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**Datasheet for the decision
of 2 December 2014**

Case Number: T 1194/12 - 3.2.01

Application Number: 05853742.4

Publication Number: 1716019

IPC: B60R21/04, B60R19/18

Language of the proceedings: EN

Title of invention:

MODULAR ENERGY ABSORBER OF VARYING TOPOGRAPHY AND METHOD FOR
CONFIGURING SAME

Applicant:

Oakwood Energy Management, Inc.

Headword:

Relevant legal provisions:

EPC Art. 123(2), 54, 56

Keyword:

Amendments - added subject-matter (yes)
Novelty - main request (no)
Inventive step - auxiliary request (no)

Decisions cited:

Catchword:



**Beschwerdekammern
Boards of Appeal
Chambres de recours**

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Case Number: T 1194/12 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 2 December 2014

Appellant: Oakwood Energy Management, Inc.
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Decision under appeal: **Decision of the Examining Division of the
European Patent Office posted on 5 December 2011
refusing European patent application No.
05853742.4 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman G. Pricolo
Members: C. Narcisi
P. Guntz

Summary of Facts and Submissions

- I. The appeal is from the decision of the Examining Division posted on 5 December 2011 revoking European patent No. 05 853 742.4.
- II. The applicant filed an appeal on 20 January 2012. With the statement of grounds of appeal, received on 11 April 2012, the appellant requested to set aside the decision and to grant a patent according to a new filed sole request. Oral proceedings were requested as an auxiliary measure.
- III. Independent claim 1 of this request reads as follows:

"A modular energy absorber (10) comprising:
one or more energy absorbing modules (12), the or each module comprising an assembly of crushable energy absorbing units (16) united by a common means (14) for coordinating them, the common means (14) for coordinating comprising a basal structure which coordinates the said assembly of crushable energy absorbing units (16); wherein
the basal structure has a topography including a number (n) of apertures (18), where n is an integer ≥ 0 ; and
the basal structure positioning the plurality of units (16) in relation to each other before and during relative motion between an incident object and the energy absorber, so that impact forces resulting therefrom are at least partially absorbed by the energy absorbing units (16), at least some of the energy absorbing units (16) including:
an upper perimeter (22), a lower perimeter (24) and an intermediate wall (26) extending therebetween with a number (m) of breaches (28) in the intermediate wall before impact where m is an integer ≥ 0 , the breaches

(28) not extending the entire length of the intermediate wall (26) between the upper perimeter (22) and the lower perimeter (24) and the intermediate wall (26) at least partially collapsing during energy absorption;

wherein at least some of the energy absorbing units (16) are oriented such that their intermediate walls (26) are inclined to a major incident component of an impacting force, and wherein some of the energy absorbing units (16) cooperate to afford mutual support in decelerating an object that imparts the impacting force;

characterised by an energy absorbing module (12) having a plurality of crushable energy absorbing units (16) of different shapes, each of said plurality of energy absorbing units having a lower perimeter (24) of a given shape and an upper perimeter (22) of the same given shape as the associated lower perimeter, the given shape being selected from the group consisting of a circle, an oval, an oblate oblong and an ellipse."

- IV. In a communication pursuant to Rule 100(2) EPC, dated 10 July 2014, the Board expressed the preliminary view that claim 1 according to the sole request did not meet the requirements of Article 123(2) EPC because of the omission of some features. By not including the feature that the intermediate wall of at least some of the energy absorbing units has the same shape as the upper and lower perimeter thereof, an unallowable intermediate generalization had been made. Additionally, claim 1 did not contain the feature relating to an upper wall of some of the energy absorbing units which was recited in claim 1 as filed. Moreover, the subject-matter of claim 1 appeared to be not new in view of D7 (US-B1-6 247 745). The Board pointed out that it appeared that even if claim 1 were

amended by introducing the omitted features in claim 1, thereby overcoming the Article 123(2) EPC objections, its subject-matter would still lack novelty over D7. Finally, the Board indicated that the alternatives within the subject-matter of claim 1 comprising apertures ($n > 0$) and breaches ($m > 0$) did not involve an inventive step in view of D7 in combination with D1 (US-A1-2004/0178662).

V. The appellant replied to the communication with letter of 10 September 2014. The requests as filed with the statement of grounds were maintained and an auxiliary request was filed.

The appellant did not put forward further arguments in relation to the main request filed with the statement of grounds of appeal. Arguments were only presented as to why the auxiliary request overcame the objections raised by the Board in its communication.

VI. Claim 1 of the auxiliary request reads as follows (differences with respect to claim 1 of the main request highlighted by the Board):

"A modular energy absorber (10) comprising:
one or more energy absorbing modules (12), the or each module comprising an assembly of crushable energy absorbing units (16) united by a common means (14) for coordinating them, the common means (14) for coordinating comprising a basal structure which coordinates the said assembly of crushable energy absorbing units (16); wherein
the basal structure has a topography including a number (n) of apertures (18), where n is an integer ≥ 1 ; and
the basal structure positioning the plurality of units (16) in relation to each other before and during relative motion between an incident object and the

energy absorber, so that impact forces resulting therefrom are at least partially absorbed by the energy absorbing units (16), at least some of the energy absorbing units (16) including:

an upper perimeter (22), a lower perimeter (24) and an intermediate wall (26) extending therebetween with a number (m) of breaches (28) in the intermediate wall before impact where m is an integer ≥ 1 , the breaches (28) not extending the entire length of the intermediate wall (26) between the upper perimeter (22) and the lower perimeter (24) and the intermediate wall (26) at least partially collapsing during energy absorption;

an upper wall (40) extending from the upper perimeter (22), one or both of the intermediate (26) and the upper (40) walls at least partially collapsing according to deformation characteristics associated with each wall;

wherein at least some of the energy absorbing units (16) are oriented such that their intermediate walls (26) are inclined to a major incident component of an impacting force, and wherein some of the energy absorbing units (16) cooperate to afford mutual support in decelerating an object that imparts the impacting force;

characterised by an energy absorbing module (12) having a plurality of crushable energy absorbing units (16) of different shapes, each of said plurality of energy absorbing units having a lower perimeter (24) of a given shape, an upper perimeter (22) of the same given shape as the associated lower perimeter **and an intermediate wall (26) of the same given shape as the lower perimeter (24) and the upper perimeter (22)**, the given shape being selected from the group consisting of a circle, an oval, an oblate oblong and an ellipse."

VII. A summons to oral proceedings was issued and the oral proceedings took place as scheduled on 2 December 2014.

The appellant did not appear at the oral proceedings, as announced with letter of 21 November 2014. In accordance with Rule 115(2) EPC, the proceedings were continued without the appellant. The decision of the Board was announced at the end of the oral proceedings in accordance with Article 15(3) of the Rules of Procedure of the Boards of Appeal.

VIII. The appellant's submissions may be summarized as follows:

Main request

The appellant asserted, that the subject-matter of claim 1 was novel with respect to the disclosure of D7. D7 related to a significantly different type of energy absorber, in which adjacent crushable energy-absorbing units (referred to as "recesses") had lower perimeters and intermediate walls interconnected and coordinated by channels 26 which were clearly visible, for example, in the perspective view of Fig. 1 and in the inverted plan view of Fig. 2. Consequently, the base 12 did not form a basal structure which coordinated the crushable energy absorbing means, in contrast to the requirements of claim 1 of the main request. Instead, this task was performed by the channels 26 extending between adjacent energy absorbing units and shoring up neighboring intermediate walls.

Moreover, in each energy absorbing module of D7, all of the energy absorbing units were of the same shape with a circular top.

Auxiliary request

Claim 1 of the auxiliary request met the requirements of Article 123(2) EPC. The amendments made overcame the objections raised by the Board in its communication. Specifically, the feature relating to the upper wall that reads "an upper wall extending from the upper perimeter one or both of the intermediate and the upper walls at least partially collapsing according to deformation characteristics associated with each wall" had been reintroduced into claim 1.

The subject-matter of claim 1 of the auxiliary request was limited to the apertures $n \geq 1$ and breaches $m \geq 1$ and was not rendered obvious by the disclosure of D7 in view of D1. One of the problems solved by the invention was to provide a "customized", "tunable" energy absorber that absorbed energy in part by an incident object that impacted the absorber. The response of an energy absorbing unit to impact was determined by the provision of a number (m) of breaches in the crushable member before impact. This number of breaches (m) was now defined as an integer bigger or equal to 1 in claim 1. The claimed invention had thus a non-obvious combination of features that provided design flexibility to the engineer (reference was made to page 5 first paragraph of the WO publication of the application): "...within a given energy absorber a module common and means for coordinating may or may not be flat and may or may not have a number (n) of apertures; one or more of the energy absorbing units in a given module may be provided with a number (m) of breaches (e.g., slits, or slots, or slits and slots, or neither slits nor slots); and the means for coordinating may be provided with a flat or curved topography".

Reasons for the Decision

Main request

1. Added subject matter - Article 123(2) EPC

1.1 In the communication according to Rule 100(2) EPC (see point IV. above), the Board raised objections under Article 123(2) EPC in respect of claim 1 of the main request. The appellant (see point V. above) did not submit any arguments in reply. The Board therefore sees no reason to deviate from its preliminary view that the subject-matter of claim 1 of the main request extends beyond the content of the application as filed, contrary to Article 123(2) EPC.

1.2 The application as filed discloses (see page 12, lines 14 to 18 and figure 12) that the intermediate wall has the same shape as the upper and lower perimeters. The wording of claim 1, in contrast, leaves the shape of the intermediate wall open. Therefore an intermediate generalization has been made which is not acceptable in the case at hand because the shape of the intermediate walls is structurally and functionally inextricably linked with the shape of the upper and lower perimeter (see e.g. T 1066/10, T 0414/97 or T 0461/05). The insertion of the incomplete feature concerning the shape of the energy absorbing units leads the person skilled in the art to the conclusion that the shape of the intermediate wall is freely selectable, thus providing him with new technical information.

1.3 Claim 1 does not mention the presence of an upper wall of at least some of the energy absorbing units. This

feature was present in claim 1 as filed.

The basis for the omission of this feature, resulting in a generalization of the claimed subject-matter, cannot be found in the application as filed. In fact, apart from claim 1 as filed, the feature "upper wall" is further present in claims 5, 14, 16 and 23 as filed. Moreover, in all the embodiments shown in the figures an upper wall is present (see figures 1(c), (d), (e), 2(a), 3 to 12).

By omitting this feature, the skilled person is presented with new technical information as compared to the application as filed, in the sense that the "at least some energy absorbing units" do not need to be provided with an upper wall, which, as can be inferred from the text of claim 1, "at least partially collapses according to the deformation characteristics associated with each wall", and is thus indispensable to the desired object of producing predefined energy absorption characteristics (see page 4 , first paragraph "One object of the invention...").

2. *Novelty - Article 54 EPC*

2.1 The subject matter of claim 1 is not new in view of the energy absorber disclosed in D7.

2.2 D7 discloses all the features of claim 1 when considering the alternative without both apertures ($n = 0$) and breaches ($m = 0$). Indeed D7 discloses (see figures 6 and 7; column 4, lines 1 to 20; references in parenthesis applying to this document): a modular energy absorber comprising: one or more energy absorbing modules (30, 32), the or each module comprising an assembly of crushable energy absorbing units (16, 20') united by a common means (12) for coordinating them, the common means (12) for

coordinating comprising a basal structure (12) which coordinates the said assembly of crushable energy absorbing units (16, 20'); wherein the basal structure (12) has a topography including a number (n) of apertures (18), where n is an integer ≥ 0 ; and the basal structure (12) positioning the plurality of units (16, 20') in relation to each other before and during relative motion between an incident object and the energy absorber, so that impact forces resulting therefrom are at least partially absorbed by the energy absorbing units (16, 20'; column 2 line 66 to column 3, line 11, and column 4, lines 22-27), at least some of the energy absorbing units (16, 20') including: an upper perimeter, a lower perimeter and an intermediate wall (20) extending therebetween with a number (m) of breaches in the intermediate wall before impact where m is an integer ≥ 0 , the breaches not extending the entire length of the intermediate wall between the upper perimeter and the lower perimeter (non-binding feature when considering $m = 0$) and the intermediate wall (20) at least partially collapsing during energy absorption (column 2 line 66 to column 3, line 11, and column 4, lines 22-27); wherein at least some of the energy absorbing units (16, 20') are oriented such that their intermediate walls (20) are inclined (α , γ) to a major incident component of an impacting force (24, 24'), and wherein some of the energy absorbing units (16, 20') cooperate to afford mutual support in decelerating an object that imparts the impacting force; wherein an energy absorbing module (30, 32) having a plurality of crushable energy absorbing units (16, 20') of different shapes (column 4, lines 18-21), each of said plurality of energy absorbing units having a lower perimeter of a given shape and an upper perimeter of the same given shape as the associated lower perimeter, the given shape being selected from

the group consisting of a circle, an oval, an oblate oblong and an ellipse.

- 2.3 The appellant considers that the base 12 of D7 does not form a basal structure which coordinates the crushable energy absorbing means and that the coordination is only performed by the channels 26 extending between adjacent energy absorbing units.
This argument cannot be followed.

The basal structure according to claim 1 is merely defined as a common means for coordinating and positioning the energy absorbing units of a module. In this sense, both the base 12 and the channels 26 fulfill this function and the base 12 together with the channels 26 can be described as the basal structure. This is supported by figure 8 of the application as filed, which is similar to figure 7 of D7, and which likewise contains channels shoring up neighboring intermediate walls.

- 2.4 The appellant is further of the opinion that in each energy absorbing module of D7 all the energy absorbing units are of the same shape with a circular top so that D7 fails to disclose the characterising portion of claim 1.

Nevertheless, according to column 4, lines 18 to 21 of D7, the recesses 20', i.e. the absorbing units, maybe of mixed shapes, such as truncated cones, sections of ellipsoids or hyperboloids, within a given energy absorbing module.

Therefore this feature is also disclosed in D7.

Moreover, according to the wording of claim 1 there is no specific definition of a module. A module is merely

defined as comprising an assembly of crushable energy absorbing units united by common means comprising a basal structure (see also description page 4, second paragraph of the application as filed). Bearing this in mind, the absorber of figure 6 can be described as comprising just one module having all the recesses (and thus comprising absorbing units of different shapes), or any other subdivision of the absorber comprising a plurality of recesses could be described as a module and thus not necessarily just the division into two modules (30 and 32) along the bent portion of the absorber as mentioned in the description of D7 (column 4, lines 18-21).

Auxiliary request

3. *Added subject matter - Article 123(2) EPC*

3.1 The subject-matter of claim 1 of the auxiliary request extends beyond the content of the application as filed, contrary to Article 123(2) EPC.

3.2 The appellant added to claim 1 the feature "an upper wall extending from the upper perimeter one or both of the intermediate and the upper walls at least partially collapsing according to deformation characteristics associated with each wall" in order to overcome the objection raised by the Board based on the omitted upper wall feature from claim 1 as filed.

3.3 Nevertheless this amendment does not remove all the causes of non-compliance with Article 123(2) EPC. Claim 1 as originally filed also includes the feature according to which the upper walls are inclined to a major incident component of the impacting force. This feature, which is also essential for achieving the

desired object of producing predefined energy absorption characteristics, is not present in claim 1 of the auxiliary request. Nor is there any basis in the application as filed for this generalization.

4. *Inventive step - Article 56 EPC*

4.1 In any case, the subject-matter of claim 1 does not involve an inventive step in view of D7 in combination with D1.

4.2 The following additional features of claim 1, as compared to claim 1 of the main request (see point VI. above, with added features being highlighted), are also known from D7 (see Figures 6 and 7):

- an upper wall (top portion of each element as seen in Fig. 7) extending from the upper perimeter, one or both of the intermediate and the upper walls at least partially collapsing according to deformation characteristics associated with each wall (inherent characteristic of the walls); and
- an intermediate wall (20) of the same given shape as the lower perimeter and the upper perimeter (as the elements are substantially conical).

Therefore, the subject-matter of claim 1 differs from the energy absorber of D7 in that:

- i) the basal structure has a topography including a number (n) of apertures, where n is an integer ≥ 1 ; and
- ii) a number (m) of breaches are present in the intermediate wall before impact where m is an integer ≥ 1 , the breaches not extending the entire length of the intermediate wall

between the upper perimeter and the lower perimeter.

- 4.3 The technical effect of these features is the alteration in the rigidity of the coordinating means and of the energy absorbing units.
- 4.4 The objective technical problem can thus be formulated, in accordance with the appellant's submissions, as to provide a "customized", "tunable" energy absorber that absorbs energy in part by an incident object that impacts the absorber.
- 4.5 Document D1, pertaining the same technical field (i.e. modular energy absorbers), teaches (see in particular paragraphs [0012] to [0022] and [0067]) that in order to tune and configure a modular energy absorber to produce predefined energy absorption characteristics, the means for coordinating (i.e. the basal structure 14) the energy absorbing units (i.e. the crushable members) has a topography with a variable number (n) of apertures (18, see Fig. 1A), (n) being an integer selected from the group of (0, 1, 2, ..., 100); and the crushable members have a number (m) of breaches (28, see Fig. 1C) within their intermediate wall, (m) being an integer selected from the group of (0, 1, 2, ..., 100), which can or cannot run the entire length of the intermediate wall (see [0067]).
- 4.6 D1 points therefore exactly to the same solution of the technical problem. Accordingly, the skilled person would use the teaching of D1 to further increase the adaptability of the modular energy absorber of D7 to different energy absorption properties without exercising an inventive activity.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



A. Vottner

G. Pricolo

Decision electronically authenticated