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D E C I S I O N
of 17 November 1995

Case Number: T 0487/92 - 3.3.1

Application Number: 82200868.6

Publication Number: 0070074

IPC: C11D 1/83

Language of the proceedings: EN

Title of invention:
Foaming surfactant compositions

Patentee:
THE PROCTER & GAMBLE COMPANY

Opponent:
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Henkel Kommanditgesellschaft auf Aktien
Henkel Corporation
Dr. Braxmeier, Johannes

Headword:
Surfactant compositions/PROCTER & GAMBLE

Relevant legal provisions:
EPC Art. 54(1), 56, 123(3)

Keyword:
"Novelty (yes - after amendment)"
"Inventive step (yes)"
"Change of category (yes)"
"Fresh ground of opposition (not admitted)"

Decisions cited:
T 0301/87, T 0024/81, T 0021/81, T 0192/82, G 0002/88, G 0009/99, G 0010/91

Catchword:
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Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0487/92 - 3.3.1

D E C I S I O N
of the Technical Board of Appeal 3.3.1
of 17 November 1995

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Decision under appeal: **Interlocutory decision of the Opposition Division of the European Patent Office posted 5 May 1992 concerning maintenance of European patent No. 0 070 074 in amended form.**

Composition of the Board:

Chairman: F. Antony
Members: R. K. Spangenberg
W. Moser

Summary of Facts and Submissions

I. European patent No. 0 070 074 was granted to the Procter and Gamble Company on 15 August 1988 on the basis of European patent application No. 82 200 868.6. This patent application had been filed on 12 July 1982 and claimed the priorities of 13 July 1981 and 26 April 1982 from two earlier patent applications in the United States. Notices of Opposition against the grant of the above-identified patent were received from Hüls AG (Opponent I); Henkel KGaA (Opponent II); Henkel Corporation (Opponent III); and Dr J. Braxmeier (Opponent IV). The oppositions were based on the grounds of Article 100(a) and (b) EPC. In response to these oppositions the Opposition Division maintained the patent in amended form.

II. In its decision, which was announced orally on 17 March 1992 and dispatched on 5 May 1992, and which was based on an amended text submitted by the patent proprietor as his main request on 14 February 1992, the Opposition Division considered a great number of documents, in particular the following ones:

D1. US-A-3 219 656;
D2. US-A-3 547 828;
D4. US-A-3 721 633;
D5. US-A-3 839 318;
D10. AT-B-135 333;
D11. Rohm & Haas, Technical Bulletin, Triton CG-110;
D21. Rivista Italiana, ottobre 1974, pages 567-572; German translation (D21T);
D22. Nonionic Surfactants, 1967, pages 683 and 693-697;
D23. Journal of the American Chemical society, 38, pages 410-418 (1961);
D24. Tensid-Taschenbuch, 1981, pages 300 to 306;

D26. Journal of the American Oil Chemist's Society, vol. 47, pages 162 to 167 (1970);

D40. Fettalkohole, pages 126, 127, 98-101, 106 and 107 (not dated), and

D46. Patentee's combined experimental report dated February 1992, as amended during the oral proceedings before the Opposition Division.

The Opposition Division held that the amended patent satisfied the requirements of Article 123(2) and (3) EPC and that the disclosure of the claimed subject-matter was in accordance with Article 100(b) EPC. It further held that the subject-matter of the patent as amended was novel, in particular having regard to the provisos in Claim 1. An inventive step was also acknowledged, since the Opposition Division held that the claimed compositions had better foam properties than the compositions described in the state of the art represented by D11 and D21T, as demonstrated in D46, and that the relevant prior art did not suggest that the claimed compositions would have these improved foam properties.

III. Against that decision notices of appeal were lodged by Opponent II (Henkel KGaA, hereinafter Appellant I) on 23 May 1992; by Opponent III (Henkel Corporation, hereinafter Appellant II) on 24 June 1992; by Opponent I (Hüls AG, hereinafter Appellant III) on 27 June 1992 and by Opponent IV (Braxmeier, hereinafter Appellant IV) on 3 July 1992.

Statements of grounds of appeal were received on 7 September 1992 (Appellant I), 2 September 1992 (Appellant II), 9 September 1992 (Appellant III), and 15 September 1992 (Appellant IV). During the appeal proceedings the Respondent submitted several sets of

further amended claims and, on 10 November 1995, an amended specification. He also submitted two further documents, namely

(D62) Technical commentary by Dr. Dyet, and
(D63) DE-A-4 005 959.

Oral proceedings took place on 17 November 1995. Appellant II, who was duly summoned, was not represented. At the end of the oral proceedings the Respondent requested that the patent be maintained with Claims 1 to 14 submitted as auxiliary request on 10 November 1995. Claim 1 of this set, which corresponds to a set of claims submitted on 30 April 1993 by way of a third subsidiary request, reads as follows:

"Use as a foaming dishwashing composition of a composition comprising:

(1) an alkylpolyglucoside surfactant having the formula

$$RO(R^1O)_tZ_x$$

wherein Z is a moiety derived from glucose, R is an alkyl group containing 12 to 18 carbon atoms, R^1 is ethylene, propylene and/or glyceryl, t is from 0 to 10, and x is a number from 1.5 to 4;

(2) an anionic cosurfactant selected from the group consisting of sulfates, sulfonates, carboxylates and mixtures thereof, neutralised with one or more cationic moieties, the weight ratio of (2) to (1) being from 1:10 to 10:1 and wherein the alkyl-polyglucoside contains less than 50% short chain alkyl polyglucoside and less than 10% unreacted fatty alcohol except that:

(1) the weight ratio of (2) to (1) is superior to 1:1 when the anionic surfactant is an alkalimetal alkylbenzensulfonate and when in the general formula for the alkylpolyglucoside t = 0;

(2) the weight ratio of (2) to (1) is at least 1:2 when the anionic cosurfactant is soap; and

(3) when the anionic cosurfactant does not contain a sulfonate or carboxylate x must be from 1.5 to 3 and the alkylpolyglucoside surfactant must have a free fatty alcohol content of less than 2% by weight."

Appellant I also requested that the patent be maintained according to the Respondent's request, whereas Appellants III and IV requested that the decision under appeal be set aside and the patent be revoked. Appellant II had made the same request in writing.

IV. The Appellants' submissions, insofar as they remained relevant to the above requests, can be summarised as follows:

Appellant III submitted for the first time during the oral proceedings that the present Claim 1 had no basis in the application as filed.

Appellant IV contested the novelty of the subject-matter of the present Claim 1 in respect of D4 and D10. He argued, in particular, that, as a consequence of the presence of the expression "comprising" in the definition of the compositions to be used, the present Claim 1 was not properly delimited from the general technical teaching derivable from the above documents, which implicitly disclosed the use of the compositions described therein for manual dishwashing purposes.

Appellants III and IV emphasised, in addition, that a skilled person in the field of detergents intended for cleaning purposes would not concentrate his activities on the increase of foam stability, but rather on the overall performance of detergent compositions, of which

foam stability is only one aspect of minor importance. Thus, if the state of the art would suggest that a certain composition was expected to have a desirable overall performance, the skilled person would use it, regardless of possible additional benefits such as foam stability. The class of alkyl polyglucoside-surfactants was described in a number of publications, including D1, D4, D5, D11, D21 and D40, which were so closely related that a skilled person would have regarded their information content as one single piece of technical disclosure. In these documents the relevant properties of alkyl polyglucosides containing alkyl chains of various length were described. Therefore, the skilled person could have clearly seen which advantages and disadvantages the use of any member of this class of compounds would involve. The selection of any particular member of this class in response to predetermined commercial requirements was therefore, so they submitted, a mere matter of choice, not involving any inventive step. Moreover, Appellant IV argued that all test results in the field of manual dishwashing were so strongly influenced by the test conditions, in particular the type of soil employed, that their results were inherently unreliable. In order to support his submission, he referred, on the one hand, to the test reports submitted by the Respondent, which were summarised in D46 and, on the other hand, to the test report submitted by Appellant III on 10 March 1992.

In addition, Appellants III and IV submitted that, in the absence of any limitation in the present Claim 1 to the particular relative amounts of components (1) and (2) of the compositions to be used, it was not credible that the alleged improvements were obtained by the use of all compositions covered by Claim 1. For these

reasons, so they argued, the test reports submitted by the Respondent were not indicative for the presence of an inventive step.

Likewise, Appellant II, in his written submissions, essentially argued that a skilled person would have known from the state of the art that a C_{12}-alkyl polyglucoside had a slightly better cleaning effect than the commercial C_{10}-alkyl polyglucoside, and equally good foam stability.

V. The Respondent's submissions in support of his request can be summarised as follows:

In respect of the construction of the present Claim 1 he submitted that the formula $RO(R^1O)_tZ_x$ clearly related to a mixture of individual chemical compounds, hence, while x had to be an integer for each individual compound of this formula, the average number of glucose derived moieties in the said mixture could have any value between 1.5 and 4. Consequently the mixture described by that formula could contain a certain amount of monoglucosides, but had to contain an amount of polyglucosides sufficient to bring the average number of x to at least 1.5.

He further submitted that, after deletion of Claim 9 as granted and the corresponding deletion of lines 29 to 36 of the description as granted, it was now clear that the expression "anionic cosurfactant" was to be given its ordinary meaning, which excludes amphoteric surfactants, such as betains. Although he admitted that minor amounts of amphoteric surfactants may additionally be present as "other ingredients", he affirmed that they were not intended to be covered by the term "anionic cosurfactant".

He also declared that he did not claim the use in machine dishwashers and that the claim was restricted to the use in manual dishwashing.

He further submitted that the objection under Article 100(c) raised by Appellant III for the first time during the appeal proceedings amounted to a new opposition ground not arising from amendments of the patent during opposition proceedings, and as such could only be considered by the Board with his consent, which he did not wish to give.

Regarding novelty, he submitted that D4 and D10 did not disclose the use of mixtures of alkylpolyglucosides and anionic surfactants as manual dishwashing compositions.

In respect of inventive step he argued that it was a matter of fact that, after the disclosure of the patent in suit had become available to the public, the use of alkyl polyglucosides of the type covered by the definition in the present Claim 1 had been widely used for manual dishwashing, whereas they had never before been so used, although this class of compounds as well as their use as surfactants for other purposes had been known for a long period of time; rather, the interest of those skilled in the art had concentrated on the structurally different disaccharide derivatives known e.g. from D22 and D23. Moreover, the particular alkyl polyglucoside containing compositions to be used according to the patent in suit were by far more suitable for use as manual dishwashing compositions than other compositions known or suggested by the state of the art, such as those containing the alkyl polyglucoside disclosed in D11 and D21. The superiority of the compositions to be used according to the present Claim 1 clearly followed from the test report submitted as D46, in particular from Experiments 13, 14 and 18.

This superiority was quite unexpected, since from the prior art it could at most be derived that all alkyl polyglucosides, including that disclosed in D11 and D21, would have similar performance. The tests for foam stability in the prior art were not performed in the presence of soil, let alone in the presence of the type of fatty soil which is usually to be found on used dishes, so that these tests could not guide a skilled person trying to improve manual dishwashing, as explained in more detail in D62. Referring to D63, a patent application originating from Appellant III, he disputed the allegation that tests performed under realistic dishwashing conditions, such as those mentioned in D46, were unreliable.

Reasons for the Decision

1. The appeals are admissible.

2. The amendments made to the patent as granted during the opposition and appeal proceedings satisfy the requirements of Article 123(2) and (3) EPC, since the change of category from a composition to the use of that composition as a dishwashing composition, which is based on the disclosure in the description as filed, page 12, lines 25 to 29, corresponding to the patent as granted, page 6, lines 17 to 19, does not extend the scope of the claims (see G 2/88, OJ EPO 1990, 93). The substitution of "x" for "it" in the penultimate line of the printed text of Claim 1 as granted as well as on page 2, line 50 of the printed description is not an amendment of the text as granted but merely to the printed version thereof, and as such unobjectionable under Article 123(3) EPC.

3. During the oral proceedings on 17 November 1995, Appellant III raised for the first time a ground of opposition pursuant to Article 100(c) EPC. He objected to the term "alkali metal benzenesulfonate" in proviso (1) of Claim 1. This term was not amended during the opposition or appeal proceedings and its meaning is in no way influenced by the limitation, during these proceedings, of Claim 1 to a particular use. Therefore, this ground of opposition does not arise from amendments of the claims after grant and should not, therefore, have been raised after expiration of the opposition period. In the Board's judgment, taking account of decision G 9/91 and opinion G 10/91 of the Enlarged Board of Appeal, such a new ground of opposition can only be considered in appeal proceedings if the Respondent agrees, which is not the case here. Appellant III has not brought forward any argument as to why the reasoning given by the Enlarged Board of Appeal should not be applicable to the present case or as to other reasons why the Board should consider this late submission. Therefore, the Board holds that it has no power to decide this issue.

4. The **construction of the meaning of certain expressions** used in the present Claim 1 was in dispute between the parties. Insofar as the meaning of these expressions is relevant to the issues to be decided, it is thus necessary to establish their correct meaning.

4.1. In the Board's judgment it is clear that the formula $RO(R^1O)_eZ_x$ in Claim 1 relates to a mixture of individual chemical compounds, and that x defines the average number of glucose derived moieties in that mixture (see also D26, page 162, the last two paragraphs of the introduction and Figure 1). Therefore, the above formula

defines products which may **contain** substantial amounts of alkyl monoglucosides, but does not relate to products which **essentially consist** of alkyl monoglucosides.

4.2. The Board is satisfied that after deletion of Claim 9 as granted and the corresponding part of the description in the patent in suit the expression "anionic cosurfactant" is to be given its ordinary meaning, which excludes amphoteric surfactants, such as betains.

4.3. The Board is further satisfied that the Respondent's declaration that the term "dishwashing" in present Claim 1 is meant exclusively to cover **manual** dishwashing, hence the said claim does not include the use for machine dishwashing, is in accordance with the information content of the present patent specification in the light of the relevant common general knowledge (see e.g. D24, the introductory paragraph of Chapter 3.4), so that a skilled person would not assign to that term in present Claim 1 a meaning different from that intended by the Respondent.

4.4. Having regard to Claim 1 as amended, the Board finds that the exact meaning of the three exceptions contained in Claim 1 is no longer relevant to the issues to be decided here, but is solely a matter of clarity pursuant to Article 84 EPC. However, after grant, in the Board's judgment lack of clarity is only at issue insofar as it should arise from an amendment of the claims as granted (see also decision T 301/87, OJ EPO 1990,335, Reasons No. 3.7). This is not the case here, since the said three exceptions were already present in Claim 1 as granted and their meaning has not been affected by any of the amendments made after grant. Therefore, for the purpose of this decision, there is no need for the Board to define the exact meaning of these exceptions.

5. The objections under Article 100(b) EPC were withdrawn during the oral proceedings. The Board can see no reason for further pursuing this issue on its own motion under Article 114(1) EPC. Hence the issues which remain to be decided in this appeal are those of novelty and inventive step.

6. **Novelty** was disputed by Appellant IV in respect of documents D4 and D10.

6.1. D4 relates to an aqueous built liquid detergent composition consisting essentially of a builder selected from sodium nitrilotriacetate, potassium nitrilotriacetate, and potassium polyphosphates and an alkyl glycoside of a monohydric alcohol and a reducing saccharide selected from monosaccharides and polysaccharides containing from 2 to 50 monomeric units and from 5 to 6 carbon atoms in each monomeric unit. Particularly preferred alkyl glycosides are those wherein the monohydric alcohol contains from 10 to 14 carbon atoms and which contain from 1 to 4 glucose units (column 2, lines 31 to 36). According to column 6, line 75 to column 7, line 7 these liquid detergents may also contain an anionic synthetic detergent, for example, an alkali metal salt of dodecylbenzene sulfonate. The amount of anionic detergent is usually no more than the amount of alkyl glycoside present, so that the liquid detergent compositions may contain from 0 to 1 part by weight of anionic detergent per part of alkyl glycoside. These products were intended for washing soiled clothing and for other household chores (see column 1, lines 43 to 45). In the Board's judgment, the expression "other household chores" cannot be regarded as referring clearly and unambiguously to manual dishwashing, since it follows e.g. from D11 (see Chapter XII ("Applications") on page 6) that there is a distinction between a "hand dishwashing detergent" and

an "all purpose household detergent". However, in order to destroy novelty, there must be a **clear and unambiguous** disclosure of subject-matter falling within the ambit of the present Claim 1. It is not sufficient to state that the subject-matter of that claim is **covered** by the disclosure of D6.

6.2. D10 discloses the use of alkylglucosides for increasing the capillary activity ("Erhöhung der Kapillaraktivität"), in particular in water-based fluids which are used in textile, leather and related industries. Therefore, in respect of that document it is very doubtful whether it even **covers** the use of compositions disclosed therein for manual dishwashing. Certainly, however, it does not **disclose** that use.

6.3. For these reasons, the Board holds that **the use** claimed in present Claim 1 **is novel** in respect of the disclosure in the above documents, even if one were to accept that these documents disclose compositions falling within the definition of the compositions to be used according to that claim.

7. *Inventive step*

7.1. The inventive step involved in the use now claimed was disputed by Appellants II, III and IV with regard to documents D1, D2, D4, D5, D11, D21, D26 and D40. Among these documents, D1, D2, D4, D5, D11, D21, and D26 relate to alkyl polyglucosides of the type to be used according to the patent in suit.

7.1.1. **D1** relates to a process for preparing C_{8-18}alkyl **monoglucosides** (see column 1, lines 10 to 28, in particular the formula in line 15), whereby at the same time alkyl polyglucosides may be formed as by-products. However, a purification step is described in Examples I

and II, by which these by-products are removed (see column 6, lines 68 to 71 and column 7, lines 34 and 35). For all other individual compounds prepared according to that document analytical data are presented, but the Appellants have not shown that any of these compounds was a mixture of alkyl glucosides which contains substantial amounts of alkyl polyglucosides. The Board therefore holds that the chemical and physical parameters given in that document and relied upon by the Appellants relate exclusively to C_{8-18}alkyl **mono**glucosides. These are the compounds which are said in that document to be about equally effective as foam stabilisers in anionic and nonionic surfactants as are alkanolamides (column 4, line 74 to column 5, line 2). In this context Table V in column 5 specifically mentions 80/20 mixtures of sodium dodecylbenzene-sulfonate and either a C_{10}-alkyl **mono**glucoside or a C_{12}-alkyl **mono**glucoside. However, since there is no indication in D1 that the foam stabilisation had been measured in the presence of soil, the Board accepts that the foam stabilisation addressed in this document relates only to foam formed in clean water, i.e. in the absence of soil, as submitted by the Respondent. The Appellants did not dispute this submission.

7.1.2. **D2** discloses that an alkyl chain length of at least 11 carbon atoms is critical for good surface activity and textile detergency of alkyl polyglucosides (i.e. compounds having more than one glucose unit per molecule) (see column 2, lines 8 to 15), and that these compounds are useful as hydrotropes (solubilising agents) for alkyl **glucosides**, i.e.alkyl **mono**glucosides (column 4, lines 31 to 33 and Table I), whereas **D5** describes a modified process for obtaining alkyl monoglucosides as well as alkyl polyglucosides. The surface tension values of dilute aqueous solutions of the products of this process shown by Table 1 in

column 3 of D5 are identical with those in Table 1 of D1, so that it can be safely inferred that they also relate to alkyl monoglucosides. From these data it can further be inferred that the C_{12}-glucoside lowers the surface tension of clean water more effectively than the C_{10}-glucoside.

7.1.3. As previously mentioned (see point 6 above), D4 relates to an aqueous built liquid detergent composition consisting essentially of certain builders and an alkyl glucoside wherein the monohydric alcohol may preferably contain from 10 to 14 carbon atoms and which may preferably contain from 1 to 4 glucose units (column 2, lines 31 to 36), which composition may additionally contain an anionic synthetic detergent such as, for example, an alkali metal salt of dodecylbenzene sulfonate. The chief problem addressed in that document is the difficulty of including in a homogeneous solution sufficient detergent and builder to provide the performance expected of a product intended for washing soiled clothing and for other household chores, without at the same time including in that solution components which do not contribute much to the performance of the composition, such as hydrotropes or organic solvents (see column 1, lines 38 to 54).

7.1.4. D26 is a scientific paper setting out certain physical properties of alkyl polyglucosides. The alkyl chain of the tested products has from 10 to 18 carbon atoms and the average number of glucose units is between 1.3 and about 10 (see e.g. Table 1 on page 163). In the chapter "Results and Discussion", the use of these alkyl polyglucosides in solid and liquid heavy-duty laundry compositions is discussed. It is also mentioned that these products should be especially valuable in shampoos

(see the paragraphs under the heading "Detergency" on page 167). The possibility of using these products for manual dishwashing is, however, not mentioned.

The state of the art represented by the above-referred documents corresponds essentially to that acknowledged in the patent in suit (see page 2, lines 10 to 16).

7.1.5. D11 discloses the properties and potential uses of a C_{8-10}-alkyl polyglucoside product called TRITON (reg.. trade mark) CG 110. It was accepted by all parties to these proceedings that this product contains an average number of glucose units of about 1.7, so that the only difference between this alkyl polyglucoside and one falling within the definition in the present Claim 1 is the number of carbon atoms in the alkyl chain, which is 8 to 10 in the known product and 12 to 18 in the alkyl polyglucosides to be used according to Claim 1. The known product is said to provide very low skin and eye irritation at use dilutions, excellent foam and foam stability, good detergency, wetting and soil removal. The product is further said to be compatible with anionic, cationic, nonionic and amphoteric materials, to provide good lime soap dispersion and hard water tolerance. It is also stated that the product synergistically reduces skin irritation of harsher components and is readily biodegradable (see page 1). The document further contains quantitative data relating to the aforementioned properties as well as suggestions for applications, **inter alia** as a hand dishwashing detergent, because it is a good cleaner, which is mild to hands and produces good foam (see page 6).

7.1.6. D21 is concerned with cosmetic applications of the product disclosed in D11.

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7.1.7. **D24** is a textbook reflecting, in its section 3.4.1, the common general knowledge relating to compositions used in manual dishwashing at the time just prior to the priority date of the patent in dispute. According to this document, compositions suitable for manual dishwashing normally contain anionic surfactants and, optionally, minor amounts of certain nonionic surfactants, which may act as foam boosters (see page 301, the first two paragraphs of section 3.4.1). Alkylglucosides are not mentioned in this context.

7.1.8. Similarly, **D40** is a publication reflecting the common general knowledge about higher alkanols derived from fatty acids. It is stated there that alcohols having 6 to 10 carbon atoms are normally used as solvents and for the manufacturing of plasticisers, whereas alcohols having from 12 to 18 carbon atoms, so-called "detergent range alcohols", are particularly useful for the manufacturing of surfactants. Among these the alcohols having 12 to 14 carbon atoms, called "laurics", are preferred (see pages 126 and 127).

7.2. Although the subject-matter of Claim 1 is now the use of certain compositions containing alkyl polyglucosides and anionic surfactants for (manual) dishwashing, Appellants III and IV insisted that D4 should be regarded as representing the most closely related state of the art. The Board does not share this opinion. In the Board's judgment, the "problem and solution approach" consistently used by the Boards of appeal for deciding the issue of inventive step implies that a technical problem exists which a skilled person **would** set out to solve. Such technical problems normally arise from drawbacks encountered during activities which are within the framework of the routine duties of the notional "persons skilled in the art". Whereas the Board can accept that it belongs to the normal duties of a

notional "person skilled in the art" to take account of all documents belonging to his technical field, it cannot accept that these normal duties also include the task of considering any hypothetical technical problem that may arise from such a document, such as, with respect to the circumstances set out in point 7.1.3 above, to find further uses for certain compositions described or suggested therein for a particular purpose. Such a "retrospective" way of defining a technical problem is in the Board's judgment artificial and normally inappropriate, because of the inherent risk to make use of the knowledge of the disclosure of the contested patent, which would be contrary to the intention behind the development of the "problem and solution approach", which was precisely to **avoid** hindsight considerations (see T 24/81, OJ EPO 1983, 133, Reasons No. 4). For this reason, the Board is not satisfied that in the present case the definition of the above-mentioned technical problem in respect of D4 was obvious to the person skilled in the art.

7.3. Therefore, the Board rather accepts the Respondent's position, which was also supported by Appellant I, that a realistic technical problem must take account of the technical field in which the patent in suit offers a contribution to the art, i.e. the technical field of manual dishwashing.

7.3.1. The relevant state of the art in this technical field is represented by D24 (see point 7.1.7 above) and is acknowledged in the patent specification, where e.g. in Example I a consumer test is reported which showed that a composition containing 18 weight % sodium $C_{11,8}$alkyl benzene sulfonate and 12 weight % C_{12-13}alkyl polyglucoside$_{2-3}$ (>2% free fatty alcohol) was rated more favourably by consumers than a "premium" commercial dishwashing composition containing 12 weight % of sodium

C_{14-15}alkyl polyethoxylate$_3$ sulfate instead of the alkyl polyglucoside. In addition, the Board considers, having regard to the common general knowledge summarised in D24, that the disclosure in D11 relating to manual dishwashing would have been understood by those skilled in the art to mean that this alkyl polyglucoside may be used to replace the nonionic surfactants normally present as foam boosters in manual dishwashing compositions. While D11 does not specifically spell out that the alkyl polyglucoside concerned should be used together with an anionic cosurfactant, it may be derived from D24 that it is common general knowledge that compositions designed for manual dishwashing contain major amounts of anionic surfactants (see point 7.1.7 above). The use for manual dishwashing of compositions containing the alkyl polyglucoside of D11 plus major amounts of an anionic surfactant may therefore be regarded as implicitly disclosed by D11. The Board can therefore accept that a skilled person may have considered this document as starting point for further development.

7.3.2. In respect of this state of the art, which is more closely related to the subject-matter of the present claims than the state of the art acknowledged in the patent specification, the Respondent had submitted during the opposition proceedings the test report D46, which demonstrates, especially having regard to Experiments 13, 14 and 18, that the alkyl polyglucosides defined in the present claims are **better** foam stabilisers than the alkyl polyglucoside recommended for this use in D11.

7.3.3. In view of this, the relevant technical problem can be seen in looking for a further improvement in the technical field of manual dishwashing, or, more particularly, for compositions to be used in manual

dishwashing which would produce a better stabilised foam in the presence of soils typically present on soiled dishes than would compositions disclosed or suggested by D11 for that use.

7.3.4. The solution to this problem proposed by the patent in suit is to use the compositions defined in the present Claim 1 for manual dishwashing.

7.3.5. According to the Respondent's test results reported in D46, Experiments 13, 14 and 18, suds formation, and particularly the stability of suds on addition of soil ("suds mileage"), for a number of mixtures of an alkyl polyglucoside with a number of different anionic surfactants are greater when C_{12-14}-alkyl - poly$_{(about\ 1.5)}$glucoside (APG 1) than when equal amounts of the commercial alkyl polyglucoside, C_{8-10} alkyl - poly$_{1.7}$glucoside (described in D11) are used, with test conditions reflecting the **normal conditions in manual dishwashing**. (It is observed that, while the alkyl polyglucoside APG 1 used in these experiments does not clearly fall within the ambit of the definition given in Claim 1, the average number of glucose units being **about** 1.5, rather than **at least** 1.5, the Appellants have not challenged that APG 1 is representative for the alkyl polyglucosides to be used according to the patent in suit.)

On the other hand, the test results submitted by Appellant III on 10 March 1992, on the basis of which Appellant IV disputed the reliability of the Respondent's test results, were performed with soils and detergent concentrations normally applied in testing **hair shampoos**, and are thus not relevant to the use of such compositions for manual dishwashing.

The further allegation, submitted by Appellant IV, that test results in the technical field of manual dishwashing are inherently unreproducible and therefore unreliable, was refuted by the Respondent on the basis of D63, i.e. a document which originates from Appellant III and relates to manual dishwashing compositions, in which test procedures similar to those used by the Respondent are relied upon. This allegation is, in addition, not in conformity with the common general knowledge reflected by D24, where similar test results are reported and considered relevant (see page 305, Tables 20 and 21).

The Board therefore accepts the reliability of the test results reported in D46, Experiments 13, 14 and 18. Accordingly, it is in the Board's judgment credible that all members of the class of compositions generically defined in Claim 1 perform better in manual dishwashing than **corresponding** compositions (i.e. compositions containing the same amounts of ingredients, the sole difference being the length of the alkyl chain of the alkyl polyglucoside) containing the product mentioned in D11. Consequently, the stated technical problem is credibly solved.

In this respect, the Board observes that, since the relevant technical problem did **not** consist in searching for compositions which in this respect perform better than the **very best** compositions which may be formulated by using the alkyl polyglucoside of D11, there is no basis for following the submission maintained by Appellant III during the oral proceedings, to the effect that the subject-matter of the patent in suit should be limited, by indicating appropriate concentration ranges, to compositions which would solve such a more demanding technical problem.

7.3.6. The Board has therefore examined whether the relevant state of the art, which is summarised in point 7.1.1 to 7.1.8 above, provides a hint towards the above solution of this technical problem.

7.3.7. In this context, the Board is unable to accept the Appellants' submission that it was common general knowledge that in a given surfactant the alkyl chain should normally have a chain length of 12 to 18 carbon atoms, hence a skilled person would in any case have chosen such an alkyl chain length with a view of improving the detergency of an alkyl polyglucoside. This submission is not supported by document D40 relied upon in this respect by the Appellants. Pages 126 and 127 of D40 say in the second full paragraph on page 127 that the so-called "laurics" are particularly suitable for making anionic detergents, whereas oleyl alcohol, an unsaturated C18-alcohol, is particularly suitable for preparing nonionic detergents by ethoxylation (see page 127, last paragraph). The Board further infers from pages 98 to 101 and 106 to 107 of D40 that a typical property of surfactants, i.e. the critical micelle concentration (cmc) depends not only upon the length of the alkyl chain, but also upon the chemical nature of the hydrophilic group. Therefore, since alkyl polyglucosides contain a hydrophilic group which is structurally very different from the hydrophilic groups present in the detergents mentioned in D40, the Board is not satisfied that a skilled person could, on the basis of D40, make any reliable predictions as to the influence of the length of the alkyl chain on the detergency of alkyl polyglucosides. Thus the information provided by D1, D2, D5 and D26 is in the Board's judgment more relevant to the question which structure-activity-relationship a skilled person would expect for alkyl polyglucosides. While Appellant III submitted in writing that the combined disclosure of these documents

(see paragraphs 7.1.1, 7.1.2 and 7.1.4 above) taught that a C_{10}-alkyl polyglucoside, when used **as the sole surfactant**, was unsuitable as a light-duty detergent, its cleaning effect being too low, and that a suitable alkyl polyglucoside should have more than 11 carbon atoms in the alkyl chain, present Claim 1 relates to the use of **mixtures of alkyl polyglucosides and anionic surfactants** for manual dishwashing, and the cleaning effect of pure alkyl polyglucosides (in the absence of anionic cosurfactants) does therefore not allow any valid conclusion in respect of the solution of the relevant technical problem. The Board cannot derive from these documents any information suggesting to the skilled person that, for the purpose of improving the relevant mixtures, the alkyl polyglucosides defined in the present Claim 1 would be more suitable than the alkyl polyglucoside of D11, nor were the Appellants apparently able to refer to any such information.

7.3.8 D4 offers to the skilled person a great number of compositions containing alkyl polyglucosides and an anionic cosurfactant (see points 6.1 and 7.1.3 above). Since this document is, however, not concerned with manual dishwashing, it does not contain any information about the particular suitability of any of those compositions for that specific purpose. Therefore, on the basis of this document, in combination with D11 and the aforementioned common general knowledge, the skilled person could at most assume that all compositions disclosed therein would be equally useful for manual dishwashing as is a composition containing an anionic surfactant and the alkyl polyglucoside of D11, with no reason for selecting just those compositions defined in Claim 1 of the patent in suit. This view was not disputed by the Appellants.

Nor did the Appellants contest the Respondent's submission that the only further documents that contain information about the foam stability of solutions comprising alkyl polyglucosides, namely D1 and D5, contain only information about the stability of foams produced from alkyl glucosides and, optionally, an anionic cosurfactant, **in clear water** (see also point 7.1.1 and 7.1.2 above). The Board infers e.g. from Table V of D1 that in the case of mixtures of alkyl monoglucosides with sodium dodecylbenzenesulfonate there is no significant difference in foam stability under such conditions between alkyl glucosides having 10 and those having 12 carbon atoms in the alkyl chain. On the other hand, the Board infers from D11 and D24 that a composition intended for use in manual dishwashing must produce stable foam in **water which contains fatty soils** (see D24, page 302, last paragraph), and, from D24, that there is a difference between foam stability of detergent combinations in clear water and in water which contains fatty soils. The Board therefore accepts the Respondent's submission that information about foam stability in clear water as provided by D1 and D5 is of no great significance for a skilled person looking for alkyl polyglucoside containing compositions to be particularly useful for manual dishwashing. For this reason, a skilled person would not expect, on that basis, that the use of an alkylpolyglucoside having 12 to 14 instead of 8 to 10 carbon atoms in the alkyl chain would produce a significantly more stable foam in the presence of soil under the working conditions of manual dishwashing. On the contrary, he would at most expect about equal performance of the two alkylpolyglucosides.

7.3.9. Accordingly, the Board is satisfied that the combined content of the documents mentioned above would not have led the skilled person to the claimed solution of the

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stated technical problem. The claimed use of the particular compositions defined in present Claim 1 therefore involves an inventive step.

7.4. Since, however, the Appellants have put so much emphasis on attacking the inventiveness of the subject-matter of the patent in suit on the basis of the allegation that D4 represents the closest state of the art, the Board has examined whether, on the basis of the Appellants' considerations, the claimed use would be obvious if one were to accept, for the sake of argument, that the notional "person skilled in the art" did not exercise inventive skill in recognising the technical problem defined by the Appellants in respect of that state of the art, as explained in point 7.2 above.

7.4.1. Starting from D4, the Appellants submitted that the technical problem was to discover a further use for certain compositions disclosed therein, namely those falling within the definition of the alkyl polyglucosides according to Claim 1 of the patent in suit. According to their submission, it was obvious to solve this problem by proposing to use the said compositions for manual dishwashing, such a use having been suggested by D11 for a different composition likewise covered by the disclosure of D4 (see points 6.1 and 7.1.3 above).

7.4.2. Even if, however, the Appellants' starting point for defining the technical problem were to be accepted, it would not be acceptable to define that problem without taking into account **all** the technical advantages **objectively** achieved by the claimed use. In other words, the Board could in no case accept the Appellants' submission, which by the way was not based on any evidence, that the class of compositions generically

defined in Claim 1 was merely an arbitrary selection from the host of compositions covered by the disclosure of D4.

It was not disputed that the alkyl polyglucoside recommended in D11 (see point 7.1.5 above) fell within the broad definition of the alkyl polyglucosides of D4. As already explained previously (see point 7.3.5 above) the Board accepts the reliability of the Respondent's test results reported in D46; hence it is credible that all members of the class of compositions generically defined in Claim 1 perform better in manual dishwashing than corresponding compositions (i.e. compositions containing the same amounts of ingredients, the sole difference being the length of the alkyl chain of the alkyl polyglucoside) containing the product mentioned in D11.

7.4.3. On the above basis, tentatively starting from D4, the technical problem for which a solution was sought would therefore not just be to search for some new use for certain old compositions, but rather to search, among the great number of compositions disclosed or suggested by D4, for those compositions which were **more useful for manual dishwashing** than the aforementioned "corresponding" compositions containing the alkyl polyglucoside disclosed in D11.

7.4.4. The solution offered by the patent in suit for that alleged technical problem can be seen in using the compositions defined in Claim 1 of the patent in suit for manual dishwashing. As previously explained (see point 7.4.2 above), the Board can accept that the above-defined technical problem is thereby credibly solved.

7.4.5. The Board has thus examined whether the relevant state of the art, which is summarised in points 7.1.1 to 7.1.8 above, would provide the skilled person with a pointer towards the above solution of the said alleged technical problem.

Among those documents, only D11 relates to the use of an alkyl polyglucoside in manual dishwashing compositions. For the reasons set out previously (see point 7.3.1), the use of compositions containing the alkyl polyglucoside, recommended in D11, and major amounts of an anionic surfactant may be regarded as being implicitly disclosed in D11. A skilled person looking for possible further uses of compositions containing an alkyl polyglucoside as defined in D4 and an anionic cosurfactant, might therefore have considered manual dishwashing for a composition containing the alkyl polyglucoside of D11 and an anionic cosurfactant. The use of such a composition, however, is not contemplated by the patent in suit. On the contrary, the alleged technical problem was to search for a new use for **different compositions** which were even **more useful** in manual dishwashing and were also covered by the disclosure of D4.

As previously explained (see point 7.3.8 above), D4 is not concerned with manual dishwashing, and does not contain any information about the particular suitability of any of the compositions covered by it for that specific purpose. The only further documents that contain information about the foam stability of alkyl polyglucosides, namely D1 and D5, refer to the stability of foams produced in clear water. As also explained previously, this information is rather irrelevant to a skilled person looking for compositions being particularly useful for manual dishwashing.

7.4.6. Therefore a skilled person would not be led by the combined content of the documents mentioned above to the claimed solution of the technical problem defined by the Appellants on the basis of D4, and the Appellants' line of argument based upon D4 as being the closest state of the art does not render the subject-matter of the present Claim 1 obvious either.

7.5. With regard to the question raised by the Appellants, whether the skilled person was in a "one-way street" situation, as submitted by Appellants II, III and IV, the Board holds that it does in no way follow from the statement in document D2, according to which the detergency is much better for C_{11}-alkylpolyglucosides than for the C_6-homologues, that a skilled person would necessarily use a C_{12-14}- or C_{12-18}- alkyl polyglucoside in combination with an anionic surfactant for manual dishwashing. Rather, the later technical development reflected by D11, which recommends a C_{8-10}-alkyl polyglucoside, is evidence to the contrary. Moreover, there is the Respondent's undisputed submission that, among the known alkyl polyglucosides, those mentioned in D22 and D23 were even more promising candidates for further developments in the technical field of manual dishwashing. Accordingly, in the present case, which is in no way comparable with the cases decided in e.g. T 21/81 (see OJ EPO 1983, 15) or T 192/82 (see OJ EPO 1984, 415) no "one-way street" situation exists, and, therefore, this line of argument is not suitable to deny the presence of an inventive step.

7.6. Nor was it "obvious to try", on the basis of the allegation that the combined information derivable from D1, D5 and D11 suggested to the skilled person that alkylglucosides having 10 and those having 12 carbon atoms in the alkyl chain would have about the same detergent properties, using an alkylpolyglucoside having

from 12 to 14 carbon atoms in the alkyl chain for the same purposes recommended in D11 for an alkylpolyglucoside having 8 to 10 carbon atoms in the alkyl chain. This argument rather relates to the question what a skilled person **could** have done in view of the state of the art than to the question what this person **would** have done in order to solve the relevant technical problem. In the Board's judgment, however, a skilled person **would** normally only have tried to replace the alkyl polyglucoside recommended in D11 if there had been a sound reason to do so. In the present case, however, where those alkylpolyglucosides having from 12 to 14 carbon atoms in the alkyl chain had the predictable disadvantage of being considerably less readily available than the alkyl polyglucoside with which D11 is concerned, no sound reason to use just those products for manual dishwashing can be seen, in the absence of any reasonable expectation of an improvement.

8. Having regard to the change of category of Claim 1 of the patent in suit with respect to the wording of Claim 1 of the patent as granted, the necessary adaptation of the description will require major amendments, which should be left to the competent Opposition Division. With regard to this adaptation, the Opposition Division may consider whether it is necessary and appropriate to indicate that some embodiments of the present description relate to subject-matter covered by other patents of the same priority date (see e.g. page 4, line 56 to page 5, line 43 of the patent as granted in respect of EP-B-70 075 and EP-B-70 076).

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the Opposition Division with the order to maintain the patent with the Claims 1 to 14 submitted on 10 November 1995 as auxiliary request and a description to be adapted thereto.

The Registrar: The Chairman:

E. Görgmaier F. Antony