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Datasheet for the decision of 4 December 2018

Case Number: T 0420/15 - 3.3.03

Application Number: 06782343.5

Publication Number: 1925629

IPC: C08G18/75, C08G18/38, G02C7/02

Language of the proceedings: EN

Title of invention:
POLYTHIOURETHANE
-BASED POLYMERIZABLE COMPOSITION AND OPTICAL RESIN OBTAINED FROM THE SAME

Patent Proprietor:
Mitsui Chemicals, Inc.

Opponent:
PPG Industries Ohio, Inc.

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - (no)- main request, first auxiliary request

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Case Number: T 0420/15 - 3.3.03

D E C I S I O N
of Technical Board of Appeal 3.3.03
of 4 December 2018

Appellant: (Opponent)	PPG Industries Ohio, Inc. 3800 West 143rd Street Cleveland, OH 44111 (US)
Representative:	f & e patent Fleischer, Engels & Partner mbB, Patentanwälte Braunsberger Feld 29 51429 Bergisch Gladbach (DE)
Respondent: (Patent Proprietor)	Mitsui Chemicals, Inc. 5-2, Higashi-Shimbashi 1-chome Minato-ku Tokyo 105-7117 (JP)
Representative:	Wills, Andrew Jonathan Mewburn Ellis LLP City Tower 40 Basinghall Street London EC2V 5DE (GB)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 19 December 2014 rejecting the opposition filed against European patent No. 1925629 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman	D. Semino
Members:	M. C. Gordon
	W. Ungler

Summary of Facts and Submissions

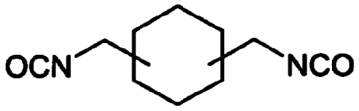
I. The appeal lies against the decision of the opposition division posted on 19 December 2014 rejecting the opposition filed against European patent number 1 925 629.

II. The patent was granted with a set of 12 claims whereby claim 1 read as follows:

1. A polymerizable composition comprising,

(A) an alicyclic isocyanate compound represented by the following Formula (1) and/or by following Formula (2) :

(1)



(2)

(B) at least one polythiol compound which is at least one compound selected from:

4-mercaptomethyl-1,8-dimercapto-3,6-dithiaoctane,
1,1,3,3-tetrakis(mercaptomethylthio)propane,
5,7-dimercaptomethyl-1,11-dimercapto-3,6,9-trithiaundecane,
4,7-dimercaptomethyl-1,11-dimercapto-3,6,9-trithiaundecane, and
4,8-dimercaptomethyl-1,11-dimercapto-3,6,9-trithiaundecane, and

(C) at least one diol selected from 1,4-butanediol, triethylene glycol and diethylene glycol.

III. A notice of opposition against the patent was filed in which revocation of the patent on the grounds of Article 100(a) EPC (lack of novelty, lack of inventive step) was requested.

The following documents, *inter alia*, were cited in the opposition proceedings:

D1: EP-A-1 746 118
D2: EP-A-1 878 758

D3: WO-A-01/36508
D4: EP-A-1 923 415 (application in co-pending case T 727/15)
D4a: English translation of JP 2005-339 721 (one of the priority documents of D4)
D4b: English translation of JP 2006-65994 (one of the priority documents of D4)
D5: English translation of JP 2005/237382 (one of the priority documents of D4; also a priority document of the patent in suit).

IV. According to the decision, the ground of opposition pursuant to Article 100(b) EPC, raised for the first time at the oral proceedings before the opposition division was not admitted.

Novelty over the disclosures of D1, D2 and D4 was acknowledged.

Inventive step was recognised starting from D1 and from D3 as the closest prior art. With respect to D3, it was held that the subject-matter claimed was distinguished by the selection of the particular polyols. No effect had been shown with respect to other polyols. However the compositions containing polyol were considered to exhibit improved tintability compared to resins not containing a polyol. Hence the problem was the provision of compositions having improved tintability. As the prior art contained no indication to the claimed solution, the claimed composition was inventive.

V. The opponent (appellant) lodged an appeal against this decision, maintaining objections with respect to lack of novelty and lack of inventive step. Furthermore the non-admittance of the ground of opposition pursuant to Article 100(b) EPC was challenged.

These matters were pursued in a letter of 11 April 2016 and a further letter of 30 October 2018, following issue of the communication of the Board.

VI. The patent proprietor/respondent replied and filed with the rejoinder an auxiliary request, wherein claim 1 was amended by the introduction of the following wording at the end:

"wherein the composition is obtained by (i) mixing component (A) with the component (C) and then adding component (B); or (ii) mixing the components (A),(B) and (C) at once."

Further submissions were made with letters of 4 May 2018, 31 October 2018 and 20 November 2018.

VII. Oral proceedings were held before the Board on 4 December 2018.

VIII. The arguments of the appellant, insofar as relevant for the present decision, can be summarised as follows:

With respect to inventive step over D3, the document also related to compositions for optical elements and disclosed polymerisable compositions from components of the classes according to those of claim 1. The only difference was the definition of specific members within each of these groups.

The evidence provided by D4a, which although not prepublished could be taken as relevant experimental evidence, showed that a composition containing butanediol did not result in a useful optical product, but gave rise to a runaway polymerisation. In particular this indicated that an essential feature of

the claim was lacking, i.e. that the claim was not reproducible over its entire scope. This was a defect not only with respect to Article 84 EPC, but also with respect to sufficiency of disclosure and was relevant in the analysis of inventive step.

In the letter of 11 April 2016 it had already been submitted that the arguments advanced in support of the objection of insufficiency of disclosure provided clear evidence that butanediol did not necessarily lead to a usable product, meaning that the problem of providing an alternative - useful - product could not be considered as having been solved over the entire scope of the claim.

The relevance of this argument for the assessment of inventive step could therefore not be considered as late filed since it had been invoked in the letter of 11 April 2016 in response to the respondent's reply to the statement of grounds of appeal.

Thus the objective problem had to be formulated as the provision of a further polymerisable composition regardless of its suitability for any particular use. This problem was solved in a non-inventive manner by arbitrarily selecting representatives of each class of monomers from the disclosure of D3.

The same objections applied to the auxiliary request since this did not restrict the process to that purportedly shown not to give rise to the indicated problems.

IX. The arguments of the respondent, insofar as relevant for the present decision can be summarised as follows.

The identification of D3 as closest prior art was based on an inadmissible approach, since it was necessary to make selections from the disclosure thereof in order artificially to construct the subject-matter invoked. In particular polyols were disclosed only as optional components.

The chain of argument based on D4a had to be considered as late filed, never having previously being invoked in the context of inventive step in the procedure. On the contrary it was an attempt to reintroduce the - not admitted - objection of insufficiency of disclosure. The evidence adduced by the appellant, comparative example 1 of D4a, showed that in this particular case a polymerisable composition containing butanediol did not result in a usable composition. The patent explained the method that was to be adopted in order to arrive at a successful outcome when using butanediol. This method was however not employed in D4a, meaning that comparative example 1 of D4a could not serve as a valid comparative example. If anything, comparative example 1 of D4a would speak in favour of inventive step. The patent established that the claimed restricted set of compositions compared to D3 did lead to useful compositions and provided a teaching of how this was to be accomplished. There was thus no need to draft the claims to exclude those instances where no useful result was obtained.

It was inevitably the case for any patent claim that an embodiment falling within its scope which would not lead to the required result could be constructed. This however did not put inventive step into question. On

that basis the reasoning of the opposition division had to be seen as correct, and an inventive step should be acknowledged

The auxiliary request specified the manner of preparing the composition and expressly covered that sequence of steps shown to avoid the problem of runaway reaction.

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

XI. The respondent requested that the appeal be dismissed (main request). In the alternative maintenance of the patent on the basis of the auxiliary request, filed with the rejoinder to the statement of grounds of appeal was requested.

Reasons for the Decision

1. Main Request - inventive step

1.1 Closest prior art

The patent is directed to the production of a polymerisable composition for use as an optical resin, i.e. for preparing lenses (paragraph [0001], [0010], [0011], [0012], [0013]). *Inter alia* it is required that the polymerised compositions exhibit properties such as high refractive index, high Abbe's number as well as suitable mechanical properties and excellent working properties (paragraph [0003]).

D3 similarly relates to the technical field of preparation of an optical polymerisate and defines the same requirements (title; page 3, lines 14-20).

Accordingly D3 can be considered to represent the closest state of the art.

1.2 Distinguishing feature

According to D3, claim 1 and page 4, lines 14-34, the polymerisable composition is based on a first component comprising at least one polyisocyanate reactant having at least two functional groups selected *inter alia* from isocyanate and being the reaction product of a polythiol monomer having at least two thiol groups, a polycyanate monomer and an optional reactive hydrogen component and a second component containing at least one polyamine reactant having primary or secondary amine functional groups.

Operative claim 1 employs the term "comprising" indicating that the specified components are mandatory, but that the composition is not limited thereto. Hence the presence in D3 of components which are not specified in operative claim 1 does not modify the present analysis.

According to D3 (page 6, lines 10ff) one of the permissible dithiol compounds is 4-mercaptomethyl-3,6-dithia-1,8-octandithiol (page 3, line 16), which is the first named dithiol in operative claim 1.

Polyisocyanates are disclosed in D3 *inter alia* on page 11, starting from line 5 where bis(isocyanatomethyl)cyclohexane is listed among the options (page 11, line 11). Permissible diols as the optional reactive hydrogen component are specified on page 15 where in line 30 butane 1,4-diol, and in line 33 diethylene glycol are specified. Thus all mandatory components of operative claim 1 are to be found in D3.

However the specific combination thereof is not disclosed.

Accordingly the subject-matter claimed is distinguished from the disclosure of D3 by restriction to a specific subset of components - some of which are disclosed therein as optional (diols) - selected from within the disclosure thereof.

It is correct, as argued by the respondent, that diols are disclosed in D3 only as optional components. However no conditions are reported under which these are to be employed, i.e. it is not the case that the - optional - use of diols is contingent on a certain set of preconditions being met which might indeed represent a two-step selection. Accordingly the observation of the respondent is correct, but of no relevance when assessing the status of the diols as a distinguishing feature with respect to D3.

Thus in identifying the relevant disclosure of D3 no artificial or restricted *ex post facto* interpretation needs to be applied, contrary to the position of the respondent.

1.3 Technical effect and technical problem

1.3.1 According to the examples of the patent, compositions prepared from the three monomers specified in claim 1 result in compositions usable for optical devices, whereas compositions lacking the active hydrogen compound exhibit poor properties in particular of tintabilty and impact resistance.

1.3.2 However the experimental data of D4a, and D4b which are priority documents of D4, which document shares two -

other - priority documents, *inter alia* D5 - with the present patent, show the following:

According to comparative example 1 of D4a and D4b (the same example in each case) compositions are prepared from the same components and proportions as employed in the first stage of example 1 of the patent in suit. However the difference is that in D4a/D4b 1,4-butane diol and 4-mercaptomethyl-1,8-dimercapto-3,6-dithiaoctane were added at once (D4a, pages 28 and 29, example 1). This resulted in a runaway reaction as evidenced by abrupt heat generation and resulting in high viscosity making moulding of the resulting composition impossible. In the procedure adopted in example 1 of the patent in suit 1,4-butanediol was added, stirred, the mixture then cooled, stirred and at that point the mercapto compound added.

Since the components employed in comparative example 1 of D4a fall within the definition of operative claim 1 the resulting polymerisable composition also falls within the scope of operative claim 1.

However as confirmed by D4a, the product so obtained, while in terms of its constitution resulting from a polymerisable composition falling within the scope of operative claim 1, is unsuitable for forming a lens.

This evidence shows that the claim encompasses embodiments which do not give rise to the desired properties, but produce a polymer composition which is unsuitable for the envisaged use.

1.3.3 The respondent challenged the admissibility of this approach, arguing that D4a had not been previously invoked in association with an objection of lack of

inventive step. However in its response to the appeal, on page 3, section 2 with respect to the matter of sufficiency of disclosure the respondent acknowledged the evidence of this example, arguing that this was an isolated case within the scope of the claim and was associated with the particular diol. It was also noted in the first paragraph of page 4 of the letter that the patent acknowledged this problem in paragraphs [0038] and [0039], and taught that this could be avoided by adopting a particular sequence of addition of the components as explained therein:

[0038] Next, processes for producing the resin of the invention will be explained.
The resin of the invention can be obtained by the reaction between the above-mentioned components (A) to (C). The order of mixing the components is not particularly limited, but for example, there may be employed:

(i) a process which includes first reacting the component (A) with the component (C) and then adding the component (B) thereto to carry out a polymerization; or
(ii) a process which includes mixing the components (A), (B), and (C) at once to carry out a polymerization.

Herein, for the polymerization process, for example, a process which includes curing by heating can be employed.
[0039] When the component (C) is 1.4-butanediol, which lacks an ether bond in the molecular structure, it is preferable to employ the above-mentioned process (i). In this manner, sudden heat generation or viscosity increase can be further controlled upon mixing the components.

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In particular the method (ii) corresponds to that employed in D4a, comparative example 1 whilst method (i) is that employed in the examples of the patent in suit.

1.3.4 The appellant in the subsequent letter of 11 April 2016 advanced the argument that this evidence would also point to a deficit with respect to inventive step, in that the required technical effect was not obtained over the entire scope of the claims (paragraph bridging pages 4 and 5 of said submission).

This argument, even if not advanced in the statement of grounds of appeal, can be regarded as being in direct reply to the position taken by the respondent in the rejoinder. Furthermore it relies on no new facts, evidence or technical argument, but simply realigns the

significance of the facts on file with respect to the Articles of the EPC.

1.3.5 Consequently the Board does not consider this argument as being late filed.

1.3.6 The patent does indeed indicate measures in terms of the process to be taken in order to avoid the problem of run-away polymerisation as explained in paragraphs {0038} and {0039] as noted above. However operative claim 1 is directed to a product and there is no definition or restriction in terms of any process aspects. Accordingly the presence in the description of relevant information as to the process to be adopted cannot serve to overcome the objection raised.

1.3.7 The evidence is thus that compositions falling within the terms of the claim in respect of the monomer composition do not necessarily, i.e. over the entire scope of the claim, result in usable (mouldable) compositions. Under these circumstances, the only technical problem which can be formulated is the provision of further polymerisable compositions based on the teaching of D3, regardless of their suitability for any particular use.

The respondent argued additionally that it was almost inevitable that for any patent claim a non-operational embodiment falling within its scope could be constructed (see section IX, penultimate paragraph, above).

The above conclusions on the formulation of the objective technical problem are however based not on some non-disclosed, theoretical, notionally constructed

composition that falls under the terms of the claim but relies on an explicitly named component of the claims (butanediol) and on experimental evidence provided by the proprietor itself.

Accordingly this argument is not found persuasive.

1.4 Solution to the problem - obviousness

Said problem was solved by selecting - in the light of the evidence arbitrarily - components, including those stated to be optional, from within the teaching of D3.

Such an approach involving an arbitrary combination of features disclosed in the closest prior art itself is inherently obvious as a solution to such a minimal problem.

Consequently the subject-matter of claim 1 of the main request does not meet the requirements of Article 56 EPC.

2. Auxiliary request

In contrast to the main request, claim 1 of the auxiliary request contains definitions of the process steps (see section VII, above).

However both alternatives of paragraph [0038] are encompassed.

The examples of the patent in suit employ the first method, i.e. two step addition, resulting in a mouldable composition. As noted above, in comparative example 1 of D4a the second method, i.e. addition of all components at once is exemplified resulting in a

run-away polymerisation and an unusable product.

Since both alternatives are covered by the claim, there is no difference in substance compared to the main request with the consequence that the same conclusion with respect to inventive step applies.

As the parties have not provided additional and separate arguments with regard to inventive step of the auxiliary request, there is no need for the Board to elaborate on the issue in any further detail.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The patent is revoked.

The Registrar: The Chairman:

G. Rauh D. Semino

Decision electronically authenticated