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D E C I S I O N
of 10 January 2001

Case Number: T 0558/99 - 3.2.1

Application Number: 94306710.8

Publication Number: 0642943

IPC: B60J 10/06

Language of the proceedings: EN

Title of invention:
Flush glass sealing system

Patentee:
SCHLEGEL CORPORATION

Opponent:
STANDARD PRODUCTS INDUSTRIEL

Headword:
-

Relevant legal provisions:
EPC Art. 56
EPC R. 67, 68(2)

Keyword:
"Inventive step (yes)"
"Refund of the appeal fee (no)"
"Reasoned decision (yes)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0558/99 - 3.2.1

D E C I S I O N
of the Technical Board of Appeal 3.2.1
of 10 January 2001

Appellant: (Proprietor of the patent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 25 March 1999 revoking European patent No. 0 642 943 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: F. A. Gumbel
Members: J. Osborne
J. H. P. Willems

Summary of Facts and Submissions

I. The patent proprietor's appeal is against the decision of the Opposition Division to revoke the European patent No. 0 642 943.

II. The patent had been opposed on the grounds that the subject-matter of the claims lacked novelty and inventive step (Article 100(a) EPC). The following evidence was taken into account during the opposition proceedings:

D1: EP-A-0 448 270

D2: FR-A-2 551 129

D3: GB-A-1 454 528

D4: EP-A-0 040 336

D5: FR-A-1 342 216

D6: FR-A-2 165 229

D7: FR-A-2 468 717

D8: FR-A-2 579 927

D9: FR-A-2 580 285.

Two further documents were disregarded by the Opposition Division under Article 114(2) EPC:

D10: FR-A-2 431 644

D11: FR-E-0 093 308.

III. The decision of the Opposition Division was posted on 25 March 1999. Notice of appeal together with payment of the appeal fee was received on 21 May 1999 and the reasons for the appeal were received on 30 July 1999.

IV. In oral proceedings held on 10 January 2001 the appellant requested that the decision of the Opposition Division be set aside and that the patent be maintained in amended form based on Claims 1 to 21, 23, 24, 26, 27 as granted and Claims 22, 25 as filed during the oral proceedings. The appellant additionally requested that the appeal fee be refunded.

V. The respondent requested that the appeal be dismissed.

VI The claims according to the appellant's request contain independent Claims 1, 22, 25 which read as follows, whereby in comparison with Claims 22, 25 as granted additions are indicated in bold text and deletions are included in square parentheses:

1. "A flush glass window seal for forming a seal between the body of a motor vehicle and a movable window panel comprising a plastic carrier-attaching body having a generally U-shaped first portion for attaching the window seal to the body of a motor vehicle defined by a first base and first and second legs (16,18), a glass run channel portion (12) of inverted U-shaped configuration defined by a second base (20), said second leg (18) and a third leg (38), and first and second inwardly depending extensions (40,42) on the ends of the second and third legs (18,32) for forming first and second mounting channels

at the ends of the legs (18,32), and a U-shaped resilient insert (14) disposed in the glass run channel portion having at least two resilient sealing surfaces (58,60) for forming a slidable seal with the window panel, and first and second anchoring lobes (50,52) engaging the first and second mounting channels of the carrier for securing the inset (14) within the glass run channel portion (12), characterised in that the carrier attaching body is formed of a thermoplastic elastomer which is self-supporting and substantially rigid."

22. "A method for **producing** [assembling] a flush glass window seal comprising co-extruding thermoplastic elastomers of different durometer values to form a substantially rigid **and self-supporting**, dual durometer thermoplastic elastomer carrier**-attaching body** (12) in a one-piece **construction, made up of a glass run channel portion of** generally **inverted** U-shaped configuration for receiving a resilient insert (14), **and a U-shaped first portion for attaching the window seal to the body of a motor vehicle,** extruding a generally flat, resilient insert (14) for said thermoplastic elastomer carrier**-attaching body** (12), folding said resilient insert (14) into a generally U-shaped configuration, and pressing said folded insert (14) into the **glass run channel portion of the** carrier**-attaching body (12)** mechanically to secure the insert (14) to the carrier**-attaching body** (12)."

25. "A method for **producing** [assembling] a flush glass window seal comprising moulding thermoplastic elastomers of different durometer values to form a substantially rigid **and self-supporting**, dual durometer

thermoplastic elastomer carrier**-attaching body** (12) in a one-piece **construction, made up of a glass run channel portion of** generally **inverted** U-shaped configuration (10) for receiving a resilient insert (14), **and a U-shaped first portion for attaching the window seal to the body of a motor vehicle,** extruding a generally flat, resilient insert (14) for said thermoplastic elastomer carrier**-attaching body** (12), folding said resilient insert (14) into a generally U-shaped configuration, and pressing said folded insert (14) into the **glass run channel portion of the** carrier**-attaching body (12)** mechanically to secure the insert (14) to the carrier**-attaching body** (12)."

VII. The dependent Claims 2 to 21, 23, 24, 26, 27 define preferred embodiments of the subject-matter of the respective independent claims.

VIII. The arguments of the appellant (patent proprietor) can be summarised as follows:

The carrier-attaching body known from D1, which forms the closest prior art, relates to a flush glass seal in which the seal is carried by a carrier-attaching body which is mounted on a single flange to one side of the seal. The carrier-attaching body performs two functions, namely to carry the flexible seal and to attach itself to a flange on the vehicle. The body includes a metal reinforcement which provides sufficient rigidity to hold the seal in the required position but which renders the body heavy and expensive to manufacture. By comparison, D4 and D7 relate to glass seals having attaching portions which engage two flanges, one each side of the glass and the sealing

portion is symmetrically supported between the mounting portions. The documents teach that metal reinforcements in the mounting portions may be dispensed with when a compound of plastics and thermosetting materials is used to manufacture the mounting portions. However, these serve only one function, to attach the flexible seal portion to a flange on the vehicle. Furthermore, the materials which are proposed for the mounting portions are vulcanised and so are classified as thermosetting.

As regards the request to refund the appeal fee the appellant argued that the decision of the Opposition Division was not sufficiently reasoned (Rule 68 (2) EPC) in as far as only one function of the carrier-attaching body is considered, the statements regarding the disclosures of D4 and D7 are wrong and, with respect to Page 7 of the decision, first paragraph, no reason is given why the skilled person would arrive at the subject-matter of Claim 1.

IX. The respondent (opponent) essentially argued that the subject-matter of Claim 1 differs from that of D1 by the materials defined in the characterising portion. D4 discloses that the choice of a suitable plastics material allows the deletion of the metal reinforcement in a glass seal. The skilled person is left only with the task of selecting a suitable plastics material. As acknowledged in the patent in suit the materials defined in the characterising portion of Claim 1 are well known and the skilled person merely needs to choose from amongst well known materials which are obviously suitable for the purpose. Moreover, the equivalence of thermoplastic and thermosetting materials for manufacturing glass seals is known in the

art, as evidenced by D8.

Reasons for the Decision

1. *Amendments*

1.1 The definition in Claims 22, 25 of the carrier-attaching body as being "self-supporting" is derivable from the application as originally filed in as far as at least in the first embodiment (Figure 1) the carrier-attaching body comprises a U-shaped channel 15 and an inverted U-shaped channel produced from one material having no reinforcement. The embodiment of Figure 2 includes a metal foil in the inverted U-shaped channel but the carrier-attaching body is otherwise "essentially the same" as in the first embodiment and so implicitly would be self-supporting also without the foil.

1.2 The claims as granted include not only the step of inserting the insert into the carrier-attaching body but also the steps of extruding or moulding the carrier-attaching body and of extruding the resilient insert and so clearly are not limited to the assembly of the seal. Moreover, according to the description, which according to Article 69(1) EPC is to be used to interpret the claims when determining the scope of protection to be afforded, the invention lies in the material used for the carrier-attaching body, not in the insertion of the insert into the body (see particularly Column 1, Line 13 to Column 2, Line 11). It follows that also in this respect the scope of protection afforded by the method claims as granted is not limited to the assembly of the glass seal but

includes the manufacture of the carrier-attaching body from thermoplastic elastomer. The replacement in Claims 22, 25 of the term "assembling" by the term "producing" therefore does not extend the scope of protection afforded by these claims.

1.3 The remainder of the amendments to Claims 22, 25 serve merely to improve the clarity of the claims and are clearly derivable from the application as originally filed.

1.4 The Board therefore is satisfied that the requirements of Articles 84 and 123(2), (3) EPC are fulfilled by the amendments.

2. *Interpretation of Claim 1*

2.1 Claim 1 of the patent in suit defines the material of the carrier-attaching body as a thermoplastic elastomer. In the description of the patent in suit (bridging Columns 4, 5) it is stated that this term lacks a clear definition in the art and during the opposition and appeal proceedings differing views have been put forward concerning whether the compounds disclosed in D4, D7 are to be regarded as being thermoplastic elastomers. It therefore is necessary for an examination of novelty and inventive step to clarify which characteristic properties are to be regarded as belonging to this term as used in the patent in suit. Thermoplastic elastomers have the performance properties of conventional thermoset rubbers but they are able to be fabricated as thermoplastics (*Walker and Rader*, "Handbook of Thermoplastic Elastomers", New York, Van Nostrand Reinhold), i.e. they soften upon heating to a sufficient extent that they flow, allowing

them to be formed by, for instance, moulding. This melting is a reversible process and permits the material to be reshaped after heating, as with conventional thermoplastics. Thermoplastic elastomers have domains of elastomeric material bound by thermoplastic material and this binding reversibly softens upon heating to the extent that the material will melt, allowing it to be repeatedly moulded. The absence of vulcanisation of thermoplastic elastomers after being moulded leaves the material unchanged from the raw material, suitable to be recycled.

2.2 According to Claim 1 the carrier-attaching body is "formed of" a thermoplastic elastomer which is substantially rigid. However, the dependent Claims 3, 7 define that the carrier-attaching body also includes thermoplastic elastomer of a differing hardness, which forms projections for engaging the flange on which the carrier-attaching body is to be mounted. Moreover, dependent Claims 16 to 18 define additional materials which may be included in the carrier-attaching body. The Board therefore interprets the term "formed of" as meaning that the carrier-attaching body is "substantially formed of" the substantially rigid thermoplastic elastomer.

3. *Novelty*

The respondent made no objection during appeal that the claims lacked novelty and no cited document discloses a carrier-attaching body for a glass seal, being formed of thermoplastic material. The subject-matter of all of the claims therefore is novel (Article 54 EPC).

4. *Inventive step*

4.1 The Board is in agreement with both parties that the closest prior art is known from D1. D1 discloses in the embodiment of Figure 3 a flush glass window seal for forming a seal between the body of a motor vehicle 12 and a movable window panel 14, comprising a substantially rigid carrier-attaching body 30 comprising a reinforcement member 34 with an integral skin 36 (sentence bridging Columns 2, 3). The carrier-attaching body has a generally U-shaped first portion 40 for attaching the window seal on the body of a motor vehicle, defined by a first base and first and second legs, a glass run channel portion 42 of inverted U-shaped configuration defined by a second base 60, the second leg 50 and a third leg 48, and first and second inwardly depending extensions on the ends of the second and third legs for forming first and second mounting channels 52, 58 at the ends of the legs. A U-shaped resilient insert 32 disposed in the glass run channel portion has at least two resilient sealing surfaces 74, 76, 80 for forming a slidable seal with the window panel, and first and second anchoring lobes 82, 88 engaging the first and second mounting channels of the carrier for securing the insert within the glass run channel portion. The material of the skin is not disclosed but it is common ground amongst the parties that typically it would be a thermosetting, elastomeric material. The carrier-attaching body mounts on a flange 46 and the resilient seal member is cantilevered in a position beside the flange. The glass run channel portion of the carrier-attaching body serves to hold the resilient sealing member in position and to support its outer leg 66 in order to ensure adequate sealing to the glass. A sliding window glass may exert a high load when breaking an ice seal which has built up between the outer face of the glass and its seal and this load

will be reacted in D1 by the third leg 48 of the carrier-attaching body. The leg 48 will tend to be pulled away from abutment with the vehicle door, creating a force moment about the mounting flange 46.

4.2 The subject-matter of Claim 1 differs from that of D1 in that the carrier-attaching body is formed of a thermoplastic elastomer which is self-supporting and substantially rigid. This has a number of effects, as set out in the patent specification in Columns 1, 2. The corresponding problem was to modify the carrier-attachment body of D1 in order to reduce cost and weight and to improve appearance whilst still performing the functions of mounting the resilient seal member on the single flange, of carrying it in a position adjacent thereto and of supporting its outer leg.

4.3 D4 relates to a glass window seal of symmetrical construction for mounting on two flanges. The seal comprises two mounting portions 1, 2 co-extruded with a glass run portion 8, 10, 11 carried between the mounting portions. D4 starts from a prior art in which the mounting portions are formed of elastomeric material surrounding a metal reinforcement (Page 2, first paragraph), which exhibits problems as set out in the remainder of Page 2 of D4, including high weight (Lines 29 to 33). The solution taught by D4 is to delete the metal reinforcement and to produce the mounting portions from a compound of elastomeric and plastic materials (Page 8, Lines 21 to 29) which is extruded and subsequently vulcanised (Page 5, Lines 12 to 19). The final material then has "great rigidity" (Page 8, Line 31) and the properties of an elastomer at temperatures below 90°C whilst being plastically

deformable at higher temperatures (Page 5, Lines 21 to 31). The glass run portion remains of conventional elastomer (Page 7, Lines 13 to 26).

4.3.1 The rigidity of the mounting portions of the seal of D4 is important only for ensuring a satisfactory retention on the flange. Because of the symmetrical arrangement of the seal of D4 and the resilience of the sealing portion, the mounting portions are subjected almost exclusively to loads in the plane of the window glass which are created close to the respective mounting flange. High loads on the seal such as would be produced by an attempt to break an ice seal would be directly transmitted to the attachment portion immediately adjacent to the frozen area. Lateral forces to ensure sealing to the sides of the window glass are transmitted directly to the flanges. The functions of carrying a resilient seal portion cantilevered from a single mounting portion and supporting the outer leg of the seal portion which must be performed by the arrangement of D1 are not performed by the arrangement of D4. For this reason the Board considers that the skilled person would not be encouraged by the teaching of D4 to delete the reinforcement of D1 and to attempt to manufacture the carrier-attaching body either from the material defined in D4 or from any other material which may be suitable for the purpose.

4.3.2 Moreover, although the final properties of the compound disclosed in D4 appear to resemble those of a thermoplastic elastomer, D4 merely discloses that heating the material causes it to become plastically deformable (Page 5, Line 27; Page 9, Lines 28 to 31; Page 10, Lines 5 to 10). Manufacture of the product includes vulcanisation of the material and there is no

disclosure of the material being meltable after the product has been manufactured. It is implicit that the plastic deformation merely allows the extruded seal section to be formed to the outline of the window. It follows that, even if the skilled person starting from D1 were to attempt to adopt the teaching of D4, he still would not arrive at the subject-matter of Claim 1 of the patent in suit.

4.4 The disclosure of D7 is similar to that of D4 in as far as the embodiment of Figure 1 relates to a symmetrical seal intended to be mounted between two flanges and in which metal reinforcement of the mounting portions 1, 2, 3 is rendered unnecessary by manufacturing the mounting portions from a high hardness vulcanised elastomer which can be deformed upon heating (Page 1, Lines 36, 37; Page 3, Lines 27 to 33). Also similarly to D4, the glass run portion remains of soft elastomer (Page 2, Lines 18 to 21). The above considerations in respect of D4 therefore relate equally to the first embodiment of D7. The disclosure of D7 in respect of a second embodiment of a seal is no more relevant to the subject-matter of Claim 1 because, although it appears to mount on a single flange, it provides a seal only to one side of the window glass, adjacent to the mounting portion and so equally gives no teaching regarding the additional functions performed by the carrier-attaching body of D1.

4.5 D8 relates to the provision of low friction surfaces on sealing elements and mentions that these sealing elements may be manufactured from thermoplastics materials (Page 1, Lines 6 to 17). However, this statement relates not to the carrier portion 2 of the seal but to the resilient sealing portion 1 and so is

not relevant to the subject-matter of Claim 1 of the patent in suit. The remaining cited documents, to which the respondent did not refer during the oral proceedings, are less relevant than those already discussed and so need not be treated in detail.

4.6 Since the subject-matter of Claim 1 is not rendered obvious by the cited prior art it is found to involve an inventive step (Article 56 EPC).

4.7 Claims 22, 25 each concern the manufacture in one piece from thermoplastic elastomer of a carrier-attaching body having a U-shaped attachment portion and an inverted U-shaped glass run channel portion. Since the Board has found that such a carrier-attaching body manufactured without a metal reinforcement is not obvious in the light of the prior art, it follows that the manufacture of such a body must equally be not obvious. The subject-matter of Claims 22, 25 therefore also involves an inventive step.

4.8 Since Claims 2 to 21, 23, 24, 26, 27 contain all features of the respective independent claims from which they are dependent, it follows that the subject-matter of these claims also involves an inventive step.

5. *Request for reimbursement of the appeal fee*

5.1 In its decision the Opposition Division treats inventive step of Claim 1 as granted under Point 2 "Main request". It begins on Page 5 by establishing which features are known from the closest prior art D1, continues to establish which features are not known (Page 6 second paragraph), the effect of these differentiating features (Page 6, third paragraph) and

it then defines what it considered to be the problem to be solved (Page 6, fourth paragraph). It defines this problem as "to adapt the carrier attaching body of ... D1 so as to make the seal lighter and less expensive to produce/install by adapting the carrier attaching body so as not to require a metal insert whilst still enabling the carrier to perform its function of supporting the seal in a rigid manner on the edge of the vehicle opening". In the following two paragraphs the Opposition Division states its opinion that the problem and its solution are both known in the prior art D4 and D7. In the first paragraph on Page 7 it then states that the skilled person starting from D1 and faced with the stated problem would, in the knowledge of D4 and D7, "immediately arrive at the obvious solution of forming the carrier attaching body ... of a thermoplastic elastomer ... without the use of inventive skill." In the following paragraph the Opposition Division then states that the invention "consists merely ... in the use of a well known type of material ... for the carrier attaching body of a flush glass window seal (closely analogous situation to the ... seals of D4 and D7) ... ".

5.2 In its reasoning the Opposition Division has adopted the problem-solution approach commonly used by the Boards of Appeal at the EPO and as recommended by the Guidelines C-IV, 9.5 and, in the opinion of the Board, the argumentation follows a logical chain such that a reader can understand why the Opposition Division came to the conclusion which it did. Whether the Opposition Division was correct in determining the problem to be solved and in deciding whether the skilled person would directly and unambiguously arrive at the claimed subject-matter is a matter of judgement and not a

procedural matter. This applies equally to the matter of whether the Opposition Division correctly analysed the functions of the carrier-attaching body. However, in this respect the Board notices that the definition of the function in the first paragraph of Page 7 by use of the wording "supporting the seal" and "supporting ... on the edge of the vehicle opening" does in fact define the two functions defined by the appellant.

5.3 Moreover, in the opinion of the Board it is clear from the phrase "closely analogous" that the Opposition Division considered that the teaching of D4 and D7 was sufficiently relevant to that of the arrangement of D1 that the skilled person would apply the teaching of D4 or D7 to D1. Again, it is not a procedural matter whether the Opposition Division was correct in its assessment of the obviousness of the combination. It is equally not a procedural matter whether the Opposition Division was correct in assessing the materials disclosed in D4 and D7 as being thermoplastic elastomers.

5.4 The Board therefore considers that the requirements of Rule 68 (2) EPC are fulfilled and that there has been no substantial procedural error.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance with the order to maintain the patent with the following documents:

Claims 1 to 21, 23, 24, 26, 27 as granted;

Claims 22 and 25 as filed during the oral proceedings held on 10 January 2001;

Description and figures as granted.

3. The request for reimbursement of the appeal fee is rejected.

The Registrar: The Chairman:

S. Fabiani F. Gumbel