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**Datasheet for the decision
of 17 December 2008**

Case Number: T 1630/06 - 3.3.01
Application Number: 01102492.4
Publication Number: 1229090
IPC: C09D 11/10
Language of the proceedings: EN

Title of invention:

A polyurethane resin, a coating composition comprising a polyurethane resin, use of a polyurethane resin for printing plastic substrates, method of producing a polyurethane resin, a method of producing a laminate carrying a printed image

Patentee:

Siegwerk Benelux NV

Opponents:

Tennants Inks & Coatings Supplies Ltd.
Sun Chemical Corporation

Headword:

Polyurethane ink binders/SIEGWERK

Relevant legal provisions:

EPC Art. 100(a)

Keyword:

"Inventive step (yes) - solution not obvious even if the problem to be solved is regarded as to provide an alternative"

Decisions cited:

T 0129/88

Catchword:

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Summary of Facts and Submissions

I. The representative of Opponent II, Sun Chemical Corporation, filed an appeal in the name of the patent proprietor against the decision of the opposition division posted on 02 August 2006 rejecting both oppositions against European patent no. 1 229 090. The appeal was received by the EPO on 12 October 2006 and the appeal fee paid on the same day.

With the letter dated 27 October 2006, the representative stated that he acted on behalf of Sun Chemical Corporation and not on behalf of the patent proprietor and requested that the notice of appeal be amended accordingly under Rule 88 EPC 1973. The statement setting out the grounds for appeal was received by the EPO on 12 December 2006.

II. The decision under appeal was based on claims 1 to 25 as granted, independent claim 1 reading as follows:

"1. A polyurethane resin being the reaction product of at least one diisocyanate and components having isocyanate reactive functional groups, said components comprising a first group of at least one polyol, a second group of at least one polyol and a third group of at least one polyol, and optionally at least one amine and a reaction terminating agent, wherein all polyols of said first group are of an average molecular weight in the range of between 1000 to 10000 g/mol, wherein all polyols of said second group are of an average molecular weight in excess of 10000 up to 20000 g/mol, wherein all polyols of said third group are of an average molecular weight of equal or less than 800 g/mol and wherein in particular the ratio of

the equivalent weights of the diisocyanate to the components having isocyanate reactive functional groups is selected such that essentially all of the isocyanate groups of the diisocyanate are present as the reaction product with one of said isocyanate reactive functional groups."

III. The oppositions had been filed on the grounds under Article 100 (a) (lack of novelty and of inventive step) and 100 (b) EPC (sufficiency of disclosure).

IV. The following documents were *inter alia* cited during the opposition procedure:

(D1) US-A-5 654 390

(D3) EP-A-0 604 890

(D4) Mitchanol International News Letter, Mitchanol International Limited, Mitchum/UK, 10 pages, dated "August 1996" on the seventh page

(D5) Brochure "MITCHANOL INTERNATIONAL Resin makers for the printing ink world, 12 pages, Mitchanol International Limited, Mitchum/UK, not dated

(D6) G. Oertel (ed.), Polyurethane Handbook, 2nd edn., Hanser Publishers, München/DE, 1994, pages 26-27, 55-72, 105-106, 479-482

(D7) Statement of Marilyn Cindy Carter (with enclosures MC1-MC6), not dated, 7 pages

(D8) Mitchanol International Technical Data, SURKOPAK 5277, Mitchanol International Limited, Mitchum/UK, 2 pages and one page "FORMULATION/PRODUCTION SHEET"; not dated

(D11) US-A-5 100 997

(D12) T. Higuchi et al., "High Molecular Weight Polyols for Two-Component Polyurethane Curing Systems",

33rd Annual Polyurethane Technical/Marketing
Conference, Sept. 30-Oct.3, 1990, 375-379

V. The opposition division decided that

- grounds under Article 100 (b) EPC did not prejudice the maintenance of the patent as the person skilled in the art knew how to determine the average molecular weight of the polyols and how to produce high molecular weight polyols;
- the subject-matter claimed was novel in view of the alleged public prior use (see documents (D4)-(D8)) because it was not proven that the product used fell under the scope of the claims; it was also novel in view of document (D1) which neither disclosed the ratio of isocyanate groups to groups capable of reacting with the isocyanate groups, nor the combination of the three polyols.

As regards inventive step, the opposition division agreed with the parties in that document (D3) was the closest prior art. The problem to be solved was to provide a resin with improved initial adhesiveness and improved heat stability. When trying to solve this problem, the person skilled in the art would not have consulted document (D11) as this document does not deal with initial adhesiveness and does not suggest the problem of delamination under heat (heat stability).

VI. The present decision is based on claims 1 to 25 submitted at the oral proceedings of 17 December 2008 before the Board.

These differ from the claims as granted in that the range for the average molecular weight of the second group polyols has been restricted to between 11 500 and 18 000 g/mol. This was achieved by replacing in the wording of claim 1 (see point II above) the words "excess of 10000 up to 20000" by "the range of between 11500 and 18000" and by making respective amendments in claims 3, 5, 19, 22 and 24.

VII. In the written procedure the Appellant *inter alia* argued that the subject-matter of the claims was not novel. He did not maintain this objection - which was based on document (D1) - against the claims amended during the oral proceedings (see point VI above).

He considered document (D3) to represent the closest prior art for the assessment of inventive step.

He argued that no specific technical effect had been demonstrated in view of document (D3). So the problem to be solved was to provide an alternative binder for an ink. Document (D3) taught to use a polyol having an average molecular weight in the range of from 3 000 to 10 000 and mentioned that low molecular weight polyols gave rise to low adhesiveness. It was thus obvious for the person skilled in the art, so he argued, to add a higher molecular weight polyol when making the polyurethane, namely one having an average molecular weight between 11 500 and 18 000. For this reason, the subject-matter of the claims did not involve an inventive step.

VIII. The Respondent-Patent Proprietor did not maintain in the oral proceeding before the Board its objection that

the appeal was inadmissible due to being filed in the name of the Patent Proprietor who was not adversely affected by the decision.

The Respondent-Patent Proprietor argued that document (D1) did not disclose the use of the polyol having an average molecular weight in the range of between 11 500 and 18 000 so that the subject-matter of the claims was novel.

He also considered document (D3) to represent the closest prior art. The problem to be solved was to provide a resin with improved heat resistance and improved initial adhesiveness. The comparative test in the patent in suit showed that this problem was solved. The solution provided by the patent in suit was not derivable from document (D3) which was silent on high molecular weight polyols, nor from its combination with (D11) or (D12). If, however, the problem to be solved could only be considered as to provide an alternative binder for an ink, then document (D3) taught to follow strictly the teaching of the document in order to avoid disadvantages, such as a loss in blocking resistance. For this reason, this document gave no indication to add a third polyol.

IX. Opponent I did not file any observations during the appeal. Opponent I was not represented during the oral proceedings before the Board as announced in its letter dated 18 November 2008.

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

The Respondent-Patent Proprietor requested that the decision under appeal be set aside and the patent be maintained on the basis of claims 1 to 25 submitted during the oral proceedings on 17 December 2008.

Opponent I did not submit any requests during the appeal procedure.

XI. At the end of the oral proceedings the decision of the Board was announced.

Reasons for the Decision

1. *Admissibility*

The Respondent-Patent Proprietor did not maintain its objection that the appeal was inadmissible. The Board is satisfied that the appeal is admissible for the reasons given in its communication dated 30 November 2006.

2. *Article 123 EPC*

The claims 1, 3, 5, 19, 22 and 24 of the patent as granted were amended by restricting the average molecular weight of the second group of polyols from "in excess of 10000 to 20000" to a range of between 11 500 and 18 000. These amendments have a basis in claim 5 of the application as originally filed.

3. *Novelty*

Novelty was no more under dispute between the parties. The subject-matter claimed differs from the disclosure of document (D1) or (D3) in that neither of these documents discloses polyurethanes made from the three groups of polyols having average molecular weights within the ranges given in present claim 1.

The same applies to the alleged public prior use (see point V above) as none of the polyols specified in the two recipes for the preparation of polyurethanes filed was shown to have an average molecular weight within the range of between 11 500 and 18 000 (see the statement in (D7) including its enclosures MC1 and MC5; see the page "FORMULATION/PRODUCTION SHEET" of document (D8)). The alleged public prior use was raised by Opponent I who did not play an active part in the appeal proceedings (see points IX and X above). The Board was neither in a position to, nor under any obligation under Article 114 (1) EPC, to analyse these two polyurethanes on its own motion (see T 0129/88, OJ EPO 1993, 598, point 3 of the reasons).

Hence, the subject-matter of the present claims is considered to be novel.

4. *Inventive step*

4.1 The Appellant agreed with the Respondent-Patent Proprietor in that document (D3) is to be considered as the closest prior art.

Like the patent in suit, document (D3) relates to binders for printing inks (see (D3), claims 8-10; see claim 25 of the patent in suit). In contrast to this, document (D1) does not refer to printing inks but to "urethane products requiring very high flex fatigue resistance such as belts, automotive and industrial products and non-pneumatic tires." (see column 1, lines 14-17). Hence, the Board is satisfied that (D3) represents the closest prior art.

4.2 Document (D3) discloses polyurethanes prepared by reacting a diisocyanate with

- a first polyol having a number average molecular weight of 3 000 to 10 000, and
- a second polyol having a number average molecular weight of not more than 200 (see claim 1 and page 5, line 2).

4.3 The Appellant considered the problem to be solved in view of document (D3) to be the provision of an alternative binder for printing inks (see point VII above). This problem was indeed solved as is evident from the examples of the patent in suit. In view of the outcome of this decision, there is no need to define a more ambitious problem.

4.4 Hence, it has to be assessed whether or not it would have been obvious for the person skilled in the art to have arrived at the solution of the patent in view of the disclosure of document (D3) or its combination with that of any other prior art document cited.

4.4.1 Document (D3) teaches to use a mixture of a low and of a high molecular weight polyol for preparing the

polyurethane (see point 4.2 above). It mentions that the resulting ink is poor in blocking resistance whenever the molecular weight of one of the polyols exceeds the range indicated in the claims of said document (see (D3), page 5, lines 6-7 and 15-17). On the other hand, it states that the adhesiveness of the ink and its adaptability for boiling or retorting treatment is low whenever the molecular weight of the high molecular weight polyol is below the range indicated (see page 5, lines 4-6).

This document thus gives the skilled reader the impression that the average molecular weights of the low and the high molecular weight polyols had been carefully optimised in order to yield polyurethanes which are suitable as binders in printing inks.

Therefore, document (D3) gives no indication to the person skilled in the art looking for alternative binders for printing inks to modify the mixture of the low and the high molecular weight polyol described therein. Hence, this document alone cannot render the subject-matter of the present claims obvious which requires a mixture of three polyols differing in their average molecular weights. In this context it makes no difference whether the molecular weights are expressed as number averages as in document (D3) or as weight average molecular weights as in the patent in suit (see page 4, line 51 of the patent in suit and page 5, lines 2-4 of document (D3)).

- 4.4.2 Moreover, the person skilled in the art looking for alternative binders for printing inks would not have deduced from document (D11) or (D12) to add a third

polyol to the composition for making the polyurethane according to document (D3) as neither (D11) nor (D12) deals with binders for printing inks (see (D11), column 6, lines 32-40, and (D12), page 375, the first sentence under the heading "INTRODUCTION"). Likewise, document (D1) which does not refer to printing inks (see point 4.1 above) would not have been considered by the person skilled in the art when trying to solve the technical problem defined above.

- 4.4.3 As all the present claims require that the polyurethane be prepared from the mixture of the three polyols defined in claim 1, the subject-matter of the present claims involves an inventive step.

5. *Adapted description*

The Patent Proprietor provided a description adapted to the amended claims. The Appellant did not object to the adapted description. The Board is satisfied that the amendments in the description merely serve to adapt it to the amended claims.

6. For these reasons, the present claims and the description adapted thereto meet the requirements of the EPC.

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 as amended in the following version:

Description

Pages 2, 4, 7, 8 and 13 of the patent specification;
pages 3, 5, 6, 9, 10, 11 and 12 received during the
oral proceedings on 17 December 2008.

Claims

Claims 1 to 25 received during the oral proceedings on
17 December 2008.

The Registrar:

The Chairman:

M. Schalow

P. Ranguis