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**Datasheet for the decision  
of 10 September 2024**

**Case Number:** T 1824/22 - 3.3.02

**Application Number:** 09745806.1

**Publication Number:** 2300487

**IPC:** C07F7/22, C08K5/58

**Language of the proceedings:** EN

**Title of invention:**

HIGH PURITY MONOALKYL TIN COMPOUNDS AND USES THEREOF

**Patent Proprietor:**

PMC Organometallix, Inc.

**Opponents:**

Galata Chemicals, LLC  
REAGENS S.P.A.

**Relevant legal provisions:**

EPC Art. 56

**Keyword:**

Inventive step

**Decisions cited:**

G 0009/92, G 0004/93, G 0001/99, T 1937/17, T 1621/16



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Case Number: T 1824/22 - 3.3.02

**D E C I S I O N**  
**of Technical Board of Appeal 3.3.02**  
**of 10 September 2024**

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**Decision under appeal:** **Interlocutory decision of the Opposition  
Division of the European Patent Office posted on  
16 May 2022 concerning maintenance of the  
European Patent No. 2300487 in amended form.**

**Composition of the Board:**

**Chairman**            M. O. Müller  
**Members:**            A. Lenzen  
                              B. Burm-Herregodts

## **Summary of Facts and Submissions**

I. This decision concerns the appeals filed by the patent proprietor and opponent 2 against the decision of the opposition division (decision under appeal) that European patent No. 2 300 487 (patent) in amended form meets the requirements of the EPC.

In its decision, the opposition division held that auxiliary request 2 before it met the requirements of the EPC.

II. Reference is made in the present decision to the following documents filed with the opposition division:

D1 US Re. 32,935

D22 US 5,100,946

III. With the statement of grounds of appeal, the patent proprietor filed the sets of claims of a main request and auxiliary requests 1 to 6. By letter of the same day, it filed replacement auxiliary requests 1 and 2.

IV. By letter dated 12 February 2024, the proprietor withdrew its appeal, making it the sole respondent and opponent 2 the sole appellant in the current case.

V. The parties were summoned to oral proceedings to be held by videoconference on 10 September 2024.

VI. By letter dated 7 March 2024, opponent 1 announced that it would not be attending the oral proceedings.

VII. In preparation for the oral proceedings, the board issued a communication under Article 15(1) RPBA.

- VIII. On the day before the oral proceedings, the respondent announced that it would not be attending the oral proceedings.
- IX. Oral proceedings before the board were held on 10 September 2024 by videoconference in the presence of only the appellant.
- X. The parties' requests were as follows.

The appellant requested that:

- the decision under appeal be set aside and that the patent be revoked in its entirety
- the appeal fee be reimbursed
- the case be remitted to be re-heard before the opposition division in a different composition
- auxiliary requests 1, 2 and 4 to 6 not be admitted

In writing, the respondent requested that:

- all of its claim requests be admitted
- the decision under appeal be set aside and that the patent be maintained in amended form based on one of the following sets of claims:
  - the main request, filed with the statement of grounds of appeal
  - auxiliary request 1 or 2, filed with the letter after, but on the same day as, the statement of grounds of appeal
  - auxiliary requests 3 to 6, filed with the statement of grounds of appeal

- the board not find that substantial procedural violations took place

Before the patent proprietor withdrew its appeal, opponent 1 had requested in writing that:

- the patent proprietor's appeal be dismissed
- auxiliary requests 4 to 6 not be admitted

XI. Summaries of the parties' submissions relevant to the present decision and key aspects of the decision under appeal are set out in the reasons for the decision below.

### **Reasons for the Decision**

Main request and auxiliary requests 1, 2 and 5 - Admittance

1. With the withdrawal of the patent proprietor's appeal, opponent 2 is the sole appellant (see point IV. above).
2. If an opponent is the sole appellant against an interlocutory decision maintaining a patent in amended form, the patent proprietor is primarily restricted during appeal proceedings to defending the patent in the form in which it was maintained by the opposition division in its interlocutory decision. Amendments proposed by the patent proprietor as a party to the proceedings as of right under Article 107, second sentence EPC may be rejected as inadmissible by the board if they are neither appropriate nor necessary (G 9/92 and G 4/93, OJ EPO 1994, 875; order No. 2). As a rule, an amended claim which would put the opponent and sole appellant in a worse situation than if it had not appealed must be rejected (G 1/99, OJ EPO, 2001, 381; order).

3. Claim 1 of auxiliary request 2 which the opposition division considered allowable reads as follows (emphasis added):

*"Article comprising at least one chlorine-containing polymer matrix and at least one stabilizer composition comprising:*

- from 95 wt% to 99.99 wt% of at least one monoalkyltin compound of formula  $R\text{Sn}(T)_3$ ;*
- from 0.001 wt% to 1 wt% of at least one dialkyltin compound of formula  $R_2\text{Sn}(T)_2$ ;*
- from 0.005 wt% to 1 wt% of at least one trialkyltin compound of formula  $R_3\text{Sn}(T)$ ; and*
- from 0 wt% to 5 wt% of one or more impurities,*

*wherein R is chosen from among methyl, n-butyl, 2-ethylhexyl, n-octyl, or n-decyl, and*

*T is chosen from among thioglycolate esters, 2-ethylhexylthioglycolate esters, isooctylthioglycolates, isobutylthioglycolates, and thioglycolate itself,*

*wherein the stabilizer composition is from 0.01 wt% to 10 wt% of the chlorine-containing polymer matrix; and*

***the article further comprises at least one co-stabiliser which is disodium adipate."***

Therefore, the article according to this claim 1 necessarily comprises disodium adipate (DSA) as a co-stabiliser.

4. However, the definition of the article of claim 1 of the main request and auxiliary requests 1, 2 and 5 on

appeal is broader than that of claim 1 of auxiliary request 2 considered allowable by the opposition division. More specifically, the article of claim 1 of the main request and auxiliary requests 1, 2 and 5 no longer necessarily has to contain DSA as a co-stabiliser but may also contain a co-stabiliser other than DSA. In other words, with respect to the main request and auxiliary requests 1, 2 and 5, opponent 2 as the sole appellant is in a worse situation than if it had not appealed.

5. The above assessment was set out by the board in its communication under Article 15(1) RPBA and was never subsequently challenged by the respondent. Therefore, at the oral proceedings, at which the respondent was not present, the board saw no reason to change its assessment and decided not to admit the main request and auxiliary requests 1, 2 and 5.

Auxiliary request 3 - Inventive step (Article 56 EPC)

6. Claim 1 of auxiliary request 3 on appeal is identical to claim 1 of auxiliary request 2 which the opposition division considered allowable. Its wording is reproduced above (see point 3 above).
7. The parties agreed that D1, example IV is the closest prior art.
8. D1, example IV demonstrates the efficacy of mono-*n*-octyltin-S,S',S''-tris(isooctylmercaptoacetate) as a heat stabiliser for vinyl chloride polymers.

Mono-*n*-octyltin-S,S',S''-tris(isooctylmercaptoacetate) as referred to in this example is the same as mono-*n*-octyltin-S,S',S''-tris(isooctylthioglycolate) (see D1,



column 2, lines 37 to 41). Therefore, mono-*n*-octyltin-*S,S',S''*-tris(isooctylmercaptoacetate) is an  $R\text{Sn}(T)_3$  compound as required by claim 1 ( $R = n\text{-octyl}$ ;  $T = \text{isooctylthioglycolate}$ ).

The test samples employed for heat stability tests are prepared using a mixture consisting of:

- (1) 100 parts of a vinyl chloride homopolymer
- (2) 18.5 parts of an acrylonitrilebutadiene-styrene terpolymer
- (3) 0.5 part of calcium stearate
- (4) 0.5 parts of a low molecular weight polyethylene wax
- (5) 0.1 part of a blue dye
- (6) 2.0 parts of mono-*n*-octyltin-*S,S',S''*-tris(isooctylmercaptoacetate)

The resulting mixture is formed into small sheet samples under heat (177 °C). The samples are heated to 204 °C, and their colour rated after a number of 5-minute intervals. At 204 °C, the samples require between 20 and 25 minutes of heating to darken completely to a black colour. By contrast, an unstabilised polymer composition without mono-*n*-octyltin-*S,S',S''*-tris(isooctylmercaptoacetate) turns black during the milling operation and adheres to the mill rolls.

#### 9. Distinguishing features

According to the respondent, the subject-matter of claim 1 was distinguished from D1, example IV in that:

- (i) the "*stabilizer composition [comprises]:*  
...

- *from 0.001 wt% to 1 wt% of at least one dialkyltin compound of formula  $R_2Sn(T)_2$ ;*
  - *from 0.005 wt% to 1 wt% of at least one trialkyltin compound of formula  $R_3Sn(T)$ ; ..."*
- (ii) *"the article further comprises at least one co-stabiliser which is disodium adipate"*

Below, it is assumed in the respondent's favour that this is correct.

10. Technical effect

The appellant and opponent 1 argued, and this was not contested by the respondent, that distinguishing feature (i) is not associated with a technical effect.

With regard to distinguishing feature (ii), the respondent referred to example F of the patent. It took the view that the stabiliser combination of claim 1, i.e. the combination of the tin-based stabiliser comprising certain amounts of  $R_3Sn(T)$ ,  $R_2Sn(T)_2$  and  $R_3Sn(T)$  with the co-stabiliser DSA, gave the article synergistically improved colour hold under thermal stress. However, since the amounts of  $R_2Sn(T)_2$  and  $R_3Sn(T)$  are not associated with a technical effect (see above), it will be assumed below in favour of the respondent that at least the combination of the monoalkyltin compound  $R_3Sn(T)$  with DSA gives the article synergistically improved colour hold under thermal stress.

11. Objective technical problem

In view of the previous point, the objective technical problem is to provide an article showing a

synergistically improved colour hold under thermal stress.

12. Obviousness

12.1 As the amounts of  $R_2Sn(T)_2$  and  $R_3Sn(T)$  are not associated with any effect, their amounts constitute an arbitrary variation of the amounts disclosed in D1. Arbitrarily varying the amounts of  $R_2Sn(T)_2$  and  $R_3Sn(T)$  (for example by adding these compounds or by purifying the tin stabiliser used in D1, example IV in favour of the other tin species  $R_3Sn(T)_3$ ) so that they fall within the ranges provided for in claim 1 is part of the routine activity of the skilled person and cannot constitute an inventive step (see distinguishing feature (i) above).

D22 relates to a stabilised polymer composition comprising poly(vinyl chloride), i.e. a chlorine-containing polymer according to claim 1. Stabilisation of this polymer is achieved by combining a metal-based stabiliser and DSA. DSA is added in an amount to produce a synergistic thermal stabilising effect with the metal-based stabiliser (D22, claims 1 and 2). The metal-based stabilisers used in the examples of D22 are all tin-based. One of them, monobutyltin tris(isooctylmercaptoacetate) (table in column 12, stabiliser C), is according to formula  $R_3Sn(T)_3$  in claim 1. The increased thermal stability, which is due to the addition of DSA, is shown in the examples by the fact that discolouration of the polymer only occurs later. Given this and contrary to the view expressed in the decision under appeal (point 27.2.2, second paragraph), the board agrees with the appellant that it would have been obvious for the skilled person to add DSA to the mixture of D1, example IV to synergistically

increase the colour hold under thermal stress of the resulting polymer film (see distinguishing feature (ii) above).

- 12.2 The respondent compared example 1 and comparative example 1 in table 1 of D22. Example 1 uses Sn-based stabiliser B (a mixture of 80 wt% of monobutyltin 2-mercaptide sulfide, 5 wt% of mercaptoethyl tallate and 15 wt% of diluent) and 1.2 parts per hundred of resin (phr) of DSA. Comparative example 1 uses Sn-based stabiliser C (monobutyltin tris(isooctylmercaptoacetate) and 2.0 phr of disodium hydrogen phosphate (DSP). Comparative example 1 shows a better stability time (12.9 min.) than example 1 (12.3). The respondent concluded that the skilled person looking for an improved co-stabiliser for the monoalkyltin stabiliser of D1 would choose DSP and not DSA.

This is not convincing. D22 (column 13, lines 44 to 49) clearly sets out the benefits of both DSA in example 1 and DSP in comparative example 1. The skilled person would therefore have expected a synergistic improvement not only in the use of DSP but also in the use of DSA.

13. Therefore, the subject-matter of claim 1 does not involve an inventive step, and auxiliary request 3 is not allowable.
14. The above assessment was set out by the board in its communication under Article 15(1) RPBA and was never subsequently challenged by the respondent.

Auxiliary requests 4 and 6

15. Claim 1 of auxiliary request 4 differs from claim 1 of auxiliary request 3 only in a slightly higher lower limit for the amount of  $\text{RSn(T)}_3$  in the stabiliser composition:

claim 1 of auxiliary request 3: "*from 95 wt% to 99.99 wt%*"

claim 1 of auxiliary request 4: "*from **97** wt% to 99.99 wt%*" (emphasis added)

The respondent never argued, let alone showed, that this amendment resulted in an additional distinguishing feature over D1. It is also not apparent to the board why this should be the case since the synthesis of the tin-based stabiliser composition used in D1, example IV starts from *n*-octyltin trichloride, which already has a very high purity of 99.2% (D1, example I). Thus, the above reasoning for the subject-matter of claim 1 of auxiliary request 3 equally applies to that of claim 1 of auxiliary request 4.

Furthermore, even if it were assumed in favour of the respondent that this amendment resulted in an additional distinguishing feature over D1, the reasoning above for the subject-matter of claim 1 of auxiliary request 3 would still apply *mutatis mutandis*. More specifically, without any technical effect linked to the higher lower limit for the amount of  $\text{RSn(T)}_3$  in the stabiliser composition, which was never argued, let alone shown, by the respondent, the objective technical problem would still be as defined above, i.e. to provide an article showing a synergistically improved colour hold under thermal stress. For the reasons given above, the solution to this problem would have been

obvious. In particular, the mere arbitrary variation of the amount of  $R_{2}Sn(T)_2$  in the stabiliser composition would not have involved an inventive step.

16. Claim 1 of auxiliary request 6 differs from claim 1 of auxiliary request 3 only in that the ranges for  $R_2Sn(T)_2$  and  $R_3Sn(T)$  in the stabiliser composition have been narrowed:

claim 1 of auxiliary request 3: "*from 0.001 wt% to 1 wt% of ...  $R_2Sn(T)_2$* " and "*from 0.005 wt% to 1 wt% of ...  $R_3Sn(T)$* "

claim 1 of auxiliary request 6: "*from **0.01** wt% to **0.1** wt%*" for both  $R_2Sn(T)_2$  and  $R_3Sn(T)$  (emphasis added)

However, the respondent never argued, let alone showed, that these narrower ranges were linked to a technical effect. Therefore, the reasoning above for the subject-matter of claim 1 of auxiliary request 3 applies *mutatis mutandis* also to that of claim 1 of auxiliary request 6.

17. It follows that the subject-matter of claim 1 of auxiliary requests 4 and 6 does not involve an inventive step and that these two auxiliary requests are not allowable either.

In view of this negative conclusion on the allowability of auxiliary requests 4 and 6, it was not necessary to decide at the oral proceedings on the admittance of these requests.

18. In its communication under Article 15(1) RPBA, the board had already set out that the reasoning for the subject-matter of claim 1 of auxiliary request 3

applies *mutatis mutandis* also to that of claim 1 of auxiliary requests 4 and 6. This was never subsequently challenged by the respondent.

Requests for reimbursement of the appeal fee

19. The appellant requested that the appeal fee be reimbursed.

According to the appellant, the decision under appeal was not properly reasoned. It did not contain a reasoned explanation on some of the conclusions drawn by the opposition division. Furthermore, some of the appellant's central arguments had not been addressed. This lack of reasoning amounted to a substantial procedural violation and justified reimbursement of the appeal fee.

20. The appellant criticised the following aspects of the decision under appeal.

- (a) The opposition division had acknowledged the relevance of the examples of the application as filed for the requirements of Articles 123(2) and 83 EPC without dealing with the appellant's submission that none of these examples disclosed a stabiliser composition or an article as defined in the claims as granted or the claims of auxiliary request 2 which the opposition division considered allowable.
- (b) The opposition division had not given any reasons for its conclusion that claim 1 of auxiliary request 2 better reflected the technical contribution of the alleged invention, a point made by the appellant with regard to Article 123(2) EPC.

- (c) The opposition division had not addressed one of the appellant's central arguments made with regard to Article 83 EPC, namely that the skilled person could not know whether they had manufactured a claimed article or not.
- (d) Despite the appellant's counter-arguments, the opposition division had not given any reasons for accepting the respondent's submission that a technical effect could be derived from a comparison of example F of the patent with example IV of D1.

21. As regards points (a) to (d) above, the board set out in its communication under Article 15(1) RPBA that this request should be rejected for the following reasons:

- The appellant's criticism under points (a), (b) and (d) shows at most that the opposition division's reasoning could have been more detailed. However, in the current case, this does not amount to a substantial procedural violation.
- The appellant's criticism under point (c) relates to an objection under Article 84 EPC and not under Article 83 EPC. The opposition division, therefore, did not have to deal with it under Article 83 EPC.
- The appellant's criticism under point (b) is irrelevant. The board agrees with T 1937/17 (point 4.3 of the Reasons) that whether or not subject-matter resulting from an amendment is associated with an undisclosed technical contribution as held in T 1621/16 (point 1.7.3 of the Reasons) with regard to multiple selections from lists of converging alternatives is irrelevant for the assessment of the requirements of Article 123(2) EPC.



22. At the oral proceedings before the board, the appellant did not submit any further arguments. Therefore, the board saw no reason to deviate from its preliminary view and decided to reject the appellant's request for a reimbursement of the appeal fee.

Request for remittal

23. The appellant requested that the case be remitted to be re-heard before the opposition division in a different composition. At the oral proceedings, the board decided to reject this request. It is not necessary to give reasons for this decision as the appellant - in view of the final decision on the revocation of the patent - is not adversely affected by it.

**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:



U. Bultmann

M. O. Müller

Decision electronically authenticated