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D E C I S I O N
of 1 February 2002

Case Number: T 0874/97 - 3.3.6

Application Number: 91306287.3

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Language of the proceedings: EN

Title of invention:
Detergent compositions

Patentee:
UNILEVER PLC, et al

Opponent:
(01) Henkel Kommanditgesellschaft auf Aktien
(02) The Procter & Gamble Company

Headword:
Detergent tablet/UNILEVER

Relevant legal provisions:
EPC Art. 69(1), 54, 56

Keyword:
Claim 1 to be interpreted in the light of the description: "Novelty (yes) - criteria for novelty of so-called selection inventions not applicable (point 3.2)"; "Inventive step (yes) - comparative tests showing further improvement of the prior art (points 4.2.3 to 4.2.5)".

Decisions cited:
T 0916/94, T 0364/97, T 0016/87, T 0198/84, T 0279/89

Catchword:
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Case Number: T 0874/97 - 3.3.6

D E C I S I O N
of the Technical Board of Appeal 3.3.6
of 1 February 2002

Appellant: (Proprietor of the patent)
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Decision under appeal: **Decision of the Opposition Division of the European Patent Office posted 3 June 1997 revoking European patent No. 0 466 484 pursuant to Article 102(1) EPC.**

Composition of the Board:

Chairman: P. Krasa
Members: L. Li Voti
C. Holtz

Summary of Facts and Submissions

I. The present appeal is from the decision of the Opposition Division to revoke the European patent No. 0 466 484 concerning a detergent tablet.

Claim 1 of the granted patent had the following wording:

"1. A tablet of compacted particulate detergent composition comprising a detergent-active compound, a detergency builder, and optionally other detergent ingredients, characterised in that the tablet, or a discrete region thereof, consists essentially of a matrix of particles at least 90% of which have a particle size within a range having upper and lower limits each lying within the range of from 200 to 2000 µm and differing from each other by not more than 700 µm, with not more than 5% of said particles larger than the upper limit and not more than 5% of said particles smaller than the lower limit."

II. Two notices of opposition were filed against the patent, wherein the Respondents 01 and 02 (Opponent 01 and Opponent 02) sought revocation of the patent *inter alia* on the grounds of Article 100(a) EPC, in particular because of an alleged lack of novelty and of inventive step of the claimed subject-matter.

The oppositions were based *inter alia* upon the following documents:

(H1): EP-B-0 523 099

(H2): EP-A-0 355 626

(H3): DE-B-1 271 884

(P1): J.A.O.C.S., vol. 40, pp. 621 to 624, "Tableting of Detergents" by J. P. Mallee

(P2): DE-A-3 326 459

(P4): US-A-4 370 250

(P9): US-A-3 081 267.

III. In its decision, the Opposition Division found that neither the claims according to the main request nor those according to any of the auxiliary requests submitted by the Appellants (Patent Proprietors) complied with the patentability requirements of the EPC.

Claim 1 of the main request differed from claim 1 as granted only insofar as the wording

"comprising a detergent active compound and a detergency builder"

had been introduced between "... a discrete region thereof" and ",consists essentially of...".

This request also contained dependent claims 2 to 14 which were identical with claims 2 to 14 as granted and related to particular embodiments of the product of claim 1.

The Opposition Division decided in particular that

- claim 1 of the main request containing the wording "consists essentially of a matrix of particles" encompassed tablets comprising a minor proportion of particles visually distinguishable from those belonging to the matrix, e.g. particles being dramatically greater than those constituting the

matrix or particles having a greater particle size than the matrix particles and being qualitatively different, e.g. having a different colour;

- the claimed subject-matter was novel over the cited documents (H1), (P1), (P2) and (P4) since the prior art did not disclose a tablet having a matrix of particles having a particle size distribution as in the patent in suit;

- the technical problem addressed by the patent in suit, i.e. the provision of detergent tablets having fully satisfactory dissolution and disintegration properties and being of excellent physical stability, had already been solved by documents (H2) and (P4) wherein detergent tablets having a matrix of particles with a narrow particle size distribution had already been used;

- the experimental work of Mr Wraige, submitted with the letter of 16 September 1996 (Mr Wraige's declaration), did not prove the presence of any unexpected additional advantage due to the selected particle size distribution of claim 1 and, on the contrary, suggested that not all the products falling within the scope of the invention could solve the addressed problem;

- it was known from document (P9) that the proportion of particles having a size below 200 µm had to be reduced in order to improve the dissolution properties of a detergent tablet; therefore it was obvious to apply this teaching to the tablet known from example 1 of document (P4);

- no inventive step could be either recognised in claim 1 of the main or of the auxiliary requests.

IV. An appeal was filed against this decision wherein the main request, corresponding to the main request submitted before the first instance, was accompanied by six auxiliary requests.

V. The Appellants' arguments in defence of the main request, submitted in writing and at the oral proceedings held before the Board on 1 February 2002, can be summarized as follows:

- the wording "consists essentially of a matrix of particles" in claim 1 had to be interpreted in the light of page 3, lines 22 to 27, of the description according to which the claimed tablets could comprise a minor proportion of visually contrasting particles not belonging to the so called matrix, which particles were much larger in at least one dimension than those of the matrix; small sized binder particles belonged instead to the matrix and had to comply with its particle size distribution;

- the claimed subject-matter was novel over the cited prior art which did not disclose the selected particle size distribution;

- the claimed invention aimed at providing detergent tablets which had sufficient mechanical strength to prevent them from breaking during handling and yet an adequate rate of dispersion and dissolution in a wash liquor, notably a faster dissolution at lower temperatures than prior art tablets;

- this goal had been achieved by means of a specific narrow size distribution of the particles constituting the so called matrix;

- Mr Wraige's declaration, filed before the first instance, confirmed the improved dissolution at low temperatures of the claimed tablets ("para 4" and "para 5") with respect to tablets having a broader or different particle size distribution, such as the tablets "para 9" (similar to the product known from document (P4)) or the tablets "para 3" (similar to the products known from document (H2));

- since the prior art did not recognise the importance of such specific narrow particle size distribution for further improving the tablet dissolution at low temperature, the claimed subject-matter involved an inventive step.

VI. The Respondents' counter-arguments presented in writing and orally can be summarized as follows:

- claim 1 containing the wording "consists essentially of", did not clearly identify which particles had to be regarded as not belonging to the particulate matrix; e.g. solid binders of very small particle size or particles having a size smaller than the upper limit required by claim 1 but visually contrasting with the other particles could be considered to fall outside the matrix;

- the claimed subject-matter lacked novelty for the reasons put forward at the first instance or in the light of document (H2); the example of this document disclosed, for example, a detergent tablet with a matrix having necessarily a particle size distribution as in the patent in suit; moreover, the selection of the specific particle size distribution of claim 1 could not establish

novelty since it did not comply with all the requirements for a purposive selection laid down in T 279/89.

With regard to the experimental data contained in Mr Wraige's declaration they submitted that even though the tested samples according to the patent in suit appeared to confirm a numerical trend towards improved dissolution, such results were not relevant since

- the experiments carried out in the declaration had no technical significance or

- the numerical improvements fell within the experimental error or

- the comparative experiments had not been carried out with respect to the closest prior art, represented by example 1 of document (P4).

Therefore the Respondents argued with regard to inventive step that

- the selected narrow particle size distribution did not bring about any advantage over the tablets known from document (P4) or from document (H2);

- furthermore it was obvious for the skilled person, taking into account his common knowledge at the priority date of the patent in suit or considering the teaching of document (P9), to reduce the amount of small sized particles in order to improve the dissolution properties of a detergent tablet;

- therefore, starting from document (P4), it was obvious to modify the particle size distribution of this document by reducing the amount of fines

with an expectation of success; alternatively, the claimed subject-matter amounted to a non-inventive selection from the broader scope of (H2);

- therefore the claimed subject-matter of all requests lacked an inventive step.

The objections raised in writing under Article 83 EPC were withdrawn at the oral proceedings.

VII. The Appellants request that the decision of the first instance be set aside and the patent be maintained on the basis of the main request filed with the letter of 24 August 2001 which is the same as the main request mentioned above in point IV or alternatively on the basis of one of the six auxiliary requests filed either with the statement of the grounds of appeal (second, third, fourth and sixth auxiliary requests) or with the letter of 24 August 2001 (first and fifth auxiliary requests).

The Respondents request that the appeal be dismissed.

VIII. At the end of the oral proceedings, the Chairman announced the decision of the Board.

Reasons for the decision

Main Request

1. The Board is satisfied that the amended claim 1 complies with the requirements of Article 123 EPC. Since the amendments to this claim were not disputed by the Respondents, there is no need to give detailed reasons for this finding.

2. *Interpretation of Claim 1*

2.1 The tablet of claim 1 or a discrete region thereof consists essentially of a matrix of particles at least 90% of which have a particle size within a range having upper and lower limits each lying within the range of from 200 to 2000 µm and differing from each other by not more than 700 µm, with not more than 5% of said particles larger than the upper limit and not more than 5% of said particles smaller than the lower limit.

The wording "consisting essentially of" in claim 1 implies that the tablet can comprise particles not belonging to the so called matrix; this kind of particle cannot, however, be clearly identified from the wording of the claim.

Since the wording in question was already contained in the granted claim its clarity under Article 84 EPC was not open to objection within the terms of Article 100 EPC; the scope of this unclear claim has, however, to be assessed for the judgement of novelty and inventive step.

The established jurisprudence of the Boards of Appeal of the EPO indicates that the wording of such a claim must be interpreted taking into account the relevant parts of the description in accordance with Article 69(1) EPC (see e.g. T 0364/97, point 2.3 of the reasons and T 0916/94, point 5 of the reasons, both unpublished in the OJ EPO; see also T 0016/87, OJ EPO 1992, 212, point 6 of the reasons).

2.2 The patent teaches that the claimed tablets can comprise a minor proportion of visually contrasting particles not within the size range of the matrix, e.g. a small proportion of much larger particles; colouring of the particles or a contrasting shape are only

optional features which would confer more contrast with respect to the matrix particles (see page 3, lines 22 to 27).

Moreover the matrix is derived by compaction of a particulate composition consisting essentially of relatively uniform size and shape (see page 3, lines 3 to 5). Identical passages with the same teaching are found in the application as filed.

Therefore, it is the Board's opinion that the subject-matter of claim 1 relates to tablets comprising a **major proportion** of a matrix of particles having a relatively uniform size and shape, the particles having a size within the range of from 200 to 2000 µm and differing from each other by not more than 700 µm, not more than 5% of said particles being larger than the upper limit and not more than 5% of said particles being smaller than the lower limit, and a **minor proportion** of visually contrasting particles of much larger particle size, i.e. of particles which would be visually recognisable as **not belonging to the matrix** because of their **much greater** dimension, for example particles having a size much greater than the upper limit given for the matrix particles.

The simple presence of a qualitative difference, e.g. colouring, is therefore not sufficient for qualifying such particles as not belonging to the matrix; it is therefore the Board's finding that the conclusion reached by the first instance that, within a given mixture of particles complying with the particle size distribution requirements of claim 1, the portion of particles having greater particle size has to be considered outside the matrix if coloured, since it can be distinguished from the rest of the particles, is not supported by the description of the patent in suit

according to which only particles visually recognisable as having a **much greater** size should be considered as not belonging to the matrix.

A portion of particles, the size of which is just outside the rest of the particles distribution, and cannot thus be visually recognised as being **much greater,** is therefore part of the matrix.

From this finding it follows also that any small additional binder particles, which are not visually contrasting with the other particles because of their small particle size, must be considered to belong to the matrix and must comply with the size distribution requirements of claim 1.

3. *Novelty*

3.1 The Respondents, though maintaining the objections against the novelty of the claimed subject-matter already raised at the first instance on the basis of the cited documents (H1), (P1), (P2) and (P4), did not add any supplementary argument in writing or orally during the appeal proceedings and did not indicate why in their opinion the Opposition Division erred in its judgement on novelty of the subject-matter of claim 1.

The Board, having considered these documents, finds no reason for diverging in this respect from the decision of the first instance that the claimed subject-matter was novel over these documents.

Therefore this matter does not need to be addressed herein in detail.

3.2 At the oral proceedings before the Board the Respondents objected that the claimed subject-matter lacked novelty in the light of the teaching of document (H2).

This document discloses a tablet comprising a particulate matrix formed from powdery components having an average particle size between 200 and 1200 µm, with less than 5% of said particles larger than 2000 µm and not more than 1% of said particles smaller than 50 µm (page 5, lines 28 to 31), thus encompassing an interval of particle size of **more than 1900 µm**.

It does not, however, contain any explicit teaching about a narrower particle size distribution within said limits and also the average particle size of the two particulate components constituting the matrix in the tablet of the illustrative example, i.e. 0.4 µm and, respectively, 0.5 µm, does not necessarily imply a particle size distribution as claimed in the patent in suit.

This document therefore neither discloses the amount of particles below 200 µm to be less than 5% nor the particle size distribution to be such that at least 90% of the particles have a size within the range of 200 to 2000 µm and differ from each other by not more than 700 µm.

The Board finds moreover that the claimed subject-matter does not amount to a mere selection from the subject-matter disclosed in document (H2) since this document, as indicated above, does not mention or point to any limitation of the particle size **distribution** within the indicated upper and lower size limits of the

matrix particles, which limitation is on the contrary an essential **additional** feature of the present claim 1.

Therefore the criteria for novelty of so-called selection inventions set out in the decision T 0198/84 (OJ EPO 1985, 209, points 5 to 7 of the reasons for the decision) and confirmed in point 4.1 of the decision T 0279/89 (not published in the OJ EPO), relating to the selection of a narrower sub-range of numerical values from a broader range, do not apply to the chosen particle size distribution of the claim 1 in question.

3.3 Therefore none of the cited documents destroys the novelty of the claimed subject-matter.

4. *Inventive step*

4.1 Most suitable starting point

The patent in suit, and in particular the subject-matter of claim 1, relates according to the description of the patent to the provision of detergent tablets which have sufficient mechanical strength to prevent them from breaking during handling and yet display a rapid rate of dispersion and dissolution in a wash liquor (page 2, lines 20 to 24, 40 to 42 and page 4, lines 22 to 24). Such tablets, or a discrete region thereof, consist essentially of a matrix of particles at least 90% of which have a particle size within a range having upper and lower limits each lying within the range of from 200 to 2000 µm and differing from each other by not more than 700 µm, with not more than 5% of said particles larger than the upper limit and not more than 5% of said particles smaller than the lower limit.

Document (P4) discloses tablets having a matrix of particles with a particle size distribution such as at least 90% are comprised between 75 and 850 µm (200 to 20 U.S. mesh; see column 3, lines 47 to 51), i.e. they do not differ from each other by more than 775 µm; moreover this document aims at a similar technical problem as is addressed in the patent in suit, since it deals with the provision of tablets of improved physical integrity and solubility (column 1, lines 11 to 18; column 2, lines 55 to 59 and column 11, lines 24 to 27) and a disintegration time of about 3 minutes or less in cold water is considered to be highly desirable (column 2, lines 15 to 32). Moreover the detergent tablet of the illustrative example 1 contains at least 92% of the particle within a size range of less than 700 µm, specifically between 180 and 850 µm (80 and 20 U.S. mesh) and 1% of particles above 850 µm. This tablet, however, comprises as conceded by the Respondents about 12% of particles below 200 µm and therefore less than 90% of the particles within the range of 180 and 850 µm and therefore slightly less than 90% of the particles within the range of 200 to 2000 µm whilst claim 1 of the patent in suit requires not more than 5% of particles below 200 µm and at least 90% of the particles within the range of 200 to 2000 µm.

Therefore the Board accepts this document, relating to a similar technical problem as is addressed in the patent in suit and disclosing similar tablets, as the most suitable starting point for assessing an inventive step.

Documents (H2) and (H3), used previously by the Respondents as starting point for the discussion of inventive step, also deal with the improvement of the physical stability and solubility of detergent tablets. However, they cannot qualify as the most suitable

starting point because they do not envisage a narrower particle size distribution like in document (P4), the range of particle size in document (H2) covering an interval of up to 1950 µm (see point 3.2 above) and that of document (H3) an explicit interval not narrower than 1500 µm (see example 2, column 8, lines 37 to 40).

4.2 Technical problem and Experimental Evidence

4.2.1 The technical problem as presented in the patent in suit can be formulated as the provision of detergent tablets which have sufficient mechanical strength to prevent them from breaking during handling and yet display an improved rate of dispersion and dissolution in a wash liquor, especially in cold water (page 2, lines 20 to 24, 40 to 42 and page 4, lines 22 to 28) with respect to the prior art.

4.2.2 The illustrative examples of the patent in suit show this improvement with regard to a tablet having a particle size distribution such as more than 90% of the particle sizes fall within a range of 1620 µm (table of particle size on page 9), thus having a particle size distribution more similar to that of documents (H2) and (H3) and not to that of document (P4), which is taken as the most suitable starting point for assessing inventive step. Therefore, these examples cannot show whether the goal of the patent in suit has been effectively achieved.

4.2.3 Mr Wraige's declaration compares *inter alia* detergent tablets according to the patent in suit (samples "para 4" and "para 5") with a tablet ("para 9") having 6.3% of the particles of a size above 850 µm but below 1000 µm, 94% of the particles of a size between 90 µm and 850 µm, i.e. within an interval of 760 µm and 90% of the particles being of a size between 180 and 1000 µm, i.e. within an interval of 820 µm, the amount

of particles below 200 µm being more than 10%, which tablet can thus be fairly considered to represent a tablet falling within the teaching of document (P4) (see point 4.1 above).

The results for the disintegration time of the tested tablet, the amount of tablet (tablet residue) not disintegrated within 10 minutes from the start of the disintegration test and the dissolution time in a washing machine, all calculated following the same methods as used in the patent in suit (page 4, lines 22 to 29 and 39 to 43), show in the second set of comparisons of table I a reduction of the amount of residue and an improvement of the dissolution time of the tablets "para 4" and "para 5" with respect to the comparative tablet "para 9", by maintenance of an acceptable physical stability identified by the diametral fracture stress which according to the patent in suit should be of at least 5 kPa and preferably at least 7 kPa (page 5, lines 24 and 25). The first set of comparisons on table I also show an improvement at least with respect to the dissolution time, but as submitted by the Respondents, relate to less compacted tablets having a diametral fracture stress below 5 kPa and which therefore do not possess the physical stability preferred by the patent in suit. These results are therefore of minor relevance.

The tests of table I of Mr Wraige's declaration thus confirm the improved dissolution rate at low temperatures of the claimed tablets with respect to tablets having a different particle size distribution according to the teaching of document (P4), the most suitable starting point for assessing inventive step.

Similar results are moreover also obtained considering the comparison with the tablet "para 3" which is similar to the comparative example in the patent in

suit and to a tablet "para 8" relating to a particle size distribution having the proper amounts of particles between 200 µm and 2000 µm but only 87.5% of the particles within an interval of 700 µm (250 to 1000 µm) and 91% thereof within a range within 788 µm (212 to 1000 µm), i.e. a very close particle size distribution which, however, appears not to belong to the state of the art.

4.2.4 The Respondents criticized the tests carried out in this Declaration by submitting that

- the experiments carried out in the declaration had no technical significance since they did not reflect the reality of the tablet "in use" in a washing machine or

- the numerical improvements fell within the experimental error or

- the comparative experiments had not been carried out with respect to the closest prior art, represented by example 1 of document (P4).

4.2.5 The Board cannot agree to this criticism since the Respondents have not produced any evidence that the results of this declaration are false or not reliable; on the contrary the Board finds that the tests described in the patent in suit can be performed by the skilled person without difficulty and yield reliable significant results which can be correlated to a dissolution in cold water in a washing machine.

Finally, the Board notes that the specific embodiment of example 1 of document (P4) is not considered in that document as being superior to any other embodiments falling within the limits indicated in column 3, lines 47 to 51 and that the tablet of this specific

example contains an amount of particles below 200 µm comparable with that of the tablet "para 9" of Mr Wraige's declaration and slightly less than 90% of particles within the range of 200 to 2000 µm, just as in the composition "para 9". Consequently, the Board regards the tested composition "para 9" as representative for the teaching of document (P4) as a tablet of example 1.

Therefore the Board concludes that the specific particle size distribution of claim 1 brings about the addressed improved solubility while maintaining an acceptable physical stability and that the claimed subject-matter effectively solves the technical problem as formulated above (see point 4.2.1 above).

4.3 Evaluation of inventive step

4.3.1 It remains to be decided whether it was obvious for the skilled person, starting from the teaching of document (P4) (column 3, lines 47 to 51 and example 1) and taking into account the common general knowledge at the priority date of the patent in suit, to modify the particle size distribution disclosed in this document by reducing the amount of fines below 200 µm to less than 5% in order to further improve the properties of the tablets.

4.3.2 As submitted by the Respondents the state of the art contained a clear warning against the use of too small particles during tableting and the reduction of the amount of fines was considered suitable in order to improve solubility. For example, document (P9), which however addressed only a detergent tablet solubility in warm water of at least 54°C (130°F), suggested the use of an amount of less than 20% of particles of a size of below 200 µm (column 2, lines 37 to 40 and 48 to 64 as well as column 3, lines 11 to 14) since they tend to

occlude the interparticle voids in the tablet and do not permit water to permeate and disrupt the tablet, the specific example I e.g. limiting such amount to 10.6% in a particle size distribution of up to 1400 µm (column 7, lines 31 to 35 and lines 44 to 45). Document (P1), moreover, disclosing tablets with a very broad particle size distribution between 250 and 2360 µm (60 and 8 mesh), suggests the elimination of **very fine** particles without indicating any specific size limit (page 621, right column, last two lines; page 622, left column, lines 3 to 20).

Documents (H2) and, respectively, (H3) suggested moreover, the reduction of particles below 50 µm to less than 1% (page 5, line 30) or, respectively, of particles below 100 µm to less than 5% (column 2, lines 43 to 45).

According to document (P4) the amount of particles below 50 µm should be less than 10% (see column 3, lines 47 to 51).

4.3.3 The prior art therefore had already suggested the importance of eliminating small particles; however, it had nowhere been recognised or suggested that a further control of the amount of particles below 200 µm to less than 5% and simultaneously of the particle size distribution of the particles between 200 and 2000 µm so that they do not differ from each other by more than 700 µm would bring about a further improvement of the dissolution properties of the tablets by maintenance of their physical stability as convincingly shown in Mr Wraige's declaration discussed above in point 4.2.3.

4.3.4 The Respondents further submitted that it was common general knowledge to reduce the particle size distribution in order to reduce the packing density and

increase the interparticle porosity in a powder mixture; however, as already shown above, document (P4) had already taught the use of a narrow particle size distribution of not more than 775 µm (see point 4.1 above). Nevertheless it had not been recognised that a further improvement was still possible.

Therefore the teaching of document (P4), also taking into account the common general knowledge of the skilled person at the priority date of the patent in suit or the teaching of the other documents mentioned, could not lead to the claimed invention.

4.3.5 Finally, the Board cannot accept the conclusion of the Opposition Division that no inventiveness can be found in the slight modification of the tablets known from document (P4) which are very close to the claimed subject-matter, since as explained above, the skilled person had no incentive for modifying the particle size distribution disclosed in this document for achieving an improved dissolution of the tablets while still maintaining acceptable physical stability.

4.3.6 For these reasons the Board decides that the subject-matter of claim 1 involves an inventive step.

The subject-matter of dependent claims 2 to 14, relating to particular embodiments of the tablets of claim 1, therefore also involves an inventive step.

Since the main request has been found to comply with the requirements of the EPC there is no need to discuss the auxiliary requests.

Order

For these reasons it is decided that:

The decision under appeal is set aside.

The case is remitted to the first instance with the order to maintain the patent on the basis of claims 1 to 14 of the main request as filed with letter of 24 August 2001 and a description adapted thereto.

The Registrar: The Chairman:

G. Rauh P. Krasa