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**D E C I S I O N**  
**of 17 June 2005**

**Case Number:** T 0034/02 - 3.3.3

**Application Number:** 89305745.5

**Publication Number:** 0346097

**IPC:** C08L 33/04

**Language of the proceedings:** EN

**Title of invention:**

Thickening system

**Patentee:**

UNILEVER PLC, et al

**Opponents:**

Henkel KGaA  
The Procter & Gamble Company

**Headword:**

-

**Relevant legal provisions:**

EPC Art. 54, 56, 83, 114(2)

**Keyword:**

"Disclosure - sufficiency (yes)"

"Novelty (yes)"

"Inventive step (yes)"

**Decisions cited:**

G 0009/91, G 0010/91, G 0004/92, T 0219/83, T 0453/87,  
T 0435/91, T 0892/94, T 0190/99, T 1029/01

**Catchword:**

-



Case Number: T 0034/02 - 3.3.3

**D E C I S I O N**  
of the Technical Board of Appeal 3.3.3  
of 17 June 2005

**Appellant 01:** Henkel KGaA  
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**Representative:** -

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**Appellant 02:** UNILEVER PLC  
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**Representative:** Watson, Robert James  
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**Decision under appeal:** Interlocutory decision of the Opposition  
Division of the European Patent Office dated  
13 November 2001 and posted 18 December 2001  
concerning maintenance of European patent  
No. 0346097 in amended form.

**Composition of the Board:**

**Chairman:** R. Young  
**Members:** W. Sieber  
C. Heath

## Summary of Facts and Submissions

I. The mention of the grant of European patent No. 0 346 097, with 14 claims, in respect of European patent application no. 89 305 745.5, filed on 7 June 1989 and claiming a GB priority of 8 June 1988 (GB 8813552) was published on 13 May 1998 (Bulletin 1998/20). Claim 1 read as follows:

"A composition comprising a liquid system which contains an aqueous liquid medium including 0.05 to 20 wt% of detergent, and a thickening mixture dispersed in the liquid medium, which thickening mixture is present in an amount from 0.01 to 5% by weight with respect to the liquid system and comprises a gum-type polymer which is a polysaccharide and an acrylic-type polymer which is selected from the group consisting of synthetic cross-linked acrylate and methacrylate homopolymers and copolymers and mixtures and derivatives thereof,

wherein the gum-type polymer and the acrylic-type polymer are present in a weight ratio of gum-type polymer to acrylic-type polymer of between 50:1 and 1:100, and wherein each said polymer, when in the liquid medium in the absence of the other said polymer, has a relationship between concentration and viscosity, measured at a shear rate of  $10 \text{ sec}^{-1}$  and a temperature of  $25^\circ\text{C}$  such that a graph of  $\log(\text{viscosity})$  against  $\log(\text{concentration})$  is a sigmoid curve having a portion where, over a range of concentration the gradient of the curve of  $\log(\text{viscosity})$  against  $\log(\text{concentration})$  is

constant or increases with log (concentration), and the amount of each of the said polymers is such that the concentration thereof in the liquid medium lies within the said range over which the gradient of the polymer's said curve of log (viscosity) against log (concentration) is constant or increasing, the liquid system having a viscosity of at least 20 cPs at a shear rate of  $10 \text{ sec}^{-1}$  greater than that of the liquid medium in the absence of the said thickening mixture, said liquid system containing either no disperse phase, or a disperse phase which is particulate solid material."

Claims 2 to 14 were dependent claims.

II. Notices of opposition were filed by Henkel KGaA (opponent 01) on 10 February 1999, and by The Procter & Gamble Company (opponent 02) on 12 February 1999, respectively, both parties requesting revocation of the patent in its entirety. The oppositions were based on the grounds of Article 100(a) EPC, ie lack of novelty and lack of inventive step (opponent 01 and 02), and on the grounds of Article 100(b) EPC, ie insufficiency of disclosure (opponent 01).

The oppositions were supported *inter alia* by the following documents:

D2: US-A-4 687 663;

D5: US-A-4 540 576;

D6: EP-A-0 048 612; and

D7: EP-A-0 067 025.

III. By an interlocutory decision which was announced orally on 13 November 2001 and issued in writing on 18 December 2001, the opposition division held the opposition of opponent 01 admissible, refused the proprietor's main request (claims as granted) and its first auxiliary request and decided that the patent could be maintained in amended form according to the second auxiliary request.

- (a) As to the admissibility of the opposition of opponent 01, the opposition division noted that an opponent was not obliged to substantiate all of the possible objections or allegations in order to file an admissible opposition. In the present case, opponent 01 had named documents and had given arguments with respect to lack of novelty. With regard to admissibility, it was not necessary that these arguments were convincing or correct or successful. Furthermore, the opponent might argue with respect to inventive step as soon as novelty was established.
  
- (b) The opposition division was also of the opinion that the requirements of Article 83 EPC were met. The two polymers referred to in Claim 1 as granted were "sufficiently defined by giving data on amounts as well as on the nature of the polymers and the measurement of the sigmoid curve as defined on page 3, lines 53 to 55 of the description".

- (c) The claims as granted as well as the claims according to the 1<sup>st</sup> auxiliary request were held to lack novelty over the content of D7, in particular over Example 3 which disclosed a liquid cleansing product comprising a surfactant and the two polymers Jaguar HP-60 and Carbopol<sup>®</sup> 934 in an amount of 0.35% each, whereby Jaguar HP-60 corresponded to the gum-type polymer and Carbopol<sup>®</sup> 934 to the acrylic-type polymer of granted Claim 1. Furthermore, Claim 1 of D7 disclosed a lower limit of 0.1% for the gum-type polymer and 0.15% for the acrylic-type polymer which ranges were considered to fall within the ranges of granted Claim 1.
- (d) The claims of the 2<sup>nd</sup> auxiliary request (with 14 claims including independent Claims 1, 5 and 10) were considered to be novel and inventive over the cited prior art whereby
- Claim 1 was directed to the use of the composition of granted Claim 1 as a lavatory cleaner, a liquid abrasive cleaner or a liquid fabric washing composition;
  - Claim 5 corresponded to Claim 1 as granted except that the gum-type polymer had to be selected from the group comprising xanthan gums and derivatives thereof; and
  - Claim 10 corresponded to Claim 1 as granted except that the liquid system contained a dispersed particulate solid in an amount of 1 to 70% by weight of the composition.

IV. Notices of appeal against the above decision were filed by opponent 01 (appellant 01) on 8 January 2002 and by the proprietor (appellant 02) on 24 January 2002, the prescribed fees being paid on 8 January 2002 and 25 January 2002, respectively. The statements of grounds of appeal were filed on 18 April 2002 and on 23 April 2002, respectively.

V. The arguments of opponent 01 (appellant 01) presented in the statement of grounds of appeal and its further submissions dated 21 August 2002 may be summarized as follows:

(a) The patent in suit failed to disclose a technical concept for finding the appropriate amount for the two thickeners. Moreover, a skilled person was forced to use trial and error in order to find a polymer combination (nature of polymers and amounts thereof) which provides the promised synergistic effect resulting in an undue burden. In this context, reference was made to T 435/91 (OJ EPO 1995, 188) and to Figure 7 of the patent in suit.

(b) Claim 10 of auxiliary request 2 lacked novelty over D7, contrary to the opinion of the opposition division.

(c) Independent Claims 1, 5 and 10 of auxiliary request 2 also lacked an inventive step over D7 which was considered to represent the closest prior art.

As regards the restriction to xanthan gums in Claim 5 of auxiliary request 2, the skilled person knew that this polymer type had good thickening properties. This was apparent from D8.

D8: *W.H. McNeely et al*, "Xanthan and some other biosynthetic gums" in R.L. Whistler, *Industrial Gums*, vol. 2, Academic Press, New York and London (1973), pages 486 495.

VI. The arguments of the proprietor (appellant 02) presented in the statement of grounds of appeal and its further submissions dated 28 August 2002, 11 November 2003 and 26 April 2005 may be summarized as follows:

- (a) The board was invited to review the admissibility of the opposition of opponent 01 because the decision under appeal did not properly address this issue, in particular with regard to the substantiation on the ground of lack of novelty raised by opponent 01.
- (b) Concerning sufficiency of disclosure, the proprietor argued that there was a clear teaching in the patent in suit as to how the amount of the two thickening polymers defined in functional terms had to be determined ("*deriving this graph for both polymers, and then selecting the amount of each polymer so that it lies on the portion of the sigmoid curve where the gradient is constant or increasing*").
- (c) It had never been shown by the opponents that the concentrations of the polymers named in D7 fell on



the required portion of the sigmoid curves for those polymers. Thus, the opposition division effectively ignored the requirements of Claim 1 in its decision on novelty. The proprietor (appellant 02) drew attention to the lack of experimental evidence from either opponent, despite the burden of proof lying with them.

To demonstrate that D7 did not disclose the claimed subject-matter, the proprietor (appellant 02) submitted a leaflet for Carbopol<sup>®</sup> polymers and a repetition of Example 1 of D7:

D9: leaflet for Carbopol<sup>®</sup> polymers from 1980 (including a replotted graphs for Carbopol<sup>®</sup> 940, 934 and 941);  
and

D10: repetition of Example 1 of D7.

(d) The examples in the patent in suit demonstrated an unexpected advantage, namely synergism between two thickeners. This had not been recognised in the prior art and was also absent from the teaching of D7.

(e) Furthermore, the proprietor (appellant 01) filed auxiliary requests 1 to 4 whereby auxiliary requests 1 and 2 were identical to those considered by the opposition division. However, these auxiliary requests are not of importance for this decision and, consequently, they will not be considered in further detail.

- VII. In a communication, issued on 21 March 2005 accompanying a summons to oral proceedings, the salient issues to be discussed at the oral proceedings were identified by the board as being firstly, the admissibility of the opposition of opponent 01, secondly, sufficiency of disclosure in particular with respect to the functional definition of the amounts of the gum-type polymer and the acrylic-type polymer by reference to a sigmoid curve, and, thirdly, novelty and inventive step.
- VIII. With letter dated 26 April 2005, the proprietor (appellant 02) informed the board that it did not intend to attend the oral proceedings.
- IX. Opponent 02 (party as of right) informed the board with letter dated 2 May 2005 that it would not attend the oral proceedings. However, it was requested to set aside the interlocutory decision of the opposition division and to revoke the patent.
- X. On 17 June 2005, oral proceedings were held before the board where the proprietor (appellant 02) and opponent 02 (other party) were not represented. Because they had been duly summoned, however, the oral proceedings were continued in their absence in accordance with Rule 71(2) EPC.
- (a) Opponent 01 (appellant 01) requested to introduce a new ground of opposition, namely Article 100(c) EPC.
- (b) As regards sufficiency of disclosure, opponent 01 (appellant 01) pointed out that the measurement of

the sigmoid curve as required in Claim 1 was inconsistent with the teaching given in the patent in suit. Furthermore, it relied on the argument already submitted in writing that the patent in suit failed to disclose a technical concept for finding the appropriate amount for each polymer.

- (c) The functional definition of the amounts of the two thickeners could not be used as a novelty distinguishing feature. Consequently, the disclosure of D2 (in particular Examples 4, 6 and 10) and D7 (all Examples) was novelty destroying for the subject-matter of Claim 1 as granted.
- (d) It was known from D2 that a mixture of a gum-type thickener and an acrylic-type thickener influenced the rheological behaviour of dental preparations. Thus, relating to the same technical field as the patent in suit, D2 was considered to represent the closest prior art. Furthermore, the skilled person knew from D6 and D5 that such a mixture of thickeners provided advantages with respect to the reduction of the overall amount of thickener to be used. Apart from that, the skilled person would always work at low thickener concentrations because it was common general knowledge (eg the manufacturer's leaflets for Carbopol<sup>®</sup> polymers) that the increase in thickening was at highest at low thickener concentrations. Consequently, the subject-matter of granted Claim 1 was obvious in the light of this prior art. In fact, it was nothing more than the explanation of a known

effect. In this connection, reference was made to T 892/94 (OJ EPO 2000, 001).

XI. Opponent 01 (appellant 01) requested that the interlocutory decision under appeal be set aside and the patent be revoked in its entirety.

The proprietor (appellant 02) requested that the appeal of appellant 01 be dismissed, that the interlocutory decision under appeal be set aside and that the patent be maintained as granted (main request), or, in the alternative, that the patent be maintained on the basis of any of the auxiliary requests (1<sup>st</sup> to 4<sup>th</sup> auxiliary request) with

- 1<sup>st</sup> auxiliary request (Claims 1 to 14) as filed with letter dated 13 September 2001 before the opposition division and refiled with letter dated 22 April 2002;
- 2<sup>nd</sup> auxiliary request (Claims 1 to 14) as filed with letter dated 13 September 2001 before the opposition division and refiled with letter dated 22 April 2002;
- 3<sup>rd</sup> auxiliary request (Claims 1 to 14) as filed with letter dated 28 August 2002; and
- 4<sup>th</sup> auxiliary request (Claims 1 to 14) as filed with letter dated 28 August 2002.

Opponent 02 (party as of right) requested that the interlocutory decision under appeal be set aside and the patent be revoked in its entirety.

## Reasons for the Decision

### 1. *Admissibility of opposition of opponent 01*

1.1 The proprietor (appellant 02) challenged the admissibility of the opposition of opponent 01, an issue which, according to its opinion, had not been properly addressed by the opposition division. However, the proprietor (appellant 02) did not formulate a request in this respect. Nevertheless, the board has examined this issue *ex officio*.

1.2 With regard to the admissibility of the opposition of opponent 01, the objection of the proprietor (appellant 02) appears to have two aspects, namely

- inadmissibility of the opposition of opponent 01 as a whole because the grounds of Article 100(a) EPC have not been sufficiently substantiated as required by Rule 55(c) EPC;
- inadmissibility of the grounds of Article 100(a) EPC raised by opponent 01 because these grounds have not been sufficiently substantiated.

1.2.1 The opposition of opponent 01 was based on the grounds of Article 100(a) and 100(b) EPC (point II, above). The proprietor (appellant 02) has apparently accepted that the ground of Article 100(b) EPC had been sufficiently substantiated by opponent 01 in the notice of opposition. The board is also of the opinion that the ground of Article 100(b) EPC was sufficiently

substantiated. Thus, a possible insufficient substantiation with regard to other grounds of opposition, in the present case with regard to the grounds of Article 100(a) EPC, cannot cause an inadmissibility of the opposition as a whole (see eg T 1029/01 of 22 May 2003, not published in the OJ EPO; point 2 of the reasons). Consequently, the proprietor's (appellant 02) first attack cannot succeed.

1.2.2 In the present case, not only opponent 01 but also opponent 02 based its opposition on the grounds of Article 100(a) EPC, namely lack of novelty and lack of inventive step (point II, above). Opponent 02 properly supported these grounds which has never been disputed by the proprietor (appellant 02). Consequently, the grounds of Article 100(a) EPC are in any case part of the factual and legal framework of the present opposition and opposition appeal proceedings and it is unnecessary for the board to rule on the second issue raised by the proprietor (appellant 02), ie as to whether or not opponent 01 properly supported the grounds of Article 100(a) EPC.

1.3 It follows from the above that the opposition of opponent 01 is admissible.

## 2. *Admissibility of the appeals*

The appeals of opponent 01 (appellant 01) and of the proprietor (appellant 02) comply with Articles 106 to 108 EPC and Rule 64 EPC and are therefore admissible.

3. *Late filed ground of opposition (Article 100(c) EPC)*
- 3.1 Opponent 01 (appellant 01) argued for the first time in the oral proceedings before the board that the granted patent extended beyond the application as filed and requested that the patent also be revoked in view Article 100(c) EPC therewith raising a new ground of opposition.
- 3.2 The introduction of new grounds of opposition is governed by G 9/91 (OJ 1993, 408, points 16 and 18 of the reasons) and G 10/91 (OJ 1993, 420, point 3 of the headnote) where it is held that fresh grounds of opposition may be considered in appeal proceedings only with the approval of the proprietor of the patent.
- 3.3 In the present case, the board could not ask for such an approval because the proprietor was not present at the oral proceedings (point X, above) where the new ground of opposition was raised for the first time. To continue the proceedings in writing in order to ask the proprietor (appellant 02) for such an approval was not considered by the board as an appropriate alternative. For a party to wait until oral proceedings before presenting the new ground of opposition that could have been presented earlier (the new ground of opposition was raised more than six years (!) after filing the opposition) *de facto* amounts to an abuse of procedure (in analogy to G 4/92 (OJ EPO 1994, 149; point 7 of the reasons).

- 3.4 Consequently, the board rejected the request of opponent 01 (appellant 01) to introduce Article 100(c) EPC as a new ground of opposition into the proceedings in accordance with Article 114(2) EPC.

*Main request*

4. *Sufficiency of disclosure*

- 4.1 Claim 1 as granted refers to a composition comprising a liquid system which contains an aqueous liquid medium including 0.05 to 20 wt% of detergent and a thickening mixture of two polymer types in an amount of from 0.01 to 5% by weight with respect to the liquid system. Furthermore, Claim 1 specifies the chemical nature of these two polymer types, namely a specific gum-type polymer and a specific acrylic-type polymer, and the amount of each polymer type, whereby the amount is defined on the one hand by the weight ratio of gum-type polymer to acrylic-type polymer and on the other hand in functional terms via a relationship between concentration and viscosity of each polymer. The latter requirement is defined as follows:

*"... wherein each said polymer, when in the liquid medium in the absence of the other said polymer, has a relationship between concentration and viscosity, measured at a shear rate of  $10 \text{ sec}^{-1}$  and a temperature of  $25^\circ\text{C}$  such that a graph of  $\log$  (viscosity) against  $\log$  (concentration) is a sigmoid curve having a portion where, over a range of concentration the gradient of the curve of  $\log$  (viscosity) against  $\log$  (concentration) is constant or increases with  $\log$  (concentration), and the amount of each of the said polymers is such that the concentration thereof in the liquid medium lies within the said range over which the*



*gradient of the polymer's said curve of log (viscosity) against log (concentration) is constant or increasing, ...".*

- 4.2 The arguments put forward by opponent 01 (appellant 01) against sufficiency of disclosure were directed to this functional definition of the amount for each polymer, namely that the determination of the sigmoid curve as described in Claim 1 was inconsistent with the teaching given in the patent specification and that the patent in suit failed to disclose a technical concept ("*Lehre für ein zielgerichtetes Vorgehen*") for finding the appropriate amount for each polymer.
- 4.3 According to opponent 01 (appellant 01), the wording in Claim 1 that "each said polymer, **when in the liquid medium** (emphasis added) ... has a relationship between concentration and viscosity ... such that a graph of log (viscosity) against log (concentration) is a sigmoid curve" means that the sigmoid curves of the polymers have to be measured in the liquid medium only, eg in water only.
- 4.3.1 This interpretation of opponent 01 (appellant 01) not only ignores the fact that the passage relied upon does not read "in the liquid medium only", it also ignores that Claim 1 requires already in line 1 that the liquid medium includes 0.05 to 20 wt% of a detergent. The attribution of the detergent to the liquid medium seems to suggest that the term "liquid medium" as used in Claim 1 is not only directed to a liquid as such, eg water, but also to the liquid including further ingredients.

4.3.2 Thus, if anything, Claim 1 raises doubts as to how the sigmoid curve of each polymer has to be determined, ie either in the liquid medium only, as alleged by opponent 01 (appellant 01), or in the liquid medium including detergents and, possibly, other ingredients present in the liquid medium. The quoted wording of Claim 1 ("each said polymer, when in the liquid medium ... ") would therefore be examined carefully by the person skilled in the art, using the description and the drawings when deciding how the sigmoid curves referred to in Claim 1 are to be determined.

4.3.3 At page 3, lines 53 to 55 of the patent in suit, it is stated that the sigmoid curves have to be measured "**in the presence of any other ingredients which might be present in the liquid medium**" (emphasis added). Furthermore, the patent in suit teaches at page 4, lines 9 to 18 that the sigmoid curve of Carbopol<sup>®</sup> 910 can be influenced by the addition of 3% sodium chloride which is illustrated in Figure 7. This example demonstrates how an unsuitable system can be "tailored" to become a suitable one. This implies that the sigmoid curve of the polymer is measured both with and without sodium chloride. Otherwise one would not observe a change in the behaviour of the sigmoid curve.

4.3.4 If, however, the relevant wording of Claim 1 were to be interpreted as proposed by opponent 01 (appellant 01), then it would not be consistent with the patent taken as a whole. Therefore, the skilled person trying, with synthetical propensity ie building up rather than tearing down (see T 190/99 of 6 March 200; point 2.4 of the reasons), to arrive at an interpretation of the relevant passage of Claim 1 which is technically

sensible and takes into account the whole disclosure of the patent (Article 69 EPC) would rule out the interpretation of opponent 01 (appellant 01).

- 4.3.5 The only criticism that arises against Claim 1 goes to the rather careless use of the terms "liquid system" and "liquid medium" whose meanings appear to overlap. In fact, the terms may even be used synonymously. However, this is purely an issue under Article 84 EPC which is not a ground of opposition.
- 4.3.6 Hence, the board finds that there is no discrepancy between Claim 1 as granted and the patent specification which could lead to difficulties with respect to the implementation of the invention. Moreover, the contested claim, on its proper interpretation, is fully supported by the patent specification.
- 4.4 According to opponent 01 (appellant 01) the patent in suit fails to disclose a technical concept for finding the appropriate amount for each polymer. Moreover, a person skilled in the art is forced to use trial and error in order to find a polymer combination (nature of polymers and amounts thereof) which provides the promised synergistic effect resulting in an undue burden. In this context, opponent 01 (appellant 01) referred to T 435/91 (*supra*) and to Figure 7 of the patent in suit.
- 4.4.1 There is no dispute that every polymer will have a sigmoid curve in a particular liquid medium (including possible further ingredients) - the sigmoid curve is simply a graph indicating how the viscosity of the polymer in question varies with increasing

concentration in the particular liquid medium (in the absence of the other thickening polymer). The measurement of viscosity will involve making up a number of solutions which vary in the concentration of one polymer and measuring viscosity. This is a straightforward process of measuring one property, namely viscosity, while altering one independent variable, namely concentration. Of course, someone carrying out this measurement of viscosity at varying concentrations can take guidance from the patent in suit as to likely ranges of concentrations to prepare for measurement of viscosity. Furthermore, the patent in suit explains the various portions of a sigmoid curve (page 3, lines 41 to 44; Figure 1) and provides guidance for those cases where the shape of the sigmoid curve may be non-ideal (page 3, lines 44 to 52).

- 4.4.2 After deriving this graph for both polymers, the skilled person has to select the amount of each polymer so that it lies on the portion of the sigmoid curve where the gradient is constant or increasing in order to obtain a synergistic thickening of the composition. This means that the overall thickening is not merely the predicted sum of the two viscosities but is unexpectedly greater. If the same polymers are used at even higher concentration, there would still be thickening. Indeed there might be greater thickening, but the extent of thickening would no longer be unexpectedly greater than predicted, and a greater quantity of polymer would be used.

This is illustrated in Example 1 of the patent in suit where the gum-type polymer is a xanthan gum designated Shellflo-XA and the acrylic polymer is designated

PPE 1042. As can be seen from the table bridging pages 5 and 6, 0.2% of Shellflo-XA in the absence of PPE 1042 give a viscosity of 206 mPas at  $10 \text{ sec}^{-1}$ . 0.5% of PPE 1042 in the absence of Shellflo-XA give a viscosity of only 24 mPas at  $10 \text{ sec}^{-1}$ . It would be predicted that by using the two together the viscosity would be about 230 mPas. However, an unexpected greater viscosity of 420 mPas is observed.

Examples 2 and 3 are a very clear illustration of the fact that the range of concentration at which this unexpected synergy is observed is dependent on the choice of polymer. Example 2 uses 0.1% of xanthan gum (Shellflo-XA) with varying amounts of Carbopol<sup>®</sup> 940 as the acrylic-type polymer. Example 3 uses the same concentration of Shellflo-XA but uses Viscalex HV 30 as the acrylic-type polymer. In Example 2 it is shown that when the quantity of Carbopol<sup>®</sup> 940 is 0.07% or less the overall viscosity is greater than would be expected by simple linear addition of the viscosities. This unexpected synergy is at a maximum when the concentration of Carbopol<sup>®</sup> 940 is about 0.04% and is declining almost to vanishing point when the concentration of Carbopol<sup>®</sup> 940 is 0.08%. By contrast with Viscalex HV 30, the effect is small at 0.1% and is at its maximum at a concentration of 0.3% before falling away at even higher concentration.

4.4.3 Thus, contrary to the assertion of opponent 01 (appellant 01) the patent in suit provides a technical concept for finding the appropriate amount for each polymer and clear guidance for the implementation of this concept. Moreover, in view of the variation from one polymer to the other (see Examples 2 and 3) the

functional definition in terms of the shape of the sigmoid curve is justified. It may be tedious to establish the graphs for the polymers a skilled person may want to use, in particular because all ingredients present in the liquid medium have to be taken into account, but no undue difficulties arise when establishing these graphs.

- 4.4.4 Opponent 01 (appellant 01) made reference to T 435/91 (*supra*), a case where one of the essential components was only defined by its function (an additive which forces a detergent composition into hexagonal liquid crystal phase). According to this decision, the requirements of Article 83 EPC are not met if the patent discloses only isolated examples but fails to disclose any technical concept fit for generalisation, which would enable the skilled person to achieve the envisaged result without undue difficulty within the whole ambit of the claim containing the functional definition (headnote, point 2.2.1 of the reasons).

However, the present case differs from T 435/91 (*supra*) because the patent in suit provides technical information as to how to obtain, with a reasonable expectation of success, the appropriate amount of thickening polymers. In fact, this information is, as pointed out in section 4.4.2, above, a fully self-sufficient technical concept as to how the appropriate amount is to be obtained, namely selecting the amount of each polymer so that it lies on the portion of the sigmoid curve where the gradient is constant or increasing.

4.4.5 Opponent 01 (appellant 01) also referred to Figure 7 of the patent in suit which shows the variation in synergy for a 0.1% Shellflo XA solution with various concentrations of Carbopol<sup>®</sup> 910 in the absence and in the presence of 3% sodium chloride. According to opponent 01 (appellant 01), the fact that this combination of thickening agents shows in the absence of sodium chloride no synergy at all is evidence for the lack of concept in the patent in suit. However, opponent 01 (appellant 01) seems to overlook that Figure 7 shows synergy at a very low concentration of Carbopol<sup>®</sup> 910. It appears from Figure 6, the sigmoid curve for Carbopol<sup>®</sup> 910, that the gradient of the sigmoid curve at this low concentration is constant, therefore one would expect synergy. Furthermore, the comments of opponent 01 (appellant 01) concerning Figure 7 seem to overlook the explanation of that figure which is given on page 4, lines 9 to 18 of the patent in suit. According to this passage, a mixture of 0.1% Shellflo XA and 0.2% Carbopol<sup>®</sup> 910 in aqueous dispersion at pH 9.5 gives a synergistic increment of approximately -30%. It can be seen from Figure 6 that a concentration of 0.2% Carbopol<sup>®</sup> 910 is not in the required part of the sigmoid curve. That is, according to the proprietor (appellant 02), why there is no synergy. The purpose of Figure 7, as explained in the text, is to show that if someone wished to achieve synergy with 0.2% or anything from 0.1 to 0.5% Carbopol<sup>®</sup> 910, they would have the opportunity of increasing the electrolyte concentration, ie moving the sigmoid shape of the log (viscosity)/log (concentration) graph towards higher values of concentration of this polymer. Thus, whilst the explanation given in connection with Examples 1 to 3 shows how to put the

invention into effect, the further explanation given in connection with Figures 6 and 7 is about how to put the invention into effect while accepting a restriction on the choice of concentration of one polymer. Consequently, Figure 7 cannot invalidate the technical concept as presented in the patent in suit.

4.4.6 Hence, the board finds that the patent in suit discloses a technical concept fit for generalisation which enables the skilled person to achieve the envisaged result as regards the functional definition of the amounts of the polymers without undue difficulty.

4.5 It follows from the above, that the requirements of Article 83 EPC are met.

## 5. *Novelty*

It may be convenient to recall at this juncture that D2 and D7 are the only documents relied upon by opponent 01 (appellant 01) for novelty (see section X, above). The opposition division has relied only on the latter document to refuse Claim 1 as granted in view of Article 54 EPC.

### 5.1 Document D7

5.1.1 D7 claims in Claim 1 a liquid cleansing product comprising from 5 to 30% surfactant, from 0.1 to 1.0% guar material selected from guar gum and guar gum derivatives, from 0.15 to 1.0% of carboxyvinyl polymer, and water. The products provide beneficial skin feel properties. D7 has five examples which disclose cleansing products comprising surfactants and a



combination of two thickening polymers, namely Carbopol<sup>®</sup> 934 in combination with various types of Jaguar components (Jaguar HP-60, Jaguar HP-11 and Jaguar-A-40-F). Carbopol<sup>®</sup> 934 is an acrylic type polymer according to Claim 1 of the patent in suit, and the Jaguar components are all gum-type polymers according to Claim 1. The range of amounts of Carbopol<sup>®</sup> 934 (0.25 to 0.35%) and Jaguar gums (0.30 to 0.60%) in the examples is narrower than the full range claimed in D7. It is conspicuous to the board that there is no disclosure of a composition in D7 with amounts of either polymer being below 0.25%.

5.1.2 It has never been shown for a composition disclosed in D7, either in the opposition or in the opposition appeal proceedings, that the concentrations of both polymers would lie on the required portion of the sigmoid curves for those polymers. Since, however, the onus of proof in this respect lies with the opponents (T 219/83, OJ EPO 1986, 211), the novelty objection based on D7 must fail.

5.1.3 In this connection it should be noted that the only evidence that has been submitted to the EPO regarding the disclosure of D7 was the experimental evidence D10 provided by the proprietor (appellant 02). In following Example 1 of D7, the proprietor (appellant 02) has shown that the gradient of the graph  $\log(\text{viscosity})$  against  $\log(\text{concentration})$  is decreasing when the concentration of Jaguar HP-60 reaches 0.3 wt.%. Accordingly, the composition of Example 1 of D7 falls outside the scope of Claim 1 as granted.

5.1.4 Furthermore, it appears from the decision under appeal (point 4), that the opposition division combined a specific example, ie Example 3, with the lower limits of the two ranges given in Claim 1 for the thickening polymers (0.1% guar material and 0.15% carboxyvinyl polymer) in order to create a novelty destroying embodiment. However, this approach cannot succeed because such a combination is the result from a multiple selection from the disclosure of D7 which does not emerge from D7 as being implicitly disclosed for the skilled person (eg T 453/87 of 18 May 1989; not published in the OJ EPO; point 7.2 of the reasons). Apart from this there is no evidence on file that this "artificial" embodiment would meet the requirements of Claim 1 as granted.

5.1.5 For the above reasons, the board concludes that the subject-matter of Claim 1 of the patent in suit is novel over the disclosure of D7.

5.2 Document D2

5.2.1 D2 relates to a method for cleaning teeth and a dental preparation to be used therewith which comprises two components, a first component containing hydrogen peroxide and a second component containing sodium bicarbonate as an active ingredient (Claim 1). According to Claim 11, the first component is a gel comprising as a gelling agent a member selected from the group consisting of (a) copolymers of acrylic acid cross-linked with polyallyl sucrose, (b) an organic polymeric acid colloid, and (c) a polyoxyethylene/polyoxypropylene block copolymer.

According to the disclosure in column 3, lines 31 to 51, the most preferred gelling agents are stated to be those marketed by the company Goodrich under the trademark Carbopol 941, 1342, 934 and 940 which correspond to the acrylic-type polymers of Claim 1 of the patent in suit. The synthetic cross-linked acrylate polymer can be used in combination with a suitable amount of non-ionic cellulose gum such as hydroxyethyl or hydroxypropyl cellulose or hydroxypropyl methylcellulose (column 3, lines 23 to 29) which are gum-type polymers as referred to in Claim 1 of the patent in suit.

In addition to this general disclosure, Examples 4, 6 and 10 of D2 disclose compositions comprising a liquid system which contains an aqueous liquid medium, a detergent and a mixture of Carbopol<sup>®</sup> 934 and hydroxypropyl cellulose (Examples 4 and 10) and hydroxypropyl methylcellulose (Example 6), respectively.

5.2.2 Although the burden of proof lies on the opponents (see section 5.1.2, above), they have never demonstrated that the concentrations of the two thickening polymers used in the examples of D2 would lie on the required portion of the sigmoid curves for these polymers. Also at the oral proceedings before the board where opponent 01 (appellant 01) relied on D2 as a novelty destroying document, no such evidence was provided.

5.2.3 Hence, the board concludes that the subject-matter of Claim 1 is novel over D2.

5.3 It follows, in view of the above, that the subject-matter of Claim 1 as granted and, by the same token, the subject-matter of Claims 2 to 14 as granted, is novel over D7 and D2.

6. *Problem and solution*

6.1 The prior art considered during the examination proceedings is discussed in the introductory part of the patent specification. From this discussion, it can be taken that polymeric thickening agents such as polysaccharide hydrocolloids and polymers which include acrylate homo- and copolymers and derivatives thereof were well known. It is discussed furthermore that it was known in the field of polymeric thickening agents that, in general, the viscosity of a liquid is dependent on the concentration of thickening agent in that liquid (page 2, lines 38 to 39 of the patent specification). Also the combined use of crosslinked acrylic-type polymers and gum-type polymers being polysaccharides is known (cf the discussion of D2 on page 3, lines 8 to 10 of the patent specification).

Thickening agents are used in many areas of industry to impart a certain rheological behaviour to liquid media. Thus, the patent in suit specifically refers to compositions in the form of a toothpaste (Claim 13) or in the form of a shampoo, shower and bath gel (Claim 14).

6.2 D2 uses a mixture of thickening agents in dental preparations (section 5.2.1, above). Thus, apart from using the same types of polymer thickeners, namely gum-type and acrylic-type polymers, the compositions of D2

serve a similar purpose as the compositions of the patent in suit, in particular those referred to in granted Claim 13. Hence, the board accepts that D2 represents the closest prior art, as submitted by opponent 01 (appellant 01).

6.2.1 As explained in section 4.4.2, above, the data in the patent in suit show that if crosslinked acrylic-type polymer was used jointly with a gum-type polymer **and** if the concentration of both polymers was selected so that for the individual polymers the concentration lies on the part of the sigmoid curve where the gradient is constant or rising, the overall thickening is not merely the predicted sum of the two viscosities but was unexpectedly greater. Thus, the patent in suit goes beyond the mere provision of an effective mixture of thickening agents, it aims at the optimization of a particular mixture already known in the prior art, namely a mixture of a specific gum-type polymer and a specific acrylic type polymer.

6.2.2 Therefore, the objective technical problem to be solved by the patent in suit has to be seen in the optimization of a thickening mixture of a gum-type polymer and an acrylic type polymer with respect to its thickening efficiency, ie a balance between the extent of thickening and the amount of thickening agents used. In this connection, the patent in suit uses the term "synergistic effect" (eg page 2, lines 3 to 4 of the patent in suit).

6.3 The solution proposed by the patent in suit is to select the concentration of both of these polymers so that for the individual polymers the concentration lies

on the part of the sigmoid curve where the gradient is constant or increasing. In view of the experimental evidence in the patent in suit, in particular with respect to Examples 1 to 3 (see section 4.4.2, above), the board has no reason to doubt that the claimed measures provide an effective solution to the stated problem.

7. *Inventive step*

7.1 For the assessment of inventive step, it is necessary to consider whether the skilled person, in possession of the technical teaching according to D2, would have expected that the thickening efficiency of a mixture of a gum-type polymer and an acrylic-type polymer could be enhanced by choosing specific amounts of the individual components.

7.2 In D2 itself, there is no suggestion as to how the thickening properties of a mixture a gum-type polymer and an acrylic-type polymer might be further improved, let alone a hint as to select the amounts with respect to the log (viscosity)/log (concentration) graph. Consequently, the disclosure of D2 itself offers no hint to the solution of the relevant technical problem.

7.3 At the oral proceedings before the board, opponent 01 (appellant 01) argued that D6 provided a hint that the combination of a gum-type thickener and an acrylic-type thickener provides a synergistic effect.

7.3.1 D6 discloses thickeners made by blending an alkaline wet gum with a polymeric polyacid whereby the product has a matrix of gum thickener. The gum thickeners used

are polysaccharides (page 2, lines 19 to 38). Preferred polymeric polyacids are - *inter alia* - polyacrylic acids copolymerised with a minor amount of a polyallyl ether of a polyol marketed under the trade mark "Carbopol" (page 3, lines 15 to 19). The product, after being dried and ground, is soluble in water, can be processed in conventional equipment, shows a stronger thickening capacity than unmodified natural products and is therefore usable in smaller amounts (page 2, lines 14 to 18). In the textile industry, for example, excellent printing results are achieved due to the reduced amount of thickener (page 5, lines 1 to 8).

7.3.2 Thus, D6 teaches that a mixture of gum-type polymer and acrylic-type polymer is a more effective thickener than prior art thickeners whereby the presence of a detergent, a mandatory feature of granted Claim 1, is not mentioned at all. However, the technical problem as defined in section 6.2.2, above, goes beyond the mere provision of an effective thickener combination, it goes to the optimization of the thickening efficiency of a combination of gum-type thickener and acrylic-type thickener. And to this aspect, D6 does not provide any information at all. Consequently, D6 cannot provide a suggestion as to the solution offered by the patent in suit, either on its own or in combination with D2.

7.4 The same arguments as to D6 apply also to D5 briefly referred to by opponent 01 (appellant 01) at the oral proceedings before the board. D5 discloses a thickener consisting of xanthan gum and a water soluble salt of an acrylic acid polymer but there is no hint as to the optimization of the thickening efficiency of the

disclosed mixture. In addition, the presence of a detergent is not mentioned.

7.5 The argument of opponent 01 (appellant 01) submitted at the oral proceedings that the skilled person would, in view of the common general knowledge (ie higher increase in thickening at lower thickener concentrations), work at low thickener concentrations is not convincing. As can be seen from Example 2 (section 4.4.2, above), working at low concentrations does not necessarily lead to an optimization in thickening efficiency. At a concentration of 0.08% Carbopol<sup>®</sup> 940, ie at a rather low concentration, the synergy is declining almost to vanishing point. It appears therefore that the argument of opponent 01 (appellant 01) is based on hindsight since without the knowledge of the teaching of the patent in suit a skilled person had no incentive whatsoever to focus on particular amounts of gum-type thickener and acrylic type thickener.

7.6 The fact that the teaching of the patent goes beyond the teaching of D2 and/or D6 defeats also the argument of opponent 01 (appellant 01) that the claimed subject-matter is a mere explanation of a known effect. Consequently, T 892/94 (*supra*) relied upon in this connection is not applicable to the present case.

7.7 In view of the above, it is evident that the subject-matter of Claim 1 as granted and, by the same token, the subject-matter of Claims 2 to 14 as granted, does not arise in an obvious way from documents D2 and D6 and/or D5. Hence the subject-matter of Claims 1 to 14 as granted involves an inventive step (Article 56 EPC).



8. Because the proprietor (appellant 02) succeeded on the main request, there was no need to consider its auxiliary requests.

## **Order**

### **For these reasons it is decided that:**

1. The opposition of opponent 01 (appellant 01) is admissible.
2. The appeal of opponent 01 (appellant 01) is dismissed.
3. The decision under appeal is set aside.
4. The patent is maintained unamended (ie as granted).

The Registrar:

The Chairman:

E. Görgmaier

R. Young