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Datasheet for the decision of 19 August 2014

Case Number: T 0092/13 - 3.2.08

Application Number: 04748224.5

Publication Number: 1653114

IPC: F16F7/12

Language of the proceedings: EN

Title of invention:
IMPACT-ABSORBING MEMBER

Patent Proprietors:
Nippon Steel & Sumitomo Metal Corporation
Toyoda Iron Works Co., Ltd.

Opponent:
Shape Corporation

Headword:

Relevant legal provisions:
EPC Art. 83, 123(2), 56

Keyword:
Sufficiency of disclosure - (yes)
Allowabiliy of amendments -
main request and auxiliary request 1 - (no)
Inventive step - auxiliary request 15 - (yes)

Decisions cited:

Catchword:

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Case Number: T 0092/13 - 3.2.08

D E C I S I O N
of Technical Board of Appeal 3.2.08
of 19 August 2014

Appellant I: (Patent Proprietor 1)	Nippon Steel & Sumitomo Metal Corporation 6-1, Marunouchi 2-chome Chiyoda-ku Tokyo 100-8071 (JP)
Appellant I: (Patent Proprietor 2)	Toyoda Iron Works Co., Ltd. 4-50, Hosoyacho Toyoda-shi, Aichi-ken 471-8507 (JP)
Representative:	Price, Nigel John King J A Kemp 14 South Square Gray's Inn London WC1R 5JJ (GB)
Appellant II: (Opponent)	Shape Corporation 1835 Industrial Drive Grand Haven MI 49417 (US)
Representative:	Bauer, Clemens Müller Schupfner & Partner Patent- und Rechtsanwaltspartnerschaft mbB Bavariaring 11 80336 München (DE)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 26 November 2012 concerning maintenance of the European Patent No. 1653114 in amended form.**

Composition of the Board:

Chairman	T. Kriner
Members:	P. Acton
	I. Beckedorf

Summary of Facts and Submissions

I. The duly filed and reasoned appeals are directed against the interlocutory decision of the opposition division finding that, taking into account the amendments made during the opposition proceedings according to auxiliary request 2 then on file, European patent No. EP 1 653 114 met the requirements of the Convention.

II. Oral proceedings took place before the board of appeal on 19 August 2014.

Appellants I (patent proprietors) requested

- that the decision under appeal be set aside,

- that the patent be maintained in amended form on the basis of one of the sets of claims filed as main request and as first auxiliary request with letter of 26 July 2013 and

- that the appeal of appellant II be dismissed (fifteenth auxiliary request) or, alternatively,

- that in setting aside the decision under appeal the patent be maintained in amended form on the basis of one of the sets of claims filed as sixteenth to thirty-second auxiliary requests with letter of 26 July 2013.

Appellant II (opponent) requested

- that the decision under appeal be set aside,

- that the patent be revoked and

- that the appeal of appellants I be dismissed.

III. Independent claim 1 as granted (main request) reads:

"A crash box (10, 10-1) formed from a tubular body for absorbing impact energy by buckling when it receives an impact load in the axial direction from a first end (15) in the axial direction (Feature 1.1),

wherein said tubular body has a transverse cross sectional shape along at least a portion in the axial direction which is a closed cross section having a generally polygonal shape and which has no flange on the outside of the closed cross section, and in a region of at least one side of a basic cross section defined as the polygon having the largest area of the polygons obtained by connecting with straight lines a portion of a plurality of vertices constituting the generally polygonal shape, at least one groove (14) which is recessed towards the inside of the basic cross section is provided in a location other than at an end point of the side, and remaining regions of the side outside the above-mentioned region of the side having the groove (14) have a generally straight shape, and

wherein the groove (14) extends from a second end (16) of the tubular body in the axial direction towards the first end of the tubular body (Feature 1.6),

characterized in that:

at least two sides of the plurality of sides of the polygon defining the basic cross section have different lengths from each other (Feature 1.7);

and the at least one side (12) in which the at least one groove (14) is provided is a side of the plurality of sides having the largest length among the sides (Feature 1.8)."

Claim 1 according to auxiliary request 1 differs therefrom in that it specifies after Feature 1.7 that:

"the basic cross section has the shape of a flat polygon".

Claim 1 according to auxiliary request 15 differs from claim 1 as granted in that it specifies after Feature 1.7 that:

"the basic cross section has the shape of a flat octagon" (Feature 1.7a).

The definitions of Features 1.1, 1.6, 1.7, 1.7a and 1.8 were introduced by the board.

IV. The following documents are relevant for the present decision:

D5: EP-A-0 856 681
D15: US-A-6 588 830
D16: DE-A-197 31 342
D17: WO-A-02/38418
D18: US-A-5 868 457

V. Appellant II's arguments can be summarised as follows:

a) Main request and auxiliary request 1 – allowability of the amendments

The presence of a groove in the longest side of the cross section of the crash box was originally disclosed exclusively in combination with a flat octagon, as described in "Principle 3" on page 11, lines 3 and 4, and in the examples described in Tables 1 and 2.

Therefore, the features describing the presence of a groove in the longest side of a generic polygon (main request) or of a flat polygon (auxiliary request 1) were not originally disclosed. Hence claim 1 according to the main request and to auxiliary request 1 did not fulfil the requirements of Article 123(2) EPC.

b) Auxiliary request 15 – sufficiency of disclosure

Feature 1.4 of claim 1 according to all requests defined a basic cross section with a "generally polygonal shape".

However, the meaning of the term "generally polygonal shape" was not described in the patent in suit and was ambiguous especially when read in combination with the expression "generally straight lines".

Hence, auxiliary request 15 did not comply with the requirements of Article 83 EPC.

c) Auxiliary request 15 – interpretation of claim 1

Feature 1.1 defined the crash box merely as an object to be achieved and hence did not limit the scope of the claim. If at all it only described the crash box as being an object suitable to absorb energy in the axial direction. Therefore, a bumper, which was made of a tubular body and was able to absorb energy in the axial direction, could also be considered to be a crash box in the sense of claim 1.

d) Admission of D17 and D18 into the proceedings

These documents were filed together with the grounds of appeal and hence at the earliest possible time in the appeal proceedings. They represented a reaction to the set of claims filed during the oral proceedings in the opposition proceedings, during which a feature of the description was introduced into claim 1.

Since the filing of these documents was normal behaviour for a losing party, they should be admitted into the appeal proceedings.

e) Auxiliary request 15 – inventive step

Starting from D5

The crash box of claim 1 differed from that of D5 only by the shape of its cross section.

Since the problem underlying the patent in suit, namely the provision of a crash box which can secure a prescribed amount of shock absorption by stably buckling, was already solved by the crash box according to D5, the objective problem had to be redefined. In

view of the shape of the claimed crash box, the problem could be regarded as the provision of a crash box which could easily be connected to a vehicle's frame having an octagonal cross section. For the skilled person confronted with this problem, it was obvious to change the cross section of the crash box of D5 into an octagon already on the basis of his general knowledge. Moreover, the use of crash boxes with octagonal cross sections was well known, as shown for example in D15 and D16.

Starting from D17

The crash box according to D17 could be considered to represent the closest prior art as well. The subject-matter of claim 1 differed therefrom only by Feature 1.6. Therefore, the problem to be solved was to make the crash box more stable. For the skilled person it would be obvious to consider the teaching of D5, which disclosed grooves extending in the axial direction, to solve the problem above. Moreover, it was generally known to the skilled person that axially extending groves provided additional stability to a tubular body.

Hence the subject-matter of claim 1 did not involve an inventive step when starting from D17 either.

Starting from D18

The claimed crash box differed from the crash box according to D18 by the provision of axially extending grooves.

The skilled person was aware that in a crash box with a flat octagonal cross section the long sides are unstable. Therefore, the objective problem to be solved

was the increase of the stiffness of the crash box. Since it was common general knowledge that the use of axially extending grooves increases the stiffness of tubular bodies, introducing such grooves in the crash boxes according to D18 would be obvious and did not involve any inventive activity.

For the reasons set out above, the subject-matter of claim 1 according to auxiliary request 15 did not involve an inventive step.

VI. Appellants I's arguments can be summarised as follows:

a) Main request and auxiliary request 1 – allowability of the amendments

It was correct that a crash box with grooves in at least one of the longest sides of the cross section was not literally disclosed in the original application, neither in combination with a generic polygon nor with a flat polygon.

However, for assessing the allowability of the amendments it was not relevant what was literally disclosed, but what the skilled person would have derived from the teaching of the application as a whole.

Paragraph [0031] showed that the application referred not only to a flat octagon, but also to generic polygons. Furthermore, paragraph [0115] taught that the tests described in Tables 1 and 2 with respect to flat octagons could be transferred to flat polygons. Consequently, a crash box with a cross section in the form of a generic polygon or a flat polygon having a groove in its longest side was originally disclosed.

Therefore, the main request and auxiliary request 1 fulfilled the requirements of Article 123(2) EPC.

b) Auxiliary request 15 – sufficiency of disclosure

Normally, one embodiment was enough to assure that the invention is disclosed in a manner sufficiently clear and complete for the skilled person to carry it out. In the present case, a plurality of embodiments of the invention was disclosed in the examples of Tables 1 and 2, so that the skilled person had no problem in carrying out the invention.

Hence auxiliary request 15 complied with the requirements of Article 83 EPC.

c) Auxiliary request 15 – interpretation of claim 1

The expression "crash box" implied specific features and dimensions linked to the function and position of the crash box within the vehicle. These were not present in a bumper, which could not be considered to represent a crash box.

Admission of D17 and D18 into the proceedings

These documents should not be admitted into the proceedings since they were not a mere reaction to the feature introduced into claim 1 but gave rise to a completely new line of argumentation.

If they were admitted into the proceedings, the case should be remitted to the opposition division, in order to give the patent proprietors the right to two instances.

d) Auxiliary request 15 – inventive step

Starting from D5

It was clear from D5, especially from claim 1, that the invention was strictly linked to the shape of the crash box's cross section, which had four identical branches with a 90° angle between them.

Therefore, it would go against the teaching of D5 to modify the crash box's cross sectional shape to connect the crash box to the vehicle's frame. Moreover, neither D15 nor D16 suggested modifying the shape of a crash box in order to adapt it to that part of the frame to which it had to be fixed.

Starting from D17

D17 disclosed crash boxes for which stable buckling was achieved by transverse grooves positioned on the longest sides of the octagonal cross section.

It was correct that it is common general knowledge that axially extending grooves increase the axial stiffness of a tubular body. However, it was not evident why the skilled person would aim at stiffening the crash boxes of D17 at all.

Moreover, D5 was focused on the buckling of a crash box of a very specific geometry, so that its teaching could not be transferred without further measures to a completely different cross sectional geometry. Therefore, there was no reason why the skilled person would apply its teaching to the crash boxes according to D17.

Starting from D18

Starting from the crash box of D18 it was not evident why the skilled person would try to solve the problem of increasing its axial stability.

This was particularly the case since D18 taught the introduction of transverse grooves in order to generate a predetermined bending point.

Therefore, the definition of the problem to be solved was already based on hindsight, and the subject-matter of claim 1 involved an inventive step when starting from D18 as well.

Reasons for the Decision

1. Main request and auxiliary request 1 – allowability of the amendments

1.1 Claim 1 as originally filed stipulates that "a groove which is recessed towards the inside of the outline [of the cross section] is provided in a location other than at the end point of the side". Hence, claim 1 as filed does not specify on which side of the cross section to position the groove.

Claim 1 as granted (main request) specifies in the characterising portion that:

"the at least one side (12) in which the at least one groove (14) is provided is a side of the plurality of sides having the largest length among the sides" (Feature 1.8),

while claim 1 according to auxiliary request 1 further declares that

"the basic cross section has a shape of a flat polygon".

1.2 Undisputedly, the application as originally filed does not literally describe a crash box having a cross section in the form of a generic polygon or of a flat polygon with at least one groove in its longest side.

The patent proprietors argue that the skilled person would derive from the general teaching of the application, particularly from paragraphs [0031] and [0115], that the application referred not only to cross sections in the form of a flat octagon, but also to crash boxes in the form of generic polygons or flat polygons. In particular, paragraph [0115] showed that the results of the examples carried out for a crash box with a cross section in the shape of a flat octagon could be transferred to a crash box having a cross section in the shape of a flat polygon. Hence the subject-matter of claim 1 according to the main request and to auxiliary request 1 was implicitly disclosed in the original application.

1.3 However, in order to fulfil the requirements of Article 123(2) EPC, it is not sufficient that a feature can somehow be derived from an application; rather, it is necessary that the feature can be derived clearly and unambiguously from the application as originally filed.

In the present case, for claim 1 as granted or according to auxiliary request 1 to fulfil the requirements of Article 123(2) EPC, it would be necessary for the application as filed to disclose a

crash box with a cross section in the form of a generic polygon or – respectively - of a flat polygon, where a groove is provided in at least one of the longest sides.

It is true that paragraph [0031] refers to a polygon in the shape of a rectangle. However, there is no hint that such a rectangle is comprised in the claimed invention.

1.4 It is also correct that paragraph [0115] summarises the results of Tables 1 and 2, stating that "From the results shown in Table 2, it can be seen that by providing a suitable groove, a crash energy absorption member can be given a transverse cross sectional shape which is a flat polygon which could not be used in the past". However, there is no reason to assume that merely through this single reference to a "flat polygon" in the recapitulation of the experiments the applicants intended to cover all types of flat polygon, and even less all generic polygons.

On the contrary, both Principles 2 and 3 (see paragraphs [0032] and [0035]), which represent the core of the invention underlying the disputed patent, refer exclusively to the stability of a crash box with a flat octagonal cross section.

Moreover, the examples carried out in order to describe the invention (see [0102]), which are summarised in Tables 1 and 2, also refer exclusively to crash boxes with flat octagonal cross sections.

Hence, since no teaching of a crash box with a generic or a flat polygonal shape with a groove in its longest side is disclosed in the application as filed, both the

main request and auxiliary request 1 do not fulfil the requirements of Article 123(2) EPC.

In view of this conclusion, the issue of Rule 80 EPC, discussed in the annex to summons to oral proceedings and during the oral proceedings, is not relevant any longer.

2. Auxiliary request 15 – sufficiency of disclosure

Sufficiency of disclosure is to be assessed on the basis of the patent as a whole, including the description and claims, and not only on the claims alone.

Generally, an invention is in principle sufficiently disclosed if at least one way is clearly indicated enabling the person skilled in the art to carry out the invention. In the present case the examples listed under Runs 1 to 8 in Table 1, in combination with Figure 14, describe several ways of carrying out the invention. Therefore, the claimed crash box is sufficiently disclosed.

It is correct that the term "generally polygonal shape" as well as "generally straight lines" can be considered to be vague. However, this is not a matter of sufficiency of disclosure, but at best of clarity of the claim. Moreover, since claim 1 further specifies that the basic cross section has the shape of a flat octagon, it does not leave any doubt as to how the phrase "generally polygonal shape" is to be interpreted.

Hence auxiliary request 15 complies with the requirements of Article 83 EPC.

3. Auxiliary request 15 – interpretation of claim 1

Feature 1.1 of claim 1 defines a crash box as being "formed from a tubular body for absorbing impact energy by buckling when it receives an impact load in the axial direction".

The term crash box is known to the skilled person, who is aware that it is a part of the vehicle structure positioned between the bumper and the frame to absorb axial energy. This implies specific properties of the device which do not correspond to those of a bumper.

Moreover, Feature 1.1 specifies that the crash box is able to absorb impact energy in the axial direction by buckling. While a bumper, like any tubular body, is in principle able to absorb energy in the axial direction, it is not able to do so by buckling. When submitted to an axial force, it will bend and not buckle.

Hence, a bumper cannot be considered to be a crash box, and any prior art disclosing a bumper cannot destroy the novelty of claim 1, nor can it function as a starting point for the assessment of inventive step.

As far as appellant II referred to the patent document US-B-8 454 080, this document was not admitted into the proceedings.

4. Admission of D17 and D18 into the proceedings

4.1 During the oral proceedings in the opposition proceedings Feature 1.7a was introduced into claim 1. This feature was not present in any of the granted claims but was extracted from the description. The opponent filed D17 and D18 together with the grounds of

appeal in order to react to the introduction of this new feature. This is to be considered as normal behaviour for a losing party, especially since the opponent had only one hour's break in the oral proceedings in the opposition proceedings to look for documents disclosing Feature 1.7a. Hence these documents are admitted into the proceedings.

4.2 Since the EPC does not enshrine the right to two instances of judgment, and since the line of attack starting from D17 and D18 had been known to the patent proprietors from the beginning of the appeal proceedings, the board decided not to remit the case to the opposition division.

5. Auxiliary request 15 – inventive step

5.1 Starting from D5

5.1.1 Undisputedly, the crash box according to claim 1 differs from that of D5 only by the shape of its cross section.

5.1.2 The opponent argued that, since the problem defined in the contested patent (see [0016]) was already solved by D5, the objective problem had to be reformulated as "the provision of a crash box which could be easily connected to corresponding parts of the vehicle's frame having an octagonal cross section". Due to his general knowledge, the skilled person would modify the cross section of the crash box of D5 into an octagon without the need for any inventive skill, in particular since crash boxes with octagonal cross sections were known from D15 and D16.

5.1.3 The opponent did not explain why, starting from the difference between the claimed crash box and that of D5, the skilled person would reformulate the objective problem underlying the invention as the provision of an easy connection to the vehicle's frame.
If, as pointed out by opponent, the crash box of D5 already solves the problem underlying the disputed patent, then the objective problem has to be reformulated as the provision of an alternative way of securing a prescribed amount of shock absorption in a crash box.

Hence the question arises whether or not the skilled person would modify the cross section of the crash box according to D5 so that it has the form of a flat octagon in order to solve this problem.

5.1.4 D5 stresses, for example through the wording of claim 1, that the invention works only with a specific form of crash box cross section, namely a cross section with four symmetrical arms having an angle of 90° between each of the neighbouring arms. Therefore, independently of the objective problem underlying the patent in suit, changing the shape of the cross section in order to achieve the attachment to the vehicle's frame would go against the teaching of D5.

Finally, even if the skilled person considered the change of the cross section a workable solution to the problem posed, the selection of an octagonal cross section as shown in D15 and D16 could only be caused by an ex post facto analysis of the patent in suit.

Hence, starting from D5, the subject-matter of claim 1 involves an inventive step.

5.2 Starting from D17

5.2.1 Claim 1 stipulates that grooves extend from a second end of the crash box in the axial direction towards the first end (Feature 1.6). In contrast, in D17 grooves extend transversally along the longest sides of the flat octagon.

5.2.2 The opponent argues that starting from the crash box according to D17 the skilled person would aim at providing a more stable crash box. Being aware that the longer sides of the octagonal cross section are the weakest ones, he would solve the problem by providing axially extending grooves in these sides of the crash box. He would be encouraged to do so both by the teaching of D5 and by the common general knowledge.

5.2.3 Generally, the function of crash boxes is to absorb impact energy in the axial direction and by doing so to reduce the impact force transmitted to the frame of the vehicle. For this purpose, they are designed in such a way that when an axial force is applied they buckle in a stable manner into the shape of a bellows.

Hence, contrary to the opponent's submissions, the object to be solved by the claimed invention cannot be the stiffening of the crash box, since such a provision would lead to a behaviour of the crash box which is contrary to its fundamental functioning principle.

5.2.4 Therefore, even if it is accepted as general knowledge that axial grooves increase the axial stability of a tubular body, the skilled person has no reason to provide such grooves in the crash box according to D17.

5.2.5 Nor could D5 induce the skilled person to modify the cross section of the crash boxes according to D17 by providing axial groves. As pointed out above under 5.1.4, D5 discloses a crash box whose functioning is strictly linked to its cross sectional's shape. Therefore, this document could not encourage the skilled person to perform a modification of a crash box having a cross section which is fundamentally different from a regular quadrangle with four arms with 90° between them either.

Hence, starting from D17, the subject-matter of claim 1 involves an inventive step as well.

5.3 Starting from D18

5.3.1 D18 discloses a crash box (101) with a flat octagonal cross section which is axially linked to a structural part of a vehicle.

The subject-matter of claim 1 differs therefrom by Feature 1.6.

5.3.2 The opponent submits that the skilled person was aware that the longer sides of a flat polygon are the weaker ones and would aim at solving the objective problem of providing a more stable crash box. It being generally known that axially extending grooves are able to stabilise tubular structures, it would be obvious to introduce such grooves in the crash box according to D18.

5.3.3 As pointed out above under 5.2.3, the skilled person has no reason to render a crash box more stable, since such behaviour of a crash box goes against the very aim

of a crash box to buckle into the shape of a bellows in order to absorb the axial impact energy.

Hence the skilled person has no reason to modify the crash box of D18 by introducing axially extending grooves.

5.4 Therefore, the subject-matter of claim 1 according to auxiliary request 15 involves an inventive step as well.

Order

For these reasons it is decided that:

The appeals of both the patent proprietors and the opponent are dismissed.

The Registrar: The Chairman:

N. Schneider T. Kriner

Decision electronically authenticated