

Search history

Search 1: vortex and turbine and flow and deflect and decelerate and aerodynamics (Results 8)
Search 2: CPC=(b64c23/06 AND B64D33/00) (Results 3)
Search 3: CPC=(b64c23/06) (Results 466)
Search 4: CPC=(B64D33/00) (Results 181)
Search 5: TURBINE AND AIR AND FLOW AND 3 (Results 81)

1) Family number: 432000 (DE1951422A1)

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Title: TRAGFLUEGEL MIT KLAPPEN ZUR VOR- UND/ODER AUFTRIEBSERZEUGUNG Wing FLAPS FOR BEFORE AND / OR BOOST PRODUCTION (Machine translation)

Abstract: Source: DE1951422A1 [DE] Patentansprüche 1 Umstroemter Tragfluegel, insbesondere Flugzeugtragfluegel, mit sich in Spannweitenrichtung erstreckenden Klappen, die zur Vor- und/oder Auftriebs erzeugung einen Diffusorspalt bilden koennen, in den dann eine Stroemung geleitat wird, da durch g e k e n n z e i c h n e t, dass: die den Diffusor spalt (9) bildenden Wandungen der Klappen (5,6) eine zur Bindung zumindest eines Potentialwirbels geeignete Kontur aufweisen und mit Ejektoroeffnungen (12,13) versehen sind, durch die dem zugeordneten Potentialwirbel Stroemungsenergie zufuehrbar ist 2.

Machine translation: Patentansprüche a flow around a wing, especially Flugzeugtragfluegel, with the spanwise extending panels which can be used to provide pre-and / or generating lift a diffuser gap, in the then current will geleitat, characterized in that: splitting the diffuser (9) forming the walls of the flap (5,6) have a potential to bind at least one vertebra and provided with suitable contour Ejektoroeffnungen (12,13), are due to the associated potential vortex is fed to second Stroemungsenergie

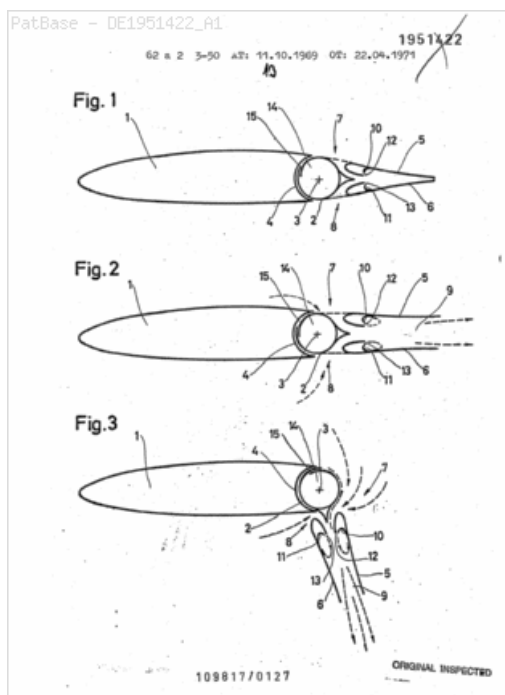
Classifications:

International (IPC 8-9): B64C21/04 B64C23/06 (Advanced/Invention); B64C21/00 B64C23/00 (Core/Invention)

International (IPC 1-7): B64C3/50

CPC: B64C2230/04 B64C23/06 B64C21/04 Y02T50/162 Y02T50/166 B64C2230/16

European: B64C21/04 B64C23/06 L64C700/62C3F3 Y02T50/16B Y02T50/16D



Family:

Publication number	Publication date	Application number	Application date
DE1951422 A1	19710422	DE19691951422	19691011

Priority:

DE19691951422 19691011

Probable Assignee:

MESSERSCHMITT BOELKOW BLOHM

Assignee(s): (std):

MESSERSCHMITT BOELKOW BLOHM

Inventor(s): (std):

UFER ERICH DIPL ING

2) Family number: 65602004 (US2017129593A)

© PatBase

Title: PANELS COMPRISING UNEVEN EDGE PATTERNS FOR REDUCING BOUNDARY LAYER SEPARATION

Abstract: In one embodiment, an airfoil includes a first side and a second side opposite the first side, and an apparatus coupled to the first side of the airfoil, the apparatus comprising a first edge having a first uneven edge pattern.

Classifications:

International (IPC 8-9): B64C21/00 B64C21/10 B64C23/06

B64C3/10 B64C3/14 F15D1/12 (Advanced/Invention);

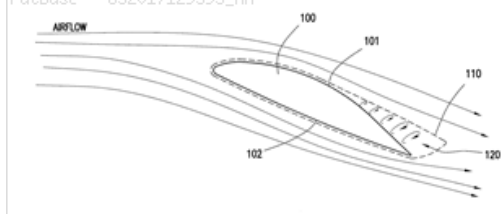
B64C3/14 (Advanced/Non-invention)

CPC: B64C21/10 B64C2003/148 B64C2230/26 Y02T50/12

Y02T50/166 B64C3/14 B64C23/06 B64C2003/147

US: 1/1 244/200.1

PatBase - US2017129593_AA



Family:

Publication number	Publication date	Application number	Application date
DE602016009160 D1	20190131	DE201660009160T	20161107
EP3165454 A1	20170510	EP20160197492	20161107
EP3165454 B1	20190109	EP20160197492	20161107
JP2017125603 A2	20170720	JP20160217289	20161107
US2017129593 AA	20170511	US20150934818	20151106
US10421533 BB	20190924	US20150934818	20151106

Priority:

US20150934818 20151106 EP20160197492 20161107

Probable Assignee: LOCKHEED MARTIN CORP

Assignee(s): (std): LOCKHEED CORP

Assignee(s): LOCKHEED MARTIN BETHESDA CORP ; LOCKHEED MARTIN CORP

Inventor(s): (std): BARUZZINI DAN ; BENNER KENT W ; DAN BARUZZINI ; DOMEL NEAL DAVID ; ELY II RICHARD SCOTT ; ELY RICHARD SCOTT ; KENT W BENNER ; MILLER DANIEL N ; NEAL DAVID DOMEL ; SCOTT ELY RICHARD

Inventor(s): MILLER DANIEL N BAINBRIDGE ISLAND ; ELY RICHARD SCOTT HURST ; DOMEL NEAL DAVID ALEDO ; BENNER KENT W FORT WORTH ; BARUZZINI DAN PALMDALE

Agent(s): GRUENECKER PATENT U RECHTSANWALTE PARTG MBB; NISHIJIMA TAKAKI; KURASAWA ICHIRO; MATSUSHITA MITSURU; DESHIMARU TAKESHI; BAKER BOTTS LLP

Designated states: AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR

3) Family number: 3392006 (US4913381A)

© PatBase

Title: Aerodynamic components having leading edge devices

Abstract: PCT No. PCT/GB87/00320 Sec. 371 Date Jan. 12, 1989 Sec. 102(e) Date Jan. 12, 1989 PCT Filed May 12, 1987 PCT Pub. No. WO87/06908 PCT Pub. Date Nov. 19, 1987. In modern thin wing aircraft flow separation at high incidence may originate at the leading edge. This invention combats the problem by restricting the growth of the region of separated flow by re-energizing the boundary flow downstream of reattachment line (7). It utilizes upper surface grooves (8 and 9) extending rearwardly from the leading edge (5) of the wing. The grooves (8 and 9) have a width at opening in the range 0.05 to 1.0 percent of the aerofoil span and length in the range 1 to 20 percent of the local chord length. Spanwise flow across the grooves causes vortex formation which produces the desired effect without significant drag penalty. In swept wings the grooves are parallel to chord. In straight or forward swept wings the grooves are inclined. The wing includes several grooves each acting as a barrier to growth of flow separation until swallowed within the separated flow.

Classifications:

International (IPC 8-9): B64C21/10 B64C23/06 (Advanced/Invention)

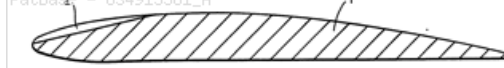
International (IPC 1-7): B64C21/10 B64C23/06

CPC: B64C21/10 B64C23/06 Y02T50/162 Y02T50/166

European: B64C21/10 B64C23/06 Y02T50/16B Y02T50/16D

US: 244/199 244/200 244/200.1 416/235

PatBase - US4913381_A



Family:

Publication number	Publication date	Application number	Application date
DE3766828 D1	19910131	DE19873766828	19870512
EP0305374 A1	19890308	EP19870902666	19870512
EP0305374 B1	19901219	EP19870902666	19870512
GB8611502 A0	19860618	GB19860011502	19860512
US4913381 A	19900403	US19890299942	19890112
WO8706908 A1	19871119	WO1987GB00320	19870512

Probable Assignee: QINETIQ LTD

Assignee(s): (std): SECR DEFENCE ; SECR DEFENCE BRIT

Assignee(s): SECRETARY OF STATE FOR DEFENCE ; THE SECRETARY OF STATE FOR DEFENCE IN HER BRITANNIC MAJESTY S GOVERNMENT OF THE UNITED KINGDOM OF GREAT BRITAIN AND ; THE SECRETARY OF STATE FOR DEFENCE IN HER BRITANNIC MAJESTY S GOVERNMENT OF THE UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND ; THE SECRETARY OF STATE FOR DEFENCE IN HER BRITANNIC MAJESTY'S GOVERNMENT OF THE UNITED KINGDOM OF GREAT BRITAIN AND NORTHERN IRELAND LONDON GB ; QINETIQ LTD ; SEC DEP FOR DEFENCE IN HER BRITANNI ; SEC DEP FOR DEFENCE IN HER BRITANNIC MAJESTY S GOV ; SEC DEP FOR DEFENCE IN HER BRITANNIC MAJESTY S GOVERNMENT OF UNITED KINGDOM OF GREAT BRITAIN AND ; SEC DEP FOR DEFENCE IN HER BRITANNIC MAJESTY'S GO ; SEC DEP FOR DEFENCE IN HER BRITANNIC MAJESTY'S GOV

Inventor(s): (std): MABEY DENNIS G ; MABEY DENNIS GEORGE ; MABEY GEORGE

Inventor(s): MABEY GEORGE DENNIS BEDFORD MK43 8JA GB

Designated states: AT BE CH DE FR GB IT LI LU NL SE US

Title: PRISMATIC-SHAPED VORTEX GENERATORS

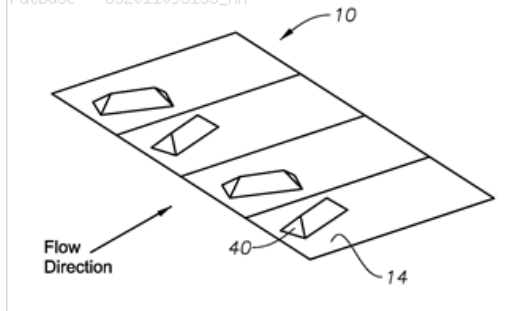
Abstract: A prismatic vortex generator for attenuating flow separation which occurs during supersonic flow of air over structure such as an aircraft airfoil, its fuselage, surfaces forming a part of a jet engine inlet, or similar surfaces subjected to supersonic airflow. A series of prismatic vortex generators are provided, each of which is configured to generate a vortex which attenuates flow separation and weight drag resulting from the supersonic airflow. Each prismatic vortex generator has a prismatic shape with a base, leading and trailing ends, and sidewalls that incline toward and join each other to form an apex. The leading end of each prismatic vortex generators is inclined away from the direction of flow.

Classifications:**International (IPC 8-9):** B64C21/10 B64C23/06

B64C9/00 (Advanced/Invention)

CPC: B64C23/06 Y02T50/162**European:** B64C23/06 Y02T50/16B**US:** 244/130 244/199 244/199.1 244/200 244/200.1 244/200.100P

PatBase - US2011095135_RR

**Family:**

Publication number	Publication date	Application number	Application date
EP2316728 A2	20110504	EP20100251861	20101027
EP2316728 A3	20131016	EP20100251861	20101027
US2011095135 AA	20110428	US20090606811	20091027
US8210482 BB	20120703	US20090606811	20091027

Priority:

US20090606811 20091027

Probable Assignee: LOCKHEED MARTIN CORP**Assignee(s):** (std): BARUZZINI DAN J ; LOCKHEED CORP ; MILLER DANIEL N**Assignee(s):** LOCKHEED MARTIN CORP**Inventor(s):** (std): BARUZZINI DAN J ; MILLER DANIEL N**Agent(s):** KAY ROSS MARCEL; BRACEWELL AND GIULIANI LLP**Designated states:** AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR**Title:** SUPERSONIC AIRCRAFT AND METHOD

Abstract: A supersonic aircraft having highly swept subsonic leading edge portions of the wings provided with boundary layer control suction slots. When the airplane is operating at high angles of attack under circumstances where noise is objectionable, air is drawn in through the suction strips to alleviate separated air flow and substantially eliminate (or at least alleviate) vortices that would otherwise develop over the upper wing surface. This improves the L/D ratio and permits the engines to be at a lower power setting, thus alleviating noise. There are shown a double delta planform configuration, and an arrow plan form configuration. Also, the boundary layer control suction can be used in conjunction with laminar flow control suction.

Classifications:**International (IPC 8-9):** B64C21/06 B64C23/06 B64C30/00

B64D15/04 (Advanced/Invention);

B64C21/00 B64C23/00 B64C30/00 B64D15/00 (Core/Invention)

International (IPC 1-7): B64C21/04 B64C21/06 B64C30/00

B64D15/04

CPC: B64C2230/04 B64C2230/06 B64C21/06 B64C23/06 B64C30/00

B64D15/04 Y02T50/162 Y02T50/166 B64C2230/14

European: B64C21/06 B64C23/06 B64C30/00 B64D15/04

Y02T50/16B Y02T50/16D

US: 244/204 244/208 244/209 244/35.00A 244/35A D12/333

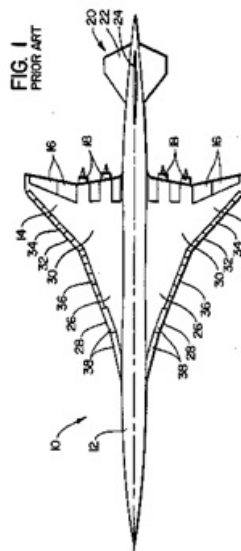
PatBase - US5348256_R

U.S. Patent

Sep. 30, 1994

Sheet 1 of 9

5,348,256



Family:

Publication number	Publication date	Application number	Application date
DE69309666 D1	19970515	DE19936009666	19930625
DE69309666 D1	19970515	DE19936009666T	19930625
DE69309666 T2	19970724	DE19936009666T	19930625
EP0630807 A1	19941228	EP19930201847	19930625
EP0630807 B1	19970409	EP19930201847	19930625
US5348256 A	19940920	US19920883590	19920513

Priority:

US19920883590 19920513 EP19930201847 19930625

Probable Assignee: BOEING CO

Assignee(s): (std): BOEING CO

Assignee(s): THE BOEING CO SEATTLE WASH US ; THE BOEING COMPANY

Inventor(s): (std): PARIKH PRADIP G

Inventor(s): PARIKH PRADIP G RENTON WA 98058 US

Designated states: DE FR GB NL

6) Family number: 23912041 (US6446904B)

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Title: AIRCRAFT WEAPONS BAY HIGH FREQUENCY ACOUSTIC SUPPRESSION APPARATUS

Abstract: An aircraft weapons bay high frequency acoustic suppression apparatus is disclosed. The apparatus includes an extendable spoiler retractably received within an aircraft weapons bay. An injector unit is received within the spoiler for injecting high frequency pulses of pressurized gas into the airstream. The injector unit includes a resonance tube in outlet fluid communication with a nozzle. The pulsating output of the resonance tube perturbs the flow of pressurized gas in the nozzle, effectively breaking it up into discrete slugs or pulses which then exit the nozzle and enter the airstream. The high frequency perturbation of the airflow across the weapons bay, created by the aircraft weapons bay high frequency acoustic suppression apparatus of the present invention effectively suppresses undesirable acoustic resonance within the open weapons bay.

Classifications:

International (IPC 8-9): B64C23/06 B64D1/06 B64D7/00

F15D1/08 (Advanced/Invention);

B64C23/00 B64D1/00 B64D7/00 F15D1/00 (Core/Invention)

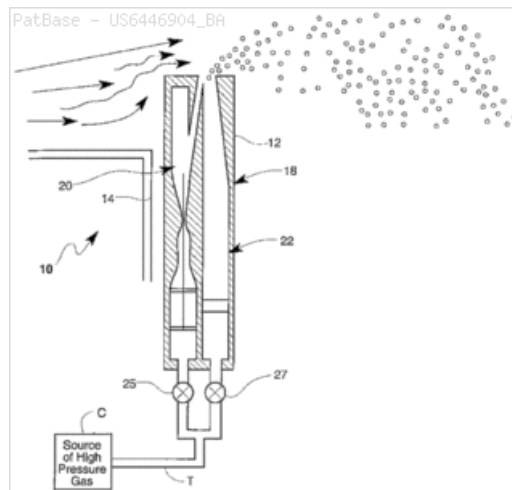
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CPC: B64C2230/04 B64D1/06 B64C23/06 B64D7/00 F15D1/08

Y02T50/162 Y02T50/166 B64C2230/14 B64C2230/16

European: B64C23/06 B64D1/06 B64D7/00 F15D1/08 Y02T50/16B
Y02T50/16D

US: 244/1.00N 244/130 244/1N 244/207

**Family:**

Publication number	Publication date	Application number	Application date
US6446904 BA	20020910	US20010973175	20011005

Priority:

US20010973175 20011005

Probable Assignee: US AIR FORCE

Assignee(s): (std): US AIR FORCE

Assignee(s): THE UNITED STATES OF AMERICA AS REPRESENTED BY THE SECRETARY OF THE AIR FORCE ; AIR FORCE GOVERNMENT OF US SEC THE ; AIR FORCE GOVERNMENT OF US SEC THE BLDG ; AIR FORCE US GOV REPRESENTED BY SECRETARY OF THE A ; AIR FORCE US GOV REPRESENTED BY SECRETARY OF THE AS ; SECRETARY OF AIR FORCE AS US GOV ; THE UNITED STATES OF AMERICA AS REPRESENTED BY THE

Inventor(s): (std): STANEK MICHAEL J

Inventor(s): MICHAEL J STANEK

Agent(s): RICHARD A LAMBERT; BOBBY D SCEARSE; THOMAS L KUNDERT

7) Family number: 1235048 (US3937594A)

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Title: OBJECT DISPOSED IN A FLUID FLOW AND HAVING A SELECTED CONFIGURATION TO MINIMIZE GENERATION OF KARMAN'S VORTEX STREET

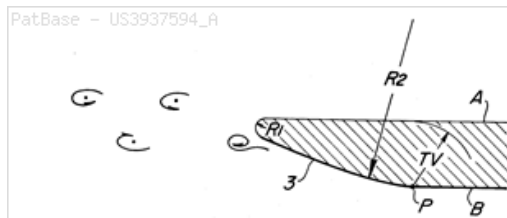
Abstract: An object disposed in a fluid flow and defined by two surfaces, each extending along a stream line and one of said two surfaces having a reference contour. To eliminate the danger that a violent oscillation is generated due to resonance between the natural oscillation of the object and the oscillation caused by Karman's vortex which develops at the downstream end portion of the object, said downstream end portion of the object is so formed as to provide a configuration satisfying the following relations: $R1/TV$ less than or equal to 0.2 and $R2/TV=6-10$ where, $R1$ is a radius of curvature of the first portion of

object's downstream end portion which is continuous with said reference surface, R2 is a radius of curvature of the second portion of object's downstream end portion extending between said first portion and the other surface, and TV is the minimum thickness of the object between said two surfaces measured from the joining point or juncture between said second portion and the other surface.

Classifications:

International (IPC 8-9): B64C23/06 B64C3/14 F01D5/14 F03B3/12 F03B3/18 F04D29/24 (Advanced/Invention); B64C23/00 B64C3/00 F01D5/14 (Core/Invention)
International (IPC 1-7): B64C3/14 F01D5/14 F03B3/12 F03B3/18
CPC: B64C23/06 F01D5/141 Y02E10/223 Y02T50/162
European: B64C23/06 F01D5/14B Y02E10/22B Y02T50/16B
US: 244/35.00R 244/35R 416/223.00A 416/223A

PatBase - US3937594_A



Family:

Publication number	Publication date	Application number	Application date
CA991508 A1	19760622	CA19740198092	19740425
JP1210980 C3	19840612	JP19730047258	19730427
JP49133730 A2	19741223	JP19730047258	19730427
JP58007830 B4	19830212	JP19730047258	19730427
US3937594 A	19760210	US19740463430	19740423

Priority:

JP19730047258 19730427

Probable Assignee: HITACHI LTD

Assignee(s): (std): HITACHI LTD

Assignee(s): ITO HIDEO ; SATO HARUMASA ; TANAKA MIZUHO

Inventor(s): (std): ITO HIDEO ; TANAKA MIZUHO ; SATO HARUMASA

Inventor(s): ITO SHIGEO

8) Family number: 12936058 (US5598990A)

© PatBase

Title: SUPERSONIC VORTEX GENERATOR

Abstract: A vortex generator for attenuating flow separation which occur during supersonic flow of air over structure such as an aircraft airfoil, its fuselage, surfaces forming a part of a jet propulsion unit, turbine or compressor blades, or similar surfaces subjected to supersonic airflow. A series of vortex generators are provided each of which comprises a cavity in the component over which the supersonic air is flowing that is configured to generate a spiral vortex which attenuates flow separation and weight drag resulting from the supersonic airflow. Each cavity is of generally triangular configuration defined by two side walls which diverge in a direction away from the apex of the triangular cavity, and a flat bottom wall joined to the side walls. In an alternate embodiment, means is provided for selectively shifting the bottom wall from a retracted inner position, to an outer location essentially flush with the surface over which the supersonic airflow is occurring.

Classifications:

International (IPC 8-9): B64C23/06 (Advanced/Invention); B64C23/00 (Core/Invention)

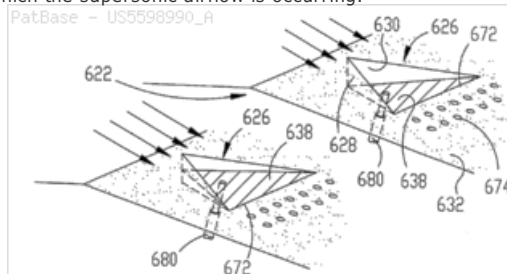
International (IPC 1-7): B64C23/06

CPC: B64C2230/26 B64C23/06 Y02T50/162 Y02T50/166

European: B64C23/06 Y02T50/16B Y02T50/16D

US: 180/762 244/198 244/199 244/200 244/200.1 280/762 296/180.1 296/180.2

PatBase - US5598990_A



Family:

Publication number	Publication date	Application number	Application date
US5598990 A	19970204	US19940356646	19941215

Priority:

US19940356646 19941215

Probable Assignee: OF KANSAS CENTER FOR RESEARCH INC UNIV

Assignee(s): (std): UNIV KANSAS CENTER FOR RESEARC

Assignee(s): UNIVERSITY OF KANSAS CENTER FOR RESEARCH INC ; OF KANSAS CENTER FOR RESEARCH INC UNIV

Inventor(s): (std): FAROKHI SAEED ; TAGHAVI RAY R

9) Family number: 14945066 (DE19909190A1)

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Title: AIRCRAFT AIR EDDIES ALSO GENERATE A BREAK EDDY BETWEEN THE WING TIP AND FUSELAGE IN AN OPPOSITE TWIST TO THE MAIN AIR EDDY FROM THE WINGS TO MERGE THEM TOGETHER TO BREAK DOWN THE MAIN EDDY BEHIND THE AIRCRAFT

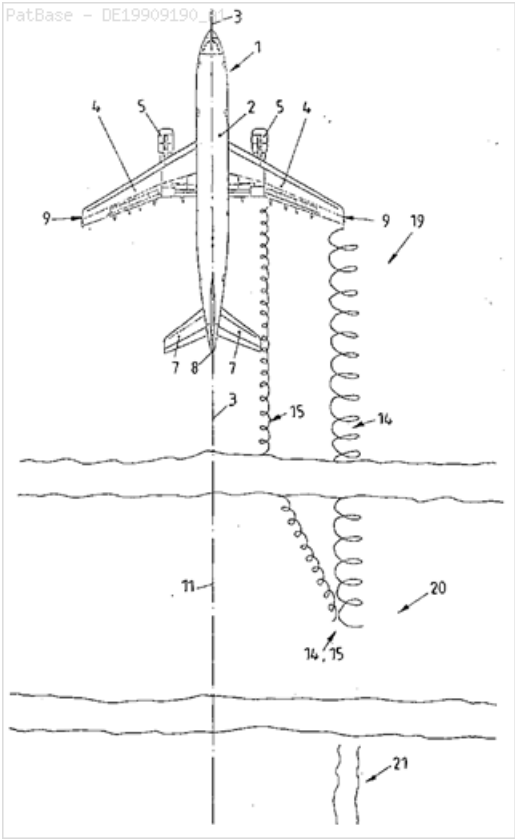
Abstract: To reduce air eddies at an aircraft wing, at least one break eddy (15) is generated at a point between the wing tip (9) and the fuselage (2), with an opposite twist to the twist direction of the main eddy (14) from the wings. The main eddy (14) is degraded over a flight length of at least 20 wingspans behind the aircraft (1). At least one break eddy (15) is merged with the degraded main eddy (14) to trigger the instabilities within the main eddy and break it up completely.

Classifications:

International (IPC 8-9): B64C23/06 (Advanced/Invention); B64C23/00 (Core/Invention)

International (IPC 1-7): B64C23/06

CPC: Y02T50/162 B64C23/065 B64C23/06



Family:

Publication number	Publication date	Application number	Application date
DE19909190 A1	20000914	DE19991009190	19990303
DE19909190 C2	20010222	DE19991009190	19990303

Priority:

DE19991009190 19990303

Probable Assignee: DEUTSCH ZENTR LUFT AND RAUMFAHRT

Assignee(s): (std): DEUTSCH ZENTR LUFT AND RAUMFAHRT

Assignee(s): DEUTSCHES ZENTRUM F LUFT U RAUMFAHRT EV ; DEUTSCHES ZENTRUM FUER LUFT UND RAUMFAHRT EV

Inventor(s): (std): STUFF ROLAND ; VOLLMERS HEINRICH

10) Family number: 33538069 (EP1714869B1)

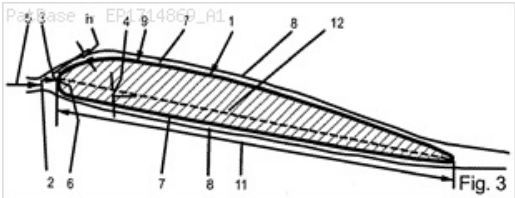
© PatBase

Title: LIFTING SURFACE WITH IMPROVED SEPARATION BEHAVIOUR UNDER STRONGLY VARIABLE ANGLE OF INCIDENCE

Abstract: The surface has a variable blade angle (4) to an incidence flow and devices that are provided in a region of a profile front edge (2) of surface. The devices include a passive eddy generator (3) that is arranged at or near a retaining point of the surface with low blade angle. The eddy generator is functionless at low blade angle and steps out with increased blade angle from a boundary layer of a flow on a suction side of the surface. An independent claim is also included for a rotary-wing aircraft with a lift surface.

Classifications:

International (IPC 8-9): B63B39/00 B64C21/02 B64C23/00 B64C23/06 B64C27/467 (Advanced/Invention); B63B39/00 B64C21/00 B64C23/00 B64C27/32 (Core/Invention) CPC: B64C21/02 B64C23/06 B64C27/467 B64C2003/146 B64C2230/20 B64C2230/28 Y02T50/162 Y02T50/166 European: B64C21/02 B64C23/06 B64C27/467 L64C3/14G Y02T50/16B Y02T50/16D



Family:

Publication number	Publication date	Application number	Application date
DE102005018427 A1	20061102	DE200510018427	20050421
DE502006002406 D1	20090205	DE200650002406T	20060328
EP1714869 A1	20061025	EP20060006391	20060328
EP1714869 B1	20081224	EP20060006391	20060328
PL1714869 T3	20090630	PL20060006391T	20060328

Priority:

DE200510018427 20050421 EP20060006391 20060328

Probable Assignee: DEUTSCH ZENTR LUFT AND RAUMFAHRT

Assignee(s): (std): DEUTSCH ZENTR LUFT AND RAUMFAHRT ; DEUTSCHES ZENTRUM FA¼R LUFT U RAUMFAHRT E V

Assignee(s): DEUTSCHES ZENTRUM FA¼R LUFT U RAUMFAHRT EV ; DEUTSCHES ZENTRUM FUER LUFT UND RAUMFAHRT E V ; DEUTSCHES ZENTRUM F LUFT U RAUMFAHRT E V ; DEUTSCHES ZENTRUM F LUFT U RAUMFAHRT EV

Designated states: AL BA DE FR GB HR MK NL PL YU

US: 244/130 244/204.1 244/207 244/42



PatBase PDF Export - Page: 7 23/07/2020

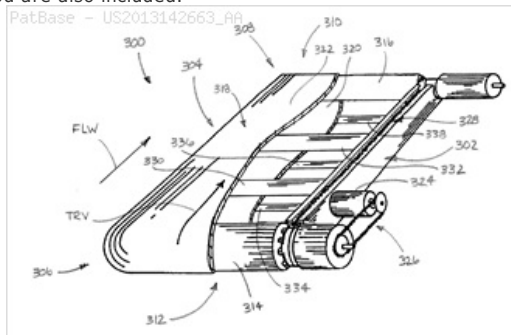
disposed along one side of the device structure with at least one of said first and second boundary layer collision points formed by the endless band. An airplane, a wind turbine and a method are also included.

Classifications:

International (IPC 8-9): B64C23/02 B64C23/06 F01D9/02 F03D1/06 (Advanced/Invention)
CPC: B64C23/06 F03D1/0633 F03D1/0675 B64C23/02 Y10T29/49826 Y02E10/721

European: B64C23/02

US: 29/428 416/243



Family:

Publication number	Publication date	Application number	Application date
US2013142663 AA	20130606	US20110814658	20110806
US9988141 BB	20180605	US20110814658	20110806
WO12019179 A1	20120209	WO2011US46877	20110806

Priority:

US20100371205P 20100806 US20110814658 20110806 WO2011US46877 20110806

Probable Assignee: ECOLOGICAL ENERGY CO

Assignee(s): (std): ECOLOGICAL ENERGY CO ; GARVER THEODORE M

Inventor(s): (std): GARVER THEODORE M

Agent(s): FAY SHARPE LLP; DUGAN MATTHEW P

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT QA RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

13) Family number: 61901098 (US2016083083A)

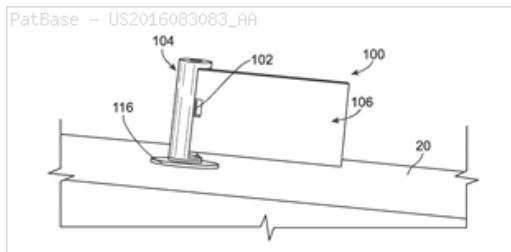
© PatBase

Title: VORTEX GENERATORS RESPONSIVE TO AMBIENT CONDITIONS

Abstract: A deployable vortex generator attached to a lifting surface includes a vane moveable relative to the lifting surface. The vane moves from a deployed position to a retracted position in response to a change in ambient conditions. In the deployed position, the vane acts on the air flow to create vortices. In the retracted position, the vane is closely aligned with the free stream velocity.

Classifications:

International (IPC 8-9): B64C13/02 B64C21/10 B64C23/06 (Advanced/Invention)
CPC: B64C23/06 Y02T50/162 B64C13/02 B64C21/10 B64C2230/06
US: 1/1 244/200.1



Family:

Publication number	Publication date	Application number	Application date
CN105438450 A	20160330	CN201510599569	20150918
CN105438450 B	20191213	CN201510599569	20150918
DE602015030646 D1	20190613	DE201560030646T	20150917
EP2998219 A1	20160323	EP20150185618	20150917
EP2998219 B1	20190522	EP20150185618	20150917
US2016083083 AA	20160324	US20140491916	20140919
US2018118332 AA	20180503	US20170783742	20171013
US9789956 BB	20171017	US20140491916	20140919
US10507907 BB	20191217	US20170783742	20171013

Priority:

US20140491916 20140919 EP20150185618 20150917 US20170783742 20171013

Probable Assignee: BOEING CO

Assignee(s): (std): BOEING CO

Assignee(s): BOEING CO CHICAGO

Inventor(s): (std): BORDOLEY ANAT ; CLINGMAN DAN J ; TILLOTSON BRIAN J ; WANG MICHAEL CHIH HUAN

Inventor(s): WANG MICHAEL CHIH HUAN SEATTLE ; TILLOTSON BRIAN J KENT ; CLINGMAN DAN J MILTON ; BORDOLEY ANAT SEATTLE

Agent(s): BOULT WADE TENNANT LLP; BOULT WADE TENNANT; PATTERSON AND SHERIDAN LLP

Designated states: AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR

Title: Foils

Abstract: PCT No. PCT/GB95/00185 Sec. 371 Date Jul. 25, 1996 Sec. 102(e) Date Jul. 25, 1996 PCT Filed Jan. 30, 1995 PCT Pub. No. WO95/20521 PCT Pub. Date Aug. 3, 1995A method of reducing the effects of induced drag on a foil. A foil is provided with a series of steps along its span in the trailing edge, whereby a series of spaced vortices is generated. The spanwise spacing of the steps is selected so that the vortices are prevented from combining into a larger vortex at least until the aerodynamic effect of the larger vortex on the foil is insignificant.

Classifications:

International (IPC 8-9): B64C23/06 B64C3/10 (Advanced/Invention); B64C23/00 B64C3/00 (Core/Invention)

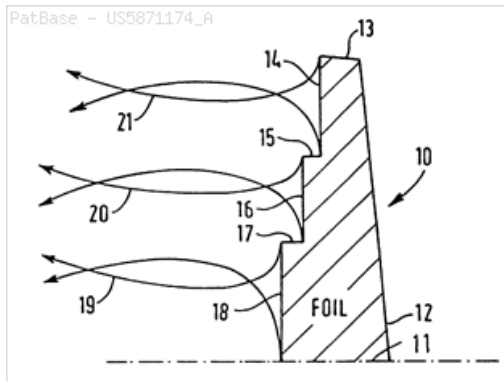
International (IPC 1-7): B64C23/06 B64C3/10

CPC: B64C3/10 B64C23/06 Y02T50/12 Y02T50/162

European: B64C23/06 B64C3/10 Y02T50/12 Y02T50/16B

US: 244/199.2 244/35.00R 244/35R 244/45.00R 244/45R

PatBase - US5871174_A



Family:

Publication number	Publication date	Application number	Application date
AU199515406 A1	19950815	AU19950015406	19950130
CA2181257 AA	19960715	CA19952181257	19950130
DE69501114 D1	19980108	DE19956001114	19950130
DE69501114 D1	19980108	DE19956001114T	19950130
DE69501114 T2	19980702	DE19956001114T	19950130
EP0740626 A1	19961106	EP19950907069	19950130
EP0740626 B1	19971126	EP19950907069	19950130
ES2111393 T3	19980301	ES19950907069T	19950130
GB9401691 A0	19940323	GB19940001691	19940128
US5871174 A	19990216	US19960682610	19960725
WO9520521 A1	19950803	WO1995GB00185	19950130

Priority:

GB19940001691 19940128 WO1995GB00185 19950130

Probable Assignee: HANNAY IAN

Assignee(s): (std): HANNAY IAN ; HANNAY IAN MORTON ; IAN MORTON HANNAY

Assignee(s): HANNAY IAN MORTON FLEET HANTS GB

Inventor(s): (std): HANNAY IAN MORTON

Inventor(s): HANNAY IAN MORTON FLEET HANTS GB ; IAN MORTON HANNAY

Agent(s): RIDOUT AND MAYBEE LLP

Designated states: AT AU BE CA CH CN DE DK ES FR GB GR IE IT JP LU MC NL PT RU SE UA US

Title: AERODYNAMIC DEVICES FOR ENHANCING LIFT AND REDUCING DRAG

Abstract: An aerodynamic device for enhancing lift and reducing drag on a body, comprising a plurality of raised members, each having a symmetric profile and including a central portion having an elongated profile, and first and second outer portions having elongated profiles and arranged substantially parallel to and on opposing sides of the central portion, wherein the plurality of raised members are situated adjacent one another to form a continuous structure on or defining at least a portion of a surface of the body and oriented such that the raised members are substantially aligned with a direction of localized flow on the body. An aerodynamic device for enhancing lift and reducing drag of a flying disc, wherein the plurality of raised members are situated adjacent one another to form a continuous structure and the raised members are oriented in a substantially circumferential direction on the surface of the flying disc.

Classifications:

International (IPC 8-9): B63B1/36 B64C21/00 B64C21/10

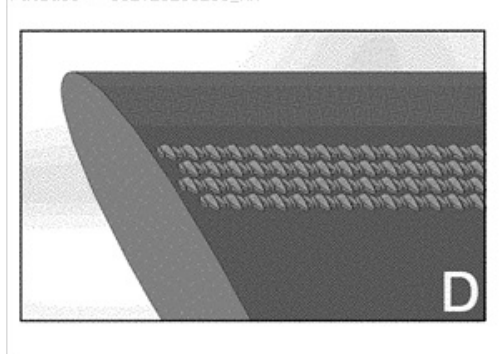
B64C23/00 B64C23/06 B64C3/14 F15D1/00 (Advanced/Invention)

CPC: B64C23/06 B64C2230/20 Y02T50/162 Y02T50/166 Y02T70/121

B64C2230/26

US: 1/1 244/200.1

PatBase - US2018265183_AA



Family:

Publication number	Publication date	Application number	Application date
US2018265183 AA	20180920	US20180986477	20180522

Priority:

US20170468311P 20170307 US20170563308P 20170926 WO2018US21363 20180307
US20180986477 20180522

Probable Assignee: HARVARD COLLEGE

Assignee(s): (std): UNIV SOUTH CAROLINA ; HARVARD COLLEGE

Assignee(s): PRESIDENT AND FELLOWS OF HARVARD COLLEGE ; OF SOUTH CAROLINA UNIV

Inventor(s): (std): BERTOLDI KATIA ; DOMEL AUGUST G ; HAJ HARIRI HOSSEIN ; LAUDER GEORGE V ; SAADAT MEHDI

Agent(s): DYKEMAN DAVID J ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

16) Family number: 51040182 (US2014140856A)

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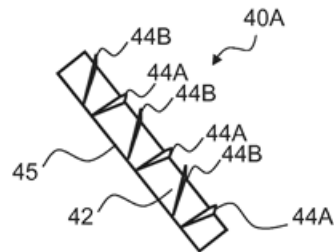
Title: WIND TURBINE BLADE COMPRISING VORTEX GENERATORS

Abstract: Disclosed is a wind turbine blade and a method for retrofitting a wind turbine blade, the wind turbine blade extending in a longitudinal direction along a pitch axis and having a tip end and a root end as well as a blade length, the wind turbine blade further comprising a profiled contour including a pressure side and a suction side, as well as a leading edge and a trailing edge with a chord having a chord length extending there between, the profiled contour, when being impacted by an incident airflow generating a lift, wherein the suction side of the wind turbine blade is provided with a plurality of vortex generators positioned along a mounting line having a proximal end point nearest the root end and a distal end point nearest the tip end, wherein the mounting line is a concave line seen from the trailing edge of the wind turbine blade.

Classifications:

International (IPC 8-9): B21D53/78 B21K3/04 B23P15/02 B23P23/00 B23P6/00 B64C23/06 F01D5/14 F03D1/00 F03D1/06 F03D11/00 F03D11/04 F03D13/20 F03D17/00 F03D7/02 F03D7/04 F03D80/00 F03D80/50 (Advanced/Invention); B64C23/06 F03D13/10 F03D80/50 (Advanced/Non-invention) **CPC:** F03D1/0675 F05B2240/32 Y02T50/162 F05B2240/132 F05B2240/301 F03D1/0641 F05B2250/11 F05B2250/13 F03D13/10 B64C23/06 F03D7/022 F03D7/0232 F03D1/0608 F03D7/0244 F03D7/0256 F03D7/04 F05B2240/122 F03D17/00 F03D80/50 Y02E10/723 Y10T29/49318 F03D1/0658 F01D5/145 F03D1/0633 F05B2240/30 F05D2240/30 Y02E10/721 **US:** 1/1 29/889.1 416/1 416/235 416/236R

PatBase - US2014140856_AA



Family:

Publication number	Publication date	Application number	Application date
CN103917445 A	20140709	CN201280045899	20120720
CN103917445 B	20160706	CN201280045899	20120720
CN103974878 A	20140806	CN201280046107	20120716
CN103974878 B	20190730	CN201280046107	20120716
CN103987622 A	20140813	CN201280045333	20120720
CN103987622 B	20190528	CN201280045333	20120720
DE602012010408 D1	20151022	DE201260010408T	20120720
DE602012033420 D1	20170727	DE201260033420T	20120720
DK2736805 T3	20171002	DK20120737573T	20120720
DK2739528 T3	20191209	DK20120735880T	20120716
DK2739529 T3	20151221	DK20120735912T	20120720
EP2548800 A1	20130123	EP20110175051	20110722
EP2548801 A1	20130123	EP20110175052	20110722
EP2736805 A2	20140604	EP20120737573	20120720
EP2736805 B1	20170614	EP20120737573	20120720
EP2739528 A2	20140611	EP20120735880	20120716
EP2739528 B1	20190828	EP20120735880	20120716
EP2739529 A2	20140611	EP20120735912	20120720
EP2739529 B1	20150909	EP20120735912	20120720
ES2555999 T3	20160112	ES20120735912T	20120720
ES2640514 T3	20171103	ES20120737573T	20120720
ES2759027 T3	20200507	ES20120735880T	20120716
GB201202894 A0	20120404	GB20120002894	20120221
IN00183CN2014 A	20150313	IN2014CN00183	20140109
IN00184CN2014 A	20150123	IN2014CN00184	20140109
IN00186CN2014 A	20150123	IN2014CN00186	20140109
PL2736805 T3	20171229	PL20120737573T	20120720
PL2739528 T3	20200331	PL20120735880T	20120716
PL2739529 T3	20160229	PL20120735912T	20120720
TR201515185 T4	20151221	TR20150015185T	20120720
TR201713332 T4	20171023	TR20170013332T	20120720
TR201918410 T4	20191223	TR20190018410T	20120716
US2014140856 AA	20140522	US20120232108	20120720
US2014219810 AA	20140807	US20120233930	20120716
US2014241880 AA	20140828	US20120131848	20120720
US2017363061 AA	20171221	US20170691137	20170830

US9777703 BB	20171003	US20120131848	20120720
US10047720 BB	20180814	US20120232108	20120720
US10145357 BB	20181204	US20170691137	20170830
WO13014015 A2	20130131	WO2012EP63915	20120716
WO13014015 A3	20130502	WO2012EP63915	20120716
WO13014080 A2	20130131	WO2012EP64298	20120720
WO13014080 A3	20130926	WO2012EP64298	20120720
WO13014082 A2	20130131	WO2012EP64301	20120720
WO13014082 A3	20130822	WO2012EP64301	20120720

Priority:

EP20110017502	20110722	EP20110175027	20110722	EP20110175052	20110722
EP20110175051	20110722	GB20120002894	20120221	EP20120735880	20120716
WO2012EP63915	20120716	EP20120735912	20120720	WO2012EP64301	20120720
EP20120737573	20120720	WO2012EP64298	20120720	US20140131848	20140325
US20170691137	20170830				

Probable Assignee: LM WIND POWER A S

Assignee(s): (std): HANSEN ROLF ; LM WIND POWER AS ; LM WINDPOWER AS ; LM WP PATENT HOLDING AS ; MADSEN JESPER ; MUELLER OLAF ; MULLER OLAF ; WUERTH INES ; WURTH INES

Assignee(s): LM WINDPOWER A S ; LM WP PATENT HOLDING A S ; LM WIND POWER A S

Inventor(s): (std): MADSEN JESPER ; MUELLER OLAF ; WUERTH INES ; WURTH INES ; HANSEN ROLF ; MULLER OLAF

Inventor(s): INES WUERTH ; JESPER MADSEN ; WRTH INES ; ROLF HANSEN ; OLAF MUELLER

Agent(s): Kitchen Steven Richard; HUSSEY PAUL ANTHONY; COPA COPENHAGEN PATENTS; CARVAJAL Y ISABEL; ISABEL CARVAJAL Y URQUIJO; TUGBA DERYA YILMAZ; HALISE BETUEL ATABAY VARLIK; JERALD L; NATH GOLDBERG AND MEYER; TANYA E; MEYER JERALD L; KOCK ANNIE J; HARKINS TANYA E; KITCHEN STEVEN RICHARD

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT QA RO RS RU RW SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

17) Family number: 51767182 (US2013009016A)

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Title: RETRACTABLE VORTEX GENERATOR FOR REDUCING STALL SPEED

Abstract: A device and methods for low speed performance improvement of a lifting surface assembly are disclosed. At least one vortex generator is coupled to the lifting surface assembly, and the vortex generator is extended through the lifting surface assembly by drooping a hinged leading coupled to the lifting surface assembly to increase lift. The vortex generator is retracted inside the lifting surface assembly to decrease drag.

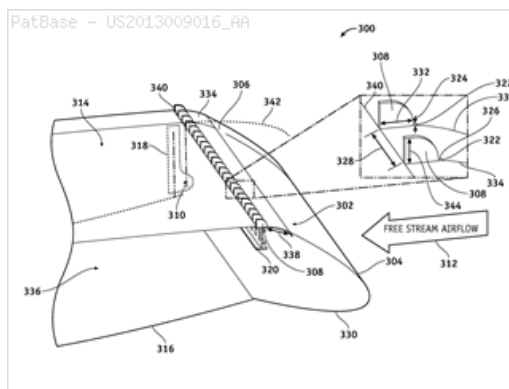
Classifications:

International (IPC 8-9): B64C B64C13/16 B64C21/00 B64C23/00 B64C23/06 B64C3/38 B64C9/12 B64C9/24 B64C9/34 (Advanced/Invention); B64C (Subclass/Invention)

CPC: Y02T50/12 Y02T50/162 Y02T50/32 B64C23/06 B64C9/24 B64C2003/148 B64C2230/26 Y02T50/166 B64C9/12

European: B64C23/06 B64C9/24 L64C230/26 L64C3/14K

US: 244/199.1 244/204.1 244/213 244/214 244/215 244/219 244/76R



Family:

Publication number	Publication date	Application number	Application date
BR102012016563 A2	20140527	BR20121016563	20120704
CA2774821 AA	20130105	CA20122774821	20120410
CA2774821 C	20170328	CA20122774821	20120410
CN102862674 A	20130109	CN201210231985	20120705
CN102862674 B	20150225	CN201210231985	20120705
DE602012035557 D1	20170921	DE201260035557T	20120620
EP2543588 A1	20130109	EP20120172660	20120620
EP2543588 B1	20170809	EP20120172660	20120620
ES2646445 T3	20171213	ES20120172660T	20120620
IL219688 A0	20120731	IL20120219688	20120509
IL219688 A1	20180531	IL20120219688	20120509
RU2012127684 A	20140110	RU20120127684	20120703
RU2600014 C2	20161020	RU20120127684	20120703
US2013009016 AA	20130110	US20110176539	20110705
US8657238 BB	20140225	US20110176539	20110705

Priority:

US20110176539	20110705	CA20122774821	20120410	EP20120172660	20120620
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Probable Assignee: BOEING CO

Assignee(s): (std): BOEING CO LTD ; FOX BRUCE R ; FOX STEPHEN J ; BOEING CO ; ZE BOING KOMPANI

Assignee(s): BOEING CO CHICAGO ; THE BOEING COMPANY

Inventor(s): (std): BRYUS R FOKS ; FOX BRUCE R ; FOX STEPHEN J ; STIVEN DZH FOKS

Inventor(s): BRUCE R FOX ; FOX STEPHEN J EVERETT ; STEPHEN J FOX ; FOX BRUCE R EVERETT
Agent(s): SMART AND BIGGAR; WITTE WELLER AND PARTNER PATENTANWALTE MBB; WITTE WELLER AND PARTNER; REINHOLD COHN AND PARTNERS; LOWELL; AMEH IP; ELAHE
Designated states: AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR

18) Family number: 4852185 (US3578264A)

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Title: BOUNDARY LAYER CONTROL OF FLOW SEPARATION AND HEAT EXCHANGE

Abstract: Boundary layer control for delay or prevention of flow separation and/or increase in rate of heat exchange between a surface and a fluid by an arrangement of surface elements which may take the form of either crests or discreet concave depressions in the surface, having effective depths or dimensions of less than that of the adjacent boundary layer thickness, to cause the formation of vortices with succeeded surface elements being positioned to cause vortex amplification, for effective boundary layer mixing with less drag, weight penalty, noise, and energy loss than that of conventional vane-type generators.

Classifications:

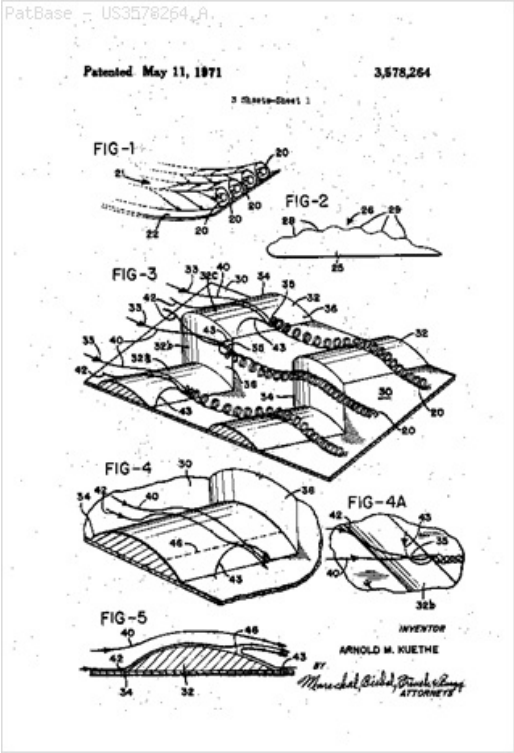
International (IPC 8-9): B64C21/10 B64C23/06 F28F1/32 F28F13/12 (Advanced/Invention); B64C21/00 B64C23/00 F28F1/32 F28F13/00 (Core/Invention)

International (IPC 1-7): B64C21/00 B64C21/10 B64C23/00 B64C23/06 F15D1/00 F15D1/06 F15D1/12 F28F1/20 F28F13/00 F28F13/02

CPC: F04D29/681 Y10S415/914 F28F13/12 B64C21/10 B64C23/06 F01D5/145 F05D2250/21 F05D2250/22 F05D2250/24 F05D2250/711 F05D2250/712 F28F1/32 Y02T50/162 Y02T50/166 Y02T50/673

European: B64C21/10 B64C23/06 F28F1/32 F28F13/12 Y02T50/166 Y02T50/16D

US: 165/0.1 165/109.1 165/181 181/220 244/130 244/199 244/200 244/200.1 244/41 415/119 415/914



Family:

Publication number	Publication date	Application number	Application date
DE1934246 A1	19700122	DE19691934246	19690705
FR2012571 A1	19700320	FR19690023198	19690708
GB1281899 A	19720719	GB19690034681	19690709
US3578264 A	19710511	US19680743350	19680709
US3578264 B1	19911119		00000000
US3741285 A	19730626	US19700079948	19701012

Priority:

US19680743350 19680709 US19700079948 19701012

Probable Assignee: BATTELLE DEVELOPMENT CORP

Assignee(s): (std): BATTELLE DEVELOPMENT CORP ; KUETHE A ; UNIV MICHIGAN

Assignee(s): BATTELLE DEVELOPMENT COR ; KUETHE A US ; KUETHE ARNOLD M ; OF MICHIGAN A CONSTITUTIONAL CORP OF MI UNIV ; OF MICHIGAN A CONSTITUTIONAL CORP UNIV ; UNIV

Inventor(s): (std): ARNOLD M KUETHE ; KUETHE A ; KUETHE ARNOLD M ; M KUETHE ARNOLD

Inventor(s): KUETHE A US

19) Family number: 22053189 (US2558816A)

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Title: FLUID MIXING DEVICE

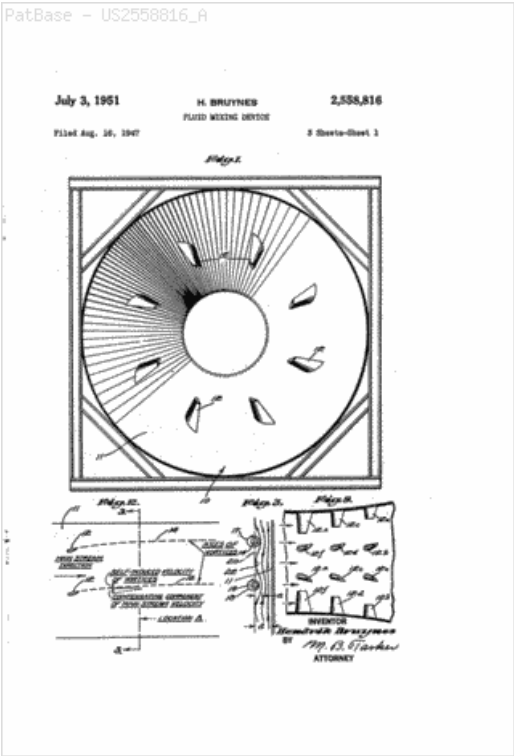
Abstract: (Claim 1) 1. In combination, a fluid flow confining passage, and means for setting up a plurality of vortices in the fluid stream flowing through said passage about axes generally parallel with the direction of fluid flow, said means comprising a plurality of blades of airfoil cross section projecting from the wall of said passage into said stream at spaced points about its periphery and terminating in blade tips located in said stream adjacent the imaginary surface separating the boundary - layer and main stream flows, said blades having their chord lines inclined relative to the stream flowing through said passage to set up vortices trailing from said blade tips.

Classifications:

International (IPC 8-9): B64C23/06 G01M9/04 (Advanced/Invention); B64C23/00 G01M9/00 (Core/Invention)

International (IPC 1-7): B01F5/02

CPC: Y10S415/914 G01M9/04 B64C23/06 Y02T50/162



Family:

Publication number	Publication date	Application number	Application date
US2558816 A	19510703	US19470769042	19470816

Priority:

US19470769042 19470816

Probable Assignee:	UNITED AIRCRAFT CORP
Assignee(s): (std):	UNITED AIRCRAFT CORP
Inventor(s): (std):	HENDRIK BRUYNES
Inventor(s):	BRUYNES HENDRIK

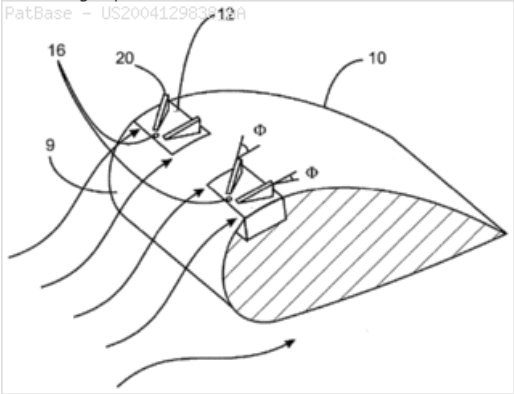
20) Family number: 30715196 (US2004129838A) © PatBase

Title: FLOW CONTROL DEVICE AND METHOD OF CONTROLLING FLOW

Abstract: The present invention relates to a flow control device and more particularly to reactive modular flow control device with deployable flow effectors. The present invention further relates to a method of operating the flow control device. One embodiment of the present invention includes a method of controlling air flow across a surface of an aircraft under certain flight conditions comprising the steps of sensing fluid separation from the surface by measuring the pressure on the surface; determining a standard deviation of the pressure measurements over a period of time; and deploying a flow effector in response to the standard deviation of the pressure measurements exceeding a predetermined threshold number.

Classifications:

International (IPC 8-9): B64C13/16 B64C23/06 (Advanced/Invention); B64C13/00 B64C23/00 (Core/Invention)
International (IPC 1-7): B64C23/06
CPC: B64C23/06 Y02T50/162 B64C3/58
European: B64C23/06 Y02T50/16B
US: 244/130 244/199 244/203 244/204 244/204.1 244/204.100P



Family:

Publication number	Publication date	Application number	Application date
US2004129838 AA	20040708	US20030336114	20030103
US6837465 BB	20050104	US20030336114	20030103
US7334760 BA	20080226	US20060523161	20060919

Priority:

US20030336114 20030103 US20040879413 20040629 US20060523161 20060919

Probable Assignee: ORBITAL RESEARCH INC

Assignee(s): (std): ORBITAL RES INC

Assignee(s): ORBITAL RESEARCH INC ; SCHMIDT ROBERT N ; PRINCE TROY ; PATEL MEHUL P ; MODARRES MO

HAMMAD ; LISY FREDERICK J ; DICOCCO JACK M ; CARVER REED

Inventor(s): (std): MODARRESZADAH MOHAMMED ; SCHMIDT ROBERT N ; PRINCE TROY ; PATEL MEHUL P ; MODARRES MO HAMMAD ; LISY FREDERICK J ; DICOCCO JACK M ; CARVER REED

Agent(s): BRIAN; KOLKOWSKI BRIAN M; BRIAN M

21) Family number: 890223 (US3480234A)

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Title: METHOD AND APPARATUS FOR MODIFYING AIRFOIL FLUID FLOW

Abstract: (Claim 1) 1. Apparatus for modifying the airflow across a surface of an airfoil to control airflow separation from such surface, comprising: fluid flow means disposed adjacent the airfoil for directing a fluid stream in a generally spanwise direction over the surface of the airfoil and at sufficient momentum to establish a vortex extending "m a generally spanwise direction along at least a portion of the airfoil surface; and a source of fluid pressure connected to supply fluid to said fluid flow means.

Classifications:

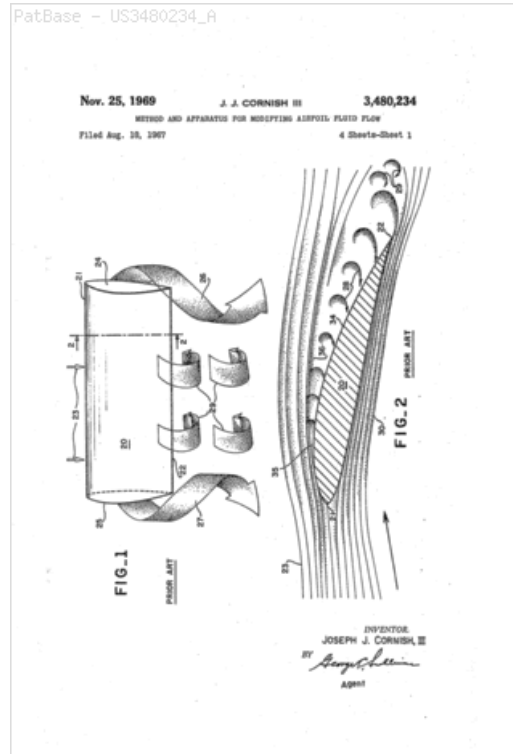
International (IPC 8-9): B64C23/06 (Advanced/Invention); B64C23/00 (Core/Invention)

International (IPC 1-7): B64C23/06 B64C3/00

CPC: Y10S415/914 B64C23/06 Y02T50/162 Y02T50/166 B64C2230/04 B64C2230/06 B64C2230/16

European: B64C23/06 Y02T50/16B Y02T50/16D

US: 244/130 244/199.1 244/199.3 244/40 415/914 416/90.00A 416/90A



Family:

Publication number	Publication date	Application number	Application date
US3480234 A	19691125	US19670661646	19670818

Priority:

US19670661646 19670818

Probable Assignee: LOCKHEED MARTIN CORP

Assignee(s): (std): LOCKHEED AIRCRAFT CORP ; LOCKHEED MARTIN CORP

Inventor(s): (std): CORNISH JOSEPH J

Inventor(s): JOSEPH J CORNISH

22) Family number: 2009224 (US4466587A)

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Title: NACELLE INSTALLATION

Abstract: Nacelle installation having devices for constraining hot core exhaust gas from flowing over the trailing portion of a highly swept pylon supporting a high bypass turbofan engine. The devices can comprise a pylon ejector, a core nozzle shroud or a plurality of vortex generators and are disposed generally in the region adjacent the intersection of the core nozzle exit of the engine and the pylon shelf portion of the pylon.

Classifications:

International (IPC 8-9): B64C23/06 B64D29/00 B64D33/04 F02K1/52 (Advanced/Invention); B64C23/00 B64D29/00 B64D33/00 F02K1/00 (Core/Invention)

International (IPC 1-7): B64C1/38 B64D29/00 B64D29/02 F02K3/06

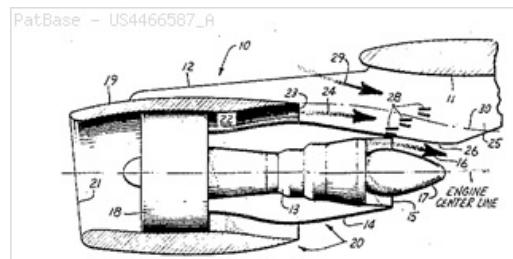
CPC: B64D29/02 B64C7/02 B64C23/06 B64D33/04 F02K1/52 F05D2270/173 Y02T50/162 Y02T50/671

European: B64C23/06 B64C7/02 B64D33/04 F02K1/52

R05D270/173 Y02T50/16B Y02T50/67B

US: 244/1.00N 244/121 244/130 244/199 244/199.1 244/1N

244/53.00R 244/53R



Family:

Publication number	Publication date	Application number	Application date
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DE3246737 A1	19830630	DE19823246737	19821217
FR2518492 A1	19830624	FR19820021420	19821221
FR2518492 B1	19870828	FR19820021420	19821221
GB2112077 A1	19830713	GB19820030665	19821027
GB2112077 B2	19850807	GB19820030665	19821027
IT1195962 A	19881103	IT19820024675	19821210
IT8224675 A0	19821210	IT19820024675	19821210
JP58122294 A2	19830720	JP19820218525	19821215
US4466587 A	19840821	US19810332893	19811221

Priority:

US19810332893 19811221

Probable Assignee: GENERAL ELECTRIC CO A CORP

Assignee(s): (std): GEN ELECTRIC

Assignee(s): GENERAL ELECTRIC CY ; GENERAL ELECTRIC COMPANY ; GENERAL ELECTRIC CO A CORP ; GENERAL ELECTRIC CO

Inventor(s): (std): DUSA DONALD JOHN ; WAGENKNECHT CONRAD DUDLEY ; WAGENKNECHT CONRAD D ; KONRADO DADORII WAAGENKUNEHITO ; DUSA DONALD J ; DONARUDO JIYON DOUSA

Inventor(s): JOHN DUSA DONALD ; DUDLEY WAGENKNECHT CONRAD ; DONALD JOHN DUSA ET CONRAD DUDLEY WAGENKNECHT ; CONRAD DUDLEY WAGENKNECHT ; DONALD JOHN DUSA

23) Family number: 32220227 (WO06027630A2)

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Title: METHOD OF CONTROLLING VORTEX BURSTING

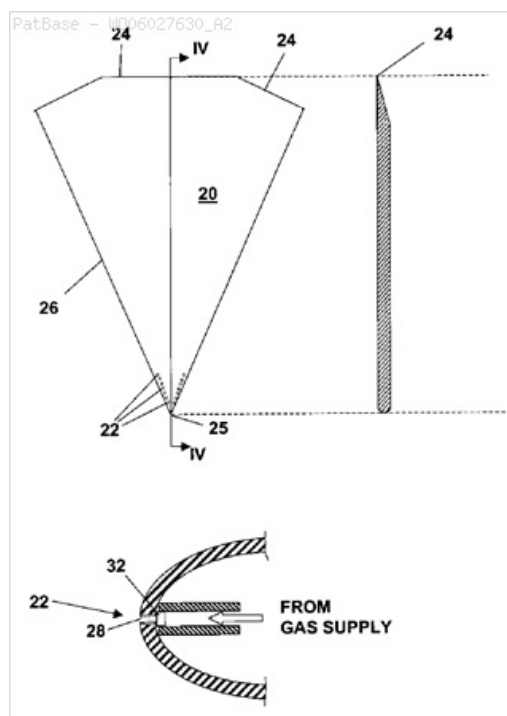
Abstract: The invention addresses the issue of vortex bursting on delta wing structures by distribution of gas jets and/or fins/vanes along the leading edge or set back therefrom to emit gas pulses from the gas jets into the airstream flowing over the leading edge of the wings.

Classifications:

International (IPC 8-9): B64C23/06 (Advanced/Invention); B64C23/00 (Core/Invention)

CPC: B64C2230/02 B64C23/06 Y02T50/162 Y02T50/166 B64C2230/18

European: B64C23/06 Y02T50/16B Y02T50/16D



Family:

Publication number	Publication date	Application number	Application date
GB200420293 A0	20050810	GB20040020293	20040910
WO06027630 A2	20060316	WO2005GB50147	20050908
WO06027630 A3	20060608	WO2005GB50147	20050908

Priority:

GB20040020293 20040910

Probable Assignee: BAE SYSTEMS PLC

Assignee(s): (std): BAE SYSTEMS PLC ; JAWORSKI ARTUR JERZY ; WARSOP CLYDE ; WATSON MARK ; WOOD NORMAN

Inventor(s): (std): WOOD NORMAN ; WATSON MARK ; WARSOP CLYDE ; JAWORSKI ARTUR JERZY

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE KG KM KP KR KZ LC LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RU SC SD SE SG SI SK SL SM SN SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

24) Family number: 1424236 (US4039161A)

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Title: Hidden vortex generators

Abstract: An improvement to the controllability of aircraft wherein vortex generators are connected to a control surface in front of the hinge line of the control surface so that when the control surface is deflected, the vortex generators project into the airstream on the opposite side from the deflecting control surface. The action of the vortex generators causes the airflow to remain attached to the control surface at higher angles of attack than would otherwise be possible thus increasing the lift of the airfoil and control surface.

Classifications:

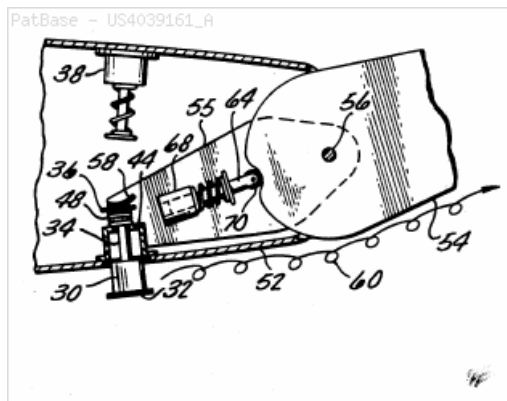
International (IPC 8-9): B64C23/06 (Advanced/Invention)

International (IPC 1-7): B64C3/58 B64C9/34

CPC: B64C23/06 Y02T50/162

European: B64C23/06 Y02T50/16B

US: 138/39 244/113 244/200.1 244/213



Family:

Publication number	Publication date	Application number	Application date
US4039161 A	19770802	US19750622893	19751016

Priority:

US19750622893 19751016

Probable Assignee: MC DONNELL DOUGLAS CORP

Assignee(s): (std): MC DONNELL DOUGLAS CORP

Assignee(s): MCDONNELL DOUGLAS CORP

Inventor(s): (std): BAUER ANDREW B

25) Family number: 2022252 (US4434957A)

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Title: Low drag surface

Abstract: A low drag surface comprises at its upstream edge an intermittent linear vortex producing means extending transverse to the flow of fluid across the surface. The vortex producing means produces a succession of rolling vortices which roll across the surface reducing the drag between the main flow and the surface.

Classifications:

International (IPC 8-9): B64C21/10 B64C23/06 (Advanced/Invention)

International (IPC 1-7): B64C23/06 B64C3/14 F01D5/14 F15D1/10

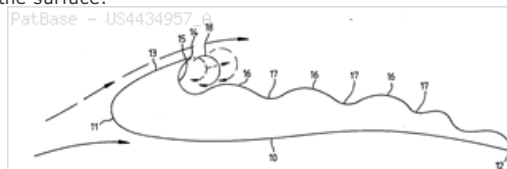
CPC: B64C21/10 B64C23/06 B64C2003/142 B64C2003/148

Y02T50/12 Y02T50/162 Y02T50/166

European: B64C21/10 B64C23/06 L64C3/14C L64C3/14K

Y02T50/12 Y02T50/16B Y02T50/16D

US: 244/130 244/199.1 244/200 244/35.00R 244/35R 416/223.00R 416/223R



Family:

Publication number	Publication date	Application number	Application date
GB2129908 A1	19840523	GB19830007870	19830322
GB2129908 B2	19850904	GB19830007870	19830322
US4434957 A	19840306	US19820363449	19820330

Priority:

US19820363449 19820330

Probable Assignee: ROLLS ROYCE INC

Assignee(s): (std): ROLLS ROYCE ; ROLLS ROYCE INC

Assignee(s): ROLLS ROYCE INC A US CORP ; ROLLS ROYCE LTD

Inventor(s): (std): MORITZ ROBERT RUDOLPH ; MORITZ ROBERT R

Inventor(s): ROBERT RUDOLPH MORITZ

26) Family number: 51413263 (US2012273297A)

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Title: CHANNELING GAS FLOW TUBE

Abstract: A tube for moving gas between an entry end into which gas is introduced and an exit end through which gas exits the tube, the tube comprising a plurality of adjoining adjacent guides, each guide comprising an outer half of a smoothly-curved, modified torus, and an outer rigid tube wall. Each guide forms an internal cavity with a cavity mouth opening into an inner portion of the tube, the cavities shaped such that a vortex forms within each of the cavities as gas passes through the tube, and the flow of fluid in the tube is unidirectional and axial from the entry end to the exit end.

Classifications:

International (IPC 8-9): B62D35/00 B62D37/02 B64C21/02

F01N1/02 F01N1/08 F01N1/12 F01N13/00 F01N13/02 F01N13/08

F02C7/045 F02M35/12 F15C1/16 F15D1/00 F15D1/06 F15D1/12

F16L55/033 F16L9/22 F41A21/30 F42B10/42 F42B30/02 G10K11/00

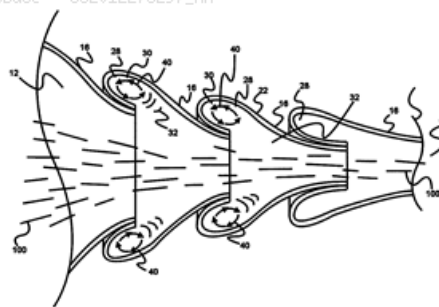
G10K11/16 (Advanced/Invention);

B62D35/00 F01N1/00 F41A21/00 (Advanced/Non-invention)

CPC: F15D1/003 G10K11/00 B62D35/001 B64C21/02 F01N1/02

F01N1/12 F16L55/033 F16L55/052 G10K11/16 F01N1/026
F01N13/082 F01N2470/20 F01N2470/24 F01N2490/155 F01N2490/16
F02C7/045 F05D2260/96 F41A21/30 F42B10/42 Y10T137/2087
Y10T137/2093 F15D1/02 B64C23/06
European: F01N1/02C F01N13/08B F41A21/30 R01N470/20
R01N470/24 R01N490/15B R01N490/16
US: 102/501 137/808 137/809 138/155 181/212 181/213 181/223
181/227 181/228 181/231 181/232 181/262 181/270 296/180.1
89/14.4

PatBase - US2012273297_AA



Family:

Publication number	Publication date	Application number	Application date
US2012273297 AA	20121101	US20120540492	20120702
US2014158249 AA	20140612	US20130938213	20130709
US2015337878 AA	20151126	US20150636150	20150302
US8210309 BA	20120703	US20080238253	20080925
US8479878 BB	20130709	US20120540492	20120702
US8967326 BB	20150303	US20130938213	20130709
US9739296 BB	20170822	US20150636150	20150302
WO16141106 A1	20160909	WO2016US20525	20160302

Priority:

US20080238253 20080925 US20120540492 20120702 US20130938213 20130709
US20150636150 20150302

Probable Assignee: PARALLAXIAL INNOVATION LLC

Assignee(s): (std): PARAFUIDICS LLC ; PARALLAXIAL INNOVATION LLC ; SCHLOSSER GEORGE PAUL ; SCHLOSSER THOMAS GEORGE

Inventor(s): (std): SCHLOSSER GEORGE PAUL ; SCHLOSSER THOMAS GEORGE

Agent(s): GALVIN PATENT LAW LLC; BRIAN R; GALVIN BRIAN R

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

27) Family number: 34858273 (US2008217485A)

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Title: SMART VORTEX GENERATOR, AND AIRCRAFT, VESSEL, AND ROTARY MACHINE BEING EQUIPPED WITH THE SAME

Abstract: A smart vortex generator including a main body, disposed on a body surface, such as a main wing of aircraft, making a boundary to a flow of fluid, and at least a part of which includes a shape memory alloy. A form of the main body, depending on a temperature increment/decrement of the fluid, changes between (1) a first form capable of suppressing a flow separation by a vortex generation and (2) a second form capable of suppressing a turbulent flow, by a phenomenon that the shape memory alloy undergoes a phase transformation between a high-temperature-side stable phase and a low-temperature-side stable phase. The smart vortex generator demonstrates a multi-directional characteristic depending on a temperature change, such that no energy supply from the outside is required. The structure is simple, and repairs and maintenance as well as installation to existing wings are easy.

Classifications:

International (IPC 8-9): B63B1/32 B64C21/00 B64C23/06

C22C19/03 F15D1/10 (Advanced/Invention);

B64C23/00 C22C19/03 F15D1/00 (Core/Invention)

CPC: B63B1/36 B63B2231/28 B64C23/06 C21D2201/01

C21D2211/001 C21D2211/008 C22C19/03 C22F1/006 F04C2270/20

F05B2240/122 F05C2251/08 F15D1/12 Y02T50/162 Y02T70/121

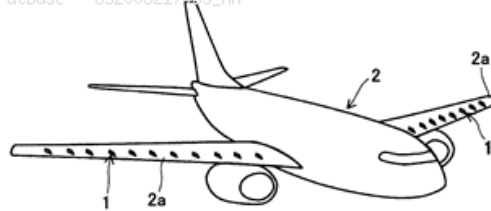
European: B64C23/06 C22C19/03 C22F1/00M F15D1/12

M21D201/01 M21D211/00A M21D211/00M R04C270/20 R05B240/122

R05C251/08 Y02T50/16B

US: 244/199.3 244/204.1 244/204.100P

PatBase - US2008217485_AA



Family:

Publication number	Publication date	Application number	Application date
CA2622938 AA	20080317	CA20052622938	20051228
CA2622938 C	20101109	CA20052622938	20051228
JP2007077620 A1	20090604	JP20070528908T	20051228
JP4940434 B1	20120530	JP20070528908T	20051228
JP4940434 B2	20120530	JP20070528908T	20051228
US2008217485 AA	20080911	US20080088771	20080331
US8256720 BB	20120904	US20080088771	20080331
WO07077620 A1	20070712	WO2005JP24290	20051228

Priority:

WO2005JP24290 20051228

Probable Assignee: NATIONAL UNIV NAGOYA UNIV CORP

Assignee(s): (std): IKEDA TADASHIGE ; UNIV NAGOYA ; UNIV NAGOYA NAT UNIV CORP

Assignee(s): NATIONAL UNIV ; NATIONAL UNIV NAGOYA UNIV CORP

Inventor(s): (std): IKEDA TADASHIGE

Agent(s): GOWLING LAFLEUR HENDERSON LLP; OHKAWA HIROSHI; OBLON SPIVAK MCCLELLAND MAIER AND NEUSTADT PC; OBLON SPIVAK MCCLELLAND MAIER AND NEUSTADT LLP

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LC LK LR LS LT LU LV LY MA MC MD MG MK ML MN MR MW MX MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RU SC SD SE SG SI SK SL SM SN SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

28) Family number: 29391322 (WO05023645A1)

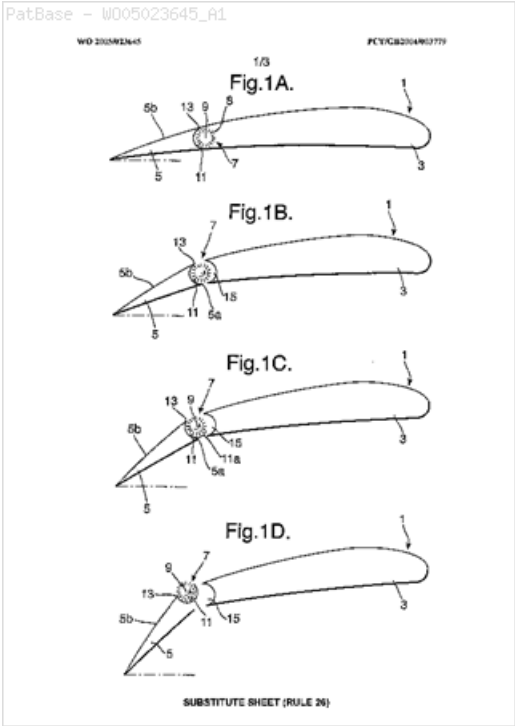
© PatBase

Title: LIFT AUGMENTATION DEVICE AND METHOD

Abstract: A wing (1) including a lift augmentation device, comprising a main wing body (3) and a displaceable auxiliary body (5) defining a lift augmenting configuration and a non-augmenting configuration and moveable to intermediate configurations therebetween. A vortex is generated extending spanwise of the wing at the junction between the main wing body and the auxiliary lift-augmenting body, the arrangement being such that the generated vortex rotates in a direction which causes the airflow in the vortex to be co-current with the airflow passing over the wing body at a relatively lower pressure side of the wing body and the flow of the vortex air to be counter current with the over the wing body in the relatively higher pressure region around the wing body.

Classifications:

International (IPC 8-9): B64C11/00 B64C23/02 B64C23/06 B64C3/50 B64C39/00 (Advanced/Invention)
International (IPC 1-7): B64C23/02 B64C23/06 B64C3/00 B64C9/00
CPC: B64C3/50 B64C11/006 B64C23/02 B64C23/06 B64C39/005 Y02T50/162
European: B64C11/00G B64C23/02 B64C23/06 B64C3/50 B64C39/00C1 Y02T50/16B



Family:

Publication number	Publication date	Application number	Application date
GB200320870 A0	20031008	GB20030020870	20030905
GB2405624 A1	20050309	GB20030020870	20030905
WO05023645 A1	20050317	WO2004GB03779	20040903

Priority:

GB20030020870 20030905

Probable Assignee: FANWING LTD

Assignee(s): (std): FANWING LTD ; PEEBLES PATRICK

Assignee(s): FANWING LIMITED

Inventor(s): (std): PEEBLES PATRICK

Inventor(s): PATRICK PEEBLES

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NA NE NI NL NO NZ OM PG PH PL PT RO RU SC SD SE SG SI SK SL SN SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

29) Family number: 64979326 (US2019270517A)

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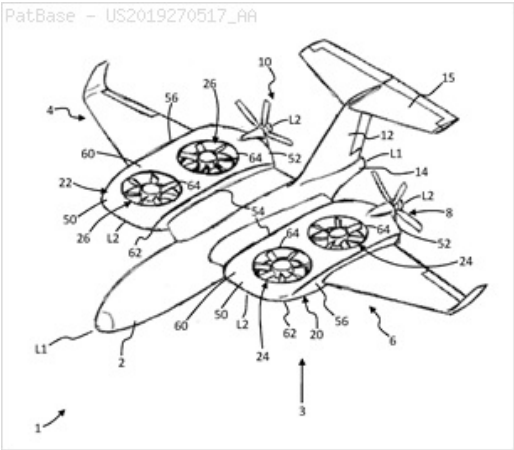
Title: VERTICAL TAKE-OFF AND LANDING AIRCRAFT

Abstract: A lift rotor or 'thrust' system or assembly for a VTOL aircraft, comprising first and second lifting thrusters or rotors contained within a housing, the housing containing a leading edge, a trailing edge, an upper surface and a lower surface; wherein the housing includes one or more airflow manipulation devices provided on or associated with the housing configured to manage the airflow into or through at least one of the first and second rotors. In other aspects, the invention embraces an aircraft wing including a lift thruster system as defined above, and also an aircraft comprising such a lift thruster system.

Classifications:

International (IPC 8-9): B64C11/00 B64C11/46 B64C23/06 B64C27/20 B64C27/22 B64C29/00 B64C7/02 B64C9/02 B64C9/22 (Advanced/Invention)

CPC: B64C11/001 B64C11/46 B64D27/14 B64C7/02 B64C9/02
B64C9/22 B64C23/06 B64C27/20 B64C27/22 B64C29/0025
B64D27/12 B64D35/02 B64D35/04



Family:

Publication number	Publication date	Application number	Application date
EP3532378 A1	20190904	EP20170792166	20171027
GB201618199 A0	20161214	GB20160018199	20161027
GB2555440 A1	20180502	GB20160018199	20161027
US2019270517 AA	20190905	US20170345238	20171027
WO18078386 A1	20180503	WO2017GB53247	20171027

Priority:

GB20160018199 20161027 WO2017GB53247 20171027

Probable Assignee: MONO AEROSPACE IP LTD

Assignee(s): (std): MONO AEROSPACE IP LTD

Inventor(s): (std): BRIAN MORGAN ; MORGAN BRIAN

Agent(s): BARKER BRETTELL LLP

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

30) Family number: 11433329 (US6105904A) © PatBase

Title: Deployable flow control device

Abstract: A deployable flow control device for a flow surface over which fluid having a fluid boundary layer flows which fluid boundary layer exhibits certain dynamics is disclosed. The deployable flow control device comprises a flow effector which is movably attached to a housing which is attachable, either initially or retrofitably, to a flow surface. The flow effector can position in a modular sub-housing removably attachable to the housing. The flow effector is deployed into and retracted out of the boundary layer on the flow surface and thereby controls the boundary layer dynamics. Devices (including devices utilizing a sealable, flexible element) operably connect to the flow effector and deploy and retract it. The sealable, flexible element has two elastic states defined as quiescent and deformed such that, when the sealable, flexible element is utilized, the flow effector is deployed into and retracted out of the fluid boundary layer based upon the elastic state of the sealable, flexible element.

Classifications:

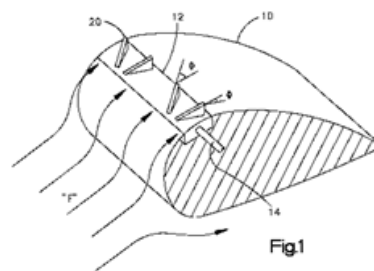
International (IPC 8-9): B64C23/06 B64C3/58 (Advanced/Invention);
B64C23/00 B64C3/00 (Core/Invention)

International (IPC 1-7): B64C23/06

CPC: B64C3/58 B64C23/06 Y02T50/162

European: B64C23/06 B64C3/58 Y02T50/16B

US: 244/130 244/199 244/200.1 244/204 92/101

**Family:**

Publication number	Publication date	Application number	Application date
AU199932125 A1	19991018	AU19990032125	19990329
US6105904 A	20000822	US19980050303	19980330
WO9950141 A1	19991007	WO1999US06753	19990329

Priority:

US19980050303 19980330 WO1999US06753 19990329

Probable Assignee: ORBITAL RESEARCH INC

Assignee(s): (std): ORBITAL RESEARCH INC ; LISY FREDERICK J ; SCHMIDT ROBERT N

Assignee(s): AIR FORCE UNITED STATES ; AIR FORCE UNITED STATES AFMC LO JAZ

Inventor(s): (std): SCHMIDT ROBERT N ; LISY FREDERICK J

Inventor(s): FREDERICK J LISY ; ROBERT N SCHMIDT

Designated states: AL AM AT AU AZ BA BB BE BF BG BJ BR BY CA CF CG CH CI CM CN CU CY CZ DE DK EE ES FI FR GA GB GD GE GH GM GN GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LK LR LS LT LU LV MC MD MG MK ML MN MR MW MX NE NL NO NZ PL PT RO RU SD SE SG SI SK SL SN SZ TD TG TJ TM TR TT UA UG US UZ VN YU ZW

31) Family number: 11516352 (WO0015961A1)

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Title: WIND TURBINE BLADE WITH VORTEX GENERATOR

Abstract: A wind turbine blade is provided with a plurality of vortex generators (3) projecting from its lee surface (2) for controlling the boundary layer separation. Each vortex generator (3) is formed as a solid and in a top view substantially wedge-shaped body defined by two lateral faces (4, 5) arranged substantially perpendicular to the surface of the blade, when seen in a top view said faces extending mutually divergently from a tip (6), which faces toward the leading edge (1) of the blade, to the trailing edge (7) of the blade. Each vortex generator (3) is furthermore in downstream direction defined by a rear face (8) and in upstream direction by a top face (9). When seen in the direction from the tip (6) toward the rear face (8) along a transverse plane of the blade, the top face (9) extends non-convergently such that the height (h2) at the tip (6) is less or equal to its height (h1) at the rear face (8).

Classifications:

International (IPC 8-9): B64C23/06 F03D1/06 F03D11/00 F03D80/00 (Advanced/Invention);

B64C23/00 F03D1/00 F03D11/00 (Core/Invention)

International (IPC 1-7): B64C23/06 F03D1/06 F03D11/00

CPC: F03D80/00 F03D1/0633 B64C23/06 F03D1/065 F05B2240/122 F05B2240/30 Y02E10/721 Y02T50/162

European: B64C23/06 F03D1/06B6 F03D1/06C F03D11/00 R05B240/122 R05B240/30 R05B250/081 Y02E10/72B Y02E10/72D Y02T50/16B

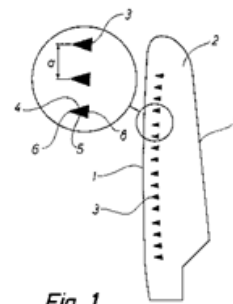


Fig. 1

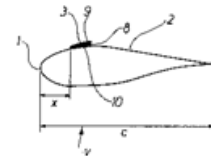


Fig. 2

Family:

Publication number	Publication date	Application number	Application date
AU199956180 A1	20000403	AU19990056180	19990916
AU199956180 A5	20000403	AU19990056180	19990916
WO0015961 A1	20000323	WO1999DK00490	19990916

Priority:

DK19980001167 19980916 WO1999DK00490 19990916

Probable Assignee: LM GLASFIBER AS**Assignee(s):** (std): GRABAU PETER ; LM GLASFIBER AS**Assignee(s):** LM GLASFIBER A S**Inventor(s):** (std): GRABAU PETER**Inventor(s):** PETER GRABAU

Designated states: AE AL AM AT AU AZ BA BB BE BF BG BJ BR BY CA CF CG CH CI CM CN CR CU CY CZ DE DK DM EE ES FI FR GA GB GD GE GH GM GN GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LK LR LS LT LU LV MC MD MG MK ML MN MR MW MX NE NL NO NZ PL PT RO RU SD SE SG SI SK SL SN SZ TD TG TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW

32) Family number: 58851381 (US2015090356A)

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Title: VORTEX GENERATORS

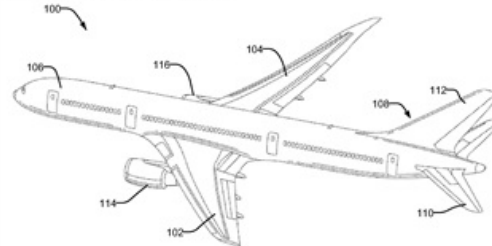
Abstract: Vortex generators are disclosed herein. An example apparatus includes a housing including a surface. The example apparatus also includes a bimorph actuator disposed in the housing. The bimorph actuator includes a first bimorph beam having a first portion fixed relative to the surface. A blade is rotatably coupled to the bimorph actuator, and the bimorph actuator is to rotate the blade to extend a portion of the blade through the surface to generate a vortex in a fluid flowing past the surface.

Classifications:

International (IPC 8-9): B64C21/00 B64C23/00 B64C23/06 F15D1/00 (Advanced/Invention)

CPC: F15D1/009 B64C23/005 B64C23/06 Y02T50/162 Y02T50/166 Y10T137/2087

US: 1/1 137/808

**Family:**

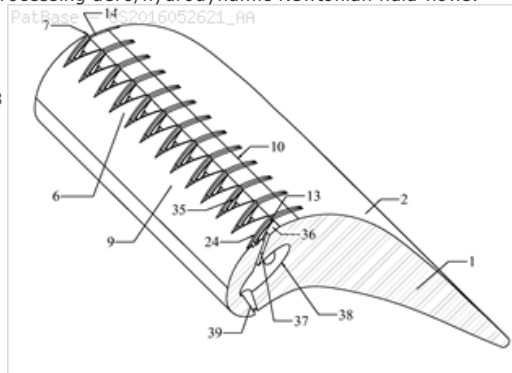
Publication number	Publication date	Application number	Application date
CN104512548 A	20150415	CN201410456956	20140909
CN104512548 B	20170412	CN201410456956	20140909
DE602014025133 D1	20180607	DE201460025133T	20140923
EP2853486 A1	20150401	EP20140185895	20140923
EP2853486 B1	20180509	EP20140185895	20140923
ES2682348 T3	20180920	ES20140185895T	20140923
US2015090356 AA	20150402	US20130042443	20130930
US9309903 BB	20160412	US20130042443	20130930

Priority:

US20130042443 20130930 EP20140185895 20140923

Probable Assignee: BOEING CO**Assignee(s):** (std): BOEING CO**Assignee(s):** BOEING CO CHICAGO**Inventor(s):** (std): CLINGMAN DAN JOHN ; DAN JOHN CLINGMAN ; ESTHER SHIFRA ZIDOVETZKI ; MALLARI RANDY LEE M ; MALLARI RANDY LEE MACARAEG ; RANDY LEE MACARAEG MALLARI ; ZIDOVETZKI ESTHER S ; CLINGMAN DAN J ; ZIDOVETZKI ESTHER SHIFRA**Inventor(s):** CLINGMAN DAN J CHICAGO ; ZIDOVETZKI ESTHER S CHICAGO ; MALLARI RANDY LEE M CHICAGO**Agent(s):** BOULT WADE TENNANT; CARPMAELS AND RANSFORD LLP; CARVAJAL Y ISABEL; HANLEY FLIGHT AND ZIMMERMAN LLC**Designated states:** AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR**33) Family number: 57053385 (US2016052621A)**

© PatBase

Title: ENERGY EFFICIENCY IMPROVEMENTS FOR TURBOMACHINERY**Abstract:** A method and apparatus are disclosed that allow Conformal Vortex Generator art to improve energy efficiency and control capabilities at many points in a turbomachine or device processing aero/hydrodynamic Newtonian fluid-flows.**Classifications:****International (IPC 8-9):** B64C23/06 F01D5/14 F01D5/18 F04D29/38 F04D29/68 F15D1/06 F23R3/14 (Advanced/Invention)
CPC: B64C21/04 F01D5/048 F01D5/148 F01D5/20 F02K1/34 F02K1/46 F04D29/281 F04D29/30 F04D29/324 F04D29/544 F23R3/18 Y02T50/166 F05D2240/35 B64C23/06 F01D5/145 F04D29/681 F04D29/684 F05D2240/121 F05D2240/122 F05D2240/303 F05D2240/304 F05D2250/183 Y02T50/162 Y02T50/672 Y02T50/673 F01D5/14 F04D29/38 F15D1/06 F23R3/14
US: 137/13 137/808**Family:**

Publication number	Publication date	Application number	Application date
AU2013375126 AA	20150813	AU20130375126	20130125
BR112015017808 A2	20170711	BR20151117808	20130125
CA2899238 AA	20150723	CA20132899238	20130125
CN105307931 A	20160203	CN201380071493	20130125
EP2948369 A1	20151202	EP20130873064	20130125
EP2948369 A4	20170118	EP20130873064	20130125
IN06881DN2015 A	20151211	IN2015DN06881	20150804
JP2016509651 T2	20160331	JP20150554259T	20130125
NZ710406 A	20171124	NZ20130710406	20130125
RU2015131056 A	20170228	RU20150131056	20130125
RU2642203 C2	20180124	RU20150131056	20130125
US2016052621 AA	20160225	US20130392056	20130125
WO14114988 A1	20140731	WO20131B50676	20130125

Priority:

US20090224481P 20090710 US20130392056 20130125 WO20131B50676 20130125

Probable Assignee: ANTHONY IRELAND**Assignee(s):** (std): ANTHONY IRELAND ; PETER IRELAND ; IRLAND PITER ; IRELAND PETER S ; IRELAND PETER ; IRELAND ANTHONY**Assignee(s):** IRLAND ENTONI**Inventor(s):** (std): ANTHONY IRELAND ; PETER IRELAND ; IRLAND PITER ; IRLAND ENTONI ; IRELAND PETER S ; IRELAND PETER ; IRELAND ANTHONY**Agent(s):** PHOENIX INTELLECTUAL PROPERTY; BERESKIN AND PARR LLP SENCRL SRL; EMMI MARIO; PATENTIKA; IRELAND ANTHONY**Designated states:** AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW**34) Family number: 58643386 (US2016215758A)**

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Title: VORTEX GENERATOR FOR A WIND TURBINE**Abstract:** A blade for a wind turbine having an airfoil with a thickness of at least 20 percent and in particular at least 25 percent including a vortex generator pair between chord wise position 20 percent c and 70 percent c, the vortex generator pair including 2 not directly connected fins and a base which interconnects the fins and where the fins are placed under opposite angles of attack. The fins are cambered by at least 1 percent in particular by at least 2 percent and more particularly by a least 3 percent of the fin chord. According to an embodiment the base of the vortex generator pair is W-shaped, the fins of a pair are designed to generate contra rotating vortices and the distance between the suction sides of the

fins is approximately 150 percent of that between the pressure sides and the trailing part of the fins is rounded so that non-concentrated vortices are generated.

Classifications:

International (IPC 8-9): B64C23/06 F03D1/06

F03D3/06 (Advanced/Invention);

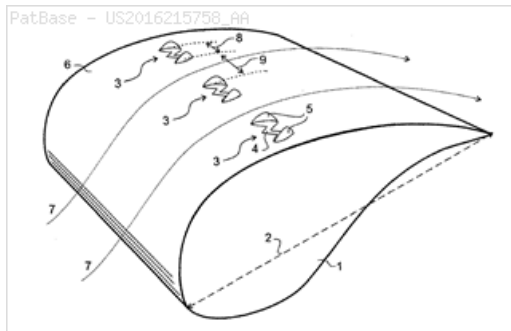
F03D1/00 (Core/Invention)

CPC: B64C23/06 B64C2230/26 F03D1/0675 F05B2240/122

F05B2240/30 Y02E10/721 Y02T50/162 Y02T50/166 F03D1/0633

F03D1/0641 F03D3/062

US: 1/1 416/236R



Family:

Publication number	Publication date	Application number	Application date
■ CN105556114 A	20160504	CN201480048464	20140901
■ CN105556114 B	20200605	CN201480048464	20140901
■ DK3042073 T3	20191014	DK20140792895T	20140901
■ EP3042073 A1	20160713	EP20140792895	20140901
■ EP3042073 B1	20190731	EP20140792895	20140901
■ EP3597902 A1	20200122	EP20190188811	20140901
■ ES2742414 T3	20200214	ES20140792895T	20140901
■ HR20191399 T1	20191115	HR20190001399	20190801
■ HU046566 T2	20200330	HU20140792895T	20140901
■ LT3042073 T	20191010	LT20140792895T	20140901
■ PL3042073 T3	20191231	PL20140792895T	20140901
■ PT3042073 T	20191030	PT20140792895T	20140901
■ RS59138 B1	20190930	RS20190001021	20140901
■ SI3042073 T1	20191231	SI20140031387T	20140901
■ TR201912478 T4	20191021	TR20190012478T	20140901
■ US2016215758 AA	20160728	US20140916040	20140901
■ US2020018285 AA	20200116	US20190558729	20190903
■ US10443562 BB	20191015	US20140916040	20140901
■ WO15030573 A1	20150305	WO2014NL00028	20140901

Priority:

NL20131040365 20130902

EP20140792895 20140901

WO2014NL00028 20140901

US20160916040 20160302

US20190558729 20190903

Probable Assignee: CORTENERGY BV

Assignee(s): (std): CORTEN GUSTAVE PAUL ; CORTEN HOLDING BV ; WOBLEN PROPERTIES GMBH

Assignee(s): CORTENERGY BV

Inventor(s): (std): CORTEN GUSTAVE PAUL ; GUSTAVE PAUL CORTEN

Agent(s): EISENFUEHR SPEISER; MARIA ROEB ROEB; CENK SEVINC; BROOKS KUSHMAN PC

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

35) Family number: 3879389 (US4418880A)

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Title: FLUID FLOW AUGMENTOR

Abstract: There is described a fluid flow concentrating device suitable, for example, for concentrating the flow of tidal waters or of wind, which comprises a hollow body closed at one end and open at the other. The body has a fixed circumferential wall composed of a plurality of fixed spaced vanes and a nozzle located at the open end of the wall. Fluid moving from outside the device through the vanes to the inside of the body creates a vortex within the body and a fluid flow axially of the body through the nozzle. In certain preferred embodiments a turbine is located for rotation in a direction opposite to the direction of rotation of the vortex about a vertical axis, centrally within the nozzle downstream of the fluid flow. The turbine can be used to drive a generator or a motor to, for example, propel a marine craft, or, the augmentor can be used on an aircraft to assist the lift of a wing, or, in another application, can be used with a jet turbine engine to improve both the intake to and the thrust from the engine.

Classifications:

International (IPC 8-9): B63H7/00 B64C11/00 B64C23/06

F03B13/26 F03D3/00 F03D9/00 (Advanced/Invention);

B63H7/00 B64C11/00 B64C23/00 F03B13/00 F03D3/00

F03D9/00 (Core/Invention)

International (IPC 1-7): B63H13/00 B64C23/06

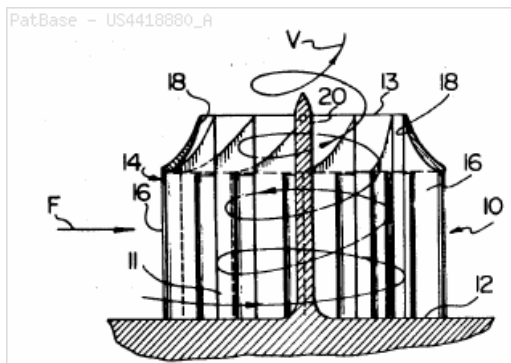
CPC: F03D3/00 B63H7/00 B64C11/006 B64C23/06 F03B13/264

Y02E10/28 Y02E10/74 Y02T50/162 F03D9/32 Y02E10/728

European: B63H7/00 B64C11/00G B64C23/06 F03B13/26C

F03D3/00 F03D9/00 Y02E10/28 Y02E10/72 Y02E10/74 Y02T50/16B

US: 239/127.3 239/265.11 244/12.1 244/199 244/199.1 244/23.00A 244/23A 244/53.00B 244/53B 415/3.1 416/191 440/8



Family:

Publication number	Publication date	Application number	Application date
US4418880 A	19831206	US19810325118	19811127

Priority:

US19810325118 19811127

Probable Assignee:

WAAL J F DE

Assignee(s): (std):

WAAL J F DE

Assignee(s):

DE WAAL J F

Inventor(s): (std):

DE WAAL J F

36) Family number: 20168409 (GB750305A)

© PatBase

Title: IMPROVEMENTS IN AXIAL-FLOW COMPRESSOR, TURBINE AND LIKE BLADES

Abstract: 750,305. Boundary layer control. ROLLSROYCE, Ltd. Feb. 5, 1954 [Feb. 5, 1953], No. 3339/53. Class 4. A blade 10 for an axial flow turbine or compressor is provided on one or both surfaces with a spanwise-extending continuous or intermittent recess 15 located chordally at a point or points upstream of the position at which the boundary layer would otherwise break away. The presence of the recess converts the laminar flow into turbulent flow to delay the breakaway.

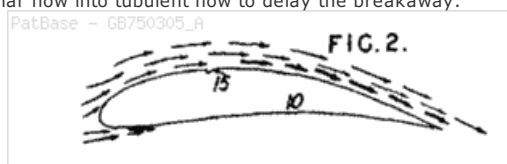
Classifications:

International (IPC 8-9): B64C23/06 F01D5/14 F04D29/32 F04D29/68 (Advanced/Invention);
B64C23/00 F01D5/14 F04D29/32 F04D29/66 (Core/Invention)

International (IPC 1-7): F04D29/68

CPC: B64C2230/08 B64C2230/24 B64C2230/28 B64C23/06 F01D5/145 F04D29/324 F04D29/681 Y02T50/162 Y02T50/166
European: B64C23/06 F01D5/14B3 F04D29/32B3 F04D29/68C Y02T50/16B Y02T50/16D

PatBase - GB750305_A

**Family:**

Publication number	Publication date	Application number	Application date
GB750305 A	19560613	GB19530003339	19530205

Priority:

GB19530003339 19530205

Probable Assignee:

ROLLS ROYCE

Assignee(s): (std):

ROLLS ROYCE

Assignee(s):

ROLLS ROYCE LIMITED ; ROLLS ROYCE LTD

Inventor(s): (std):

WHITEHEAD DENIS SWORD

37) Family number: 4234416 (US4955565A)

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Title: LOW DRAG SURFACE

Abstract: A low drag surface comprises at its upstream edge, an intermittent linear vortex producing means which extends transverse to the flow over the surface and produces a succession of rolling vortices extending transverse to said flow. The vortices move across the surface and reduce drag in the manner of roller bearings. In preferred embodiments the vortex producing means is mechanical, in the form of an oscillating part or fluid dynamic, in the form of a nozzle arrangement.

Classifications:

International (IPC 8-9): B64C23/06 (Advanced/Invention);
B64C23/00 (Core/Invention)

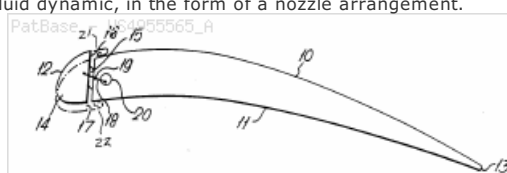
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CPC: B64C2230/04 B64C2230/06 B64C23/06 Y02T50/162 Y02T50/166 B64C2230/16

European: B64C23/06 Y02T50/16B Y02T50/16D

US: 244/130 244/199 244/204.1 244/207

PatBase - US4955565_A

**Family:**

Publication number	Publication date	Application number	Application date
US4955565 A	19900911	US19840662983	19840920

Priority:

US19840662983 19840920

Probable Assignee:

ROLLS ROYCE PLC

Assignee(s): (std):

ROLLS ROYCE PLC

Assignee(s):

ROLLS ROYCE A BRITISH CO LTD ; ROLLS ROYCE LTD

Inventor(s): (std):

COPLIN JOHN F

38) Family number: 8615419 (US5634613A)

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Title: TIP VORTEX GENERATION TECHNOLOGY FOR CREATING A LIFT ENHANCING AND DRAG REDUCING UPWASH EFFECT

Abstract: Methods for using tip generated vortices to improve performance of foils. These methods include generating a substantially streamwise beneficial vortex (74) near the outboard end (60) of a foil (82). This beneficial vortex (74) spins in the opposite direction of an induced drag vortex (62), and is used to create an upwash field (76) which neutralizes induced drag by deflecting the flow behind the trailing edge (56) at an upward angle. Upwash field (76) causes the lift vector (118) on the foil (82) to tilt forward, thereby creating a forward directed force of induced thrust upon the foil (82). Beneficial vortex (74) is also used to contain and compress the high pressure field existing along the attacking surface of the foil (82), and

displace the induced drag vortex (62) inboard from the tip of the foil (82). Numerous performance parameters are improved dramatically by using beneficial vortex (74), as well as by using a double vortex pattern (124). Methods for creating, using, and controlling these vortex patterns are offered along with a variety of embodiments for employing such methods.

Described embodiments include a twist (66) along the span of a foil (82b), an anhedral tip droop having a divergent axis of droop curvature (86), a movable vortex flap (102), a cone shaped vortex generator (134), a curved outboard droop (146), and a vortex flap network (162). Methods are also disclosed for reducing overall tip vorticity.

Classifications:

International (IPC 8-9): B64C23/06 B64C3/10

F15D1/10 (Advanced/Invention);

B64C23/00 B64C3/00 (Core/Invention)

International (IPC 1-7): B64C21/00 B64C23/00 B64C23/06

B64C3/00 B64C3/10 B64C3/14 B64C3/38 B64C5/08 B64C9/06

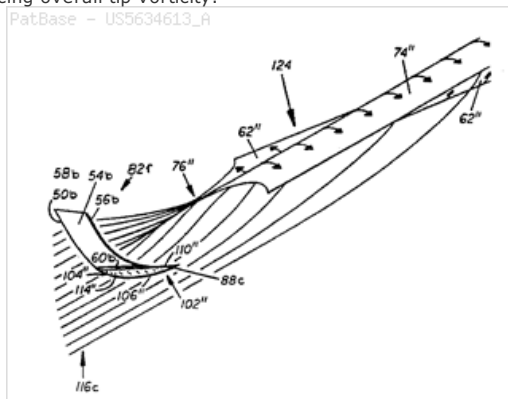
F15D1/10

CPC: Y02T50/164 B64C23/06 B64C23/069 Y02T50/162

European: B64C23/06 B64C23/06A Y02T50/16B Y02T50/16B2

US: 244/130 244/198 244/199 244/199.1 244/199.2 244/204

244/212 244/215 244/219 244/35.00R 244/35R 244/46



Family:

Publication number	Publication date	Application number	Application date
AT308457 E	20051115	AT19950927254T	19950718
AU199531342 A1	19960222	AU19950031342	19950718
AU710239 B2	19990916	AU19950031342	19950718
CA2195413 AA	19970117	CA19952195413	19950718
CA2195413 C	20051025	CA19952195413	19950718
DE69534567 D1	20051208	DE19956034567	19950718
DE69534567 D1	20051208	DE19956034567T	19950718
EP0772544 A2	19970514	EP19950927254	19950718
EP0772544 A3	19991222	EP19950927254	19950718
EP0772544 A4	20020529	EP19950927254	19950718
EP0772544 B1	20051102	EP19950927254	19950718
EP1645506 A2	20060412	EP20050022365	19950718
JP10503140 T2	19980324	JP19960505829T	19950718
MX9700525 A1	19980531	MX19970000525	19950718
US5634613 A	19970603	US19940276407	19940718
WO9603215 A2	19960208	WO1995US09051	19950718
WO9603215 A3	19960509	WO1995US09051	19950718

Priority:

US19940276407 19940718

EP19950927254 19950718

WO1995US09051 19950718

Probable Assignee: MCCARTHY PETER THOMAS

Assignee(s): (std): MCCARTHY PETER T ; MCCARTHY PETER THOMAS ; PETER THOMAS MCCARTHY

Inventor(s): (std): MCCARTHY PETER THOMAS ; MCCARTHY PETER T

Inventor(s): PETER THOMAS MCCARTHY

Agent(s): DAVIES COLLISON CAVE; DAVIES COLLISON CAVE PTY LTD; SMART AND BIGGAR

Designated states: AM AT AU BB BE BF BG BJ BR BY CA CF CG CH CI CM CN CZ DE DK EE ES FI FR GA GB GE GN GR HU IE IT JP KE KG KP KR KZ LI LR LT LU LV MC MD MG ML MN MR MW MX NE NL NO NZ PL PT RO RU SD SE SI SK SN SZ TD TG TJ TT UA UG US UZ VN

39) Family number: 68496424 (US2018038342A)

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Title: VORTEX GENERATORS FOR WIND TURBINE ROTOR BLADES

Abstract: The present disclosure is directed to a vortex generator configured for mounting to either of a suction side or a pressure side of a rotor blade. The vortex generator includes a base portion having a contour in an uninstalled state that substantially aligns with or conforms to a contour of a plurality of locations of either on the suction side or the pressure side of the rotor blade. Further, the vortex generator includes a protrusion member extending upwardly from the base portion. The protrusion member includes a plurality of tines separated by at least one slit. Moreover, the base portion and the protrusion member are constructed of a rigid material. In addition, the vortex generator includes a flexible coating material configured at least partially around the base portion and/or within or around the at least one slit.

Classifications:

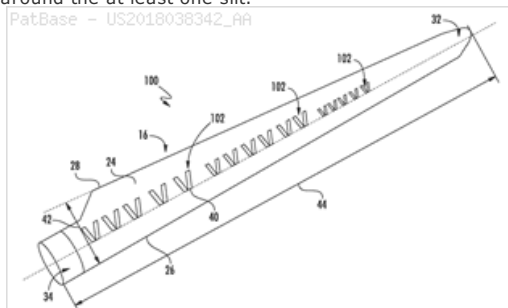
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CPC: B64C23/06 F03D1/0608 F03D1/0675 F05B2230/50

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F03D1/0641

US: 1/1 416/235



Family:

Publication number	Publication date	Application number	Application date
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EP3279467 A1	20180207	EP20170181222	20170713
US2018038342 AA	20180208	US20160229295	20160805

Priority:

US20160229295 20160805

Probable Assignee: GENERAL ELECTRIC CO

Assignee(s): (std): GEN ELECTRIC

Assignee(s): GENERAL ELECTRIC CO

Inventor(s): (std): ALTHOFF NICHOLAS KEANE ; JOHNSON STEPHEN BERTRAM ; TOBIN JAMES ROBERT ; VOSSLER ALEXANDER WILLIAM

Agent(s): BEDFORD GRANT RICHARD

Designated states: AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR

40) Family number: 15289430 (US6371414B)

© PatBase

Title: SYSTEM AND METHOD FOR MANIPULATING AND CONTROLLING FLUID FLOW OVER A SURFACE

Abstract: The present invention provides a system and method for actively manipulating and controlling aerodynamic or hydrodynamic fluid flow over a surface. More specifically, the present invention provides a system and method to control aerodynamic or hydrodynamic fluid flow behavior of a ducted fluid flow using very-small-scale effectors. The system and method for actively manipulating and controlling fluid flow over a surface includes the placement of arrays of very-small-scale effectors on ducted surfaces bounding the ducted fluid flow. These very-small-scale effectors actively manipulated the boundary layer manipulated to control the flow behavior of the ducted fluid flow and suppress or prevent flow separation within the primary fluid flow.

Classifications:

International (IPC 8-9): B64C23/06 F01D17/08 F01D5/14 F15C5/00 F15D1/04 F15D1/06 F16K99/00 (Advanced/Invention); B64C23/00 F01D17/00 F01D5/14 F15C5/00 F15D1/00 F16K99/00 (Core/Invention)

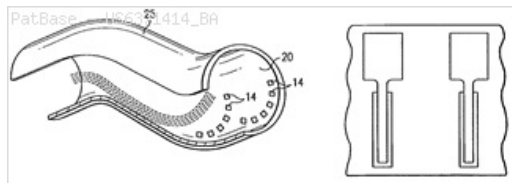
International (IPC 1-7): B64C1/38 B64C2/100 B64C21/00 B64D33/02 F02C7/04 F15C5/00 F15D1/04 F15D1/06

CPC: F05D2220/20 F05D2240/40 F05D2260/2212 F16K99/0001 B64C23/06 F01D5/145 F01D17/08 F05D2270/17 F15C5/00

F15D1/0025 F15D1/04 F15D1/06 F16K99/0021 F16K99/0059 F16K99/0061 Y02T50/162 Y02T50/673 Y02T50/675

European: B64C23/06 F01D17/08 F01D5/14B3 F15C5/00 F15D1/00E2 F15D1/04 F15D1/06 F16K99/00M F16K99/00M2H F16K99/00M4D4 F16K99/00M4D6 R05B220/20 R05B240/40 R05B260/222 R05D270/17 Y02T50/16B Y02T50/16D Y02T50/67D Y02T50/67F

US: 138/38 244/199 244/201 244/203 244/204 244/204.1 244/53.00B 244/53B



Family:

Publication number	Publication date	Application number	Application date
AU200062172 A1	20010205	AU20000062172	20000714
AU200062172 A5	20010205	AU20000062172	20000714
EP1198675 A1	20020424	EP20000948708	20000714
US6371414 BA	20020416	US19990354866	19990716
US6682021 BA	20040127	US20020117706	20020405
WO0106134 A1	20010125	WO2000US19400	20000714

Priority:

US19990354866 19990716

WO2000US19400 20000714

US20020117706 20020405

Probable Assignee: LOCKHEED MARTIN CORP

Assignee(s): (std): HAMSTRA JEFFREY W ; LOCKHEED CORP ; MILLER DANIEL N ; TRUAX PHILIP P ; YAGLE PATRICK J

Assignee(s): LOCKHEED MARITN CORP ; LOCKHEED MARTIN CORP

Inventor(s): (std): TRUAX PHILIP P ; MILLER DANIEL N ; HAMSTRA JEFFREY W ; YAGLE PATRICK J

Inventor(s): DANIEL N MILLER ; JEFFREY W HAMSTRA ; PATRICK J YAGLE ; PHILIP P TRUAX

Agent(s): WILLIAM N HULSEY III; HUGHES AND LUCE LLP

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BY BZ CA CF CG CH CI CM CN CR CU CY CZ DE DK DM DZ EE ES FI FR GA GB GD GE GH GM GN GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LI LK LR LS LT LU LV MA MC MD ME MG ML MN MR MW MX NZ NE NL NO NZ PL PT RO RU SD SE SG SI SK SL SN SZ TD TG TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW

41) Family number: 71786430 (EP3398852A1)

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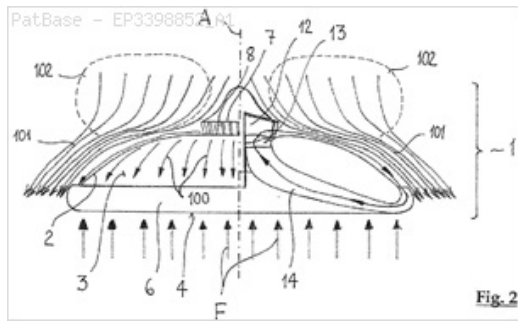
Title: METHOD AND DEVICE FOR CREATING A LIFTING FORCE ON A WING-DISC TRANSPORT APPARATUS PROCEDE ET DISPOSITIF POUR CREER UNE FORCE DE LEVAGE SUR UN APPAREIL DE TRANSPORT D'AILE-DISQUE

Abstract: There is described a method for creating a lifting force on a wing-disc transport apparatus, which transport apparatus comprises a generally lentiform structure (2) having a convexly shaped upper surface (3). The lentiform structure (2) further comprises a means (12, 13) for accelerating a fluid medium, which is taken in from the environment surrounding the wing-disc transport apparatus (1), and after acceleration is expelled through at least one outlet openings (8) into the surrounding environment. In accordance with the invention the accelerated fluid medium (100) is expelled through at least one outlet opening (8) which is positioned above the convex upper surface (8) of the lentiform structure (2), and is transported along the convex surface (3) in a vortex. There is also described a device for creating a lifting force on a wing-disc transport apparatus in accordance with the described method.

Classifications:

International (IPC 8-9): B64C1/00 B64C23/06 B64C29/02 B64C29/04 B64C39/00 B64D17/80 (Advanced/Invention)

CPC: B64C39/001 B64C1/0009 B64C23/06 B64C29/02 B64C39/024 B64C39/064 B64C2201/02 B64C2201/10 B64C2201/145 B64C2201/162 B64D17/80



Family:

Publication number	Publication date	Application number	Application date
EP3398852 A1	20181107	EP20170168884	20170501

Priority:

EP20170168884 20170501

Probable Assignee: ECOTECH ENGINES AG

Assignee(s): (std): ECOTECH ENGINES AG

Inventor(s): (std): NOSKOV ALEXANDER VICTOROVICH ; IGNATENKO ARTEM PAVLOVICH

Agent(s): BOHEST BRANCH OSTSCHEWIZ AG

Designated states: AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR

42) Family number: 22155447 (US2650752A)

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Title: BOUNDARY LAYER CONTROL IN BLOWERS

Abstract: (Claim 1) 1. Fig- 6 is therefore indicative of the fact that the total energy of the entire main stream remains substantially constant and that the energy of the boundary layer portion is increased while the energy of the remaining stream is decreased slightly as shown by the shaded area BI.

Classifications:

International (IPC 8-9): B64C23/06 F04D21/00 F04D29/54 F04D29/68 (Advanced/Invention);

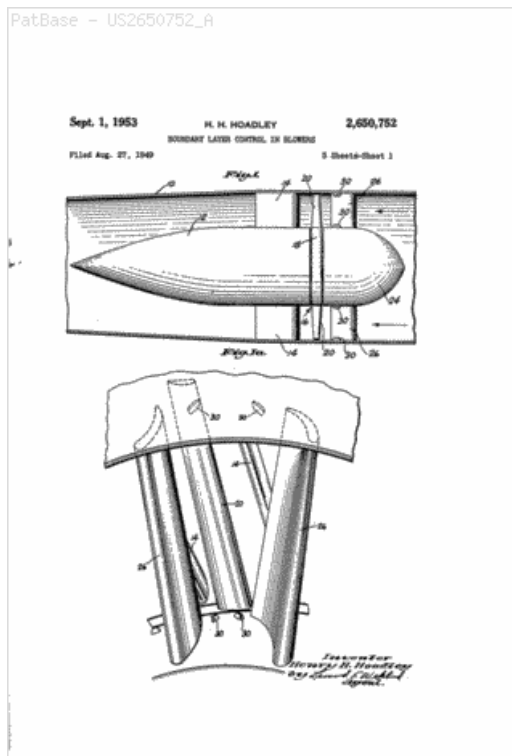
B64C23/00 F04D21/00 F04D29/40 F04D29/66 (Core/Invention)

International (IPC 1-7): G01M9/00

CPC: Y10S415/914 F04D21/00 B64C23/06 F04D29/541 F04D29/681 Y02T50/162

European: B64C23/06 F04D21/00 F04D29/54C F04D29/68C Y02T50/16B

US: 138/37 244/130 244/200.1 415/194 415/195 415/207 415/208.2 415/210.1 415/914 416/236.00A 416/236A 416/245.00A 416/245A



Family:

Publication number	Publication date	Application number	Application date
US2650752 A	19530901	US19490112723	19490827

Priority:

US19490112723 19490827

Probable Assignee: UNITED AIRCRAFT CORP

Assignee(s): (std): UNITED AIRCRAFT CORP

Inventor(s): (std): HOADLEY HENRY H

43) Family number: 33688454 (US2006254254A)

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Abstract: The present invention provides a pulse detonation insert that induces flow obstructions within the pulse detonation chambers, wherein the flow obstructions are operable to induce turbulence within a primary fluid flow passing over the obstructions. This turbulence may take the form of vortices that enhance the mixing of the oxidizer and fuel within the primary flow. Additionally, supports couple to the pulse detonation chamber walls and flow obstructions to hold the flow obstructions in place within the pulse detonation chamber. The combustion/Detonation of the mixed oxidizing fuel results in an increased velocity of the primary flow exiting the pulse detonation chamber and reduced the amount of unburnt fuel within the exhaust.

Classifications:

International (IPC 8-9): F02C5/02 F02K7/00

F02K7/02 (Advanced/Invention);

F02C5/00 F02K7/00 (Core/Invention)

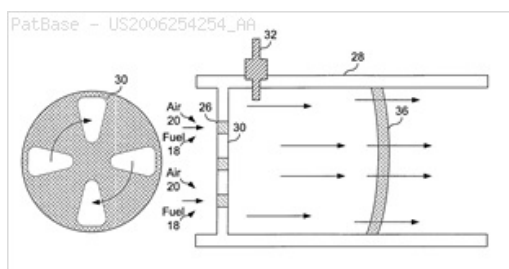
CPC: B64C2230/18 F02K7/02 B64C23/06 F02C5/00 F02K1/28

F02K1/30 F02K7/06 Y02T50/162 Y02T50/166

European: B64C23/06 F02C5/00 F02K1/28 F02K1/30 F02K7/02

F02K7/06 Y02T50/16B Y02T50/16D

US: 60/204 60/204P 60/224 60/247 60/247S 60/39.38 60/39.76



Family:

Publication number	Publication date	Application number	Application date
US2006254254 AA	20061116	US20050127459	20050512
US7520123 BB	20090421	US20050127459	20050512

Priority:

US20050127459 20050512

Probable Assignee: LOCKHEED MARTIN CORP

Assignee(s): (std): BOESPFLUG MATTHEW ; LOCKHEED CORP ; PINARD PIERRE ; SADDOUGH SEYED ; STEENBURGH DENNIS

Assignee(s): LOCKHEED MARTIN CORP ; GENERAL ELECTRIC CO

Inventor(s): (std): PINARD PIERRE ; STEENBURGH DENNIS ; BOESPFLUG MATTHEW ; SADDOUGH SEYED

Agent(s): ROBERT A MCLAUCHLAN; BRACEWELL AND GIULIANI LLP

44) Family number: 68500461 (US2018162521A)

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Title: METHOD OF PREVENTING SEPARATION OF A FLUID FLOW AND FLOW BODY SYSTEM

Abstract: A method of preventing separation of a fluid flow flowing over a flow surface is described. The method includes generating longitudinal vortices for suppressing or delaying separation of the flow, and enhancing the longitudinal vortices. A flow body system having a flow body and a flow control arrangement is further described.

Classifications:

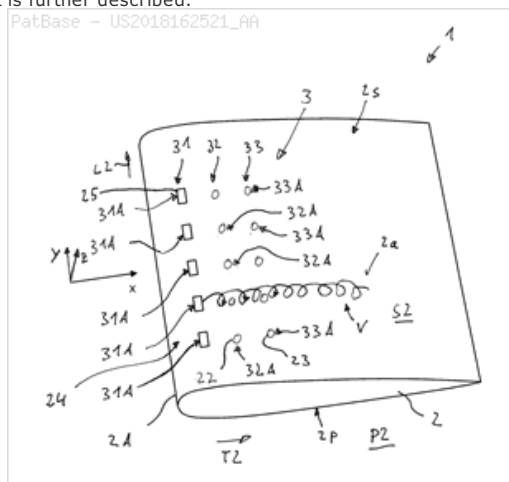
International (IPC 8-9): B64C21/02 B64C21/04 B64C23/06

F15D1/00 F15D1/12 (Advanced/Invention)

CPC: F15D1/0055 B64C21/02 F15D1/002 B64C21/04 B64C23/06

F15D1/004 F15D1/008 F15D1/12 Y02T50/162

US: 1/1 244/204.1



Family:

Publication number	Publication date	Application number	Application date
DE102016224889 A1	20180614	DE201610224889	20161214
DE102016224889 B4	20191107	DE201610224889	20161214
GB201720760 A0	20180124	GB20170020760	20171213
GB2559844 A1	20180822	GB20170020760	20171213
US2018162521 AA	20180614	US20170840546	20171213

Priority:

DE201610224889 20161214

Probable Assignee: AIRBUS DEFENCE AND SPACE GMBH

Assignee(s): (std): AIRBUS DEFENCE AND SPACE GMBH

Inventor(s): (std): LANGENBACHER PETER ; MEYER MICHAEL ; STORM STEFAN ; STEFAN STORM ; PETER LANGENBACHER ; MICHAEL MEYER

Agent(s): ISARPATENT PATENT U RECHTSANWAELTE BEHNISCH BARTH CHARLES HASSA PECKMANN AND PARTNER MBB

Title: ENGINE NACELLE**Abstract:** A nacelle for a gas turbine jet engine for an aircraft includes flow disruptors to provide boundary layer turbulence when the engine is exposed to air flow that is obtuse to direction of travel of the engine.**Classifications:****International (IPC 8-9):** B64C23/06 B64D29/06 B64D33/02

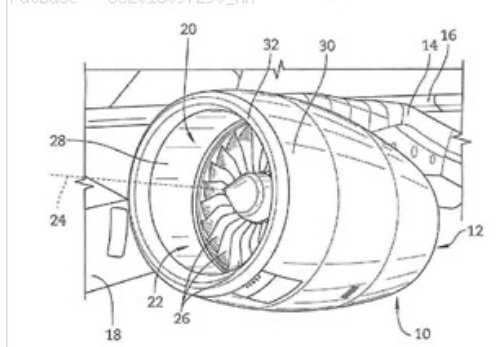
F01D25/24 F01D9/00 (Advanced/Invention)

CPC: B64C23/06 B64D33/02 B64D2033/0226 Y02T50/162

B64D29/06 F01D9/00 F01D25/24 F05D2220/323 F05D2240/127

US: 415/182.1

PatBase - US2016097290_AA

**Family:**

Publication number	Publication date	Application number	Application date
DE602015043759 D1	20200109	DE201560043759T	20150903
EP3002210 A1	20160406	EP20150183778	20150903
EP3002210 B1	20191218	EP20150183778	20150903
US2016097290 AA	20160407	US20150839315	20150828
US10072511 BB	20180911	US20150839315	20150828

Priority:

US20140058876P 20141002 US20150839315 20150828 EP20150183778 20150903

Probable Assignee: ROLLS ROYCE CORP**Assignee(s):** (std): ROLLS ROYCE NAM TECH INC ; ROLLS ROYCE NORTH AMERICAN TECH INC ; ROLLS ROYCE CORP**Assignee(s):** ROLLS ROYCE INDIANAPOLIS CORP ; ROLLS ROYCE NORTH AMERICAN TECHNOLOGIES INC ; ROLLS ROYCE NORTH AMERICAN TECHNOLOGIES INC INDIANAPOLIS**Inventor(s):** (std): FULAYTER ROY D ; FULAYTER ROY DAVID ; SMITH CRAWFORD F ; SMITH III CRAWFORD F**Inventor(s):** SMITH III CRAWFORD F CARMEL ; FULAYTER ROY DAVID AVON**Agent(s):** DAUNCEY MARK PETER; BARNES AND THORNBURG LLP**Designated states:** AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR**Title:** Vortex suppression for an eductor**Abstract:** A vortex suppressing flow eductor apparatus having a vortex filament producing flow eductor is provided with corresponding vortex destroying plates positioned and extending sufficiently downstream from a point within educted flow and deep enough into the vortex filament so as to essentially destroy the vortex filament. A particular embodiment provides a freestream sensor scoop, for use in an aircraft gas turbine engine inlet, having an eductor diffusing channel and a fairing surrounding a forward portion of the diffusing channel. A sensor supporting mast is provided for helping to measure freestream air characteristics. Vortex destroying plates are provided for suppressing vortex filaments generated by the channel, fairing, and mast.**Classifications:****International (IPC 8-9):** B64C21/00 B64C23/06 F01D21/00

F02C7/00 F02C7/04 F15D1/00 G01M15/04 G01M9/00

G01N1/20 (Advanced/Invention);

B64C21/00 B64C23/00 F01D21/00 F02C7/00 F02C7/04 G01M15/04

G01M9/00 G01N1/20 (Core/Invention)

International (IPC 1-7): B64C21/00 B64C23/06 F01D21/00

F02C7/00 F02C7/04 F15D1/00 G01M15/00 G01M9/00 G01N1/20

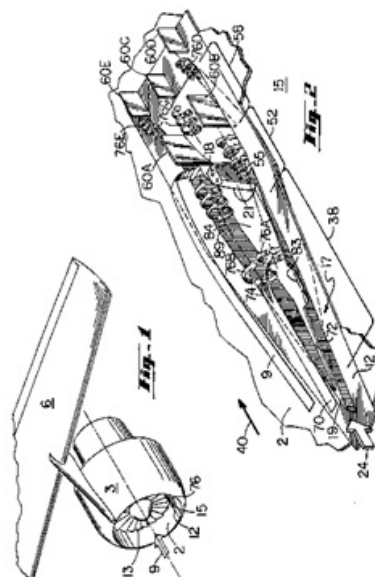
CPC: B64C21/00 B64C23/06 F01D21/003 F02C7/04 Y02T50/162

Y02T50/166

European: B64C21/00 B64C23/06 F01D21/00B F02C7/04

Y02T50/16B Y02T50/16D

US: 181/215 181/220 73/863.41 73/863.43

**Family:**

Publication number	Publication date	Application number	Application date
CA2068110 AA	19921214	CA19922068110	19920507
EP0518592 A1	19921216	EP19920305228	19920608
JP5187960 A2	19930727	JP19920137365	19920529
US5517865 A	19960521	US19910714807	19910613

Priority:

US19910714807 19910613 CA19922068110 19920507

Probable Assignee: GEN ELECTRIC

Assignee(s): (std): GEN ELECTRIC

Assignee(s): GENERAL ELECTRIC CO ; GENERAL ELECTRIC CO A NEW YORK CORP ; GENERAL ELECTRIC COMPANY ; WISLER DAVID C ; SHIN HYOUN WOO

Inventor(s): (std): SHIN HYOUN WOO ; WISLER DAVID CHARLES ; WISLER DAVID C ; HIYOUNNUU SHIN ; DEBITSUTO CHIYAARUSU UISURAA

Agent(s): CRAIG WILSON AND CO

Designated states: DE FR GB IT

47) Family number: 3885481 (US5156362A)

© PatBase

Title: JET ENGINE FAN NACELLE

Abstract: A jet engine fan nacelle which maintains attached flow during engine windmilling. The nacelle includes a cylindrical airfoil body having an inner surface. A plurality of vortex generators are positioned on the inner surface between the nacelle body's leading edge and its throat within ninety degrees of rotation from the crown line hilite about the nacelle's longitudinal axis. The vortex generators energize the airflow to maintain an attached flow around the leading edge and along the outer surface of the nacelle's body without separating from the outer surface which would produce an undesirable increase in drag.

Classifications:

International (IPC 8-9): B64C23/06 B64D29/00

B64D33/02 (Advanced/Invention);

B64C23/00 B64D29/00 B64D33/00 (Core/Invention)

International (IPC 1-7): B64C23/06 B64D29/00

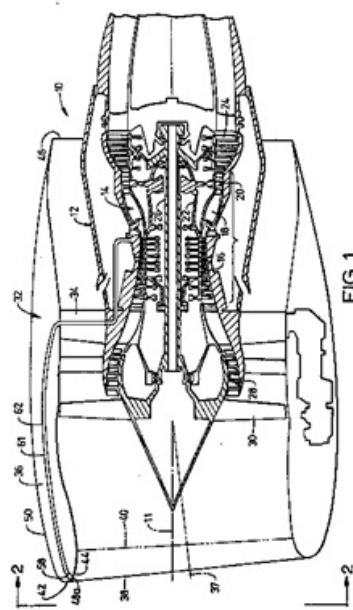
CPC: B64C23/06 B64D29/00 B64D33/02 B64D2033/0226

Y02T50/162

European: B64C23/06 B64D29/00 B64D33/02 L64D33/02D

Y02T50/16B

US: 244/130 244/199 244/200.1 244/53.00B 244/53B

**Family:**

Publication number	Publication date	Application number	Application date
CA2065637 AA	19921201	CA19922065637	19920409
EP0516468 A2	19921202	EP19920304944	19920529
EP0516468 A3	19930908	EP19920304944	19920529
US5156362 A	19921020	US19910708330	19910531

Priority:

US19910708330 19910531 CA19922065637 19920409

Probable Assignee: GEN ELECTRIC

Assignee(s): (std): GEN ELECTRIC ; LEON ROSS M

Assignee(s): GENERAL ELECTRIC CO ; GENERAL ELECTRIC COMPANY

Inventor(s): (std): LEON ROSS M ; LEON ROSS MICHAEL

Agent(s): CRAIG WILSON AND CO

Designated states: DE FR GB IT

48) Family number: 61253491 (US2017137116A)

© PatBase

Title: EFFICIENCY IMPROVEMENTS FOR FLOW CONTROL BODY AND SYSTEM SHOCKS

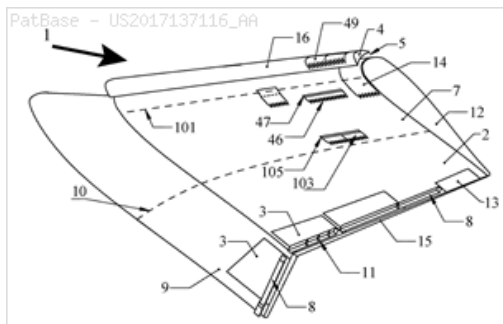
Abstract: Methods and related apparatus embodiments are disclosed that allow novel Conformal Vortex Generator and/or Elastomeric Vortex Generator art to improve energy efficiency and control capabilities at many surface points of a body or object moving at speed in aero/hydrodynamic Newtonian fluids, by reducing; shock energy losses, surface flow turbulence, and/or momentum layer thicknesses.

Classifications:

International (IPC 8-9): B64C21/10 B64C23/06 B64F5/60 F01D5/14 F01D9/02 F04D27/00 F04D29/32 F04D29/54 F23R3/00 (Advanced/Invention)

CPC: B64C21/10 B64C3/10 B64C2230/26 Y02T50/12 Y02T50/166 B64C23/06 F04D29/324 F04D29/542 F23R3/002 F04D29/681 F01D5/145 F01D5/147 F05D2240/127 F05D2250/182 F05D2250/183 Y02T50/162 Y02T50/672 Y02T50/673 F15D1/003 F15D1/12

US: 1/1 244/200.1

**Family:**

Publication number	Publication date	Application number	Application date
US2017137116 AA	20170518	US20140319807	20140624
WO15198093 A1	20151230	WO20141B62549	20140624

Priority:

US20090224481P 20090710 WO20141B62549 20140624

Probable Assignee: IRELAND ANTHONY

Assignee(s): (std): IRELAND ANTHONY ; IRELAND PETER

Inventor(s): (std): IRELAND ANTHONY ; IRELAND PETER

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

49) Family number: 77404507 (US2020025072A)

© PatBase

Title: ANTI-ICE SYSTEM EXHAUST AIR DISRUPTOR

Abstract: An airflow disruptor for a gas turbine engine bleed air exhaust port employs a disruptor plate rotatably mounted upstream from an exhaust port of an exhaust duct. An actuator is coupled to the disruptor plate and adapted to rotate the disruptor plate into an external airflow responsive to temperature of exhaust flow in the exhaust port whereby the external airflow is turbulated upstream of the exhaust port.

Classifications:

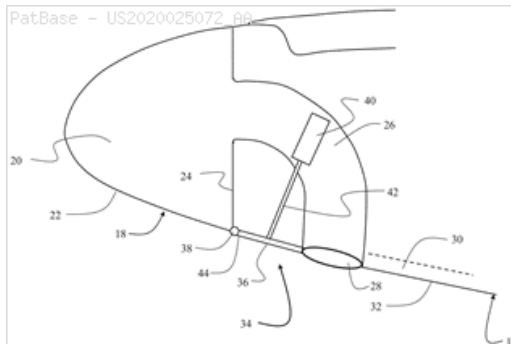
International (IPC 8-9): B64C23/06 B64D15/00 B64D15/04

B64D15/20 F01D17/10 F01D25/02 F02C6/08

F02C9/18 (Advanced/Invention);

B64C7/00 B64D33/02 (Advanced/Non-invention)

CPC: B64C7/00 B64C23/06 B64D15/04 B64D2033/0233 F02C6/08 F01D17/105 F01D25/02 F02C9/18 B64D15/00 B64D15/20



Family:

Publication number	Publication date	Application number	Application date
■ CN110733647 A	20200131	CN201910573541	20190628
■ EP3597540 A1	20200122	EP20190172886	20190507
■ JP2020033001 A2	20200305	JP20190131521	20190717
■ US2020025072 AA	20200123	US20180038550	20180718

Priority:

US20180038550 20180718 JP20190131521 20190717

Probable Assignee: BOEING CO

Assignee(s): (std): BOEING CO

Inventor(s): (std): KIMBERLY A MILLER ; MACKIN STEVE G ; MILLER KIMBERLY A ; STEVE G MACKIN

Agent(s): WITTE WELLER AND PARTNER PATENTANWALTE MBB

Designated states: AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR

50) Family number: 34729523 (US2009314898A)

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Title: DEVICES AND METHODS TO IMPROVE WING AERODYNAMICS AT LOW AIRSPEEDS

Abstract: Aircraft wings are provided with aerodynamic devices that improve the wing's low airspeed aerodynamics. In preferred embodiments, the aircraft wings include a slat operatively positioned at the wing's leading edge for movement between a retracted position for relatively high airspeed aircraft operations, and a deployed position for relatively low airspeed aircraft operations. An aerodynamic device is positionally fixed to the wing laterally adjacent the leading edge slat, the device having a forward end extending forwardly of the wing leading edge. The device is operable in response to movement of the slat into the deployed position thereof so as to improve the aerodynamics of the wing at low airspeed aircraft operations, but provides substantially no aerodynamic improvement when the slat is in the retracted position thereof during high airspeed aircraft operations.

Classifications:

International (IPC 8-9): B64C21/00 B64C23/06 B64C3/00 B64C3/50

B64C3/58 B64C7/02 B64C9/00 B64C9/24 (Advanced/Invention);

B64C21/00 B64C23/00 B64C3/00 B64C9/00 (Core/Invention)

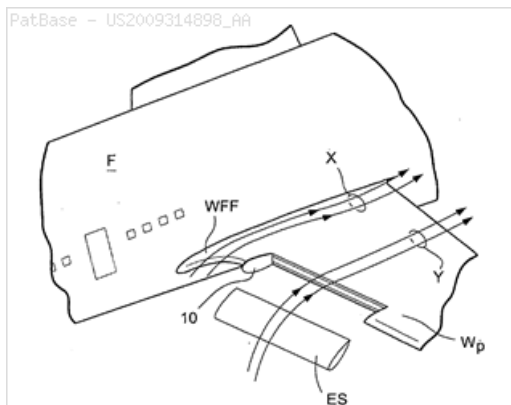
CPC: B64C3/58 B64C7/02 B64C9/24 B64C23/06 Y02T50/162

Y02T50/32

European: B64C23/06 B64C3/58 B64C7/02 B64C9/24 Y02T50/16B

Y02T50/32

US: 244/199.1 244/204.1 244/214 244/214P



Family:

Publication number	Publication date	Application number	Application date
■ BRPI0603262 A	20070515	BR2006PI03262	20060808
■ EP2051906 A2	20090429	EP20070784931	20070808
■ EP2051906 A4	20130605	EP20070784931	20070808

EP2051906 B1	20180919	EP20070784931	20070808
US2009314898 AA	20091224	US20090367059	20090206
US8118265 BB	20120221	US20090367059	20090206
WO08017134 A2	20080214	WO2007BR00202	20070808
WO08017134 A3	20090402	WO2007BR00202	20070808

Priority:

BR20060603262 20060808 BR2006PI03262 20060808 WO2007BR00202 20070808

Probable Assignee: EMBRAER SA

Assignee(s): (std): EMBRAER AERONAUTICA SA ; DE AREAL SOUTO FERRARI MARCELL ; FERRARI MARCELLO DO AREAL SOUTO ; EMBRAER SA ; EMBRAER S A

Assignee(s): EMBRAER EMPRESA BRASILEIRA DE AERONAUTICA S A ; DE AREAL SOUTO FERRARI MARCELLO ; EMBRAER EMPRESA BRASILEIRA DE AERONAUTICA SA ; SCHAEFFLER KG ; YABORA INDUSTRIA AERONAUTICA SA

Inventor(s): (std): FERRARI MARCELLO DO AREAL SOUT ; MARCELLO DO AREAL SOUTO FERRARI ; FERRARI MARCELLO DO AREAL SOUTO ; DE AREAL SOUTO FERRARI MARCELLO ; DE AREAL SOUTO FERRARI MARCELL ; DO AREAL SOUTO FERRARI MARCELLO ; DO AREAL SOUTO FERRARI MARCELL

Agent(s): PROPI SL; LIESEGANG EVA; NIXON AND VANDERHYE PC; GIACCHETTA ANDRE ZONARO

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SV SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

51) Family number: 5233537 (US4648571A)

© PatBase

Title: Transverse thrust lift augmentation system

Abstract: Disclosed is a propulsive lift mechanism which improves the short takeoff and landing capabilities of an aircraft by generating transverse thrust lift augmentation by exhausting gasses ported from the main exhaust through a nozzle, close behind and parallel with the trailing edges of the wings of the aircraft, which transverse jet together with thrust vectoring means of the aircraft, provide improved aerodynamic lift on the wings of the aircraft. The transverse nozzle, having means adjustable for creating reverse thrust, and optionally for discharging said exhaust gasses with a swirling motion, may provide both increased circulation of air over the wings as well as improved flow separation control on the trailing edge flaps of the wings. Exhaust gas from the jet engine of the aircraft is ported to the transverse nozzles by flap valves operating in the exhaust of the jet engine.

Classifications:

International (IPC 8-9): B64C23/06 B64C9/38 (Advanced/Invention)

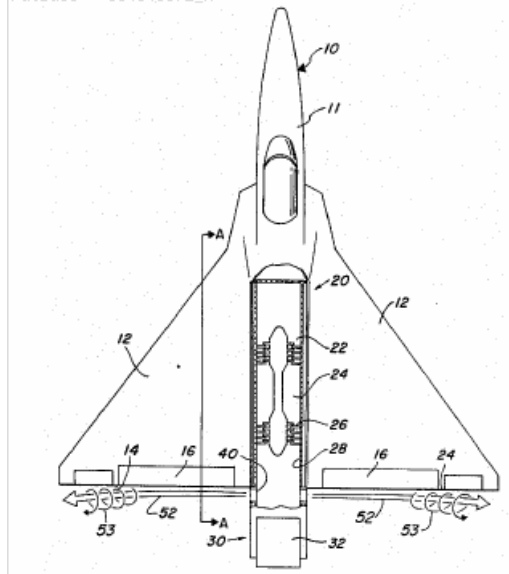
International (IPC 1-7): B64C21/04 B64C23/06

CPC: B64C9/38 B64C23/06 Y02T50/162 Y02T50/32

European: B64C23/06 B64C9/38 Y02T50/16B Y02T50/32

US: 244/199.1 244/207 D12/335

PatBase - US4648571_A



Family:

Publication number	Publication date	Application number	Application date
US4648571 A	19870310	US19840632374	19840719

Priority:

US19840632374 19840719

Probable Assignee: NORTHROP CORP

Assignee(s): (std): NORTHROP CORP

Assignee(s): NORTHROP A CA CORP CORP

Inventor(s): (std): GERHARDT HEINZ A

52) Family number: 71974543 (US2018334249A)

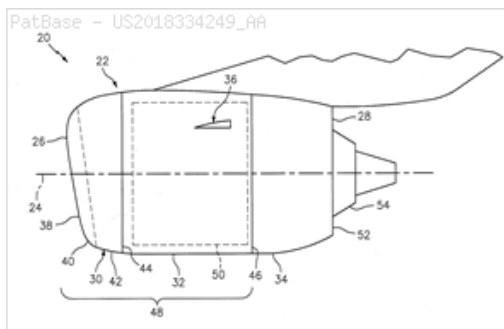
© PatBase

Title: STRAKE FOR AIRCRAFT PROPULSION SYSTEM NACELLE

Abstract: An assembly is provided for an aircraft propulsion system. This assembly includes a nacelle exterior skin and a strake. The strake is configured with a base and an airfoil that projects out from the base. The base is recessed into and connected to the nacelle exterior skin.

Classifications:

International (IPC 8-9): B64C23/06 B64D29/00 (Advanced/Invention)
CPC: B64C23/06 B64D29/00
US: 1/1 244/199.1



Family:

Publication number	Publication date	Application number	Application date
US2018334249 AA	20181122	US20170596556	20170516

Priority:

US20170596556 20170516

Probable Assignee:

ROHR INC

Assignee(s): (std):

ROHR INC

Inventor(s): (std):

BINKS ALAN J

53) Family number: 48146569 (US2011006165A)

© PatBase

Title: APPLICATION OF CONFORMAL SUB BOUNDARY LAYER VORTEX GENERATORS TO A FOIL OR AERO/ HYDRODYNAMIC SURFACE

Abstract: A method of improving aerodynamic performance of foils by the application of conformal, low drag vortex generators. A film of erosion protection material or other conformal material is placed on the foil to provide a medium for the incorporation of planform edge vortex generators. The form edge is shaped to achieve submerged vortex generating shapes of chevron or ogival planforms, extending primarily chordwise on the foil surface. The vortex generators promote improved boundary layer dynamics by mixing free stream flow into the boundary layer while minimising separation and fluid losses. At the trailing edge, the shape formed with the chevrons applied apex forward, acts as a vented gurney tab series and additionally as disruptors to the Von Karman Street wake, delaying sheet rollup into the tip vortex.

Classifications:

International (IPC 8-9): B63B1/36 B64C21/10 B64C23/06

F04D29/38 F15D1/12 (Advanced/Invention);

B64C3/14 (Advanced/Non-invention)

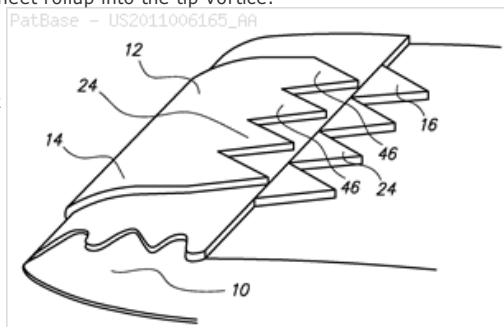
CPC: B64C23/06 B64C23/065 B64C2003/147 Y02T50/12 Y02T50/162 Y02T50/164

European: B64C23/06 B64C23/06A L64C3/14H Y02T50/12

Y02T50/16B Y02T50/16B2

US: 244/130 244/198 244/199 244/199.1 244/199.2 244/200.1

244/200.100P 416/223.00RP 416/223R



Family:

Publication number	Publication date	Application number	Application date
AU2010269959 AA	20110113	AU20100269959	20100709
AU2010269959 BB	20170629	AU20100269959	20100709
AU2010269959 CA	20171109	AU20100269959	20100709
AU2010269960 AA	20110113	AU20100269960	20100709
AU2010269960 BB	20160804	AU20100269960	20100709
CA2767135 AA	20110113	CA20102767135	20100709
CA2767139 AA	20120103	CA20102767139	20100709
CA2916550 AA	20110113	CA20102916550	20100709
CA2916550 C	20170829	CA20102916550	20100709
EP2451704 A1	20120516	EP20100796792	20100709
EP2451704 A4	20140423	EP20100796792	20100709
EP2452081 A1	20120516	EP20100796791	20100709
EP2452081 A4	20140423	EP20100796791	20100709
NZ597321 A	20141031	NZ20100597321	20100709
NZ597322 A	20140926	NZ20100597322	20100709
US2011006165 AA	20110113	US20100832967	20100708
US2011008174 AA	20110113	US20100832966	20100708
US8870124 BB	20141028	US20100832966	20100708
WO11004261 A1	20110113	WO2010IB01874	20100709
WO11004262 A1	20110113	WO2010IB01885	20100709

Priority:

US20090224481P 20090710

US20100832966 20100708

US20100832967 20100708

CA20102767139 20100709

WO2010IB01874 20100709

WO2010IB01885 20100709

CA20162767139 20160108

Probable Assignee: PETER S IRELAND

Assignee(s): (std): IRELAND PETER ; IRELAND PETER S ; PETER S IRELAND

Assignee(s): FUEL EFFICIENCY CORP A PUERTO RICO SUCCESSOR BY MERGER TO ENERGY EFFICIENCY A NEVADA

CORP

Inventor(s): (std): IRELAND PETER ; IRELAND PETER S

Agent(s): BALDWIN INTELLECTUAL PROPERTY; PHOENIX INTELLECTUAL PROPERTY; BRION RAFFOUL; BERESKIN AND PARR LLP SENCRL SRL; STRAUBE URS NORMAN; NWAMU PC; FIDEL D

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

54) Family number: 74169597 (WO19086616A1)

© PatBase

Title: SWIRLING ELEMENT, AERODYNAMIC PROFILE, AND METHOD FOR PRODUCING A SWIRLING ELEMENT

Abstract: The present invention relates to a swirling element for swirling a fluid flow for a rotating aerodynamic profile or a turbine, comprising: a fastening portion, which is designed for fastening to a profile surface; and a flow-active portion, which is connected to the fastening portion and which has a baffle plate which, at least in some sections, is formed with its entire cross-section rotated about a common axis. The present invention also relates to an aerodynamic profile having a swirling element of this kind, and to a method for producing a swirling element of this kind.

Classifications:

International (IPC 8-9): B64C23/06 F02K1/46

F03D1/06 (Advanced/Invention)

CPC: F03D1/0633 B64C23/06 F02K1/46 F03D1/0675 F05B2230/50

F05B2240/122 F05B2240/40 F05B2250/25 F05B2260/96

F05D2240/127 B64C2230/28

PatBase - WO19086616_A1

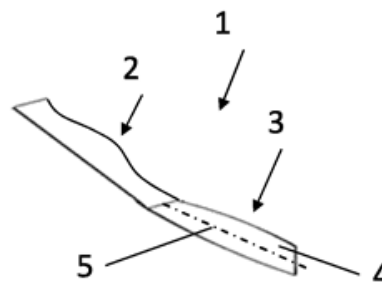


Fig. 1

Family:

Publication number	Publication date	Application number	Application date
DE102018113800 A1	20190502	DE201810113800	20180610
WO19086616 A1	20190509	WO2018EP80031	20181102

Priority:

DE201710125663 20171102 DE201810113800 20180610

Probable Assignee: ROEHM KLAUS

Assignee(s): (std): ROEHM KLAUS

Inventor(s): (std): ROEHM KLAUS

Agent(s): ISARPATENT PATENT U RECHTSANWAELTE BEHNISCH BARTH CHARLES HASSA PECKMANN U PARTNER MBB

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

55) Family number: 67556612 (US2017335771A)

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Title: FENCE FOR DUCT TONE MITIGATION

Abstract: Aspects of the disclosure are directed to a system associated with an engine of an aircraft comprising: a duct, an inlet coupled to the duct, and a fence coupled to the inlet or located upstream of the inlet. In some embodiments, the system further comprises a valve body coupled to the duct. In some embodiments, the valve body includes at least one valve that is configured to rotate between a closed state and an open state.

Classifications:

International (IPC 8-9): B64D29/00 B64D33/00 F01D25/24

F02C3/04 F02C7/24 (Advanced/Invention);

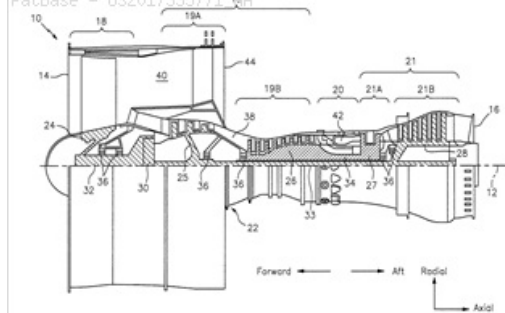
B64C23/06 (Advanced/Non-invention)

CPC: B64C23/06 B64D29/00 B64D33/00 F01D25/24 F02C3/04

F02C7/24 F05D2220/32 F05D2260/96

US: 1/1 415/119

PatBase - US2017335771_A1



Family:

Publication number	Publication date	Application number	Application date
DE602017002460 D1	20190328	DE201760002460T	20170523
EP3248884 A1	20171129	EP20170172558	20170523
EP3248884 B1	20190306	EP20170172558	20170523
US2017335771 AA	20171123	US20160161953	20160523
US10487744 BB	20191126	US20160161953	20160523

Priority:

US20160161953 20160523 EP20170172558 20170523

Probable Assignee: UNITED TECHNOLOGIES CORP

Assignee(s): (std): UNITED TECHNOLOGIES CORP ; UNITED TECH CORP

Assignee(s): UNITED TECHNOLOGIES FARMINGTON CORP

Inventor(s): (std): ZYSMAN STEVEN H ; ZSURKA MARK ; SHANNON DANIEL W ; POST KEITH A ; KOUSHIK SUDARSHAN N ; DE LA RIVA DIEGO H

Inventor(s): DE LA RIVA DIEGO H VERNON ; KOUSHIK SUDARSHAN N WEST HARTFORD ; POST KEITH A COLCHESTER ; SHANNON DANIEL W GLASTONBURY ; ZSURKA MARK GOLDENS BRIDGE ; ZYSMAN STEVEN H AMSTON

Agent(s): SCHMITT NILSON SCHRAUD WAIBEL WOHLFROM PATENTANWAELTE PARTNERSCHAFT MBB; GITTINS ALEX MICHAEL; DEHNS; O SHEA GETZ PC

Designated states: AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR

56) Family number: 54110627 (US2014374566A)

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Title: ATTACHMENT PYLON FOR AN UNDUCTED FAN

Abstract: A pylon configured to secure a turbine engine to a structural element of an aircraft, the pylon including a streamlined profile defined by two opposite faces and extending longitudinally between a leading edge and a trailing edge, and at least a first one of the two faces presenting at least locally a succession of non-through hollows and of bumps.

Classifications:

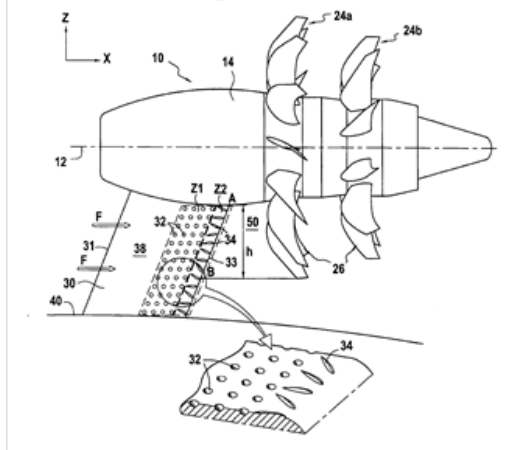
International (IPC 8-9): B64C21/10 B64C23/06 B64D27/14

B64D27/26 B64D29/04 (Advanced/Invention)

CPC: Y02T50/162 Y02T50/166 Y02T50/66 B64C2230/26 B64C23/06 B64C2230/14 B64C2230/28 B64D27/14 B64D29/04 B64D2027/005 B64C23/00 B64C2230/04 B64D27/26 B64D2027/262 B64C21/10

US: 248/554

PatBase - US2014374566_AA



Family:

Publication number	Publication date	Application number	Application date
FR2983834 A1	20130614	FR20110061457	20111212
FR2983834 B1	20150102	FR20110061457	20111212
GB201410399 A0	20140723	GB20140010399	20121212
GB2511255 A1	20140827	GB20140010399	20121212
US2014374566 AA	20141225	US20120364981	20121212
WO13088068 A1	20130620	WO2012FR52905	20121212

Priority:

FR20110061457 20111212 WO2012FR52905 20121212

Probable Assignee: SNECMA

Assignee(s): (std): SNECMA

Inventor(s): (std): MEHIER NICOLAS ; FERNANDO RASIKA ; MONTI FABIEN ; SIRVIN NICOLAS

Inventor(s): FABIEN MONTI ; RASIKA FERNANDO ; NICOLAS SIRVIN ; NICOLAS MEHIER

Agent(s): CABINET BEAU DE LOMENIE; BESNARD CHRISTOPHE ET AL

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

57) Family number: 2446645 (US4452266A)

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Title: AIR ASPIRATION DEVICE OF AIRCRAFT-MOUNTED GAS-TURBINE ENGINE

Abstract: A triangular airfoil plate is forward of and below the air intake duct of an aircraft-mounted gas-turbine engine, and a small airfoil member is below the airfoil plate. An inductive action of leading-edge separation vortices generated from the

leading edges of the airfoil plate and the small airfoil member is utilized to curve the direction of air flowing into the air intake duct and thereby to prevent turbulence in the intake airflow and resulting defective operation or failure of the engine during flight of the aircraft at large angles of attack.

Classifications:

International (IPC 8-9): B64C23/06 B64D33/02

F02C7/04 (Advanced/Invention);

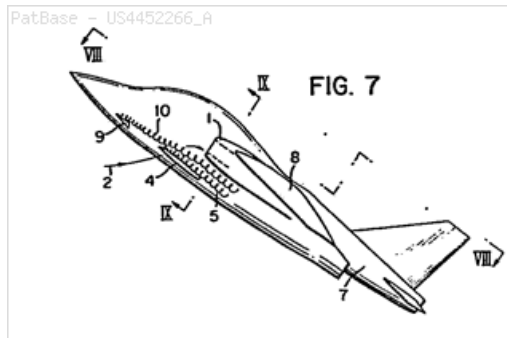
B64C23/00 B64D33/00 F02C7/04 (Core/Invention)

International (IPC 1-7): B64C23/06 B64D27/20 B64D33/02 F02C7/04

CPC: Y10T137/0536 B64C23/06 B64D33/02 B64D2033/0226 B64D2033/026 Y02T50/162

European: B64C23/06 B64D33/02 L64D33/02D L64D33/02R2 Y02T50/16B

US: 137/15.1 244/53.00B 244/53B



Family:

Publication number	Publication date	Application number	Application date
DE3167115 D1	19841213	DE19813167115	19811113
DE3167115 D1	19841213	DE19813167115T	19811113
EP0052360 A1	19820526	EP19810109684	19811113
EP0052360 B1	19841107	EP19810109684	19811113
JP1231931 C3	19840926	JP19800161089	19801115
JP57086526 A2	19820529	JP19800161089	19801115
JP59005777 B4	19840207	JP19800161089	19801115
US4452266 A	19840605	US19810319022	19811106

Priority:

JP19800161089 19801115

Probable Assignee: FUJI JUKOGYO KALBUSHIKI KAISHA

Assignee(s): (std): FUJI HEAVY IND LTD

Assignee(s): FUJI JUKOGYO KABUSHIKI KAISHA ; FUJI JUKOGYO KALBUSHIKI KAISHA ; FUJI JUKOGYO KK

Inventor(s): (std): OGINO SABURO ; OGINO SABUROU ; TANIGUCHI YOSHITOMO KAWASAKI J ; KIYOSHIMA SATORU ; KIYOSHIMA SATOSHI ; TANIGUCHI YOSHITOMO

Inventor(s): KYOSHIMA SATORU ; TANIGUCHI YOSHITOMO KAWASAKI JUKOGYO

Designated states: DE FR GB IT SE

58) Family number: 63731662 (US2016298646A)

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Title: GAS TURBINE DIFFUSER AND METHODS OF ASSEMBLING THE SAME

Abstract: A gas turbine diffuser for use with a gas turbine power system is provided. The diffuser includes an annular inner wall and an annular outer wall circumscribing the inner wall such that a gas path is defined between the inner and outer walls. The diffuser further includes a plurality of circumferentially-spaced struts extending from the inner wall to the outer wall across the gas path. At least one of the struts has a flap.

Classifications:

International (IPC 8-9): B23P19/00 F01D25/24 F01D25/28

F01D25/30 F01D5/14 F01D9/04 F02C7/00 F04D29/54

F04D29/68 (Advanced/Invention);

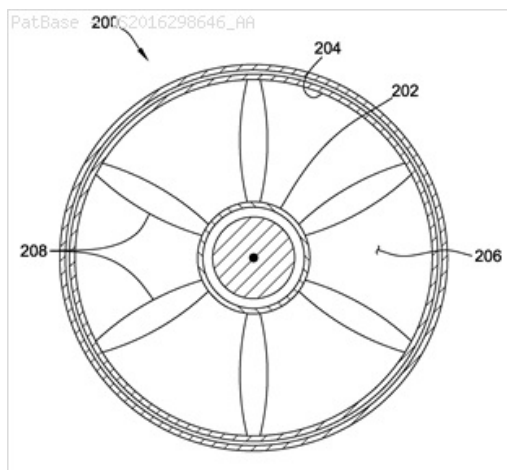
B64C23/06 F01D25/16 (Advanced/Non-invention)

CPC: B23P19/00 B64C23/06 F01D9/045 F01D25/162 F01D25/24

F01D25/28 F04D29/542 F01D25/30 F01D5/145 F04D29/544

F04D29/681 F05D2240/122 F05D2240/123 F05D2240/127

US: 1/1 60/751



Family:

Publication number	Publication date	Application number	Application date
CN106050335 A	20161026	CN201610215307	20160408
CN106050335 B	20200616	CN201610215307	20160408
EP3078805 A1	20161012	EP20160163830	20160405
EP3078805 B1	20200325	EP20160163830	20160405
JP2016200142 A2	20161201	JP20160074876	20160404
US2016298646 AA	20161013	US20150681441	20150408
US10151325 BB	20181211	US20150681441	20150408

Priority:

US20150681441 20150408 JP20160074876 20160404

Probable Assignee: GENERAL ELECTRIC CO

Assignee(s): (std): GEN ELECTRIC ; GENERAL ELECTRIC CO
Inventor(s): (std): CHENGAPPA MANJUNATH BANGALORE ; MANJUNATH BANGALORE CHENGAPPA ; MOORTHY SUBRAMANIYAN ; PATEL PRADEEP ; PRADEEP PATEL ; SUBRAMANIYAN MOORTHY
Agent(s): LEE BRENDA; BRP RENAUD AND PARTNER MBB RECHTSANWAELTE PATENTANWAELTE STEUERBERATER; ARMSTRONG TEASDALE LLP
Designated states: AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR

59) Family number: 59879662 (US2015204306A)

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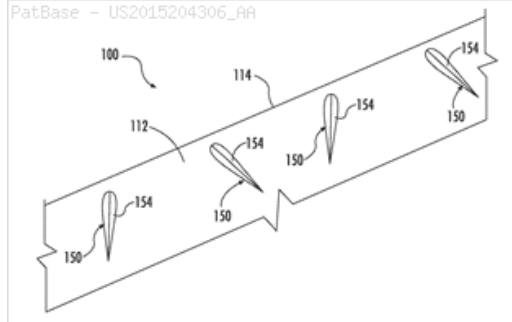
Title: ROTATABLE AERODYNAMIC SURFACE FEATURES FOR WIND TURBINE ROTOR BLADES

Abstract: The present subject matter directed to a rotor blade assembly for a wind turbine having at least one rotatable aerodynamic surface feature configured thereon. The rotor blade assembly includes a body shell including a pressure side surface and a suction side surface extending between a leading edge and a trailing edge. The aerodynamic surface feature is disposed adjacent to the pressure side surface, the suction side surface, and/or both. In addition, the surface feature may have a generally airfoil-shaped cross section. As such, an actuator can be configured at least partially within an internal volume of the surface feature, the actuator being configured to rotate the surface feature relative to the body shell.

Classifications:

International (IPC 8-9): B64C23/06 B64C3/58 F03D1/06 F03D7/02 F03D7/04 F03D80/00 (Advanced/Invention)
CPC: F03D7/022 B64C3/58 B64C23/06 F03D1/0633 F03D1/0641 F03D1/0675 F03D7/0224 F03D7/0232 F03D7/024 F03D7/0252 F03D80/00 F05B2240/122 F05B2240/30 F05B2240/31 F05B2240/313 F05B2260/502 Y02E10/721 Y02E10/723 Y02T50/162
US: 416/23

PatBase - US2015204306_AA



Family:

Publication number	Publication date	Application number	Application date
US2015204306 AA	20150723	US20140157598	20140117
US9752559 BB	20170905	US20140157598	20140117

Priority:

US20140157598 20140117

Probable Assignee: GENERAL ELECTRIC CO
Assignee(s): (std): GEN ELECTRIC
Assignee(s): GENERAL ELECTRIC CO
Inventor(s): (std): TOBIN JAMES ROBERT ; HERR STEFAN
Agent(s): DORITY AND MANNING PA

60) Family number: 68006686 (US2017370387A)

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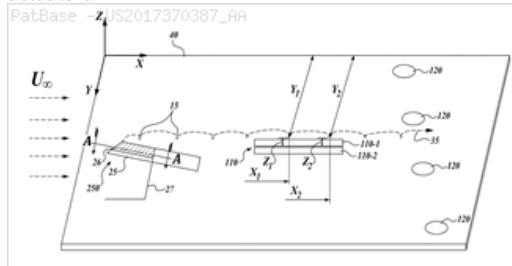
Title: ACTIVE CONTROL OF VORTICES FOR SKIN FRICTION REDUCTION

Abstract: Systems and method for active control of stationary vortices for aerodynamic structures are disclosed herein. In one embodiment, a method for active control of vortices over a solid surface includes: generating vortices proximate to the solid surface; sensing locations of vortices by printed skin sensors; and maintaining the vortices in their fixed spanwise positions with respect to the solid surface by actuation of printed skin actuators.

Classifications:

International (IPC 8-9): B64C21/00 B64C23/00 B64C23/06 F15D1/12 (Advanced/Invention)
CPC: F15D1/12 B64C23/06 B64C21/00 B64C23/005 Y02T50/162 Y02T50/166 F15D1/0075 F15D1/008
US: 1/1 137/13

PatBase - US2017370387_AA



Family:

Publication number	Publication date	Application number	Application date
US2017370387 AA	20171228	US20170630380	20170622

Priority:

US20160353401P 20160622 US20170630380 20170622

Probable Assignee: QUEST INTEGRATED LLC
Assignee(s): (std): QUEST INTEGRATED LLC ; UNIV WASHINGTON
Assignee(s): OF WASHINGTON UNIV
Inventor(s): (std): COTEL ALINE ; BREIDENTHAL ROBERT E ; NINO GIOVANNI

Title: LOAD COMPENSATING DEVICES

Abstract: Various air deflector shapes, sizes and configurations for use in a load compensating device on an airfoil are provided. The air deflector arrangements are configured to alter the airflow around the air deflector in order to affect sound or acoustics associated with the air deflector when deployed during operation. Some example configurations that may alter the air flow around the air deflector include air deflectors having a plurality of apertures, air deflectors including a scalloped edge, and/or air deflectors including a plurality of protrusions extending from a portion of the air deflector.

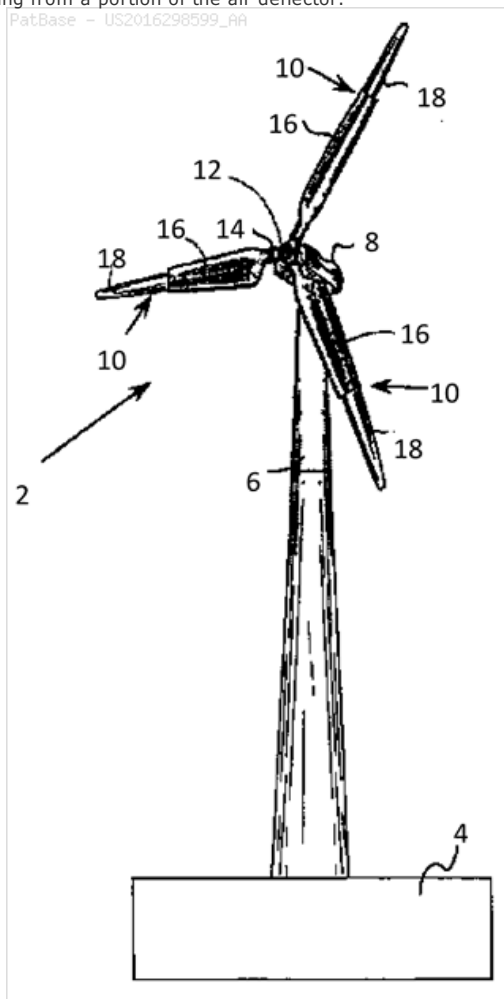
Classifications:

International (IPC 8-9): B62D35/00 B64C21/08 F03D1/06 F03D7/02 F03D80/00 F15D1/10 (Advanced/Invention)

CPC: B64C21/10 B64C23/06 B64C2230/08 B64C2230/26 F03D1/0633 F03D7/0232 F03D7/0296 F05B2240/31 F05B2250/183 Y02E10/721 Y02T50/162 Y02T50/166 B64C21/08 F03D7/022

US: 1/1 416/23

PatBase - US2016298599_AA

**Family:**

Publication number	Publication date	Application number	Application date
BR102016007738 A2	20161116	BR20161007738	20160407
CA2925831 AA	20161008	CA20162925831	20160405
CA2925831 C	20180515	CA20162925831	20160405
EP3078848 A1	20161012	EP20160164225	20160407
IN201614012175 A	20161014	IN201614012175	20160406
US2016298599 AA	20161013	US20150681703	20150408
US9890765 BB	20180213	US20150681703	20150408

Priority:

US20150681703 20150408

Probable Assignee: FRONTIER WIND LLC

Assignee(s): (std): FRONTIER WIND LLC ; GE INFRASTRUCTURE TECH LLC

Assignee(s): GE INFRASTRUCTURE TECHNOLOGY LLC ; KHAN JEHAN Z ; TIAN QING ; BAKER JONATHON P

Inventor(s): (std): BAKER JONATHON P ; KHAN JEHAN Z ; TIAN QING

Inventor(s): QING TIAN ; JEHAN Z KHAN ; JONATHON P BAKER

Agent(s): RIDOUT AND MAYBEE LLP; CRAIG WILSON AND CO; WINTER BRANDL FUERNISS HUEBNER ROESS KAISER POLTE PARTNERSCHAFT MBB; DORITY AND MANNING PA

Designated states: AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR

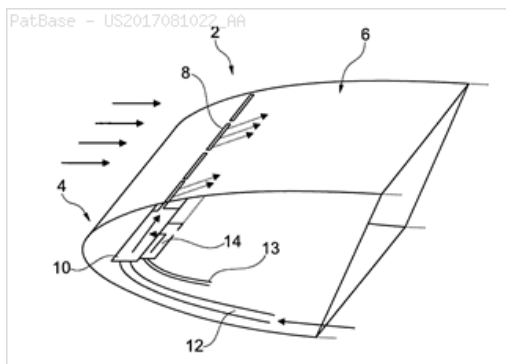
Title: COOPERATIVE ACTUATOR SYSTEM FOR ACTIVE FLOW CONTROL

Abstract: A cooperative actuator system for active flow control, a vehicle comprising such cooperative actuator system, and a method for operating an actuator system for active flow control. The cooperative actuator system includes actuators, a control unit, and a data unit. The actuators are distributed along the surface in at least a first group and a second group downstream of the first group. The control unit is configured to control the actuators of the first group so that they form a

first flow structure along the surface. The data unit is configured to provide data of the first flow structure. The control unit is further configured to control the actuators of the second group based on the data of the first flow structure, so that the actuators of the second group cooperatively interact with the first flow structure to form a second flow structure along the surface.

Classifications:

International (IPC 8-9): B64C21/08 B64C23/00 B64C23/06
B64G1/22 G05B19/042 (Advanced/Invention)
CPC: G05B19/0428 B64C23/06 B64G1/22 G05B2219/45207
B64C23/005 B64C2230/04 B64C21/08 B64C2230/02 B64C2230/06
B64C2230/18 Y02T50/166
US: 1/1 701/3



Family:

Publication number	Publication date	Application number	Application date
EP3144221 A1	20170322	EP20150185707	20150917
EP3144221 A8	20170719	EP20150185707	20150917
US2017081022 AA	20170323	US20160265920	20160915
US10071799 BB	20180911	US20160265920	20160915

Priority:

EP20150185707 20150917

Probable Assignee: AIRBUS DEFENCE AND SPACE GMBH

Assignee(s): (std): AIRBUS DEFENCE AND SPACE GMBH

Inventor(s): (std): BAUER KARIN ; BLECHSCHMIDT MARKUS ; NITSCHKE WOLFGANG

Agent(s): LORENZ AND KOPF PARTG MBB PATENTANWALTE LKGLOBAL; LORENZ AND KOPF LLP

Designated states: AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR

63) Family number: 77076706 (US2020001982A)

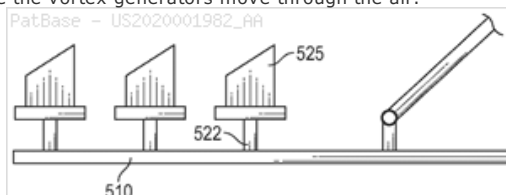
© PatBase

Title: SHORT TAKE OFF AND LANDING AIRCRAFT WITH ADJUSTABLE VORTICES DEVICE

Abstract: An improved aircraft system is provided. The improved aircraft system comprises an adjustable vortices device that may be attached to an aircraft to create various vortices effects, which increase take-off weight and improve low-speed handling of the aircraft. The adjustable vortices device comprises a linear actuator, a pivot mechanism, and a vortex generator. The pivot mechanism is operably connected to the linear actuator in a way such that the translational energy of the linear actuator causes the pivot mechanism to rotate about a central axis. The vortex generator is moveably attached to a surface of the aircraft and coupled to the pivot mechanism in a way such that rotating the pivot mechanism causes the vortex generator to rotate about a central axis, which alters the angle the vortex generators move through the air.

Classifications:

International (IPC 8-9): B64C13/34 B64C13/40 B64C15/02
B64C21/10 B64C23/06 B64C3/14 B64C3/38 B64C3/40 B64C9/32
B64D37/04 F16H19/04 (Advanced/Invention)
CPC: B64C21/10 B64C23/072 B64C3/385 B64C3/40 B64C9/32
B64C3/36 B64C3/14 B64C13/34 F16H19/04 B64C13/40
B64C2003/148 B64C15/02 B64C3/58 B64C5/04 B64C23/06
B64C2230/26



Family:

Publication number	Publication date	Application number	Application date
US2020001982 AA	20200102	US20180025081	20180702

Priority:

US20180025081 20180702

Probable Assignee: UTT LARRY

Assignee(s): (std): UTT LARRY

Inventor(s): (std): UTT LARRY

64) Family number: 48844727 (US2012211599A)

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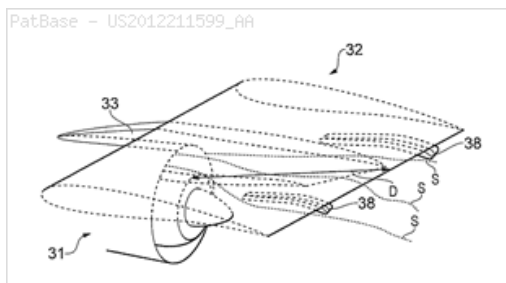
Title: FLOW-MODIFYING FORMATION FOR AIRCRAFT WING

Abstract: An aircraft wing has an engine attachment position at which a gas turbine engine is attached beneath the wing, in use the engine ejecting a propulsive gas jet with a jet shear layer being formed between the gas jet and the surrounding air. The aircraft wing further has one or more elongate, flow-modifying formations protruding from the underside of the wing. The length direction of the or each formation is along the fore and aft direction of the wing with the trailing edge of the formation being rearward of the trailing edge of the wing. The flow-modifying formations can be arranged such that they interact with the jet shear layer to reduce noise generated by the interaction of the jet shear layer and the wing. They can also be arranged to block, attenuate and/or to scatter the noise reflected by the wing.

Classifications:

International (IPC 8-9): B64C23/00 B64C3/00 B64C3/58
B64C5/08 (Advanced/Invention)

CPC: B64C7/02 B64C23/06 Y02T50/162 B64C3/00 B64C3/58
B64C5/08
European: B64C23/06 B64C7/02 Y02T50/16B
US: 244/1.00NP 244/1N



Family:

Publication number	Publication date	Application number	Application date
GB201102911 A0	20110406	GB20110002911	20110221
GB2488172 A1	20120822	GB20110002911	20110221
GB2488172 B2	20140129	GB20110002911	20110221
US2012211599 AA	20120823	US20120357024	20120124

Priority:

GB20110002911 20110221

Probable Assignee: ROLLS ROYCE PLC

Assignee(s): (std): BRITCHFORD KEVIN M ; MORVANT ROMUALD ; ROLLS ROYCE PLC

Inventor(s): (std): BRITCHFORD KEVIN M ; MORVANT ROMUALD ; BRITCHFORD KEVIN M

Inventor(s): KEVIN MARK BRITCHFORD ; ROMUALD MORVANT

65) Family number: 3018747 (US4836473A)

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Title: Apparatus for influencing a boundary layer on the surface of a body moving through a medium

Abstract: The pressure drag on the skin of an aircraft is reduced by rigidly securing boundary layer influencing members to the skin of the aircraft, including the wings, the elevator and fin/rudder assemblies, and the body near the tail end. These members may be vortex generators and boundary layer diverters and are always located in the attached flow. In addition, if the members are placed upstream of any air intakes, especially flush air intakes, the air intake efficiency is also improved. The influencing members have an effective height above the surface corresponding, at the most, to the displacement thickness portion of the boundary layer.

Classifications:

International (ipc 8-9): B64C21/00 B64C23/06 (Advanced/Invention)

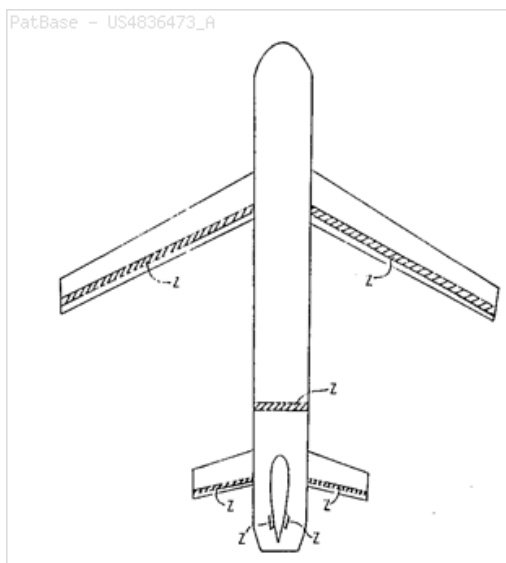
International (ipc 1-7): B62D35/00 B64C21/00 B64C23/06

B64D33/02 F15D1/12

CPC: B64C21/00 B64C23/06 Y02T50/162 Y02T50/166

European: B64C21/00 B64C23/06 Y02T50/16B Y02T50/16D

US: 244/130 244/200.1 244/53.00B 244/53B



Family:

Publication number	Publication date	Application number	Application date
DE3521329 A1	19861218	DE19853521329	19850614
DE3521329 C2	19891123	DE19853521329	19850614
FR2583374 A1	19861219	FR19860008516	19860612
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GB2176570 A1	19861231	GB19860013108	19860529
GB2176570 B2	19890125	GB19860013108	19860529
GB8613108 A0	19860702	GB19860013108	19860529
US4836473 A	19890606	US19870058511	19870605

Priority:

DE19853521329 19850614

Probable Assignee: MESSERSCHMITT BOELKOW BLOHM

Assignee(s): (std): MESSERSCHMITT BOELKOW BLOHM

Assignee(s): MESSERSCHMITT BOELKOW BLOHM GES ; MESSERSCHMITT BOELKOW BLOHM GES MIT BESCHRAENKTER ; MESSERSCHMITT BOELKOW BLOHM GMBH ; MESSERSCHMITT BOELKOW BLOHM GMBH 8012 OTTOBRUNN DE ; MESSERSCHMITT BOKOW BLOHM GESELLSCHAFT MIT BESCHRAENKTER HAFTUNG ; MESSERSCHMITT BOKOW BLOHM GMBH

Inventor(s): (std): AULEHLA FELIX ; GENSSLER HANS PETER ; GENSSLER HANS PETER DIPL ING

66) Family number: 42252754 (US2015060593A)

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Title: HIERARCHICAL CLOSED-LOOP FLOW CONTROL SYSTEM FOR AIRCRAFT, MISSILES AND MUNITIONS

Abstract: The present invention relates to a missile or aircraft with a hierarchical, modular, closed-loop flow control system and more particularly to aircraft or missile with a flow control system for enhanced aerodynamic control, maneuverability and stabilization, and to a method of operating the flow control system. Various embodiments of the present invention involve different elements including flow sensors, active flow control device or activatable flow effectors and logic devices with closed loop control architecture. The sensors are used to estimate or determine flow conditions on the various surfaces of a missile or aircraft. The active flow control device or activatable flow effectors create on-demand flow disturbances, preferably micro-disturbances, at different points along the various aerodynamic surfaces of the missile or aircraft to achieve a desired stabilization or maneuverability effect. The logic devices are embedded with a hierarchical control structure allowing for rapid, real-time control at the flow surface."

Classifications:

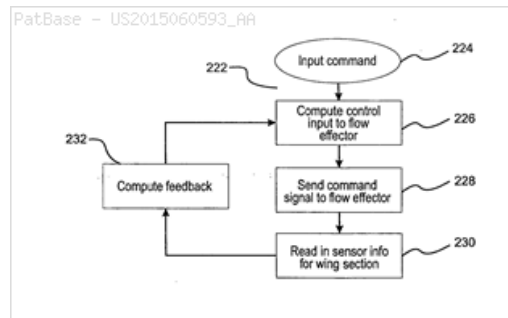
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B64C5/10 B64C5/12 F41G7/00 F42B10/02 F42B10/14 F42B10/60
F42B10/62 F42B15/01 F42B15/10 G01C23/00
G05D1/00 (Advanced/Invention);
F41G7/00 F42B10/00 F42B10/64 F42B15/00 F42B15/01
G01C23/00 (Advanced/Non-invention);
B64C21/00 B64C5/00 F42B10/00 (Core/Invention)

International (IPC 1-7): B64C23/06

CPC: G05D1/107 F42B10/38 F42B10/40 F42B10/42 F42B10/668
F42B15/01 F42B10/60 F42B10/62 F41G7/00 G05D1/0816 F42B10/02
F42B10/14 G05D1/0088 B64C23/06 B64C5/12 B64C21/00
F42B10/64

European: B64C5/12 F42B10/14 G05D1/10C

US: 1/1 199/130 199/75R 244/175 244/195 244/198 244/200.1
244/203 244/204.1 244/3.21 244/3.22 244/3.24 244/76.00C
244/76C 244/91 244/99.1 244/99.12 701/29.1 701/3



Family:

Publication number	Publication date	Application number	Application date
US2015060593 AA	20150305	US20130010909	20130827
US6685143 BA	20040203	US20030336117	20030103
US7070144 BA	20060704	US20030750422	20031230
US7226015 BA	20070605	US20040766225	20040128
US7977615 BA	20110712	US20070800606	20070507
US8190305 BA	20120529	US20090557599	20090911
US8191833 BA	20120605	US20060415534	20060502
US8417395 BA	20130409	US20030725266	20031201
US8548650 BA	20131001	US20120455182	20120425
US9310166 BB	20160412	US20130010909	20130827
US9429400 BA	20160830	US20090615218	20091109
US9429400 BA	20160830	US20090615218	20091109
US9429400 BA	20160830	US20090521809P	20091109
US9637223 BA	20170502	US20120457686	20120427
US10137979 BA	20181127	US20110151640	20110602
US10139209 BA	20181127	US20160057211	20160301

Priority:

US20030336117 20030103	US20030725266 20031201	US20030750422 20031230
US20040766225 20040128	US20050311767 20051219	US20060415534 20060502
US20070800606 20070507	US20090557599 20090911	US20090615218 20091109
US20110151640 20110602	US20120455182 20120425	US20120457686 20120427
US20130010909 20130827	US20160057211 20160301	

Probable Assignee: ORBITAL RESEARCH INC

Assignee(s): (std): CARVER REED ; DICOCCO JACK ; DICOCCO JACK M ; KOLACINSKI RICHARD ; NG TSUN MING TERRY ; ORBITAL RES INC ; ORBITAL RESEACH INC ; PATEL MEHUL ; PATEL MEHUL P ; PRINCE TROY ; PRINCE TROY S ; VASUDEVAN SRIKANTH ; STUCKE RUSSELL ; SOWLE ZAK ; SCHMIDT ROBERT N ; LISY FREDERICK J ; ORBITOL RES INC

Assignee(s): ORBITOL RESEARCH INC ; AIR FORCE UNITED STATES ; ORBITAL RESEARCH INC ; ICTS EUROPE HOLDINGS BV

Inventor(s): (std): CARVER REED ; DICOCCO JACK ; DICOCCO JACK M ; KOLACINSKI RICHARD ; LISY FREDERICK J ; NG TSUN MING TERRY ; PATEL MEHUL ; PATEL MEHUL P ; PRINCE TROY ; PRINCE TROY S ; SCHMIDT ROBERT N ; SOWLE ZAK ; STUCKE RUSSELL ; VASUDEVAN SRIKANTH

Agent(s): BRIAN M; BRIAN; ROBERT K; KOLKOWSKI BRIAN

67) Family number: 12520755 (US6116015A)

© PatBase

Title: Breather outlet

Abstract: A breather outlet (14) for the gearbox of a gas turbine engine comprises a mast (18) which extends from the nacelle (10) of the gas turbine engine. The mast (18) contains a breather duct (20) which interconnects the interior of the gearbox with an exhaust outlet (22). The mast (18) has an aerodynamic main portion (25) and a sub portion (27) extending rearwardly from the main portion (25). The exhaust outlet (22) is in the sub portion (27) and is arranged to direct oil and air in a downstream direction. The exhaust outlet (22) is spaced from the trailing edge (26) of the main portion (25), the sub portion (27) has guide vanes (28) in the breather duct (20) to straighten the oil and air flow and vortex generators (30) are provided on the mast to avoid oil staining of the nacelle (10).

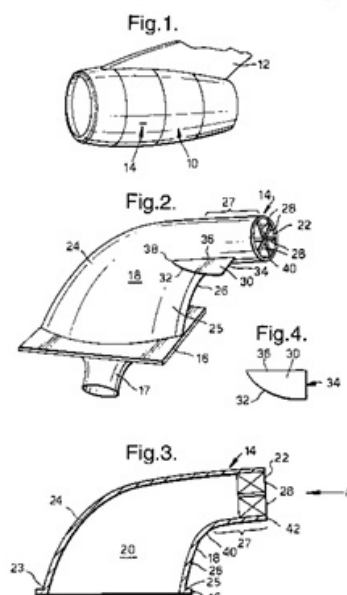
Classifications:

International (IPC 8-9): B64C23/06 B64D33/04
B64D35/00 (Advanced/Invention);

B64C23/00 B64D33/00 B64D35/00 (Core/Invention)
International (IPC 1-7): B64D33/04 F02C7/06
CPC: B64C1/1453 B64C23/06 B64D33/04 Y02T50/162
European: B64C1/14B4 B64C23/06 B64D33/04 Y02T50/16B
US: 60/39.08 60/801

PatBase - US6116015_A

U.S. Patent Sep. 12, 2000 Sheet 1 of 2 6,116,015



Family:

Publication number	Publication date	Application number	Application date
DE69907054 D1	20030528	DE19996007054	19990208
DE69907054 D1	20030528	DE19996007054T	19990208
DE69907054 T2	20031106	DE19996007054T	19990208
EP0940338 A2	19990908	EP19990300890	19990208
EP0940338 A3	20020313	EP19990300890	19990208
EP0940338 B1	20030423	EP19990300890	19990208
GB9804807 A0	19980429	GB19980004807	19980306
US6116015 A	20000912	US19990247905	19990211

Priority:

GB19980004807 19980306

Probable Assignee: ROLLS ROYCE PLC

Assignee(s): (std): ROLLS ROYCE PLC

Assignee(s): ROLLS ROYCE PLC LONDON

Inventor(s): (std): TAYLOR KATHRYN VICTORIA ; MYLEMANS IAN JOHN ; HYDE STEPHEN PAUL ; DAWS GRAHAM PHILLIP ; DAWS GRAHAM P ; HYDE STEPHEN P ; MYLEMANS IAN J ; TAYLOR KATHRYN V

Designated states: AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE

68) Family number: 32258757 (US2009173834A)

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Title: ELEMENT FOR GENERATING A FLUID DYNAMIC FORCE

Abstract: This invention relates to an element (11) for generating a fluid dynamic force, the element (11) comprising first (13) and second (15) surfaces extending in opposite directions from a leading edge (17) of the element (11) and meeting at a trailing edge (18) thereof to define a three dimensional body that is shaped to generate a fluid dynamic force when immersed at an angle of attack α to a fluid flow over the element (11) in a flow direction U, the first surface (13) comprising an array of fluid inlets (19) and the second surface (15) comprising a corresponding array of fluid outlets (21), each said inlet (19) being fluidly coupled to a said outlet (21) by means of a fluid duct (23) at least part of which is pitched at an angle θ to a tangent plane (Y-Y) to said second surface (15) in the vicinity of said outlet (21) and skewed at an angle ϕ to said fluid flow direction U, the arrangement being such that the element (11) is operable in use to generate a relatively high fluid pressure region downstream of said leading edge (17) proximate said first surface (13) and a relatively low fluid pressure region downstream of said leading edge (17) proximate said second surface (15), and fluid from said relatively high fluid pressure region is enabled to flow into said fluid inlets (19) through said fluid ducts (23) and out of said fluid outlets (21) into said relatively low pressure region to generate fluid vortices which reenergise said low pressure region and delay boundary layer separation from said second surface (15).

Classifications:

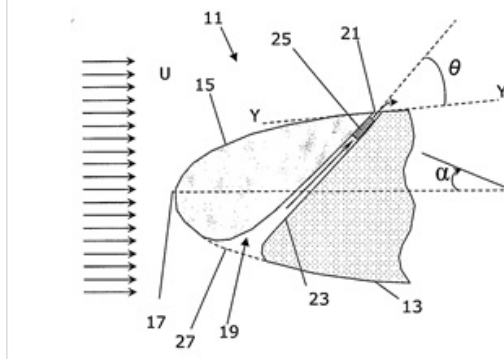
International (IPC 8-9): B64C21/02 B64C21/04 B64C23/06 F03D11/00 F15D1/12 (Advanced/Invention);

B64C21/00 B64C23/00 F03D11/00 F15D1/00 (Core/Invention)
International (IPC 1-7): B64C23/06

CPC: B64C2230/06 B64C21/025 F15D1/12 B64C23/06 Y02T50/162 Y02T50/166 B64C2230/18 B64C2230/20 F03D1/0641 F05D2240/30 Y02E10/721

European: B64C21/02B B64C23/06 F15D1/12 Y02T50/16B Y02T50/16D

US: 244/198 244/198P 244/200.1 244/204.1

**Family:**

Publication number	Publication date	Application number	Application date
AT501932 E	20110415	AT20060764945T	20060713
CN101258071 A	20080903	CN200680029269	20060713
CN101258071 B	20110921	CN200680029269	20060713
DE602006020732 D1	20110428	DE200660020732T	20060713
DE602006044801 D1	20150423	DE200660044801T	20060713
DK2316729 T3	20150622	DK20060182928T	20060713
EP1907279 A1	20080409	EP20060764945	20060713
EP1907279 B1	20110316	EP20060764945	20060713
EP2316729 A2	20110504	EP20100182928	20060713
EP2316729 A3	20111102	EP20100182928	20060713
EP2316729 B1	20150311	EP20100182928	20060713
GB200514338 A0	20050817	GB20050014338	20050713
GB200613978 A0	20060823	GB20060013978	20060713
GB2428459 A1	20070131	GB20060013978	20060713
GB2428459 B2	20091021	GB20060013978	20060713
IN01216DN2008 A	20080627	IN2008DN01216	20080212
JP2009501304 T2	20090115	JP20080520954T	20060713
US2009173834 AA	20090709	US20060995440	20060713
US7832689 BB	20101116	US20060995440	20060713
WO07007108 A1	20070118	WO2006GB02596	20060713

Priority:

GB20050014338 20050713 EP20060764945 20060713 EP20100182928 20060713
 WO2006GB02596 20060713

Probable Assignee: UNIV CITY

Assignee(s): (std): JARILO LTD ; UNIV CITY ; PRINCE SIMON ANDREW ; KHODAGOLIAN VAHIK

Assignee(s): CITY UNIVERSITY ; JARILO LTD WARWICK ; CITY UNIV

Inventor(s): (std): VAHIK KHODAGOLIAN ; ANDREW PRINCE SIMON ; PRINCE SIMON ANDREW ; PRINCE SIMON ; KHODAGOLIAN VAHIK

Inventor(s): KHODAGOLIAN VAHIK CENTRE FOR AERONAUTICS ; KHODAGOLIAN VAHIK LONDON ; PRINCE SIMON LONDON ; SIMON ANDREW PRINCE ; PRINCE SIMON ANDREW CENTRE FOR AERONAUTICS

Agent(s): MILHENCH MARK LORNE ET AL; MILHENCH MARK LORNE; SYMONS RUPERT JONATHAN; SCHNECK AND SCHNECK; THOMAS

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BW BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD MG MK ML MN MR MW MX MZ NA NE NG NI NL NO NZ OM PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN SY SZ TD TG TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

69) Family number: 70785784 (WO19239123A1)

© PatBase

Title: WING-TIP DEVICE

Abstract: A wing tip device comprising a shroud arranged to at least partially surround a wing tip of a wing. The shroud provides a longitudinal air channel, wherein the air channel is substantially parallel to the direction of movement of the wing. The shroud is arranged to provide open side portions at an upper surface of the wing and at a lower surface of the wing to allow air inflow into the air channel from the upper surface of the wing and from the lower surface of the wing. A stationary propeller is mounted within the air channel, the stationary propeller comprising a plurality of blades.

Classifications:

International (IPC 8-9): B64C23/06 B64C27/46 B64C5/08 F01D5/00 (Advanced/Invention)

CPC: B64C5/08 B64C23/065 B64C27/463 B64C23/06

PatBase - WO19239123_A1

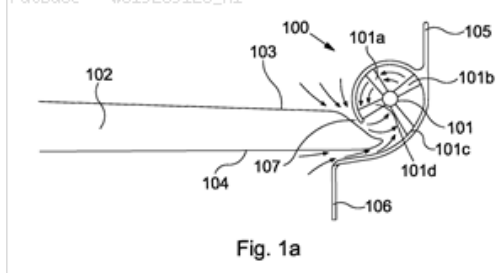


Fig. 1a

Family:

Publication number	Publication date	Application number	Application date
GB201809838 A0	20180801	GB20180009838	20180615
GB2570170 A1	20190717	GB20180009838	20180615
GB2570170 B2	20200304	GB20180009838	20180615
WO19239123 A1	20191219	WO2019GB51618	20190611

Priority:

GB20180009838 20180615

Probable Assignee: PUNTER THOMAS JAMES

Assignee(s): (std): PUNTER THOMAS JAMES ; THOMAS JAMES PUNTER

Inventor(s): (std): THOMAS JAMES PUNTER ; PUNTER THOMAS JAMES

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BN BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DJ DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IR IS IT JO JP KE KG KH KM KN KP KR KW KZ LA LC LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PA PE PG PH PL PT QA RO RS RU RW SA SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

70) Family number: 23530817 (US2006060722A)

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Title: CONTROLLING BONDARY LAYER FLUID FLOW

Abstract: A method of controlling fluid flow (14) in a boundary layer at a fluid-surface interface comprising, providing a plurality of blades (11) which project from the fluid contracting surface into a boundary layer such that in use the blades (11) are orientated to control fluid flow (14) in the boundary layer.

Classifications:

International (IPC 8-9): B64C21/10 B64C23/06 F15D1/06 F15D1/10 F15D1/12 (Advanced/Invention);

F15D1/06 (Advanced/Non-invention);

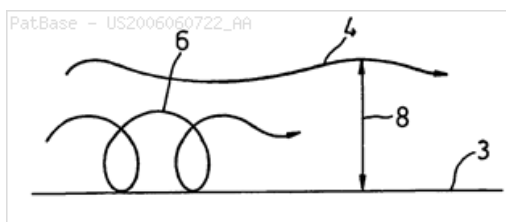
B64C21/00 B64C23/00 F15D1/00 (Core/Invention)

International (IPC 1-7): B64C21/10 F15D1/06 F15D1/10 F15D1/12

CPC: B64C21/10 B64C23/06 F15D1/12 Y02T50/162 Y02T50/166

European: B64C21/10 B64C23/06 F15D1/12 Y02T50/16B Y02T50/16D

US: 244/200.1 244/200.100P



Family:

Publication number	Publication date	Application number	Application date
AU2003240096 AA	20031231	AU20030240096	20030613
EP1525136 A1	20050427	EP20030732710	20030613
GB200213551 A0	20020724	GB20020013551	20020613
JP2005529298 T2	20050929	JP20040513110T	20030613
KR20050077732 A	20050803	KR20047020253	20030613
US2006060722 AA	20060323	US20030517798	20030613
WO03106260 A1	20031224	WO2003GB02548	20030613

Priority:

GB20020013551 20020613 WO2003GB02548 20030613

Probable Assignee: NOTTINGHAM UNIV OF

Assignee(s): (std): CHAN HO ; HUTCHINS NICOLAS ; PUSAN NAT UNIV IND ; PUSAN NAT UNIV IND COOP FOUND ; UNIV NOTTINGHAM ; PUSAN NAT UNIV ; HUTCHINS NICHOLAS ; CHOI KWING SO ; PUSAN NAT UNIVERSITY

Assignee(s): THE UNIVERSITY OF NOTTINGHAM ; PUSAN NATIONAL UNIVERSITY ; OF NOTTINGHAM UNIV ; NOTTINGHAM UNIV OF ; NOTTINGHAM UNIV ; UNIVERSITY OF NOTTINGHAM THE ; UNIVERSITY OF NOTTINGHAM ; PUSAN NATIONAL UNIV IND ; PUSAN NATIONAL UNIV ; PUSAN NATIONAL UNIV IND UNIV COOPERATION FOUNDATIO ; PUSAN NATIONAL UNIV IND UNIV COOPERATION FOUNDATION ; PUSAN NATIONAL UNIVERSITY INDUSTRY UNIVERSITY COOP ; PUSAN NATIONAL UNIVERSITY INDUSTRY UNIVERSITY COOPERATION FOUNDATION

Inventor(s): (std): HUTCHINS NICOLAS ; CHOI KWING SO ; CHAN HO ; HUTCHINS NICHOLAS ; CHUN HO HWAN

Inventor(s): KWING SO CHOI ; NICHOLAS HUTCHINS

Agent(s): BAKER AND BOTTS

Designated states: AE AG AL AM AT AU AZ BA BB BE BF BG BJ BR BY BZ CA CF CG CH CI CM CN CO CR CU CY CZ DE DK DM DZ EC EE ES FI FR GA GB GD GE GH GM GN GQ GR GW HR HU ID IE IL IN IS IT JP KE KG KP KR KZ LC LI LK LR LS LT LU LV MA MC MD MG MK ML MN MR MW MX MZ NE NI NL NO NZ OM PH PL PT RO RU SC SD SE SG SI SK SL SN SZ TD TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

71) Family number: 46826861 (US2012001019A)

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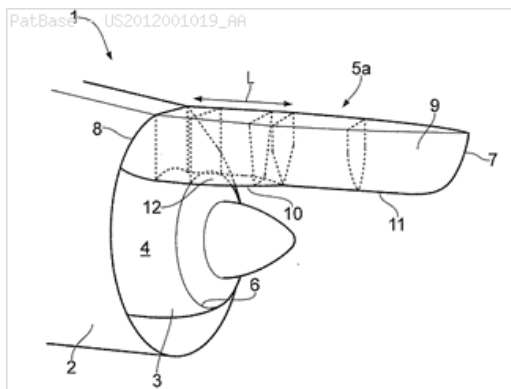
Title: PYLON FOR ATTACHING A GAS TURBINE ENGINE

Abstract: A pylon is provided for attachment of a gas turbine engine to a wing of an aircraft. The gas turbine engine comprises a core fairing surrounding a core generator and defining a nozzle for discharging a core gas flow, and a fan nacelle surrounding the core fairing to define an annular bypass duct therebetween for discharging fan air. The pylon has a trailing edge which is rearward of the trailing edge of the core fairing and the trailing edge of the fan nacelle. The pylon further has having two laterally-spaced side faces which span the bypass duct between the fan nacelle and the core fairing and extend in the rearward direction of the engine to end at the trailing edge of the pylon. Each side face has a bottom edge which extends in a rearward direction of the engine from the core fairing to the bottom end of the trailing edge of the pylon. The bottom edges merge at a merging position between the trailing edge of the fan nacelle and the trailing edge of the pylon such that the bottom edges form a single bottom edge from the merging position to the bottom end of the trailing edge of the pylon. The pylon is intended to exert control on the bypass flow of a gas turbine engine. Other pylons are also provided which can also exert such control.

Classifications:

International (IPC 8-9): B64C1/40 B64C23/00 B64C23/06 B64C7/02

B64D27/10 B64D27/12 B64D27/18 B64D27/26 B64D29/02
B64D29/06 B64D33/04 (Advanced/Invention)
CPC: B64C23/06 Y02T50/162 B64C7/02 B64D29/02 B64D33/04
B64D27/12 B64D27/26
European: B64D29/02
US: 244/1.00NP 244/199.1 244/199.3 244/1N 244/54 244/54P
244/54S



Family:

Publication number	Publication date	Application number	Application date
DE602011037496 D1	20170614	DE201160037496T	20110616
EP2402250 A2	20120104	EP20110170181	20110616
EP2402250 A3	20151104	EP20110170181	20110616
EP2402250 B1	20170503	EP20110170181	20110616
EP2402251 A2	20120104	EP20110171651	20110628
EP2402251 A3	20150805	EP20110171651	20110628
GB201011056 A0	20100818	GB20100011056	20100701
GB201102597 A0	20110330	GB20110002597	20110215
GB201102809 A0	20110406	GB20110002809	20110218
GB2481667 A1	20120104	GB20110002809	20110218
US2012001019 AA	20120105	US20110162049	20110616
US2012001022 AA	20120105	US20110170702	20110628
US8651426 BB	20140218	US20110170702	20110628
US9010680 BB	20150421	US20110162049	20110616

Priority:

GB20100011056 20100701 GB20110002597 20110215 GB20110002809 20110218
EP20110170181 20110616

Probable Assignee: ROLLS ROYCE PLC

Assignee(s): (std): BRITCHFORD KEVIN M ; MORVANT ROMUALD ; ROLLS ROYCE PLC

Inventor(s): (std): BRITCHFORD KEVIN M ; BRITCHFORD KEVIN MARK ; MORVANT ROMUALD

Inventor(s): MORVANT ROMUALD TAMWORTH ; ROMUALD MORVANT ; BRITCHFORD KEVIN MARK LOUGHBOROUGH ; KEVIN MARK BRITCHFORD

Agent(s): GEE PHILIP DAVID; ROLLS ROYCE PLC; OLIFF PLC

Designated states: AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR

72) Family number: 3112872 (US5058837A)

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Title: LOW DRAG VORTEX GENERATORS

Abstract: A generally V-shaped device (40) that is installed on a surface (48) over which there is a flowing medium (50) whose viscosity causes a boundary layer to form between free-stream medium and the surface. The point (46) of the V-shape generator (40) is oriented facing the down stream direction. Usually a plurality of generators (40) are positioned in a line crosswise to the flow spaced so that the vortices created thereby do not interfere. Flow between the arms (42 and 44) of each generator (40) generates a pair of counterrotating vortices (64 and 68) with diameters (66) much larger than the height of the generator to provide stronger flow control with less parasitic drag than prior art vortex generators. The height of the generator (40) is usually less than the height of the local boundary layer (73), but may extend above the boundary layer (73) especially when the generator (40) is use to control spanwise flow or to reduce tip vortices.

Classifications:

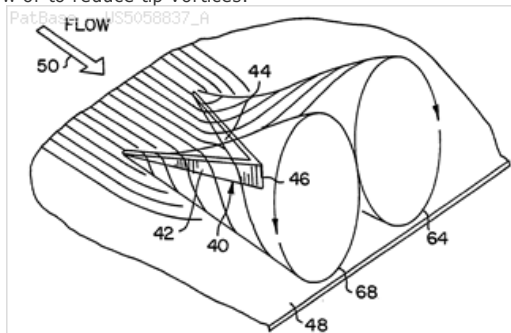
International (ipc 8-9): B64C23/06 F15C1/18 (Advanced/Invention); B64C23/00 (Core/Invention)

International (ipc 1-7): B64C23/06 F15C1/18

CPC: B64C23/06 Y02T50/162

European: B64C23/06 Y02T50/16B

US: 244/198 244/199 244/200.1



Family:

Publication number	Publication date	Application number	Application date
CA2014014 AA	19901007	CA19902014014	19900406
EP0466826 A1	19920122	EP19900906715	19900405
EP0466826 A4	19920708	EP19900906715	19900405
US5058837 A	19911022	US19890335204	19890407
WO9011929 A1	19901018	WO1990US01871	19900405

Priority:

Probable Assignee: WHEELER GARY O
Assignee(s): (std): WHEELER GARY O
Inventor(s): (std): WHEELER GARY O
Agent(s): SMART AND BIGGAR
Designated states: AT BE CH DE DK ES FR GB IT JP LI LU NL SE

73) Family number: 47944877 (EP2270312A1)

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Title: AERO- OR HYDRODYNAMIC CONSTRUCTION

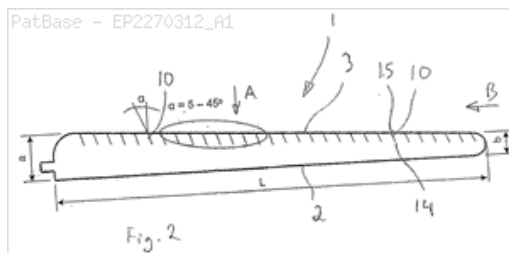
Abstract: The invention relates to an aero- or hydrodynamic construction, which is arranged to be in relative motion with respect to a medium, the construction comprising a front end (2) where the medium is encountered and a rear end (3) where the medium exits the construction, the construction comprising an aerofoil (10) with an end (14) for encountering the medium and an end (15) for leaving the medium. In order to keep undesired energy losses caused by the construction when it moves with respect to the medium very small, in which case it would operate with high efficiency and have a low noise level, the construction is **characterized in that** the aerofoil comprises a ridge part (4) and a valley part (5), which constitute a flow channel which is set at an angle (α) to the direction of motion of the construction in order to remove the medium in the form of tubular turbulent flow, a micro-vortex, from the rear end of the construction, the turbulent flow being substantially opposite to the direction of motion of the construction.

Classifications:

International (IPC 8-9): B64C11/16 F01D5/14 F02K1/46
 F03D1/06 (Advanced/Invention)

CPC: F05D2250/184 F05D2250/314 F05D2250/70 F01D5/145
 B64C23/06 F02K1/46 F03D1/0608 F05B2250/184 F05B2250/314
 F05B2250/70 Y02E10/721 Y02T50/162 Y02T50/673

European: B64C23/06 F01D5/14B3 F02K1/46 F03D1/06B
 R05B250/184 R05B250/314 R05B250/70 Y02E10/72 Y02E10/72B
 Y02T50/16B Y02T50/67D

**Family:**

Publication number	Publication date	Application number	Application date
EP2270312 A1	20110105	EP20090164277	20090701
EP2270312 A9	20110330	EP20090164277	20090701

Priority:

EP20090164277 20090701

Probable Assignee: PEM ENERGY OY**Assignee(s):** (std): PEM ENERGY OY**Inventor(s):** (std): SEPPELAE MIKAEL ; ROENKKOE VAEINOE ; PYLKKAEENEN JUHANI**Agent(s):** ROITTO KLAUS

Designated states: AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL
 PT RO RS SE SI SK SM TR

74) Family number: 49887902 (US2011268557A)

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Title: SYSTEM AND METHOD FOR ATTENUATING THE NOISE OF AIRFOILS

Abstract: A system and method for reducing the noise of an airfoil is provided. The airfoil includes a main portion including a leading edge and a trailing edge. The airfoil further comprises a noise attenuator coupled to the main portion and disposed proximate to at least a portion of the trailing edge. The noise attenuator has a chord length in the range of about 0.5 to about 5 times a trailing edge thickness and is fixed relative to the trailing edge. The airfoil can be a rotating blade deployed on a wind turbine. The airfoil can also be deployed on an aircraft as a fixed wing.

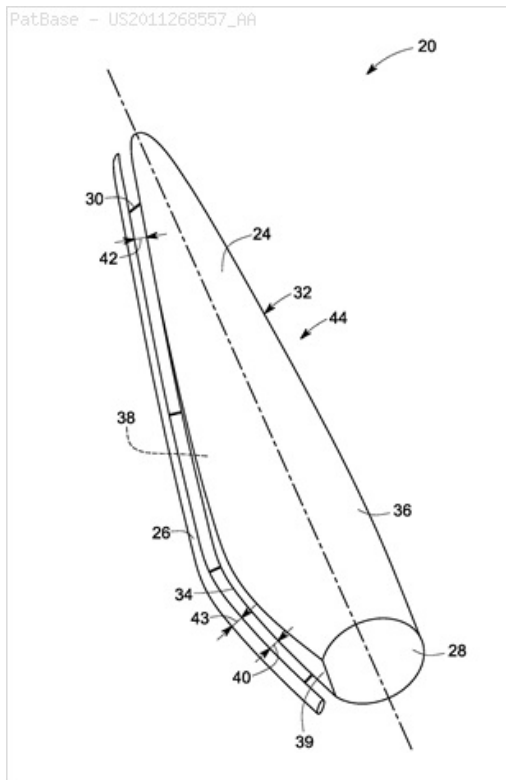
Classifications:

International (IPC 8-9): B24D B63B1/32 B64C1/40 B64C11/18
 B64C23/06 B64C3/10 B64C3/14 F01N1/00 F03D1/06 F04D29/32
 F04D29/66 F04D29/68 G10K11/16 (Advanced/Invention)

CPC: Y02E10/721 F04D29/324 B63B1/322 B64C23/06 B64C2003/147
 F03D1/0633 F03D1/0675 F04D29/681 F05B2240/122 F05B2240/30
 F05B2260/96 Y02T50/162 Y02T50/166 Y02T70/12 B64C2230/14

European: B64C23/06 F03D1/06B6 F03D1/06C6 F04D29/32B3
 F04D29/68C L63B1/32B L64C3/14H R05B240/122 R05B240/30
 R05B260/96 Y02T50/16B Y02T50/16D Y02T70/12

US: 181/211 181/211S 181/296 181/296S 244/1.00NS 244/1N
 415/119 415/119P

**Family:**

Publication number	Publication date	Application number	Application date
■ CN102431642 A	20120502	CN201110309837	20110929
■ EP2439403 A1	20120411	EP20110181458	20110915
■ IN02700DE2011 A	20130104	IN2011DE02700	20110919
■ US2011268557 AA	20111103	US20100893728	20100929

Priority:

US20100893728 20100929

Probable Assignee: GENERAL ELECTRIC CO**Assignee(s):** (std): GEN ELECTRIC**Assignee(s):** GENERAL ELECTRIC CO ; GENERAL ELECTRIC COMPANY**Inventor(s):** (std): DRACK LORENZ EDWIN ; SENGUNDERMUDALIAR GOWRI JAGANATHAN ; RANGWALLA AKIL ABBAS ; EDWIN DRACK LORENZ ; JAGANATHAN SENGUNDERMUDALIAR GOWRI ; ABBAS RANGWALLA AKIL**Inventor(s):** SENGUNDERMUDALIAR GOWRI JAGANTHAN**Agent(s):** BEDFORD GRANT RICHARD**Designated states:** AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR**75) Family number: 62552913** (US2016159476A)

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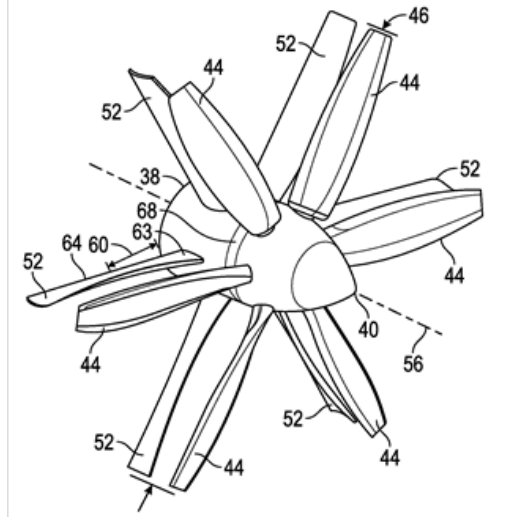
Title: GUIDE VANES FOR A PUSHER PROPELLER FOR ROTARY WING AIRCRAFT

Abstract: A propulsor system for a rotary winged aircraft includes a propeller including having a propeller hub rotatable about a propeller axis and a plurality of propeller blades secured to and extending radially outwardly from the propeller hub. The propeller is oriented on the rotary winged aircraft to provide forward thrust for the rotary winged aircraft when the propeller is rotated about the propeller hub. A plurality of guide vanes non rotatable about the propeller axis are positioned upstream of the plurality of propeller blades. The plurality of guide vanes are positioned to turn an airflow flowing into the plurality of propeller blades, thereby reducing an angle of attack of the plurality of propeller blades relative to the airflow.

Classifications:**International (IPC 8-9):** B64C23/06 B64C27/473

B64C27/82 (Advanced/Invention)

CPC: B64C27/82 B64C2027/8236 B64C23/06 B64C27/473**US:** 244/17.21

**Family:**

Publication number	Publication date	Application number	Application date
DE602015034205 D1	20190814	DE201560034205T	20151208
EP3031720 A1	20160615	EP20150198458	20151208
EP3031720 B1	20190724	EP20150198458	20151208
US2016159476 AA	20160609	US20150963859	20151209
US10086935 BB	20181002	US20150963859	20151209

Priority:

US20140089377P 20141209 EP20150198458 20151208 US20150963859 20151209

Probable Assignee: SIKORSKY AIRCRAFT CORP

Assignee(s): (std): SIKORSKY AIRCRAFT CORP

Assignee(s): SIKORSKY AIRCRAFT STRATFORD CORP

Inventor(s): (std): GERMANOWSKI PETER J ; LORBER PETER F ; MOFFITT BLAKE ALMY ; SCHATTUCK COLMAN D ; SHATTUCK COLMAN D ; WAKE BRIAN E ; MOFFITT BLAKE A ; WEINER STEVEN D

Inventor(s): WEINER STEVEN D ORANGE ; MOFFITT BLAKE A SOUTH WINDSOR ; WAKE BRIAN E SOUTH GLASTONBURY ; LORBER PETER F SOUTHBURY ; GERMANOWSKI PETER J STRATFORD

Agent(s): SCHMITT NILSON SCHRAUD WAIBEL WOHLFROM PATENTANWAELTE PARTNERSCHAFT MBB; KLUNKER SCHMITT NILSON HIRSCH; CANTOR COLBURN LLP

Designated states: AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR

76) Family number: 49460936 (US2013001362A)

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Title: ARRANGEMENT OF AERODYNAMIC AUXILIARY SURFACES FOR AN AIRCRAFT

Abstract: An arrangement of aerodynamic auxiliary surfaces is configured for being arranged on the underside of an aircraft and furthermore includes a longitudinal axis and at least one aerodynamic auxiliary surface, wherein the aerodynamic auxiliary surface is laterally offset referred to the longitudinal axis, and wherein the aerodynamic auxiliary surface is configured for generating vortices when it is subjected to an oncoming air flow. This makes it possible to compensate vortices caused by the shape of the aircraft such that the directional stability of the aircraft can be improved and the aerodynamic drag may be reduced.

Classifications:

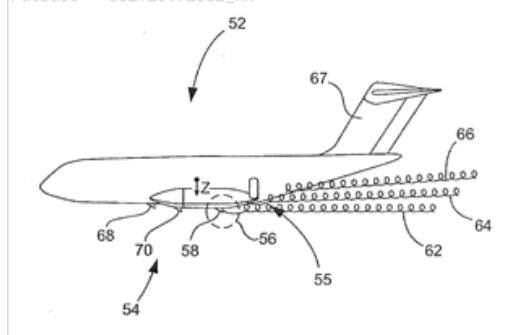
International (IPC 8-9): B64C1/38 B64C23/06 (Advanced/Invention); B64C21/10 (Advanced/Non-invention)

CPC: B64C23/06 Y02T50/162 B64C21/10

European: B64C23/06 Y02T50/16B

US: 244/130

PatBase - US2013001362_AA

**Family:**

Publication number	Publication date	Application number	Application date
CA2790189 AA	20110825	CA20112790189	20110208
CA2790189 C	20160719	CA20112790189	20110208
CN102762454 A	20121031	CN201180010248	20110208
CN102762454 B	20151125	CN201180010248	20110208
DE102010008623 A1	20110825	DE201010008623	20100219
EP2536626 A1	20121226	EP20110704576	20110208
US2013001362 AA	20130103	US20120588276	20120817
US9038950 BB	20150526	US20120588276	20120817

WO11101275 A1	20110825	WO2011EP51834	20110208
WO11101275 A4	20111201	WO2011EP51834	20110208

Priority:

DE201010008623 20100219 US20100306187P 20100219 WO2011EP51834 20110208
US20120588276 20120817

Probable Assignee: AIRBUS OPERATIONS GMBH

Assignee(s): (std): AIRBUS OPERATIONS GMBH ; GOLDHAHN IRIS ; KREUZER PETER ; SCHABER SVEN

Inventor(s): (std): PETER KREUZER ; SVEN SCHABER ; IRIS GOLDHAHN ; SCHABER SVEN ; GOLDHAHN IRIS ; KREUZER PETER

Agent(s): BORDEN LADNER GERVAIS LLP; Maiwald Patentanwalts GmbH; LERNER DAVID LITTENBERG KRUMHOLZ AND MENTLIK LLP; MAIWALD PATENTANWALTS GMBH

Designated states: AE AG AL AM AO AT AU AZ BA BB BE BF BG BH BJ BR BW BY BZ CA CF CG CH CI CL CM CN CO CR CU CY CZ DE DK DM DO DZ EC EE EG ES FI FR GA GB GD GE GH GM GN GQ GR GT GW HN HR HU ID IE IL IN IS IT JP KE KG KM KN KP KR KZ LA LC LI LK LR LS LT LU LV LY MA MC MD ME MG MK ML MN MR MT MW MX MY MZ NA NE NG NI NL NO NZ OM PE PG PH PL PT RO RS RU SC SD SE SG SI SK SL SM SN ST SV SY SZ TD TG TH TJ TM TN TR TT TZ UA UG US UZ VC VN ZA ZM ZW

77) Family number: 52062942 (US2012248072A)

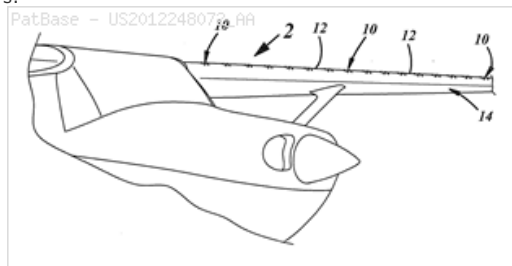
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Title: PLASMA ACTUATED VORTEX GENERATORS

Abstract: A plasma-actuated vortex generator arrangement includes a plurality of spaced-apart vortex generators, and a plasma actuator distributed amongst the plurality of vortex generators.

Classifications:

International (IPC 8-9): B23K10/00 B64C23/00 B64C23/06 F01D5/14 F02C7/04 F03D1/06 H05H1/26 (Advanced/Invention)
CPC: B64C23/005 B64C23/06 B64C2230/12 B64C2230/26 F02C7/04 F03D1/0675 F05B2240/122 F05D2240/127 F05D2270/172 Y02E10/721 Y02T50/162 Y02T50/166
European: B64C23/00A B64C23/06 F02C7/04 F03D1/06C6 R05B240/122 R05D240/127 R05D270/172
US: 219/121.48 219/121.5 219/121.51 219/121.52 244/199.1 244/199.3



Family:

Publication number	Publication date	Application number	Application date
DE602011008538 D1	20140904	DE201160008538T	20111125
EP2505782 A1	20121003	EP20110190780	20111125
EP2505782 B1	20140723	EP20110190780	20111125
US2012248072 AA	20121004	US20110073549	20110328
US8916795 BB	20141223	US20110073549	20110328

Priority:

US20110073549 20110328 EP20110190780 20111125

Probable Assignee: LOCKHEED MARTIN CORP

Assignee(s): (std): FINLEY DENNIS B ; LOCKHEED CORP ; MACHERET SERGEY ; MCCLURE PAUL D

Assignee(s): LOCKHEED MARTIN CORP ; LOCKHEED MARTIN CORP BETHESDA

Inventor(s): (std): FINLEY DENNIS B ; MACHERET SERGEY ; MCCLURE PAUL D

Inventor(s): MCCLURE PAUL D FORT WORTH ; MACHERET SERGEY PALMDALE ; FINLEY DENNIS B GRANBURY

Agent(s): PATENTANWALTSKANZLEI MEYER; HARRISON GODDARD FOOTE; BARKER ROSEMARY ANNE; REISING ETHINGTON PC; JOHN J

Designated states: AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR

78) Family number: 54883956 (US2013255248A)

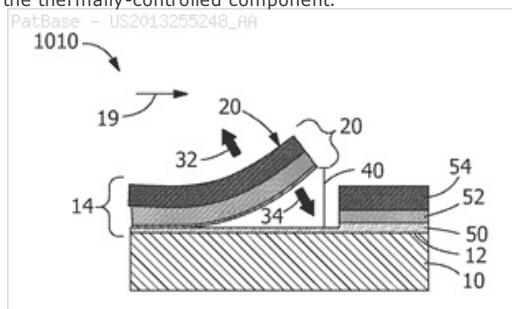
© PatBase

Title: THERMALLY-CONTROLLED COMPONENT AND THERMAL CONTROL PROCESS

Abstract: A thermally-controlled component and thermal control process are disclosed. The thermally-controlled component includes thermally-responsive features. The thermally-responsive features are configured to modify a flow path to control temperature variation of the thermally-controlled component. The thermally-responsive features deploy from or retract toward a surface of the thermally-controlled component in response to a predetermined temperature change. The thermal control process includes modifying the flow path in the thermally-controlled component to control temperature variation of the thermally-controlled component and/or cooling a region of the thermally-controlled component through the thermally-responsive features deploying from or retracting toward a surface of the thermally-controlled component.

Classifications:

International (IPC 8-9): B32B15/00 B32B15/01 B32B3/02 C23C28/00 C23C28/02 F01D11/00 F01D11/18 F01D17/08 F01D25/00 F02C7/28 F03G7/06 F16J15/16 F16J15/44 F16K31/00 F16S5/00 F28F27/00 G01K5/68 G05D23/08 (Advanced/Invention)
CPC: F03G7/06 F28F27/00 F16K31/002 F01D17/085 F28B1/02 F28D5/00 F28D7/106 F28D15/02 F28F13/06 F28F13/12 F28F2255/04 Y10T29/49826 F16S5/00 B62D35/00 B64C23/06 B64C2230/28 F01D5/145 F05D2260/22141 F05D2300/50212 F05D2300/505 F03D1/0675 F04D29/681 F05B2240/313 F15D1/007 F15D1/12 Y10T137/6416 Y02E10/721 Y02T50/162 Y02T50/166 Y02T50/66 Y02T50/673 Y02T50/676 F03D7/022 F01D11/003 F01D11/18 F05D2300/5021 F16J15/164 F16J15/445 Y02E10/723 F03D80/40 C23C28/021 C23C28/023 G05D23/08 Y10T428/1241
US: 1/1 137/334 165/287 251/11 29/428 415/1 415/47 428/603



Family:

Publication number	Publication date	Application number	Application date
EP2644748 A2	20131002	EP20130159387	20130315
EP2644748 A3	20160323	EP20130159387	20130315
JP2013226823 A2	20131107	JP20130065333	20130327
US2013255248 AA	20131003	US20120690298	20121130
US2013255796 AA	20131003	US20120690438	20121130
US2013255931 AA	20131003	US20120690376	20121130
US2013259640 AA	20131003	US20120690233	20121130
US2013260169 AA	20131003	US20120436420	20120330
US9169567 BB	20151027	US20120436420	20120330
US9587632 BB	20170307	US20120690298	20121130
US9671030 BB	20170606	US20120690233	20121130

Priority:

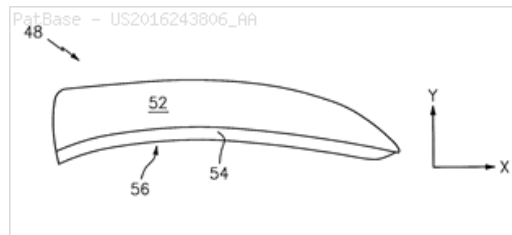
US20120436420 20120330 US20120690233 20121130 US20120690298 20121130
US20120690438 20121130 US20120690376 20121130

Probable Assignee: GENERAL ELECTRIC CO**Assignee(s):** (std): DIMASCIO PAUL STEPHEN ; GEN ELECTRIC ; HEFNER REBECCA EVELYN**Assignee(s):** GENERAL ELECTRIC CO ; FUJITSU SEMICONDUCTOR LTD**Inventor(s):** (std): ARNETT MICHAEL DOUGLAS ; DIMASCIO PAUL STEPHEN ; HEFNER REBECCA EVELYN ; HIGGINS CHRISTOPHER D**Agent(s):** SZARY ANNE CATHERINE; ILLINGWORTH LAW WILLIAM ILLINGWORTH; MCNEES WALLACE AND NURICK LLC**Designated states:** AL AT BA BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC ME MK MT NL NO PL PT RO RS SE SI SK SM TR**79) Family number: 63294963 (US2016243806A)**

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Title: METHOD FOR MANUFACTURING A NACELLE STRAKE

Abstract: A method for manufacturing a strake is provided. The method includes: providing a first thermoplastic laminate panel; providing a second thermoplastic laminate panel; attaching the first thermoplastic laminate panel to the second thermoplastic laminate panel such that at least a portion of the attachment surface of the first thermoplastic laminate panel is attached to the attachment surface of a portion of the second thermoplastic laminate panel, which attached portions form a body of the strake; forming a first flange from a portion of the first thermoplastic laminate panel; and forming a second flange from a portion of the second thermoplastic laminate panel.

Classifications:**International (IPC 8-9):** B29C53/38 B32B37/06 B32B37/08 B32B37/14 B64C5/06 B64F5/00 B64F5/10 (Advanced/Invention)**CPC:** B64C5/06 B29C53/38 B64F5/10 B64C23/06 B64C7/00 B64D29/02**US:** 1/1 156/196**Family:**

Publication number	Publication date	Application number	Application date
US2016243806 AA	20160825	US20150626694	20150219
US9937998 BB	20180410	US20150626694	20150219

Priority:

US20150626694 20150219

Probable Assignee:

ROHR INC

Assignee(s): (std):

ROHR INC

Inventor(s): (std):

FROST JUDDSON

Agent(s):

OSHEA GETZ PC

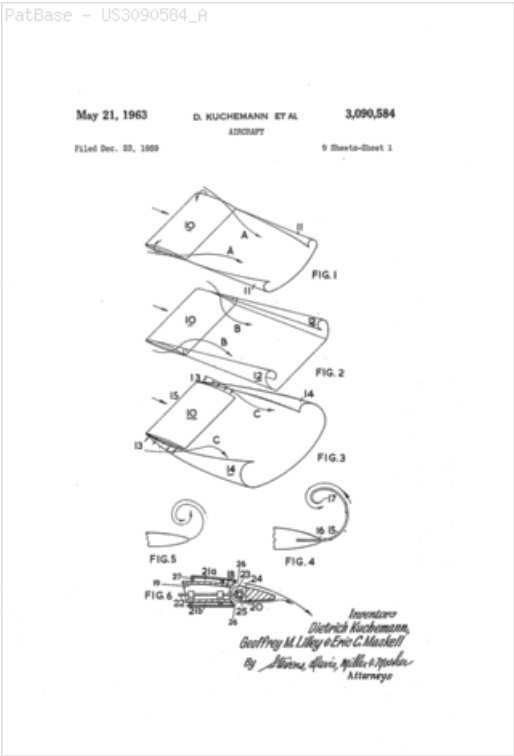
80) Family number: 22219963 (US3090584A)

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Title: AIRCRAFT

Abstract: (Claim 1) 1. An aircraft having an aerodynamic lift member with a leading portion including leading edges which is swept in relation to the normal direction of flight of the aircraft and from which in a given region air flowing over said leading portion is shed therefrom as a vortex sheet in forward flight, and comprising lips in, and extending along, at least part of one of said edges to define in said region slot shaped fluid discharge outlet means, and a combination of cooperating members including nozzles for ejecting a powerful gaseous jet from the discharge means, and means for moving the nozzles to adjust the direction in which the jet is blown, the discharge means and the combination of members being so disposed in relation to the "in flight" vortex sheet as to direct the ejected gaseous jet to stimulate the shedding of and enlarge and strengthen the vortex sheet.

Classifications:**International (IPC 8-9):** B64C23/06 (Advanced/Invention); B64C23/00 (Core/Invention)**International (IPC 1-7):** B64C9/38**CPC:** B64C2230/04 B64C23/06 Y02T50/162 Y02T50/166 B64C2230/16



Family:

Publication number	Publication date	Application number	Application date
US3090584 A	19630521	US19590861699	19591223

Priority:

19560815 US19590861699 19591223

Probable Assignee: POWER JETS RES AND DEV LTD

Assignee(s): (std): POWER JETS RES AND DEV LTD

Assignee(s): POWER JETS RESEARCH AND DEVELOPMENT LIMITED ; POWER JETS RESEARCH AND DEVELOPMENT LTD

Inventor(s): (std): DIETRICH KUCHEMANN ; MICHAEL LILLEY GEOFFREY ; CYRIL MASKELL ERIC

Inventor(s): MASKELL ERIC CYRIL ; KUCHEMANN DIETRICH ; LILLEY GEOFFREY MICHAEL

81) Family number: 4564985 (US3904151A) © PatBase

Title: SUPERSONIC UPFLOW WING

Abstract: Present supersonic aircraft are extremely inefficient, with part of the dissipated energy constituting a pollution product as the sonic boom. These deficiencies arise from the speed of sound compromise of the conservative forward transfer of the irrotational lifting vortex around the wing, resulting in a continuous discharge of angular momentum which is constrained by continuity from appearing in its natural vorticity form and instead is forced into a compressive form as the shock wave system. The present invention employs the propulsion jet to provide a variable density flow field under the wing to relax this constraint, enabling the discharged angular momentum to appear as dynamic vorticity to benefit lift rather than suffer thermal dissipation via the wave system. The aircraft engines and a connecting spanwise manifold are located forward to emit the propulsive jet as a sheet underneath the wing at a pressure greater than atmospheric. The jet expansion cancels the asymmetric wing compression, transforming its energy to the rotational form of vorticity concentrated in the jet immediately below the wing. This vorticity provides an aft upwash that adds to the jet velocity constituting an upward inclined flow, enabling the wing to operate at a lesser angle with a reduced drag component, corresponding to the useful work recovered from the otherwise wasted compression energy. The vorticity laden jet sustains the wing pressure through its internal structure and extends aft of the wing as a vortex flap. This longer effective chord/reduced angle wing system generates lift more efficiently via a larger mass of air, spreading downstream the pressure due to the aircraft weight, thus reducing the sonic boom. Claims, 19 Drawing Figures

Classifications:

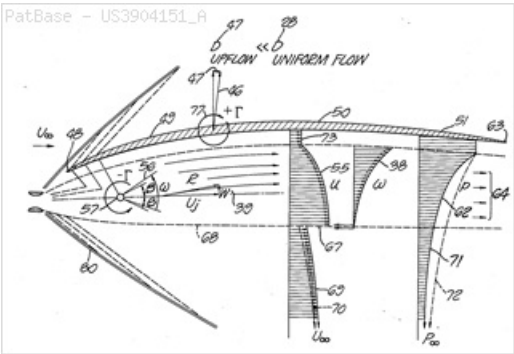
International (IPC 8-9): B64C23/06 B64C30/00 (Advanced/Invention); B64C23/00 B64C30/00 (Core/Invention)

International (IPC 1-7): B64C21/00 B64C21/04 B64C23/06 B64C3/04 B64C30/00 B64D27/18

CPC: B64C23/06 Y02T50/162 B64C30/00 B64C23/065 Y02T50/164

European: B64C23/06A B64C30/00 Y02T50/16B2

US: 244/1.00N 244/119 244/15 244/199 244/1N 244/204.1 244/207 244/219 244/35.00R 244/35R 244/42CC 244/53R



Family:

Publication number	Publication date	Application number	Application date
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Priority:

US19730342151 19730316 US19750584635 19750606 US19760747505 19761206
US19790068464 19790821 US19810324653 19811124

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