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**Datasheet for the decision
of 8 March 2023**

Case Number: T 2121/19 - 3.2.08

Application Number: 12708668.4

Publication Number: 2668361

IPC: E06B3/663

Language of the proceedings: EN

Title of invention:

SPACER PROFILE AND INSULATING GLASS UNIT COMPRISING SUCH A
SPACER

Patent Proprietor:

Technoform Glass Insulation Holding GmbH

Opponent:

ENSINGER GmbH

Relevant legal provisions:

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

Keyword:

Amendments - allowable (yes)
Claims - clarity - main request (yes)
Novelty - (yes)
Inventive step - (yes)
Sufficiency of disclosure - (yes)

Decisions cited:

G 0003/14



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Case Number: T 2121/19 - 3.2.08

D E C I S I O N
of Technical Board of Appeal 3.2.08
of 8 March 2023

Appellant: Technoform Glass Insulation Holding GmbH
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Decision under appeal: **Interlocutory decision of the Opposition
Division of the European Patent Office posted on
24 May 2019 concerning maintenance of the
European Patent No. 2668361 in amended form.**

Composition of the Board:

Chair P. Acton
Members: M. Foulger
F. Bostedt

Summary of Facts and Submissions

- I. With the decision posted on 24 May 2019, the opposition division decided that the patent according to auxiliary request II dated 26 March 2019 met the requirements of the EPC.
- II. The opponent filed an appeal against this decision.
- III. Oral proceedings took place before the Board on 8 March 2023. As announced with the letter of 1 February 2023, the appellant (opponent) was not present at the oral proceedings and in accordance with Rule 115(2) EPC and Article 15(3) RPBA 2020 the proceedings were continued without it and it was treated as relying solely on its written case.
- IV. The appellant requested that the decision under appeal be set aside and the patent be revoked. Moreover, that auxiliary requests I to IV and VII not be admitted into the proceedings.
- V. The respondent (patent proprietor) requested that the appeal be dismissed and the patent be maintained in the form found allowable by the opposition division (the then valid auxiliary request II), or in the alternative, that the patent be maintained on the basis of one of auxiliary requests I to IV and VII filed on 1 February 2023, or auxiliary requests V and VI filed as auxiliary requests I and II on 13 February 2020.
- VI. The appellant has referred to the following documents in appeal proceedings:

D1: DE 195 30 838 A1

D2: DE 198 07 454 A1
D3: EP 1 099 038 A1
D7: "Nanoparticle Technology Handbook", M. Hosokawa et al., Elsevier, 1st edition, 2007
D9: EP 1 428 657 A1
D11: EP 0 991 815 B1
D12: US 4,696,857 A
D13: WO 2004/005376 A2
D14: US 7,078,453 B1
D15: WO 00/47657 A2
D16: EP 0 764 739 B1
D17: WO 2008/141771 A1
D18: WO 2007/140009 A2
D20: CA 782179 A
D21: EP 0 196 493 A2
D23: US 2011/0259416 A1
D25: WO 2006/027146 A1

VII. Claim 1 of the main request reads:

"**(1.1)** A spacer profile that is adapted to be used in a spacer frame (50) of an insulating glass unit for door, window or facade elements, the insulating glass unit comprising panes (51, 52) having an intervening space (53) defined between the panes (51, 52), the spacer profile comprising

(1.2) a hollow profile body (10) made of a first synthetic material comprising a chamber (20) for accommodating hygroscopic material, the hollow profile body (10)

- extending in a longitudinal direction (Z),
- comprising an inner wall (12), which is adapted to face the intervening space (53) between the panes (51, 52) of the insulating glass unit in an assembled state of the insulating glass unit,
- comprising an outer wall (14) on the opposite side of

the inner wall (12) in a height direction (Y), the height direction (Y) being perpendicular to the longitudinal direction (Z), and
- comprising, in a lateral direction (X) that is perpendicular to the longitudinal direction (Z) and the height direction (Y), a first side wall (16) and a second side wall (18) on the opposite side of the first side wall (16),

wherein

the inner wall (12) and the outer wall (14) and the first and second side walls (16, 18) are connected for forming the chamber (20), and

(1.3) a diffusion-resistant diffusion barrier portion (34) forming at least partly a diffusion barrier (36), characterized in that

(1.4) the diffusion barrier portion (34) is made of a second synthetic material to which sheet silicate lamellas are added and is formed as at least a part of the outer wall (14),

wherein

(1.4a) in order to achieve the diffusion resistance of the diffusion barrier portion (34),

the sheet silicate lamellas (38) are orientated within the second synthetic material in parallel to the outer wall (14) in a plurality of planes (40) laying upon another in the height direction (Y), and

(1.4b) the sheet silicate lamellas (38) in each sheet plane (40) are offset in the lateral direction (X) to the sheet silicate lamellas (38) in the respective adjacent sheet planes (40)."

(Feature references added in bold)

VIII. The appellant argued essentially the following:

a) Article 123(2) EPC

The application disclosed a spacer profile in which the silicate layers were spaced from each other - as illustrated in Fig. 4 of the application. Moreover, the layers were described as being "spaced" (application, p. 11, 3rd paragraph). However, claim 1 of the main request covered embodiments in which the lamellas were in contact and these had not been originally disclosed. The subject-matter of claim 1 was thus an unallowable intermediate generalisation and infringed Article 123(2) EPC.

b) Article 84 EPC

Features 1.4a) and 1.4b) were introduced into the claim from the description during opposition proceedings. They could thus be examined for clarity.

In feature 1.4a), a "plurality of planes" is mentioned. In feature 1.4b) "sheet planes" are then introduced. It was not clear whether these terms referred to the same thing.

Moreover, the terms of features 1.4a) and 1.4b) allowed embodiments where the lamellas were spaced such that they did not provide a barrier effect. This was in contradiction to the description (application as filed, p. 11, first paragraph).

Moreover, the term "diffusion resistance" was in itself unclear.

c) Sufficiency of disclosure

The patent did not teach the skilled person how to carry out the invention. In particular, the form and dimensions of the extrusion slit were not disclosed. Therefore, the invention was not disclosed in a manner sufficiently clear and complete for the skilled person to carry it out.

d) Novelty

D1 and D2 both disclosed spacer profiles which contained silicate lamellas. It was inevitable that when extruding this profile that the lamella would be arranged into sheet planes as claimed. Thus, the subject-matter of claim 1 was known from these documents.

e) Inventive step

A spacer profile according to the preamble of claim 1 was known from D1, D2, D3 and D25. The problem solved by the characterising features was to improve the barrier properties of the spacer.

The barrier effect of sheet silicates was well known to the skilled person, see D7, D9, D11 - D18, D20, D21, D23.

It would therefore have been obvious for the skilled person to apply this to the spacer profile known from D1, D2, D3 or D25 and thereby arrive at the subject-matter of claim 1 without an inventive step being involved.

IX. The respondent argued essentially the following:

a) Article 123(2) EPC

Fig. 4 of the application was an idealised representation - as pointed out in p. 11, 2nd paragraph. The skilled person would realise that there would be some deviation from this ideal and consequently in some cases the lamellas would be touching.

b) Article 84 EPC

The claim was clear - the modifications made during opposition proceedings did not introduce any lack of clarity.

c) Sufficiency of disclosure

The invention was sufficiently disclosed.

c) Novelty

Neither D1 nor D2 disclosed a sheet silicate structure as claimed. Moreover, they did not disclose how the spacer profiles were produced. Hence, it could not be taken that the sheet silicates were orientated in parallel according to claim 1.

d) Inventive step

Taking either D1, D2, D3 or D25 as closest prior art, the subject-matter of claim 1 involved an inventive step.

None of the documents D7, D9, D11 - D18, D20, D21 or

D23 relate to the technical field of insulating windows nor do they provide a hint or a suggestion to use sheet silicates for a diffusion barrier portion of a spacer profile.

Therefore, the subject-matter of claim 1 involved an inventive step.

Reasons for the Decision

1. Article 123(2) EPC

Features 1.4a and 1.4b were added to claim 1 of the patent as granted during opposition proceedings.

The opponent argued that these features of claim 1 now included undisclosed embodiments wherein there was no spacing between the lamellas. The claimed subject-matter thus related to an undisclosed intermediate generalisation.

In assessing the question of added subject-matter it is established case law at the EPO Boards of Appeal that amendments can only be made within the limits of what a skilled person would derive directly and unambiguously, using common general knowledge, and seen objectively and relative to the date of filing from the application as originally filed (Case Law of the Boards of Appeal, 10th edition, 2022, II.E.1.3.1.).

In the present case, the skilled person would understand that the lamellas were not arranged perfectly regularly as shown in Fig. 4 but rather somewhat erratically, as explained in the application p. 11, 2nd paragraph. This is also what the skilled

person would expect as the flow through the nozzle is unlikely to be perfectly laminar.

The skilled person would therefore realise that a spacing of zero was indeed included in the disclosure of the application because it was inevitable from the manufacturing process that some lamellas would touch. Hence, the skilled person would consider that zero spacing was included in the disclosure of the application as originally filed.

It is correct that Figure 4 shows lamellas which are all spaced apart from each other. However, as set out on page 11, 2nd paragraph, this figure represents an idealised and simplified illustration of the diffusion barrier layer. Moreover, the 3rd paragraph on page 11, to which the appellant referred, is a description of Figure 4 and hence also describes an idealised situation and not the actual distribution of the lamellas within the diffusion barrier layer.

Hence, the subject-matter of claim 1 does not extend beyond the content of the application as originally filed.

2. Article 84 EPC

Features 1.4a) and 1.4b) were taken from the description and may thus be examined for clarity (G 3/14).

It is correct that in feature 1.4a) the term "plane" is used and in feature 1.4b) the term "sheet plane" is used. The skilled person reading the claim would however immediately realise that these refer to the same item. Thus, there is no lack of clarity introduced

by the modifications in this respect.

The appellant further argued that configurations with lamellas spaced in such a way that they did not provide a barrier effect were covered by the amended claim which would stand in contradiction with the description as originally filed p. 11, first paragraph which requires diffusion resistance or rather diffusion impermeability.

The Board does not find this convincing. Feature 1.3 requires a diffusion-resistant diffusion barrier portion forming at least partly a diffusion barrier. Thus, any embodiment of the diffusion barrier portion where the lamellas did not act as a diffusion barrier would not fall under the scope of the claim. Hence, there is no contradiction between claim and description.

Moreover, the objection against the term "diffusion resistance" is not due to the amendment because feature 1.3 of the granted claim already referred to "diffusion-resistant". Any possible lack of clarity was thus already in the granted claim and cannot be examined.

Claim 1 therefore fulfills the requirements of Article 84 EPC.

3. Sufficiency of disclosure

The patent discloses the materials used and the process of extruding through a slit (paragraph [0062]). It does not give temperatures, speeds, or exact material compositions. The skilled person however knows what result is to be achieved and has the starting points.

They would therefore use routine trial and error to arrive at the result required. Such routine experimentation is well within the capabilities of the skilled person.

The invention is therefore sufficiently disclosed.

4. Novelty with respect to D1 and D2

D1 discloses a spacer profile where a substance which usually contains lamellas is added to the polymer material, e.g. talc ("Talkum") or mica ("Glimmer"), see D1, col. 3, l. 40 to 45. D2 also discloses a spacer profile in which flaky ("plattchenförmig") particles are added. These particles can be made of wollastonite, mica or talc (see D2, p. 3, l. 25 to 27).

However neither D1 nor D2 give any details of the process used to extrude the profiles. There is no mention, as in the attacked patent, paragraph [0062], of an extrusion nozzle in the form of a slit which generates a laminar flow. Therefore, despite the similar starting materials used in D1 and D2, there is no evidence that the lamellas are orientated as claimed, consequently features 1.4a and 1.4b are not known from D1 or D2.

The subject-matter of claim 1 is thus new with respect to D1 and D2.

5. Inventive step

5.1 D1 or D2 in combination with the knowledge of the skilled person

The subject-matter of claim 1 differs from the

disclosure of D1 and D2 by features 1.4a and 1.4b.

The problem to be solved is to improve the barrier properties of the spacer.

The appellant argued that the skilled person would from their general knowledge extrude the spacer profile as known from D1 or D2 in such a way as to arrive at the claimed subject-matter in order to improve the barrier properties by forming a laminar structure.

This is not persuasive because there is no evidence that such a manner of extruding spacer profiles in order to achieve a laminar flow was generally known and used prior to the attacked patent. It cannot thus be regarded as being part of the common general knowledge.

5.2 D1 or D2 in combination with D7, D9, D11 - D18, D20, D21 or D23

The appellant also referred to documents D7, D9, D11 - D18, D20, D21 or D23 as support for their view that this formed part of the common general knowledge.

These documents disclose:

D7: discloses using silicate layers in a nylon 6-clay hybrid (p. 458, 3rd paragraph). These improve the gas "barrierability" (impermeability) of the film.

D9: relates to the use of sheet silicates in barrier films and discloses in paragraph [0022] that a labyrinth structure formed by stratified silicate can provide a gas barrier layer.

D11: discloses a food container such as a cup, tub or tray with a coat forming a barrier layer, see paragraph [0001].

D12: relates to improving the permeation resistance of

thin-walled articles such as film or containers (col. 3, l. 23 - 30). The platelets are disposed parallel to the broad face of the film. It is not disclosed how many lamella layers there are and consequently features 1.4a) and b), which require a plurality of layers, are not known from this document.

D13: discloses a film, see p. 1, l. 13 - 18, but not the structure of the sheet silicate.

D14: discloses a coating composition, see col. 4, l. 7 - 11. Sheet silicates are disclosed, see col. 5, l. 18 - 25, but not their structure.

D15: discloses a method for producing a multi-layered silicate but there is no teaching that would lead the skilled person to combine it with D1 or D2 in a window spacer.

D16: discloses a moisture proof paper sheet and stacks of sheets (p. 2, 1st para.).

D17: discloses a vapour barrier including a crystalline platelet barrier, p. 2, 1st para.

D18: relates to a moisture vapour barrier for paper and paperboard, see claim 1.

D20: mica-flake paper for electroluminescent lights, see claim 1.

D21: discloses a diffusion barrier for a plastic composite isolator, see claim 1.

D23: discloses a photovoltaic device with a barrier layer.

It is correct, as argued by the appellant, that the above documents demonstrate that the use of silicates to provide a barrier was well known before the priority date of the attacked patent. However, the documents cited are not related to spacer profiles but are related to films, foils or paper. The appellant has not shown that the relevant skilled person, i.e. the skilled person tasked with solving the objective

technical problem related to the spacer, would combine D1 or D2 with the teaching of documents related to different fields. Thus, it would not have been obvious for the skilled person to apply the teaching of these documents to the spacer profiles known from D1 or D2.

The subject-matter of claim 1 involves an inventive step with regard to either D1 or D2 as closest prior art.

5.3 D3 or D25 as closest prior art

D3 discloses a spacer profile according to the preamble of claim 1 (see Fig. 2). This spacer has a diffusion barrier made of metal (see paragraph [0026]) and gaps to reduce heat conductivity. These gaps reduce the effectiveness of the diffusion barrier.

D25 also discloses a spacer profile according to the preamble of claim 1, see claim 1 of D25. This profile has a one-piece diffusion barrier film 30. The film 30 is preferably metallic (see paragraph [0073]).

The problem to be solved is therefore to provide a spacer which has a best possible barrier resistance without increasing the thermal conductivity.

The appellant argued that the skilled person would know that metal was a good conductor of heat and would therefore replace the metal barrier with a material with lower thermal conductivity. The appellant further argued that the skilled person would have considered D1, D2 or D7, D9, D11 - D18, D20, D21, D23 and would have thereby arrived at the subject-matter of claim 1.

This is not however convincing because, as discussed

above, D1 and D2 do not disclose the features 1.4a) and 1.4b) of claim 1.

Moreover, as discussed above with respect to D1 and D2 as closest prior art, the skilled person would not have applied features from unrelated technical fields such as those addressed in D7, D9, D11 - D18, D20, D21 or D23 to a spacer profile for a door or window or facade elements. In this respect, the appellant has not identified specific teachings in these documents that would indicate their suitability for the use in a spacer profile for a door or window or facade elements.

The subject-matter of claim 1 thus involves an inventive step with respect to either D3 or D25 as closest prior art.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chair:



C. Moser

P. Acton

Decision electronically authenticated