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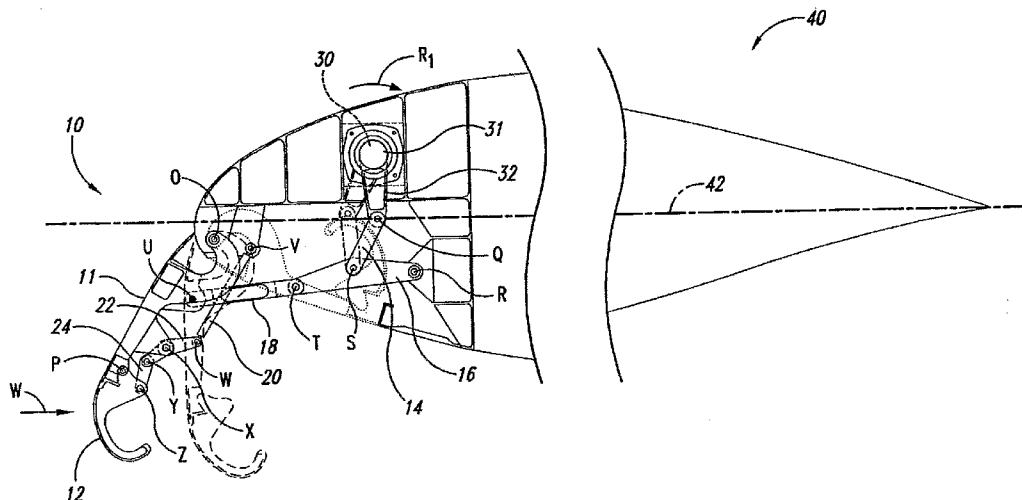
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22 February 2007

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: LEADING EDGE FLAP APPARATUSES AND ASSOCIATED METHODS



(57) Abstract: The present invention is directed generally toward leading edge flap apparatuses and corresponding methods. One aspect of the invention is directed toward an aircraft system having an airfoil, an actuator driver, and a leading edge device with two flow surfaces (11, 12) and six links. In a further aspect of the invention, the flow surfaces of the leading edge device are at least approximately located in the same position when the actuator device is in two different positions. Another aspect of the invention is directed toward an aircraft system having an airfoil and a leading edge device movable between at least a retracted position and an extended position along a motion path having two segments. The second flow surface (12) can be positioned generally behind and/or generally above the first flow surface (11) when the first and second flow surfaces are located in the first segment of the motion path.

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# INTERNATIONAL SEARCH REPORT

International application No

PCT/US2005/033304

**A. CLASSIFICATION OF SUBJECT MATTER**  
INV. B64C9/22 B64C3/50

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)  
B64C

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 practical, search terms used)

EPO-Internal, WPI Data

**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 5 158 252 A (SAKURAI SEIYA [US]) 27 October 1992 (1992-10-27)  abstract; figure 14 -----	1, 2, 7, 28, 29, 34-37 8-14, 19-23, 38-40
X  Y	EP 1 338 506 A (FAIRCHILD DORNIER GMBH [DE]) 27 August 2003 (2003-08-27) abstract; figures 1, 3, 5-7, 12  -----  -/-	1, 2, 28, 29, 34-37 8-14, 19-23, 38-40

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

\* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*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)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*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
- \*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
- \*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.
- \* & \* document member of the same patent family

Date of the actual completion of the international search

7 November 2006

Date of mailing of the international search report

17/11/2006

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## INTERNATIONAL SEARCH REPORT

International application No

PCT/US2005/033304

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6 375 126 B1 (SAKURAI SEIYA [US] ET AL) 23 April 2002 (2002-04-23)	1,2,7, 28,29, 34-37
A	abstract; figure 3  -----	8,10,11, 13,14, 19-23, 38-40

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2005/033304

### Box 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 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 additional sheet

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 an additional fee, this Authority did not invite payment of any additional fee.
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.
- ☐ No protest accompanied the payment of additional search fees.

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-7, 28-37

An aircraft system/method of making or configuring an aircraft (system), comprising:  
an airfoil having a leading edge, a lower surface, and a chord line; and  
a leading edge device having a first flow surface and a second flow surface, the first flow surface being coupled to the airfoil and the second flow surface being coupled to the first flow surface, the leading edge device being movable along a motion path among:  
a retracted position;  
an extended position; and  
an intermediate position with the first flow surface at least approximately perpendicular to the chord line of the airfoil, and wherein the motion path has:  
a first segment between the retracted position and the intermediate position along which the second flow surface is positioned at least one of generally behind and generally above the first flow surface; and  
a second segment between the extended position and the intermediate position.

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2. claims: 8-27, 38-40

An aircraft system/method of making an aircraft system, comprising:  
an airfoil;  
an actuator driver coupled to the airfoil; and  
a leading edge device having:  
a first flow surface coupled to the airfoil;  
a second flow surface coupled to the first flow surface;  
a first link being pivotally coupled to the actuator driver;  
a second link being pivotally coupled to the airfoil and to the first link;  
a third link being pivotally coupled to the second link and to the first flow surface;  
a fourth link being pivotally coupled to the airfoil;  
a fifth link being pivotally coupled to the fourth link and to the first flow surface, and  
wherein:  
(a) the second link is coupled to both the first link and the third link at a first common point; or  
(b) both the third link and the fifth link are pivotally coupled to the first flow surface at a second common point; or  
both (a) and (b); and  
a sixth link being coupled to the fifth link and the second flow surface.

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2005/033304

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
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