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**Datasheet for the decision
of 19 May 2011**

Case Number: T 0870/09 - 3.2.05

Application Number: 02020180.2

Publication Number: 1291159

IPC: B29C 73/16

Language of the proceedings: EN

Title of invention:

Puncture sealing agent for a tire, and process for producing the same

Patentee:

Sumitomo Rubber Industries, Ltd.

Opponent:

Continental Aktiengesellschaft

Headword:

-

Relevant legal provisions:

EPC Art. 56, 84, 114(2)

Relevant legal provisions (EPC 1973):

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Keyword:

"Inventive step (main request, auxiliary request 1 - no; auxiliary request 2 - yes"

"Admissibility of late filed request 1c - no"

Decisions cited:

-

Catchword:

-



Case Number: T 0870/09 - 3.2.05

D E C I S I O N
of the Technical Board of Appeal 3.2.05
of 19 May 2011

Appellant: Continental Aktiengesellschaft
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Respondent: Sumitomo Rubber Industries, Ltd.
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Representative: Manitz, Finsterwald & Partner GbR
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Decision under appeal: Interlocutory decision of the Opposition
Division of the European Patent Office posted
12 February 2009 concerning maintenance of
European patent No. 1291159 in amended form.

Composition of the Board:

Chairman: W. Zellhuber
Members: W. Widmeier
E. Lachacinski

Summary of Facts and Submissions

- I. The appellant (opponent) lodged an appeal against the interlocutory decision of the Opposition Division maintaining European patent No. 1 291 159 in amended form.
- II. Oral proceedings before the Board of Appeal were held on 19 May 2011.
- III. The appellant requested that the decision under appeal be set aside and that the European patent No. 1 291 159 be revoked in its entirety.
- IV. The respondent (patent proprietor) requested as main request that the appeal be dismissed, or as auxiliary measure, that the decision under appeal be set aside and the patent in suit be maintained on the basis of any of the sets of claims filed as auxiliary requests 1 to 3 on 19 April 2011 and auxiliary request 1c submitted during oral proceedings, in the following order: 1, 1c, 2, 3. Furthermore he requested that the proceedings be continued in writing.
- V. Claim 1 of the main request (claim 1 as maintained by the opposition division) reads as follows:

"1. A puncture sealing agent for a tire, at least comprising a rubber latex, an adhesive agent, an antifreezing agent, and a surfactant, wherein natural rubber latex or natural rubber latex a part thereof being replaced by a synthetic rubber latex is used as rubber latex, propylene glycol is used as the antifreezing agent, the ratio of the propylene glycol

to the total weight of the puncture sealing agent is set from 20 to 40 % by weight, and wherein the ratio of the surfactant to the total weight of the puncture sealing agent is between 0.4 and 2.0 % by weight."

Claim 1 of auxiliary request 1 reads as follows:

"1. A puncture sealing agent for a tire, at least comprising a rubber latex, an adhesive agent, an antifreezing agent, and a surfactant, wherein natural rubber latex or natural rubber latex a part thereof being replaced by a synthetic rubber latex is used as rubber latex, propylene glycol is used as the antifreezing agent, the ratio of the propylene glycol to the total weight of the puncture sealing agent is set from 20 to 40 % by weight, wherein the ratio of the surfactant to the total weight of the puncture sealing agent is between 0.4 and 2.0 % by weight, and wherein the rubber latex is made of a deprotein natural rubber latex with the ratio of nitrogen to rubber solid content being set to 0.1 % or less by weight and the ratio of the rubber solid content to the total weight of the puncture sealing agent being set to 25 % or more by weight."

Independent claim 6 of auxiliary request 1c reads as follows:

"6. A puncture sealing agent for a tire, at least comprising a rubber latex, an adhesive agent, an antifreezing agent, and a surfactant, wherein natural rubber latex or natural rubber latex a part thereof being replaced by a synthetic rubber latex is used as rubber latex, propylene glycol is used as the

antifreezing agent, the ratio of the propylene glycol to the total weight of the puncture sealing agent is set from 20 to 40 % by weight, wherein the ratio of the surfactant to the total weight of the puncture sealing agent is between 0.4 and 2.0 % by weight, wherein the ratio of the rubber latex to the total weight of the puncture sealing agent is set from 40 to 60 % by weight and the ratio of the adhesive agent thereto is set from 10 to 30 % by weight, and wherein the puncture sealing agent is obtainable with a process comprising an adhesive agent pouring/mixing step of pouring/mixing the adhesive agent into/with the rubber latex under stirring to prepare an adhesive agent poured/mixed solution, and an antifreezing agent pouring/mixing step of pouring/mixing an aqueous propylene glycol solution wherein the propylene glycol is diluted with water into/with the adhesive agent poured/mixed solution under stirring, wherein the surfactant is mixed with the rubber latex previous to the antifreezing agent pouring/mixing step."

Claim 1 of auxiliary request 2 reads as follows:

"1. A process for producing a puncture sealing agent for a tire, at least comprising a rubber latex, an adhesive agent, and an antifreezing agent, wherein propylene glycol is used as the antifreezing agent, and further the ratio of the propylene glycol to the total weight of the puncture sealing agent is set to 20 to 40 % by weight, comprising an adhesive agent pouring/mixing step of pouring/mixing the adhesive agent into/with the rubber latex under stirring to prepare an adhesive agent poured/mixed solution, and

an antifreezing agent pouring/mixing step of pouring/mixing an aqueous propylene glycol solution wherein the propylene glycol is diluted with water into/with the adhesive agent poured/mixed solution under stirring."

VI. The following documents were in particular referred to in the appeal procedure:

D1: DE-A-197 53 630

D2: DE-A-195 45 935

D6: EP-A-0 846 552

D12: GB-A-1 497 864

VII. The appellant's arguments can be summarized as follows:

Main request

Document D1 is to be considered as closest prior art. It discloses a puncture sealing agent with a rubber latex composition as defined in claim 1, and it discloses propylene glycol as antifreezing agent, the ratio of the antifreezing agent to the total weight of the puncture sealing agent being from 1 to 50 % and 5 to 30 %, respectively, cf. page 2, line 67 to page 3, line 9, thus in the same range as specified in claim 1. Consequently, the difference between the puncture sealing agent of document D1 and the subject-matter of claim 1 is that the latter comprises a surfactant. The effect of the surfactant is indicated in paragraph [0028] of the patent in suit. For the same purpose, i.e.

for stabilising the composition, document D12 teaches the use of a surfactant in a puncture sealing agent (cf. page 2, lines 93 to 98). The amount of surfactant to be used depends on the materials used for the sealing agent and for the surfactant; however, there is no general upper or lower limit for the amount of stabilising surfactant. Also document D6 discloses a puncture sealing agent with a surfactant whose amount must necessarily be in tune with the material used for it out of the long list of possible surfactants, cf. page 3 of document D6. Thus, the limits of 0,1 to 0,3 percent indicated in document D12, which are outside the range specified in claim 1, do not teach away from the use of a surfactant in an amount of 0,4 to 2 percent by weight of the weight of the sealing agent. On the contrary, the combination of documents D1 and D12 leads in an obvious manner to the subject-matter of claim 1. There is no synergistic effect of the surfactant and the antifreezing agent; it is just an aggregation of obvious features. Thus, also starting from document D6, which discloses a puncture sealing agent with a surfactant in an amount as specified in claim 1 of the patent in suit, a skilled person would arrive in an obvious manner at the subject-matter of this claim, because document D6 already indicates that glycols other than ethylene glycol may be used as antifreezing agent.

Auxiliary request 1

Document D6 already discloses deproteinized rubber latex with the same content of nitrogen as specified in claim 1 of auxiliary request 1. Thus, the subject-matter of this claim is not further distinguished from

this document so that the same conclusion as to inventive step applies as for the subject-matter of claim 1 of the main request.

Auxiliary request 1c

Document D6 has already been considered and discussed in the opposition proceedings. A claim taking account of the disclosure of this document could therefore have been filed earlier. Auxiliary request 1c is to be considered late filed for this reason and should not be allowed.

It is established case law that a product obtained by a new and inventive process is not necessarily also new and inventive. Claim 6 of auxiliary request 1c does not refer to aggregation lumps of rubber particles and creamy material. It is thus not possible to discern when a product falls under the scope of this claim and when it does not.

Auxiliary request 2

The process of claim 1 of auxiliary request 2 differs from the process according to the example on page 5 of document D2 only in that it explicitly mentions the dilution of the propylene glycol with water. However, propylene glycol is a hygroscopic substance. Thus, in practice propylene glycol without some content of water does not exist. The effect mentioned in paragraph [0010] of the patent in suit will be achieved already with low water content. Claim 1 is not limited to a certain amount of water so that also propylene glycol usually sold with a water content of 0,5% falls under the scope

of this claim. Anyway, water is always contained in the sealing agent, such as in the surfactant or in the rubber latex. Thus, it is unavoidable that the propylene glycol is diluted with water so that it is obvious to use in any case diluted propylene glycol. The process of claim 1 of auxiliary request 2 does therefore not involve an inventive step.

VIII. The respondent's arguments can be summarized as follows:

Main request

Closest prior art is constituted by document D1. This document refers already to two measures for enhancing the storage stability of the puncture sealing agent, i.e. the addition of sulphur and oxide of zinc, cf. page 3, lines 20 to 28. Thus, there is no motivation for a skilled person to further add a surfactant to the sealing agent of document D1. Thus, one would not combine document D1 with document D12 which discloses a puncture sealing agent comprising a surfactant.

Moreover, document D12 teaches away from an amount of surfactant as specified in claim 1, because it clearly indicates that an amount of more than 0.3% by weight of surfactant is to be avoided as then the sealing effect gets lost, cf. page 2, lines 98 to 105. Furthermore, there is no hint to be found, neither in document D1 nor document D12, that the combination of propylene glycol as antifreezing agent and a surfactant in the amount as specified in claim 1 results in a stabilizing effect. When starting from document D6, the problem to be solved could be considered as enhancing the storage stability of the puncture sealing agent. However, there is no hint that a certain antifreezing agent in a

certain amount in combination with propylene glycol as antifreezing agent could be the solution. Document D6 does not give a skilled person a reason for using propylene glycol as antifreezing agent. There are hints to choose from various surfactants rather than to change the antifreezing agent. The specific combination of propylene glycol and a certain amount of surfactant as specified in claim 1 is thus not rendered obvious from prior art.

Auxiliary request 1

Paragraph [0016] of the patent in suit refers to the advantages of deproteinized rubber latex. This kind of latex is a further distinction over document D1. However, it is acknowledged that the sealing agent of document D6 comprises such a rubber latex.

Auxiliary request 1c

In the Board's communication attached to the summons for oral proceedings document D6 has not been mentioned. In the oral proceedings, however, it turned out that it is considered as closest prior art for claim 1 of the main request and auxiliary request 1. As this was surprising for the respondent, auxiliary request 1c should be allowed in order to respect the respondent's right to be heard.

The process referred to in claim 6 of auxiliary request 1c is novel and inventive. Thus, also the product obtained by this process is likewise novel and involves an inventive step. In a product not produced by this process generation of aggregation lumps of rubber

particles will occur. Thus, it is possible to distinguish a product obtained by the process referred to in claim 6 from a sealing agent obtained by another process.

Auxiliary request 2

Document D2 does not disclose the use of propylene glycol. The example on page 5 refers to ethylene glycol. Moreover, claim 1 of auxiliary request 2 requires that the propylene glycol is intentionally diluted with water. This is also expressed in paragraph [0035] of the patent in suit. The dilution is then added to the mixture of the other components. If the propylene glycol contains, due to its hygroscopic nature, some water molecules then this does not constitute a dilution. Neither document D2 nor the other documents disclose such an active step of diluting propylene glycol with water. This step is also not rendered obvious from the prior art documents as they do not give a skilled person any motivation for it. Thus, the process of claim 1 of auxiliary request 2 involves an inventive step.

Reasons for the Decision

1. *Main request*

Document D6 discloses a puncture sealing agent for a tyre (cf. page 2, lines 3 to 6), comprising natural rubber latex, an adhesive agent, an antifreezing agent, and a surfactant (cf. page 2, lines 40 to 54). The ratio of the antifreezing agent to the total weight of

the puncture sealing agent is 14 to 25% by weight (cf. page 4, lines 48 to 50), and the ratio of the surfactant to the total weight of the puncture sealing agent is between 0.0036 to 0.648% by weight (cf. page 2, lines 46 and 47 and Table 1 which indicates a rubber solid content of 36% of the total weight of the puncture sealing agent). The content of antifreezing agent and surfactant are within the respective ranges specified in claim 1. The subject-matter of this claim differs therefore from document D6 in that propylene glycol is used as the antifreezing agent. However, document D6 refers besides ethylene glycol and polyethylene glycol to other glycols which may be used as antifreezing agents (cf. page 4, line 48). With the hint to "other" glycols in document D6 a person skilled in the art will include any glycol which is suitable as an antifreezing agent. Propylene glycol is a common and usual antifreezing agent. The skilled person will therefore consider also propylene glycol as one of the possible antifreezing agents so that it is just a matter of choice to use propylene glycol instead of ethylene glycol or polyethylene glycol.

The subject-matter of claim 1 of the main request does therefore not involve an inventive step with respect to the disclosure of document D6.

2. *Auxiliary request 1*

The additional feature of claim 1 of auxiliary request 1 that the rubber latex is made of a deprotein natural rubber latex with the ratio of nitrogen to rubber solid content being set to 0.1% or less by weight and the ratio of the rubber solid content to the

total weight of the puncture sealing agent being set to 25% or more by weight is also a feature of the puncture sealing agent of document D6 (cf. page 2, lines 40 to 42 and table 1). This feature cannot therefore further distinguish the subject-matter of this claim from document D6. For the same reasons as the subject-matter of claim 1 of the main request also the subject-matter of claim 1 of auxiliary request 1 lacks an inventive step with respect to document D6.

3. *Auxiliary request 1c*

Auxiliary request 1c was submitted at the oral proceedings and is thus to be considered late filed within the meaning of Article 114(2) EPC. The respondent argued that this request should nevertheless be allowed because the Board has not mentioned document D6 in its communication attached to the summons for oral proceedings. However, this communication was clearly declared as a preliminary opinion of the Board, document D6 has already been discussed in the opposition procedure and is subject of the decision under appeal (cf. point II.5), and the appellant has based his appeal among other documents also on document D6 and referred to it in the statement setting out the grounds of appeal (cf. pages 1, 2 and 5 of the grounds of appeal). Moreover, document D6 is cited in the patent in suit as related prior art and constitutes the starting point of the invention (cf. paragraphs [0004] to [0007] of the patent in suit). It could thus not have been a surprise for the respondent that this document is also considered in the appeal procedure. Nevertheless, oral proceedings were adjourned for 90 minutes after the Board had announced its conclusions

on the main request and auxiliary requests 1 and 2, thus giving the respondent the required time for formulating the further auxiliary request 1c.

Claim 6 of auxiliary request 1c relates to a puncture sealing agent and specifies besides the product features of this sealing agent the process by which it is obtainable. However, a puncture sealing agent having these product features must not necessarily have been produced by such a process. If a puncture sealing agent does not form aggregations lumps of rubber particles then this is not exclusively the result of the process specified in claim 6. There may be other measures which lead to the same result. Consequently, a puncture sealing agent obtained by this process cannot necessarily be distinguished from a puncture sealing agent obtained by a different process. Thus, the process specified in claim 6 does not characterize the product which is obtained by it. This constitutes a lack of clarity and conciseness within the meaning of Article 84 EPC.

One of the criteria for exercise of discretion of the Board under Article 114(2) EPC is whether a claim of a late filed request is prima facie allowable or not. Due to its lack of clarity claim 6 of auxiliary request 1c is prima facie not allowable. This request is therefore rejected as late filed.

4. *Auxiliary request 2*

One of the steps of the process of claim 1 of auxiliary request 2 is pouring or mixing an aqueous propylene glycol solution, wherein the propylene glycol is

diluted with water, into or with the mixture of adhesive agent and rubber latex. Although propylene glycol is a hygroscopic substance and absorbs therefore under normal circumstances some water from the environment one would not designate propylene glycol as it is sold and used as diluted with water. The expression "wherein the propylene glycol is diluted with water" in claim 1 is to be understood as actively diluting the propylene glycol with water rather than as the normal absorption of water due to the hygroscopic nature of propylene glycol.

None of the documents considered in the appeal procedure discloses a process for producing a puncture sealing agent where propylene glycol as the antifreezing agent is diluted with water prior to pouring or mixing it into or with the solution of the rubber latex and the adhesive agent. These documents also lack any hint to act in that way. This process step also cannot be considered as an arbitrary measure because, as can be seen from a comparison of Examples A and B with Example C of Table 1 of the patent in suit, it lowers the amount of generated rubber aggregation lumps significantly. Consequently, the process of claim 1 of auxiliary request 2 is new and involves an inventive step.

5. *Request to continue in writing*

The discussion during oral proceedings has not revealed any new facts which would require a further consideration of the case in writing. As stated above, the respondent could not have been surprised by the fact that document D6 was considered also in the appeal

procedure and discussed during oral proceedings. Nevertheless, the respondent has had the opportunity to file a new auxiliary request after discussion of this document. The present decision is thus based only on grounds and evidence on which the parties have had the opportunity to present their comments. The requirements of Article 113 (1) EPC are therefore met. The respondent's request to continue the proceedings in writing is rejected for this reason.

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 on the basis of the following documents:
 - claims 1 to 5 as filed as auxiliary request 2 on 19 April 2011;
 - description, pages 2 and 7 filed during oral proceedings, and pages 3 to 6 and 8 as granted;
 - drawings, pages 11 to 13 as granted.

The Registrar:

The Chairman:

D. Meyfarth

W. Zellhuber