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D E C I S I O N
of 16 March 1995

Case Number: T 0726/92 - 3.2.3

Application Number: 84106856.2

Publication Number: 0130438

IPC: E06B 3/66

Language of the proceedings: EN

Title of invention:
Structural spacer glazing

Patentee:
Vision Engineering & Design Inc.

Opponent:
Josef Gartner & Co.

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Skilled person; inventive step (confirmed)"

Decisions cited:
T 0176/84

Catchword:
-

Case Number: T 726/92 - 3.2.3

D E C I S I O N
of the Technical Board of Appeal 3.2.3
of 16 March 1995

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Decision under appeal: Interlocutory decision of the Opposition Division
of the European Patent Office dated 12 May 1992,
posted on 11 June 1992, concerning maintenance of
European patent No. 0130438 in amended form.

Composition of the Board:

Chairman: C. T. Wilson
Members: F. Brösamle
L. C. Mancini

Summary of Facts and Submissions

I. With the interlocutory decision announced during the oral proceedings of 12 May 1992 and communicated in written form on 11 June 1992, the Opposition Division upheld the European patent No. 0130 438 in amended form, since it was felt that the subject-matter of granted Claim 1 is patentable in the light essentially of the following documents

- (D1) DE-U-7 002 866
- (D2) US-A-4 370 841 and
- (D3) US-A-3 530 633.

II. The Opponent (Appellant in the following) lodged an appeal on 5 August 1992 against this interlocutory decision paying the appeal fee on the same day and filing the Statement of Grounds of Appeal on 9 October 1992.

He requests to set aside the impugned decision and to revoke the patent in suit since granted Claim 1 does not define inventive subject-matter. He cited inter alia documents

- (D11) FR-A-2 514 057 and
- (D15) DE-U-6 750 551

to prove that connections in the form of tongues and grooves are known in the art of glazing units/façade elements.

- III. Following a Communication according to Article 11(2) RPBA oral proceedings took place before the Board.

- IV. The Proprietor (Respondent in the following) modified his request in that the decision of the Opposition Division should be set aside and a patent be granted on the base of documents submitted during the oral proceedings.

- V. Claim 1 thereof reads as follows:

"1. A glass insulating sealed unit capable of being mounted on a building without the use of exterior stops comprising at least two spaced-apart glass plates (159, 160; 348, 350) or a glass plate and an insulating panel and spacer means (158, 252, 269, 330) to join and seal the edge portions of said two glass plates or said glass plate and said insulating panel arranged about the entire periphery thereof and between said plates or said plate and said panel, characterized by said spacer means providing means for fastening said sealed unit to said building along at least one side of said unit so that the exterior glass surface thereof is the outermost point of the unit and adjacent surrounding surfaces of said building, said fastening means including a channel-shaped recess (176, 258, 270, 332, 372) that is open along the edge of the unit, and connectors (256, 271, 287, 294, 298, 306, 342, 366, 370) for connecting said sealed unit by said fastening means to an adjoining support member, each connector having a flat end portion (178,

260, 273, 299, 366) wherein said sealed unit is fastened to said support member by insertion of said flat end portion into said recess and by attachment of said connectors to the adjoining support member."

III. Appellant's arguments can essentially be summarized as follows:

- nearest prior art is (D1); Claim 1 is not sufficiently delimited over this piece of prior art since the only distinguishing feature is the existence of a channel-shaped recess;
- a skilled person is aware of both glazing units and façade elements so that confronted with the objective problem of the invention he would turn to (D2) and essentially to (D3);
- though formally novel, the subject-matter of Claim 1 cannot be seen as inventive;
- (D10) to (D15) whether or not admitted to the proceedings prove at least common knowledge.
- apart from (D1) to (D3) and (D11/D15) connectors in the form of channel-shaped recesses and flat ends entering therein are known in the common art, see wooden boards and furniture;
- since Claim 1 is not restricted to specific sealing constructions, to specific dimensions and the

atmosphere between the panes convincing arguments cannot be based thereon by the Respondent;

- since a simple combination of (D1) and (D3) leads to the subject-matter of Claim 1 this cannot define inventive subject-matter since from (D3) it is known to prevent moisture from entering the façade elements;
- with respect to granted Figure 3, it was felt that it does not fall under the wording of Claim 1 and consequently should have been deleted.

VII. The Respondent essentially brought forward the following arguments:

- the problems of glass insulating units were stressed in that their seals have to be able to maintain an atmosphere between the panes be it air or argon even under positive or negative wind loads;
- the invention is intended to overcome the restriction that the glazing unit according to (D1) is supported only at four counterpoints;
- a groove/flat-end connector as claimed in Claim 1 allows a glazing unit to be supported not only at four points but at an indefinite number of supporting points as a consequence of the axial extension of the grooves/flat ends, (see granted Figures 3 to 5);
- the groove/flat-end connector as claimed in Claim 1 allows not only a correct support effect but also

simultaneously offers the possibility of relative movement of the glazing unit with respect to the building construction which in itself is also resilient;

- with the invention according to Claim 1 it is achieved that the improved glazing unit remains as similar as possible to standard known glazing units;
- (D3), even if considered by a skilled person, does not give a crucial hint towards the invention, since wooden blocks "4,4" and foam filled elements "3" do not appear to be a model for a glazing construction even if in (D3) a groove/flat-end connector **per se** is taught;
- (D1) has to be seen as a whole i.e. (D1) is not restricted to Figure 4 but also to the embodiments laid down in Figures 6 to 8 thereof leading a skilled person away from the subject-matter of Claim 1;
- (D11) and (D15) are felt completely irrelevant, Article 114(2) EPC, since in (D11) additional inserts are provided which in combination with resilient clips act as a spacer/support system; the double function of the spacers as claimed cannot be seen from (D11) and from (D15) it can be seen that exterior stops are a must and completely contradictory to what is claimed in Claim 1; moreover (D15) teaches a mounting of a glazing unit **on the building site** which again is contradictory to Claim 1;

- it is admissible to defend a patent claim with advantages which are implicit to a construction clearly disclosed in the originally filed documents;
- the simplicity of the claimed support system is felt to be a strong indication of inventive step since the relevant prior art is more than 15 years older than the claimed invention;
- after restriction of the granted set of claims by deleting granted Claims 9 and 11 to 14, all drawings and their corresponding texts not covered by Claim 1 - in which superfluous reference signs have been deleted for reasons of clarity and consistency -, the patent in its amended form as submitted in the oral proceedings is seen as valid so that the impugned decision has to be set aside.

Reasons for the Decision

1. The appeal is admissible.
2. *Amendments*

Claims 1 to 9 as submitted during the oral proceedings correspond to granted Claims 1 to 8 and 10 so that no objections under Article 123(2) and (3) EPC have to be raised.

The amendments to Claim 1, namely deletion of reference signs, are a consequence of the deletion of drawings which disclose embodiments not falling under the scope of protection of Claim 1. Apart from the deletion of

reference signs Claim 1 is identical to its granted version.

3. *Nearest prior art*

There was agreement between the parties that (D1) has to be seen as the nearest prior art document.

4. *Novelty*

The Appellant conceded that the subject-matter of Claim 1 is novel since at least a channel shaped recess cannot be seen from (D1); this issue needs therefore no further argument.

5. *Problem to be solved by the invention*

5.1 From (D1) see Figures 4 and 1 thereof, a glazing unit is known which is supported at its corners i.e. on four points of the glazing unit, see particularly Figure 1 lines "VIII-VIII" and "IX-IX". This means that these supporting means have to transmit the wind loads either positive or negative via four connectors - whether rigid or pivotable as in Figure 6 to 8 of (D1) to the building structure (framework "10").

5.2 With respect to the sealing of the glazing unit this constitutes a danger as far as the long term tightness of the sealing is concerned.

5.3 The claimed invention according to Claim 1 seeks to overcome the above deficiencies i.e. to provide an insulating sealed unit that is glazed without exterior

stops or gaps and that has improved and simplified fastening means for attaching the insulating sealed glass units to a building, see column 2 lines 9 to 11 of the description as submitted during the oral proceedings (linguistic errors and misspellings amended).

5.4 The above problem to be solved constitutes the objective technical problem to be solved by the invention when starting from (D1) and this objective technical problem is considered in connection with the assessment according to Claim 1, i.e. application of the problem-solution-approach.

6. *Claimed solution according to Claim 1*

6.1 The claimed solution of the objective problem according to Claim 1 is essentially characterized by a channel-shaped recess in at least one side of the glazing unit whereby this recess is open along the edge of the glazing unit and whereby a connector having a flat end portion is inserted into said recess and the connector is adjoined to the support member.

6.2 In the light of the problem to be solved, and of the specific embodiments described, (see granted Figures 3 to 5, reference signs "44, 52, 53, 54", showing long connections and granted Figures 15 to 18 showing the use of a plurality of short connectors), the interpretation of Claim 1 is based on a recess/flat-end connector extending over a **substantial axial distance**, (see Article 69(1) and (2) EPC (interpretation of a claim in the light of the description and drawings)).

The subject-matter of Claim 1 therefore differs from the disclosure of D1 not only by a channel-shaped recess, but also by the provision of its substantial axial length.

7. *Inventive step*

7.1 The question whether (D11) and (D15) should be formally allowed into the proceedings or not need not be decided since the documents are irrelevant for the following reasons:

- (D11), see for instance Figures 3 to 5, comprises a **spacer**, see reference sign "3", which maintains the mutual distance between the panes "1,2"; in addition to this spacer **inserts** "22, 26" are mounted which in combination with clips "14, 27, 29" act as a positioning means; the double function **of one single** spacer as claimed, namely acting as a spacer and as a supporting means, cannot be seen from (D11). It is further doubtful whether clips as described in (D11) are suitable for transmitting wind loads;
- (D15) discloses a spacer "3" in combination with a glazing system mounted on the **building site**, see page 3 paragraph 1 thereof; contradictory to Claim 1 exterior stops are realised, see Figures 2 to 4 reference signs "11, 19, 23"; it is therefore not apparent what should be transferred from (D15) to (D1) to achieve a glazing unit according to Claim 1.

Since the Appellant did not discuss (D12) to (D14) in the oral proceedings before the Board but solely relied

on (D11) and (D15) it appears superfluous to discuss these documents in detail. The Board is moreover convinced that they also are irrelevant, Article 114(2) EPC, in connection with the validity of the patent as amended.

- 7.2 In above remarks 5.1 to 5.3 the specific problems of glazing units are set out. One of these problems is the need for a long term tightness of the seals, be it the prevention of access of moisture from outside or the outflow of a gas such as air or argon from the interior of the glazing unit.

It is obvious that long term tightness is influenced by existing wind loads either positive or negative and by UV-radiation. Since the manner in which wind loads are transferred to the building structure has also an influence on the long term reliability of the glazing unit as the resilience of the building in itself, it is clear that glazing units have their own specific problems which may be different from façade panels.

- 7.3 The solution to these problems according to Claim 1 clearly fulfils the requirements set out above in detail since exterior stops or gaps are no longer necessary for fixing the glazing unit due to the connector in the form of a channel-shaped recess and a flat-end connector entering into that recess. These have to be seen as a simple and reliable fastening means which not only supports the glazing unit to the building structure but overcomes the restriction of only four corner support points and also offers in use an ample possibility to the glazing unit to move, be it

under wind loads or as a consequence of the thermal expansion of the glazing unit. In comparison to prior art glazing units it is obvious that the claimed construction does not rely on protruding panes so that the units can be easily handled without being destroyed. In the case of failure of a seal at least one pane (inner pane) remains fastened to the building structure.

- 7.4 The Appellant contended that a combination of (D1) and (D3) renders obvious the subject matter of Claim 1.

Seeing the background and the specific advantages of the glazing unit according to Claim 1 it is doubtful whether a skilled person would at all consider (D3) since this document concerns a building panel construction in which no gas exists in the interior but rather a foam, see reference signs "3,3". Moreover the visible parts "1,1" are made from metal and consequently are opaque. Though in (D3) a water-tightness of the panel construction is mentioned, see column 1 line 44, the means for achieving such water-tightness appear to be unsuitable for glazing units, since wooden spacers (see column 2 line 19) are the means for achieving water-tightness. A skilled person would, however, not turn to wooden spacers in combination with glazing units even if (D3) discloses a channel-shaped recess and a flat end connector. Though movement is mentioned in column 1, line 45 of (D3), it cannot be seen how the fixed panels can move when fastened to the building structure.

- 7.5 It has indeed to be questioned whether a skilled person would turn at all to (D3) when starting from (D1) and being confronted with the objective problem to be solved, the decision T 176/84, OJ EPO 1986,50 making clear that a skilled person would only turn to neighbouring technical fields in which the same or similar problems exist; as set out above (D3) does not deal with the same or similar problems as (D1) i.e. as in combination with glazing units.
- 7.6 Even defining the skilled person as having knowledge of glazing units **and** façade constructions cannot overrule the principles laid down in T 176/84, since this definition appears to be arbitrary and the result of inadmissible hindsight. Hindsight is, however, not the correct approach when dealing with the assessment of inventive step. It is also an arbitrary interpretation of the prior art when the Appellant argues that the only difference between façade elements and glazing units has to be seen in the property "transparent" or "non transparent". Whilst appreciating the many similarities between these two arts, the Board is of the opinion that this approach ignores the fundamental differences between façade elements and glazing units, which glazing units have their own specific problems not existing with façade elements, as set out above.
- 7.7 Summarising the above considerations the skilled person even if he considered (D3) is not led in an obvious manner to a construction as claimed in Claim 1, since whilst from (D3) some features **taken out of their context** are in agreement with features of Claim 1, other features such as wooden spacers and foam between

the inner and outer covers are contradictory to Claim 1. A combination of the teachings of (D1) and (D3) - without knowing the claimed invention - would therefore not result in a glazing unit according to Claim 1, Article 56 EPC.

- 7.8 What is stressed in connection with (D3) is widely applicable to (D2) which document was no longer discussed in the oral proceedings before the Board. In (D2) again a panel is known for a wall or a ceiling of a building. As a further difference to (D3) spacers are not realised in (D2) since the panels "2,3" are solid and rigid parts consisting of wood, particle board, synthetic resin and the like.

(D2) being less relevant than (D3) it is not necessary to consider a combination of (D1) and (D2) when assessing the inventive step of the subject-matter of Claim 1.

- 7.9 For the reasons set out above, in the Board's judgement the subject-matter of Claim 1 involves an inventive step within the meaning of Article 56 EPC.

- 7.10 Hence, it follows that Claim 1 can be maintained. Dependent Claims 2 to 9 relate to modifications of the subject-matter of Claim 1 and can likewise be maintained.

8. The description and the drawings as submitted in the oral proceedings are now consistent with the claims so that the patent in suit can be maintained on that basis.

The Appellant argued that the former Figure 9, now Figure 3, did not fall under the teaching of Claim 1 since a channel-shaped recess is provided for on only one side of the supporting structure. The Board cannot agree with this argument since Claim 1 does not prescribe that there must exist a double-arrangement of channel-shaped recesses and flat-end connectors.

Order

For these reasons it is decided that:

1. The contested decision is set aside.
2. The patent is maintained, based on the documents submitted during the oral proceedings.

The Registrar:

The Chairman:

N. Maslin

C. T. Wilson