



Europäisches Patentamt  
Beschwerdekammern

European Patent Office  
Boards of Appeal

Office européen des brevets  
Chambres de recours

Veröffentlichung im Amtsblatt	Ja/Nein
Publication in the Official Journal	Yes/No
Publication au Journal Officiel	Oui/Non

13

Aktenzeichen / Case Number / N<sup>o</sup> du recours : T 194/85

Anmeldenummer / Filing No / N<sup>o</sup> de la demande : 80 200 087.7

Veröffentlichungs-Nr. / Publication No / N<sup>o</sup> de la publication : 0 014 508

Bezeichnung der Erfindung: Process for the preparation of colour stabilised  
Title of invention: vinyl chloride polymers  
Titre de l'invention :

Klassifikation / Classification / Classement : CO8F 14/06

### ENTSCHEIDUNG / DECISION

vom / of / du 13 October 1987

Anmelder / Applicant / Demandeur :

Patentinhaber / Proprietor of the patent /  
Titulaire du brevet :

Shell Internationale Research  
Maatschappij B.V.

Einsprechender / Opponent / Opposant :

N.V. DSM

Stichwort / Headword / Référence :

EPÜ / EPC / CBE Articles 52(1), 56

Kennwort / Keyword / Mot clé :

"Change of category of claim" "Inventive step  
denied"

Leitsatz / Headnote / Sommaire

Europäisches  
Patentamt

Beschwerdekammern

European Patent  
Office

Boards of Appeal

Office européen  
des brevets

Chambres de recours



Case Number : T 194/85

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.1  
of 13 October 1987

**Appellant :**  
(Proprietor of the patent)

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

**Representative :**

Aalbers, Onno  
P.O. Box 302  
NL-2501 CH The Hague

**Respondent :**  
(Opponent)

NAAMLOZE VENNOOTSCHAP DSM  
van der Maesenstraat 2  
NL-6411 LP Heerlen/NL

**Representative :**

Hoogstraten, Willem Cornelis Roeland  
OCTROOIBUREAU DSM  
Postbus 9  
NL-6160 MA Geleen

**Decision under appeal :**

Decision of the Opposition Division of the  
European Patent Office dated 30 January 1985, posted  
on 30 May 1985, revoking European patent  
No. 0 014 508 pursuant to Article 102(1) EPC.

**Composition of the Board :**

**Chairman :** K. Jahn

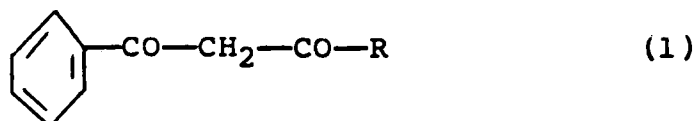
**Members :** C. Gérardin

G.D. Paterson

## Summary of Facts and Submissions

- I. The mention of the grant of the patent No. 14 508 in respect of the European patent application No. 80 200 087.7, filed on 31 January 1980 and claiming priority of 9 February 1979 from an earlier application GB 7 904 660, was announced on 8 June 1983 on the basis of five claims, of which the only independent claim reads as follows:

Process for the production of a colour stabilised polymer of vinyl chloride containing as stabiliser an aromatic beta diketone of the formula



wherein R represents an alkyl or aryl group optionally substituted by a carboxyl group, or an alkylene group linked with another 3-phenyl-1,3-oxopropyl moiety, and from 0.001 to 5%, by weight of the polymer, of one or more divalent metal carboxylates, the polymer being a polymer prepared by aqueous suspension polymerisation, characterised in that, the aromatic beta diketone is incorporated into the polymer by effecting the suspension polymerisation in the presence of from 0.005 to 0.04% by weight of the vinyl chloride, of said aromatic beta diketone and that the carboxylate is incorporated in the polymer by blending the polymer with added carboxylate.

II. The Respondent (Opponent) filed an opposition against the grant of the patent on 7 March 1984 by telex confirmed with a letter on 9 March 1984 on grounds of lack of novelty and inventive step. Of the documents cited in support of the opposition only the following ones are here relevant:

(d) GB-A-1 511 621

(e) US-A-3 862 066

(f) DE-A-2 213 927.

III. The Opposition Division revoked the patent in an orally pronounced decision on 30 January 1985. The reasons for this decision were set out in a written decision dated 30 May 1985, and were essentially as follows:

(i) Novelty

With regard to the teaching of document (d), considered as the closest prior art, the subject-matter of Claim 1 differed by the fact that the amount of  $\beta$ -diketone is lower and that this compound is already present prior to suspension polymerisation. Novelty could thus be acknowledged.

(ii) Inventive step

It is known from document (e) that additives incorporated at the polymerisation stage result in improved homogeneity and stability over the corresponding mixtures prepared according to conventional dry blending procedures. This effect applies to all the materials known to stabilise vinyl chloride polymers against the degradative action of heat and light.

Document (f), which is concerned with the improvement of thermal and colour stability of vinyl chloride polymer moulded articles, such as bottles, foresees the addition of one stabiliser (a phospholipid) during the polymerisation and the blending of the other (a metal carboxylate) after the reaction had been completed. The simple modification of the process disclosed in document (d) along this suggestion would thus lead to the subject-matter of the patent-in-suit.

The effect of a ten-fold improvement of stability resulting from the process according to the disputed patent cannot be regarded as surprising since document (f) specified that the addition of a phospholipid during the polymerisation stage is eight times more effective in terms of stability than when this compound is incorporated at the end of the polymerisation.

- IV. The Appellant (Patentee) thereafter filed a notice of appeal with payment of the prescribed fee on 11 July 1985.

A statement of grounds of appeal was filed on 16 September 1985, in which the Appellant contended that the subject-matter of Claims 1 to 5 involved an inventive step, and requested that the patent be maintained. He enclosed an amended specification with proposed amended Claims 1 to 5 which defined the subject-matter in terms of the "Application of a colour stabilised polymer of vinyl chloride for manufacturing clear bottles", and stated that he "wished to continue the procedure" with such claims.

In reply to a communication of the Board in which an objection under Article 123(3) EPC was raised against the change of category of claims, the Appellant filed a new set of claims, the first five corresponding to the claims rejected by the first instance, whereas the last two concerned a process for the manufacture of sheets and bottles as well as the sheets and bottles obtained by this process.

After a further objection under Article 123(3) EPC against these last two claims which was raised by the Board during the oral proceedings held on 13 October 1987, the proposed claims the subject of the appeal were eventually limited to the original version as granted.

V. The arguments presented by the Appellant in the statement of grounds and in oral proceedings can be summarised as follows:

- (1) Documents (d), (e) and (f) should not be combined since they deal with different problems. Whereas document (d) describes the manufacture of articles, such as bottles, which should show no tendency to yellow, the stabilization of vinyl chloride polymer articles mentioned in document (f) aims at preventing a coloration in black, and document (e) basically concerns compositions having improved homogeneity.
- (11) Addition of a metal salt of a carboxylic acid prior to polymerisation as suggested in document (e) does not always result in improved stability, as demonstrated in the comparative example provided together with the statement of grounds of appeal.

(iii) The addition of the diketone prior to polymerisation and of the metal salt after polymerisation is inventive in two respects:

- first of all, it is a selection which is not evident in view of the prior art which suggests the addition of all the stabilisers either before polymerisation, or after polymerisation;
- that lesser amounts of diketone enable a satisfactory colour rating should be regarded as surprising.

(iv) The object of the claimed process was not to improve the colour stability of vinyl chloride polymers which was found acceptable, but merely to obtain the same stabilising effect with a lower amount of diketone.

VI. The arguments put forward by the Respondent can be summarised as follows:

- (1) Document (e) teaches that the addition of stabilisers before polymerisation confers a better homogeneity, thus less coloration, to vinyl chloride compositions. This means that the same stabilising effect can be obtained with a lesser amount of diketone when this compound is incorporated into the monomer.
- (ii) Comparative tests carried out by the Respondent demonstrate that the addition of metallic soap to vinyl chloride monomer is of limited efficiency, in practice 57%, because part of this stabiliser is flushed away with the water present during polymerisation. There is thus an economic incentive

to add this particular type of stabiliser to the polymer already formed. This conclusion is fully in line with the teaching of document (f), according to which zinc and calcium salts of carboxylic acids are added to the polymer already dried.

VII. The Appellant requests the decision under appeal to be set aside and a patent be maintained on the basis of the original claims.

The Respondent requests the appeal to be rejected.

#### Reasons for the Decision

1. The appeal complies with Articles 106 to 108 as well as Rule 64 EPC and is, therefore, admissible.
2. During examination and opposition proceedings, including an appeal stage of such proceedings, there is a presumption that the Applicant or Patentee wishes to maintain his application or patent, unless and until he makes a clear and unambiguous statement to the contrary in relation to part or all of the subject-matter of the application or patent.

In the present case, as set out in greater detail in paragraph IV above, during the appeal the Appellant first stated in the statement of grounds that he wished to continue the appeal on the basis of a different category of claims from the original process claims which were rejected by the first instance, but later reverted to the original process claims as the subject of the appeal. In the Board's view the Appellant's statement in his statement of grounds, being merely a proposal to amend to a form of claim which he initially hoped would be allowable, should not in its



content be interpreted as precluding the Appellant either from proposing further alternative amendments, or as he did in the present case, from reverting to the original claims as the subject of his request.

3. The disputed patent relates to a process for the preparation of colour stabilised vinyl chloride polymers with an aromatic beta diketone and one or more divalent metal carboxylates as stabilizing additives.

The closest state of the art is represented by document (d) which discloses the stabilisation of vinyl chloride polymers against thermal degradation with a combination of

- (a) 0.1 to 5% by weight of one or more divalent metal salts of carboxylic acids, conveniently employed for stabilising such polymers, and
- (b) 0.05 to 5% by weight of a beta diketone which may be aromatic or aliphatic,

both compounds being added to the polymer already formed. Aromatic beta diketones which contain an aromatic as well as an aliphatic radical, such as benzoylacetone, stearoylacetophenone, palmitoylacetophenone and lauroylacetophenone which all fall within the general formula according to Claim 1, are mentioned as particularly suitable for prolonged stabilising activity (page 2, lines 100 to 109). Although this system confers a satisfactory colour stability to articles, such as bottles, prepared from this polymer composition (page 3, lines 24 to 33), it was found economically unattractive because it involves relatively large amounts of beta diketone.

4. In the light of this closest prior art the technical problem underlying the patent-in-suit can be seen in providing an improved process for stabilising vinyl chloride polymers which enables the same stabilising effect for a lesser amount of beta diketone.

This problem is solved according to the disputed patent by incorporating 0.005 to 0.04% by weight of an aromatic beta diketone already at the suspension polymerisation stage and blending 0.05 to 5% by weight of divalent metal carboxylate(s) with the polymer after completion of polymerisation.

In view of the results obtained in the Examples of the disputed patent, the Board is satisfied that this technical problem has been plausibly solved.

5. The solution claimed by the Appellant is not to be found in any prior art document so that novelty is acknowledged. As the Respondent no longer raises the issue of novelty it is not necessary to consider the matter in detail.

It has thus to be examined whether the subject-matter of the patent-in-suit as defined in original Claim 1 involves an inventive step with regard to the teaching of the cited documents.

6. The addition of a stabiliser to vinyl chloride monomer, thus prior to suspension polymerisation, and the incorporation of the same stabiliser into the polymer already formed are not equivalent in terms of stabilization.

According to document (e), an improved method for preparing vinyl chloride polymer compounds suitable for the production of bottles consists in incorporating the usual additives, especially the stabiliser(s) in the polymerisation step. More specifically, this addition should be performed prior to or during, but before termination of polymerisation so that the suspension polymerisation is conducted in the presence of dispersed or dissolved additives (column 1, lines 10 to 51). The presence of these additives at an early stage results in improved homogeneity, uniformity, stability as well as colour retention during extrusion fabrication (column 3, lines 38 to 55). This beneficial effect extends to all the stabilisers known in the art to be effective against degradative action of heat and/or light of vinyl chloride polymers (column 5, lines 61 to 65).

7. Although the teaching of document (e) would suggest, as a general rule in order to improve the efficiency of stabilisers, to add any stabiliser and more generally any monomer-soluble additive or combination thereof prior to polymerisation, provided it does not affect the reaction adversely (column 8, lines 16 to 21 and column 11, lines 46 to 50), there is some restriction as far as the metallic soaps are concerned, as demonstrated by the Respondent during oral proceedings. Part of zinc and calcium carboxylate added to vinyl chloride monomer is flushed away with the water of polymerisation and only 57% of the additive is kept within the polymer; in spite of the better homogeneity of the mixture, the resulting stability is not optimal. There is thus a practical reason based on considerations of efficiency not to add a metallic soap prior to polymerisation.

This particular feature is illustrated in document (f) which discloses the preparation of stabilized vinyl chloride polymers by suspension polymerisation in presence of polyvinyl alcohol and a phospholipid (Claim 1). According to the preferred embodiment (page 5, paragraph 3) and to the only example, the metallic soaps, especially as a combination of zinc and calcium carboxylates, are added to the polymer already dried. This leads to polymer compositions with high thermal stability which are particularly suitable for the manufacture of bottles (page 2, paragraphs 2 and 3).

The fact that document (f) is concerned with the problem of preventing the blackening of vinyl chloride polymers whereas the process according to the patent-in-suit aims at preventing yellowing does not reflect different mechanisms of coloration, but merely different levels of degradation. For the skilled man there is thus an incentive to apply the teaching of document (f) concerning the addition of metal carboxylates to the solution of the present problem.

8. The simple knowledge of the beneficial effect on stability resulting from the addition of the main stabilizer prior to polymerisation and of the technical reasons not to add a metal carboxylate at this early stage would thus lead the skilled man faced with the above mentioned problem to modify the basic teaching of document (e) in the sense of the patent-in-suit. In this regard, the combination of features corresponding to the subject-matter of Claim 1 are considered as obvious.

From a quantitative point of view, the fact that the early addition of a beta diketone results in improved efficiency of this stabilizer means that the same stabilizing effect can be achieved with a lesser amount of this compound than when it added after polymerisation. The beneficial result

put forward by the Appellant is not disputed, but since it corresponds in essence to what the skilled man would have expected, it cannot contribute to demonstrate an inventive step.

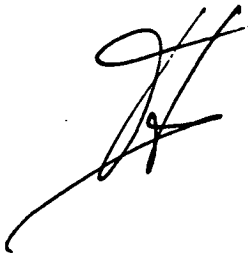
9. These arguments apply not only to Claim 1, but equally to dependent process Claims 2 to 5, which merely represent preferred embodiments of the method according to Claim 1 and thus fall with it.

**Order**

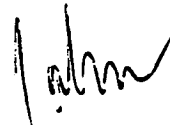
**For the above reasons, it is decided that:**


The appeal is rejected.

The Registrar:



The Chairman:



 03676

CG 24.11.87