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Datasheet for the decision of 3 February 2020

Case Number: T 0261/16 - 3.2.08

Application Number: 08843213.3

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Language of the proceedings: EN

Title of invention:
SUSPENSION SYSTEM FOR AIRCRAFT AUXILIARY POWER UNIT WITH ELASTOMERIC MEMBER

Applicant:
LORD Corporation

Headword:

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - after amendment - (yes)

Decisions cited:

Catchword:

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Case Number: T 0261/16 - 3.2.08

D E C I S I O N
of Technical Board of Appeal 3.2.08
of 3 February 2020

Appellant: (Applicant)	LORD Corporation 111 Lord Drive Cary, NC 27511 (US)
Representative:	Wynne-Jones IP Limited Essex Place 22 Rodney Road Cheltenham Gloucestershire GL50 1JJ (GB)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 25 August 2015 refusing European patent application No. 08843213.3 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairwoman	P. Acton
Members:	C. Herberhold
	Y. Podbielski

Summary of Facts and Submissions

I. By decision posted on 25 August 2015 the Examining Division refused European patent application No. 08 843 213.3. In its decision the Examining Division held that the subject-matter of claim 1 of all then pending requests did not involve an inventive step.

II. The appellant (applicant) lodged an appeal against that decision in the prescribed form and within the prescribed time limit.

It requested to set aside the impugned decision and to grant a patent based on the main request or alternatively, based on one of auxiliary requests 1-4 - all filed with the grounds of appeal.

III. By notification dated 20 December 2018, the Board informed the appellant that in its provisional opinion the subject-matter of auxiliary request 1 was new and inventive. However there remained objections under Articles 123(2) and 84 EPC.

IV. With letter dated 24 January 2019 the appellant submitted a new main request, based on the former first auxiliary request and taking into account the comments made by the Board.

It was requested to set aside the impugned decision and to grant a patent based on the newly filed main request.

On the understanding that the new main request would result in the appealed decision being set aside, the

appellant withdrew the previous main request, auxiliary requests and its request for oral proceedings.

V. As the present main request fulfils the requirements of the EPC (see below), the Board is in the position to decide the case in the written proceedings.

VI. Claim 1 of the main request (filed with letter dated 24 January 2019) reads as follows:

"An aircraft motion control auxiliary power unit suspension system for isolating an aircraft auxiliary power unit comprising:

a suspension linkage (32) including a first and a second terminal end (74, 76), each having a helical threaded portion (70, 72) having a same hand;

a first elastomeric rod end (35a) having a helical threaded portion (78) and a first motion control elastomer (40) operatively interconnecting a first motion control nonelastomeric member (36) and a second motion control nonelastomeric member (38), said helical threaded portion (78) of said first elastomeric rod end (35a) having a hand corresponding to said hand of said helical threaded portion (70) of said first terminal end (74) of said suspension linkage (32); and

a second elastomeric rod end (35b) having a helical threaded portion (80) and a first motion control elastomer (40) operatively interconnecting a first motion control nonelastomeric member (36) and a second motion control nonelastomeric member (38), said helical threaded portion (80) of said second elastomeric rod end (35b) having a hand corresponding to said hand of

said helical threaded portion (72) of said second terminal end (76) of said suspension linkage (32),

characterised in that

said helical threaded portion (78) of said first elastomeric rod end (35a) and said helical threaded portion (80) of said second elastomeric rod end (35b) are of said same hand and have the same pitch."

VII. The following documents played a role in the present decision:

D1: WO 2006/108028 A2;
D4: US 4,571,936 A1.

VIII. The essential arguments of the appellant can be summarised as follows:

The invention related to an aircraft motion control auxiliary power unit (APU) suspension system having a suspension linkage and first and second elastomeric rod ends threadedly connected thereto. According to the invention the threaded connections were of the same hand and had the same pitch, which ensured that for a given rotation of the linkage the threads will translate in the same direction by an equal amount, there being no overall change in the distance between the ends.

This was advantageous over the conventional approach for APU suspension systems which used a securable "turnbuckle" arrangement for tightening the suspension system "on-board" the aircraft to the desired tension. In such an arrangement, securing means, such as jam

nuts, welding, crimping etc. were used to make sure the ends did not vibrate loose from the linking rod.

The present invention was conceptually different from a turnbuckle device. It required the length to be set "off-board" the aircraft and then installed. While there was no possibility of the inventive device to be adjusted once installed, the device was such that it could not vibrate loose.

Such a device was not obvious in view of the teachings of documents D1 and D4. Indeed, the provision of threads having the same hand and pitch went directly against the teaching of D4 and would render the aerodynamic strut of D4 entirely unsuitable for its intended purpose because it would be incapable of any adjustment.

Thus, the claims of the new main request had to be considered novel and inventive.

Reasons for the Decision

1. The new main request is a reaction to the examining division's reasoning in point 13.10 of the decision ("....the series of events which the applicant construed would be technically acceptable if the pitch at the two extremities were the same") and to the Board's communication dated 20 December 2018. It is thus admissible.

2. Art. 123(2) EPC

Claim 1 is essentially a combination of the subject-matter of claims 17 and 22 as originally filed, with the additionally claimed suitability for isolating an

aircraft auxiliary power unit being disclosed in paragraph [0001] of the application as filed.
The dependent claims 2-10 are based on claims 18-21, 23-27 as filed.

Figure 13A - 13C as filed and paragraph [0317] et seq. provide the skilled person with the information that the feature of claim 22 as filed ("same pitch") can be combined with the features of claims 18-21, 23-27.

It is noted that in Figure 13A and in the corresponding parts of the description reference signs have been amended for consistency, which does, however, not add new technical information for the skilled person.

Consequently, the requirements of Article 123(2) EPC are fulfilled.

3. Article 84

In item 13 of the summons, the examining division objected that, while it were indeed claimed that the hands corresponded, it was not clearly stated that the rod ends were screwed into the terminal ends, the corresponding ends being coupled. In that context, the Board notes that only a respective suitability is required. The feature that the examining division regarded as missing is, however, one the skilled person would consider implicit in the claimed subject-matter in order for the suspension system to be able to fulfil its task.

4. Article 56 EPC

4.1 The Board concurs with the appellant and the examining division (see point 13.2 of the impugned decision) according to which D1 is the closest prior art.

4.2 The subject-matter of claim 1 differs from that prior art in the features of the characterizing portion, i.e. in that the helical threaded portion (78) of said first elastomeric rod end (35a) and said helical threaded portion (80) of said second elastomeric rod end (35b) are of said same hand and have the same pitch.

D1 only discloses "threaded attachments" in general, see page 12, line 21-23; page 16, line 27-29; page 20, line 6-9.

4.3 According to the invention, the technical effect of this difference is the following (see paragraphs [0317] and [0320]):

Paragraph [0320]: "If the epoxy fails due to fire, corrosion or other reasons, **or is not applied** to the threads during assembly, the described threaded arrangement prevents the distance from one linkage rod end to the other linkage rod end from **changing**, prevents the linkage ends 34, 35 from unthreading entirely, causing a loss of load carrying capability, or even unthreading more than two to four threads."

It is noted that according to that disclosure the technical effect is present whether a thread locking epoxy has been applied or not.

4.4 The problem to be solved derivable from the application as filed is thus to be seen in preventing unthreading

or loss of load carrying capability of the suspension system.

While the examining division correctly reformulated the technical problem (see points 13.4 and 13.5 of the impugned decision) in a situation where said technical problem was not solved by the then subject-matter of the claim, claim 1 of the present main request defines the threads to have same hand and pitch, which - as also accepted by the examining division - implies no change of the overall length when rotating the suspension linkage (see the decision point 13.10).

Consequently, the subject-matter defined in the present main request solves the problem derivable from the application as filed, there being no reason to reformulate the technical problem (see Case Law of the Boards of Appeal, 8th edition 2016, I.D.4.3.2).

4.5 Document D4 discloses an adjustable length connecting link (see Figure 2A) having a body portion and a pair of link terminals that include threaded shaft portions received in tapped holes located in either end of the body portion (column 4, line 61 - 66). The threads in the holes at opposite ends of the body portion of the link may be of different pitch and different diameter. The threads may also be of reversed or opposite pitch - one in the right-hand thread direction and the other in the left-hand thread direction (column 4, line 66 - col. 5, line 6). The threads may also be of different pitch (ibidem; see also column 7, line 18-59).

However, the technical effect disclosed in D4 for these features is that they "can afford certain link lengths adjustment convenience features" (column 5, line 4-7; column 7, line 18-44). In other words, the technical

effect of these features according to D4 is to adjust the length of the linkage. There is no disclosure that using same hand and pitch threads on both linkages prevents the distance from one linkage rod end to the other linkage rod end from changing due to unwanted, e.g. vibration caused rotation of the body portion. There is also no disclosure that the system disclosed in D4 would prevent unthreading of the threaded part in such situations.

Consequently, when looking for a solution to the above defined technical problem, the skilled person had no reason to apply the thread design which is disclosed in D4 for a different purpose.

4.6 To conclude, while the skilled person could apply same hand and pitch threads to the suspension linkage of D1, as they are at least indirectly disclosed as one possibility among others in D4, there is no reason why she/he would do so in view of the objective problem. Such a combination only appears obvious *ex-post*.

4.7 Thus, the subject-matter of claim 1 involves an inventive step.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the examining division with the order to grant a patent in the following version:

   Claims 1-10 as filed with letter dated 24 January 2019

   Description, pages 1-108 as filed with letter dated 24 January 2019

   Drawings, pages 1/14-12/14, 14/14 as originally filed and page 13/14 as filed with letter dated 19 May 2015.

The Registrar: The Chairwoman:

D. Hampe P. Acton

Decision electronically authenticated