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**Datasheet for the decision
of 1 March 2016**

Case Number: T 1200/12 - 3.3.09

Application Number: 01972859.1

Publication Number: 1326746

IPC: B32B27/32, B65D65/40

Language of the proceedings: EN

Title of invention:

A PACKAGING LAMINATE FOR A RETORTABLE PACKAGING CONTAINER

Patent Proprietor:

Tetra Laval Holdings & Finance S.A.

Opponent:

SIG Combibloc GmbH

Headword:

Relevant legal provisions:

EPC Art. 54, 56, 83, 84, 123(2)

Keyword:

main request: amendments (allowable), clarity (yes),
sufficiency (yes), novelty (yes), inventive step (yes)

Decisions cited:

T 0049/11

Catchword:



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Case Number: T 1200/12 - 3.3.09

D E C I S I O N
of Technical Board of Appeal 3.3.09
of 1 March 2016

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Decision under appeal: **Interlocutory decision of the Opposition
Division posted on 3 April 2012 maintaining the
European Patent No. 1326746 in amended form.**

Composition of the Board:

Chairman W. Sieber
Members: N. Perakis
D. Prietzel-Funk

Summary of Facts and Submissions

- I. This decision concerns the appeals filed by the patent proprietor and the opponent against the interlocutory decision of the opposition division that European patent No. 1 326 746 as amended meets the requirements of the EPC.
- II. With the notice of opposition the opponent had requested revocation of the patent in its entirety on the grounds of Article 100(a) (lack of novelty and inventive step) and 100(b) EPC.
- III. The documents filed during opposition included:

By the opponent:

- E1: US 4 533 576 A;
- E3: "New polypropylene resins allow more sophisticated applications in flexible packaging", Specialty Plastics Conference, Zurich, 4-6 November 1991;
- E5: Extrusion Coating Manual, T.Bezigian (ed.), Tappi Press, 1999, Chapter 20, pp 185-199;
- E8: US 4 402 172 A;
- E11: WO 90/09926 A2;
- E13: WO 97/02140 A1;
- E14: WO 97/02181 A1;
- E15: Handbook of beverage packaging, G.A. Giles (ed.), Sheffield Academic Press, 1999, pp 139-143, 148-153;
- E23: EP 025 235 A1;
- E24: US 4 881 360 A; and
- E25: W. Jenkins et al., Lebensmittelverpackungen aus Kunststoff, Behr's Verlag, 1992, p 164.

By the patent proprietor:

- D27: Definition of "retortable", Web-based dictionary;
- D30: "Packages treated at elevated temperatures in retorting processes", study reporting on retortability of materials based on E11;
- D31': English machine translation of JP 10 219 049 A;
- D32: Copy of Declaration of T. Andersson submitted in case EP 0871570;
- D35: Declaration of T. Andersson dated 25 January 2012 in the matter EP 1326746; and
- D39: English translation of Judgment 4b O 200/08 of the Düsseldorf District Court in an infringement case; and
- D42: Dictionary of Composite Materials Technology, Technomic Publishing Company, 1989, p 120.

By the opposition division:

- F1: Kunststoff-Lexikon, Stoeckert and Woebcken (ed.), Carl Hanser Verlag München Wien, 1992, p 455; and
- F2: Textbook of Polymer Science, F.W. Billmeyer, John Wiley & Sons, Inc., 1984, p 369.

IV. The opposition division held that the patent could be maintained on the proprietor's auxiliary request II. The main request was rejected for lacking novelty over example 12 of E1 and auxiliary request I was rejected as breaching Article 123(2) EPC.

Claims 1, 3 and 5 of the main request, the only request relevant to this decision, read as follows:

"1. A retortable packaging container, characterised in that it is produced by fold forming and sealing of a packaging laminate comprising a core layer (11;21) of paper or paperboard, outer liquid-tight coatings (12 and

13; 22 and 23) and a gas barrier (14,24) disposed between the core layer (11,21) and one outer coating (12;22), said gas barrier (14;24) being bonded to the core layer (11;21) by a layer (16;26) of a lamination or sealing agent which has a higher melting point than a maximum temperature to which the retortable packaging container is to be subjected during a heat treatment in a retort, characterised in that said lamination or sealing agent is a polypropylene having a melting point of above 130°C disposed in contact with said core layer."

"3. A retortable container as claimed in Claim 1 or Claim 2, characterised in that the one liquid-tight coating (12; 22) is bonded to the gas barrier (14; 24) via a layer (15; 25) of a binder by means of which the liquid-tight coating (12; 22) is partially, but reinforceably, bonded to the gas barrier (14; 24)."

"5. A retortable container as claimed in Claim 3 or Claim 4, characterised in that the gas barrier (24) is bonded to the lamination or sealing layer (26) via a layer (29) of a binder by means of which the gas barrier (24) is partially, but reinforceably, bonded to this lamination or sealing layer (26)."

V. According to the reasoning of the opposition division example 12 of E1 disclosed a retortable packaging container produced by fold forming and sealing a packaging laminate with the following structure which fell within the structure of claim 1:

polypropylene/paper/polypropylene/urethane glue/
aluminium/urethane glue/polypropylene.

Moreover, the polypropylene in example 12 of E1 was a conventional polypropylene homopolymer which, on the basis of the skilled person's technical knowledge as illustrated in E3, figure 12, had a melting point of 165°C. Thus example 12 of E1 disclosed all the features of claim 1 of the main request.

VI. On 22 May 2012 the opponent filed a notice of appeal and the statement setting out the grounds of appeal including, amongst other documents, E31:

E31: K. Oberbach, "Saechtling Kunststoff Taschenbuch", 26th edition, 1995, Carl Hanser Verlag München Wien (already submitted at the oral proceedings of 29 February 2012 before the opposition division but not admitted into the proceedings according to the minutes point 6.3).

VII. On 29 May 2012 the patent proprietor filed an appeal. The statement setting out the grounds of appeal was filed on 27 July 2012 including the main request before the opposition division (see point IV above) and two auxiliary requests. Observations on the opponent's appeal were filed with a separate letter also on 27 July 2012.

VIII. As the patent proprietor and the opponent are respectively appellant and respondent in these proceedings, for simplicity the board will continue to refer to them as the patent proprietor and the opponent.

IX. With a letter dated 1 February 2013, the opponent filed observations on the patent proprietor's appeal as well as additional documents including E57-E61:

- E58: Eidesstattliche Versicherung of M. Wolters dated 30 August 2010;
- E59: Test report "Polyethylene packages treated at elevated temperatures in retorting processes" of T. Andersson dated 13 October 2010;
- E60: Affidavit of M. Wolters dated 29 October 2010; and
- E61: Test report "Packages treated at elevated temperatures in retorting processes" of T. Andersson dated 8 November 2010.

Further arguments and documents were filed with letters of 11 November 2013, 23 July 2015 (including E74, E74' and E76) and 7 August 2015:

- E74: JP Sho 53-140678 U;
- E74': German translation of E74; and
- E76: Letter of ip-search dated 22 July 2015.

- X. With letter dated 1 September 2015 the patent proprietor filed auxiliary requests 7-16 which replaced all previously filed auxiliary request. Furthermore, the patent proprietor requested postponement of the oral proceedings scheduled to take place on 8 October 2015 in view of the submission of document E74 by the opponent.
- XI. In view of the patent proprietor's request, the board deferred the oral proceedings to 1 and 2 March 2016.
- XII. With a letter of 12 October 2015, the patent proprietor filed arguments against the relevance of E74 and submitted additional documents including D79 and D80:

- D79: Data sheet of Polypropylene, DaployTM SF313HMS; and
- D80: WO 2009/095274 A2.

- XIII. On 4 December 2015 the board issued a communication in preparation for the oral proceedings pointing out the relevant issues to be dealt with during these proceedings.
- XIV. With a letter of 15 December 2015, the patent proprietor filed additional arguments and submitted a dated and signed copy of D80.
- XV. With a letter of 29 December 2015, the opponent filed additional arguments and documents, including E86 in reaction to the communication of the board:
- E86: WO 93/18106 A1.
- XVI. Oral proceedings took place on 1 March 2016 as scheduled. During the oral proceedings the patent proprietor submitted description pages adapted to the claims of the main request.
- XVII. The relevant argument put forward by the patent proprietor in its written submissions and during the oral proceedings may be summarised as follows:
- The only sensible meaning of the layer of a polypropylene lamination or sealing agent in contact with the core layer was "direct contact". Thus claim 1 of the main request fulfilled the requirements of Article 84 EPC.
 - The contact of the layer of a polypropylene lamination or sealing agent with the core layer was clearly and unambiguously derivable from the figures of the application as published. Thus this feature fulfilled also the requirements of Article 123(2) EPC.

- The claimed invention also met the sufficiency requirements. The skilled person, taking into account the teaching of the patent in suit and the common general knowledge, was able to reproduce the invention without undue burden. In particular regarding "retortable" packaging containers, such containers with similar structure were known in the art as mentioned in the patent where reference was made to E13. Moreover, D32 showed that the skilled person knew how to test the retortability of a packaging container. The skilled person also knew how to select appropriate layers in order to obtain a retortable container as demonstrated by D32 and D35. Concerning the unsatisfactory retortability results of the opponent's technical evidence (see E58-E61), these results showed that the opponent had not made the appropriate selection of layers.

- None of E1, E11 and E74/E74' disclosed the subject-matter of claim 1.

- The container of example 12 of E1 was not made by fold forming and sealing the laminate but was assembled from a laminate sleeve and two press-formed end caps, which end caps did not contain any core layer of paperboard. This was also the interpretation of E1 by the Düsseldorf Regional Court (see D39).

- The container of E11 was retortable but did not require a polypropylene layer disposed in contact with the core layer, let alone a polypropylene with a melting point of above 130°C.

- Late-filed E74/E74' were not *prima facie* relevant and therefore should not be admitted into the proceedings.

- Regarding inventive step, either E13 or E14 could be considered as the closest prior-art document. The technical difference of the claimed container concerned the structure of the laminate, which included a polypropylene layer with a melting point of above 130°C, disposed in contact with the core layer and bonding the core layer to the gas barrier layer. The technical effect of this layer was the improvement of the retortability of the container. This improvement was not disclosed or suggested in the prior art and thus the subject-matter of claim 1 involved an inventive step.

XVIII. The relevant arguments put forward by the opponent in its written submissions and during the oral proceedings may be summarised as follows:

- Claim 1 of the main request lacked clarity because the feature "disposed in contact" was not found in the granted claims and did not have a clear meaning. It did not necessarily mean in direct contact as argued by the patent proprietor.

- If the board were to interpret the term "disposed in contact" as meaning "disposed in direct contact", this feature was not supported by the description but merely extracted from the figures. However, the figures disclosed specific laminate structures which were not taken up into the subject-matter of claim 1.

- The terms "retortable", "produced by fold forming and sealing" (both in claim 1) and "partially, but reinforceably bonded (in claims 3 and 5) were objected to under sufficiency of disclosure. The claimed invention was insufficient because the skilled person did not know how to select the various layers of the laminate in order to manufacture a retortable packaging container. This amounted to an undue burden. The opponent had repeated the invention of claim 1 but failed to obtain a retortable container (see E58-E61).

 - The subject-matter of claim 1 lacked novelty in view of the disclosure of E1, E11 and E74/E74'. The latter was accidentally found as shown in E76 and despite the late-filing it should be admitted into the proceedings as *prima facie* relevant.

 - The subject-matter of claim 1 lacked an inventive step. E13 could be considered to represent the closest prior art. E13 disclosed that the structure of the laminate could include an additional layer disposed in contact with the core layer. One possible alternative for this additional layer was polypropylene. Therefore the claimed subject-matter was an obvious alternative within the disclosure of E13, which did not involve an inventive step.
- XIX. The patent proprietor requested that the decision under appeal be set aside and that the patent be maintained on the basis of the claims of the main request submitted with the statement setting out the grounds of appeal, or alternatively on the basis of auxiliary requests 7 or 8, both submitted with the letter dated 1 September 2015, or to dismiss the appeal of the opponent, or

alternatively that the patent be maintained on the basis of one of auxiliary requests 10 to 16, also submitted with the letter dated 1 September 2015.

It also requested that documents E74/74' and E76 not be admitted into the appeal proceedings as they were late-filed and not *prima facie* relevant.

- XX. The opponent requested that the decision under appeal be set aside and that the patent be revoked.

Reasons for the Decision

1. This decision deals with the various issues raised against the main request.

The following abbreviations are used:

PP for polypropylene; **PE** for polyethylene; **LDPE** for low density polyethylene, **LLDPE** for linear low density polyethylene, **MDPE** for medium density polyethylene, **HDPE** for high density polyethylene, **PET** for polyethylene terephthalate; **Al** for aluminium.

2. Clarity

- 2.1 The opponent objected to the introduced term "[said lamination or sealing agent is] disposed in contact with said core layer" as being unclear. The opposition division was wrong to conclude that this term had to be understood to mean direct contact.

- 2.2 The board agrees with the opposition division that the term "disposed in contact" has to be understood to mean "disposed in direct contact" because there is no other sensible technical understanding of a layer disposed in

contact with another layer. If this expression allowed the presence of a further layer between the core layer and the polypropylene layer, as asserted by the opponent, then this expression would not have its natural meaning, since the polypropylene would not be disposed in contact with the core layer.

2.3 Consequently this term does not give rise to a clarity objection.

3. Amendments

3.1 Claim 1 of the main request (see above point IV) is essentially based on the combination of the following claims of the International Publication WO 02/28637 A1:

- claim 1, relating to a packaging laminate,
- claim 2, relating to a lamination or sealing agent which has a melting point of above 130°C,
- claim 3, relating to a lamination or sealing agent which is a polypropylene,
- claim 8, relating to a core layer which is a paper or paperboard layer, and
- claim 10, relating to a retortable packaging container produced by fold forming and sealing of a packaging laminate as claimed in any of the proceeding claims.

3.2 This combination does not disclose that the (layer of) lamination or sealing agent is disposed in contact with the core layer. As explained above, "disposed in contact" means that the lamination or sealing agent (i.e. the PP layer) is disposed in direct contact with the core layer.

A laminate with the PP layer being disposed in contact with the core layer is derivable from the general

disclosure of the claimed invention (see International Publication: page 3, lines 22-28; page 4, line 12), which requires that the laminate has the following basic structure:

outer coating/core layer/layer of a lamination or sealing agent/gas barrier layer/outer coating.

Furthermore, such an arrangement is exemplified by the specific embodiments of figures 1 and 2 of the International Publication, according to which the layer of lamination or sealing agent (16 and 26, respectively) is in (direct) contact with the core layer (11 and 21, respectively).

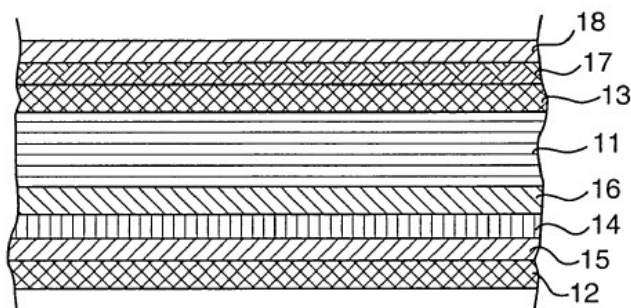


Fig 1

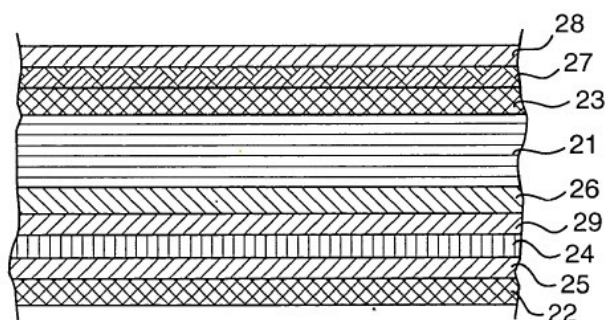


Fig 2

Thus the embodiments of figures 1 and 2 represent examples of the basic structure while containing further

adhesive layers such as layer 15 (figure 1) and layers 25 and 29 (figure 2).

3.3 The opponent objected to the term "disposed in contact" under Article 123(2) EPC, if the board were to interpret this term as meaning "disposed in direct contact".

3.4 However, on the basis of what has been set out above, the board concludes that claim 1 fulfils the requirements of Article 123(2) EPC.

4. Sufficiency

4.1 The opponent objected under sufficiency of disclosure to the terms "retortable", "produced by fold forming and sealing" (both in claim 1) and "partially, but reinforceably bonded" (in claims 3 and 5).

4.2 The term "retortable"

4.2.1 Retortable packaging containers based on packaging laminates were known in the art at the priority date of the patent in suit. The description cites WO 97/02140 (E13 of the present decision) which is an earlier patent application of the patent proprietor (see patent, paragraph [0002]). It is therefore concluded that the skilled person knew at the priority date of the patent how to make a retortable packaging container of a type similar with that claimed.

4.2.2 The claimed retortable packaging container is designed in a manner that it obviates the problems of the retortable containers of the prior art, these problems relating to delamination at extremely high temperatures and/or during an extremely long time (see patent paragraphs [0006] and [0007]). The delamination led to

the loss of both mechanical strength and configurational stability as well as the desired tightness properties (see patent, paragraph [0006]).

- 4.2.3 D42 defines "retortable" as meaning "A material that is capable of withstanding a specified thermal processing in a closed retort at temperatures above 100°C". If a container can be heat-treated in a retort above 100°C for an appreciable time such that the container material reaches the retort temperature and does not suffer any damage, i.e. maintains its structural integrity, then clearly the container is retortable. There are no parameters to be satisfied to quantify, as suggested by the opponent. In this context, reference is made to D32 (section 7) which shows that the skilled person is able to simulate the mechanical influences to which a container is exposed, by a simple qualitative test, e.g. by applying a load on top of the container in the apparatus as presented in D32 and to adjust the configurational stability to these normal influences, *inter alia* via the material and thicknesses of the various layers used. D232 demonstrates that when packages fail in retorting they do so quite dramatically from going from a condition in which they are clearly satisfactory to an unusable condition following quite small changes in retorting conditions. Thus, the person skilled in the art would have no difficulty in telling which containers are retortable and which are not. The same conclusion was reached in T 49/11 of 25 March 2014 (see point 5) involving the same parties where it was held in a similar case that a claim requirement for autoclaving of a cardboard laminate container without its dimensional stability being impaired was sufficiently disclosed relying basically on the same information and general knowledge as in the present case.

Thus the opponent's objection under Article 83 in relation to the term "retortable" must fail.

- 4.2.4 In fact, the opponent's objection in relation to the term "retortable" appears to boil down to the objection that the skilled person was not in a position to find a suitable laminate for producing a retortable container without undue burden.

However, the board agrees with the patent proprietor that the skilled person is able to select the materials for the various layers and their thickness, and to apply the test of D32 in order to find out which laminate structures provide retortability and which do not.

- 4.2.5 In particular regarding the selection of a suitable paperboard material, the skilled person is aware that it is at least preferred to select a water-resistant paperboard. Such paperboard materials were ordinary in the art at the priority date of the patent. The patent even discloses that paper or paperboard of conventional packaging quality was used in the laminates of figures 1 and 2 (see paragraphs [0021] and [0040]). Furthermore, the patent proprietor stated at the oral proceedings that many ordinary standard paperboard materials were in use for the manufacture of laminates for packaging liquids at the priority date of the patent.

On the other hand, the opponent failed with a chosen paperboard to obtain a retortable container and alleged that a unique paperboard quality such as disclosed in E57 had to be used.

The board was not in a position to resolve this apparent contradiction. However, even if the skilled person failed to put the invention into practice with a

particular paperboard, he could have been expected to use another, probably more water-resistant paperboard simply by reason of common sense.

4.2.6 Regarding the selection of suitable outer liquid-tight coating layers, the skilled person would also be able to find suitable combinations which do not impair the dimensional stability of the container under the conditions of humidity and heat by autoclaving. As stated in the patent specification (see paragraphs [0016], [022]-[0027] and [0041]-[0046]) the main purpose of the outer layers is the protection of the paperboard against humidity and heat, which would otherwise impair or destroy the dimensional stability of the container. Although there is evidence, namely D30, D32 (second and third material), E58 (laminates V3 and V4), E59 (tests marked A and C), E60 (test marked F) and E61 (tests marked 1 and 3), which shows that outermost layers made from LDPE or LLDPE fail to provide sufficient protection and this even when the layer of lamination or sealing agent is PP, there is also evidence that other materials, such as PP outer layers, succeed in providing dimensional stability as shown in D32 (first material) and D35. Thus, taking into account that laminates for retortable packaging containers were known (implying that suitable outer layers were also known) it could have been expected that the skilled person would have been able to turn the failure into success with a reasonable amount of experimentation.

4.3 The term "fold forming and sealing"

4.3.1 Claim 1 requires that the container be produced by "fold forming and sealing".

4.3.2 Regarding the meaning of the term "fold forming and sealing" it is apparent from the patent specification that this is a known method in the form/fill/seal technology according to which the whole container is made by folding a (single) blank laminate.

Paragraph [0001] states that the invention relates to a retortable packaging container or carton of the packaging laminate.

Paragraph [0002] states that the packaging laminate of this type is previously known and cites W07/02140 (E13 of this decision).

Paragraph [0003] refers to the known packaging containers and states:

"From the known packaging laminate, retortable packaging containers are produced with the aid of filling machines of the type which, from a web or from prefabricated blanks of the packaging laminate, form, fill and seal finished packages according to the so-called form/fill/seal technology".

Paragraph [0004] states how packages are made by applying this technology:

"From, for example, a flat-folded tubular packaging blank of a known packaging laminate, retortable packaging containers are produced in that the packaging blank is first raised to an open, tubular packaging carton which is sealed at its one end by fold-forming and sealing of the continuous, united foldable end panels of the packaging carton, for the formation of a substantially planar bottom closure. The packaging carton provided with the bottom is filled with the

relevant contents, e.g. a food, through its open end which is thereafter closed by a further fold-forming and sealing of the opposing end panels of the packaging carton for the formation of a substantially planar top closure. The filled and sealed, normally parallelepipedic packaging container is thereafter ready for heat treatment in order to impart to the packed food extended shelf life in the unopened packaging container".

Finally, paragraph [0053] states that:

"From a packaging laminate according to the present invention, well-functioning retortable packaging containers or cartons can be produced by fold forming and sealing in the above-described manner ..."

The reference to the "above described manner" can only concern the description of the prior art in paragraph [0004] which is the only manner disclosed in the patent in suit.

4.3.3 Furthermore, the patent proprietor submitted prior-art documents and showed that "fold forming and sealing" was indeed a method known in the art at the priority date of the patent in suit:

- E15 (pages 140-141, section 8.1.2; page 152, figure 8.11 and page 153, figure 8.12),
- E23 (figure 1; page 3, lines 8-10; page 3, line 23 to page 8, line 5),
- E24 (abstract; column 4, lines 3-9 and 29-39; figure 1) and
- E25 (page 11, lines 14-36).

- 4.3.4 Thus, the opponent's sufficiency objection based on "fold forming and sealing" must also fail.
- 4.4 The term "partially, but reinforceably bonded"
- 4.4.1 Dependent claim 3 requires that the one liquid-tight coating (12;22) is partially, but reinforceably bonded to the gas barrier (14;24) via a layer (15;25) of a binder. Dependent claim 5 requires that the gas barrier (24) is partially, but reinforceably bonded to the lamination or sealing layer (26) via a layer (29) of a binder.
- 4.4.2 The role of the binder is to reduce the extreme tensile stress sensitivity of the gas barrier material, such as aluminium foil, and avoid risks of crack formation (see paragraphs [0032] and [0051]). The patent in suit discloses that suitable binders were known in the art at the priority date of the patent and cites a specific one, namely Admer from Mitsui Japan (see paragraphs [0033] and [0052]).
- 4.4.3 Binder layers of an Admer material have been used in the technical evidence D32 (first material) and D35 (point 5) cited by the patent proprietor and E59-E61 cited by the opponent. None of these pieces of evidence show that failure in retorting the container is due to the Admer layer.
- 4.4.4 There appears to be no difficulty in understanding the term "partially, but reinforceably bonded to" in this context. Nor has the opponent shown how this would amount to insufficiency of disclosure.
- 4.5 In view of the above, the board concludes that the invention as claimed is disclosed in a manner

sufficiently clear and complete for it to be carried out by a person skilled in the art and thus fulfils the requirements of Article 83 EPC.

5. Novelty

The opponent disputed the novelty of the subject-matter of claim 1 on the basis of E1, E11 and E74.

5.1 Document E1

- 5.1.1 E1 relates to a composite (laminate) material for use in food packaging containers, which consists of a metallic foil and a thermoplastic resin including a polyolefinic resin (claims 1, 2 and 5). Example 12, to which the opponent made particular reference, discloses a first laminate made from a polypropylene film and an aluminium foil bonded to each other by a urethane-type adhesive (**laminate I** structure: PP/Al). A second laminate was manufactured by coating both surfaces of a raw paper with a PP film (**laminate II** structure: PP(30µm)/paper/PP(50µm)). Then the aluminium foil surface of laminate I and the 30µm PP surface of laminate II were bonded to each other by means of a urethane-type adhesive to give a five-layered **laminate III** with the structure:
PP(50µm)/paper/PP(30µm)/Al/PP
(see column 11, lines 42-54).

This laminate III of example 12 comprises a core layer of paper, outer liquid-tight coatings of PP and a gas barrier layer of aluminium between the core layer and one outer coating of PP. This is exactly what claim 1 requires.

Furthermore, the aluminium gas barrier layer is bonded to the paper core by the PP(30µm) layer. In other words,

the PP(30µm) layer is the layer of lamination or sealing agent which bonds the gas barrier to the core layer, whereby the PP(30µm) layer is disposed in (direct) contact with the core layer. This is also what claim 1 requires.

- 5.1.2 Regarding the manufacture of the packaging container of example 12, E1 discloses that a piece was cut off from laminate III and folded in a cylindrical form. The marginal portions of the piece were superimposed and joined by heating at 250°C to provide a composite can body (see column 12, lines 9-15).

A separate six-layered **laminate IV** having the structure:

maleic acid-modified PP/Al/PET/PET/Al/Maleic acid-modified PP

was press-formed to provide composite material 33 and put over one end of the composite can body as shown in figure 8 (see column 11, line 55 to column 12, line 8).

A PP sealing ring 34 for closure reinforcement was put further over the press-formed closure material and while applying a pressure to the can end in the horizontal direction, the aluminium foil of laminate IV was heated by high-frequency induction heating to heat-bond the can body to the laminate 33, and the laminate 33 to the sealing ring 34 (see column 12, lines 20-27).

Thus, example 12 of E1 describes a container manufactured from a sheet of paperboard-based laminate rolled and longitudinally sealed to form a tubular body portion and then closed at each end using end caps of a different laminate structure.

This is different from the manufacturing process of claim 1, which requires that the container is produced by fold forming and sealing a (single) blank. The method of example 12 of E1, which supplements the forming of the body of a container by applying separate end caps is something that the person skilled in the art would not consider to be a fold forming and sealing process for a packaging container. Rather the skilled person would understand that fold forming relates to a process where the container is entirely produced by folding a single blank (see also point 4.3 above).

The board's interpretation of such a process is also in line with the interpretation given by the Düsseldorf Regional Court in its decision in the related infringement proceedings in Germany, which held that E1 does not disclose a container made by fold forming and sealing (see D39: page 14 to page 16).

Thus the manufacturing method constitutes a first difference between the container of claim 1 and the container of example 12 of E1.

- 5.1.3 Regarding the PP layer, example 12 specifies neither the kind of PP nor its melting point. The only information E1 provides with regard to PP is that examples of polyolefin resins used in the composite materials of E1 are PP and PE, PP being especially preferred. The polyolefin resins may be acid-modified, and blends of acid-modified and unmodified polyolefins can also be used (column 3, lines 50-61). Since example 12 specifically refers to acid-modified PP for the preparation of laminate IV, one can derive from the passage in column 3 that the reference to PP in the various laminates must mean unmodified PP. However, E1,

and in particular example 12, does not disclose a PP with a melting point of above 130°C.

- 5.1.4 The opponent considered that the PP is a homopolymer, which inherently has a melting point above 130°C. However, the skilled reader of E1 would understand that the unmodified PP includes not only PP homopolymers but also PP copolymers, such as copolymers of propylene and ethylene, which were known and used in this art at the priority date of E1. For example, laminate packaging materials suitable for use with food in a retort environment with a PP layer which is a copolymer of propylene and ethylene are disclosed in E8 (see abstract; claims 1 and 3).

Regarding the melting point of PE-PP copolymers, it is not necessarily above 130°C. Reference is made to D31' which discloses propylene-ethylene random copolymers used in packaging films with a melting peak temperature of 118.9°C (paragraph [0032]) and E86 which discloses isotactic random reactant polymers of propylene containing from 5-20 wt% of ethylene with a remelt temperature of below 125°C and above 120°C (page 19, lines 6-18; claim 1).

As already said above example 12 of E1 does not directly and unambiguously disclose a PP homopolymer. It is therefore irrelevant that the state of the art discloses PP homopolymers with a melting point above 130°C, namely 160°C or above (see F1: page 455, under "Polypropylen"; F2: page 368, under "Structure"; E3: page 12.11, figure 12; E5: page 190, middle of left column; E31: section 4.1.5.1, page 368, lines 5-7).

In view of the above, the the melting point of the PP is another difference between the container of claim 1 and the container of example 12 of E1.

- 5.1.5 The opponent argued that the skilled person in this art is the packaging engineer who has no extensive knowledge of PP resins and who would consult a handbook such as those cited above, which illustrate the general technical knowledge, and thus would consider that a homopolymer of PP with a melting point of 160-165°C was the PP referred to in E1.

However, the skilled person would also find in these handbooks that PP has processability problems (see E5: page 199, under "objection" and E31: page 367, under "Allgemeine Eigenschaften"). Therefore, it is indeed questionable that he would consider PP homopolymer as the only PP to be used in the laminate structure of E1.

- 5.1.6 Regarding the retortability of the container, this feature is neither explicitly nor implicitly disclosed in example 12 of E1.

The board accepts that E1 discloses that *"Composite containers are suitable for packing foods, and as required, can be hot-packed, retorted, and aseptically filled"* (underlining added). However, this general statement does not mean that all these steps, and in particular retorting, can be carried out with each and every composite container envisaged by E1. A retorting step at 120°C for 30 minutes was carried out in E1 only in some of the examples, namely examples 9, 10, 11 and 13. Thus E1 does not directly and unambiguously disclose that also the container of example 12 was retortable.

Nor does the retortability of the container of example 12 directly and unambiguously derive from the laminate structure IV. Example 12 simply discloses that the container is suitable for sterilisation by heat and subsequent aseptic filling, which does not necessarily mean that it is retortable under the retorting conditions of the patent in suit (see paragraphs [0006] and [0012]), i.e. when the heat treatment is carried out at an extremely high temperature within the range of 70-130°C and/or during an extremely long treatment time.

Thus retortability of the container of claim 1 is a further difference over the container of example 12 of E1.

5.1.7 In view of the above differences, the subject-matter of claim 1 is novel over the disclosure of E1.

5.2 Document E11

5.2.1 E11 relates to shelf-stable packaging of perishable liquid food products in hermetically sealed gable top cartons (page 1, first paragraph). These cartons are made by fold forming and sealing (figures 4-6; page 19, line 5 to page 21, line 6).

5.2.2 According to E11, the food product is filled into the carton, the carton is sealed, the food product in the sealed carton is heated to a temperature sufficient for pasteurisation and is maintained at the pasteurisation temperature for a time sufficient to kill essentially all microorganisms remaining within the carton (claim 1). The food product is maintained at a pasteurisation hold temperature in the range of 160 to 174°F (71 to 79°C), preferably at 167°F (75°C) for about 10 minutes (claims 11 and 14; page 14, first full

paragraph). Thus the gable top carton of E11 is retortable in the sense of the patent in suit.

5.2.3 E11 further discloses that the gable top carton is constructed from sheets of material which include at least a basic outer layer of cardboard and an inner layer of a thermoplastic material, i.e. a packaging laminate. The sheets are entirely plastic coated and can include additional barrier layers.

The preferred structural material has five layers, three of which are plastic:

- an inner coating of PE,
 - an aluminium barrier,
 - another polymeric layer to bond the foil,
 - a layer of paper board, and
 - an outer layer of PE or lacquer
- (page 18, lines 3-12).

5.2.4 However, contrary to the laminate of claim 1, the "another polymeric layer" is not disclosed to be a PP layer, let alone a PP layer having a melting point of above 130°C.

5.2.5 It is true that page 18, lines 14-18, states that *"Suitable plastics for the carton also include ..., polypropylene, ...and other plastics that are used for food products"*.

However, contrary to the assertions of the opponent, this passage does not directly and unambiguously disclose that the "another polymer layer bonding the paper with the aluminium foil" must be a polypropylene layer. Rather, it relates to suitable plastics in general and thus also includes the plastics of the inner

and outer layers. Moreover, the PP of this passage is not disclosed to have a melting point of above 130°C.

- 5.2.6 The opponent referred also to the passage on page 29, under "2. Hold zone", which states: "The temperature should not be greater than about 174°F, at which the time will be about 4 minutes, as otherwise there may be problems with softening of the plastic where the carton is polyethylene and delamination of foil from paperboard will occur. Slightly higher temperature may be used with plastics having a higher softening point such as polypropylene."

However, the PP referred to in this passage does not directly and unambiguously relate to the layer bonding the cardboard to the aluminium foil, and is not disclosed to have a melting point of above 130°C (in this context see points 5.1.3 and 5.1.4 above). In fact, this passage is rather vague. It is not clear at all which PE layer should be substituted by PP. The outer and the inner layer of the preferred structure (point 5.2.3 above)? Or only the outer PE layer as assumed by the opposition division? Or all, as assumed by the opponent?

- 5.2.7 Thus the subject-matter of claim 1 is also novel over the disclosure of E11.

5.3 Documents E74/E74'

- 5.3.1 E74, a Japanese utility model, and its German translation E74' were filed by the opponent after the parties had been summoned to oral proceedings. E76, a letter from ip-serach.ch, was filed in order to justify the late-filing of E74 and E74'.

5.3.2 E74' discloses a packaging container produced apparently by fold forming and sealing of a packaging laminate (see E74: figure 2). Laminate constructions are disclosed in various places in E74/E74', namely on page 2, lines 8-9:

thermoplastic resin/gas barrier layer/thermoplastic resin/Al/thermoplastic resin/paper/thermoplastic resin;

on page 2, line 23 (corresponding to figure 1 of E74):

PE/Al/PE/paper/PE;

and on page 3, lines 13-22 (corresponding to figure 3 of E74) is:

PE/gas barrier layer/PE or bonding agent/Al/PE/paper/PE.

The outer layers are made of a thermoplastic resin, in particular PE; the layer which bonds the gas barrier layer to the paper core layer is also made of a thermoplastic resin, in particular PE. E74' does not disclose that this bonding layer is made of PP, let alone of a PP with a melting point of above 130°C. It is admitted that E74' discloses that the thermoplastic resin can be PP, isocyanate melamine resin, etc. (page 3, lines 21-23), but this passage does not indicate which of the thermoplastic resin layers can be replaced by a PP layer. This passage cannot be understood to mean that each one of the three listed polymer types could be used for all thermoplastic resin layers. This would not make technical sense for all these resins. The outer layer on each face of the laminate has to be heat-sealable and neither melamine nor isocyanate would be appropriate for that.

Consequently, it is not *prima facie* derivable from E74' that the thermoplastic layer bonding the aluminium layer to the paper layer should be a PP layer, let alone a PP with a melting point of above 130°C. Additionally it is not *prima facie* derivable from E74' that the container is retortable.

5.3.3 It is apparent from the above, that E74/E74' are not more relevant than the other documents on file cited against the novelty of the subject-matter of claim 1. Therefore the board decided not to admit these documents into the proceedings. Since E76 was submitted to justify the late-filing of E74/E74', it was consequently also not admitted.

5.4 As none of the cited documents discloses the container of claim 1, the subject-matter of this claim satisfies the requirements of Article 54 EPC.

6. Inventive step

6.1 The claimed invention

Claim 1 concerns a retortable packaging container. The patent specification discloses in paragraph [0002] that the aim of the patent is to provide a container with improved retorting performance compared to known packaging laminates as those of WO97/02140 (E13 of the present decision). The retorting performance of a container is tested by putting it in a retort after filling followed by sealing and heating it with the aid of a gaseous medium such as hot steam to a temperature in the range of 70 to 130°C or more (paragraph [0005]). According to paragraph [0006], the known materials used to manufacture the laminate for the container perform well but exhibit problems under extreme conditions of

temperature and/or duration. The task of the patent is therefore to enable the container to resist autoclaving under these conditions, i.e. that the container does not lose both its mechanical strength and configurational stability under such harsher conditions.

6.2 Closest prior art

6.2.1 E13 is cited in the patent in suit (paragraph [0002]) and relates to packaging laminates based on cardboard and paper. Folded containers manufactured from these laminates are filled with food and heat-treated in a humid atmosphere at a temperature of 85°C or more, i.e. the containers are retortable. E13 aims at a good product protection which implies among other things that the container remains sufficiently mechanically strong and dimensionally stable and withstands the outer influences to which the container is exposed during normal handling without being deformed or destroyed (page 1, lines 16-21; page 3, lines 20-28). E13 lies in the same technical field and seeks to solve the same technical problem as the patent in suit. It is therefore considered to represent the closest prior art. During the oral proceedings the opponent considered E13, and the very similar E14, as the most promising starting documents towards the claimed invention. The patent proprietor did not dispute this selection and the board saw no reason to do so.

6.2.2 The disclosure of E13

As set out above E13 discloses a retortable packaging container produced by fold forming and sealing of a packaging laminate (paragraphs [0002] and [0003]). In its broadest aspect, such a laminate comprises:

- a relatively thick strengthening base layer (1) of a liquid absorbing material, preferably paper or cardboard (see page 4, lines 4-6, 10-11 and 16-17)
[this corresponds to the core layer of claim 1];

- an outer coating (2) consisting of a polymer selected from the group of PP, oriented PP, metalized (usually with aluminium) oriented PP, HDPE, LLDPE, metallized HDPE, polyester, metallized oriented polyester or amorphous polyester, and which is designed to be heat resistant and have good vapour barrier properties (see page 4, lines 7-10; page 4, line 34 to page 5, line 9)
[this corresponds to one of the outer liquid-tight coatings of claim 1];

- and

- an inner coating (3) consisting of a polymer selected from the group of PP, HDPE, LLDPE, polyester or amorphous polyester, and which is designed to be heat resistant and have good vapour barrier properties (see page 4, lines 7-10; page 4, line 34 to page 5, line 2; page 5, lines 9-12)
[this corresponds to the other outer liquid-tight coating of claim 1].

Preferably, the packaging laminate may also have:

- a barrier layer (4), obviously a gas barrier layer in this technical field, arranged between the base layer (1) and the inner coating (3). The layer can

inter alia consist of aluminium (see page 5, lines 14-19)

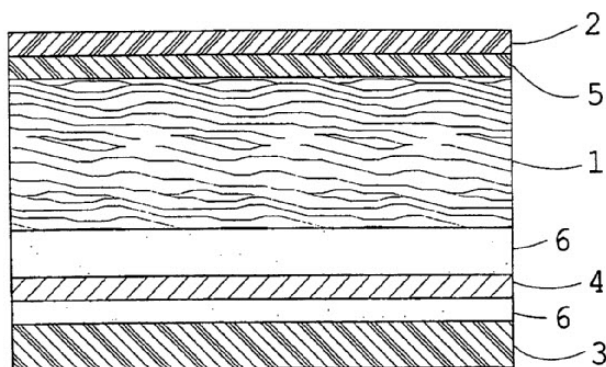
[this corresponds to the gas barrier (layer) of claim 1].

- a layer (5) arranged between the base layer (1) and the outer coating (2), which layer can consist of PP, LDPE, MDPE, HDPE or amorphous polyester (see page 5, lines 24-29); and an additional similar layer (5) arranged on the other side of the base layer (1) (see page 5, lines 30-31);
- a coating (6) adjacent to one or both sides of the barrier layer (4), which coating can consist of an adhesive plastic, a heat-sealable plastic (eg PE), a primer or a lacquer (see page 5, line 32 to page 6, line 1), and
- **an additional layer** incorporated between the base layer (1) and the adjacent coating (6), which layer then preferably consists of one of the above-mentioned components of the layer (5) (see page 6, lines 1-4).

It should be mentioned at this juncture that the **additional layer** incorporated between the base layer (1) and the adjacent coating (6) and the additional similar layer (5) arranged on the other side of the base layer (1) appear to describe the same option: they are located at the same place in the laminate structure and are made of the same material, i.e. those of layer (5). Thus, it is irrelevant to which layer one refers regarding the additional layer. However, in the following the board will rely of the layer incorporated between the base layer (1) and the adjacent coating (6) when discussing the presence of an additional layer.

6.2.3 The particular laminated structure of figure 1 consists of the following layers:

outer coating (2)/layer (5)/base layer (1)/coating (6)/
barrier layer (4)/coating (6)/inner coating (3)



This structure does not include a PP between the base layer (i.e. the core layer of claim 1) and the barrier layer (gas barrier of claim 1).

The opponent based its case on the possible presence of an **additional layer** between the base layer (1) and the adjacent coating (6) in the structure of figure 1, whereby it omitted in the presented drawing the top layer (2) and the two layers (6). Since, however, there is no suggestion in E13 that in particular layers (6) can be omitted from the structure of figure 1 if the additional layer is included, a more accurately drawn version of the modified figure 1 has, as pointed out by the patent proprietor, the following layer sequence:

outer coating (2)/layer (5)/base layer (1)/**additional layer**/coating (6)/barrier layer (4)/coating (6)/inner coating (3)

	2	PP
	5	PP
	1	Board
		additional
	6	PE
	4	Al
	6	PE
	3	PP

For this structure the opponent selected PP for layers (2), (3) and (5). For the coating (6) the patent proprietor suggested PE, which is the only concrete polymer material mentioned in E13.

The additional layer consists of one of the components mentioned for the layer (5), and the opponent adopted PP as the material for the additional layer. However, E13 does not disclose that the PP has a melting point of above 130°C. Moreover, such a PP layer does not serve to bond the Al barrier because of the intervening PE coating 6 which prevents the additional PP layer from holding the Al layer. This is so because the bond strength is defined by the weakest link in the bonding chain of PP-PE, which is still determined by the PE coating 6. Claim 1 requires, however, that PP bonds the barrier to the board which is not possible in the modified version of figure 1.

But even if coating 6 was not made of PE but another material - E13 mentions in rather general terms also an adhesive plastic, a heat-sealable plastic, a primer or a lacquer (paragraph bridging pages 5 and 6) - it is not disclosed that the adhesive strength of coating 6 has to

be stronger than the one of the additional PP layer, which is a prerequisite so that the additional PP layer bonds the barrier layer to the base layer.

6.2.4 It is therefore concluded that the subject-matter of claim 1 differs from the disclosure of D13 in that:

- The layer disposed in contact with the core layer is a PP layer having a melting point of above 130°C, and
- this PP layer bonds the core layer to the gas barrier layer (i.e. between the core layer and the gas barrier layer PP has to be the weakest link in any bonding chain).

6.3 The technical problem and its solution

6.3.1 According to the patent the technical problem underlying the invention of claim 1 in view of E13 consists in the provision of an improved packaging container which withstands harsher retortability conditions without undergoing delamination and thereby maintaining both mechanical strength and configurational stability (see paragraph [0049]).

6.3.2 The solution is provided by the use of a packaging laminate as specified in claim 1 and further illustrated in the figures of the patent.

Figure 1 of the patent shows a single layer (16) of a PP with a melting point of above 130°C between the core layer and the gas barrier layer, which eliminates the risk of weakened bonding strength and the later delamination between these two layers (see paragraph [0030]).

Figure 2 shows (i) a PP layer (26) with a melting point of above 130°C disposed in contact with the core layer and (ii) an additional adhesive layer (29) disposed in contact with the PP layer on the one side and the gas barrier layer on the other side (see paragraphs [0037], [0039], [0049]). In order that the PP layer bonds the core layer to the gas barrier layer, PP is the weakest link in the bonding chain 26-29.

6.3.3 The improvement in retorting is shown in the technical evidence submitted by the patent proprietor.

The technical evidence filed in D32 shows that a package according to claim 1 withstands autoclave retorting better than comparative packages according to the disclosure of E13. The tested packages have laminate structures with a layer of WG341C from Borealis as the PP bonding layer (layer (26) according to claim 1) and an adhesive layer PP* of Admer QF830E from Mitsui Chemicals (adhesive layer (29) in figure 2):

according to claim 1:

outside PP/board/PP/PP*/Al foil/PP*/inside PP
(best retortability results)
PP fulfils the PP requirements of claim 1.
PP* has a higher bonding strength than PP.

according to E13:

outside PP/board/LDPE/Al foil/PP*/inside PP
(worse retortability results)

The only difference is the bonding via an LDPE layer which results in worse mechanical strength after retorting compared with the PP/PP* bonding.

according to E13:

outside LLDPE/board/LLDPE/Al foil/inside LLDPE
(the worst retortability results)

When the outer layers are made of LLDPE (linear low density polyethylene), the results are even worse.

- 6.3.4 The opponent filed various experiments which allegedly challenge the technical effect achieved by the claimed invention. However, the unsatisfactory results in terms of retortability simply show that for optimal retortability other criteria have also to be taken into account (see also point 4.2 above).

For example, the technical evidence of D30 shows that a laminate with the structure:

outside LDPE/board/PP/PP*/Al foil/LDPE inside

results in unsatisfactory retortability. The only conclusion one can draw from this experiment is that LDPE apparently cannot be used as the outermost layers in a laminate structure for retorting purposes, even if the adhesive layer between the core board and the barrier material is PP. However, nothing can be inferred from this example about the superiority of a PP lamination or sealing agent in a packaging container otherwise suitable for retorting.

6.4 Obviousness

- 6.4.1 The skilled person starting from the retortable packaging container of E13 and aiming at an improved packaging container, i.e. made from a laminate which withstands harsher retortability conditions and does not

undergo delamination, would not find in the art any hint towards a laminate structure with a PP layer disposed in contact with the core layer, bonding the core layer to the core layer, whereby the PP of the layer has a melting point of above 130°C.

6.4.2 Coating 6 itself of E13 is not disclosed to be a PP layer, let alone a PP layer with a melting point of above 130°C, and this despite the fact that coating 6 is disposed in contact with the core layer (figure 1; sentence bridging pages 5/6). Coating 6 is disclosed to consist of an adhesive plastic, a heat sealable plastic such as PE, a primer or a lacquer.

6.4.3 Even if an additional layer was incorporated between the base layer and coating 6, and was therefore disposed in contact with the core layer, this layer would not necessarily be a PP layer since further polymers are listed as suitable candidates beyond PP (page 6, lines 1-4 read in conjunction with page 5, lines 25-29). As the patent proprietor explained during the oral proceedings, the skilled person would not be motivated to select polypropylene because he knows that PP is more difficult to process (see E3: page 12.10, lines 1-4 under figure 8; E5: page 199, right column and table 6, under "Processability"). Moreover, E13 does not give any information regarding the function or advantage of using an additional PP layer in the structure of figure 1. Thus, the opponent's choice of the additional layer, and in particular a PP layer, appears to be based on hindsight.

6.4.4 Apart from the fact that E13 does not hint at the use of a PP layer, E13 also does not disclose that the PP should have a melting point above 130°C or that the PP layer should bond the core layer to the barrier layer in

the sense that the PP layer is the weakest link in the bonding chain.

- 6.4.5 The opponent asserted that the skilled person, a processing engineer with no particular knowledge regarding polymers, would have consulted E31 (page 368, lines 5-7), which discloses general technical information regarding PP homopolymers with a melting point between 160-165°C, and would have used such a homopolymer. The board considers that this assertion of the opponent is based on hindsight. There is no reason to interpret the PP of E13 exclusively as a homo-PP because as already set out above (see point 5.1.4) this term includes also PP copolymers.
- 6.4.6 Also none of the other cited documents discloses the use of a PP layer as set out in claim 1 in order to prevent delamination under harsher retorting conditions.
- 6.4.7 Thus the subject-matter of claim 1 is neither obvious from E13 alone nor in combination with the other cited documents.
- 6.5 It may be added at this juncture that the same conclusion is reached when considering E14 to represent the closest prior art, since E14 discloses retortable food packaging containers with a laminate structure which is the same as that of E13 (see, figure 1, page 7, line 19 to page 9, line 2).
- 6.6 On the basis of the above considerations, the board comes to the conclusion that claim 1 is patentable.

7. The dependent claims

Dependent claims 2 to 7 correspond to specific embodiments of claim 1 which are *mutatis mutandis* patentable.

8. As the main request is patentable, there was no need to discuss the auxiliary requests.

9. The description

During the oral proceedings the patent proprietor submitted amended description pages 1-9. The opponent did not raise any objection to the amended description. Nor did the board see any reason to do so.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the opposition division with the order to maintain the patent on the basis of the following documents:
 - claims 1 to 7 filed as main request with the statement setting out the grounds of appeal dated 27 July 2012
 - description pages 2 to 6 as filed during the oral proceedings on 1 March 2016
 - figures 1 and 2 (one page) as granted.

The Registrar:

The Chairman:



K. Boelicke

W. Sieber

Decision electronically authenticated