Aktenzeichen / File Number / Numéro du dossier

T 0970191 -3.3.3

In der Anlage erhalten Sie

- ☐ eine Kopie des Berichtigungsbeschlusses
- ☐ ein korrigiertes Vorblatt (Form 3030)
- ☐ einen Leitsatz / Orientierungsatz (Form 3030)
- ☐ _____

Please find enclosed

- ☒ a copy of the decision correcting errors
- ☐ a corrected covering page (Form 3030)
- ☐ a headnote / catchword (Form 3030)
- ☐ _____

Veuillez trouver en annexe

- ☐ une copie de la décision rectifiant des erreurs
- ☐ une page de garde (Form 3030) corrigée
- ☐ un sommaire / une phrase vedette (Form 3030)
- ☐ _____

Anmeldung Nr. / Patent Nr.: _____ (soweit nicht aus der Anlage ersichtlich)

Application No. / Patent No.: 88109706.7 (if not apparent from enclosure)

Demande n° / Brevet n°: _____ (si le n° n'apparaît pas sur l'annexe)

D. Spigarelli

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0970/91 - 3.3.3

D E C I S I O N
of 9 January 1995 correcting errors in the Decision of the Technical Board of Appeal 3.3.3 of 29 November 1994

Appellant: MITSUI TOATSU CHEMICALS, Inc.
2-5 Kasumigaseki 3-chome
Chiyoda-Ku
Tokyo 100 (JP)

Representative: Schüler, Horst, Dr.
Patentanwalt
Kaiserstrasse 69
D-60329 Frankfurt (DE)

Decision under appeal: **Decision of the Examining Division of the European Patent Office dated 2 August 1991 refusing European patent application No. 88 109 706.7 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: C. R. J. Gérardin
Members: P. Kitzmantel
M. K. S. Aúz Castro

In application of Rule 89 EPC the decision given on 29 November 1994 is hereby corrected as follows:

On page 7, section 4.1.2 the first sentence of the second paragraph

> "D1 and D3 (in view of its aforementioned priority and publiation dates, for the purposes of inventive step, to be considered only for the non-overlapping Contracting States CH, GB, LI and NL) both relate to optical lenses having appropriate optical properties (refractive index, transparency, coloration) and - although making use of compositions meeting the essential requirements of present Claims 1 and 2 - do not comprise any suggestion as to the use of these compositions as coating or adhesive materials."

is amended to read:

> "D1 relates to optical lenses having appropriate optical properties (refractive index, transparency, coloration) and - although making use of compositions meeting the essential requirements of present Claims 1 and 2 - does not comprise any suggestion as to the use of these compositions as coating or adhesive materials."

The Registrar:

E. Görgmaier

The Chairman:

C. Gérardin

0038.B

10.1.95

BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS | BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE | CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

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(C) [X] To Chairmen

D E C I S I O N
of 29 November 1994

Case Number: T 0970/91 - 3.3.3

Application Number: 88109706.7

Publication Number: 0296502

IPC: C08G 18/38

Language of the proceedings: EN

Title of invention:
Low-hygroscopic sulfur-containing urethane resin, coating material and adhesive

Applicant:
MITSUI TOATSU CHEMICALS, Inc.

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - use claims - ex post facto analysis - remote technical field"

Decisions cited:
-

Catchword:
-

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0970/91 - 3.3.3

D E C I S I O N
of the Technical Board of Appeal 3.3.3
of 29 November 1994

Appellant: MITSUI TOATSU CHEMICALS, Inc.
2-5 Kasumigaseki 3-chome
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Decision under appeal: **Decision of the Examining Division of the European Patent Office dated 2 August 1991 refusing European patent application No. 88 109 706.7 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: C. R. J. Gérardin
Members: P. Kitzmantel
M. K. S. Aúz Castro

Summary of Facts and Submissions

I. The appeal, which was filed on 5 October 1991, lies against the decision of the Examining Division dated 2 August 1991 refusing European patent application 88 109 706.7, filed on 17 June 1988, claiming the priorities of 19 June 1987 and 3 July 1987 from two Japanese applications, and published under No. 0 296 502. The appeal fee was paid together with the Notice of Appeal and a Statement of Grounds for the Appeal was filed on 9 December 1991.

II. The decision under appeal was based on a set of three claims, filed on 2 April 1991 (with letter dated 27 March 1991), Claim 1 reading as follows:

Claim 1:
"A coating composition of a long pot life which comprises, as essential components, a polyisocyanate compound having m (which is an integer of 2 or more) isocyanate groups in one molecule and a polythiol compound having n (which is an integer of 2 or more) thiol groups in one molecule, said polyisocyanate compound and said polythiol compound being selected so that the total number of m + n is 5 or more, the ratio of said polyisocyanate compound to said polythiol compound being such that a molar ratio of functional groups NCO/SH is in the range of 0.5 to 3.0, 0.01 to 1.0% by weight of an organic tin compound being added to said composition containing said polyisocyanate compound and said polythiol compound, and the resulting mixture being capable of curing by heating."

Independent Claim 2 related to an "adhesive composition" comprising the same compositional features as the coating composition of Claim 1, but for the final

statement characterising the "resulting mixture" as "being capable of causing adhesion by heating".

Independent Claim 3 related to a "shape memory article comprising a sulfur-containing urethane resin composition that has been moulded to a desired shape by cast polymerisation of a composition" as defined in Claim 1, and "wherein said article is capable of being deformed under heating at a temperature of at least 70°C and external pressure into a shape different from the moulding shape and said article retains said deformed shape upon cooling to a temperature lower than 70°C and wherein said deformed article retains the moulded shape upon heating to at least 70°C in the absence of pressure."

The appealed decision held that Claims 1 and 2 basically related to a "composition per se" and Claim 3 to a "moulded article" and that therefore the subject-matter of these claims lacked novelty under Article 54(3) EPC for all designated Contracting States over

D2: EP-A-271 839;

Example 1 of D2 disclosed a composition comprising a polyisocyanate, a polythiol and an organic tin catalyst within the terms of Claims 1 and 2 which composition was cast polymerized to produce a moulded article in accordance with Claim 3.

III. While originally the Appellant wanted in the first place to defend the application in suit on the basis of the claims as refused by the appealed decision, it withdrew this request after having been informed by the Rapporteur that the Board was inclined to endorse said decision, but would accept in principle the allowability under Article 52 EPC of use claims.

In view thereof, oral proceedings scheduled by the Board on the Appellant's request for 15 July 1994 were rendered unnecessary and have been cancelled.

IV. With its letter of 31 August 1994 (received 1 September 1994) and in response to several proposals of the Board for amending previously filed use claims, the Appellant submitted as its sole request the following set of three claims:

Claim 1:
"Use as a long pot life coating composition of a sulfur containing urethane resin composition which comprises, as essential components, a polyisocyanate compound having m (which is an integer of 2 or more) isocyanate groups in one molecule and a polythiol compound having n (which is an integer of 2 or more) thiol groups in one molecule, said polyisocyanate compound and said polythiol compound being selected so that the total number of m + n is 5 or more, the ratio of said polyisocyanate compound to said polythiol compound being such that a molar ratio of functional groups NCO/SH is in the range of 0.5 to 3.0, 0.01 to 1.0% by weight of an organic tin compound being added to said composition containing said polyisocyanate compound and said polythiol compound, and the resulting mixture being capable of curing by heating."

Claim 2:
"Use as a long pot life adhesive composition of a sulfur containing urethane resin composition which comprises, as essential components, a polyisocyanate compound having m (which is an integer of 2 or more) isocyanate groups in one molecule and a polythiol compound having n (which is an integer of 2 or more) thiol groups in one molecule, said polyisocyanate compound and said polythiol compound being selected so that the total

number of m + n is 5 or more, the ratio of said polyisocyanate compound to said polythiol compound being such that a molar ratio of functional groups NCO/SH is in the range of 0.5 to 3.0, 0.01 to 1.0% by weight of an organic tin compound being added to said composition containing said polyisocyanate compound and said polythiol compound, and the resulting mixture being capable of causing adhesion by heating."

Claim 3:
"Use as a shape memory article of a moulding prepared by cast polymerization from a sulfur-containing urethane resin composition comprising, as essential components, a polyisocyanate compound having m (which is an integer of 2 or more) isocyanate groups in one molecule and a polythiol compound having n (which is an integer of 2 or more) thiol groups in one molecule, said polyisocyanate compound and said polythiol compound being selected so that the total number of m + n is 5 or more, the ratio of said polyisocyanate compound to said polythiol compound being such that a molar ratio of functional groups NCO/SH is in the range of 0.5 to 3.0, said composition further comprising 0.01 to 1.0% by weight of an organic tin compound, wherein said article is capable of being deformed under heating and external pressure into a shape different from the moulded shape and said article retains said deformed shape upon cooling and wherein said deformed article recovers the moulded shape upon heating in the absence of pressure."

V. The Appellant requested that the decision under appeal be set aside and that a patent be granted in the following version:

Claims:
No. 1 to 3 filed with letter of 31 August 1994.

Description:

Pages 2, 3, 6 to 11, 13 to 39 as originally filed.
Pages 1, 4, 5 and 12 filed with letter of 21 November 1994.
Page 5a filed with letter of 17 October 1994.

Reasons for the Decision

1. The appeal is admissible.

2. *Article 123 (2) EPC*

Claims 1 and 2 combine, respectively, the features of original Claims 4, 9 and 14 or 5, 10 and 15; the property of "long pot life" is supported by several references in the original description (page 5, lines 13 and 16; page 7, line 11; page 15, line 9; page 17, line 22).

Claim 3 combines the features of original Claims 3, 8 and 13 with the definition of the phenomenon "shape memory" as exemplified in Examples 10 and 11 of the description as originally filed.

The claims comply thus with the provision of Article 123 (2) EPC.

3. *Novelty*

All three claims make use of the same polythiourethane composition and are directed either to the use of the composition itself for coating (Claim 1) or adhesive (Claim 2) purposes, or to the use of the moulded

composition as shape memory article. In the latter case the scope of the claim comprises the actual exploitation of this property.

The known prior art, in particular D2 and the further documents held to be relevant by the Examining Division

D1: JP-A-60-199016
(cf. corresponding US-A 4 689 387),

D3: EP-A-268 896 (claiming priority of 21 November 1986, published on 1 June 1988, Designated Contracting States DE, FR, IT) and

D4: EP-A-210 859,

is silent about the uses and/or the compositional features covered by any of Claims 1 to 3.

D1, D2 and D3 relate to optical lenses; D4 relates to a composition, which may be useful as adhesive or coating, and which comprises (a) an isocyanate-functional prepolymer, possibly comprising as hydrogen-active component polysulfide polythiols (but not indicating the total number of the NCO plus SH groups in the respective compounds, which number, according to the present claims, shall be at least 5), and (b) considerable amounts of a halogenated resin, which latter component is not present in the compositions according to the application in suit.

Hence, Claims 1, 2 and 3 relate to novel subject-matter.

4. *Inventive step*

4.1 Claims 1 and 2

4.1.1 According to the application in suit prior art polyol based urethane compositions used as coating and adhesive materials suffer from a short pot life and a high hygroscopicity with the consequential drawbacks of warping, cracking and hydrolytic bond-cleavage (cf. "Background of the Invention"). In the light of these shortcomings, the problem underlying the application in suit can be regarded as the provision of polyurethane-type compositions having superior coating and adhesive properties, including a high adhesive force.

According to Claims 1 and 2 this technical problem is to be solved by urethane resins derived from a polyisocyanate and a polythiol having a combined functionality of at least 5.

As can be concluded from the experimental data in the application in suit (Tables 1, 2 and 3) this problem has been credibly solved.

4.1.2 The available prior art does not contain any suggestions that the above-defined problem could be solved by a polythiourethane composition according to present Claims 1 and 2.

D1 and D3 (in view of its aforementioned priority and publication dates, for the purposes of inventive step, to be considered only for the non-overlapping Contracting States CH, GB, LI and NL) both relate to optical lenses having appropriate optical properties (refractive index, transparency, coloration) and - although making use of compositions meeting the essential requirements of present Claims 1 and 2 - do

not comprise any suggestion as to the use of these compositions as coating or adhesive materials. Given the remoteness of the field of optical lenses from coating and adhesive applications, any presumption of a **prima facie** obviousness of the usability of lens compositions as coating or adhesive material would be based on an **ex post facto** analysis. The inventive step objection based on the "excellent weatherability" of the lenses according to D1 raised by the Examining Division in its communication of 28 November 1990, item 4) is therefore ill-founded, even when taking into account that "weathering resistance" is headed for also for the coating composition used according to Claim 1 (cf. page 2, lines 15 to 17 of the application as filed). Owing to the different conditions of exposure to weather of an optical lens (e.g for eyeglasses, cameras) and an outdoor coating, these two applications imply quite different degrees of "weathering resistance". Hence, a good weatherability of an optical lens cannot provide an incentive for the skilled person to use the same compositions for coating or adhesive purposes.

D2 is an intermediary publication under Article 54 (3) EPC being valid for the same Contracting States as the application in suit. Hence D2, for the purpose of the assessment of inventive step, has to be disregarded completely.

D4, although relating to compositions **inter alia** useful as adhesives and coatings (cf. section 3 above), mentions polysulfide polythiols (column 4, lines 31 to 34; claims 1 and 5) only as one example in a list of possible active hydrogen containing polymers and does not disclose, let alone attach any importance to the combined isocyanate and thiol functionality of the composition. Furthermore, in the only "Prepolymer Example" comprising a polythiol (No. 14) it is used

together with considerable amounts of butane diol and trimethylol propane; such mixtures are obviously outside the scope of present Claims 1 or 2, which are restricted to the use of a polythiol as the only essential hydrogen active compound. Moreover, in contrast to the compositions according to the application in suit, the compositions according to D4 comprise also up to 50 weight percent halogenated resin (column 5, lines 41 to 49); this resin, which is said to provide the desired level of handling and bonding performance before and after cure, represents thus an essential ingredient of these compositions. The disclosure of D4 cannot, therefore, provide any incentive to the skilled person to solve the present technical problem in the way it was solved according to the application in suit: there was no reason for the expert either to use polythiols as essentially sole hydrogen active compounds and only in such combinations with polyisocyanates which have a combined minimum functionality of 5, or to depart from the teaching of that citation, i.e. to delete an ingredient regarded as essential for the achievement of high tackiness (cf. column 21, lines 24 to 28).

The subject-matter of Claims 1 and 2 complies therefore with the provisions of Article 56 EPC.

4.2 Claim 3

This claim is directed to the use of mouldings as shape memory articles.

None of the cited documents contains any suggestion of a moulded body having shape memory properties and the use for this purpose according to Claim 3 was therefore non-obvious to the skilled person.

4.3 The requirements of Article 52 EPC are therefore met by the subject-matter of Claims 1 to 3.

5. The description has been brought into conformity with Claims 1 to 3 and the application as a whole is thus in order for granting.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the first instance with the order to grant a patent in the version set out in section V of this decision.

The Registrar: The Chairman:

E. Görgmaier C. Gérardin