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D E C I S I O N
of 20 July 2005

Case Number: T 0410/03 - 3.3.6

Application Number: 96933370.7

Publication Number: 874896

IPC: C11D 17/00

Language of the proceedings: EN

Title of invention:
Encapsulated bleach particles

Patentees:
Unilever PLC, et al

Opponent:
The Procter & Gamble Company

Headword:
Alginate coating/UNILEVER

Relevant legal provisions:
EPC Art. 56

Keyword:
"Inventive step (yes): no incentive in the prior art to use a cross-linked alginate for encapsulating a solid core particle of bleach"

Decisions cited:
-

Catchword:
-

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Case Number: T 0410/03 - 3.3.6

D E C I S I O N
of the Technical Board of Appeal 3.3.6
of 20 July 2005

Appellant: The Procter & Gamble Company
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Respondents: Unilever PLC
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 11 February 2003 rejecting the opposition filed against European patent No. 874896 pursuant to Article 102(2) EPC.**

Composition of the Board:

Chairman: G. Raths
Members: L. LiVoti
U. Tronser

Summary of Facts and Submissions

I. The present appeal is from the decision of the Opposition Division to reject the opposition against the European patent no. 0 874 896 relating to encapsulated bleach particles.

This patent was granted with a set of 9 claims, claim 1 reading as follows:

"1. Encapsulated bleach particle, comprising

(a) 1-30% by weight of a coating including an alginate wherein at least 10% by weight of said alginate is cross-linked with alkali earth metal ions;
(b) 99-70% by weight of a core material selected from the group consisting of a peroxygen bleach compound, a bleach catalyst, and a peroxygen bleach precursor."

Dependent claims 2 to 5 relate to specific embodiments of the bleach particle of claim 1, claims 6 to 8 to a process for its preparation and claim 9 to a detergent composition comprising it.

II. In its notice of opposition the Opponent sought revocation of the patent on the grounds of Article 100(a) EPC, in particular because of lack of inventive step of the claimed subject-matter and referred *inter alia* to the following documents:

(1): WO-A-94/12613; and
(2): EP-A-573731.

In its letter dated 19 December 2002 it referred additionally to document

(8): Ullmann's Encyclopedia of Industrial Chemistry, vol. A25 (1994), pages 23 and 34 to 40.

III. In its decision the Opposition Division found that the claimed subject-matter complied with the requirements of the EPC and, in particular, that it was not obvious for the skilled person, starting from the teaching of documents (1) or (2), to use alginates cross-linked with alkaline earth metal ions for encapsulating bleach particles with the expectation of obtaining a product stable to degradation.

IV. An appeal was filed against this decision by the Opponent (Appellant).

During the written proceedings the Appellant referred additionally *inter alia* to the documents

(9a): English translation of JP-A-7-26292; and
(10): Enzyme Microb. Technol., 1989, vol. 11, pages 706 to 716: "Chemical and physical properties of algal polysaccharides used for cell immobilization" by K.B. Guiseley.

Oral proceedings were held before the Board on 20 July 2005.

V. The Appellant submitted in writing and orally *inter alia* that

- the tests provided in the patent in suit did not show that the use of a coating of alginates cross-linked with alkaline earth metal ions brought about any improvement in the stability of the encapsulated bleach over the products of the closest prior art, i.e. those known from documents (1) or (2);

- it was already known to the skilled person from documents (10) and (8) that these cross-linked alginates build up jelly beads which could be used for encapsulating cells and enzymes and that such a coating had thermal, mechanical and chemical stability; moreover, such a coating was soluble in cold water in the presence of calcium sequestering agents;

- taking document (1) as the starting point for the evaluation of inventive step, it was thus obvious for the skilled person to use alginates cross-linked with alkaline earth metal ions instead of the water-soluble alginate biopolymer suggested in document (1) for protecting sensitive or reactive additives such as bleaches;

- the prior art in fact did not contain any prejudice against the use of such cross-linked alginates for protecting bleaches and showed, e.g. in documents (1) and (9), that alginates were compatible with bleaches;

- for similar reasons it was obvious to the skilled person to try the alginates cross-linked with alkaline earth metal ions as an encapsulating coating for bleaches alternatively to the hydrophobic coating used in document (2); and

- the claimed subject-matter lacked thus an inventive step.

VI. The Respondents (Patent Proprietors) submitted *inter alia* that

- the tests in the patent in suit showed that a bleach encapsulated as required by the patent in suit was satisfactorily stable against degradation upon storage and that it was soluble in cold water in the absence of a detergent composition comprising sequestering agents;

- document (1) related to a very different type of particles consisting of a molecular solid solution of the additive to be protected in a biopolymer and did not relate to particles comprising a core of a sensitive additive material and an encapsulating coating therefor;

- the starting point for evaluating inventive step had thus not to be represented by document (1) but by document (2) which related to particles structurally similar to those of the patent in suit;

- document (2) required that the hydrophobic coating used for encapsulating bleach particles did not contain components having highly hydrophilic groups like carboxylic acid groups; thus, it taught away from using alginates, which are compounds comprising carboxylic acid groups, as part of the hydrophobic coating disclosed therein; moreover, the alginates used according to the teaching of document (2) as water-swellable grains capable of expanding in cold water and of breaking the hydrophobic coating were not cross-

linked with alkaline earth metal ions, since the cross-linked compounds could not form water-swellable grains;

- moreover, the skilled person, in the light of the teaching of the prior art, e.g. documents (8) and (10), would not have had any incentive to try to use in the encapsulation of bleach cores an alginate cross-linked with alkaline earth metal ions which had been used in very remote technical fields for encapsulating and immobilizing cells and enzymes, i.e. materials very different from detergent ingredients;

- the prior art did not contain any suggestion that a coating of these cross-linked alginates would render encapsulated bleaches stable to degradation;

- the claimed subject-matter thus involved an inventive step.

VII. The Appellant requests that the decision under appeal be set aside and that the patent be revoked.

The Respondents request that the appeal be dismissed.

Reasons for the Decision

1. *Inventive step*

1.1 The patent in suit and, in particular, the subject-matter of claim 1, relates to encapsulated bleach particles, comprising a solid core material selected from the group consisting of a peroxygen bleach compound, a bleach catalyst and a peroxygen bleach

precursor and a coating including an alginate wherein at least 10% by weight of said alginate is cross-linked with alkali earth metal ions (see page 2, lines 5 to 6 and 44 to 49).

As explained in the patent in suit, it was known in the prior art to protect sensitive solid ingredients of a detergent formulation such as bleach particles by separating them physically from their environment, e.g. by encapsulation (page 2, lines 11 to 13).

Several coating materials had already been tried in the prior art for encapsulating bleaches. However, since a single coat is often not sufficient for achieving a satisfactory stability of the protected bleach, a second coating has to be added, thereby increasing the costs of encapsulation; moreover, some coatings have an adverse interaction with the bleach to be protected and lead to an unsatisfactory stability to degradation upon long-term storage (see page 2, lines 14 to 23).

The technical problem underlying the claimed invention is thus defined in the description of the patent in suit as the provision of a single coat of encapsulating material able to improve the stability to degradation upon storage of the coated bleach particles, thereby maintaining good solubility characteristics during the wash (page 2, lines 29 to 33).

1.2 Two documents, namely documents (1) and (2) were discussed as a possible starting point for the evaluation of inventive step by the Opposition Division in the decision under appeal and by the parties.

The Board notes that both documents relate to the technical problem identified in the patent in suit of providing bleach particles having a better stability against degradation upon long-term storage whilst maintaining a good solubility during the wash (see document (1) page 1, lines 10 to 19; page 2, lines 1 to 19 and document (2), page 2, lines 5 to 24).

However, document (1) does not relate to the encapsulation of a core bleach particle with a single coating but to a product prepared by forming a molecular solid solution of an adjunct, such as a bleach, in a biopolymer and drying it, wherein the ingredients to be protected are thus homogenously distributed within the biopolymer which can also be used as an additional coating (see page 13, lines 14 to 29). An example of this kind of product is described on page 27, lines 12 to 17, as a reddish-brown coloured glassy material.

The Board finds thus that the products disclosed in document (1) do not contain a core of solid bleach encapsulated by a coating and are thus structurally different from those claimed in the patent in suit.

On the contrary, document (2), relating to particles having a solid core of a peroxy compound and a coating comprising a hydrophobic substance, deals with products structurally similar to those of the patent in suit.

The Board takes thus document (2) as the most reasonable starting point for the evaluation of inventive step of the claimed subject-matter.

Document (2) discloses particles differing from the subject-matter of claim 1 of the patent in suit only insofar as they do not contain an alginate cross-linked with alkaline earth metal ions in the encapsulating coating.

1.3 The Board agrees with the Appellant that the patent in suit does not contain any evidence that the subject-matter of claim 1 of the patent in suit is more stable to degradation upon storage than the products of document (2) but provides just a comparison in regard to products comprising a sulphate coating (see page 8, line 4) and thus in regard to a more remote state of the art.

However, the Board finds that the products according to claim 1 described in the examples of the patent in suit are satisfactorily stable upon long-term storage and have a good solubility during washing (see tables 2, 3, 6 and 7).

Thus, in the light of the teaching of document (2) and of the description of the patent in suit, the technical problem underlying the claimed invention can be defined as the provision of an alternative type of coating which can be used as a single coating for encapsulating bleaches, which coating provides acceptable stability upon degradation under long-term storage and has good solubility during washing.

The Board thus finds that the claimed bleach particles credibly solved the above mentioned technical problem.

1.3.1 According to the teaching of document (2) the water-swellable grains capable of expanding in cold water and of breaking the hydrophobic coating can consist of alginate (page 3, lines 23 to 29). This disclosure, however, does not relate to alginates cross-linked with alkaline earth metal ions since these compounds do not possess such a property but it relates to the known alkali metal alginates.

Moreover, document (2) requires that the hydrophobic coating should not contain components having highly hydrophilic groups like carboxylic acid groups (page 2, lines 55 to 57) and thus teaches away from using alginates, i.e. components comprising carboxylic groups as part of the hydrophobic coating.

The Board finds therefore that the only question remaining to be answered for evaluating inventive step is whether the skilled person, considering the teaching of the prior art and his common general knowledge at the priority date of the patent in suit, would have tried a coating comprising an alginate cross-linked with alkaline earth metal ions for encapsulating a solid core comprising a bleach as an alternative to the hydrophobic coating disclosed in document (2) and whether he would have expected to obtain, by means of such an alternative coating, a product having a satisfactory stability upon long-term storage and good solubility in water.

1.4 The Board notes that it was known from document (10) and from the more recent document (8), which can reasonably be assumed to represent the common general knowledge of the skilled person at the priority date of

the patent in suit, that alginates cross-linked with alkaline earth metal ions were thickening and gelling agents, stabilizing agents for suspensions and were able to form thermostable jelly beads which were porous, and permitted within certain limits the diffusion of substrates, products and by-products, and could be used in biotechnology for encapsulating and immobilizing bioactive cells; such products had mechanical stability and chemical stability to phosphates and could be dissolved in water by treatment with calcium sequestering agents (see document (10), page 706, left-hand column, lines 11 to 14 and 17 to 18 below "Introduction", page 708, right-hand column, lines 3 to 5, 33 to 42; paragraph bridging pages 708 and 709; paragraph bridging pages 713 and 714; page 714, paragraph bridging left-hand and right-hand column; and document (8), page 39, left-hand column, lines 10 to 32; paragraph 2.4.5 on pages 39 to 40 in combination with table 2.2 on page 23, e.g. points 1, 5, 12, 18, 19, 33; especially, last four lines of paragraph 2.4.5 on page 40).

The prior art thus did not contain any explicit suggestion to use alginates cross-linked with earth metal ions as an encapsulating coating for solid bleaches or for other solid sensitive components of a detergent composition.

1.5 The Appellant argued that the prior art suggested the compatibility of alginates with bleaches since document (1), discussed hereinabove, suggested the use of water-soluble alginate as biopolymer in combination with bleaches and as a coating of the solid molecular solutions disclosed therein (page 5, lines 9 to 12 in

combination with page 13, lines 14 to 29), document (9) disclosed a composition containing a peroxide and a cross-linked alginate (see claims 1 and 4), and document (10) taught that alginates cross-linked with barium ions were chemically stable against phosphates (page 713, right-hand column, last paragraph).

The Board finds, to the contrary, that the prior art, though suggesting the compatibility of alginates in a certain specific type of products, did not contain any teaching or suggestion about the stability against degradation upon storage of a porous coating of cross-linked alginate which permitted within certain limits the diffusion of substrates, products and by-products as taught in document (10) (page 706, left-hand column, lines 11 to 14 and 17 to 18 below "Introduction").

Therefore, the prior art did not contain any incentive for the skilled person to use such cross-linked alginates as a coating for bleach particles and furthermore the skilled person, a practitioner in the field of detergents, would not have looked, in the Board's judgement, in the distant field of biotechnology for encapsulating materials suitable for protecting satisfactorily bleaches used in detergent compositions.

Therefore, the Board concludes that it was not obvious for the skilled person, in the light of the teaching of the prior art, to use such a cross-linked alginate as an alternative to the hydrophobic coating of document (2) with the expectation of obtaining a satisfactory stability upon long-term storage.

The subject-matter of claim 1 of the patent in suit complies thus with the requirements of Article 56 EPC.

1.6 Since the subject-matter of claim 1 involves an inventive step, the subject-matter of the dependent claims 2 to 5 as well as of claims 6 to 8, relating to a process for the preparation of the product of claim 1, and of claim 9, relating to a detergent composition comprising such a product, also involve an inventive step.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

G. Rauh G. Raths