of the United States Patent and Trademark Office for			
		ted by the undersigned on the date(s) opposite the undersigned name(s).			
Date		Inventor Signature (SEAL)			
Date		Inventor Signature (SEAL)			
Date	8th FEB. 20	12 Inventor Signature Jawodhouse . (SEAL)			
Date		Inventor Signature (SEAL)			
neither,	This assignment should prefethen it should be signed before	erably be signed before; (a) a Notary Public if within the U.S.A. (b) a U.S. Consul if outside the U.S.A. If re at least two witnesses who also sign here:			
Date		Witness(es) for A L Harding			
Date .		Witness(es) for T Randles			
Date .	8th FB. 2012	2 Witness(es) for P.D. That de	-J-		
Date -		Witness(es) for			

PATENT

RECORDED: 03/06/2012 REEL: 027844 FRAME: 0789