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**Datasheet for the decision  
of 3 June 2016**

**Case Number:** T 0530/13 - 3.2.01

**Application Number:** 06734316.0

**Publication Number:** 1843943

**IPC:** B64C9/20, B64C9/32

**Language of the proceedings:** EN

**Title of invention:**

SYSTEMS AND METHODS FOR CONTROLLING AIRCRAFT FLAPS AND  
SPOILERS

**Patent Proprietor:**

The Boeing Company

**Opponent:**

AIRBUS SAS (FR) / AIRBUS OPÉRATIONS SAS (FR) / AIRBUS OPERATIONS  
LTD (GB) / AIRBUS OPERATIONS GMBH (DE) / AIRBUS OPERATIONS S.L.  
(ES)

**Headword:**

**Relevant legal provisions:**

EPC Art. 100(c), 54(3), 56

**Keyword:**

Amendments - intermediate generalisation (no)

Novelty - prior European application (yes)

Inventive step - (yes)

**Decisions cited:**

**Catchword:**



**Beschwerdekammern**  
**Boards of Appeal**  
**Chambres de recours**

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Case Number: T 0530/13 - 3.2.01

**D E C I S I O N**  
**of Technical Board of Appeal 3.2.01**  
**of 3 June 2016**

**Appellant I:**  
(Patent Proprietor)

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**Decision under appeal:**

**Interlocutory decision of the Opposition  
Division of the European Patent Office posted on  
3 January 2013 concerning maintenance of the  
European Patent No. 1843943 in amended form.**

**Composition of the Board:**

<b>Chairman</b>	G. Pricolo
<b>Members:</b>	W. Marx
	O. Loizou

## Summary of Facts and Submissions

- I. Appeals were filed by the patent proprietor and the opponent respectively against the interlocutory decision of the opposition division to maintain European patent No. 1 843 943 in amended form.
- II. In its decision the opposition division held that the subject-matter of claim 11 according to auxiliary request IV, filed during the oral proceedings, did not extend beyond the content of the application as filed. Moreover, the subject-matter of claims 1 and 11 was considered to be novel and inventive over the following prior art:
- A1: EP 1 516 813 A1 (under Article 54(3) EPC);
  - A2: US 4,120,470 A;
  - A3: GB 1 304 194 A1;
  - A4: FR 2 756 540 A1;
  - A5: US 4,530,271 A;
  - A6: US 5,957,798 A1;
  - A7: US 4,720,066 A.
- A further document A8 (GB 2 108 635 A) filed outside the nine-month opposition period was not admitted into the procedure for being late-filed and prima facie not more relevant than the documents already on file. Moreover, the opposition division did not see a need to take into account a late-filed affidavit A9.
- III. Oral proceedings took place before the board on 3 June 2016, at the end of which appellant I (patent proprietor) withdrew its appeal and appellant II (opponent) its objections regarding Article 83 and 84 EPC.

The appellant I (patent proprietor) requested that the appeal of appellant II be dismissed.

The appellant II (opponent) requested that the decision under appeal be set aside and the patent be revoked.

IV. Claim 1 of auxiliary request IV as allowed by the opposition division corresponds to claim 1 as granted and reads (broken into a feature analysis adopted by the parties):

- f1) An aircraft wing system (200), comprising:
- f2) a wing (210) having a trailing edge (211);
- f3) a flap (220) positioned proximate to the wing trailing edge (211) and being deployable relative to the wing between a first flap position and a second flap position;
- f4) a first actuator (221) operatively coupled to the flap (220) to move the flap (220) between the first flap position and the second flap position;
- f5) a spoiler (230) positioned at least proximate to the flap (220), the spoiler (230) being movable among at least three positions including a first spoiler position in which the spoiler (230) forms a generally continuous contour (214) with an upper surface (212) of the wing, a second spoiler position in which the spoiler (230) is deflected downwardly from the first spoiler position, and a third spoiler position in which the spoiler (230) is deflected upwardly from the first spoiler position; and
- f6) a second actuator (231) operatively coupled to the spoiler (230) to move the spoiler among the first, second and third spoiler positions mechanically independently of motion of the flap (220),

**characterized in that**

f7) the second actuator (231) is configured to move the spoiler (230) independently of the flap (220) during a first mode of operation,

and **in that**

f8) the second actuator (231) is configured to release a force applied to the spoiler (230) allowing the spoiler (230) to be driven by direct mechanical contact with the flap (220) from the second spoiler position to the first spoiler position as the flap (220) moves from the second flap position to the first flap position.

Independent method claim 11 reads as follows (additions to claim 11 as granted are underlined):

- g1) A method for operating an aircraft wing system (200), comprising:
- g2) placing a wing (210) in a high lift configuration by deflecting a flap (220) downwardly to form a gap with a trailing edge (211) of the wing, and deflecting a spoiler (230) downwardly to form a gap (224) with the flap (220) without mechanically tying the motion of the flap (220) to the motion of the spoiler (230); and
- g3) placing the wing (210) in a speed brake configuration by deflecting the flap (220) downwardly and deflecting the spoiler (230) upwardly without mechanically tying the motion of the flap (220) to the motion of the spoiler (230);
- g4) wherein during normal operation signals are transmitted to a flap actuator (221) and a spoiler actuator (231) so that the flap (220) and the spoiler (230) retract without interfering with each other,

**characterized in that**

g5\*) if retraction signals fail to be transmitted to the spoiler actuator (231), the spoiler actuator (231) releases a force applied to the spoiler (230, and the flap (220) makes physical contact with the spoiler (230) and pushes the spoiler (230) to its retracted position as the flap (220) moves to its retracted position.

- V. The appellant II (being the sole appellant after withdrawal of the patent proprietor's appeal) essentially argued as follows:

The only way described in the application as filed in which an actuator could release a force applied to the spoiler for the very specific condition "if retraction signals fail" was to be found on page 6, showing a release mechanism in the spoiler actuator. Omission of the essential feature of the invention that the spoiler actuator was "back driven" from claim 11 resulted in subject-matter extending beyond the content of the application as filed as it possibly introduced other ways of decoupling the motion of the spoiler from the spoiler actuator, which constituted an unallowable intermediate generalisation. The application as filed did not mention any embodiment in which the spoiler actuator was not back driven. The description on page 6, lines 24 to 27 to which the opposition division had referred, clearly described that the spoiler actuator included the clutch device, i.e. the "release mechanism" formed part of the spoiler actuator itself such that the spoiler actuator was back driven (pivotal connections at either end of the spoiler actuator were unaffected by the release mechanism). Lines 27 to 30 on page 6 simply stated that alternative release mechanisms within the spoiler actuator to make it back



drivable might be provided. There was no disclosure in the application as filed that the "release mechanism" might be disposed between the spoiler and the spoiler actuator or between the spoiler actuator and the aircraft wing, nor that the spoiler actuator would work in a manner different than by reducing its length.

Claim 1 lacked novelty in view of A1. As acknowledged by the patent proprietor, features f1 to f4 were all known from A1. Feature f5 ("deflected downwardly") did not require a rotational movement. A1 also taught a spoiler actuator being mechanically independent of the motion of the flap according to features f6 and f7. As regards feature f8, the opposition division correctly stated that the retracting flap shown in Figure 4 of A1 would exert a force on spoiler part 7B via direct mechanical contact in case retraction signals transmitted to jack 16 failed, in addition to forces exerted on the spoiler via spring 8, jack 16 and the electromagnetic blocking device 19-20. Overcoming the blocking force of the electromagnetic blocking device 19-20 would render the jack 16 freely pivotable, thus moving the spoiler out of the way of the retracting flap. The spoiler would rotate upwardly through the neutral ("first") position.

Claim 1 (and also claim 11 which substantially mirrored claim 1 in method form) lacked inventive step in view of A2, A3, A4 or A7 in light of the common general knowledge or any of A5, A6 or A8. Features f1 to f7 were disclosed in any of A2, A3, A4 and A7. The problem to be solved over any of these documents, as set out by feature f8, was how to safely accommodate a failure of the spoiler actuator to retract (how to safely retract the flap when the spoiler failed to retract). The only structural feature of f8 was that "the second actuator

was configured to release a force applied to the spoiler", all the remaining features being functional.

As acknowledged by the opposition division (and confirmed by the affidavit A9), the use of back drivable spoiler actuators and/or redundant actuators constituted known solutions to this problem. The alleged invention of claim 1 therefore resided in the mere selection - amongst commonly known solutions - of a back drivable actuator replacing the single actuator known from A2, A3, A4 or A7 (if not yet configured to release a force) to solve the problem posed, which could not be considered to involve an inventive step. Such a back drivable spoiler actuator would be configured to release a force applied to the spoiler.

Using the flap to move the spoiler was the necessary result of the configuration shown e.g. in Fig. 5 in A2. The skilled person would not be dissuaded from allowing direct contact between the flap and spoiler, using the retracting motion of the flap to push back the downwardly deflected spoiler in view of potential damage, since the desire to avoid damage to aircraft flight control surfaces in a failure scenario was secondary to the need to safely accommodate the failure. When considering failure scenarios, certain events were hypothesized and components were designed to accommodate them, but these events were actually not intended to occur in normal use. The term "allowing" in claim 1 required that a measure was "permitted to happen", which would be the case when providing a single back-drivable actuator. Moreover, flap and spoiler aircraft flight control surfaces contacted one another relatively frequently during the operational life of an aircraft due to so called "mis-rigging" events. As a result, the spoiler was pre-loaded against

the flap, and due account was taken of this in aircraft flight control surface design. The force between the flap and the spoiler was no different in a mis-rigging event as compared to the spoiler back driving event of the claimed invention. Mechanical contact between the flap and the spoiler would not have dissuaded the skilled person from using a back drivable spoiler actuator. The patent was silent as to any measures which should be taken in order to strengthen or reshape the flap and spoiler, so it could be concluded that such additional measures were not required and could be devised without the exercise of an inventive skill.

A5 and A6 described alternative back drivable spoiler actuators, A5 describing an alternative hydraulic actuator including a relief valve, and A6 an electro-mechanical actuator including a relief mechanism. A8 described a single back drivable spoiler actuator not used as part of a redundant spoiler actuator, including a pressure release valve which relieved excess fluid pressure in the spoiler actuator above a predetermined threshold generated by external forces tending to raise the spoiler, inherently limiting the loads experienced by the spoiler flight control surface, thus avoiding or at least mitigating any damage to the spoiler without the need for any additional measures to be devised regarding the rigidity and/or the shape of the flap and spoiler. By no more than a simple substitution of the spoiler actuators in any of A2, A3, A4 and A7 with the spoiler actuator described in A8 the skilled person would arrive at the claimed invention and fulfil the only structural difference between the known aircraft wing system and the subject-matter of claim 1. The remaining functional features of the characterising portion of claim 1 were the inherent result of such a substitution in the event of a failure to retract of

the spoiler actuation means. The independent claims did not suggest that the second actuator was the sole actuator for moving the spoiler. The question of whether the spoiler was configured to be driven by direct mechanical contact with the flap was purely a result of the geometry of the flap and spoiler arrangement and the geometric interference between the flap and spoiler arising in the event of failure of the spoiler actuator when the spoiler was in the drooped position.

VI. The arguments of the appellant I (being the respondent after withdrawal of its appeal) may be summarised as follows:

Late-filed documents A8 and A9 should not be admitted into the proceedings since they were not prima facie more relevant than documents A1 to A7.

What was important was not the specific structural arrangement of the various release mechanisms envisaged in the patent in suit, but the fact that they could reduce or eliminate the mechanical ties between the flap and the spoiler in the event that retraction signals failed to be transmitted to the spoiler. It was immaterial whether retraction of the flap and the spoiler involved releasing the spoiler from its actuator and then back-driving only the spoiler, or back-driving the spoiler and the spoiler actuators. A skilled person immediately understood that when a clutch device was operated as release mechanism, the spoiler might be back-driven by physical contact with the flap without the spoiler actuator being back-driven as well. Therefore, back-driving of the spoiler actuator was not an essential feature.

Document A1 did not disclose a second actuator configured to release a force applied to the spoiler according to feature f8. The spoiler actuator in A1 ("vérin" 16) always applied a force on the spoiler, even in its retracted position (see paragraph [0028]). If the flap were to be retracted against the spoiler while the spoiler actuator - not releasing a force - would remain in its partly extended position for lack of a retraction signal, and if the blocking force of the electromagnets would be overcome, the resulting upward movement of the spoiler would be dictated by the pivoting movement of the fixed length actuator about its pivot. The resulting upwardly deflected position of the spoiler would not be the same as the first spoiler position defined in feature f8, in which the spoiler formed a generally continuous contour with the upper surface of the wing. Moreover, the only consequence of any release of force by the actuator in A1 - which was neither disclosed nor suggested in A1 - would be to allow the trailing edge spoiler part 7B to be retracted into the leading edge spoiler part 7A by the action of the biasing spring 8, without direct mechanical contact between the flap and the spoiler. A1 did not say what happened in case of failure.

As regards inventive step, feature f8 of claim 1 consisted of two separate features, and the second feature, although worded functionally (the spoiler is allowed to be driven by direct mechanical contact with the flap), could not be simply disregarded: it specified that the claimed aircraft wing system did not include any back-up actuator for driving the spoiler. The effect of feature f8 was that the flap could be used as back-up actuator, i.e. solved the problem of how to provide a system where redundancy was accomplished by simple structural means. The fact that

provisions were to be made to deal with possible failure cases did not mean that such provisions were obvious by implication. The cited prior art only documented back drivable actuators in conjunction with redundant arrangements, where a failed actuator would be back-driven by a back-up actuator. There was no disclosure or suggestion that a flight control surface which failed to retract could be actuated by direct mechanical contact with another flight control surface. It was clearly counter-intuitive to design a flight control system such as to intentionally run one flight control surface into another in order to move it back to its neutral position in case of failure. Accepting the risk of damage to the flap and/or spoiler in order to allow a failure of the spoiler actuator to be accommodated without requiring major structural modifications to the flight control system was part of the patented invention. Even if direct mechanical contact between flaps and spoilers were a common occurrence due to "mis-rigging", such contact would be neither intentional nor forceful. In the patented invention, the flap was intentionally brought into direct mechanical contact with the spoiler with such force that the spoiler was returned to its first or neutral position.

Figure 5 in A2 just showed the root of the problem, but not the claimed solution, i.e. using an existing part and providing a release function. Documents A5 and A6 disclosed actuators that included some provisions to release a force, but the actuator was designed to be back-driven by another actuator stepping in to provide the required movement. A8 related to a blocking valve to keep the spoiler locked in its retracted position, even when subjected to external (aerodynamic) loads. The valve disclosed in A8 also had a pressure relief

function, which did not serve to release a force on the spoiler, but merely served to quickly exhaust excess pressure in the rod end of the cylinder (spoiler actuator), maintaining a desired high level of fluid pressure so that the piston stayed in its retracted position.

### **Reasons for the Decision**

1. *Claim 11 - amendments (Articles 100(c) and 123(2) EPC)*
- 1.1 The subject-matter of claim 11 does not extend beyond the content of the application as filed.
- 1.2 The characterising portion of granted claim 11 was amended during opposition proceedings (see feature g5\*) by addition of the feature according to which the spoiler actuator releases a force applied to the spoiler, to overcome an objection under Article 100(c) EPC. Basis for this amendment is to be found on page 6, paragraph [0020] of the application as filed, also reciting the entry condition ("if retraction signals fail") of feature g5\*, and in claims 27, 30 and 31 as originally filed.
- 1.3 Appellant II objected to the omission of the allegedly essential feature that the spoiler actuator was "back driven" (see page 6, line 19), arguing an unallowable intermediate generalisation.
- 1.4 In this respect the board notes that paragraph [0020] on page 6 of the application as filed only cites by way of example ("For example, the spoiler actuator can be 'back driven'") a back driven spoiler actuator in a failure case ("if retraction signals fail"). Subsequently, the mode of operation in this failure

case is specified by a more functional description ("the flap 220 makes physical contact with the spoiler 230 and pushes the spoiler to its retracted position as the flap 220 moves to its retracted position"), which is included in claim 11. The board therefore considers it not to be required to include the exemplarily mentioned characterisation of the spoiler actuator to be back driven in method claim 11 as it stands, which already contains a general functional description of what happens in said failure case.

The board also cannot follow appellant II in that the application as filed only mentions embodiments in which the spoiler actuator is back driven. The description (page 6, lines 22 to 27) describes two embodiments of spoiler actuators, hydraulically and mechanically driven actuators, which might include a release mechanism, namely a release valve and a clutch, respectively. However, the description also specifies that in both embodiments the release mechanism "allows the spoiler 230 to be back driven", i.e. it is left open whether the spoiler or the spoiler actuator is back driven. Moreover, the second embodiment refers only to a clutch device in general, i.e. a device connecting and disconnecting a driving and a driven part, without further specifying the clutch in terms of its structural features or the way it is integrated within the actuation system. The board therefore finds that the mention of a clutch device does not necessarily imply that the flap driving back the spoiler would - at the same time - drive back the spoiler actuator, so back-driving of the spoiler actuator is not considered to be an essential feature.

After mentioning that other types of spoiler actuators can include corresponding release mechanisms (page 6,



lines 27 to 28), the description in the application as filed summarises (lines 28 to 30) that "in any of these embodiments, this arrangement can reduce or eliminate the mechanical ties between the flap 220 and the spoiler 230, without exposing the flap 220 to interference by the spoiler 230 in the event of a signal failure". Achieving this effect is considered to be essential for the embodiments described, which is expressed in claim 11 by the functional feature that "the spoiler actuator (231) releases a force applied to the spoiler (230)" in the event of failed retraction signals, stemming from claims 27, 30 and 31 (claims 30 and 31 relate to the two embodiments described as set out above) as originally filed.

1.5 The board therefore concludes that omitting the feature that the spoiler actuator is back driven in claim 11 does not constitute an unallowable intermediate generalisation with regard to the passages in the application as filed referred to by appellant II.

2. *Novelty (Article 100(a) EPC, Article 54(3) EPC)*

2.1 Document A1 constitutes state of the art under Article 54(3) EPC and does not take away novelty of the subject-matter of claim 1.

2.2 As acknowledged by the parties, features f1 to f4 of claim 1 are known from A1. However, the board finds that feature f8 is not directly and unambiguously derivable from the disclosure of A1. Feature f8 requires a second actuator configured to release a force applied to the spoiler allowing the spoiler to be driven by direct mechanical contact with the flap from the second spoiler position to the first spoiler position as the flap moves from the second flap

position to the first flap position. The first and second spoiler positions cannot be arbitrarily chosen, but are defined by feature f5. The second position is defined in feature f5 as a position in which the spoiler is deflected downwardly from the first position, the first position being a position in which the spoiler forms a generally continuous contour with an upper surface of the wing.

A1 shows (Figures 2 and 4) a spoiler 7 comprising a trailing edge spoiler part 7B slidably received in a leading edge spoiler part 7A. The trailing edge spoiler part 7B is retracted within the leading edge spoiler part 7A under the force of a spring 8 and can be telescopically extended by actuation of a cylinder or jack 16 as long as a blocking device 19-20 prevents rotation of the spoiler around its pivot 11. Jack 16 represents a spoiler actuator which moves the spoiler between a neutral first position, in which the trailing edge spoiler part 7B is retracted within the leading edge spoiler part 7A, and a second position, in which the trailing edge spoiler part 7B is telescopically extended to close a gap between the spoiler and flap, rotational movement being blocked by the blocking device. Irrespective of whether the second position in A1 corresponds to a downwardly deflected position as specified by feature f5, A1 is totally silent on any release of the force applied by jack 16 (i.e. the second actuator according to the wording of claim 1) to the spoiler, and in particular in relation to a flap motion as specified by feature f8 ("as the flap moves from the second flap position to the first flap position").

2.3 Even following the appellant II in that the retracting flap in Figure 4 of A1 would exert a force on spoiler

part 7B via direct mechanical contact, the board considers that feature f8 cannot be identified in A1.

The resulting movement of the spoiler in this case depends on whether the jack 16 maintains a force sufficient to overcome the blocking force of the electromagnetic blocking device, which would result in the spoiler being freely hingeable without the spoiler actuator being back driven, or whether the back-driving force exerted by the flap on the spoiler is - together with the retracting force of spring 8 - sufficient to retract the trailing edge spoiler part 7B within the leading edge spoiler part 7A against the actuation force of jack 16. However, for both scenarios it would be purely speculative to assume that the spoiler actuator, i.e. jack 16, would be configured to release a force applied to the spoiler. On the contrary, A1 even teaches (paragraph [0028]) that the spoiler actuator applies a force on the spoiler in its retracted position.

Moreover, in the first scenario, the extended chord length of spoiler 7 would not be modified and the spoiler would take a resulting upwardly deflected position in response to the retracting movement of the flap, different from the resulting first spoiler position as defined by feature f8, read in conjunction with feature f5. The first position as claimed is the end position of the spoiler movement when driven by direct mechanical contact with the retracting flap, which corresponds according to feature f5 to the neutral position where the spoiler forms a generally continuous contour with an upper surface of the wing. Assuming a neutral position intermediately during the upward rotational movement, as argued by appellant II, is at odds with the meaning of features f8 and f5. In

the second scenario in which a rotational movement would be prevented by the electromagnetic blocking device, assuming that the spoiler actuator were to release a force applied to the spoiler as required by feature f8, the spoiler would not be driven by direct mechanical contact with the flap, but by the retracting force of spring 8. At any rate, there is no clear teaching to be found in A1 that the release of force applied by the spoiler actuator is triggered by the returning movement of the flap, which in the board's judgment would be required according to the wording of feature f8 ("second actuator is configured to release a force applied to the spoiler ... as the flap moves from the second flap position ...").

- 2.4 Feature f8 is therefore not directly and unambiguously derivable from document A1, because A1 neither shows explicitly any release of force applied by the second (spoiler) actuator to the spoiler, nor can such release of force be implicitly assumed as the flap retracts from its deployed position, which would allow the spoiler to be driven by direct mechanical contact with the flap from the second spoiler position to the first spoiler position (as defined in feature f5). Since the subject-matter of claim 1 already differs from what is disclosed in A1 by feature f8, further considerations with respect to features f5 to f7 can be dispensed with.

3. *Inventive step (Article 100(a) EPC, Article 56 EPC)*

- 3.1 The subject-matter of claim 1 involves an inventive step over either document A2, A3, A4 or A7 as the closest prior art.

3.2 It was not contested that features f1 to f7 according to claim 1 were disclosed in any of A2, A3, A4 or A7. Feature f8 describes a safety measure in case the spoiler actuator fails to retract when the flap moves back from its deployed position. The problem to be solved may therefore be regarded as how to safely accommodate a failure to retract of the spoiler actuator, as formulated by appellant II.

3.3 The board does not agree with appellant II that the only structural feature of feature f8 is that "the second actuator is configured to release a force applied to the spoiler". Releasing a force already represents a functional description in the same way as the remaining features of feature f8. Feature f8 contains the second actuator as a structural element, and the specific embodiment of this actuator, as expressed by the term "is configured", is specified by functionally describing how the second actuator - in the context of the aircraft wing system - is operating. Such functional features for characterising a structural component or system is permissible when limitation by structural features would unduly limit the scope of protection. Moreover, a functional feature specifying a structural component or a system should be interpreted, on a proper construction, as providing a limitation in the sense that the component or system should be apt for carrying out the specified function.

As already set out above, on a proper construction of feature f8, a force release of the second actuator is linked to a movement of the flap ("as the flap moves from the second flap position to the first flap position"). Moreover, the force release must be such that the spoiler is allowed to be driven by direct mechanical contact with the flap. Following the

opposition division in that back drivable and/or redundant actuators are known to the skilled person, which might also imply that such actuators are configured to release a force, the board finds that a flap movement driving by direct mechanical contact the spoiler back to its neutral position is neither shown nor suggested in the available prior art. Therefore, an aircraft wing system adapted to function as specified by claim 1, and in particular by feature f8, is not considered to be an obvious solution to the problem to be solved as outlined above.

- 3.4 Appellant II argued that using the flap to move the spoiler was the necessary result of the configuration in the known closest prior art. Assuming that use of a single back-drivable actuator were at least obvious for the skilled person starting from A2, A3, A4 or A7, which might also release a force applied to the spoiler in certain failure events, the board still fails to see that it would be obvious for the skilled person to use the retracting motion of the flap - by permitting direct mechanical contact between flap and spoiler - to push back the downwardly deflected spoiler to safely accommodate a failure in the aircraft wing system.

In particular, the board does not follow appellant II in that the desire to avoid damage to aircraft flight control surfaces was secondary to the need to safely accommodate a failure to retract of the spoiler actuation. In the board's judgement, it is not obvious to accept the risk of damages to flap and/or spoiler when bringing flight control surfaces in direct mechanical contact with each other. Moreover, as set out above, the functional feature "allowing the spoiler (230) to be driven by direct mechanical contact with the flap from the second spoiler position to the first

spoiler position" in feature f8 provides a further limitation to the claimed aircraft wing system, which in the board's view is not yet implicitly provided or obviously derivable by simply providing a single back-drivable actuator, as alleged by appellant II. The aircraft wing system as claimed must be adapted to provide for a direct mechanical contact between flap and spoiler in order to drive the spoiler back to its first position, which is not considered to be obvious in view of the common general knowledge of the skilled person.

The argument that flap and spoiler aircraft flight control surfaces were designed to withstand so called "mis-rigging" events does not suggest to drive back a spoiler by direct mechanical contact with the flap either, but simply proves that flight control surfaces must be of robust design.

- 3.5 The prior art documents cited by appellant II do not add anything which would render the claimed solution according to claim 1 obvious.

A5 is concerned with a redundant arrangement of hydraulic actuators for aircraft control surfaces including a relief valve, where the second actuator steps in in case of a failure of the first actuator, i.e. there is no need to use a second control surface such as the flap for retracting a spoiler or first control surface. A6 refers to an electro-mechanical actuator, also used for movement of aircraft control surfaces, with two motors including a release mechanism, without any indication for driving a control surface via direct mechanical contact with a further control surface.

Document A8 was submitted by appellant II because it describes a single back drivable actuator, allegedly showing the only structural difference between the known aircraft wing systems according to A2, A3, A4 or A7 and the subject-matter of claim 1. However, as set out already above, the remaining functional features of the characterising portion of claim 1 are not simply considered to be the inherent result of a failure to retract of the spoiler actuation when having a single back drivable spoiler actuator. A corresponding argument applies with regard to document A9, allegedly proving the obviousness of using back drivable spoiler actuators.

- 3.6 The foregoing considerations already show that the board cannot follow the final argument of appellant II that the question of whether the spoiler was configured to be driven by direct mechanical contact with the flap was purely the result of geometry of the flap and spoiler arrangement and the geometric interference arising in the event of failure of the spoiler actuator.
- 3.7 Method claim 11 is even more specific with regard to the features which are considered to be inventive, namely specifying two subsequent steps to be taken ("the spoiler actuator releases a force ..., and the flap makes physical contact with the spoiler ...") in a specific failure case ("if retraction signals fail"). Therefore, for the same reasons given above, the subject-matter of claim 11 involves an inventive step.
4. Since claims 2 to 10 contain all the features of claim 1 and claims 11 to 15 all the features of claim 11, the same conclusions apply to the subject-matter of these claims as well.



5. In view of the foregoing, it can be left open whether the decision of the opposition division was correct in exercising their discretion not to admit documents A8 or A9.

**Order**

**For these reasons it is decided that:**

The appeal of appellant II is dismissed.

The Registrar:

The Chairman:



A. Vottner

G. Pricolo

Decision electronically authenticated