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Bezeichnung der Erfindung: Production of detergent compositions
Title of invention:
Titre de l'invention :

Klassifikation / Classification / Classement : C11D3/06

ENTSCHEIDUNG / DECISION
vom / of / du 11 December 1985

Anmelder / Applicant / Demandeur :

Patentinhaber / Proprietor of the patent / Titulaire du brevet : UNILEVER (appellant)

Einsprechender / Opponent / Opposant : HENKEL (respondent)

Stichwort / Headword / Référence : Art. 52 (1) and 56 EPC

EPÜ / EPC / CBE
"Inventive step" "absence of an unexpected effect"

Leitsatz / Headnote / Sommaire

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Case Number: T 146 83/

DECISION

of the Technical Board of Appeal 3.3.1

of 11 December 1985

Appellant: (Proprietor of the patent)
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Representative:

Decision under appeal: Decision of the Opposition Division of the European Patent Office dated 15.07.1983 revoking European patent No. 0 009 952 pursuant to Article 102(1) EPC

Composition of the Board:

Chairman: K. Jahn

Member: P. Lançon

Member: F. Benussi

I

Summary of Facts and Submissions

I European patent No. 0 009 952 was granted on 7 October 1981 with 17 claims on the basis of European patent application No. 79 302 057.9 filed on 1 October 1979 claiming the priority of the earlier national application (GB 3 907 478) of 3 October 1978. Claim 1 reads as follows:

A process for preparing a particulate alkaline detergent composition which contains at least 5% by weight of a synthetic detergent active compound or mixture thereof, at least 5% of an alkali metal tripolyphosphate and at least 2% of an alkali metal orthophosphate with a total amount of the tripolyphosphate and orthophosphate of from 10% to 40% by weight, characterised by spray drying a detergent base powder containing some or all of the detergent active compound or compounds and some or all of the alkali metal orthophosphate, and admixing at least 2.5% by weight of the alkali metal tripolyphosphate in particulate form with the spray dried base powder, with the remainder if any of the alkali metal tripolyphosphate being spray dried in the base powder, the percentages being based on the total composition.

II The opponent filed an opposition against the European patent on 20 March 1982 requesting that it be revoked on the ground of lack of novelty and inventive step. The opposition was supported by the following three documents:

(1) DE-A-2 637 890
(2) Fette, Seifen, Anstrichsmittel 58 (1956), 1029-1038
(3) Firmenprospekte der Knapsack Aktiengesellschaft, Knapsack bei Köln, "THERMPHOS" and "THERMPHOS-Hexahydrat" (1965).

III The Opposition Division revoked the patent by a decision of 15 July 1983. It considered the subject-matter of Claim 1 novel because, in its view, none of the citations described the claimed process. However, it held that Claim 1 lacked inventive step.

According to the Opposition Division, the combined teachings of documents (1) and (2) would indicate the way in which to proceed when practically pyrophosphate free detergent compositions containing degradable tripolyphosphate are to be prepared under adverse spray drying conditions viz.

(a) spray drying a detergent composition that may contain the hydrolysis resistant orthophosphate, but not the degradable tripolyphosphate and

(b) adding separately a suitable tripolyphosphate to the spray-dried detergent base.

IV A notice of appeal was filed by the Appellants against the decision of the Opposition Division on 19 September 1983. The fee for appeal had already been paid on 27 August 1983. The Statement of Grounds for appeal submitted on 11 November 1983 argued essentially as follows:

According to the Appellant, the problem which the claimed invention seeks to overcome had been wrongly stated in the Decision since it relies on a theory put forward solely in the patent specification. The problem should be considered as finding a way to reduce deposition on washing machine surface rather than to reduce the degradation of tripolyphosphate into pyrophosphate. The Appellants submitted that the Opposition Division had reached this decision with the benefit of hindsight.

V In their letter of 22 March 1984, the Respondents (Opponent) contested the Appellant's arguments. They pointed out that, in their opinion, the problem of reducing the deposit on washing machine surfaces is only part of the more general problem of the deposition in washing machines (including both on the parts of the machine and on washed fabric). This last problem is disclosed and solved in the cited documents.

VI The Appellant (Patentees) request that the decision under appeal be set aside.

The Respondents (Opponent), in turn, request dismissal of the appeal.

II

Reasons for the decision

1. The appeal is in accordance with Articles 106, 107 and 108 and Rule 64 EPC; it is thus admissible.

2. The relevant closest state of the art is described by document (1). This document corresponds to GB-A-1 530 799 already cited in the description of the patent in suit (page 1, line 4).

It had been suggested that the use of phosphate detergency builders can contribute to eutrophication problems. In response to this problem, document (1) suggests that a suitable choice of the amounts of the alkali metal tripolyphosphate and alkali metal orthophosphate renders it possible to formulate effective detergent compositions containing lower phosphorus levels than in comparable conventional sodium tripolyphosphate-based detergent

compositions with similar building capacities (see page 2, lines 1 to 5; page 4, line 27 to page 5, line 3).

In particular, document (1) describes alkaline fabric detergent compositions comprising 5% to 30% of a synthetic detergent compound and from 10% to 30% of mixed alkali metal tripolyphosphate and alkali metal orthophosphate in the ratio of from 10:1 to 1:5 parts by weight wherein the amount of the alkali metal tripolyphosphate is at least 5% and the amount of any alkali metal pyrophosphate is not more than 5%, all these percentages being expressed by weight of the total detergent composition, with the further condition that the pH of 0.1% aqueous solution of the composition is from 9 to 11 (see page 4, lines 13 to 26).

These detergent compositions should be in free-flowing powdered form and can be produced by any of the techniques commonly employed in the manufacture of such fabric washing compositions, but preferably by slurry making and spray drying processes (see page 19, 2nd paragraph).

Document (1) points out that it is desirable to add no alkali metal pyrophosphates to the compositions as they tend to increase inorganic deposition. Moreover, the presence of significant levels of the alkali metal pyrophosphates instead of the sodium tripolyphosphate or sodium orthophosphate leads to lower detergency building capacities within the limited phosphate levels permitted. However, it is well known that the condensed phosphates such as sodium tripolyphosphate tend to degrade to form other phosphates under aqueous alkaline conditions at high temperatures, which are commonly met during detergent processing. Sodium tripolyphosphate degrades to give a mixture of mainly sodium pyrophosphate with a small amount of sodium orthophosphate, so that spray-dried

detergent products contain amounts of all three of these materials.

Document (1) concludes that low levels of sodium pyrophosphate are unavoidable in spray-dried powders (see page 6, line 28 to page 7, line 3 and page 10, last line to page 11, line 16).

3. In respect of this state of the art, duly cited in the description, the Applicant has found a drawback in the level of inorganic deposits or incrustations which are sometimes found on heater elements and, to a lesser extent, on other surfaces in washing machines.

The Board see the problem as the one of finding a process for the preparation of detergent compositions of the type described in document (1), the process being such that the product obtained has a significantly lower tendency to deposition.

4. With regard to the problem, the Appellant seems willing to specify that it concerns the deposition on washing machine surfaces (Statement of Grounds, point 1).

As the Respondent pointed out, deposition, if any, must lead to deposits both on the machine and on washed fabric (letter of 22 March 1984, page 3, 1st paragraph). This view, which has remained unanswered by the Appellant, is shared by the Board as it also finds support in the description of the patent specification - namely, it is said that additionally, the use of the process of the patent in suit can give some detergent compositions a decreased tendency to form inorganic deposits on washed fabrics under adverse washing conditions (see page 2, lines 34 and 35).

As to the solution, which is the admixing of at least 2.5% by weight of the alkalimetal tripolyphosphate in particulate form with the spray-dried base powder, the comparative examples 1 and 2 show that the problem has been effectively solved.

5. As document (1) does not disclose a process wherein at least 2.5% by weight of the alkali metal tripolyphosphate in particulate form is "postdosed", the object of Claim 1 is novel.

6. For the purpose of assessing the inventive step, it must be examined whether the teaching of document (1) combined with the other documents introduced in the proceedings would obviously lead the skilled man to the claimed invention. According to the Board, the second most relevant document is document (2). This article deals with the hydrolysis of sodium tripolyphosphate when spray-drying washing agents.

Document (2) teaches that the less the concentration of the phosphate in the slurry, the more the hydrolysis of the tripolyphosphate (page 1030, 2nd column, 4th full paragraph and page 1032, 2nd column, lines 7 to 17).

Further, it adds that hydrolysis occurs not only on storage of the slurry but also during spray-drying (see page 1031, 1st column, last paragraph).

Thereafter, it indicates that pyrophosphate is the predominant product of tripolyphosphate hydrolysis in spray drying (see page 1037, 2nd column, 1st full paragraph).

Finally, it states that a certain amount of pyrophosphate in the detergent composition may be beneficial. Nevertheless, if the producer of detergents wishes to avoid hydrolysis of tripolyphosphate during spray drying, then he has the possibility of avoiding this method and to dry mix commercial powders. (See page 1038, 1st column, 1st full paragraph).

This is exactly what has been done by the Appelants.

7. In the view of the Board, the skilled man who is aware of the teachings of documents (1) and (2) must know that, although a detergent composition of the type described in document (1) has ecological advantages and gives good working results, the conventional spray drying process of preparation of such a composition leads to hydrolysis of the tripolyphosphate contained in the slurry. He also must appreciate that hydrolysis occurs more especially as the phosphorous concentration is lower than in conventional slurries, as taught in document (2). However, the product of hydrolysis, during spray drying, will essentially be the pyrophosphate (document (1) or (2)). Pyrophosphate must be avoided because it tends to increase inorganic deposition (document (1)). As presence of pyrophosphate is unavoidable in spray dried powders (cf. document (1)), the only promising way is to follow the guidance of document (2) and to choose the dry mixing of the tripolyphosphate.

Consequently, the claimed solution to the problem raised by the patent in suit is obvious to the skilled man.

8. The same conclusion must be drawn in relation to the alternative process, in which some, but not all, the alkali metal tripolyphosphate is "postdosed". Such a procedure takes advantage of the process indicated in document (2) to a lesser extent, with a corresponding worsening of the result (cf. the Grounds of Opposition, page 5, second paragraph). In the absence of any unexpected advantage, this alternative way of carrying out the process claimed must also be regarded as lacking an inventive step.

The same applies to dependent Claims 2 to 17 which also must fall with Claim 1.

9. The revocation of the patent in suit must be confirmed.

ORDER

For these reasons, it is decided that:

The appeal is rejected.