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**Datasheet for the decision
of 16 January 2020**

Case Number: T 2367/15 - 3.3.09

Application Number: 09703567.9

Publication Number: 2236281

IPC: B32B17/10, B29C47/06, C03B17/06

Language of the proceedings: EN

Title of invention:
PROCESS FOR PRODUCING GLASS/RESIN COMPOSITE

Patent Proprietor:
AGC Inc.

Opponent:
Schott AG

Headword:
Process for producing glass/resin composite/AGC

Relevant legal provisions:
EPC Art. 100(b), 100(c), 54, 56

Keyword:

Grounds for opposition - added subject-matter (no) -
insufficiency of disclosure (no)

Novelty - (yes)

Inventive step - (yes)



Beschwerdekammern
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 2367/15 - 3.3.09

D E C I S I O N
of Technical Board of Appeal 3.3.09
of 16 January 2020

Appellant: Schott AG
(Opponent) Hattenbergstrasse 10
55122 Mainz (DE)

Representative: Sawodny, Michael-Wolfgang
Dreiköniggasse 10
89073 Ulm (DE)

Respondent: AGC Inc.
(Patent Proprietor) 5-1, Marunouchi 1-chome,
Chiyoda-ku
Tokyo 100-8405 (JP)

Representative: Müller-Boré & Partner
Patentanwälte PartG mbB
Friedenheimer Brücke 21
80639 München (DE)

Decision under appeal: **Decision of the Opposition Division of the
European Patent Office posted on 8 December 2015
rejecting the opposition filed against European
patent No. 2236281 pursuant to Article 101(2)
EPC.**

Composition of the Board:

Chairman A. Haderlein
Members: F. Rinaldi
E. Kossonakou

Summary of Facts and Submissions

I. This decision concerns the appeal filed by the opponent (appellant) against the decision of the opposition division to reject the opposition against European patent No. 2 236 281.

II. In its notice of opposition, the opponent had requested revocation of the patent in its entirety based on Article 100(a) EPC (lack of novelty and lack of inventive step), 100(b) and 100(c) EPC.

III. The documents cited during both the opposition and appeal proceedings are the following:

D1: DE 100 40 640 A1

D4: JP 2007-10834 A

D13a: EP 1 137 607 B1

D15: EP 1 048 621 A2

D34: EP 2 204 355 A1

IV. The opposition division decided that none of the grounds of opposition prejudiced the maintenance of the patent as granted.

V. Claim 1 as granted reads:

"A process for producing a glass resin composite (30), which comprises
a forming step of forming molten glass (13) to obtain a glass ribbon (10), and
an edge cutting step of cutting both edges in the width direction of the glass ribbon (10) after the forming step,
which further comprises

a resin coating forming step of making the glass ribbon (10) after the edge cutting step pass through a die of a molten resin extruder to apply a molten resin on its main surfaces and edge surfaces to form a resin coating, and/or
a film laminating step of sandwiching the glass ribbon (10) after the edge cutting step between two resin films (231) wider than the glass ribbon (10) and bonding both edges in the width direction of the resin films (231) for covering."

Claims 2 to 4 are dependent on claim 1.

- VI. In reply to the statement setting out the grounds of appeal, the patent proprietor (respondent) requested that the appeal be dismissed. It also filed three auxiliary requests.
- VII. During the oral proceedings before the board, the appellant declared that it withdrew the novelty attacks based on D1 and D34.
- VIII. The appellant's arguments relevant to the present decision may be summarised as follows.
- Claim 1 as granted included added subject-matter because the application as filed did not disclose that the edge cutting step was performed after the forming of the glass ribbon.
 - The invention was not enabled because the patent in suit did not disclose how to simultaneously carry out the resin coating forming step and the film laminating step; this subject-matter was covered by the scope of claim 1.
 - D13a and its implicit disclosure anticipated the subject-matter of claim 1. As concerns the implicit

disclosure of the edge cutting step, reference was made to D15, which described such a process step.

- The subject-matter of claim 1 would be obvious to the skilled person starting from D13a as the closest prior art in combination with D15 (resin coating forming step) and D4 (film laminating step).

IX. The respondent's arguments relevant to the present decision may be summarised as follows.

- The application as filed disclosed the sequence in which the claimed process steps had to be carried out.
- The patent in suit described how to carry out a process in which both a resin coating forming step and a film laminating step were carried out.
- D13a did not disclose all the features of claim 1, in particular it did not disclose the sequence of steps and the process steps for covering the glass ribbon. As to the alleged implicit disclosure of the extrusion step, reference was made to the process of D34, which showed a different die/glass ribbon arrangement.
- The subject-matter of claim 1 involved an inventive step. There was no suggestion in the prior art to arrive at the claimed sequence of steps and at the specified resin coating forming step or film laminating step.

X. Final requests:

The appellant requested that the decision under appeal be set aside and that the patent be revoked.

The respondent requested that the appeal be dismissed (main request) or, subsidiarily, that the patent be maintained in amended form according to one of the first to third auxiliary requests filed with the reply to the appeal.

Reasons for the Decision

1. *Article 100(c) EPC*

1.1 Claim 1 as granted (see point V) differs from claim 1 as filed in that the term "after the forming step" has been added (and in that reference numbers have been inserted). The appellant argued that the application as filed did not disclose the sequence of steps in which the edge cutting step is performed after the forming of the glass ribbon. Therefore, granted claim 1 included an unallowable amendment.

1.2 However, in the application as filed, the following is disclosed with respect to the order in which the process steps are carried out (page 4, lines 4 to 14, emphasis added by the board):

"[T]he present invention includes the following embodiments (a) to (d).

(a) A process for producing a glass resin composite, which comprises the forming step, the edge cutting step and the resin coating forming step in this order.

(b) A process for producing a glass resin composite, which comprises the forming step, the edge cutting step and the film laminating step in this order."

Embodiments (c) and (d) define the consecutive order of steps in processes in which, after the forming step and the edge cutting step, both the resin coating forming step and the film laminating step are carried out.

1.3 Therefore, the sequence in which the claimed process steps are carried out is directly and unambiguously derivable from the application as filed. In particular, the edge cutting step is performed after the forming of the glass ribbon. The glass ribbon is subsequently covered in the resin coating forming step and/or the film laminating step.

1.4 Thus, the ground for opposition pursuant to Article 100(c) EPC does not prejudice the maintenance of the patent.

2. *Article 100(b) EPC*

2.1 The appellant argued that claim 1 encompassed a simultaneous execution of the resin coating forming step and of the film laminating step but the patent did not disclose how to carry out both steps at the same time.

2.2 The process of claim 1 encompasses a variant in which, after the edge cutting step, two steps are carried out, i.e. a resin coating forming step in which a molten resin is applied on the glass ribbon and a film laminating step in which the glass ribbon is sandwiched between two resin films.

However, there is nothing in the patent in suit to suggest that the two steps, namely the resin coating forming step and the film laminating step, are carried out simultaneously. On the contrary, if both steps are carried out, then this is done consecutively, as explained in paragraphs [0040] and [0041] on the one hand and paragraphs [0058] and [0059] on the other; see also point 1.2 above. In view of this, it would be manifest to the skilled person that the invention is not about the simultaneous execution of these two steps.

2.3 Thus, the ground for opposition pursuant to Article 100(b) EPC does not prejudice the maintenance of the patent.

3. *Novelty*

3.1 The appellant argued that D13a disclosed all the features of granted claim 1. Therefore, it lacked novelty.

3.2 D13a relates to a glass polymer composite film having a glass film and a polymer layer applied to at least one of its main surfaces ("Seitenflächen") and a process for manufacturing such a film (paragraph [0001]). The process comprises a hot-forming step by which a glass ribbon is vertically drawn out of a glass tank (paragraphs [0045] and [0057]; Figure 2). A polymer is then applied on the glass ribbon which is subsequently cut into individual glass pieces ("vereinzelt") (paragraph [0046]). Alternatively, the glass ribbon may be first cut into individual glass pieces on which a polymer layer is then applied (paragraph [0048]).

Therefore, D13a discloses two different processes. In the first process, a glass ribbon is first coated and then cut into individual glass pieces and in the second process, the glass ribbon is cut into individual glass pieces and subsequently coated.

As to the coating step, D13a describes that if the glass ribbon is cut into individual glass pieces before coating, the coating preferably takes place by means of spinning or spray spinning. Coating methods suitable for a continuous process are pouring on, rolling on or spraying. To apply the polymer layer on both main surfaces of the glass film, dipping is preferred (paragraph [0048]). In example 6, a polymer is extruded on a glass ribbon such that the glass edges in parallel with the drawing direction are coated with the polymer.

- 3.3 The respondent did not contest that the coating of the glass ribbon with a polymer in D13a corresponds to coating of the glass ribbon with a resin, as in claim 1.
- 3.4 However, D13a does not disclose the following features of claim 1:
 - 3.4.1 D13a does not explicitly disclose a process in which both edges in the width direction of the glass ribbon are cut after the forming step and in which a resin (molten resin or the resin films) is applied on the glass ribbon. The processes described in D13a, in particular in examples 4 and 6 and in paragraphs [0045] to [0049] and [0056] to [0058], leave no room for the interpretation that such a step is disclosed in D13a in an implicit way. In view of this, the appellant's reference to D15, which relates to a process for manufacturing uncoated individual glass panes, has no

bearing on what D13a directly and unambiguously discloses, in an implicit way, to the skilled person.

- 3.4.2 Furthermore, D13a describes a step of coating a glass ribbon by extruding a polymer on it but there is no explicit disclosure that the extrusion is carried out as in claim 1, by making the glass ribbon after the edge cutting step pass through a die of a molten resin extruder.

The board is also not convinced that the extrusion step of claim 1 is implicitly disclosed in D13a. The extrusion in example 6 of D13a is not designed to apply a molten resin on the main surfaces and edge surfaces of a glass ribbon. Rather, the extrusion occurs on one of the main surfaces such that the glass edges parallel with the drawing direction are coated with the polymer, leaving the second main surface uncoated. Conversely, the extrusion step of claim 1 of the patent results in the molten resin being applied on both main surfaces. In view of this, it is not necessary to discuss the respondent's argument based on the different extrusion die arrangement in D34.

- 3.4.3 Finally, it was uncontested that D13a does not disclose a film laminating step of sandwiching the glass ribbon after the edge cutting step between two resin films.

- 3.5 Thus, the subject-matter of claim 1 is novel (Article 54 EPC).

4. *Inventive step*

- 4.1 The patent in suit relates to the process for producing glass resin composites. It addresses issues arising with brittleness of thin glass plates, such as handling

during transport (paragraphs [0001] and [0002]). The claimed process comprises two alternative ways for applying a resin on a glass ribbon.

4.2 At the oral proceedings, the parties regarded D13a as the closest prior art. The board agrees.

As discussed above, D13a does not disclose the step of cutting both edges in the width direction of the glass ribbon after the step of forming a glass ribbon, followed by

- making the glass ribbon pass through a die of a molten resin extruder to apply a molten resin on its main surfaces and edge surfaces to form a resin coating; or
- sandwiching the glass ribbon after the edge cutting step between two resin films wider than the glass ribbon and bonding both edges in the width direction of the resin films for covering.

4.3 For assessing the technical problem solved over D13a, paragraph [0011] of the patent in suit is relevant. In this section, a prior-art patent application is discussed which belongs to the same patent family as D13a and has a disclosure corresponding to D13a. The following statements are made:

As to the handling of the prior-art glass ribbon:

"[I]t is required to cut the edges of the glass ribbon having a resin layer for the purpose of adjusting the width when the composite film is shipped as a product. Accordingly, at the time of shipping, the glass ribbon edge surfaces are already not covered with a resin and are exposed. Thus, it does not have sufficient transportability and handling efficiency."

As to the prior-art process of covering the two main surfaces of the glass ribbon with a polymer:

"[S]ince the glass ribbon is immersed in a resin in a liquid phase, it is considered that the resin is attached also to the glass ribbon edge surfaces, but it is considered that the resin will not be attached to the borders (edge portions) between the edge surface and the main surface of the glass ribbon by the influence of the surface tension of the resin liquid."

The subject-matter of claim 1 addresses the issues identified in the closest prior art and provides a solution by cutting both edges in the width direction of the glass ribbon and by applying a resin on the glass ribbon using the claimed process steps.

Thus, the objective technical problem is regarded as the provision of an improved process for producing glass resin composites having satisfactory transportability, handling efficiency and fabrication property even when the glass is very thin. This corresponds to the technical problem addressed in paragraph [0013] of the patent in suit.

It is also credible that this problem is solved so that there is no need to reformulate it.

4.4 It will now be considered whether the solution provided would have been obvious to a person skilled in the art.

4.4.1 The appellant argued that document D15 taught the skilled person to cut both edges in the width direction of the glass ribbon.

D15 relates to a process for making individual glass panes having a specific thickness. The process involves drawing vertically downward a glass ribbon from a hot-forming tool, subjecting it to an edge trimming process and cutting the panes to length from the glass ribbon (paragraph [0001]). However, D15 does not address the coating of a glass ribbon with a molten resin or a resin film. Therefore, it cannot provide any suggestion when, i.e. at which stage of the process of D13a, the cutting of the edges is to take place.

4.4.2 Moreover, as explained above, D13a does not disclose or suggest the step of making the glass ribbon after the edge cutting step pass through a die of a molten resin extruder to apply a molten resin on its main surfaces and edge surfaces to form a resin coating. Nor did the appellant point to any other prior-art document which would suggest this process step.

4.4.3 As regards the film laminating step, which may be carried out instead of the resin coating forming step, D13a describes in paragraph [0010] that lamination is problematic and disadvantages are connected with this process step. Therefore, the skilled person would find in D13a no motivation to apply a film lamination step on the glass ribbon.

Even if the skilled person considered lamination and turned to D4, they would find in this document the teaching to laminate individual glass panes but not a glass ribbon.

It follows from this that there is no suggestion to sandwich the glass ribbon after the edge cutting step between two resin films wider than the glass ribbon and

to bond both edges in the width direction of the resin films for covering.

4.5 Thus, the subject-matter of present claim 1 would not be obvious to the person skilled in the art (Article 56 EPC).

4.6 In its written submissions the appellant used other documents as the closest prior art as well. But, as stated above, at the oral proceedings it agreed to D13a being the closest prior art. Thus, it is not necessary to assess whether the subject-matter of claim 1 was obvious starting from these other documents.

5. The subject-matter of the main request is allowable. There is therefore no reason to consider the auxiliary requests.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



D. Magliano

A. Haderlein

Decision electronically authenticated