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**Datasheet for the decision
of 16 May 2014**

Case Number: T 1420/11 - 3.3.06

Application Number: 00939055.0

Publication Number: 1193310

IPC: C11D17/06, C11D3/04, C11D3/37,
C11D11/02

Language of the proceedings: EN

Title of invention:
PARTICLES FOR DETERGENT ADDITION

Patent Proprietor:
KAO CORPORATION

Opponent:
Henkel AG & Co. KGaA

Headword:
Detergent additive particles/Kao

Relevant legal provisions:
EPC Art. 52(1), 56, 84, 111(1), 123(2), 123(3)
EPC R. 80
RPBA Art. 12(2), 12(4), 13(3)

Keyword:
Late-filed document - admitted (yes)
Late-filed request - justification for late filing (yes) -
claim request clearly allowable (yes)
Amendments - allowable (yes)
Inventive step - (yes) - non-obvious combination of features

Decisions cited:

T 0068/99, T 1511/07

Catchword:



Beschwerdekammern
Boards of Appeal
Chambres de recours

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Case Number: T 1420/11 - 3.3.06

D E C I S I O N
of Technical Board of Appeal 3.3.06
of 16 May 2014

Appellant: Henkel AG & Co. KGaA
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Decision under appeal: **Interlocutory decision of the Opposition**
Division of the European Patent Office posted on
15 April 2011 concerning maintenance of the
European Patent No. 1193310 in amended form.

Composition of the Board:

Chairman P. Ammendola
Members: G. Santavicca
J. Geschwind

Summary of Facts and Submissions

I. The appeal by the opponent lies from the interlocutory decision of the opposition division maintaining European patent n° 1 193 310 in amended form according to the main request filed during the oral proceedings held on 25 March 2011.

II. This main request comprised three claims, Claim 1 reading as follows:

"1. Composite detergent particles prepared by dry-blending in a ratio (a)/(b) from 1/99 to 70/30:

detergent additive particles (a) comprising 30 to 100% by weight of two or more kinds of water-soluble substances, wherein one kind of the water-soluble substance is a carboxylic acid-based polymer which is contained in an amount of 4 to 15% by weight of the detergent additive particles (a), and further comprising less than 10% by weight of a surfactant and/or 70% by weight or less of a water-insoluble substance, the detergent additive particles having an average particle size of from 150 to 600 μm , a bulk density of 380 to 750 g/L, wherein the detergent additive particles (a) comprise a particle having a structure that there exists a hollow in an inner portion thereof, and that a particle surface is opened and communicated with the hollow in the inner portion, and wherein the detergent additive particles have a dissolution rate of 90% or more, under conditions where the detergent additive particles are supplied in water at 5°C; stirred for 60 seconds under the stirring conditions that 1 g of the detergent additive particles

are supplied to a 1-L beaker (inner diameter: 105 mm) which is charged with 1-L of hard water (71.2 mg CaCO₃ / L, a molar ratio of Ca/Mg: 7/3), and stirred with a stirring bar (length: 35 mm, and diameter: 8 mm) at a rotational speed of 800 rpm; and filtered with a standard sieve having a sieve-opening of 74 µm as defined by JIS Z 8801, wherein the dissolution rate of the detergent additive particles is calculated by Equation (1):

$$\text{Dissolution Rate (\%)} = \{1 - (T/S)\} \times 100 \quad (1)$$

Wherein *S* is a weight (g) of the detergent additive particles supplied; and

T is a dry weight of insoluble remnants of the detergent additive particles remaining on the sieve when an aqueous solution prepared under the above stirring conditions is filtered with the sieve; and

detergent particles (b) having an average particle size of from 150 to 600 µm and a bulk density of 500 to 1000 g/L, and comprising 10 to 50% by weight of a surfactant."

- III. The patent had been opposed in its entirety on the grounds of lack of novelty and inventive step (Article 100(a) EPC 1973).

The evidence relied upon in the opposition proceedings includes the following documents:

D1: EP 0 229 671 B1;

D3: DE 39 37 469 A1; and

D4: DE 42 13 036 A1.

- IV. In the decision under appeal it was *inter alia* held that:

- a) The claims of the main request were not objectionable under Articles 84 and 123(2) EPC.
- b) The claimed subject-matter was novel.
- c) The closest prior art was indisputably disclosed in D1, which concerned composite detergent particles possessing high dispersibility and solubility in cold water, as the patent in suit.
- d) It was not in dispute either that the subject-matter of Claim 1 of the main request differed from the disclosure of D1 in that the detergent additive particles comprised 4-15% by weight of a carboxylic acid-based polymer and had a bulk density of 380 to 750 g/l.
- e) The problem solved over D1 was to provide alternative composite detergent particles.
- f) Neither D1 nor its combination with D3 or D4 led the skilled person to the composition of Claim 1.
- g) Thus, the claimed composition was not obvious.

V. In its statement setting out the grounds of appeal, the appellant enclosed a further item of evidence, labelled D8: EP 0 270 240 B1.

VI. With letter dated 24 October 2013, the respondent submitted four sets of amended claims as the new main request and 1. to 3. auxiliary requests respectively.

Claim 1 of the new main request, compared to Claim 1 held allowable in the decision under appeal, comprised the following amendments:

*"further **optionally** comprising less than 10% by weight of a surfactant and/or 70% by weight or less of a water-insoluble substance" and "a bulk density of 380 to 750 **650** g/L"*

Also, the new main request, compared to the main request held allowable in the decision under appeal, contained a dependent Claim 3 reading as follows:

"3. The composite detergent particles according to claim 1 or 2, wherein the detergent additive particles (a) comprise a water-soluble polymer as the water-soluble substances."

VII. In its letter dated 16 April 2014, the appellant raised objections under Articles 84 and 123(2) EPC against all claim requests and objected that the scope of the new claims was broader than that of the claims held allowable in the decision under appeal.

VIII. Oral proceedings were held on 16 May 2014. The appellant withdrew its request to introduce a new ground of opposition under Article 83 EPC after the respondent had denied its consent. During the debate on the then pending claim requests, the appellant, for the first time, mentioned a contradiction between passages of Claim 1 that were already present in Claim 1 held allowable in the decision under appeal, but not in Claim 1 as granted. The respondent objected that this argument was an unacceptably late filed objection under Article 84 EPC. The board refused to admit such belated objection into the proceedings. The respondent nevertheless then replaced all of the previous claim requests with a new main request and 1. to 3. auxiliary requests. These new claim requests manifestly also address the alleged contradiction in Claim 1 of the previous claim requests. The issue of inventive step over D1, or D8, as the closest prior art document, possibly combined with any of D3 and D4, or D8 (i.e. D1+D8), was then discussed.

- IX. Claim 1 of the new main request, compared to Claim 1 according to the previous main request, contained the following further amendments:
*"further ~~optionally~~ comprising **no surfactant or** less than 10% by weight of a surfactant and ~~or~~ 70% by weight or less of a water-insoluble substance".*
Also, compared to the previous main request, Claim 3 has been deleted.
- X. The appellant (opponent) requested that the decision under appeal be set aside and that European patent 1 193 310 be revoked.
- XI. The respondent (patent proprietor) requested that the decision under appeal be set aside and that the patent be maintained on the basis of the claims of its main request or alternatively on the basis of the claims according to any of the 1. to 3. auxiliary requests filed during the oral proceedings (16 May 2014).
- XII. The appellant's arguments that are relevant for the present decision can be summarised as follows:

Admissibility of late filed document D8

- a) D8 was filed in reaction to the decision under appeal to show that spray-drying could produce particles having a bulk density of up to 600 g/l. Hence, the upper limit for the bulk density of 750 g/l in Claim 1 at issue was arbitrary. D8 was also relevant in respect of the use of carboxylic acid-based polymers, in the amount defined in Claim 1 at issue, in detergent additive particles having almost all other features of Claim 1 at issue. So D8 should be admitted into the proceedings.

Admissibility of the new main request

- b) Questioned by the Board, the appellant explicitly confirmed to have been given enough time to consider the amendments made and to be able to deal with the new main request. The admissibility of the new main request into the appeal proceedings was not disputed either.

Allowability of the amendments

- c) The appellant objected that the amended claims of the new main request contravened the requirements of Article 123(2) EPC. In particular, that the combination of the following features defined in Claim 1 had no basis in the application as filed:
- i) a ratio a/b from 1/99 to 70/30;
 - ii) a carboxylic acid-based polymer;
 - iii) a 4 to 15% by weight amount thereof; and,
 - iv) a bulk density of 380 to 650 g/L.

The argument by the respondent that the examples of the patent in suit supported the combination as claimed was not convincing as Example 5 was not according to Claim 1. Indeed, the application as filed listed water-soluble substances, including water-soluble polymers, and ranges of amounts thereof, as well as ranges for the bulk density. So multiple undisclosed selections among several lists mentioned in the application as filed were to be made to arrive at the subject-matter of Claim 1 at issue. Thus, Claim 1 at issue, and consequently the main request, was not allowable.

Novelty

- d) Novelty was not in dispute.

Inventive step

- e) The closest prior art was disclosed in D1 or D8, both pertaining to the same technical field and addressing same objectives as the patent in suit.
- f) D1 concerned high-density granular detergents and addressed the problem of providing detergent compositions having high dispersibility and solubility in cold water, as the patent in suit.
- g) The subject-matter of Claim 1 was distinguished therefrom by three features: the water-soluble carboxylic acid-based polymer; an amount of 4-15% by weight thereof; and, a bulk density of 380 to 650 g/L for the detergent additive particles.
- h) The patent in suit did not disclose which effect, if any, arose from the choice of the defined polymer or its defined amounts. Also, these distinguishing features had not been shown to produce any additive effects. Thus, they did not provide any proven improvement, which could thus be ignored for the assessment of inventive step. As it was known from D8 that carboxylic acid-based polymers improved the washing performance of the detergent, this could possibly be seen as an effect or a problem to be solved, if any. However, no evidence thereof was available either. Indeed, Example 5 of the patent in suit illustrated a detergent composition which solved the problem stated in the patent, despite the fact that its additive particles had not been obtained by spray-drying, i.e. that the additive particles lacked a hollow structure as defined in Claim 1, and that their bulk density was higher than 650 g/l. Hence, the problem solved was to provide a further

granular detergent composition, possibly improved in its washing performance.

- i) The composite detergent particles as claimed were obvious, for the following reasons:
 - i) Example 2 (Experiment 11) of D1 illustrated composite detergents comprising additive particles of a bulk density as claimed, good dispersibility and solubility in cold water.
 - ii) D1 also disclosed sodium carbonate additive particles being porous, i.e. hollow as defined in Claim 1.
 - iii) D1 and D8 pertained to the same technical field of the patent in suit.
 - iv) It was known from D8 that the use of a carboxylic acid-based polymer in an amount of 4 to 15% by weight improved the washing performance.
 - v) Thus, the skilled person aiming at providing further composite detergent particles, and possibly improving the washing performance, would have used the carboxylic acid-based polymer amount made known by D8 in Examples 11 and 2 of D1. Thereby, he would obviously have arrived to the subject-matter of Claim 1 at issue.
 - vi) A hint of using carboxylic acid-based polymer in zeolite-containing detergent granules, like those of Example 2 of D1, was given in D3 and D4 too.
 - vii) The respondent's argument that, since polyethyleneglycol (PEG) was used also in the detergent stock of D1, a replacement with carboxylic acid-based polymers could be carried out not only on the additive particles, and that a motivation for this further choice was necessary, was not

convincing. Claim 1 did not define where did the carboxylic acid-based polymer went within the detergent particles.

- j) Alternatively, D8 could be taken as the closest prior art document, in particular its Example 17(4). The detergent illustrated therein however contained too much surfactant. So the problem solved was the providing of granular detergents having better alkaline reserve. D8 taught that too high a surfactant's content, e.g. higher than 14.5% by weight, was a problem, which required adjustments in the composition. The skilled person would obviously have reduced the surfactant level to 10% or less. Thus, the claimed subject-matter of the main request also lacked an inventive step over D8 alone, or in combination with D1.

XIII. The respondent's arguments of relevance for the present decision can be summarised as follows:

Admissibility of late filed document D8

- a) The objections based on D8 that spray-drying could only produce particles having a bulk density up to 600 g/l, so that its limitation to 750 g/l in Claim 1 was arbitrary, were not convincing. D8 did not represent the common general knowledge. The skilled person knew how to control the bulk density of spray dried particles. So late filed document D8 was not relevant.

Admissibility of the new main request

- b) The new main claim request was filed in reaction to the discussion on the objections raised by the

appellant, e.g. that more than 10% by weight of surfactant could be present in the detergent additive particles. The new main claim request was clearly admissible and did not take the appellant by surprise. This was apparent from the fact that the appellant was able to deal with it without postponement of the oral proceedings.

Allowability of the amendments

- c) The appellant's objections that the amended claims of the main request contravened the requirements of Article 123(2) EPC arose from a wrong approach of the multiple-list theory. Indeed, the entire disclosure of the application as filed should be considered in the light of original Claims 1, 4 and 7, which directly disclosed detergent additive particles with less than 10% by weight of surfactant, two kinds of water soluble-substances, one of which being a water-soluble polymer, as well as a hollow structure of the particles as defined in Claim 1 at issue. The further limiting features such as kind and quantity of the water-soluble polymer were taken from those parts of the application as filed dealing with the water-soluble polymer. Also the narrowing down of the bulk density range was originally disclosed as such. The ratio a/b from 1/99 to 70/30 was the most general original disclosure being applicable to all embodiments. Thus, the subject-matter of Claim 1 was directly based on the originally disclosed combination of Claims 1, 4 and 7, which combination had merely been further concretised in the kind of water-soluble substance and more narrowly limited in preferred aspects thereof as originally disclosed. This was also apparent from

original Examples 1-4, comprising all the features of Claim 1 in combination. Example 5 illustrated a comparative embodiment not comprising a hollow structure as claimed. Thus, the subject-matter of Claim 1 was directly and unambiguously disclosed in the application as originally filed.

- d) The amendments made in the appeal proceedings restricted the scope of Claim 1 as granted and also the scope of Claim 1 upheld by the Opposition Division. Hence, both the requirements of Article 123(3) EPC and the principle of "*no reformatio in peius*" were respected. The amendments aimed at overcoming a ground of opposition (Rule 80 EPC).
- e) The new claims complied with Article 84 EPC.

Novelty

- f) Novelty was not in dispute.

Inventive step

- g) If consideration were given, on the one hand, to the sought-for dispersibility from a dispenser of a wash-machine and the solubility in the cold washing medium, and, on the other hand, to those features of Claim 1 such as detergent additive particles (a), detergent particles (b), two water-soluble substances, one of which being a carboxylic acid-based polymer, and less than 10% by weight of surfactant, then only D1 qualified as the closest prior art document for assessing inventive step.
- h) D1 disclosed a composite detergent composition comprising 75-95% by weight detergent particles

(I) (which might contain 2-15% by weight of water-soluble crystalline detergent particles), and 5-25% by weight of water-soluble crystalline detergent additive particles (II).

- i) Instead, D8 concerned spray-dried detergent particles and post-dosed additive detergent particles. The spray-dried particles of D8 contained too high an amount of surfactant, and were detergent particles, not additive particles. The post-dosed particles of D8 were heat-sensitive additive particles which could not be made by spray-drying. Thus, D8 was not a suitable starting point for assessing inventive step.
- j) The claimed subject-matter was distinguished from that of D1 by the use of a carboxylic acid-based polymer and of a hollow structure as defined.
- k) The problem solved over D1 was to provide granular detergent compositions having excellent distributivity upon pouring water from a dispenser of a wash-machine.
- l) That this problem had been effectively solved was proven by the examples of the patent in suit, which showed that very low or no residues remained in the dispenser after pouring water. Example 5 of the patent in suit was comparative, and was not prior art under Article 54(2) EPC, as it carried the same effective filing date of the patent in suit, so that it could not be invoked by the appellant as evidence showing that the problem had not been solved across the breadth of Claim 1.
- m) The claimed subject-matter was not obvious over the cited prior art, for the following reasons:
- n) D1 taught additive particles (II) preferably made of sodium carbonate, as such or coated, to inhibit hydration, with e.g. polyethylene glycol (PEG). These particles were devoid of a hollow structure

as defined in Claim 1 at issue, which was obtained by spray-drying. In D1, spray-drying was applied only to the preparation of the detergent powder (stock, non-additive particles). There was no hint in D1 to replace the PEG with a carboxylic acid-based polymer, nor to create a hollow structure as claimed. Since PEG was also contained in the particles of the detergent powder of D1, as apparent from table 3, its replacement, if any, could be carried out in the detergent powder too. This implied a further decision to be made between alternative options, for which a motivation was necessary. The new argument by the appellant that the porous sodium carbonate mentioned in D1 had a hollow structure as defined in Claim 1 was a mere assumption. Hence, this allegation of obviousness invoked by the appellant was not convincing.

- o) D3 and D4 concerned phosphate-free detergent additive particles, which might be spray-dried, in which however high amounts of carboxylic acid-based polymer replaced the phosphates. D3 dissuaded the skilled person from using less than 35% by weight of carboxylic acid-based polymer, and D4 less than 20% by weight. Hence, D3 and D4 did not suggest the use of carboxylic acid-based polymers in amounts of less than 14% by weight, let alone the further distinguishing features of Claim 1 at issue.
- p) D8 was even less relevant, as it did not focus on additive particles as in the patent in suit. The base powder of D8 corresponded to the detergent stock of D1. Even if, for the sake of argument, the spray-dried base powder of Example 17(4) of D8 were considered as being detergent additive particles, they would contain too much surfactant. The post-dosed particles disclosed in D8 did not

contain any hollow structure as claimed. Thus, the skilled person starting from D1, and considering any of D3, D4 or D8, could not find any hint towards the combined use of the features which distinguish the claimed subject-matter from D1. Thus, the claimed subject-matter was not obvious.

- q) This conclusion applied even if the problem solved were the providing of an alternative, as the skilled person found no suggestions thereto.

Reasons for the Decision

Admissibility of late filed document D8

1. D8 has been filed with the statement setting out the grounds of appeal, in reaction to the conclusion in the decision under appeal (page 5, penultimate paragraph, second and third sentence), that the burden of proving that a bulk density as high as 750 g/l was completely arbitrary and produced no effect lay on the opponent. The respondent did not object to the lateness of D8, and simply objected to its relevance. So the document was extensively dealt with in writing and during the oral proceedings. Therefore, the Board decided to admit D8 into the proceedings despite its late filing (Article 114(2) EPC and Article 12(2)(4) RPBA).

Admissibility of the new main request

2. The main request filed at oral proceedings before the Board differs from the main request submitted in writing with letter dated 24 October 2013 (see Point VI, *supra*) in two instances: Claim 3 has been deleted and Claim 1 has been limited in the definition of the surfactant and the water-insoluble substance for the additive particles.

The new main request was filed in reaction to the discussion on the previous main request that took place during oral proceedings.

Its admissibility into the appeal proceedings has not been disputed by the appellant, who was able to deal with the new main request during oral proceedings. Therefore, the Board decided to admit the new main claim request despite its late filing (Articles 114(2) EPC and 13(3) RPBA).

Amendments

3. The closest combination of features to Claim 1 at issue in the application as filed is that of original Claims 1, 4 and 7. Original Claim 4 depends on original Claim 1. Original Claim 7 too depends on original Claim 1 and, by referring back to "any one of claims 1 to 6", also implies that its features are freely combinable with the features defined in the preceding claims, e.g. in Claim 4.
- 3.1 Consequently, the application as originally filed directly points to the combination of the features of original claims 1, 4 and 7, i.e. to the combination of the features that one kind of the water-soluble substances is a water-soluble polymer (original Claim 7) and that the detergent additive particles have a hollow structure (original Claim 4), in the composite detergent particles according to original Claim 1.
- 3.2 Claim 1 according to the main request is distinguished therefrom by the following features (amendments made apparent by Strike-Through or Bold characters):
 - (a) "***in a ratio (a)/(b) from 1/99 to 70/30***";
 - (b) "*wherein one kind of the water-soluble substance is a ***carboxylic acid-based*** polymer*";

- (c) "**which is contained in an amount of 4 to 15% by weight of the detergent additive particles(a)**";
- (d) "further ~~optionally~~ comprising **no surfactant or less than 10% by weight of a surfactant and/or 70% by weight or less of a water-insoluble substance**";
- (e) "a bulk density of ~~300 to 1000~~ **380 to 650 g/L**".

3.3 It is not disputed that these distinguishing features as such have direct basis in the application as filed.

3.4 As regards the disputed combination of all of the features of Claim 1 at issue, it has a fair basis in the application as filed for the following reasons:

3.4.1 The features added to the combination of original Claims 1, 4 and 7 represent a definition of the blending ratio, a concretisation of the water-soluble polymer, a precision of the amount of surfactant and a limitation of the bulk density, all of which being preferred aspects of the originally disclosed combination.

3.4.2 The blending ratio feature (a) (*supra*) is mentioned on page 41, lines 3 and 4, of the application as filed, in a context dealing with "*composite detergent particles*", and represents the first, most general and preferred blending ratio in order to achieve excellent distributivity of the composite detergent particles from the dispenser and excellent detergency.

3.4.3 The carboxylic-acid based polymer feature (b) (*supra*) is mentioned on page 26, lines 6-10, of the application as filed, in a context dealing with the kind of water-soluble polymers generally defined in Claim 7 as filed, and *inter alia* reads as follows: "*The water-soluble polymer includes, for instance, carboxylic acid-based*

polymers; Among them, the carboxylic acid-based polymers are preferable from the viewpoint of enhancing the detergency of the granular detergent composition.". This passage is a specific instruction to concretise the water-soluble polymer defined in Claim 7 as filed with a carboxylic acid-based polymer in order to enhance the detergency of the granular composition.

- 3.4.4 The carboxylic-acid based polymer amount feature (c) (*supra*) is mentioned on page 26 (*supra*), lines 4-5, of the application as filed, in a context dealing with the quantity of the water-soluble polymer generally defined in original Claim 7, whereby the mention of the amount ranges precedes the listing of the preferred water-soluble polymer generally defined in Claim 7 as filed (*supra*). The mention reads as follows: "*From the viewpoints of giving an appropriate strength to the detergent additive particle and a particle structure which is capable of exhibiting fast dissolubility in the spray drying, it is preferable that the water-soluble polymer is contained in amount of from ..., still more preferably from 4 to 15% by weight ... of the additive particles.*". It is apparent therefrom that the (sub)ranges disclosed therein unambiguously apply to all of the subsequently listed polymers, *a fortiori* to the carboxylic acid-based polymers, which are preferred for enhancing detergency. Moreover, the range of 4 to 15% by weight is one of the preferred (sub)ranges for the concentration of the water soluble polymer in a context mentioning that the narrowing down of the broadest originally disclosed range to the claimed 4 to 15% by weight is "*still more preferable*" in order to achieve rapid dissolution, i.e. improved distributivity of the composition from the dispenser.

3.4.5 Distinguishing feature (d) (the no or low surfactant feature) is, on the one hand, an amendment to an optional feature present in Claim 1 as filed in order to make it obligatory and, on the other hand, a removal of the alternative "or" present in Claim 1 as filed, to make explicit the presence of both surfactant and water-insoluble substance in the defined amounts. The further limitation "*no surfactant*" serves the purpose to bring into conformity the definition "*less than 10% by weight ...*", in the new context of Claim 1, with the lower limit thereof disclosed in the application as filed (see pages 5, lines 11-12, and 21, lines 16-18). Hence, this amendment finds its basis essentially in Claim 1 as originally filed and in the extent of the meaning to be given to the feature "*less than 10% by weight of surfactant in the detergent additive particles*" as disclosed originally. It is clearly derivable from the application as filed (page 5, lines 9-15) that also this limitation contributes to improve the distributivity in the dispenser of the composite detergent composition.

3.4.6 The bulk density feature is a new range for the bulk density of the additive particles which is more limited than the range defined in original Claim 1. The relevant mention in the application as originally filed (paragraph bridging pages 32 and 33) reads as follows: "*The bulk density is from 300 to 1000 g/L (this range was defined in Claim 1 as filed), ... still more preferably from 380 to 750 g/L (this range was defined in Claim 1 upheld by the Opposition Division), most preferably from 420 to 650 g/L, in order to impart a more excellent fast solubility, and to improve the dispersibility of the granular detergent composition which is mixed with the detergent additive particles in the dispenser*". Thus, the application as filed mentions

that a narrowing down of the originally disclosed preferred (sub)ranges of values for the bulk density, renders them still more and most preferable in order to impart more excellent fast solubility, i.e. to improve the dispersibility of the granular detergent composition with additive particles in the dispenser.

3.4.7 Thus, in the application as filed, the (more) preferred aspects of the original combination of Claims 1, 4 and 7 are all disclosed in contexts with specific indications that they all serve the purpose of achieving improved solubility and dispersibility of the granular detergent composition containing additive particles in the dispenser and, thereby, improved detergency.

3.4.8 According to long standing case law (e.g. T 0068/99 of 12 June 2003, Point 3.2.2, last paragraph, of the reasons), a combination of preferred features is obviously the best way for achieving the technical effects that the invention aims to provide.

3.4.9 Also, in the present case, the application as filed contains clear pointers to the combination of the chosen polymer with the individual (sub) ranges for mixing ratio, amount of polymer and bulk density, as now defined in Claim 1 at issue. This presence of pointers to the claimed combination is the condition which is required by long standing case law (e.g. T 1511/07 of 31 July 2009, *supra*) to establish that the given combination was disclosed in the application as originally filed.

3.4.10 Furthermore, Examples 1 to 4 of the patent in suit illustrate particular embodiments of the invention with all of the features of Claim 1 at issue, which achieve

very low or no amount of remains (see Table 3 in the patent in suit). The other embodiments without all of the features of Claim 1 at issue achieve worse results. This too confirms that the combination of features now defined in Claim 1 at issue, and originally disclosed in form of preferred embodiments, is the only area where the sought-for objectives are achievable.

3.5 Thus, the Board is satisfied that the amendments made do not add subject-matter and that the subject-matter of Claim 1 is directly and unambiguously disclosed in the application as filed (Article 123(2) EPC).

3.5.1 The further features added to Claim 1 as granted clearly limit its scope (Article 123(3) EPC).

3.5.2 It is not in dispute that:

(a) The claims of the main request are narrower in scope in comparison to the claims upheld by the Opposition Division, so that the principle of "*no reformatio in peius*" is respected.

(b) The amended claims are clear (Article 84 EPC).

(c) The amendments aim at overcoming a ground of opposition (Rule 80 EPC).

Also in these respects, the Board has no reason to take a different stance.

3.6 Therefore, the new main request is formally allowable.

Novelty

4. Novelty of the claimed subject-matter is not in dispute. Since the distinguishing features over the disclosure of D1, or D8, will become apparent from the assessment of inventive step (*infra*), the Board need not give further details here.

Inventive step

The invention

5. The invention relates to composite detergent particles and a granular detergent composition (paragraph [0001] of the patent in suit).

The closest prior art

6. At the oral proceedings before the Board, it was common ground between the parties that D1 was the most appropriate starting point for assessing inventive step. Considering the similarities between the patent in suit and D1 in terms of technical field, problems addressed and product features (see *infra*), the Board has no reason to take a different stance.

The disclosure of D1

7. D1 (page 1, lines 3-5) concerns high-density granular detergent compositions having high dispersibility and solubility even in cold water, as the patent in suit.
- 7.1 According to D1 (page 3, lines 30-35), the high dispersibility, solubility and deterging capacity in cold water can be obtained by limiting the amount of the water-soluble, crystalline salts contained in the high-density granular detergent stock, which inhibit the dispersion and dissolution, and by dry-blending alkaline water-soluble crystalline salts with the stock in a limited ratio.

- 7.2 In particular, D1 (Claim 1) discloses a granular detergent composition, having a bulk density of at least 0.5 g/cm^3 and comprising a dry blend of (I) 75 to 95 wt.%, based on the total weight of the detergent composition, of granules of a detergent stock having a bulk density of at least 0.5 g/cm^3 and comprising a mixture of
- (a) 20 to 60 wt.% of an organic surfactant,
 - (b) 2 to 15 wt.% of a water-soluble, crystalline, inorganic salt selected from the group consisting of sodium carbonate, sodium sulfate, sodium tripolyphosphate, sodium pyrophosphate and/or sodium orthophosphate, and,
 - (c) 78 to 25 wt.% of another inorganic salt selected from the group consisting of alkali metal silicates having a molar ratio of silica to alkali metal oxide greater than 1.0 and aluminosilicate and/or an organic sequestering agent for a divalent metal, and
- (II) 25 to 5 wt.% based on the total weight of the detergent composition, of granules of a water-soluble, crystalline, alkaline, inorganic salt selected from the group consisting of sodium carbonate, sodium tripolyphosphate, sodium pyrophosphate and/or sodium orthophosphate, and having a particle size of 100 to 1000 μm .
- 7.3 It is apparent from the above that detergent powder (I) corresponds to detergent particles (b) of Claim 1 at issue, whilst salt (II) of D1 corresponds to detergent additive particles (a) defined in Claim 1 at issue.
- 7.4 Still according to D1 (paragraph bridging pages 3 and 4, in particular page 4, lines 3-5), the water-soluble, crystalline, inorganic salt particles (II) preferably carry thereon an organic substance having a melting point of 40°C or lower and being able of inhibiting

hydration, and these particles are also coated with an organic substance being capable of inhibiting hydration and having a melting point of 40°C or higher.

The most preferable organic substances having a melting point of 40°C or below, to be supported by the granules, include nonionic surfactants.

The most preferable organic substances having a melting point above 40°C used for coating the granule surfaces include polyethylene glycols having average molecular weight of at least 2.000.

7.4.1 Salt (II) of D1 is thus preferably made of particles of an inorganic substance carrying a nonionic surfactant and coated with polyethylene glycol. Thereby, good particles fluidity and storage stability are achieved.

7.5 PEG with a molecular weight of 13,000 is used as a **dispersant** (page 10, lines 2-4) also in the preparation of high-density granular detergent stocks (A) (Compositions 1, 2 and 3 of Table 1).

7.6 The composite detergent particles of Experiment 11 of Example 2, invoked by the appellant, are made up as follows:

- (a) sodium carbonate as water-soluble crystalline salt granules (B) having bulk density of 0.61 g/cm³ and average granule diameter of 548 µm;
- (b) Composition 4 as detergent powder (A) having bulk density of 0.76 g/cm³ and containing 40% by weight of organic surfactant; in a,
- (c) dry-blending weight ratio (A)/(B) of 85/15.

7.7 Composition 2 of Example 3 (see Table 5), also invoked by the appellant, comprises granules (B) of sodium carbonate in form of heavy ash (bulk density of 0.95 g/cm³ and average granule diameter of 363 µm), treated

with nonionic and polyethylene glycol, blended with 85% by weight of high-density powder (A) containing 49.7% by weight of the powder of organic surfactant and having a bulk density of 0.66 g/cm³.

- 7.8 Example 7, also invoked by the appellant, illustrates the use of porous sodium carbonate (having bulk density of 0.56 g/ml and average particle diameter of 550 μ m) prepared by a process disclosed in the specification of Japanese Patent Laid-Open No. 190216/ 1984.

During the oral proceedings before the Board, for the first time ever, the appellant argued that this sodium carbonate had a hollow structure as defined in Claim 1 at issue. However, neither a copy of said Japanese specification, nor any other evidence that sodium carbonate obtained thereby had a hollow structure as claimed was submitted by the appellant. This belatedly submitted unverified argument is thus not convincing.

In any case, according to D1, also this porous sodium carbonate is placed in a V-blender with a nonionic surfactant and a liquid and mixed (the porous sodium carbonate is impregnated), and then an aqueous solution of PEG, prepared previously, is added thereto and mixed (the impregnated porous sodium carbonate is coated). The so treated sodium carbonate particles can no longer have a hollow structure, if any.

- 7.8.1 Example 8 illustrates the same treatment as Example 7 but carried out on heavy soda ash.
- 7.8.2 15 wt. % of the samples of *inter alia* Examples 7 and 8 were mixed with 85 wt. % of a spray-dried detergent having the composition detailed on page 22 of D1, and the mixtures were tested for *inter alia* their degree of

fluidity. It is apparent from the test results in Table 11, that according to D1 there is no difference between the allegedly porous product of Example 7 and the heavy product of Example 8 in terms of fluidity.

- 7.9 It follows from the analysis of the disclosure of D1 that the use of a carboxylic-acid-based polymer, let alone in the defined amount, and of a hollow structure as defined in Claim 1, is not envisaged.

The technical problem according to the respondent

8. At the oral proceedings before the Board, on the basis of the results illustrated in the examples of the patent in suit, the respondent maintained that the problem solved over D1 was to provide a granular detergent composition having excellent distributivity, upon pouring water, from a dispenser of an automatic wash-machine, and dissolubility in water, as mentioned in paragraph [0004] of the patent in suit.

The solution

9. As a solution thereto, Claim 1 at issue proposes composite detergent particles characterised by detergent additive particles comprising:
- (a) 30 to 100% by weight of two or more kinds of water-soluble substances, **wherein one kind of the water-soluble substance is a carboxylic acid-based polymer which is contained in an amount of 4 to 15% by weight of the detergent additive particles (a);** and,
 - (b) **no surfactant or less than 10% by weight of a surfactant and 70% by weight or less of a water-insoluble substance;**

- (c) a particle having a structure that there exists a hollow in an inner portion thereof, and that a particle surface is opened and communicated with the hollow in the inner portion; and,
- (d) a dissolution rate of 90% or more, under conditions where the detergent additive particles are supplied in water at 5°C; stirred for 60 seconds under the stirring conditions that 1 g of the detergent additive particles are supplied to a 1-L beaker (inner diameter: 105 mm) which is charged with 1-L of hard water (71.2 mg CaCO₃ /L, a molar ratio of Ca/Mg: 7/3), and stirred with a stirring bar (length: 35 mm, and diameter: 8 mm) at a rotational speed of 800 rpm; and filtered with a standard sieve having a sieve-opening of 74 μm as defined by JIS Z 8801, wherein the dissolution rate of the detergent additive particles is calculated by Equation (1)

$$\text{Dissolution Rate (\%)} = \{1 - (T/S)\} \times 100 \quad (1)$$

wherein S is a weight (g) of the detergent additive particles supplied; and
T is a dry weight of insoluble remnants of the detergent additive particles remaining on the sieve when an aqueous solution prepared under the above stirring conditions is filtered with the sieve.

The alleged success of the solution

10. The patent in suit *inter alia* illustrates the preparation of four composite detergent particles as claimed (paragraphs [0120] to [0128]), comprising detergent additive particles 1 to 4 (Table 1).

- 10.1 The distributivity in dispenser of these granular composite detergents is determined, and from the results of the evaluation (remaining ratio) of each of the granular detergent compositions according to Claim 1 at issue and of comparative detergent compositions, as shown in Table 3, it can be gathered that the composite detergent composition according to Claim 1 (those having detergent additive particles 1 to 4 as illustrated in Table 1), at different blending ratios, leave little or no residue. In any case, their remaining ratio is at least one order of magnitude lower than the best comparative composition, namely that comprising detergent additive particle 5.
- 10.2 Detergent additive particles 5 (Table 1) are comparative as they do not have a hollow structure as defined in Claim 1 at issue (the additive particles have not been prepared by spray-drying) (paragraphs [0109] to [0111]) and their bulk density is outside the limits as set out in Claim 1 at issue.
- 10.3 The other comparative detergent compositions contain additive particles (see Table 1) which do not have all of the features defined in Claim 1 at issue, e.g. they contain too much surfactant (Comparative additive particles 1 and 2), or they do not contain any water-soluble polymer as defined in Claim 1 at issue (Comparative additive particles 3 to 5).
- 10.4 These results make apparent the fact that the defined amount of carboxylic-acid polymer, the low or no amount of surfactant in the additive particles, their hollow structure and bulk density as defined in Claim 1 at issue are not arbitrary but critical conditions to be met in order to achieve the sought-for objectives.

10.5 However, proof that a solution is not made up of arbitrary features does not necessarily prove that an improvement is effectively achieved across the whole breadth of Claim 1 over the closest prior art, especially when, as in the present case:

- (a) D1 was not acknowledged in the application as filed, and on which the patent in suit was granted, so that the problem formulated therein and the comparative examples did not take into account its disclosure; and,
- (b) it is not in dispute that also D1 addresses and solves the problem of rapid and complete solubility and distributivity of the detergent particles.

Thus, it has only to be established whether the claimed composition is actually more efficiently dissolved and distributed than the composition disclosed by D1.

10.6 None of the comparative composite detergent composition illustrated in the patent in suit corresponds to that disclosed by D1. Additive particles 3, which contain 100% of sodium carbonate and have a bulk density of 1070 g/L, which is comparable with that of the soda ash mentioned in Example 3 of D1, do not contain any nonionics, nor are they coated with PEG.

10.7 Because no comparative example over D1 is available, there is no evidence on file of a better distributivity and/or more rapid dissolubility of the claimed composite detergent composition over that of D1.

The problem effectively solved over D1 across the whole breadth of Claim 1

11. Since the problem effectively solved over D1 cannot be formulated in terms of an improvement over D1, let alone across the whole breadth of Claim 1, it has to be reformulated in a less ambitious way.
- 11.1 It can be seen in the providing of further composite detergent compositions for automatic wash-machines, which are suitable for rapid dissolution and complete distribution from the dispenser (detergent supplying tray) of (e.g. drum-type) automatic wash-machines.
- 11.2 Having regard in particular to the results presented in Table 3 of the patent in suit, the Board is satisfied that this less ambitious problem is effectively solved by the solution defined in Claim 1 at issue.

Obviousness

12. It remains to be decided whether the composition as claimed was obvious for the skilled person starting from D1 and aiming at solving the problem posed, in view of the common general knowledge and the teachings of the prior art relied upon by the appellant.
- 12.1 D1 alone
- 12.1.1 According to D1 (paragraph bridging pages 5 and 6), a deterging capacity equal to or higher than that of the ordinary spray-dried detergents can be obtained by dry-blending high-density granular detergent stock with water-soluble, crystalline inorganic salt granules treated with an organic substance capable of inhibiting hydration, such as a hydrophobic organic substance, e.g. silicone, nonionic surfactant, polyoxyethylene, polyhydric alcohol or alkylolamide; or **a polymer, e.g., polyethylene glycol** (emphasis added).

Though the organic substance capable of inhibiting hydration can be used alone, it is desirable to use it in combination with other components, e.g. in granules prepared by supporting the organic substance capable of inhibiting hydration and having a melting point of 40°C or below in the water-soluble, crystalline, inorganic salt and coating the surfaces of the obtained granules with the organic substance capable of inhibiting hydration and having a melting point above 40°.

12.1.2 Still according to D1 (page 6, lines 12-14), by this treatment, the phenomena which are the main causes of the inhibition of the dispersion and dissolution, such as formation of crystals of the salt and caking due to the coalescence of the hydrated crystals do not occur. Further (page 6, lines 14-18), by coating the surfaces of the granules with an organic substance having a melting point above 40°C, the obtained granules have a high fluidity even when the former organic substance supported on the carrier has a low melting point. Furthermore (page 6, lines 16-18), during the storage of the product, the high fluidity of the granules is not deteriorated and the dispersibility and solubility of the product are not damaged.

12.1.3 Thus, to obtain rapid dissolubility and fluidity, D1 teaches the use of additive granules which need not be spray-dried but impregnated with nonionics and coated with PEG. Polymers other than PEG are not disclosed.

12.1.4 Therefore, D1 does not suggest the use of additive particles having a hollow structure and comprising 4 to 15% by weight of a carboxylic acid-based polymer.

12.1.5 In these respects, the appellant have invoked the teachings of D8, D3 and D4.

12.2 The disclosure of D8

12.2.1 D8 (Claim 1) discloses a process for the preparation of zero-phosphate detergent powder, which comprises spray-drying an aqueous slurry to form a powder, the slurry comprising:

- (a) from 5 to 60% by weight, based on the powder, of one or more anionic detergent-active compounds;
- (b) from 0 to 30% by weight, based on the powder, of one or more nonionic detergent-active compounds;
- (c) from 15 to 86% by weight, based on the powder, of crystalline or amorphous sodium aluminosilicate builder;
- (d) from 2 to 40% by weight, based on the powder, of a polymeric carboxylic acid-based polymer;
- (e) optionally other salts;
- (f) optionally conventional minor ingredients;

characterised in that the slurry comprises from 2 to 20% by weight, based on the powder, of sodium carbonate, the powder has a total electrolyte level not exceeding 20% by weight and a particle porosity not exceeding 0.40, and if the amount of anionic detergent-active compound (a) exceeds 14.5% by weight, the weight ratio of sodium carbonate (e) to anionic detergent-active compound (a) does not exceed 1.1:1.

12.2.2 In the composition of D8, the crystalline or amorphous aluminosilicate is the principal builder and the polymeric carboxylic acid-based polymer is an auxiliary builder (page 3, lines 34-37).

12.2.3 In particular, D8 discloses (Claim 16) a granular zero-phosphate detergent composition comprising:

- (a) from 10 to 100% by weight of a spray-dried powder as obtained from the process of Claim 1, and,

(b) from 0 to 90% by weight of one or more postdosed solid and/or liquid ingredients.

The spray-dried detergent powder of D8 constitutes the base (stock) of a detergent composition or indeed the whole detergent composition (page 3, lines 3-6).

12.2.4 The detergent composition of D8 preferably has a bulk density of at least 650 g/l (see Claim 21).

12.2.5 Example 17(4) of D8 was still invoked by the appellant during the oral proceedings. It illustrates a base powder containing more than 10% by weight surfactant and less than 30% by weight of water soluble substance. The post-dosed material contains less than 10% by weight surfactant but no water soluble polymer. The bulk density is too high, i.e. 930 g/l.

12.2.6 It follows from the foregoing that the base powder of D8, containing anionic surfactants and corresponding to the detergent particles (b) according to Claim 1 at issue, is made up of spray-dried particles comprising a carboxylic acid-based polymer in amounts as claimed, but the total amount of water-soluble substance is less than 30% by weight. Also, the post dosed particles of D8, which correspond to the additive particles of Claim 1 at issue, are not spray-dried, do not comprise a water-soluble polymer and have too high a bulk density.

12.2.7 Therefore, the argument that the skilled person would obviously adopt the teaching of D8 concerning the base powder (spray-drying and carboxylic acid-based polymer) in the additive particles of D1, which instead requires the additive particles to be impregnated with nonionics and coated with PEG, can only be retrospective, as neither D1 nor D8 contains any pointer thereto.

12.3 The disclosure of D3 and D4

12.3.1 D3 and D4 both disclose granular phosphate-free detergent additive which *inter alia* contain 35 to 60% (D3, Claim 1) or 20 to 40% (D4, Claim 1) by weight of a sodium salt of at least one homo- or copolymer of m(meth-)acrylic acid. The additive particles of both D3 and D4 are prepared by spray-drying (D3, page 3, lines 19-32) (D4, page 3, lines 28-40).

12.3.2 According to both D3 (page 3, lines 33-34) and D4 (page 3, lines 43-44), these additive particles have an exceptional fluidity and can be dosed from a dispenser of wash-machine without leaving remnants, whereby these properties are stable.

12.3.3 The detergent additive particle illustrated in the example of D3 comprises 50% by weight of polymer. The detergent additive particles illustrated in Examples 1 and 2 of D4 contain 25% by weight of polymer.

12.3.4 It follows from the analysis of the disclosure of D3 and D4 that they do not suggest (at least) the use of a carboxylic-acid polymer in an amount of less than 20% by weight in detergent additive particles.

12.3.5 Since D1 requires additive particles which are not spray-dried but impregnated with nonionics and coated with PEG, and since D3 and D4 require additive particles which are spray-dried and contain at least 20% carboxylic acid-based polymers, it is not apparent how the skilled person would be motivated at combining the disclosure of D1 with those of D3 and D4.

12.3.6 In any case, the skilled person, if he were motivated to translate the disclosure of D3 and D4 (use of

carboxylic acid-based polymer in spray-dried additive particles) to the additive particles of D1 (which are not spray-dried but are impregnated and coated), would nevertheless not arrive at a content of 4 to 15% by weight of polymer as defined in Claim 1 at issue.

12.3.7 Thus, the objections of the appellant based on D1 and D8, or D3 or D4 cannot succeed.

12.4 It follows from the foregoing that the claimed solution was not obvious (Articles 52(1) and 56 EPC) over the invoked prior art.

Conclusion

13. The main request fulfils the requirements of the EPC.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance with the order to maintain the patent on the basis of the set of claims of the main request (Claims 1 to 3) filed during the oral proceedings and the description to be adapted thereto, the figures remaining unchanged.

The Registrar:

The Chairman:



D. Magliano

P. Ammendola

Decision electronically authenticated