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**Datasheet for the decision  
of 26 September 2018**

**Case Number:** T 2373/15 - 3.2.01

**Application Number:** 09250914.0

**Publication Number:** 2107004

**IPC:** B64C25/50

**Language of the proceedings:** EN

**Title of invention:**

Damping arrangement

**Patent Proprietor:**

Goodrich Actuation Systems Ltd.

**Opponent:**

Messier-Bugatti-Dowty

**Headword:**

**Relevant legal provisions:**

EPC Art. 54(1), 56

**Keyword:**

Novelty - (yes)  
Inventive step - (yes)

**Decisions cited:**

**Catchword:**



**Beschwerdekammern**

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Case Number: T 2373/15 - 3.2.01

**D E C I S I O N**  
**of Technical Board of Appeal 3.2.01**  
**of 26 September 2018**

**Appellant:** Messier-Bugatti-Dowty  
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**Decision under appeal:** **Interlocutory decision of the Opposition  
Division of the European Patent Office posted on  
29 October 2015 concerning maintenance of the  
European Patent No. 2107004 in amended form.**

**Composition of the Board:**

**Chairwoman** S. Fernández de Córdoba  
**Members:** W. Marx  
S. Mangin

## Summary of Facts and Submissions

- I. The opponent lodged an appeal against the interlocutory decision of the opposition division maintaining European patent No. 2 107 004 in amended form.
- II. In its decision the opposition division held, *inter alia*, that the subject-matter of claim 1 of the first auxiliary request was new and inventive in view of the following prior art documents:
- E1: US 7 175 134 B2;
  - E3: GB 1 416 806;
  - E4: US 6 761 243 B2;
  - E5: US 6 290 038 B1;
  - E7: US 5 277 281 A;
  - E12: US 6 095 295 A.
- III. Oral proceedings before the board took place on 26 September 2018.

The appellant (opponent) requested that the decision under appeal be set aside and that the European patent be revoked. The appellant withdrew its requests to remit the case to the department of first instance in view of the alleged procedural violations of the right to be heard and to have the appeal fee reimbursed. It also withdrew its request for a referral to the Enlarged Board of Appeal.

The respondent (patent proprietor) requested that the appeal be dismissed (i.e. maintenance of the patent on the basis of the first auxiliary request as filed with the letter dated 1 July 2016) or, in the alternative, that the patent be maintained according to one of the second to fourth auxiliary requests as filed with the

letter of 20 August 2018. The respondent withdrew its main request filed with the letter dated 1 July 2016.

- IV. Claim 1 according to the first auxiliary request reads as follows:

"A damping arrangement comprising a drive tube of an aircraft nosewheel landing gear (14) arranged to be driven for angular movement relative to a housing (20) by a motor (24), and a damping device (26) independent of the motor (24) and operable to damp oscillating motion of the drive tube (14) relative to the housing (20), and characterised in that the damping device (26) is controllable, in use, to vary the magnitude of a damping load applied to the drive tube (14), and thereby permit the application of a variable magnitude damping load to the drive tube (14)."

- V. The appellant's arguments, insofar as they are relevant to the present decision, may be summarised as follows:

*Interpretation of terms in claim 1*

The legal certainty for third parties relied fully on the term "independent" used in claim 1. As the contested patent did not give an appropriate definition of the term "independent", the most appropriate definition was that the damping device and the motor had to be physically independent or separated, i.e. physically distinct, or at least distinguishable, as known from E1, which showed clearly distinguishable parts 46, 20 (although connected by a hydraulic line). The man skilled in the art would see both parts as being independent. Thus, the term "independent" as used in the context of claim 1 ("damping device independent of the motor") merely meant "two distinct/separate

parts". A functional link between damping device and motor did not prevent both parts from being independent, as disclosed in the patent specification, showing that the damping device and the motor were acting on the drive tube. The conclusions in the contested decision with regard to documents E1 (hydraulic linkage as criterion for non-independence) and E4 (damping device directly connected to the drive member and not directly to the motor, sufficient for characterising them as independent) were contradictory in this respect. The opposition division had failed to provide a positive definition of the term "independent" and based its decision on an arbitrary interpretation of this term, without explaining why the opponent's interpretation was too broad. Moreover, the main claim as maintained in opposition proceedings did not specify this term by positive characterisation.

The patent specification mentioned in paragraph [0006] prior art document E2 in which the motor was the damper, which gave a clear indication that "distinct parts" were meant in the claimed invention. The term "independent" concerned only the structure of the claimed damping arrangement, not the control. The patent specification also cited in paragraph [0005] document E1, but the teaching given therein was not exact and would be ignored by the skilled person. In particular, the motor in E1 only served as a pump in a specific configuration shown in Figure 2 with disconnected damping device, whereas the motor was not used as a pump in the configuration of Figure 4. It was not contested that the damping function in E1 in the power-on mode was connected to the motor, which produced a pressure differential to be applied across the damper when shimmy occurred.

*Novelty*

E1 concerned an aircraft nosewheel landing gear, and the motor 20 and the damping device 46 disclosed in E1 were distinct parts, separated by valve 40. Nothing in the description of the contested patent indicated that a direct connection between the damping device and the drive member was required (which was sufficient for the opposition division to deny novelty over E4 for granted claim 1). The hydraulic connection between motor and damping device in E1 was equivalent to an electric or mechanical connection, as known from E4 or illustrated in the contested patent itself (via the drive member). Moreover, these two elements were functionally independent, since the damping device 46 did not play a role in the angular movement of the drive tube (which was assured by the motor), and the motor did not take part in dampening the oscillating motion of the drive tube. According to the respondent, "independent" meant that shimmy should not be dampened when the motor was turning the landing gear, but this was not required in claim 1.

The control of damping in E1 was electric because it was switched on or off via valve 40, so it was distinct from the control of the hydraulic motor 20. Admittedly, during the power-on mode dampening was connected to the motor. Shimmy was detected via the differential pressure on hydraulic lines 36, 38 (when the landing gear was turning), which led to a displacement of the piston 60 of the damping device 46 and thus dampened shimmying motion. However, as explicitly said in E1 (column 5, lines 2-4), the power-on damper would not interfere with the normal steering operation, i.e. motor and damping device were functionally independent. A variable damping load was disclosed in E1 (column 5,

lines 5 ff), showing a power-on damper 46 and a power-off damper 44, both being independent of the motor.

*Inventive step*

Assuming that E1 showed all features of claim 1 except for a damping device independent of the motor in the board's understanding (i.e. not showing a damping device which was controllable independently from the motor), the problem to be solved was to have the motor and the damping device separate from each other. It was not complex to eliminate the power-on damper 46 of Figure 3 in E1 (which was already variable in damping load) and connect the output ports of the control valve 34 to the input ports of valve 40, which provided a simplified hydraulic block. In the alternative, it was also possible to install another damping device in parallel to the existing damping device in E1, since claim 1 did not specify the number of damping devices. Moreover, when looking at the introductory part in document E7 (column 1, lines 8-10 and 13-16), the skilled person would be incited - also in view of the problem to improve the damping - to use the damper with variable damping known from E7 in E1. E7 also gave the hint (see column 12, lines 11-23) that there was no problem of incompatibility when adapting the damping device of E7 (of piston-type) to E1 for damping rotary motion. Apart from E7, a damper with variable adjustment of the damping load was also known from E12 (see column 1, lines 11-16 and column 4, lines 6-11). It was easy to connect the damping shaft 111 of E12 to the drive tube of E1, thus realising a damping device independent of the motor which was also variable in damping load. It was well-known that ER- or MR-dampers were widely used to provide variable damping, so the skilled person was incited to use such a damper which



was easy to connect to the drive tube. There was no further structural link, so complete independence of the damping device from the motor was achieved.

A landing gear assembly of an aircraft was also known from E5 (Figure 6), showing a motor 15 and a damping device 20. E5 did not show a damping device controllable in use to vary the magnitude of a damping load, i.e. the problem to be solved was to improve the damping device of E5. The skilled person, looking for a controllable damper, was not prevented from replacing the elastomer damper of E5 with the more complex damping device of E7. As regards the disadvantages mentioned in E5 (column 1, lines 25-26) for hydraulic dampers, it was evident that certain drawbacks had to be accepted when realising more complex functionality. The skilled person knowing the teaching of E7 (similarly: E12), would replace the damper 20 of E5 by the damper known from E7 (or E12) to take into account damping conditions, thus arriving without any inventive step at the claimed subject-matter. It was easy to attach the damper of Figure 1 of E7 by connecting stem 32 to bracket 16 of E5 and eye 24 to bracket 19 of E5. According to E7, it was advantageous to use MR dampers instead of ER dampers. The impact of temperature was not important for MR dampers, since fluid viscosity could be modified without having to vary the temperature as in hydraulic dampers. Moreover, E7 provided already a solution to account for temperature problems (column 4, lines 16-18). E5 was not reluctant to use fluids (see column 6, line 16), at least in small quantities. MR dampers provided some advantages (see E7, column 1) which compensated for some drawbacks, so the skilled person was incited to use such a damper in order to improve the independent damper of E5.

VI. The respondent argued essentially as follows:

*Interpretation of terms in claim 1*

The appellant's interpretation of the term "independent" was too broad. Any damping device was inherently "distinguishable" from a motor, as they were different types of parts. The definition of the term "independent" to be found in dictionaries (e.g. Collins) indicated that not only separate parts were meant, but that one part was "free from control" of the other part. According to the interpretation assumed by the opposition division, an indirect mechanical connection between the two parts (i.e. separate connections to the drive member) was sufficient to consider them to be independent. The notion of "independent" in claim 1 did not mean that there was absolutely no interconnection between the damper and the motor and did not exclude embodiments where damping device and motor acted on the same drive member (as the contested patent showed independent separate connections of both parts - not sharing the same structure or gear - to the drive member).

The skilled person would understand that the term "independent" in claim 1 provided some limitation relating to the lack of dependence of the damping member from the motor. Following the appellant's interpretation would remove all meaning from the term "independent", since claim 1 already specified damping device and motor as separate parts, although claimed features usually narrow down further the claimed subject-matter. It was clear from the description and the drawings that the nature of the "independent" motor and damping device resided in the fact that the driving

and damping mechanisms of the drive member were independent from each other. Moreover, the term "damping device independent of the motor" was also tied to a variable control of the damping load, as specified in the characterising portion of claim 1.

An added meaning of the term "damping device independent of the motor" was also suggested by paragraphs [0017] and [0029] in the patent specification, which described an actuation of the motor without applying a damping load. Moreover, the skilled person when reading the description and claim 1 understood that E1 (cited in introductory part of the description as filed and of the patent specification) was an example of non-independence. In E1, showing a combined driving and damping function, there was an interaction between the motor and the damping device. The invention should be distinguished from the cited prior art and an appropriate meaning for the term "independent" had to be assumed, either meaning a freedom in control or at least a meaning as adopted by the opposition division.

As regards the mention of a "constant friction brake" in the description of the patent specification, the skilled person would immediately recognise that this phrase was not consistent with claim 1 and ignore it.

#### *Novelty*

E1 did not teach a damping device independent of the motor, irrespective of whether the opposition division's interpretation of "independent" (that the damping device and motor acted on the drive member independently/separately) or the respondent's preferred claim construction (that the mechanism that produced

the damping and the mechanism for driving the drive member were independent) was used. In E1, the damping device was connected through hydraulic circuits directly to the motor, and the same hydraulic fluid (or mechanisms) actuated the motor and the damping device. In particular, the damping device 46 damped the drive member via the motor 20. The dampening mechanism in E1 was active when shimmy occurred and whenever the motor was activated to steer the nosewheel landing gear. It was not possible to control the motor without having a damping effect. In E1, the motor also controlled the level of damping load.

*Inventive step*

The problem to be solved starting from E1, without giving a pointer to the claimed solution, was seen as how to reduce energy loss or how to improve damping. The problem formulated by the appellant was already solved in E1, and why would the skilled person separate the output of damping device 46 from the motor. There would have been no motivation for the skilled person to replace the damping device of E1 (which was interdependent with the motor) with an independent damping device, since the entire purpose of E1 was to have the motor connected to the damping device through hydraulic connections. It required hindsight of the solution of claim 1 to adapt the damping device of E1 to make it fall within the scope of claim 1. There was no teaching in the prior art of an independent damper within the meaning of claim 1, since the prior art always used a feedback which implied a dependency of control between the motor and the damper. In addition, neither E7 nor E12 mentioned a landing gear of an aircraft, so it was only with hindsight to use the dampers known from E7 or E12.

Starting from E5 there was no motivation for the skilled person to replace the damper of E5 with the damping device of E7, which was only possible with hindsight. Earlier document E7 (1994) dealt with hydraulic dampers, but E5 published in 2000 taught to avoid fluid dampers, due to leakage or sealing problems and temperature sensitivity, and therefore proposed to provide a damper having an elastomer element. Thus, it was not obvious to disregard the concept of E5 and remove the elastomer damper of E5. At least, the skilled person would not replace the damper of E5 by a fluid based system, since E5 taught away from such a solution. E7 disclosed specifically an accumulator to account for thermal fluid expansion, still including seals prone to leakage. The skilled person would therefore not arrive at an independent and variable controllable damping device as claimed. The non-controlled damper of E5 was independent, but E5 avoided to use a variable damper concept.

## **Reasons for the Decision**

1. *Interpretation of the term "independent"*
  - 1.1 In the proceedings before the opposition division, the meaning of the term "independent" used in claim 1 was in dispute and of paramount importance when it came to the issue of whether the subject-matter of claim 1 as granted and also claim 1 as upheld by the opposition division was new over E1. In particular, a contentious issue was whether the term "a damping device independent of the motor" meant nothing more than "distinct mechanical parts", as argued by the opponent.

According to the patent proprietor, taking into account the description and the drawings, the feature "a damping device independent of the motor" meant that "the damping device and the motor are independently controllable". The opposition division took the view that the feature in dispute did not necessarily imply a limitation concerning the way the damping device and the motor were controlled, but that also the opponent's interpretation was too broad. Novelty over E1 was then acknowledged because the damping device in E1 was directly connected to the motor through hydraulic conduits. On the other hand, the opposition division held that a damping device not directly connected to the motor (as in E4) was sufficient to consider both parts independent of each other, so that the subject-matter of claim 1 as granted was considered not new over E4.

- 1.2 The feature "a damping device (26) independent of the motor (24)" was already present in claim 1 as granted and might have been vaguely defined. However, lack of clarity is not a ground for opposition and cannot be invoked against the granted feature "independent", since it is not related to the amendment in claim 1 as upheld by the opposition division, against which the present appeal is directed. The board also notes that no explicit definition of this term is to be found in the patent specification. Prior to reviewing the contested decision with regard to novelty over document E1, which relied on the opposition division's interpretation of the term "independent", the board finds it appropriate in the present case to construe the meaning of the term "independent" used in claim 1 in the light of the specification as a whole.

In particular, the board was not convinced that the term "independent" as used in claim 1 gives a clear technical teaching to the skilled reader and that any limitation regarding the functional interaction of motor and damping device has to be excluded.

As noted by the respondent, definitions of the term "independent" in English dictionaries (such as "free of control of") indicate that not only distinct or separate parts might be meant. Such interpretation would even correspond to the ordinary meaning of "being independent of" as known to the board, according to which the term "independent" is often used to express that two independent entities are not influenced or affected by each other.

Therefore, in accordance with the established case law, the description will be used in the following to assess the correct meaning of the term "a damping device independent of the motor" used in claim 1 in order to identify the claimed subject-matter. In case the patent specification cannot provide a basis for interpretation of the term "independent", or in case of a discrepancy between the claims and the description, however, a rather broad meaning has to be assumed.

- 1.3 First looking at the wording of claim 1 ("damping arrangement comprising a drive tube ... arranged to be driven ... by a motor, and a damping device independent of the motor and operable to damp oscillating motion"), the elements "drive tube", "motor" and "damping device" are listed as different or distinct parts of the damping arrangement. The motor and the damping device are also specified with regard to their function (motor drives the drive tube, damping device damps the oscillating motion). Thus, the question to be answered is whether further specifying in claim 1 the damping

device as being "independent of the motor" provides any further limitation in respect of those two parts, either as regards their structural configuration or in a functional respect. As argued by the appellant, a functional link between damping device and motor acting on the same drive tube (e.g. via separate gears, as disclosed in the patent specification) does not yet prevent both parts from being independent.

- 1.4 In the introductory part of the description as filed or paragraphs [0005], [0006] of the patent specification, documents of the known prior art are referred to, which were cited in opposition proceedings as E1 and E2. In E1, the hydraulic motor serves, to some extent, as a pump, generating a pressure difference across the piston of the damping arrangement, and the piston moves, serving to damp the shimmy motion. In E2, the motor is controlled in such a manner as to damp the motion, i.e. the motor itself is the damping device. Even in E1, there is an interaction between the motor and the damping device. Thus, according to the cited prior art, the motor is always involved in providing the damping effect. The invention is then described (page 2, fourth paragraph of the application as filed; paragraph [0009] of the patent specification) to provide a damping arrangement in which the damping device is independent of the motor, as also specified in claim 1. This already gives a clear hint that "independent" does not only mean "distinct or separate parts" (which might have been suggested if only E2 had been cited in the patent specification), but the term "independent" also refers to the **interaction** between the motor and the damping device.

The board does not follow the appellant's appraisal of citation E1 mentioned in the patent specification,



which allegedly would be ignored by the skilled person. The invention according to claim 1 relates to a damping arrangement of an aircraft nosewheel landing gear arranged to be driven for angular movement, i.e. to be steered, by a motor. Such steering actuation is not limited in claim 1 to a specific type of motor (an electrically powered motor is only specified in a dependent claim) and thus might be provided by a hydraulic motor which is driven by a pump, as known from E1. Therefore, the subject-matter as specified in claim 1 does not require the prior art citation of E1 in the patent specification to be ignored. The passage cited (paragraph [0005]: "In the event of shimmying, the hydraulic motor serves, to some extent, as a pump ...") might refer to a specific configuration in E1, as argued by the appellant. However, in the board's understanding, without knowing more details about the circuitry in E1, it is clear to the skilled person (see patent specification, paragraph [0003], stating that hydraulically powered arrangements have been used to power the drive tube for angular movement; and paragraph [0005] describing a hydraulically powered nosewheel landing gear known from E1) that a hydraulic motor provides the steering actuation in E1 and (as stated in paragraph [0005]) serves at least to some extent as a pump in order to damp the shimmying motion. It might be desirable to provide an electrically powered motor, but such a limitation is only specified in dependent claim 2. The hydraulic motor serving as a pump under these conditions implies that shimmying motion of the nosewheel landing gear results in the hydraulic motor returning fluid back into its supply lines so that the hydraulic motor acts as a pump (if steering takes place, in superposition to its function as a steering motor), which provides a pressure

difference across the damping device and thus a damping effect.

Thus, the person skilled in the art will understand that the invention was made starting from prior art in which either the motor is not distinct from the damping device (E2) or the motor is at least involved in providing the damping function (E1).

- 1.5 Moreover, paragraphs [0017] and [0029] of the patent specification make clear that the claimed feature of a "damping device independent of the motor" cannot be construed merely as a structural separation ("distinct parts") without providing any further limitation, but that the advantages described for the claimed invention are related to some kind of functional independency. According to paragraph [0017], "By **avoiding continuously applying** a damping load, a relatively smaller size of motor can be used to power the drive member ... in order to achieve steering". A similar advantage of the invention is described later in paragraph [0029], stating that "as the damping load is only applied **when needed**, the electric motor used to power the drive tube 14 for movement can be relatively small". Thus, the invention concerns a damping arrangement comprising a motor which can be actuated without applying a damping load, i.e. a motor not necessarily interacting with the damping device. Therefore, the motor - which according to the wording of claim 1 ("nosewheel landing gear arranged to be driven for angular movement relative to a housing by a motor") is used to provide a steering function for the nosewheel - must not necessarily be involved in providing the damping load.

1.6 The board also takes note of the characterising portion in claim 1, according to which "the damping device is controllable, in use, to vary the magnitude of a damping load applied to the drive tube". In the board's understanding, this means that the damping device is the active part ("to vary") to apply a variable magnitude damping load. Reading the characterising feature together with the feature in dispute ("damping device independent of the motor") and taking into account the aforementioned considerations (points 1.4 and 1.5), the board finds that claim 1 specifies a damping device that provides a variable damping load without the use of the motor, i.e. without the motor being involved.

1.7 In the light of the description of the patent specification (see points 1.4 and 1.5), taking into account the wording of claim 1 as a whole (see point 1.6), the board comes to the conclusion that the term "independent" used in claim 1 must be given a more precise meaning, other than merely specifying separate or distinct parts, and provides a further limitation of the claimed subject-matter. In particular, the feature in dispute of "a damping device independent of the motor" has to be construed as meaning that **the motor is not involved in providing the damping load through the damping device, i.e. that the damping load applied by the damping device is controllable independently from the motor.**

2. *Interpretation of the term "variable"*

The board confirms the opposition division's finding (see point 13.1.2) that a constant friction brake (as mentioned in the patent specification in column 3, lines 43-45) is not within the scope of the claims,

which require a damper which is controllable in use to vary the magnitude of the damping load. The phrase "for example, it could comprise a constant friction brake" mentioned in the patent specification does not affect the scope of the claims. As argued by the respondent, the skilled person would immediately recognise that this phrase is not consistent with claim 1 and thus ignore it.

3. Since the appellant withdraw its request for remittal and reimbursement of the appeal fee in view of an alleged violation of its right to be heard, and also its request for a referral to the Enlarged Board of Appeal, which were raised with regard to the opposition division's interpretation of terms in claim 1, there is no need to provide further reasoning in this respect.
4. *Novelty over E1 (Article 54(1) EPC)*
  - 4.1 The subject-matter of claim 1 is new over the disclosure of document E1 (Article 54(1) EPC).
  - 4.2 The board does not follow the appellant's view that the damping device 46 and the hydraulic motor 20 disclosed in E1 (Figures 2 and 4), although being separate or distinct parts, are independent. Within the board's understanding of the term "damping device independent of the motor" as elaborated above, the damping device in E1 cannot be regarded as independent of the motor, since the hydraulic motor 20 is involved in the control of the damping device 46. In particular, the damping function in E1 is connected to the motor, because the motor produces a pressure differential to be applied across the damper 46 when shimmy occurs, as admitted by the appellant as regards the power-on mode in E1. E1 might also suggest a functional independence between

the normal steering operation and the damping function (see column 5, lines 2-4: "the power-damper would not interfere with the normal steering operation") as argued by the appellant, but claim 1 requires independence between two parts and not between two functions, and the meaning of this kind of "independence" as claimed has been construed as explained previously. The point is not whether claim 1 requires that shimmying motion should not be damped when the motor is turning the landing gear wheel, as argued by the appellant in view of the respondent's submissions. According to the board's interpretation of a "damping device independent of the motor" claim 1 requires that the damping load applied by the damping device is controllable independently of the motor.

The appellant also argued that the control of damping was electric in E1 because it was switched on or off via valve 40, so it was distinct from the control of the hydraulic motor 20. However, switching of valve 40 only selects the damper to be used in E1, either the power-off damping orifice 44 (column 4, lines 11-16, as depicted in Figure 2), or the power-on damper 40 (column 4, lines 26-28, Figure 4). In both cases, shimmy that occurs in the landing gear is transmitted as rotational motion to the motor, which acts as a pump in the power-off (column 4, lines 22-25) or produces a pressure differential which is applied to the power-on damper 46 (see column 4, lines 41 ff). Thus, in both cases the motor is responsive to the shimmying motion of the landing gear and is involved in providing the damping load through one of the damping devices in E1, which according to the board's understanding does not fall under the meaning of a "damping device independent of the motor" as specified in claim 1. As argued by the respondent, it is not possible to control the motor in

E1 to steer the nosewheel landing gear without having a damping effect provided by the motor, which automatically is provided in case of shimmying motion of the landing gear due to the pressure differential produced across the motor.

E1 might show a variable damping load by providing a power-off damper 46 and a power-off damper 44, as argued by the appellant with respect to the characterising feature of claim 1. However, as argued above, it is always the motor which controls the level of damping load in E1, i.e. the motor is involved in providing the damping load through the damping device, which according to the board's understanding of the term "independent" does not fall under the wording of claim 1.

5. *Inventive step (Article 56 EPC)*

5.1 The subject-matter of claim 1 involves an inventive step (Article 56 EPC), irrespective of whether document E1 or E5 is considered to represent the closest prior art.

5.2 - E1 as closest prior art:

5.2.1 As found above when acknowledging novelty over E1, E1 does not show at least a damping device independent of the motor according to the board's interpretation, i.e. a damping device which is controllable independently from the motor. A formulation of the problem to be solved as proposed by the appellant ("having the damping device and the motor separate from each other") provides already a hint to the claimed solution and is not considered appropriate. Therefore, the problem to

be solved may be regarded as how to improve the damping in the damping arrangement of E1.

5.2.2 The board cannot see why the skilled person, without having knowledge of the claimed invention, would have been motivated to either replace the damping device 46 known from E1, or in the alternative, even to add a further damping device in parallel, as suggested by the appellant. In particular, the damping arrangement known from E1 is based on a layout in which the motor is connected to the damping device through hydraulic connections, as noted by the respondent. Thereby, a double functionality can be provided by the motor of E1. On the one hand, the motor is used to provide the normal steering operation. On the other hand, a pressure differential will be produced across the motor in reaction to shimmy vibrations of the landing gear wheel, which will be applied across the power-on damper 46 (see column 4, lines 41-56). Alternatively, when the landing gear wheel is not turning, the motor acts as a pump in response to a shimmy force and drives fluid through the power-off damping orifice 44 (column 4, lines 11-25). Without any further prompting in the prior art it is not considered an obvious solution to give up or even supplement this very specific and compact layout, which already provides (E1, column 4, line 58) the advantage of avoiding power loss within the damping mechanism. The entire teaching of E1 relies on a hydraulic feedback implying a dependency of control between the motor and the damper.

Therefore, irrespective of whether damping devices with variable adjustment of the damping load such as ER- or MR-dampers are widely used and known e.g. from E7 (column 1, lines 8-16) or E12 (column 1, lines 11-16; column 4, lines 6-11), the board is not convinced that

the skilled person would contemplate giving up the rather simple circuitry of E1 and modify the hydraulic system of E1. Moreover, no indication is to be found that the dampers known from E7 or E12 might be used in an aircraft and the specific operating conditions associated therewith.

5.2.3 The appellant also argued that it was easy and not complex to incorporate a damper variable in damping load as known from E7 or E12 into the hydraulic system of E1, in particular in view of the problem to improve the damping. However, although this might be hypothetically possible, the decisive criterion in assessing inventive step is not whether it was easy and the skilled person could have done so, but whether he would have done so in view of any prompting in the prior art. In the absence of any clear indication in the prior art in this regard, the board finds that the subject-matter of claim 1 involves an inventive step.

5.3 - E5 as closest prior art:

5.3.1 As acknowledged by the appellant, E5 does not show a damping device controllable in use to vary the magnitude of a damping load, as required by the characterising portion in claim 1. E5 shows an elastomer damper simple in construction that cannot leak (see column 1, lines 61-62). Thus, the problem to be solved can be seen in improving the damping device of E5.

5.3.2 The appellant was of the opinion that the skilled person, looking for a controllable damper, or in order to take into account damping conditions, was not prevented from replacing the elastomer damper of E5 with the more complex damping device of E7 (or E12). In



particular, some disadvantages mentioned in E5 for hydraulic dampers (column 1, lines 25-26) had to be accepted when realising more complex functionality, and it was allegedly easy to install the damper of Figure 1 of E7 in the landing gear of E5 (see Figure 6), and nothing prevented the skilled person from doing so.

5.3.3 Again, the problem as formulated by the appellant already contains a pointer to the claimed solution and is therefore not acceptable. Moreover, as argued already above, the decisive criterion in assessing inventive step is not whether it was easy for the skilled person to replace the elastomer damper of E5, or that he was not prevented from doing so, but whether he would have done so in view of any prompting in the prior art. E5 explicitly refers to fluid dampers in aircraft landing gear applications according to the current state of the art as being costly, subject to leakage (column 1, lines 21-27) and temperature sensitive (column 1, lines 51-58). Therefore, the board agrees with the respondent that E5 teaches to avoid fluid dampers, i.e. teaches away from replacing the elastomer damper of E5 by a fluid-based damper as known from E7 or E12, even though it would provide a variable damping force. The mere fact that E7 already provides a solution to account for temperature problems by providing an accumulator to allow for thermal expansion of the fluid (see column 4, lines 16-18), or that the impact of temperature might not be important for MR dampers, does not yet solve the leakage problem mentioned in E5 with respect to fluid dampers, i.e. it cannot provide an indication contrary to the general teaching of E5. As similar reasoning applies when taking into account that E5 uses a lubricant (column 6, line 16), which might be considered as a fluid, for the elastomer sleeve, as argued by the appellant, since it

cannot change the general teaching of E5 to use an elastomer damper to avoid the problems associated with hydraulic dampers.

- 5.3.4 In view of the above, the board holds that the subject-matter of claim 1 involves an inventive step also when starting from E5 as the closest prior art.

## Order

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

The appeal is dismissed.

The Registrar:

The Chairwoman:



A. Vottner

S. Fernández de  
Córdoba

Decision electronically authenticated