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File Number: T 137/90 - 3.3.1

Application No.: 83 200 747.0

Publication No.: 0 097 979

Title of invention: Amino-triazine derivative, its preparation
and its use in heat-curable compositions

Classification: C07D 251/70

D E C I S I O N
of 26 April 1991

Proprietor of the patent: SHELL INTERNATIONALE RESEARCH
MAATSCHAPPIJ B.V.

Opponent: Dow Chemical Europe S.A.

Headword: Aminotriazine/Shell

EPC Articles 54 and 56

Keyword: "Novelty (confirmed)"
"Inventive step (confirmed)"

Headnote



Case Number : T 137/90 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 26 April 1991

Appellant :
(Proprietor of the patent)

SHELL INTERNATIONALE RESEARCH
MAATSCHAPPIJ B.V.
Carel van Bylandtlaan 30
NL-2596 HR Den Haag (NL)

Representative :

Aalbers, Onno et al
P.O. Box 302
NL-2501 CH The Hague (NL)

Respondent(s) :
(Opponent)

Dow Chemical Europe S.A.
Bachtobelstrasse 3
CH-8810 Horgen (CH)

Representative :

Sternagel, Hans-Günther, Dr.
Patentanwälte Dr. Michael Hann,
Dr. H.-G. Sternagel
Sander Aue 30
W-5060 Bergisch Gladbach 2 (DE)

Decision under appeal :

Decision of the Opposition Division of the
European Patent Office dated 25 January 1990
revoking European patent No. 0 097 979
pursuant to Article 102(1) EPC

Composition of the Board :

Chairman : Jahn K.J.A.
Members : Andrews R.W.
Stephens-Ofner J.A.

Summary of Facts and Submissions

- I. European patent No. 0 097 979 in respect of European patent application No. 83 200 747.0, which was filed on 26 May 1983, was granted on 30 September 1987 (cf. Bulletin 87/40) on the basis of eight claims.
- II. On 23 June 1988 a notice of opposition was filed in which the revocation of the patent was requested on the grounds that its subject-matter was not patentable within the terms of Articles 52 to 57 EPC. The opposition was supported by the following documents:
- (1) US-A-3 449 228 and
 - (2) US-A-4 217 377.
- III. By a decision dated 25 January 1990, the Opposition Division revoked the European patent. The Opposition Division held that the subject-matter of the process Claims 2 and 3 and, therefore, the product of this process lacked novelty in the light of the disclosure in document (1).
- IV. An appeal was lodged against this decision on 20 February 1990 with payment of the prescribed fee. In his statement of grounds of appeal filed on the same date, his letter dated 20 August 1991 and during the oral proceedings held on 26 April 1991, the Appellant argued that the compound of Claim 1 represents a novel selection since there is no disclosure of a compound in which the moiety ratio of bisphenol A (BPA) to hexakis(methoxy-methyl)melamine (HMMM) is six.

In the Appellant's opinion, the teaching of document (1) is not enabling since HMMM can react with six or less BPA

moieties, but not with more; thus the ratio of phenolic hydroxy groups to methoxy groups in HMMM-BPA adducts has a maximum of 2. However, the 80% figure referred to in document (1) leads to a ratio of 2.28 to 1 and, therefore, cannot be read onto HMMM-BPA adducts.

With respect to inventive step, the Appellant referred to the comparative data submitted during the examining proceedings in which a curing agent disclosed in document (2) was compared with ones in accordance with the disputed patent. The result is unexpected in view of the statement of column 4, lines 50 to 59 of this document.

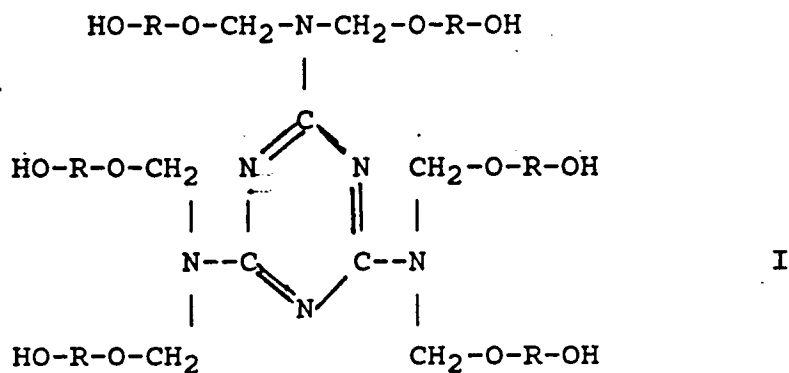
- V. The Respondent maintained that the subject-matter of Claim 1 lacked novelty since the compound is inherently disclosed in document (1).

The Respondent also contended that the claimed subject-matter did not involve an inventive step in the light of the disclosure of document (2). Since the object of the alleged invention was to provide an amino-triazine curing agent for epoxy resins which does not give rise to evolution of methanol during cure, it was obvious to replace the methoxy groups remaining in the curing agents of document (2) by the difunctional BPA. Such compounds would still act as curing agents in view of the presence of the free phenolic hydroxy groups and can clearly be obtained by increasing the molar ratio of BPA to HMMM.

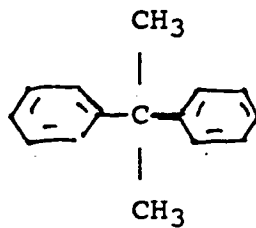
During the oral proceedings the Respondent submitted a test report in which Example 1 of the disputed patent was evaluated. According to the Respondent, this was not submitted as a basis for a new objection on the ground of insufficiency.

VI. The Appellant requested that the decision under appeal be set aside and a patent be maintained on the basis of Claims 1 to 4 filed on 20 February 1990 and the description as granted, with the exception of the deletion of the words "in accordance with the invention", line 45, page 2 of the printed patent. Independent Claims 1 and 2 read as follows:

"1. An amino-triazine derivative, suitable as a curing agent for epoxy resins, having the general formula



wherein R represents the residue



2. A heat-curable composition in powder form comprising:

(a) at least one solid epoxy compound having on average more than one epoxy group per molecule,

- (b) an amino-triazine derivative of formula (I) as defined in Claim 1, and

- (c) an alkaline epoxy curing accelerator, the amount of components (a) and (b) being selected within the range varying from stoichiometric to 100% excess of (a) or (b)."

The Respondent requested that the appeal be dismissed.

VII. At the conclusion of the oral proceedings, the Board's decision to allow the appeal was announced.

Reasons for the Decision

1. The appeal is admissible.

2. The Opponent (Respondent) sought to introduce new experimental evidence in the course of the oral proceedings. The Appellant (Patentee) objected to this evidence on the ground that he was in no position to deal with it by adducing evidence in rebuttal. In an answer to a question put to him by the Board, the Respondent's representative stated that the evidence he sought to introduce was crucial, and he freely admitted that the importance of this evidence would have been foreseeable at the opposition stage. He failed, however, to offer any, let alone any credible, explanation for the omission to file this evidence at the appropriate stage. That stage is, as is quite clearly laid down by Article 99(1) EPC in conjunction with Rule 55(c) EPC, at the date of filing of the notice of opposition. In addition, the note on "Opposition Procedure in the EPO" published in OJ EPO 1989, 14, 417, gives ample guidance as to the time and manner in which the parties' cases in opposition

proceedings should be presented. Thus, for example, paragraph 2 of the above document states: "The EPO's aim remains to establish as rapidly as possible in the interests of both the public and the parties to the opposition proceedings whether or not the patent may be maintained given the Opponent's submissions. It seeks to achieve this by means of a speedy and streamlined procedure..." (emphasis added).

Paragraph 8 goes on to state: "Under Rule 55(c), the notice of opposition must contain an indication of the facts, evidence and arguments in support of the grounds of opposition. This requirement is to be interpreted as meaning that the notice of opposition must at least indicate clearly to the proprietor the case he has to answer..." (emphasis added).

This underlying principle of early and full presentation of the parties' cases is clearly recognised and implemented by the Boards of Appeal, e.g. T 117/86, "Costs/FILMTEC", OJ EPO 1989, 401; T 182/89, "Extent to opposition/SUMITOMO", to be published; T 326/87, "Polyamide compositions/DU PONT", to be published.

It is also the practice of the Board that, if the evidential weight of late-filed documents in relation to those already in the case ("their relevance") warrants their admission into the proceedings, the case should, if fairness to the parties so demands, be remitted to the first instance pursuant to Article 111(1) EPC, and an order be made as to the apportionment of costs pursuant to Article 104 and Rule 63(1) EPC. In this connection the Board would observe that the greater the relevance, in the above sense of matter sought to be introduced late into the proceedings, the sooner it needs to be filed, unless

there exist credible reasons why the matter sought to be filed late was not or could not be submitted sooner.

In the present case the Board, having briefly examined the evidence sought to be introduced, has decided that its degree of relevance is not such as to justify its admission into the proceedings and, accordingly, the Board refuses to do so.

3. There are no formal objections under Article 123 EPC to the present Claims 1 to 4 since they correspond to Claims 1, 5, 6 and 7 respectively as filed and granted.
4. The first question to be decided is whether the compound forming the subject-matter of the present Claim 1 is novel having regard to the disclosure of document (1).
 - 4.1 In accordance with the established jurisprudence of the Boards of Appeal, in order to decide this question, it is necessary to consider whether the disclosure of this document as a whole is such as to make this compound available to the skilled person. However, a line must be drawn between what is in fact made available in the form of a feasible technical teaching and what remains hidden or otherwise undisclosed.
 - 4.2 Therefore, consideration has to be given to the actual information imparted to the skilled person by document (1). This earlier patent specification discloses the products obtained by reacting amine-aldehyde condensation products with phenols or polyols in the presence of acid catalysts (cf. the sentence bridging columns 1 and 2), usually at temperatures between 57.7°C (125°F) and 204.4°C (400°F) (cf. column 4, lines 6 and 7). According to column 4, lines 12 to 14 any water or alcohol

evolved during the reaction may be removed, if desired, or allowed to remain in the reaction mixture.

The paragraph commencing at line 15 of column 4 discloses that the proportion of the amine-aldehyde condensate in the reaction product can be varied widely. Thus, based on the total of the condensate and the hydroxy compound, the condensate can comprise from about 20% to about 80% by weight of the product, with about 40% to about 60% being preferred. The exact meaning of this paragraph is unclear since its literal interpretation would imply that no water or alcohol is eliminated during the reaction, i.e. the reaction is an addition reaction rather than a condensation. However, in making the calculation submitted during the proceedings before the Opposition Division (cf. statement of grounds of opposition filed on 23 June 1988), the Respondent construed this passage as referring to the amount of the starting materials initially present in the reaction mixture. Although the Appellant did not contest these calculations, it became clear that the Appellant had accepted the Respondent's calculation on the basis of the literal interpretation of this passage. In the Board's opinion, the only possible interpretation of this paragraph is the one adopted by the Respondent.

As the amine-aldehyde reaction product suitable as starting material, document (1) suggests the products obtained by condensing melamine, urea, benzoguanamine or similar compounds with aldehydes such as formaldehyde, acetaldehyde, crotonaldehyde, acrolein, benzaldehyde, furfural and others. All or some of the resulting alkylol groups may be etherified with an alcohol such as methanol, butanol and similar lower alkanols (cf. column 2, line 14 to column 3, line 2). The other reactant may be

essentially any phenol or polyol, including BPA (cf. column 3, lines 10 to 32).

Examples 1 to 7 describe the reaction of HMMM with a number of hydroxy compounds. The first three of these Examples illustrate the reaction of HMMM with BPA at molar ratios of 1:1.1, 1:0.95 and 1:0.49 at a temperature of 65.6°C (150°F) in the presence of acid catalysts.

- 4.3 In order to obtain the compound claimed in Claim 1 of the patent in suit, the skilled person would have to combine various pieces of information presented to him by document (1) in a certain manner. Having regard to the teaching of document (1) in its entirety, there is no clear reason for the skilled person to associate the following features: the reaction of 20% by weight of HMMM with 80% by weight of BPA; performing the reaction in such a way and at such a temperature that the evolved methanol is removed, or for such a length of time that the evolution of methanol ceased.

In the Board's judgement, therefore, the claimed subject-matter is novel in view of the disclosure of document (1).

5. The first instance, having decided that the subject-matter of the disputed patent lacked novelty, failed to go on to deal with and decide upon the issue of obviousness which had also been fully pleaded and argued before it. The Board wishes to state that this practice is generally undesirable because, if the Board decides to reverse the first instance's decision on the decided point, the second (and undecided) issue becomes the sole one upon which the outcome of the appeal will have to turn, with the consequence that in deciding that issue the Board cannot act as an appeal body, but will in reality stand in

the shoes of the first instance. Such a practice runs counter to the general scheme for appeals provided by Articles 106 to 111 EPC, as explained in decision T 26/88, (to be published), namely, that "the essential function of an appeal is to consider whether a decision which has been issued by a first instance department is correct on its merits...". Clearly, the merits of a decision on a point which had never been considered by the first instance cannot be judged by way of an appeal. Nevertheless, the Board in the present case is in the position to deal with the issue of inventive step on the basis not only of the arguments and evidence presented in the course of oral proceedings but also having regard to the arguments and evidence that was submitted to the Opposition Division.

6. The patent in suit relates to an aminotriazine derivative, suitable as a curing agent for epoxy resins, and heat-curable compositions containing it. Document (2), which is considered to represent the closest prior art, discloses a cross-linking (curing) agent for epoxy powder coating compositions which is obtained by reacting approximately 1.8 to 2.2 moles of a monohydroxy single-ring aromatic compound with approximately 1.0 mole of an alkoxyaminotriazine, such as HMMM (cf. column 3, lines 3 to 49). A disadvantage of these prior art curing agents was considered to lie in the fact that, since they retained some of the methylol ether groups, methanol was evolved during cure (cf. printed patent specification, page 2, lines 5 to 13).

6.1 Thus, the technical problem underlying the disputed patent is to be seen in providing an aminotriazine derivative for curing epoxy resins which does not give rise to evolution of methanol or similar volatiles during cure, while at the same time producing coatings having satisfactory physical

properties with respect to hardness, solvent resistance, flexibility and cathodic disbonding.

According to the patent in suit this technical problem is solved by the compound of Claim 1.

In view of the results in Table II of the disputed patent, the Board is satisfied that this technical problem is effectively solved.

- 6.2 Although document (2) actually claims the use of the above-mentioned solid curing agents in forming polymeric coatings (cf. Claim 1), some non-solid products obtained by reaction HMMM with hydroxy compounds falling outside the scope of the formula as defined in Claim 1 are disclosed (cf. Examples 55 to 68 of Table 1A and Examples 28 to 35 in columns 13 and 14). The hydroxy compounds used to prepare these products include BPA and several other dihydric phenols.
- 6.3 According to the Respondent, it is known that epoxy resins may also be cured via the reaction of the oxirane ring with hydroxy groups, therefore, the evolution of methanol could be avoided by increasing the amount of BPA reacted with HMMM above that disclosed in Examples 63 to 65, 34 and 35 of document (2) to ensure that all six methylol groups of HMMM are replaced by BPA residues. In the Board's opinion, this line of argument relies on hindsight since it ignores the fact that any of the dihydric phenols mentioned in document (2), or indeed any dihydroxy compound, would solve the problem of methanol evolution during cure and that document (2) does not provide any reason to use BPA rather than any of the other specified dihydric phenols for this purpose. Furthermore, it must be borne in mind that the problem underlying the disputed patent was not only to avoid the evolution of methanol but

also the provision of coatings having satisfactory physical properties.

- 6.4 In the Board's judgement, there is no disclosure in document (2) which would allow the skilled person to conclude that the compound of the present Claim 1 would solve the technical problem underlying the patent in suit in its entirety.
- 6.5 Moreover, the disclosure in the paragraph commencing at line 49 in column 4 of document (2) would discourage the skilled person from adopting the proposed solution since it is clearly stated that products obtained using higher phenol ratios are poor cross-linking agents due to the slow and undesirable liberation of phenol in the curing process.
- 6.6 Document (1), which is concerned with aqueous compositions adopted for electrodeposition comprising ungelled thermosetting products obtained by the acid catalysed reaction of amine-aldehyde condensation products and phenols or polyols, would be of no assistance to the skilled person in his search for a solution to the present technical problem.
- 6.7 Therefore, in the Board's judgement, the proposed solution to the technical problem underlying the disputed patent is inventive. Hence, the subject-matter of independent Claims 1 and 2 involves an inventive step.

Dependent Claims 3 and 4, which relate to preferred embodiments of Claim 2, are also allowable.

Order

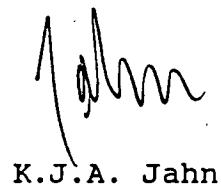
For these reasons, it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the Opposition Division with the order to maintain the patent on the basis of Claims 1 to 4 submitted on 20 February 1991 and the description as granted, with the exception of the deletion of the words "in accordance with the invention" at line 45, page 2 of the printed patent.

The Registrar:


E. Gorgmaier

The Chairman:


K.J.A. Jahn

