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**Datasheet for the decision
of 3 May 2019**

Case Number: T 2714/16 - 3.2.01

Application Number: 09752627.1

Publication Number: 2352665

IPC: B62D29/00

Language of the proceedings: EN

Title of invention:
HYBRID REINFORCEMENT STRUCTURE

Patent Proprietor:
Zephyros Inc.

Opponents:
Henkel AG & Co. KGaA
Sika Technology AG

Headword:

Relevant legal provisions:
EPC Art. 100(a), 100(b), 100(c), 111(1)

Keyword:

Amendments - added subject-matter (no)

Sufficiency of disclosure - (yes)

Novelty - (no)

Remittal to the department of first instance - (yes)

Decisions cited:

T 0909/12

Catchword:



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Case Number: T 2714/16 - 3.2.01

D E C I S I O N
of Technical Board of Appeal 3.2.01
of 3 May 2019

Appellant: Sika Technology AG
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Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 31 October 2016
rejecting the opposition filed against European
patent No. 2352665 pursuant to Article 101(2)
EPC.**

Composition of the Board:

Chairman	G. Pricolo
Members:	S. Mangin
	A. Jimenez

Summary of Facts and Submissions

- I. The appeal was filed by the opponent against the decision of the opposition division to reject the opposition filed against the patent in suit (hereinafter "the patent").
- II. The opposition division decided that:
- the subject-matter of the claims as granted did not extend beyond the content of the application as originally filed;
 - the patent disclosed the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art; and
 - the subject-matter of the claims was novel and involved an inventive step.
- III. Oral proceedings were held before the Board.
- IV. The appellant (opponent 2) requested that the decision under appeal be set aside and that the patent be revoked.

The respondent (patent proprietor) requested that the appeal be dismissed (main request), or alternatively that the patent be maintained in amended form according to the first to eighth auxiliary requests, filed with the reply to the grounds of appeal dated 3 July 2017 or according to the ninth auxiliary request, filed with letter dated 3 April 2019.

- V. Claim 1 of the main request (patent as granted) reads as follow:

A structural reinforcement comprising:

- a. a polymeric elongated base reinforcing portion (4) having a longitudinal axis;
- b. an expandable polymeric material (5) at least partially associated with the base reinforcing portion; characterized by
- c. a metallic localized reinforcement (12) aligned generally parallel with the longitudinal axis and located within a contemplated impact deformation region of the structural reinforcement wherein the metallic localized reinforcement is made of a material that is dissimilar from and has a higher tensile strength than the polymeric material of the base reinforcing portion so that upon impact in the impact deformation region the severity of deformation is reduced as compared to a part without the localized reinforcement.

VI. In the present decision, reference is made to the following documents:

O2D1: US 2003/0183317 A1

O1D4: WO 2007/082677 A1

O1D16: Wikipedia extract: "Ultimate tensile strength"

VII. The appellant's arguments relative to the main request can be summarised as follows:

Added subject-matter - Article 100(c)

The introduction of the words "polymeric" and "metallic" in claim 1 extends the subject-matter of claim 1 beyond the content of the application as filed.

Original claim 5 defines an exhaustive list of metals for the localized reinforcement while in claim 1 the

reinforcement is now defined as being metallic. The introduction of "metallic" in claim 1 leads therefore to an unallowable generalisation.

Basis for the amendment can neither be original claims 1, 5 and 16 nor paragraphs [0008]-[0010] which deal with specific embodiments nor can it be paragraph [0024] of the WO publication as it does not disclose the other features of claim 1 in particular the difference of tensile strength between the material of the components.

Sufficiency of disclosure - Article 100(b) EPC

The invention is not disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

The metallic localized reinforcement having a higher tensile strength than the polymeric material of the base reinforcing portion cannot be verified by the skilled person for the following reasons:

Material data sheets disclosing the tensile strength exist but are not suitable for comparing tensile strength as each manufacturer uses a specific test method.

Moreover the tensile strength is temperature dependent. To illustrate the influence of the temperature on the tensile strength, the opponent submitted a graph showing the tensile strength for different polymer materials at different temperatures ranging from -20 to 150°C.

Finally the tensile strength of composite material is an unusual parameter and cannot be calculated from the tensile strength of the individual components. Thus the comparison of the tensile strength of composite material cannot be carried out (see also T 0909/12). Claim 1 as well as claim 9, defining the localized reinforcement as being a composite material, are therefore not sufficiently disclosed.

Novelty - Article 100(a) EPC

The subject-matter of claim 1 is not novel over O2D1 and O1D4.

The opposition division interpreted the term "localized" as meaning "partially or even substantially covering the base reinforcing portion but never completely covering it".

This interpretation is too narrow considering the paragraph [0016], column 5, lines 32-36, paragraph [0017], column 6, lines 10-27 and paragraph [0018], column 6, lines 42-45 of the patent.

Moreover claim 1 deals with three-dimensional objects such that even if a surface is fully covered, there will still be a localisation in the thickness direction.

O2D1 discloses all the features of claim 1.

- a polymeric elongated base reinforcing portion, *figure 1, reference number 20 (or 22) and paragraph [0019];*
- an expandable polymeric material, *figure 1, reference number 22 (or 20) and paragraph [0019];*
- a metallic localized reinforcement, *figure 1, reference number 24 and paragraph [0016].*

In O2D1, the component 24 is the "strengthening material" and is made of metal, while the components 20 and 22 are made of an expandable foam. In such context the tensile strength of the metallic material will implicitly be higher than the tensile strength of the expandable foam.

In O2D1 the term "associated" in the expression "an expandable polymeric material at least partially associated with the base reinforcing portion" does not mean that the expandable material need to be directly connected with the base reinforcing portion, such that even though the foam expandable components 20 and 22 are separated by the metallic reinforcement, they can be considered as "at least partially associated". Also the expandable material can be considered as reinforcing, since any solid has the property of reinforcing.

Furthermore O2D1, paragraph [0030], discloses the polymeric base reinforcing portion being elongated and the metallic reinforcement being localized in the thickness direction.

O1D4 also discloses all the features of claim 1
- a polymeric elongated base reinforcing portion, *figure 8, reference number 2 and page 4, lines 32-37 in combination with p.5, 1.30-32.*
- an expandable polymeric material, *figure 8, reference number 3, page 6, lines 1-25.*
- a metallic localized reinforcement, *figure 8, reference number 1 and page 5, lines 10-25*

Since steel is used for the metallic reinforcement (O1D4, page 5, lines 12-14) and nylon for the polymeric elongated base (O1D4, p.5, 1.30), the tensile strength

of the localized reinforcement will be higher than the tensile strength of the polymeric elongated base reinforcing portion.

Remittal to the opposition division - Article 111(1) EPC

The appellant agreed with the proprietor's view that the case should be remitted to the opposition division in case the Board concluded that the subject-matter of claim 1 as granted was not novel.

VIII. The respondent's arguments relative to the main request can be summarised as follows:

Added subject-matter - Article 100(c) EPC

The subject-matter of claim 1 does not extend over the application as originally filed since on p.6, lines 5-6 of the application as originally filed it is verbatim disclosed that "The base reinforcing portion may be made of a polymeric material and the localized reinforcement may be made of a metallic material".

Sufficiency of disclosure - Article 100(b) EPC

The invention is disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

Since only a relationship of the tensile strength of the metallic material relative to the polymeric material is claimed, the person skilled in the art can ensure that the same test under the same conditions is applied when testing the two materials. These tests are well known to the skilled person in the art in case the

tensile strength is not already available from text books or data sheets. Moreover the skilled person in the art knows in which environment the structural reinforcement will be used and will choose the test conditions accordingly.

Novelty - Article 100(a) EPC

In view of the patent specification, including the examples and the drawings, the term "localized" means that the metallic reinforcement never completely extends over the base reinforcement. In the patent specification and in particular in paragraph [0017] it is not disclosed that the localized reinforcement can extend along the entire width and length dimensions of the base reinforcing portion or extend beyond the length or width of the base reinforcing portion.

The subject-matter "located within a contemplated impact deformation region of the structural reinforcement" is a limiting feature and does not depend on the use. The subject-matter of claim 1 is not directed to a vehicle cavity to be reinforced but to the reinforcement system itself that is placed in the cavity. The metallic localized reinforcement is not placed in a region where an impact on the cavity takes place, but in a localized region where it is expected that deformation of the structural reinforcement will take place.

The subject-matter of claim 1 is novel over O2D1 for the following reasons:

- O2D1 does not disclose directly and unambiguously that the tensile strength of the metallic localized reinforcement is higher than the polymeric material of

the base reinforcing portion. O1D16 discloses on p.4 and 5 metallic materials having a lower tensile strength than polymeric materials. For example copper has a tensile strength of 220 MPa and Vectran has a tensile strength of 2850-3500 MPa. Thus metallic material do not always have a higher tensile strength than polymeric material.

Moreover O2D1 does not disclose the expandable polymer material being at least partially associated with the base reinforcing layer as the metallic layer completely separates the two layers (20) and (22). O2D1 does not disclose either that the expandable polymer reinforces the structural reinforcement prior to expansion of the polymeric material. Not every solid material has reinforcing properties, a film for example does not.

Additionally O2D1 does not disclose the polymeric base reinforcing portion being elongated as figures 1 and 2 are a section/detail of a larger figure, which does not depict any geometry.

Finally O2D1 does not disclose either the metallic localized reinforcement being aligned generally parallel with the longitudinal axis and located within a contemplated impact deformation region of the structural reinforcement. In O2D1 the layer 24 extends over the entire area of the layers 20 and 22, and O2D1 does not refer to any impact deformation. O2D1 does not disclose either that the localized reinforcement will reduce the severity of the deformation in the impact deformation region.

O1D4 discloses that the profile 1 is the part that is reinforced by the ribbed structure 2 and not the other

way around. Moreover the profile 1 is a sheet of metal automotive shell that defines a hollow profile (see Old4, p.1 first two paragraphs) into which a structural reinforcement is inserted such that the characterising portion is not disclosed in Old4.

*Remittal to the opposition division - Article 111(1)
EPC*

The respondent requested the remittal of the case to the opposition division if the Board concluded that the subject-matter of claim 1 as granted was not novel, as this finding would be based on a substantially different interpretation of the terms of the claims as compared to that taken by the opposition division.

Reasons for the Decision

1. The appeal is admissible
2. Main request - Added subject-matter - Article 100(c) EPC and Sufficiency of disclosure - Article 100(b) EPC
 - 2.1 In respect of these issues, at the oral proceedings the parties referred to their written submissions. The Board sees no reasons for changing the preliminary opinion as set out in the communication annexed to the summons to oral proceedings, which is hereby confirmed and is as follows.
 - 2.2 The subject-matter of claim 1 does not extend over the content of the application as filed. Basis for the amendment is paragraph [0024] of the WO publication, which discloses in a general manner that "The base reinforcing portion may be made of polymeric material

and the localized reinforcement may be made of a metallic material". This is a general disclosure which can be applied to the subject-matter of claim 1.

Contrary to the opinion of the appellant the Board considers that although the disclosure in paragraph [0024] is not under "summary of the invention" but under "detailed description", the skilled person would immediately recognise that this disclosure can be applied in a general manner.

Moreover the feature related to the tensile strength of the material of the localized reinforcement being higher than the tensile strength of the elongated base is not just specific to the list of metallic materials in paragraph [0009] or in claim 5. Indeed paragraph [0008] and original claim 1 both disclose the base reinforcing portion, the expandable material and the localised reinforcement with the above mentioned tensile strength relationship, whereby the type of material for the reinforcing base portion and the localized reinforcement is not specified.

2.3 The invention is disclosed in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

Although no method for measuring the tensile strength is disclosed in the patent specification, as claim 1 requires a comparison of two tensile strength values, namely the tensile strength of material of the metallic localized reinforcement and the tensile strength of the polymeric material of the base reinforcing portion, the skilled person will be in a position to determine which material has the highest tensile strength as long as

the method for measuring the tensile strength is the same.

The graph submitted by the appellant showing the tensile strength of 4 polymers at temperatures between -50 and 150°C is not convincing. The graph does not disclose the nature of the polymer materials measured. Moreover although cars might be in extreme cases subjected to temperature -20 to 50°C, when the skilled person will choose the materials, he will choose them in view of the usual conditions i.e. not at -20 °C or 50°C.

The appellant is of the opinion that the tensile strength of composite material as a whole cannot be determined knowing the tensile strength of each individual component. While this may be correct, the skilled person can determine the tensile strength of the composite material with a standard method and use this same standard method to measure the tensile strength of the other materials. The argument of the appellant that no standard test for measuring composite material exist is a pure allegation.

In the case T 0909/12, referred to by the opponent, the claim is directed to a ski with a mounting plate attached to the upper ski surface, whereby the mounting plate provides a significantly lower modulus of elasticity "E" than the ski body. In this case the Board came to the conclusion that the invention was not sufficiently disclosed because the elastic modulus of a ski was an unusual parameter and the patent in suit did not disclose how to measure it.

In T 0909/12 (points 4.6.1 and 4.6.2 of the reasons for the decision) the Board distinguishes between

homogeneous composite material such as carbon fibre reinforced material where the elastic modulus can be defined and skis where the elastic modulus cannot be defined. Skis are usually composite materials comprising several layers and /or blocks of different materials. In addition, the composition and geometry of these layers and blocks change along the ski such that a single elastic modulus for the ski cannot be defined.

In the present case the material of the metallic localised reinforcement is a homogeneous material either made of a single material or a composite material and is not made of a material layers and/or blocks comparable to a ski. Thus in line with T 0909/12, the elastic modulus and similarly the tensile strength of the metallic localized reinforcement in claim 1 can be defined and measured.

To conclude, the skilled person is able to check whether the parameter (in the present case the relative tensile strength of the metallic material of the localized reinforcement and the polymeric material of the base reinforcing portion) is complied with when the invention is carried out.

3. Main request - Novelty- Article 100(a) EPC.

The subject-matter of claim 1 is not novel over O2D1 and O1D4. Thus the respondent's main request fails on this ground.

3.1 Lack of novelty over O2D1

3.1.1 O2D1 discloses a structural reinforcement comprising:

- a polymeric elongated base reinforcing portion having a longitudinal axis, (*figure 1, first portion 20 (or 22) and paragraphs [0018] and [0019]*)
- an expandable polymeric material at least partially associated with the base reinforcing portion, (*figure 1, second portion 22 (or 20) and paragraphs [0018] and [0019]*) and;
- a metallic localized reinforcement aligned generally parallel with the longitudinal axis and located within a contemplated impact deformation region of the structural reinforcement (*figure 1, portion 24 and [0016]*).

3.1.2 It is to be noted that in O2D1 only a selection from one list needs to be made to arrive to the subject-matter of claim 1, namely the selection of metal in the possible strengthening materials listed in paragraphs [0016] and [0017]. A selection from a single list of specifically disclosed elements does not confer novelty.

3.1.3 In this embodiment of figure 1, although the first portion 20 and the second portion 22 of expandable foam are separated by metallic reinforcement portion 24, these two portions are still to be seen as "at least partially associated". The two portions 22 and 24 are bonded on each side of the metallic reinforcement portion and are therefore associated via the metallic reinforcement.

Moreover the expandable foam can be considered as a reinforcing material as it will bring additional strength to the structure. In this respect it is noted that, contrary to the proprietor's allegation, even a film can generally "reinforce" a structure and thus be considered as a reinforcing material.

- 3.1.4 In O2D1, the portions 20 and 22 of expandable foam are elongated at least in their plane as can be seen on the sectional view of figure 1 where the thickness of the portions 20 and 22 is small compared to the width. This is confirmed by paragraph [0030] which discloses narrow ranges for the thickness of the reinforcing material 14.
- 3.1.5 Moreover the metallic reinforcement portion is restricted to a particular place, namely one entire surface of the polymeric base reinforcing portion. The metallic reinforcement can thus be considered as a "localized reinforcement". Whether the metallic reinforcement portion covers the whole surface of the polymeric elongated base reinforcing portion (in the present case the portion 20 or 22) or even extends over the base reinforcing portion is irrelevant. The metallic reinforcement portion does not cover all surfaces of the polymeric elongated base reinforcing portion and is therefore localized.
- 3.1.6 It is to be noted that the feature "located within a contemplated impact deformation region of the structural reinforcement" cannot be considered as a limiting feature as the claim does not define where the contemplated impact deformation region is located on the structural reinforcement and the extent of this region. This feature depends on where the structural reinforcement is incorporated.
- 3.1.7 Although it is not explicitly disclosed in O2D1 that the material of the metallic localized reinforcement has a higher tensile strength than the material of the polymeric elongated base reinforcing portion, this feature is implicit for a skilled person. The portion 24 in O2D1 is formed of "strengthening

material" (paragraphs [0027]-[0028] of O2D1). Moreover if the localized reinforcement is chosen to be metallic, then inevitably the metallic material chosen as strengthening material will have a higher tensile strength than the expandable polymeric material disclosed in paragraph [0019].

Some polymeric material have higher tensile strength than metallic material as the proprietor pointed out referring to O1D16. But in O2D1, the polymeric material is specified to be an expandable foam made of for example epoxy-based material, ethylene based material or a mixture thereof and the metallic material, although not specified, is a strengthening material. Under these circumstances it is clear that the tensile strength of the metallic material in O2D1 will be higher than the tensile strength of the expandable foam. It is to be noted that O2D1 relates to a reinforcing member for structures in general and in particular for automotive vehicles. In such context it is unrealistic for the metal chosen to have a tensile strength lower than an expandable polymeric foam.

3.2 Lack of novelty over O1D4

3.2.1 O1D4 also discloses all the features of claim 1.

O1D4 discloses a structural reinforcement comprising:

- a polymeric elongated base reinforcing portion having a longitudinal axis, (*figure 8 "reinforcing structure 2"*)
- an expandable polymeric material at least partially associated with the base reinforcing portion, (*figure 8 "foamable material 3"*) and
- a metallic localized reinforcement aligned generally parallel with the longitudinal axis and located within a contemplated impact deformation region of the

structural reinforcement (*figure 8, "U-shaped profile 1"*).

- 3.2.2 In O1D4, the "reinforcing structure 2" is made of nylon as a particularly preferred material (p.5, l.30), and the "U-shaped profile 1" may be made of steel (p.5, l. 11-13). With such materials, the tensile strength of the metallic material of the localized reinforcement is evidently higher than the polymeric material of the elongated base reinforcing portion.
- 3.2.3 The U-shaped profile 1 on figure 8 is localized as it does not cover all the surfaces of the reinforcing structure. The fact that in O1D4, on p.5, l.15-17 it is disclosed that "in automobile applications the profiles are typically formed from two metal pieces a U or C shaped profile and a cover which are joined together to form the hollow profile usually by welding" and on p.7, l.34-36 that "in operation a steel cover would be placed over the open mouth of the U shaped profile and welded to the flanges (4) of the profile" does not alter the fact that the metallic reinforcement is placed and localized on the outside of the elongated base reinforcing portion (the "overmoulded material").
- 3.2.4 Moreover the argument of the proprietor that O1D4 is being misinterpreted and that the U-shaped profile is not disclosed as a reinforcement but as the part to be reinforced cannot be followed. The U-shaped profile may be reinforced by the overmoulded material but at the same time the U-shaped profile also reinforces the overmoulded material and can thus be considered as a reinforcement.
4. Remittal to the opposition division - Article 111(1) EPC

The Board concurs with the respondent that the interpretation of some terms of the claim, in particular the interpretation of the expression "metallic localized reinforcement", underlying the above findings of lack of novelty, differs substantially from the interpretation made by the opposition division and puts the respondent in a situation which is substantially different from that in first instance proceedings. Moreover, both parties requested remittal. Under these circumstances, the Board considers it as appropriate to exercise its discretion under Article 111(1) to remit the case to the opposition division for further prosecution.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance for further prosecution.

The Registrar:

The Chairman:



S. Sánchez Chiquero

G. Pricolo

Decision electronically authenticated