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Datasheet for the decision of 24 November 2021

Case Number: T 0659/19 - 3.2.05

Application Number: 11702582.5

Publication Number: 2528731

IPC: B31B1/25, B31B7/00, B31F1/08

Language of the proceedings: EN

Title of invention:
Container for foodstuff made from an aluminium-free planar composite with a covered hole as part of a closure system

Applicant:
SIG Technology AG

Relevant legal provisions:
EPC Art. 56, 113(1), 116(1), 123(2)
EPC R. 103(1)(a), 103(4)(c)
RPBA 2020 Art. 12(8)

Keyword:
Inventive step - main request and auxiliary requests 1 to 10 (no), auxiliary request 11 (yes)
Amendments - added subject-matter - auxiliary request 1A (yes) - auxiliary request 11 (no)
Reimbursement of appeal fee - substantial procedural violation (no) - withdrawal of request for oral proceedings (yes)

Decisions cited:
G 0002/10

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Boards of Appeal

Chambres de recours

Boards of Appeal of the
European Patent Office
Richard-Reitzner-Allee 8
85540 Haar
GERMANY
Tel. +49 (0)89 2399-0
Fax +49 (0)89 2399-4465

Case Number: T 0659/19 - 3.2.05

D E C I S I O N
of Technical Board of Appeal 3.2.05
of 24 November 2021

Appellant: (Applicant)	SIG Technology AG Laufengasse 18 8212 Neuhausen (CH)
Representative:	Herzog IP Patentanwalts GmbH Steinstraße 16-18 40212 Düsseldorf (DE)
Decision under appeal:	**Decision of the Examining Division of the European Patent Office posted on 19 September 2018 refusing European patent application No. 11702582.5 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman	P. Lanz
Members:	T. Vermeulen
	A. Bacchin

Summary of Facts and Submissions

I. The appeal lies against the decision of the examining division, posted on 19 September 2018, by which European patent application No. 11 702 582.5 (hereinafter: the application) was refused.

II. The examining division held that the subject-matter of claim 1 according to a main request filed on 1 September 2016 and the subject-matter of claim 1 according to an auxiliary request filed at the oral proceedings held on 12 June 2018 did not involve an inventive step having regard to prior art documents D1 and D9.

III. Following documents were referred to by the examining division:

D1	EP 0 242 720 A2;	D6	US 4 754 917 A;
D2	US 2005/037162 A1;	D7	WO 98/14317 A1;
D3	WO 93/22131 A1;	D8	WO 99/50066 A1;
D4	EP 1 232 856 A1;	D9	US 2007/254147 A1.
D5	WO 02/090206 A1;		

In addition, the impugned decision contains a mention of an Experimental Report filed by the appellant (the applicant) with letter of 11 May 2018. It will be referred to as ERII.

IV. With the statement of grounds of appeal the appellant filed a set of claims as their main request, corresponding to the claims of the auxiliary request underlying the impugned decision. Further, they filed sets of claims as the auxiliary requests 1 to 14. The

appellant also filed an excerpt from the book "Aseptisches Verpacken von Lebensmitteln" (Helmut Reuter, 1987, Behr's Verlag, preface and pages 156, 157 and 260 to 263), hereinafter referred to as D10, as well as a further Experimental Report (ERIII).

V. On 29 January 2021 the board issued a communication pursuant to Rule 100(2) EPC, in which it gave its preliminary opinion that the subject-matter of claim 1 according to the main request did not involve an inventive step over a combination of documents D1 and D8 (Article 56 EPC). In addition, the board provided some observations with regard to the disclosure in the prior art of the additional features of claim 1 according to each of the auxiliary requests 1 to 14.

VI. With letter dated 17 March 2021 the appellant replied that all pending requests were maintained. In addition, an auxiliary request 1A was filed, to be inserted between the main request and the auxiliary request 1.

VII. On 14 July 2021 the appellant was summoned to oral proceedings. In the communication pursuant to Article 15(1) RPBA 2020 sent in annex to the summons the board gave its preliminary opinion that the subject-matter of claim 1 according to each of the main request and the auxiliary requests 1 to 10 did not involve an inventive step having regard to document D1 in combination with document D8 (Article 56 EPC), whereas the amendments to claim 1 according to the auxiliary request 1A did not meet the requirements of Article 123(2) EPC. The subject-matter of claim 1 according to the auxiliary request 11, on the other hand, was found to involve an inventive step over the cited prior art (Article 56 EPC).

VIII. With letter dated 3 August 2021 the appellant withdrew their request for oral proceedings and requested to decide on the appeal on the basis of the file.

IX. Subsequently, the scheduled oral proceedings were cancelled by the board.

X. The appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of the claims of the main request filed with the statement setting out the grounds of appeal or, alternatively on the basis of the claims of the auxiliary request 1A filed with letter dated 17 March 2021 or, further alternatively on the basis of the claims of any of the auxiliary requests 1 to 14 filed with the statement setting out the grounds of appeal. In addition, it was requested to reimburse the appeal fee.

XI. Claim 1 of the **main request** has the following wording:

> "A planar composite (3) for the production of a container (2) surrounding an interior (1), comprising
> a. a carrier layer (4);
> b. a barrier layer (5) of plastic joined to the carrier layer (4);
> c. at least two layers (6, 7) of thermoplastic plastic KSa and KSw which are provided on the side of the barrier layer (5) of plastic facing away from the carrier layer (4), wherein the at least two layers (6, 7) of thermoplastic plastic are made of a polyethylene or a polypropylene or a mixture thereof and wherein at least one of the at least two layers (6, 7) of plastic is a plastics mixture of at least two plastics that comprises a

polyolefin prepared by means of a metallocene as one of the at least two mixture components;
wherein the plastic mixture comprises as one of the at least two mixture components 10 to 50 wt.%, based on the plastics mixture, of the polyolefin prepared by means of a metallocene;
wherein the carrier layer (4) has at least one hole (28);
wherein the at least one hole (28) is covered by the barrier layer (5) of plastic and the at least two layers (6, 7) of thermoplastic plastic KSa and KSw as composite layers (29)."

XII. The planar composite according to claim 1 of the auxiliary request 1A has the further limitation:

"wherein the at least two layers (6, 7) of thermoplastic plastic KSa and KSw are not adhesion promoters, wherein adhesion promotors are polyolefins functionalized by copolymerization with acrylic acid, acrylates, acrylate derivatives or carboxylic acid anhydrides carrying double bonds, or at least two of these".

XIII. Claim 1 of the auxiliary requests 1 to 11 (hereinafter: ARs 1 to 11) differs from claim 1 of the main request by the following additional features:

- an adhesion promoter layer (**ARs 1 to 11**),
- the polyolefin prepared by means of a metallocene is a polyethylene (**ARs 2 to 11**),
- the carrier layer (4) is of paper of cardboard (**ARs 3 to 11**),
- at least one further layer (13) of thermoplastic plastic KSu is provided on the side of the carrier layer (4) and is joined to the carrier layer (4),

which does not provide the barrier layer (5) of plastic (**ARs 4 to 11**),

- the further layer (13) of thermoplastic plastic KSu comprises a polyethylene, a polypropylene or a mixture of these (**ARs 5 to 9**),
- from the at least two layers (6, 7) of thermoplastic plastic KSa and KSw the layer of thermoplastic KSw (7) is furthest removed from the carrier layer (4) (**ARs 6 to 11**),
- the barrier layer (5) comprises at least 70 wt.% , based on the barrier layer (5), of a plastic which has aroma or gas barrier properties (**ARs 7 and 8**),
- the barrier layer (5) of plastic has a melting temperature in a range of from more than 155 to 300 °C (**AR 8**),
- no metal foil is provided between the carrier layer (4) and the at least two layers (6, 7) of thermoplastic plastic KSa and KSw (**ARs 9 to 11**),
- the further layer (13) of thermoplastic plastic KSu comprises a polyethylene (**AR 10**),
- the further layer (13) of thermoplastic plastic KSu and the layer (6) of thermoplastic plastic KSa are made of LDPE (**AR 11**).

XIV. The appellant's submissions may be summarised as follows:

Main request

Document D1 failed to disclose a barrier layer of plastic. According to page 11, lines 4 to 7 of the application the barrier layer was defined as an aroma or gas barrier layer. Following page 5, lines 8 to 13, page 6, lines 4 to 7 and page 2, lines 7 to 10 of document D1, however, the thermoplastic layer 6 was liquid-tight, but not gas-tight. From the table on page

260 of the textbook excerpt D10 it clearly followed that polyethylene provided water-tightness in cardboard composites, whereas the gas-tightness is achieved by aluminium foils. This finding was also supported by page 1 of document D3. The skilled person would therefore understand that the requirement of gas-tightness in the sentence on page 5, lines 13 to 17 of document D1 referred to the aluminium foil, not to the thermoplastic layer 6. Furthermore, Figures 2 to 4 of document D1 implied that the aluminium foil 12 was the innermost layer because it was disposed on the side of the thermoplastic layer 6 which faced away from the carrier layer 5. The resulting sequence of layers therefore contradicted the wording of claim 1. In addition, thermoplastic layer 6 was not a layer KSa or KSw in accordance with claim 1. Nor were the further layers of thermoplastic mentioned on page 5, lines 15 and 16 of document D1 necessarily disposed on the inner side of the aluminium foil 12. Document D1 did not disclose a specific thermoplastic material, nor a mixture of at least two plastics or a reference to metallocene.

The passage on page 14, lines 18 to 22 of the application provided two alternative proportion ranges of the m-polyolefin in the plastics mixture, whereas claim 1 only referred to the alternative of the lower range. Therefore, the examining division erred in its finding that the objective technical problem lied in the enhancement of food compatibility of the laminate. Instead, the comparative examples provided in the experimental reports ERII and ERIII proved that the technical effects of the differing features lied in the improvement of the opening behaviour, namely in a reduction of the opening force which had to be applied to open the container with an opening aid of the

puncture-and-cut type, an improvement of puncturing of the hole-covering layers with an opening aid of the puncture-and-cut type, and a reduction of the formation of threads and tongues upon opening the container with an opening aid of the puncture-and-cut type. In particular report ERIII, which implemented various further layer structures and layer materials, demonstrated that these technical effects were obtained for all planar composites which reasonably fell within the scope of claim 1. The results of improved opening behaviour obtained by the Experimental Reports were independent from the specific opening aid used therein. The original application on page 3, lines 17 to 24 already implied that the invention solved a problem pertaining to opening properties.

The adhesion promoter layer 14 of document D8 was not a thermoplastic layer KSa in the sense of the invention. Such interpretation contradicted the teaching of the description and figures of the application. But, according to Article 69(1) EPC, the description and the figures should be used to interpret the claims. Therefore, interpreting an adhesion promoter layer as thermoplastic layer KSa was not appropriate. Furthermore, the range of 10 to 50 wt.% of the polyolefin prepared by means of a metallocene was not an arbitrary choice. Hence, the skilled person would not have obtained the subject-matter of claim 1 when modifying the packing material of document D1 according to the teaching of document D8.

The subject-matter of claim 1 according to the main request thus involved an inventive step.

Auxiliary request 1A

The amendment had basis on page 9, lines 12 to 16 of the originally filed description, according to which adhesion promoters, preferably, were "polyolefins functionalized by copolymerization with acrylic acid, acrylates, acrylate derivatives or carboxylic acid anhydrides carrying double bonds, for example maleic anhydride, or at least two of these". Then on page 9, lines 20 and 21, the description as originally filed taught that "the above described layers of thermoplastic plastic KSa and KSw and also the plastic layer KSu, that will be described later on, are not adhesion promoters".

Consequently, the claims of the auxiliary request 1A did not contain any subject-matter which extended beyond the disclosure of the application as originally filed.

Auxiliary request 1

The packing material of document D1 modified in view of the teaching of document D8 would include layer 14 as adhesion promoter and layer 13 as plastics mixture with a polyolefin prepared by means of a metallocene. The argued modified packing material, however, lacked a thermoplastic layer KSa. The skilled person would not have any motivation to add a further thermoplastic layer between layers 13 and 14. The subject-matter of claim 1 according to the auxiliary request 1 thus involved an inventive step.

Auxiliary request 2

By specifying that the polyolefin prepared by means of a metallocene of at least one of the at least two layers of plastic KSa and KSw was a polyethylene the planar composite of claim 1 resulted in a wider sealing window. This meant that the claimed composite could be reliably and tightly sealed at a wider choice of sealing temperatures. Accordingly, greater deviations from the adjusted sealing temperature were acceptable in container production without deterioration of the container quality, so that the process could be conducted at higher speed. The invention claimed in the auxiliary request 2 thus solved the objective technical problem cited on page 3, lines 13 to 15 of the description as originally filed, namely to provide a process which allowed production of containers of at least the same quality compared with the prior art at increased production speeds. Neither document D1 nor document D8 was concerned with widening a sealing window in order to speed up the container production process. The subject-matter of claim 1 according to the auxiliary request 2 thus involved an inventive step.

Auxiliary requests 5 to 8

Document D1 did at least not disclose any of the further distinguishing features of claim 1 according to the auxiliary requests 5 and 6. Further, document D1 failed to disclose any layer which comprised 70 wt.% of a thermoplastic material which had aroma or gas barrier properties, nor any specific thermoplastic material having a melting temperature in a range of from more than 155 to 300 °C. The widely used thermoplastic material polyethylene had a melting temperature below

this range. The subject-matter of claim 1 according to each of the auxiliary requests 5, 6, 7 and 8 thus involved an inventive step.

Auxiliary request 9

The skilled person would have had no motivation to omit the aluminium foil from the planar composite known from document D1 when combining the teachings of documents D1 and D8. Rather, the combination would have resulted in the following sequence of layers:

carrier layer 5
barrier layer 12 from D8 as thermoplastic layer 6
aluminium foil 12
layer 14 of PE
layer 13 of mPE/LDPE

Thus, the modified packing material would include an aluminium foil, contrary to the requirement of claim 1 according to the auxiliary request 9. Furthermore, as document D8 was focused on gas barrier properties, the skilled person would have certainly not found a motivation to omit one of the two gas barrier layers from the packing material of document D1. Doing so would contradict the whole purpose of document D8. The subject-matter of claim 1 according to the auxiliary request 9 thus involved an inventive step.

Auxiliary requests 10 and 11

Document D1 did at least not disclose any of the additional features of the claims 1 of the auxiliary requests 10 and 11. The subject-matter of claim 1 according to these requests thus involved an inventive step. The amendments of claim 1 according to the auxiliary request 11 found their basis in the claims as originally filed and in the description on page 8,

lines 26 to 29, on page 9, lines 5 to 10, on page 14, line 30 to page 5, line 1, on page 10, line 31 to page 11, line 2, on page 9, lines 25 to 27 and on page 16, lines 8 and 9.

Reasons for the Decision

Decision in written proceedings

1. The present decision is handed down in written proceedings under Article 12(8) RPBA 2020, according to which, subject to Articles 113 and 116 EPC, the board may decide the case at any time after filing of the statement of grounds of appeal.

2. Following the board's communication according to Rule 100(2) EPC the appellant filed further written submissions on 18 March 2021. In reply to the subsequent summons to oral proceedings and the communication according to Article 15(1) RPBA 2020, they then withdrew their request for oral proceedings and requested a decision on the basis of the file on 4 August 2021.

3. For these reasons, the issuing of the decision in written proceedings, without oral proceedings, is in compliance with the requirements of Articles 113(1) and 116(1) EPC.

Main Request

Document D1 as starting point

4. In the impugned decision the assessment of inventive step was carried out starting from document D1. This is

not disputed by the appellant. The board agrees that document D1 is a suitable starting point.

5. The appellant takes issue with the finding of the examining division that the planar composite known from document D1 has a barrier layer of plastic joined to the carrier layer. In the appellant's view, the thermoplastic layers mentioned in document D1, in particular on page 5, lines 8 to 13, on page 6, lines 4 to 7 and on page 2, lines 7 to 10, were liquid-tight, but not gas-tight. They found corroboration for this allegation in document D10, an excerpt from a textbook which on page 260 contains a comparative table showing the typical properties of polyethylene (hereinafter: PE) and aluminium foils used in cardboard composites.

A careful reading of document D1, however, does not reveal any reference to PE. The argument based on document D10 is therefore without merit.

The passages on pages 5 and 6 of document D1 admittedly imply that the thermoplastic layer 6 prevents liquid from passing through the laminate. Yet this does not mean that the layer 6 cannot serve as a gas barrier as well, especially since barrier properties normally depend on the end use requirements and since the aluminium foil is mentioned on page 5, line 16 of document D1 as merely optional ("further ... internal layers of thermoplastics or aluminium foil 12", emphasis by the board).

But even if considering, *arguendo*, that the thermoplastic layer 6 of document D1 were not a gas barrier, the broad meaning of the expression "barrier layer" used in claim 1 does not actually require it to block or to substantially reduce the diffusion of

gases. Document D3, for instance, refers in a similar context to a "liquid barrier material" (cf. page 8, second paragraph). Also the expression "gas and moisture barrier properties" at the end of the second paragraph on page 11 of the application speaks against the argument of the appellant that the first sentence of that paragraph ("Generally...in particular because...") provides a *definition* of the word "barrier" in terms of its aroma or gas barrier properties. The board is therefore of the view that, in the present context, the expression "barrier layer" can also be used in conjunction with liquids. Consequently, the thermoplastic layer 6 of document D1 is a barrier layer of plastic in the sense of claim 1.

6. The board agrees with the appellant that the lines connecting the reference signs with the layers in the drawings of document D1 imply that layer 12 is disposed on the side of the thermoplastic layer 6 facing away from the carrier layer 5. Layer 12 will therefore be referred to as "the internal layer".

7. Apart from a general reference to thermoplastics, document D1 remains silent about the materials used for the barrier layer 6 and for the further external and/or internal layers mentioned on page 5, line 15. Furthermore, there is no unmistakable disclosure of more than one internal layer 12.

8. Therefore, the board concurs with the appellant that the following features of claim 1 are not disclosed by document D1:

- at least two layers of thermoplastic plastic KSa and KSw which are provided on the side of the

barrier layer of plastic facing away from the carrier layer,

- wherein the at least two layers of thermoplastic plastic are made of a polyethylene or a polypropylene or a mixture thereof,

- wherein at least one of the at least two layers of plastic is a plastics mixture of at least two plastics that comprises a polyolefin prepared by means of a metallocene as one of the at least two mixture components, wherein the plastic mixture comprises as one of the at least two mixture components 10 to 50 wt.%, based on the plastics mixture, of the polyolefin prepared by means of a metallocene,

- wherein the at least one hole is covered ... by at least two layers of thermoplastic plastic KSa and KSw as composite layers.

Objective technical problem

9. The appellant relied on two experimental reports ERII and ERIII to derive the technical effects of the differing features, namely a reduction of the opening force which had to be applied to open the container with an opening aid of the puncture-and-cut type, an improvement of puncturing of the hole-covering layers with an opening aid of the puncture-and-cut type, and a reduction of the formation of threads and tongues upon opening the container with an opening aid of the puncture-and-cut type.

10. It is established jurisprudence of the Boards of Appeal that some beneficial effects or advantageous

properties, if appropriately demonstrated by means of truly comparable results, can in certain circumstances properly form a basis for the definition of the problem that the claimed invention sets out to solve and can, in principle, be regarded as an indication of inventive step. However, an alleged technical effect invoked subsequently during the proceedings is not to be taken into consideration when formulating the problem to be solved, if the effect cannot be unambiguously deduced by the skilled person from the original application in the light of the closest prior art or if it is not at least hinted at in that application (Case Law of the Boards of Appeal of the European Patent Office, 9th edition 2019, I.D.4.4.1 and I.D.4.4.2).

11. The board notes that the application remains silent about an opening aid "of the puncture-and-cut type". Furthermore, the application of force and the formation of threads and tongues mentioned in the bottom paragraph on page 3 of the application does not stand in any relation to the differing features identified above, which were originally part of dependent claims 7 to 9 and are only mentioned starting from page 14 of the description as originally filed.

Regarding the comparative tests forming the basis of the experimental reports, they are not concerned with the planar composite of document D1, the starting point for the inventive step assessment. Rather, the experimental results were initially set against the backdrop of document D2 as starting point (cf. the underlined titles on pages 1 and 2 of ERII).

The board also shares the reservations of the examining division concerning the question whether the technical effects alleged by the appellant are obtained over the

whole scope of claim 1. In particular, the argument of the appellant that the results of the improved opening behaviour obtained by the experimental reports are independent from the specific opening aid used therein does not seem credible from the disclosure of the original application. The fact that, in practice, there may be some containers made from the planar composite of claim 1 that exhibit an improved opening behaviour rather appears to be an additional, fortuitous advantage - a so-called "bonus effect" - which cannot be relied on to formulate the objective technical problem (see also Case Law of the Boards of Appeal of the European Patent Office, 9th edition 2019, I.D. 10.8).

As a consequence, the board does not take the technical effects alleged by the appellant on the basis of ERII and ERIII into consideration for determining the objective technical problem.

12. In the impugned decision the examining division had referred to the passage spanning from page 14, line 18 to page 15, line 2 of the application for formulating the objective technical problem. According to this passage, the presence of a polyolefin prepared by means of a metallocene (m-polyolefin) results in a "good sealability" and "in particular at higher concentrations, a relatively low stress corrosion cracking with foodstuff of high fat or free fat content". The use of m-polyethylene, m-polypropylene or a mixture thereof is associated with the effect of "widening the sealing window".

The board acknowledges that the reduction of stress corrosion cracking in the presence of foodstuff of high fat or free fat content is not necessarily obtained by

the lower concentrations of the m-polyolefin required by claim 1, as was argued by the appellant. However, the cited passage clearly implies that the technical effect of the differing features lies in a good sealability.

13. In view thereof, the board holds the view that the objective technical problem must be reformulated as to provide a planar composite used for the production of a container with a good sealability.

Obviousness

14. Document D1 is silent on which materials should be selected for the different thermoplastic layers in order to ensure the liquid-tightness and the gas-tightness typically required for aseptic food containers. Therefore, the board holds the view that the skilled person would have looked for promising solutions in the prior art related to laminates for food packaging.

15. The practice of using heat-sealable PE produced using metallocene catalysts - the so-called 'metallocene PE' abbreviated as 'm-PE'- is widely spread in the technical field of packaging laminates and came already into play a considerable time before the priority date of the application. It is described, for example, in documents D4, D8 and D9.

On page 9, lines 5 to 8 of document D8, the sealing properties of m-PE and mixtures of m-PE with other PE materials are emphasized as follows:

> "*In particular, m-PE and mixtures of m-PE and certain of the above-disclosed polyethylene types*

give extremely tight seals on thermosealing of the packaging material into finished packaging containers, which also favours the gas tightness of the packaging container."

This offers a promising path for a solution to the objective technical problem. Following that path would have prompted the skilled person to consider each of the embodiments shown in Figures 1a to 1c of document D8. They disclose a planar composite with a first thermoplastic layer 13 (13' in Figure 1c) and a second thermoplastic layer 14, both deposited on the inner side of a polyamide barrier layer 12 facing away from a paperboard carrier layer 11. In each of these embodiments the layer 14, which lies at the outside of the layer 13 or 13', is made of a PE whereas the layer 13 or 13' is preferably an LDPE or an m-PE, or a blend thereof (see page 14, lines 7 to 14 and 27 to 34 and also page 15, lines 20 to 27).

16. Hence, no inventive merit would have been required at the filing date of the application to adapt the laminate known from document D1 along those lines, i.e. by providing two PE layers on the side of the barrier layer 6 of plastic facing away from the carrier layer 5, at least one of these two PE layers being a mixture or a blend of an m-PE and an LDPE. In accordance with the teaching of document D1 on page 5, lines 17 to 18, the barrier layer 6 and these two PE layers would be hot-sealed to one another within the openable area formed by the hole in the carrier layer 5.

17. The appellant's view that the adhesion promoter layer 14 of document D8 cannot be regarded as a thermoplastic plastic layer KSa is not followed by the board. The wording of claim 1 gives no reason for narrowly

construing the layers of thermoplastic plastic KSa and KSw in the sense that they exclude adhesive promoter layers. Nor can a remark in the description to that effect alter the interpretation of the claim feature which in itself imparts a clear credible technical teaching to the skilled reader, particularly considering that the corresponding passage on page 9, lines 20 and 21 commences by the word "[p]referably".

Moreover, it is noted that page 9, lines 31 to 34 of document D8 foresees that the inner polyolefin layer 13 can also be applied "as two or more separate polyolefin layers consisting of the same or different types of polyolefin". Hence, the skilled person would have been prompted by this passage to provide two separate layers KSw and KSa of m-PE or of a blend of m-PE with LDPE on the inside of the adhesion promoter layer 14.

18. Unavoidably, the skilled person would have had to establish in which proportion the m-PE component were to be mixed with the LDPE component. Document D8 does not give an immediate answer to this question. In the absence of any explicit statement in this respect, it would have been obvious for the skilled person to opt for an equal blending ratio, i.e. 50 wt.% of m-PE and 50 wt.% of LDPE. The board is also mindful of the mention of both "10 to 50 wt.%" and "50 to 95 wt.%" in the bottom paragraph on page 14 as well as in claims 9 and 10 of the application as originally filed without any distinction made in terms of improved sealing properties. In view thereof, it is the board's judgment that the skilled person would not have expected that a minor change in the proportion of the m-PE component had an important impact on the sealability of the laminate.

Hence, the skilled person would have selected the blending ratio for the innermost layer 12 from the range of 10 to 50 wt.% without the need to become inventive.

19. In view of the foregoing, the subject-matter of claim 1 according to the main request does not involve an inventive step (Article 56 EPC).

Auxiliary request 1A

20. In the board's view, the amendment to claim 1 according to the auxiliary request 1A (cf. point XII. above) introduces subject-matter which extends beyond the disclosure of the application as originally filed (Article 123(2) EPC).

21. Adhesion promoters are disclosed on pages 8 and 9 of the description as originally filed as well as in the context of the embodiments of Figures 6 and 7. They are used as a further layer between the carrier layer and the barrier layer and/or between the barrier layer and one of the layers of thermoplastic plastic KSa or KSw "*in order to improve the cohesion of the layers and thus to make delamination difficult*", see page 8, lines 28 and 29. According to the first sentence of the second paragraph on page 9 the expression "adhesion promoters" embraces "*all polymers which, by means of suitable functional groups, are suitable for generating a firm join by the formation of ionic bonds or covalent bonds to the surface of the other particular layer*". The description then goes on to define a preferred embodiment, according to which "*[p]referably, these are polyolefins functionalized by copolymerization with acrylic acid, acrylates, acrylate derivatives or carboxylic acid anhydrides carrying double bonds, for*

example maleic anhydride, or at least two of these". Accordingly, only adhesive polymers falling within that specific group of functionalized polyolefins are taken into account in the preferred embodiment.

22. The last sentence of the second paragraph on page 9 of the description as originally filed explicitly discloses the disclaimer "*Preferably, the above described layers of thermoplastic plastic KSa and KSw and also the plastic layer KSu, that will be described later on, are not adhesion promoters*". But nothing directly links the disclaimer to the group of functionalized polyolefins of the preferred embodiment. By disclaiming only part of all possible adhesive promoters, the appellant has thus limited the subject-matter of claim 1 in the way of an intermediate generalisation. On the one hand, claim 1 is now restricted in that polyolefins functionalized by copolymerization with acrylic acid, acrylates, acrylate derivatives or carboxylic acid anhydrides carrying double bonds, or at least two of these are excluded from the materials that are eligible for the layers of thermoplastic plastic KSa and KSw. On the other hand, the specific disclaimer disclosed in the description has been generalised in that the layers of thermoplastic plastic KSa and KSw can still be made from an adhesion promoter polymer that does not fall under the functionalized polyolefins of the preferred embodiment.

23. This runs counter to the requirement that an amendment can only be made within the limits of what a skilled person would have derived directly and unambiguously, using common general knowledge, and seen objectively and relative to the date of filing, from the whole of the documents as filed (cf. G 2/10, OJ EPO 2012, 376,

Reasons 4.3), so that Article 123(2) EPC is not complied with.

Auxiliary Request 1

24. The board concurs with the appellant that document D1 does not mention any adhesion promoter, adhesive coating or bonding layer. Hence, starting from document D1, the adhesion promoter layer of claim 1 according to auxiliary request 1 is a further distinguishing feature.

25. The board, however, notes that the position of the adhesion promoter layer compared to the other layers is not claimed. It could be used to bond the barrier layer to the carrier layer, the thermoplastic layer to the barrier layer, the thermoplastic layers to each other, or to bond further unspecified layers together. Therefore, no functional interdependence with the other distinguishing features identified in point 8. above can be derived. This gives way to two separate objective technical problems which are solved by distinct features. When assessing inventive step, each of these distinct features may be considered separately.

26. The further distinguishing feature has the technical effect of improving the cohesion of the layers and thus making delamination difficult, see page 8, lines 26 to 29 of the description as originally filed. The second objective technical problem is therefore to improve the cohesion of the layers. This was not disputed by the appellant.

27. According to the embodiment shown in Figure 1b of document D8, an adhesion promotor layer 16 is provided

between the carrier layer 11 and the barrier layer 12 to bond the carrier layer to the barrier layer. A similar teaching can also be found in the embodiment shown in Figure 1c of document D8: adhesion promoter layers 14' and 16' are provided to bond a second barrier layer 12' to an innermost polyolefin layer 18 and a polyethylene layer 17', respectively (page 15, line 20 to page 16, line 14). Hence, the skilled person, when applying the teaching of either of these embodiments to the planar composite known from document D1 with the aim to solve the first objective technical problem (see point 15. above), would have also been prompted to solve the second objective technical problem by foreseeing a further adhesion promoter layer (for example, between the carrier layer 5 and the barrier layer 6 of document D1) in the way which is taught by document D8.

28. In view of the disclosure on page 9, lines 31 to 34 of document D8 (see point 17. above), it is further held that the replacement of the innermost layer 13 of the embodiment shown in Figure 1a of document D8 by two separate layers KSw and KSa, each made from a blend of LDPE and m-PE, would result in the outermost of these layers 13 being bonded to the barrier layer by virtue of an adhesive promoter layer 14.

29. In view of the foregoing, the argument provided by the appellant that the packing material of document D1 modified in view of the teaching of document D8 would lack a thermoplastic layer KSa cannot be followed. The subject-matter of claim 1 according to the auxiliary request 1 does not involve an inventive step (Article 56 EPC).

Auxiliary request 2

30. The board is not convinced by the appellant's argument that the objective technical problem should be reformulated in line with the passage on page 3, lines 13 to 15 of the description as originally filed, namely "to provide a process which allows production of containers of at least the same quality compared with the prior art at increased production speeds". Instead, in view of page 22, lines 26 to 30 of the description as originally filed, the passage on page 3 would rather refer to the feature of original claim 1 that the barrier layer is made of plastic. The material composition of the innermost thermoplastic layers, which the appellant alleges is linked to the passage on page 3, only appears in dependent claims 7 to 9 as originally filed and is not mentioned until the paragraph bridging pages 14 and 15 of the description. It is further worth noting that the technical effect of widening the seal window, which according to the appellant is key to arriving at the reformulated objective technical problem, is ascribed on page 15, lines 1 and 2 to "[t]hese measures", i.e. to the combination of the individual measures listed afore. The widening of the seal window is therefore not necessarily caused by the use of polyethylene prepared by means of a metallocene as such, but is likely the combined result of the presence of polyethylene and the one or more additives to the extent of a maximum of 15 wt.%, see page 14, line 24 to page 15, line 1.

31. Consequently, the board sees no reason to change its conclusion that the first objective technical problem solved by the distinguishing features of claim 1 according to the main request, including the amendment

of the auxiliary request 2 that the polyolefin prepared by means of a metallocene is a polyethylene, is to provide a planar composite used for the production of a container with a good sealability (see point 13. above). The second objective technical problem of improving the cohesion of the layers also remains unchanged (see point 26. above).

32. The layer 13 and 13', respectively, of each of the embodiments shown in Figures 1a, 1b and 1c of document D8 is preferably a blend of LDPE and m-PE (page 14, lines 10 to 11 and 30 to 31, page 15, lines 24 to 25), i.e. it comprises a polyethylene prepared by means of a metallocene as one of the at least two mixture components. Hence, further relying on the reasoning given in regard of the main request and the auxiliary request 1 above, the board concludes that the subject-matter of claim 1 according to the auxiliary request 2 does not involve an inventive step (Article 56 EPC).

Auxiliary request 3

33. According to page 2, lines 3 to 6 and page 5, lines 13 to 17 of document D1, the planar composite known from the starting point has a carrier layer that is preferably made from paper. This was not disputed by the appellant. In the board's view, the additional feature of claim 1 according to the auxiliary request 3 can therefore not warrant an inventive step for the same reasons as set out above with regard to claim 1 according to the auxiliary request 2 (Article 56 EPC).

Auxiliary requests 4 and 5

34. On page 5, lines 15 to 16 document D1 discloses that "further external and/or internal layers of

thermoplastics" may be added to the packing laminate. The additional feature of claim 1 according to the auxiliary request 4 is therefore known from the starting point D1. However, no information is disclosed in document D1 regarding the concrete material used for the "further external ... layers of thermoplastics". The additional feature of claim 1 according to the auxiliary request 5 is therefore a further distinguishing feature when starting from document D1.

35. In the application as filed, no particular technical effect can be found in the context of the further layer of thermoplastic plastic KSu. It is nevertheless plausible to the board that the arrangement of an additional layer of polyethylene, polypropylene or a mixture thereof on the outermost side of the carrier layer will further improve the sealing properties of the planar composite. Hence, in respect of the amendment of claim 1 according to the auxiliary request 5, the (first) objective technical problem formulated in the context of the main request (see point 13. above) is considered to be the same. Also the second objective technical problem of improving the cohesion of the layers (see point 26. above) remains unchanged. This was not disputed by the appellant.

36. In each of the embodiments shown in Figures 1a, 1b and 1c of document D8 the planar composite comprises an outer layer 15 on the side of the carrier layer 11 which does not provide the barrier layer 13 or 13'. The outer layer 15 is preferably made of LDPE, see page 14, lines 14 to 17, page 14, line 34 to page 15, line 2, and page 15, lines 27 to 30.

In view of this teaching, it would have been obvious for the skilled person, when modifying the planar

composite of document D1 with the aim of obtaining a good sealability, to provide a "further external layer", already hinted at on page 5, lines 15 to 16 of document D1, of LDPE, which is a low-density polyethylene.

37. Consequently, the board arrives at the conclusion that the subject-matter of claim 1 according to the auxiliary requests 4 and 5 does not involve an inventive step (Article 56 EPC).

Auxiliary request 6

38. The additional feature of claim 1 according to the auxiliary request 6 is not known from document D1, which, as was already explained in regard of the main request, fails to disclose at least two layers of thermoplastic plastic KSa and KSw which are provided on the side of the barrier layer of plastic facing away from the carrier layer. This distinguishing feature was, however, held to be obvious in view of the teaching of each of the embodiments shown in Figures 1a, 1b and 1c of document D8 (see points 15. to 17. above). In Figure 1b the thermoplastic layer 13 is farther removed from the carrier layer 11 than the thermoplastic layer 14. Likewise, in Figure 1c it is the thermoplastic layer 13' which is furthest removed from the carrier layer 11. The skilled person would therefore have automatically implemented the amendment of claim 1 according to auxiliary request 6 when combining the teaching of one of these embodiments with the planar composite of document D1. Taking account of the disclosure on page 9, lines 31 to 34 of document D8, this would have also been the case when combining the teaching of the embodiment shown in Figure 1a of

document D8 with the planar composite of document D1 (see also points 17. and 28. above).

39. Hence, further relying on the reasoning given in respect of claim 1 according to the auxiliary request 5, the board concludes that the subject-matter of claim 1 according to the auxiliary request 6 does not involve an inventive step (Article 56 EPC).

Auxiliary requests 7 and 8

40. Other than that it is "a liquid-tight thermoplastic layer", no information is disclosed in document D1 with regard to the composition of the barrier layer 6. As a consequence, the additional features of claim 1 according to the auxiliary requests 7 and 8 further distinguish the claimed subject-matter from the planar composite known from document D1.

41. In the application as filed, no specific technical effect can be found in respect of these further distinguishing features. Unmistakenly, specifying the aroma or gas barrier properties and the melting temperature result in a barrier layer that is particularly suited for preventing aroma or gas from passing through the planar composite. No functional interdependence with the distinguishing features concerning the thermoplastic layers KSa, KSw and KSu, or with the adhesion promoter layer can be identified, however. Therefore, a further objective technical problem is defined, namely to provide a barrier layer that is suited for preventing aroma or gas from passing through the planar composite. It applies separately from the first objective technical problem of providing a planar composite used for the production of a container with a good sealability (see point 13. above)

and from the second objective technical problem of improving the cohesion of the layers (see point 26. above).

42. In the planar composite of document D1, gas-tightness is mentioned twice: "further external and/or internal layers of thermoplastics or aluminium foil ... ensure the desired gas and liquid leak-tightness" (page 5, lines 13 to 17; emphasis added by the board), "further layers of thermoplastics and a layer of aluminium foil ... ensure the high gas-tighteness [*sic*]" (page 6, lines 9 to 12; emphasis added by the board). Although the second passage may lead the skilled person to believe that the desired gas-tightness is solved in document D1 by providing an aluminium foil, the exclusive conjunction used in the first passage shows that there is some ambiguity in respect of the presence of an aluminium foil.

43. In the board's view, when combining documents D1 and D8 in order to solve the first and second objective technical problems the skilled person would not have ignored what is disclosed with regard to gas-tightness in document D8. In particular, the description of the background art spanning from page 1, line 29 to page 2, line 13 of document D8 elucidates the drawbacks of using aluminium foil as a gas barrier in laminated packaging materials. Instead, document D8 proposes a gas barrier of polyamide, in particular a mixture of Nylon-MXD6 with another crystalline or semi-crystalline polyamide, such as PA-6 or PA-6/66, especially in the form of a NCH composite, see page 4, line 28 to page 5, line 35. In view thereof, the skilled person adopting the layers of thermoplastics plastic KSa, KSw and KSu as well as the adhesion promoter layers of the different embodiments of document D8 (see points 15.,

27., 32., 36. and 38. above) would also have realised the advantages of the specific gas barrier material used in document D8. With the different options for realising the gas barrier layer of document D1 in mind, the skilled person would have been prompted to opt for a further internal layer of thermoplastics and to select the specific material proposed by document D8, which, according to Table 2 on page 22 of document D8, has a melting temperature lying the range of from more than 155 to 300 °C.

44. Hence, the board concludes that the subject-matter of claim 1 according to the auxiliary requests 7 and 8 does not involve an inventive step (Article 56 EPC).

Auxiliary request 9

45. Claim 1 according to auxiliary request 9 further requires that no metal foil is provided between the carrier layer and the at least two layers of thermoplastic plastic KSa and KSw.

46. The appellant's line of argument in support of inventive step in the context of the auxiliary request 9 hinges on the presumption that the planar composite according to document D1 necessarily comprises an aluminium foil 12 as a (further) gas barrier layer. The board cannot adhere to this view. As explained in points 42. and 43. above, document D1 suggests to use further external and/or internal layers of thermoplastics as an alternative option. Insofar as the consequence of adopting the teaching of document D8 when modifying the planar composite of document D1 would have prompted the skilled person to discard the the option of an aluminium foil, the resulting product would not comprise any metal foil at all between the

carrier layer and the at least two layers of thermoplastic plastic KSa and KSw.

47. The board therefore arrives at the conclusion that the subject-matter of claim 1 according to the auxiliary request 9 does not involve an inventive step (Article 56 EPC).

Auxiliary request 10

48. In point 36. above, the board has presented its view that it would have been obvious for the skilled person, when modifying the planar composite of document D1 according to the teaching of document D8 with the aim of providing a planar composite used for the production of a container with a good sealability, to add a further layer of LDPE on the outside surface of the carrier layer 5 depicted in Figure 2 of document D1. As a consequence, the further layer of thermoplastic plastic KSu would comprise a polyethylene in correspondence with the limitation of claim 1 according to the auxiliary request 10.

49. Hence, the subject-matter of claim 1 according to the auxiliary request 10 does not involve an inventive step (Article 56 EPC).

Auxiliary request 11

50. In claim 1 of the auxiliary request 11 the additional feature requires that the further layer of thermoplastic plastic KSu and the layer of thermoplastic plastic KSa are made of LDPE.

Article 123(2) EPC

51. The board concurs with the appellant that the claims and the description as originally filed, in particular the passages on page 14, line 30 to page 5, line 1, on page 10, line 31 to page 11, line 2, on page 9, lines 25 to 27 and on page 16, lines 8 and 9 provide basis for the amendments of claim 1 according to the auxiliary request 11. In addition, basis for the adhesion promoter layer can be found on page 8, lines 19 to 23 of the description as originally filed. Hence, the amendments meet the requirements of Article 123(2) EPC.

Article 84 EPC

52. The board is also satisfied that the claims according to the auxiliary request 11 are clear, concise and supported by the description, so that Article 84 EPC is complied with.

Article 56 EPC

53. In point 38. the board came to the conclusion that, in each of the embodiments shown in Figures 1a, 1b and 1c of document D8, the thermoplastic layer 14 lies closer to the carrier layer 11 than the thermoplastic layer 13 or 13' comprising a mixture of m-PE. Hence, in the wording of claim 1, the layer 14 constitutes the "layer of thermoplastic plastic KSa". This layer is disclosed as preferably consisting of a polyethylene graft modified with maleic acid anhydride, see page 14, lines 12 to 14 and 32 to 34, page 15, lines 25 to 27 and claim 9 of document D8. Alternatively, page 9, lines 17 to 18 mentions mixtures of adhesive polymer and PE, but

not LDPE. In view thereof, the board is unable to see which motive the skilled person would have for making the layer 14 of LDPE. Also the suggestion on page 9, lines 31 to 34 of document D8 to apply the inner polyolefin layer 13 as two or more separate polyolefin layers consisting of the same or different types of polyolefin would not result in a planar composite having a first outermost thermoplastic layer made of a plastics mixture comprising m-PE in combination with a second innermost thermoplastic layer made of LDPE.

The combination of teachings from documents D1 and D8 can thus not lead in an obvious manner to the subject-matter of claim 1 according to the auxiliary request 11.

54. None of the other documents cited as prior art by the examining division discloses such an arrangement of layers. Regarding document D9, relied on by the examining division for its finding of lack of inventive step, the board notes that it fails to disclose a first thermoplastic layer KSw being a plastics *mixture* of at least two plastics that comprises a polyethylene prepared by means of a metallocene, in combination with a second thermoplastic layer KSa made of LDPE. Furthermore, the barrier layer of document D9 consists of a SiOx coating 13a instead of a plastic.

55. Claims 2 to 11 according to the auxiliary request 11 depend on claim 1. Furthermore, the reference to "a planar composite (3) according to one of claims 1 to 8" in feature α of the independent claim 12 according to the auxiliary request 11 entails that the above conclusion also applies to the process claims 12 to 17.

56. Hence, the board concludes that the subject-matter of the claims according to the auxiliary request 11 involves an inventive step (Article 56 EPC).

Conclusion

57. In view of the foregoing, the impugned decision can be set aside and a European patent can be granted based on the set of claims according to the auxiliary request 11 filed with the statement of grounds of appeal.

Reimbursement of the appeal fee

58. In their statement of grounds of appeal, the appellant requested the reimbursement of the appeal fee. No reasons were provided to justify this request.

59. Rule 103(1)(a) EPC stipulates that the appeal fee is reimbursed in full where the board deems an appeal to be allowable, if such reimbursement is equitable by reason of a substantial procedural violation.

One of the preconditions for a full reimbursement of the appeal fee is therefore that a substantial procedural violation has taken place in the first instance proceedings. No allegation to that effect has been made by the appellant. Nor can the board recognise that such violation occurred before the examining division. The request for reimbursement of the appeal fee under Rule 103(1)(a) EPC must therefore be refused.

60. The board notes, however, that within one month of notification of the communication issued by the board in preparation for the oral proceedings the appellant withdrew their request for oral proceedings and requested a decision according to the state of the

file. Since the scheduled oral proceedings were subsequently cancelled by the board, the criteria are met for partial reimbursement of the appeal fee according to Rule 103(4)(c) EPC. Thus the corresponding request for reimbursement of the appeal fee is granted.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the examining division with the order to grant a patent with the following claims and a description to be adapted thereto:

   Claims:
   No. 1-17 filed as the auxiliary request 11 with the statement of grounds of appeal.

3. The appeal fee is reimbursed at 25 %.

The Registrar: The Chairman:

N. Schneider P. Lanz

Decision electronically authenticated