

REVISED VERSION

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[Continued on next page]

(54) Title: UNMANNED AERIAL VEHICLE

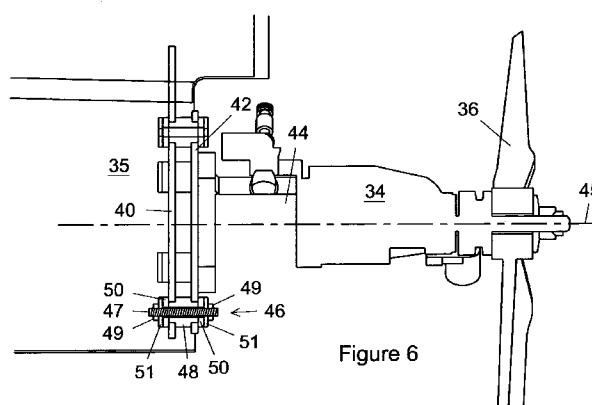


Figure 6

(57) Abstract: A UAV with an engine (34) attached to rear (38) of its fuselage by an engine mounting assembly with the rotational axis of the engine generally parallel with the axis (45) of the fuselage. The engine mounting assembly includes a fuselage bulkhead (40) and a parallel, spaced motor mount bulkhead (42) with the engine (34) attached to it. The mounting assembly also includes a number of connectors (64) that extend between the two bulkheads (40, 42) and resiliently compressible material (48) between the bulkheads in the vicinity of each connector. Each connector (64) can pivot relative to the bulkheads (40, 42) and presses on the bulkheads to compress the compressible material (48). The connectors (64) are adjustable to adjust the compressive load exerted on the compressible material (48). An undercarriage assembly (52) for a UAV comprising an upper cylinder (54) which is telescopically displaced relative to a lower cylinder (58) and a spring element (64) connected to both of the cylinders. A support structure (30) mounted in the front of the fuselage for supporting a camera and the support structure is configured to pivot the camera relative to the fuselage between different orientations.



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see Notice of 24 March 2011

INTERNATIONAL SEARCH REPORT

International application No.

PCT/IB2010/052341

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl.

B64D 27/26 (2006.01)**B64C 25/06** (2006.01)**B64C 25/62** (2006.01)**B64C 1/16** (2006.01)**B64C 25/50** (2006.01)**B64D 47/08** (2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI, EPODOC: IPC, ECLA, B64C, B64D, F16F15/02, B60K5/12 & keywords: UAV, unmanned, engine, motor, mount, support, shock, vibration, damper, isolator, absorber, and like terms.**B64C, B64D, A63H27 & keywords: telescopic, retract, spring, coil, bias and like terms.****B64C, B64D, B64D47/08, A63H27 & keywords: camera, reconnaissance, survey, image, angle, orientation, direction, pivot, adjust, variable, sensor, detect and like terms.**

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US 2008/0125920 A1 (MILES et al.) 29 May 2008 Figure 1 and paragraph [0056]	1-4 1-4
X Y	US 2007/0023582 A1 (STEELE et al.) 1 February 2007 Figures 3-4, paragraphs [0033], [0034]	1-4 1-4
Y	JP62035084 A (MATSUSHITA ELECTRIC IND CO LTD) 16 February 1987 English abstract retrieved from EPODOC database English abstract and Figures	1-4



Further documents are listed in the continuation of Box C



See patent family annex

* "A"	Special categories of cited documents: document defining the general state of the art which is not considered to be of particular relevance	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E"	earlier application or patent but published on or after the international filing date	"X"	document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L"	document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y"	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O"	document referring to an oral disclosure, use, exhibition or other means	"&"	document member of the same patent family
"P"	document published prior to the international filing date but later than the priority date claimed		

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3 December 2010

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26 OCT 2010

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/IB2010/052341

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	RU 2185549 C2 (SKOGO SOJUZA N G KUZNETSOVA) 20 July 2002 English abstract retrieved from EPODOC database English abstract and Figures 2, 6-8	1-4
Y	FR 2098600 A5 (SOCIETE ANONYME DES USINES CHAUSSON) 10 March 1972 Figures 1-5	1-4
A	WO 2007/001371 A2 (AURORA FLIGHT SCIENCES) 04 January 2007 Figures 2-3	1-4
A	US 3319918 A (RAPATA) 16 May 1967 Whole document	1-4
X	US 7136726 B2 (GREENFELD et al.) 14 November 2006 Figures 1, 1A, 2, 3B	7-16
X	US 6209834 B1 (STONEHOUSE) 3 April 2001 Figures 1, 3 and 9	7-16
X	US 6422508 B1 (BARNES) 23 July 2002 Figures 1-5, 7	7-16
A	US 4172570 A (LEONI) 30 October 1979 Abstract and Figures 1-4	5-6
A	US 5129596 A (WAGENER) 14 July 1992 Abstract and Figures 1-2	5-6
A	GB 505109 A (GENERAL AIRCRAFT LIMITED et al.) 4 May 1939 Figures 1-4	5-6
A	GB 533112 A (GENERAL AIRCRAFT LIMITED et al.) 6 February 1941 Figures 1-4	5-6

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2010/052341**Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)**

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

See Supplemental Box

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☒ No protest accompanied the payment of additional search fees.

Supplemental Box

(To be used when the space in any of Boxes I to IV is not sufficient)

Continuation of Box No: III (lack of unity)

This International Application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept.

In assessing whether there is more than one invention claimed, I have given consideration to those features which can be considered to potentially distinguish the claimed combination of features from the prior art. Where different claims have different distinguishing features they define different inventions.

This International Searching Authority has found that there are different inventions as follows:

- Claims 1-4 are directed to a UAV with an elongate fuselage and an engine attached to the fuselage by way of an engine mounting assembly, said engine mounting assembly comprising a fuselage bulkhead and a motor mount bulkhead, characterised in that said engine mounting assembly further includes a plurality of connectors and each connector being configured to pivot relative to the bulkheads; and resiliently compressible material extending between the bulkheads in the vicinity of each connector; at least some of said connectors exerting a compressive load between said bulkheads to compress the resiliently compressible material and said connectors being adjustable to adjust the compressive load exerted on the resiliently compressible material. It is considered that the engine mounting assembly having the combination of these features comprises a first distinguishing feature.
- Claims 5 and 6 are directed to an undercarriage assembly for a UAV, said assembly comprising an upper cylinder, a lower cylinder, at least one wheel attached to a lower end of the lower cylinder and a spring element connected to each of the cylinders and being configured to resist telescopic compression of the cylinder arrangement with resilient flexibility. It is considered that the undercarriage assembly having the combination of these features comprises a second distinguishing feature.
- Claims 7-16 are directed to a UAV comprising an elongate fuselage defining an internal cavity and having a front and a rear, a support structure mounted inside the cavity; and a camera supported by the support structure, with a lens that faces generally towards an underside of the front of the fuselage, in a normal orientation of the camera wherein the support structure is mounted in the front of the fuselage and is configured to pivot the camera relative to the fuselage between different orientations in which the camera lens faces towards the underside of the fuselage at different angles relative to the orientation of the fuselage. It is considered that the support structure for supporting the camera having the combination of these features comprises a third distinguishing feature.

PCT Rule 13.2, first sentence, states that unity of invention is only fulfilled when there is a technical relationship among the claimed inventions involving one or more of the same or corresponding special technical features. PCT Rule 13.2, second sentence, defines a special technical feature as a feature which makes a contribution over the prior art.

Each of the abovementioned groups of claims has a different distinguishing feature and they do not share any feature which could satisfy the requirement for being a special technical feature. Because there is no common special technical feature it follows that there is no technical relationship between the identified inventions. Therefore the claims do not satisfy the requirement of unity of invention *a priori*.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/IB2010/052341

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
US	2008125920	AU	2005291731	BR	PI0516536	CA	2484422
		CN	101044416	GB	2434786	WO	2006037237
		ZA	200702835				
US	2007023582	US	7542828				
JP	62035084	JP	58070652				
RU	2185549	NONE					
FR	2098600	NONE					
WO	2007001371	US	2006248873				
US	3319918	NONE					
US	7136726	AU	2003231341	AU	2009200781	BR	0311522
		EP	1508020	EP	1783455	IL	149934
		SG	143074	US	2005177307	WO	03102505
US	6209834	CA	2268681				
US	6422508	AU	56971/01	WO	0177627		
US	4172570	NONE					
US	5129596	DE	3934839	ES	2026009		
GB	505109	NONE					
GB	533112	NONE					
Due to data integration issues this family listing may not include 10 digit Australian applications filed since May 2001.							
END OF ANNEX							