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D E C I S I O N
of 6 May 2003

Case Number: T 0803/00 - 3.3.3

Application Number: 95928842.4

Publication Number: 0776347

IPC: C08K 3/38

Language of the proceedings: EN

Title of invention:
Calcium pyroborate as a microbicide for plastics

Applicant:
BUCKMAN LABORATORIES INTERNATIONAL, INC.

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step - obvious combination of known features"

Decisions cited:
-

Catchword:
-

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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0803/00 - 3.3.3

D E C I S I O N
of the Technical Board of Appeal 3.3.3
of 6 May 2003

Appellant: BUCKMAN LABORATORIES INTERNATIONAL, INC.
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 9 March 2000 refusing European patent application No. 95 928 842.4 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: R. Young
Members: A. Däweritz
J. Van Moer

Summary of Facts and Submissions

I. European patent application No. 95 928 842.4, based on International application No. PCT/US95/10388, filed on 16 August 1995, claiming the priority of 19 August 1994 of an earlier application in the USA (293217) and published under No. WO-A-96/06130 on 29 February 1996, was refused by a decision of the Examining Division, issued in writing on 9 March 2000.

II. The decision was based on a set of 12 claims submitted with a letter dated 27 April 1998.

The two independent claims of this set read as follows:

"1. A plastic article comprising plastic and a microbicidally effective amount of calcium pyroborate."

"9. A process for protecting the plastic article of any one of claims 1 to 8 from microbiological attack comprising:

incorporating a microbicidally effective amount of calcium pyroborate into a plastic premix and

forming the premix into said plastic article."

The remaining claims were dependent claims concerning particular embodiments of the above subject-matter.

According to the decision, the subject-matter claimed was novel over

D1: EP-A-0 434 391,

because that document related to paint compositions, but not to plastic articles (section II.(3)).

However, the subject-matter claimed was held not to be inventive in the light of the disclosure of the "prior art discussed on page 1 of the Application (plastic articles containing microbicides, e.g. barium metaborate) (which) represents the closest prior art to the subject-matter of present Claim 1. The presently claimed articles differ from those of the closest prior art in the use of calcium pyroborate as microbicide." This finding also applied to the process of Claim 9.

One of the documents mentioned on page 1 of the Application in suit,

D2: US-A-4 086 297,

had been explicitly referred to by the Examining Division in an annex to summons to oral proceedings, issued on 22 April 1999 (the oral proceedings had, however, been cancelled on 23 November 1999).

The objective technical problem solved was seen in the provision of non-toxic, mould resistant plastic articles and a process for their preparation.

It was held that document D1 described the use of silica-coated calcium pyroborate as an excellent non-toxic microbicide for paint films. The performance of this pyroborate was superior to the previously used, but toxic, barium metaborate (Example 15 and page 2, lines 5 to 10). For the skilled person seeking to solve the above-mentioned technical problem, it was, therefore, obvious to apply the teaching of D1, which

concerned the microbicidal protection of compositions containing plastics. The skilled person would have had no reason to believe that the essential microbicidal activity of calcium pyroborate would be affected by a different preparation process or end use of other plastic-containing compositions, eg solid plastic articles.

The argument that the skilled person would have expected poorer plastic processing with calcium pyroborate due to its higher water content than barium metaborate, because of the heating step in the manufacturing process of the plastic articles was deemed not persuasive. Thus, the skilled person had the option of using anhydrous forms of the compound (as noted on page 6 of the application) and the method of producing the plastic articles claimed would not necessarily involve working at temperatures where water would be lost (ie might be released from the calcium pyroborate).

It was known from D1 to reduce the water solubility of calcium pyroborate by coating it with silica. Moreover, no particular technical effect had been shown to be associated with either the particular plastic used, the amount of the pyroborate or the nature of the article formed. The plastic compounding and forming steps were deemed conventional.

III. On 18 May 2000, a Notice of Appeal against the above decision was lodged by the Appellant (Applicant). The prescribed fee was paid on the same day.

In the Statement of Grounds of Appeal, submitted on 18 July 2000, the Appellant requested interlocutory

revision under Article 109 EPC on the basis of an amended set of eight claims and further arguments, which were "believed to overcome the outstanding grounds of objection maintained by the Examiner".

Claim 1 of the new set of claims read as follows:

"1. A process for protecting a plastic article from microbiological attack comprising:

(i) incorporating a microbicidally effective amount of hydrated or silica-coated calcium pyroborate into a plastic premix,

(ii) forming the premix into said plastic article, and

(iii) heating the plastic premix prior to or during said forming step (ii)."

The remaining claims are dependent claims relating to particular embodiments of the above process.

It was argued in the Statement of Grounds of Appeal, that the claims as amended reflected the distinction of the claimed subject-matter over the closest prior art, D1, which was based on the difference in the nature of the process required for manufacture of plastic articles as opposed to manufacture of paints, as submitted in a letter dated 25 October 1999.

Those arguments were summarised in that, unlike the method of manufacture of paints, which required only a simple blending step as disclosed in D1, the production of plastic articles required a process which included

heating the plastic premix in order to melt it before pressing it into the finished article. In contrast, paints did not require this melting step because they were inherently in liquid, flowable form.

It would not have been obvious for a person skilled in the art to use hydrated or silica-coated calcium pyroborate in a method of manufacture of a plastic article, because hydrated calcium pyroborate and its modified (eg silica-coated) forms contained a sufficient amount of water, such that these compounds would have been expected to interfere in the plastics manufacturing process. Thus, the skilled person would ordinarily have avoided use of hydrated forms of calcium pyroborate in a plastics processing method because any water released during processing could have had a harmful effect on the processability of a plastic.

Surprisingly, it had been found that hydrated calcium pyroborate and its modifications in hydrated form could indeed withstand processing temperatures required of manufacturing plastic articles, and in fact poor processing characteristics were not encountered during the manufacturing process. Therefore, it was argued that the claimed subject-matter was inventive over D1.

IV. In an Annex to summons to oral proceedings, dated 10 January 2003, the Rapporteur gave his preliminary, provisional opinion on the case. The opinion was expressed as follows:

"1. On page 1 of the application text, reference is made to two documents, the first of which (referred to as D2 by the Examining Division)

discloses a composition consisting essentially of a thermoplastic resin and a microbi[o]cide. This composition, which can be described as a masterbatch, serves to impart to thermoplastic resin, and articles formed therefrom, resistance against microbiological degradation (see claim 1; column 1, lines 10 to 23, in particular line 20). The authors of the document were aware of the toxicity of the final product containing such a biocide, eg OBPA (column 2, line 48) at higher concentrations (column 1, line 60 to column 2, line 17) and chose to avoid this disadvantage by going the masterbatch route. Moreover, they also addressed the fact that the microbicide should not be leached out during normal storage or normal use (column 1, lines 10 to 14; the examples, in particular Example III: column 11, line 3 *et seq.*). According to page 1 of the application in suit, besides OBPA, barium metaborate was a well known microbicide which also causes environmental concern.

2. In accordance with the introductory part of the description (page 1), the problem to be overcome by the application in suit may thus be seen in defining a process for rendering a plastic article resistant against microbiological attack or degradation which additionally reduces environmental concern (toxicity).

3. D1 suggests a solution of the environmental problems in paints, including those due to leaching out of the microbicide, by replacing the well-known toxic microbicide by silica-coated calcium pyroborate. Suitable calcium pyroborates

include hydrated calcium pyroborate, such as the monohydrate and the higher hydrates (page 1, lines 2 to 36, in particular lines 34 to 36; and page 3, lines 36 to 37; page 4, line 15).

4. In the Statement of Grounds of Appeal, it was argued that the skilled person would ordinarily avoid use of hydrated forms of calcium pyroborate in a plastic processing method because of any water released during processing which could have a harmful effect on the processibility of a plastic.

5. As already stated in the decision under appeal, no proof for any such disadvantage has been produced. Moreover, in the examples of D1, the pyroborates are dried at temperatures within a range of from 160°C to 250°C, ie at temperatures which may correspond to the temperatures commonly used in the processing of the preferred plastics mentioned in the application in suit (page 5, paragraph 3) or may even be higher than those temperatures (cf. D2: column 6, lines 31 to 39).

6. The reference to the fact that the calcium pyroborate was used in particulate form in D1 (letter dated 27 April 1998, at the bottom of page 1) does not amount to a convincing argument in view of page 4, last paragraph and page 6, lines 3 to 5 of the application in suit.

7. It would appear that the differences between plastic articles as referred to eg in Claim 8 and painted films (eg alkyd or latex films as used in the examples of D1) with respect to the problem of

leaching out the microbicide having a low water-solubility are not so significant that the skilled person would not consider D1 as a relevant source of information for microbicides which can be used in plastics industry (cf. D1: page 3, lines 18 to 25; page 4, lines 14 to 17).

8. This point of view is supported by the fact that the calcium pyroborate to be used in the claimed process can be prepared eg according to Pera et al., ie D1 or its US counterpart as referred to in the last paragraph of page 4 of the application in suit. It is noteworthy that the disclosure of the said US counterpart to D1 is incorporated into the disclosure of the application in suit by reference in its entirety.

9. Therefore, the subject-matter of the present claims does not appear to be based on an inventive step, since it seems to be obvious to use a microbicide well-known from D1, which fulfils all the requirements of low water-solubility and resistance to extraction, in a (melt-blended) dry blend based on the same polymers as known from D2 which is then further processed in a conventional manner into final products by extrusion, melting or calendering (D2: column 6, lines 7 to 31 and column; column 7, lines 26 to 34).

10. Any submissions should be available to the Board at least one month before the oral proceedings now scheduled. If amendments of the application documents are intended, it will be necessary to indicate the clear and unambiguous basis in the application documents as originally filed.".

V. In a letter dated 24 March 2003, the Board was informed by the Representative of the Appellant that the request for oral proceedings was withdrawn, that he had not been instructed to file any further amendments and that it was understood that "this must lead to dismissal of the appeal". Furthermore, it was requested that the procedure should continue in writing.

VI. The oral proceedings were held on 6 May 2003.

Reasons for the Decision

1. The appeal is admissible.

2. In view of the information given by the Appellant in its letter of 24 March 2003, the oral proceedings were held as scheduled in accordance with Rule 71(2) EPC.

3. No objections arise from the wording of the claims with respect to the formal requirements of the EPC.

4. *Novelty*

The Board has no reason to take a view with respect to novelty different from the finding in section II.(3) of the decision under appeal.

Hence, the subject-matter claimed is novel in the sense of Articles 54(1) and (2) EPC.

5. *Inventive step*

5.1 As set out above, the Rapporteur had expressed serious doubts as to the presence of an inventive step. To that

end, reference is made to items 1 to 9 of the Annex to the summons, which is quoted in section IV, above.

5.2 Moreover, the Appellant had been informed in the Annex (item 10) that any submissions in reply to this opinion were to be made available to the Board at least one month before the oral proceedings at the latest. In the letter of the Appellant dated 24 March 2003 (see section V, above), it was only stated that no amendments were intended and that it was understood that this must lead to dismissal of the appeal.

5.3 The arguments as presented up to that date were not convincing for reasons given in the Annex to the summons (items 1 to 9, see section IV, above). Nor are they convincing in view of the fact that Claim 1 refers to the use of two alternative forms of the microbicide, ie "hydrous or silica-coated calcium pyroborate".

It follows that the arguments presented which are based on an alleged prejudice against the use of the hydrous form of the microbicide in the process requiring a heating step cannot support the claim as a whole.

The only experimental data available are based on a single type of a "modified calcium pyroborate, BL-1227", which according to page 5, second paragraph of the application is "silica-coated". Hence, the application does not provide any evidence for the usefulness of hydrated calcium pyroborate in whole range of the claimed process as defined in Claim 1.

5.4 In view of these facts and findings, the Board comes to the conclusion that the subject-matter of Claim 1 is not based on an inventive step having regard to D2 and

D1 (Article 56 EPC).

5.5 Since a decision can be made only on the basis of a request as a whole, but not on individual claims, there is no need to consider the dependent claims further.

6. It follows that the sole request comprising Claims 1 to 8 as submitted by letter of 27 April 1998 must be refused.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

E. Görgmaier R. Young