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**Datasheet for the decision
of 16 October 2008**

Case Number: T 1400/06 - 3.3.06

Application Number: 96114569.5

Publication Number: 0763593

IPC: C11D 3/00

Language of the proceedings: EN

Title of invention:

Starch-based adjuncts for detergents

Patentee:

National Starch and Chemical Investment Holding Corporation

Opponent:

Cerestar Holding B.V.

Headword:

Cold water soluble starch/NATIONAL STARCH

Relevant legal provisions:

EPC Art. 54(1)(2), 56, 123(2)

RPBA Art. 13(1)

Keyword:

"Admissibility of a new document submitted during oral proceedings (no)"

"Added subject-matter (no)"

"Novelty (yes): term to be interpreted taking into account the description"

"Inventive step (yes)"

Decisions cited:

T 1221/04

Catchword:

-



Case Number: T 1400/06 - 3.3.06

DECISION
of the Technical Board of Appeal 3.3.06
of 16 October 2008

Appellant: Cerestar Holding B.V.
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Decision under appeal: Decision of the Opposition Division of the
European Patent Office posted 19 July 2006
rejecting the opposition filed against European
patent No. 0763593 pursuant to Article 102(2)
EPC 1973.

Composition of the Board:

Chairman: P. Ammendola
Members: L. Li Voti
J. Van Moer

Summary of Facts and Submissions

I. The present appeal is from the decision of the Opposition Division to reject the opposition against European patent no. 0 763 593 concerning a detergent composition comprising at least one chemically modified starch.

Claim 1 of the patent as granted reads as follows:

"1. A detergent composition comprising at least one surfactant, at least one builder, at least one auxiliary and from 0.5 to 50 weight percent based on the weight of the detergent composition of at least one chemically modified starch which exhibits cold water solubility, provided the chemically modified starch has a viscosity from 10 WF to 95 WF and a degree of substitution from 0.5 to 3."

Dependent claims 2 to 5 relate to particular embodiments of the detergent composition of claim 1.

II. In its notice of opposition the Opponent, referring *inter alia* to documents

(1): US-A-3629121;

(2): US-A-4029590;

(3): FR-A-1342792; and

(5): Starches, Practical Guides for the Food Industry, 1999, page 39,

sought revocation of the patent on the grounds of Article 100(a) EPC, because of lack of novelty and

inventive step of the claimed subject-matter, and of Article 100(c) EPC.

III. In its decision, the Opposition Division found *inter alia* that

- claim 1 of the application as originally filed was directed to a composition comprising a surfactant, a builder and a detergent auxiliary; therefore, this claim did not exclude the possible presence of further components;

- moreover, the description of the application as originally filed disclosed or suggested that the claimed composition could contain mixtures of surfactants, mixtures of builders and co-builders and more than one type of detergent auxiliary (page 7, line 10; passage bridging pages 6 and 7 as well as page 9, lines 8 to 16); the composition according to the invention reported on page 10, lines 5 to 12 of the description, included also more than one builder and more than one type of detergent auxiliary;

- therefore, the application as originally filed contained a support for the wording of claim 1 as granted, which claim thus complied with the requirements of Article 123(2) EPC.

As regards the novelty of the claimed subject-matter the Opposition Division found that

- the meaning of the expression "cold water soluble" in the field of starches was known to the skilled person and there was no reason to interpret it in the light of

the definitions contained in paragraphs 14 to 16 of the patent in suit;

- document (1) did not disclose unambiguously a composition containing a chemically modified starch which was cold water-soluble and had a degree of substitution of 0.5 to 3;

- document (3) did not disclose a composition having from 0.5 to 50% by weight of a chemically modified starch;

- moreover, documents (1), (2) and (3) did not disclose unambiguously a chemically modified starch having a viscosity between 10 and 95 WF;

- therefore, the claimed subject-matter was novel over the cited prior art.

As regards inventive step the Opposition Division found that

- document (3), disclosing a composition having anti-redeposition properties, represented the closest prior art since it concerned a use similar to that of the invention of the patent in suit and had more features in common with the claimed invention than the compositions known from documents (1) or (2);

- the invention had convincingly solved the technical problem consisting in the provision of an alternative detergent composition having satisfactory soil removal and anti-redeposition properties;

- document (3), relating to a product having anti-redeposition properties, did not suggest how it would have been possible to provide a chemically modified starch having the combination of properties shown in the patent in suit; moreover, documents (1) and (2) did not concern the provision of a composition having anti-redeposition properties and did not disclose chemically modified starches as claimed;

- therefore, the cited prior art did not contain any teaching that would have led the skilled person to the claimed invention;

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

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

The Respondent (Patent Proprietor) submitted with its letter of 12 April 2007 several amended sets of claims to be considered as first to seventh auxiliary requests.

Oral proceedings were held before the Board on 16 October 2008.

As regards the common general knowledge of the skilled person about the water solubility of sodium carboxymethyl starches, the Appellant submitted during oral proceedings the following document:

(8): "Physiological Properties of Sodium Carboxymethyl Starch" by C.C. Wang et al., pages 471 to 481, received for publication October 24, 1949.

The Respondent submitted during oral proceedings that document (8) should not be admitted and requested an adjournment of the oral proceedings if the Board would decide conversely to admit this document.

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

- the wording of claim 1 as granted, including the expressions "at least one surfactant", "at least one builder" and "at least one auxiliary", is not supported by the original disclosure which refers to a composition comprising only "a surfactant", "a builder" and "an auxiliary"; in fact, the article "a" is equivalent to the word "one" and the term "comprising" in the claim allows only the presence of other unspecified optional components in addition to the essential ingredients listed in the claim; therefore, there is no explicit or implicit disclosure in the application as originally filed that more than one surfactant or more than one builder or more than one detergent auxiliary can be used;

- moreover, the expression "at least one" would not have in the English language exactly the same meaning as the expression "one or more" since the expression "at least one" would convey that "one" is less preferred to "more than one" whilst the expression "one or more" would not suggest any preference between "one" or "more than one"; the insinuation implied by the expression "at least one" used in claim 1 is not suggested in the original description of the invention;

therefore claim 1 would contravene the requirements of Article 123(2) EPC.

As regards the novelty of the claimed subject-matter the Appellant submitted that

- the definition of a cold water soluble chemically modified starch given in paragraph 15 of the patent in suit is unclear and should not be taken into consideration; moreover, the method of preparation of such a modified starch reported in paragraph 16 of the patent in suit is only one of the possible methods known to the skilled person for obtaining a modified starch soluble in cold water and cannot be considered to be limiting the meaning of the wording of claim 1;

- document (1) discloses detergent compositions comprising surfactants, builders, auxiliaries and a carboxylated starch, i.e. a chemically modified starch of a type also specifically listed in the patent in suit, having a degree of substitution as required in claim 1; such a chemically modified starch thus would have necessarily the same characteristics as those used in the patent in suit. Therefore, the modified starches of document (1) would be cold water soluble and would have a viscosity as required in the patent in suit;

- moreover, document (1) teaches that the therein disclosed salts of carboxylated starches are water soluble and can dissolve in light duty detergent compositions which are used at temperatures below 100 °F, i.e. 38°C, and even at cool temperatures;

therefore, document (1) would disclose explicitly that the chemically modified starches used therein are soluble in cold water;

- since the viscosity WF range required in claim 1 of the patent in suit is very broad, any chemically modified starch would have a WF as claimed; moreover, an acid-thinned starch like that exemplified in tables I and III of document (1) has a WF within the claimed range, as taught in document (5); therefore, document (1) would disclose chemically modified starches having implicitly a viscosity WF according to the patent in suit;

- since document (8) teaches that carboxymethyl starches dissolve in cold water forming a colloidal dispersion, the chemically modified starches disclosed in document (1) would also fall under the definition of a cold water soluble chemically modified starch given in paragraph 15 of the patent in suit; this property of the chemically modified starches of document (1) is confirmed by the fact that they do not show a blue stain when subjected to the known iodine test for the identification of the starch structure, which test shows that the modified starches of this document do not maintain the original structure of the starch;

- moreover, document (1) teaches also that the chemically modified starches can be mildly degraded, e.g. by autoclaving, for improving their building properties and obtaining a product not showing such a blue stain; consequently, the chemically modified starches used in document (1) must be identical to those used according to the patent in suit;

- therefore, the claimed subject-matter lacks novelty over the disclosure of document (1);

- document (2) discloses detergent compositions comprising dextrans which are chemically modified and are soluble in cold water; these chemically modified dextrans are chemically modified starches according to the patent in suit since they have necessarily a viscosity WF as claimed; moreover, they would form a colloidal dispersion in cold water;

- therefore, also the disclosure of document (2) detracts from the novelty of the claimed subject-matter.

As regards inventive step the Appellant submitted that

- the most suitable starting point for the evaluation of inventive step is not represented by document (3) but by document (1), which refers to the use in detergent compositions of chemically modified starches having both building capacity, i.e. soil removal capacity, and anti-redeposition properties;

- the tests present in the patent in suit cannot be considered to show that the claimed compositions provide any improved technical effect since the tested chemically modified starches have a degree of substitution below the lower limit required in claim 1; moreover, sample B concerns a chemically modified starch obtained from a strongly degraded starch A having a viscosity of 85 WF; therefore, it is not clear if this product can be considered to be one according to the invention;

- therefore, the patent in suit does not contain any evidence that the technical problem underlying the invention of providing a chemically modified starch capable of imparting both anti-redeposition and soil release properties has been solved by means of the subject-matter of claim 1;

- moreover, as explained in the description of the original application, the selection of a particular viscosity WF is not critical to the multi-functionality of the modified starch and thus is not critical for the achievement of any technical effect;

-therefore, starting from the disclosure of document (1), the technical problem underlying the invention can only be defined as the provision of an alternative composition comprising chemically modified starches capable of forming a colloidal dispersion in cold water;

- however, a process for rendering modified starches able to give a colloidal dispersion in cold water was already known from the prior art, as explained in paragraph 16 of the patent in suit;

- therefore, a skilled person, starting from the disclosure of document (1) and considering the suggestion of document (1) to mildly degrade the chemically modified starches described therein in order to improve their building properties, would have tried this known process for rendering the chemically modified starches capable of forming a colloidal dispersion in cold water;

- therefore, the claimed subject-matter lacked an inventive step;

- document (3) was selected as starting point for the evaluation of inventive step by the Opposition Division and by the Respondent; this document discloses a detergent composition comprising a cold water soluble chemically modified starch which has a viscosity WF of 89, as found by the Appellant by reworking example 1, which composition differs from that of claim 1 according to the main request only insofar as it comprises an amount of the chemically modified starch lower than 0.5% by weight;

- therefore, also starting from the disclosure of document (3), it would have been obvious for the skilled person to try in the compositions disclosed therein also higher concentrations of the chemically modified starch as taught, for example, in document (1), in order to provide an alternative composition having similar properties;

- the claimed subject-matter thus would lack an inventive step even starting from document (3).

VI. The Respondent submitted in writing and orally *inter alia* that

- the wording of claim 1 is supported by the original disclosure and the wording "at least one" has a meaning identical to the wording "one or more";

- document (8), submitted for the first time during oral proceedings, is belated and should not be admitted;

- document (1) does not disclose unambiguously a chemically modified starch having a cold water solubility as intended in the patent in suit, i.e. a chemically modified starch which completely disrupts its granular structure in cold water to form a colloidal dispersion; in fact, the methods of preparation disclosed in document (1) do not include a physical treatment of the chemically modified starch as described in paragraph 16 of the patent in suit and, in particular, a pregelatinization of the chemically modified starch, which is necessary in order to obtain a modified starch which dissolves in cold water by completely disrupting its granular structure and forming a colloidal dispersion; the so treated chemically modified starch would maintain substantially its molecular weight and is not fragmented;

- the fact that the chemically modified starches used in document (1) do not give a blue stain upon the known iodine test for the identification of the starch structure cannot be considered to be an evidence that these modified starches are of the same type as used in the patent in suit; moreover, even though the salts of the modified starches used in document (1) are partially water-soluble and can be dissolved in a light duty detergent composition, none of the modified starches disclosed in document (1) would form a colloidal dispersion in cold water;

- therefore, document (1) does not disclose unambiguously a cold water soluble chemical modified starch according to the patent in suit; moreover, document (1) does not disclose unambiguously a

chemically modified starch having a viscosity WF as claimed;

- furthermore, the modified dextrans of document (2) would not be considered by the skilled person to be a chemically modified starch as required in the patent in suit; moreover, they are very soluble in cold water and they would not form a colloidal dispersion as required in the patent in suit; furthermore, because of their high solubility, they would have a viscosity WF outside the range claimed;

- therefore, neither the disclosure of document (1) nor that of document (2) can be considered to detract from the novelty of the claimed subject-matter.

As regards inventive step the Respondent submitted that

- the tests of the patent in suit, though mostly relating to chemically modified starches with a degree of substitution lower than that required in claim 1, show that a cold water soluble chemically modified starch according to the invention, at variance with a similar not cold water soluble one, provides both anti-redeposition and soil removal properties; soil removal properties are considered to be different from building properties;

- document (3), representing the closest prior art, discloses the use of modified starches which are not cold water soluble as intended in the patent in suit; moreover the Appellant's allegation that such modified starches would have a viscosity as required in claim 1 has not been proven since the experimental test of the

alleged reworking of example 1 has not been provided by the Appellant; to the contrary, the method of preparation used in document (3) would cause a strong degradation of the starch that would result in a fragmented product having a viscosity WF outside the range of the patent in suit;

- since documents (1) and (2) do not disclose chemically modified starches according to the invention, the skilled person would not have found any suggestion in the prior art to replace the chemically modified starches of document (3) with other ones able to provide both anti-redeposition and soil removal properties;

- similarly, starting from the disclosure of document (1) the skilled person would not have found any suggestion in the prior art to replace the chemically modified starches of document (1) with one having the characteristics of that according to claim 1 of the patent in suit;

- therefore, the claimed subject-matter involves an inventive step.

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

VIII. The Respondent requests that the appeal be dismissed or, in the alternative, that the patent be maintained on the basis of the claims according to any of the first to seventh auxiliary requests, all of them submitted with letter of 12 April 2007.

Reasons for the Decision

1. Formal issues

- 1.1 The Respondent contested the admissibility of document (8), submitted by the Appellant for the first time during the oral proceedings before the Board for showing which was the common general knowledge of the skilled person about the water solubility of sodium carboxymethyl starches (see point IV above).

According to the Rules of Procedure of the Boards of Appeal of the EPO, any amendment to a party's case after it has filed its grounds of appeal may be admitted and considered at the Board's discretion. The discretion shall be exercised in view of *inter alia* the current state of the proceedings (Art. 13(1) RPBA).

- 1.2 It is undisputed that the document in question, having been submitted for the first time during oral proceedings, is belated. Moreover, the Appellant could not justify during oral proceedings why such a document was submitted only at such a late stage of the proceedings.

The Board finds also that there was no justification for the submission of a new document at such a late stage of the proceedings as the Respondent's arguments against the appeal were known since the Respondent's reply to the grounds of appeal of 12 April 2007 and no new facts occurred between this date and the date of the oral proceedings.

Moreover, the document in question is a scientific publication which cannot be considered to represent the established common general knowledge of the skilled person at the priority date of the patent in suit or at an earlier date, as according to the jurisprudence of the Boards of Appeal of the EPO only textbooks and general technical literature form usually part of the common general knowledge (case Law of the Boards of Appeal of the EPO, 5th edition 2006, II.A.2(a), page 173).

Therefore, in the Board's judgement, contrary to the Appellant's submission, this document cannot show which was the common general knowledge of the skilled person about the water solubility of sodium carboxymethyl starches.

The Board thus finds that this belated document is of no use to the Appellant's case and is not to be admitted.

2. Respondent's main request (claims 1 to 5 as granted)

2.1 *Article 123(2) EPC*

2.1.1 Claim 1 according to the main request relates to a detergent composition comprising "at least one surfactant", "at least one builder", "at least one auxiliary" and "at least one chemically modified starch" (see point I above).

As submitted by the Appellant, claim 1 of the application as originally filed, relating instead to a detergent composition comprising "one or more chemically modified starch" and "a surfactant", "a

builder" and "a detergent auxiliary", can be interpreted to encompass only embodiments comprising "one surfactant", "one builder" and "one detergent auxiliary" and not encompassing embodiments including more than one surfactant, builder or auxiliary as included in the wording of claim 1 as granted.

However, according to the description of the application as originally filed, the detergent compositions of the invention can comprise mixtures of surfactants as well as combinations of co-builders with conventional detergent builders (see page 7, lines 9 to 10; page 9, lines 8 to 12); moreover, the description lists a series of typical detergent auxiliaries (page 6, line 26 to page 7, line 4) and exemplifies a composition according to the invention comprising more than one builder (zeolite, sodium carbonate and sodium citrate) and more than one auxiliary (sodium sulphate, sodium disilicate, carboxymethyl cellulose and perfume) (see page 10, lines 1 to 12).

Therefore, in the Board's view, the original description contains a support for a detergent composition comprising one or more surfactants, one or more builders and one or more auxiliaries.

- 2.1.2 The Appellant submitted also that the wording "at least one...", used in claim 1 as granted but not disclosed in the original documents of the application, would not be considered in the English language to have exactly the same meaning as the wording "one or more...", which was used, for example, in the expression "one or more chemically modified starch" in claim 1 as originally filed and which, as explained hereinabove, is supported

by the original description in relation to the other components of the claimed detergent composition; in fact, in the former case the embodiment relating to the use of "one" component would be considered to be less preferred to that requiring the presence of "more than one" component whilst the expression "one or more" would not insinuate any preference between the two embodiments.

The Board notes that both expressions "at least one" and "one or more" cover identical embodiments containing one component or more than one component. Moreover, in reading the text of a claim the skilled person should try to arrive at an interpretation which is **technically sensible** and takes into account **the whole disclosure of the patent** (see Case Law of the Boards of appeal of the EPO, 5th edition 2006, II.B.5.1, page 205); therefore, he would not consider fine nuances of the used language that have no technical influence on the scope of the claim. The Appellant also did not bring any evidence that a skilled person would have interpreted necessarily the expression "at least one" as not being identical to the expression "one or more" and insinuating a certain preference for one embodiment over the other.

Therefore, the Board can only conclude that these two expressions would have been considered by the skilled person to be equivalent.

- 2.1.3 Therefore, claim 1 according to the main request complies with the requirements of Article 123(2) EPC.

2.2 *Novelty*

- 2.2.1 Claim 1 relates to a detergent composition comprising at least one surfactant, at least one builder, at least one auxiliary and from 0.5 to 50 weight percent based on the weight of the detergent composition of at least one chemically modified starch, which exhibits cold water solubility and has a viscosity of from 10 WF to 95 WF and a degree of substitution of from 0.5 to 3.

It is the established jurisprudence of the Boards of Appeal of the EPO that terms used in a patent document should be given their normal meaning in the relative art, unless the description gives the terms a special meaning, in which case the terms should be interpreted by the skilled person by taking into account the teaching of the description (see e.g. T 1221/04, points 2.2. and 2.3 of the reasons).

It is also undisputed that the expression "chemically modified starch, which exhibits cold water-solubility" was well known to the skilled person at the priority date of the patent in suit.

However, none of the parties submitted a document able to show which was the common general knowledge of the skilled person about "cold water soluble chemically modified starches" at the priority date of the patent in suit and how the skilled person would interpret the expression mentioned above.

- 2.2.2 As regards the meaning of the above mentioned expression contained in claim 1, the Respondent submitted that it should be interpreted by taking into

account the disclosure of paragraphs 14 to 16 of the patent in suit.

Paragraph 14 of the patent in suit teaches that the starches are chemically modified before rendering them cold water soluble (page 3, lines 42 to 43) and lists some methods for chemically modifying starches.

Paragraph 15 reiterates that **it is essential for the invention that the chemically modified starches be treated to make them cold water soluble** (page 3, lines 54 to 55) and specifies that **"By cold water-soluble starch is meant a starch that when added to water at ambient temperature manifests a complete disruption of the granular structure and the formation of a colloidal dispersion"** (page 3, lines 55 to 56).

Furthermore, paragraph 16 discloses a treatment for making a starch cold water soluble which involves the pregelatinization of the starch by simultaneous cooking and spray-drying, as described in U.S. patent 5,149,799 (page 3, line 57 to page 4, line 4); however, this paragraph also teaches that, alternately, other methods known to the skilled person for rendering a starch cold water soluble can be used (page 4, lines 4 to 5).

The Board thus finds that the expression "chemically modified starch, which exhibits cold water solubility" in claim 1 would be interpreted by the skilled person by taking into account the explicit teaching of paragraph 15 of the description above; therefore, the claimed chemically modified starch is one which when added to water at ambient temperature manifests a complete disruption of the granular structure and the formation of a colloidal dispersion.

To the contrary, the specific treatment indicated in paragraph 16 cannot be considered to be the only one suitable method of treatment for obtaining a cold water soluble starch and cannot be considered to have any limiting effect on the wording of claim 1.

- 2.2.3 The Appellant submitted that the wording of claim 1 should not be interpreted in the light of the definition of paragraph 15 of the patent in suit since it is a vague definition because of the use of not precise expressions such as "ambient temperature", "complete disruption", "granular structure" and "colloidal dispersion".

The Board finds that all these expressions were known to the skilled person at the priority date of the patent in suit and that the skilled person would not have had any difficulty in understanding what it is meant therewith. Moreover, the skilled person would have understood that the complete disruption of said granular structure is linked to the formation of the colloidal dispersion.

Therefore, even though the limits of the definition of paragraph 15 might be considered not to be precise, a skilled person would not have had any problem in identifying cold water soluble chemically modified starches according to this definition.

The definition of paragraph 15 thus is that to be used in assessing novelty and inventive step of the subject-matter of claim 1.

2.2.4 It is undisputed that document (1) discloses detergent compositions comprising detergent surfactants, builders, auxiliaries and a water-soluble salt, such as an alkali metal salt, of a chemically modified starch which can be a carboxymethyl starch or a starch dicarboxylic acid (see claims 1 and 7; column 8, lines 23 to 34; column 9, lines 1 to 6; column 12, lines 25 to 28; column 12, line 71 to column 13, line 24; column 19, lines 33 to 39).

However, this document does not contain any explicit indication of the viscosity WF of the used chemically modified starches.

The Appellant submitted that the viscosity range of from 10 to 95 WF of the chemically modified starches according to claim 1 of the patent in suit encompasses the greatest part of the WF scale of 0 to 100 used to measure the extent of starch conversion, wherein 0 is the WF of an unmodified starch and 100 the viscosity of water (see document (5), page 39, lines 6 to 9 and figure 4-5). Therefore, the claimed range would be so broad that the WF of any chemically modified starch would fall within; moreover, as taught in document (5) (page 39, lines 12 to 17 and figure 4-5), acid thinned starches, i.e. starches which have been subjected to acid hydrolysis, were known to have a WF of between 60 and 75 within the claimed range. Consequently, at least the acid thinned chemically modified starch disclosed in document (1) (table I, sixth compound from the top, and table III, fifth compound from the top) would have a viscosity WF within the range of claim 1.

The Board notes that the Appellant did not bring any evidence that the water-soluble salts of the carboxylated starches disclosed in document (1) would have necessarily a WF as claimed and not a WF of, for example, more than 90.

Moreover, the acid-thinned starch disclosed in said tables I and III of document (1) is the sodium salt of a carboxymethyl starch whilst document (5) relates to the viscosity WF of acid hydrolyzed starches which do not contain any carboxymethyl group. Therefore, this teaching of document (5) cannot apply without any additional evidence to the carboxymethyl starches of document (1).

Furthermore, document (1) does not contain any evidence that the disclosed chemically modified starches would be cold water soluble as defined in the patent in suit. In fact, even though they dissolve in a light duty detergent which can be used at cool temperature (see column 2, lines 32 to 44 and column 18, lines 12 to 16), there is no indication in this document that the carboxylated starches, when added to water at ambient temperature, would manifest a complete disruption of their granular structure to form a colloidal dispersion in water.

In addition, the fact that the chemically modified starches of document (1) do not show a blue stain when submitted to the known iodine test for the identification of the starch structure (column 4, lines 72 to 75), cannot be considered to be by itself sufficient evidence that such chemically modified starches would completely disrupt in water at ambient temperature to form a colloidal dispersion.

The Board notes also that the methods of preparation of the chemically modified starches of document (1) (column 3, lines 41 to 75; column 5, lines 6 to 9) can involve also an additional mild degradation step in order to improve their building properties; however, document (1) refers only to conventional techniques such as autoclaving, acid hydrolysis or enzymatic reactions (column 4, lines 63 to 72), methods which would not lead necessarily to a chemically modified starch which would completely disrupt in water at ambient temperature to form a colloidal dispersion.

Moreover, document (1) does not mention the specific treatment indicated in paragraph 16 of the patent in suit involving a pregelatinization step (see patent in suit, page 3, lines 57 to 58), which treatment would render **necessarily** the chemically modified starch cold water soluble as intended in the patent in suit.

Therefore, since the Appellant has not brought any evidence for its allegations, the Board can only decide that document (1) does not disclose a chemically modified starch as required in claim 1.

- 2.2.5 Document (2) discloses a detergent composition comprising surfactants, builders, auxiliaries and a water soluble dextrin carboxylate salt (see claim 1; column 2, lines 54 to 60; table I). However, this document does not contain any explicit indication of the viscosity WF of the used chemically modified dextrans and of the capacity of the disclosed products to form a colloidal dispersion in water at ambient temperature.

Therefore, since the Appellant has not brought any evidence that the products disclosed in document (2) would satisfy these requirements of claim 1 of the patent in suit, the Board, already on these grounds, can only decide that document (2) does not disclose a chemically modified starch as required in claim 1.

2.2.6 The Board concludes that the subject-matter of the claims according to the patent in suit is novel over the cited prior art.

2.3 Inventive step

2.3.1 The invention of claim 1 relates to a detergent composition comprising a cold water soluble chemically modified starch.

As explained in the description of the patent in suit, the detergent industry has worked for years to eliminate environmentally harmful materials from detergent compositions. One class of replacement materials examined as viable replacements for polycarboxylate detergent adjuncts is that of the polysaccharides (paragraph 5).

While the use of polysaccharides as surfactants and builders/cobuilders has been noted, polysaccharides have not been suggested heretofore for use as soil release agents. Soil release properties are different from anti-redeposition or dispersant properties, in that soil release agents actually enhance the removability of soil from the article being cleaned, while anti-redeposition agents or dispersants act to

prevent the soil and other contaminates, such as scale and particulate matter found in the wash water, from being redeposited onto the article being cleaned (paragraph 8).

Hence, the technical problem underlying the invention is formulated in the patent in suit as the provision of an environmental friendly polysaccharide adjunct for detergent compositions which imparts not only anti-redeposition properties to the detergent compositions but also imparts soil release properties (paragraph 9).

2.3.2 The most suitable starting point to be selected for assessing inventive step of a claimed subject-matter is, according to the jurisprudence of the Boards of Appeal of the EPO, not a subject-matter (in the present case a composition) having the most possible number of features in common with the claimed one but, if possible, a technically realistic starting point contained in a document dealing with the same or similar technical problem as the claimed invention and disclosing a subject-matter having a similar use and effect as the subject-matter claimed in the patent in suit (see Case Law of the Boards of Appeal of the EPO, 5th edition 2006, points I.D.3.1 to I.D.3.3 on pages 121 to 123).

Document (3), selected by the Opposition Division and by the Respondent as suitable starting point for the evaluation of inventive step, relates to the provision of an alkali metal starch phosphate, a chemically modified starch, which is able to provide anti-redeposition properties when incorporated in a detergent composition and also sequestering properties

(page 1, left column, lines 1 to 4 and 26 to 32).
However, this document does not deal explicitly with the provision of soil release properties.

Document (2) deals with the technical problem of providing a new class of starch derived detergent builders but does not deal explicitly with the provision of anti-redeposition properties (column 2, lines 37 to 53).

Document (1), relating to the provision of carboxylated starches, i.e. chemically modified starches, capable of imparting outstanding building power to a detergent composition, specifies that builders permit to attain superior cleaning performance by emulsifying soil particles and stabilizing their suspension (see column 3, lines 10 to 20 and column 1, lines 34 to 54). Therefore, in the Board's view, this document teaches that builders, by emulsifying soil particles, permit an easier soil release and removal. Furthermore, this document specifically teaches that in **most instances** the modified starches described in document (1) have anti-redeposition properties (column 12, lines 31 to 32). Therefore, this document deals with the provision of chemically modified starches capable of providing **both** anti-redeposition and soil release properties.

Therefore, the Board finds that document (1) is the only document dealing explicitly with a technical problem similar to that addressed to in the patent in suit and is to be considered as the most suitable starting point for the evaluation of inventive step.

2.3.3 Since document (1) already provided chemically modified starches as environmental friendly polysaccharide adjuncts for detergent compositions which impart anti-redeposition and soil release properties to the detergent compositions, the technical problem underlying the invention, seen in the light of document (1), can only be defined as the provision of an alternative detergent composition comprising environmental friendly polysaccharide adjuncts which provide both soil release properties and anti-redeposition properties.

The patent in suit outlines in tables 1 and 2 (paragraphs 35 and 36) the results of comparative tests between cold water soluble chemically modified starches having a viscosity WF as required in claim 1 (samples B, D, F, H, J, L and N) and not cold water soluble ones of similar viscosity (samples C, E, G, I, K and M) or a cold water soluble not chemically modified starch (sample A). The Respondent admitted during oral proceedings that the samples D, F, H, J, L and N of table 1 do not represent chemically modified starches according to claim 1, since their calculated degree of substitution is lower than 0.5, as submitted in writing by the Appellant and that the degree of substitution of sample B is not indicated.

However, as submitted by the Appellant and not contested by the Respondent, the viscosity WF and the degree of substitution of the chemically modified starch were considered not to be critical to the multifunctionality of the cold water soluble starch in the original documents of the application (page 5, lines 1 to 3).

The Board thus finds that the comparative tests of tables 1 and 2 can be considered to be representative of the multi-functionality of cold water soluble chemically modified starches similar to those of samples B, D, F, H, J, L and N but having a degree of substitution according to the limits of claim 1.

Table 2 shows that the cold water soluble samples B, D, F, H, J, L and N provide not only anti-redeposition properties but also soil removal properties even though not on all the types of tissues tested, whilst the similar not cold water soluble starches do not show any soil release effect at all. Moreover, the soil release effect of sample B is better than that of a non modified cold water soluble starch A.

This effect thus is also representative of the effect obtained by means of cold water soluble chemically modified starches having a higher degree of substitution according to the limits of claim 1, which effect is also explained in paragraphs 11 and 37 of the patent in suit.

Therefore, the Board concludes that the technical problem underlying the invention has been convincingly solved by means of a composition according to claim 1.

- 2.3.4 As explained hereinabove (point 2.2.4), the compositions disclosed in document (1) do not comprise a cold water soluble chemically modified starch according to the patent in suit.

Moreover, even though this document suggests that the building properties of the chemically modified starches disclosed therein can be improved by means of an additional mild degradation step by conventional techniques such as autoclaving, acid hydrolysis or enzymatic reactions (column 4, lines 63 to 72), there is no teaching in this document that the suggested treatments would lead to a cold water soluble chemically modified starch.

Moreover, document (1) does not contain any suggestion that would have prompted the skilled person to select another treatment like that disclosed in paragraph 16 of the patent in suit, which treatment involves a pregelatinization by simultaneous cooking and spray drying, in order to obtain an alternative modified starch having both anti-redeposition and soil release properties.

In fact, even though the method described in the patent was known to render starches cold water soluble, the prior art did not contain any hint that such a method would be also applicable, for example, to the carboxylated starches of document (1) for obtaining modified starches having similar properties.

2.3.5 Document (2) does not disclose cold water soluble chemically modified starches according to the patent in suit, as explained above (point 2.2.5).

2.3.6 Document (3) discloses alkali metal starch phosphates, chemically modified starches, which have low viscosity, are able to dissolve in cold water and provide anti-redeposition properties when incorporated in a

detergent composition and also sequestering properties (page 1, left column, lines 1 to 4 and 20 to 32).

Even though the Appellant submitted in writing that a reworking of example 1 would have given a product having a viscosity WF as required in claim 1 of the patent in suit, an experimental report was never submitted. Moreover, the validity of this alleged reworking was contested by the Respondent.

The Board thus can only conclude, in the absence of any evidence, that it has not been convincingly proved that the modified starches of document (3) have a viscosity WF as required in claim 1.

Moreover, the method of preparation used in document (1) involves a heating step for at least 2 hours at a temperature of between 120 and 170 °C (see claim 2 and example 1), a method which could degrade and even fragment starches as submitted by the Respondent. The Appellant could also not submit any evidence that the phosphate starches of document (1) are chemically modified starches which would **completely disrupt in water at ambient temperature to form a colloidal dispersion** and not very soluble modified starches having a different structure, as submitted by the Respondent.

Therefore, the Board finds that document (3) does not disclose a cold water chemically modified starch as required in claim 1 of the patent in suit.

- 2.3.7 Since the cited prior art did not disclose any cold water chemically modified starch as required in claim 1 of the patent in suit, the Board finds that the cited

prior art did not contain any guidance which would have led the skilled person to select such a cold water chemically modified starch as a replacement for those used in document (1) in the attempt to solve the technical problem underlying the invention of providing an alternative detergent composition comprising environmental friendly polysaccharide adjuncts which provide both soil release properties and anti-redeposition properties.

The subject-matter of the claims according to the main request thus involves an inventive step.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:

G. Rauh

P. Ammendola