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Datasheet for the decision of 21 January 2021

Case Number: T 1245/18 - 3.3.05

Application Number: 09753282.4

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IPC: B01J13/00, B01J13/16, C11D3/50, C11D17/00, C11D3/43, C11D3/37

Language of the proceedings: EN

Title of invention:
BENEFIT AGENT CONTAINING DELIVERY PARTICLE

Patent Proprietor:
The Procter & Gamble Company

Opponents:
UNILEVER PLC/ UNILEVER N.V.
Henkel AG & Co. KGaA

Headword:
Delivery particle/PROCTER & GAMBLE

Relevant legal provisions:
EPC Art. 54, 56, 83, 123(2)

Keyword:
Novelty - auxiliary request (yes)
Inventive step - auxiliary request (yes) - non-obvious solution
Sufficiency of disclosure - (yes)
Amendments - added subject-matter (yes)

Decisions cited:

Catchword:

Europäisches Patentamt
European Patent Office
Office européen des brevets

Beschwerdekammern

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Case Number: T 1245/18 - 3.3.05

D E C I S I O N
of Technical Board of Appeal 3.3.05
of 21 January 2021

Appellant: (Opponent 1)	UNILEVER PLC/ UNILEVER N.V. A company registered in England and Wales under Company no. 41424 of Unilever House 100 Victoria Embankment/Weena 455 London Greater London EC4Y 0DY/GB /3013 AL Rotterdam/NL (GB)
Representative:	Hardy, Susan Margaret Unilever Patent Group Colworth House Sharnbrook Bedford, MK44 1LQ (GB)
Appellant: (Opponent 2)	Henkel AG & Co. KGaA Henkelstrasse 67 40589 Düsseldorf (DE)
Representative:	Viering, Jentschura & Partner mbB Patent- und Rechtsanwälte Hamborner Straße 53 40472 Düsseldorf (DE)
Respondent: (Patent Proprietor)	The Procter & Gamble Company One Procter & Gamble Plaza Cincinnati, OH 45202 (US)
Representative:	Gill Jennings & Every LLP The Broadgate Tower 20 Primrose Street London EC2A 2ES (GB)
Decision under appeal:	**Decision of the Opposition Division of the European Patent Office posted on 23 March 2018 rejecting the opposition filed against European**

patent No. 2349551 pursuant to Article 101(2) EPC.

Composition of the Board:

Chairman	E. Bendl
Members:	T. Burkhardt
	O. Loizou

Summary of Facts and Submissions

I. The appeals lie from the opposition division's decision to reject the oppositions by both opponents against the European patent EP 2 349 551 B.

II. The following documents were among those discussed at the opposition stage:

D1 WO 2006/027664 A2

D4 CAS Registry of methyl-2,2-dimethyl-6-methylene-1-cyclohexanecarboxylate

D5 WO 03/101606 A1

D7 Belmares *et al.*, "Hildebrand and Hansen Solubility Parameters from Molecular Dynamics with Applications to Electronic Nose Polymer Sensors", Journal of Computational Chemistry 25 (15), 2004, 1814-1826

D11 WO 2007/100501 A2

III. The opposition division held in particular that the selection of features of claim 1 as granted was based on original claims 1, 2 and 7 in combination with passages of the description and thus met the requirements of Article 123(2) EPC.

IV. Both opponents (appellants) lodged an appeal against this decision.

V. In the reply to the statements setting out the grounds of appeal, the patent proprietor (respondent) maintained the main request (patent as granted) and resubmitted auxiliary requests 1 and 2 from the

proceedings before the department of first instance. In addition, it submitted a data report to support the presence of inventive step:

D13 Data report submitted by the respondent with its reply to the grounds of appeal

VI. In a communication under Article 15(1) RPBA the board informed the parties that the main request and the first auxiliary request did not appear to fulfil the requirements of Article 123(2) EPC.

In contrast, auxiliary request 2 appeared to fulfil the requirements of the EPC.

VII. Oral proceedings took place by videoconference in the absence of appellant 1, as previously announced.

VIII. Independent claim 1 of the of the main request reads as follows:

"1. Benefit agent delivery particle comprising:

a.) a core, said core comprising, based on total core weight, at least 70%, of one or more benefit agents having a ClogP of greater than 0 but less than 3.5; and b.) a shell, said shell surrounding said core material, said core and shell having a Hansen solubility parameter difference of from 1 to 20 $MPa^{1/2}$, said shell being the product of first and second shell forming materials, said first shell forming material being an aliphatic polyisocyanate,

wherein said particle has a shell material weight, based on the total benefit agent delivery particle weight, of from 20% to 60%;

the benefit agent comprises a perfume oil."

IX. Independent claim 1 of auxiliary request 1 additionally comprises the following feature:

"... and wherein at least 75% of the benefit agent delivery particles have a particle size from 1 to 80 microns"

X. As compared with the independent claim 1 of the main request, claim 1 of auxiliary request 2 further specifies the nature of the "second shell forming material":

"... and said second shell forming material comprising a polyamine selected from ethylenediamine (EDA), phenylenediamine, toluene diamine, hexamethylene diamine, diethylenetriamine, tetraethylene pentaamine, pentamethylene hexamine, 1,6-hexamethylenediamine, triethylene tetramine, 2,4-diamino-6-methyl-1,3,5 triazine 1,2-diaminocyclohexane, 4,4'-diaminodiphenylmethane, 1,5-diaminonaphthalene, 2,4,4'-triaminodiphenylether, bis(hexamethylenetriamine), 1,4,5,8-tetraaminoanthraquinone, isophorone diamine, diamino propane, diaminobutane, and mixtures thereof;"

Independent claims 9 and 10 of auxiliary request 2 read as follows:

"9. A method of treating and/or cleaning a situs comprising:
a.) optionally washing and/or rinsing said situs;
b.) contacting said situs with a benefit agent delivery particle according to any of claims 1-7 and/or a consumer product according to Claim 8; and
C.) optionally washing and/or rinsing said situs."

"10. A process of producing benefit agent delivery particles according to any of claims 1 to 7, said process consisting of producing said benefit agent delivery particles by interfacially polymerizing said shell material."

Dependent claims 2 to 8 and 11 relate to preferred embodiments.

XI. The appellants' arguments are summarised as follows:

The main request does not meet the requirements of:
- Article 123(2) EPC, because of the type and unit of the solubility parameter difference, and multiple selections of features,
- Article 83 EPC, because of the claimed solubility parameter,
- Article 54 EPC in view of Example 1F of D1, and
- Article 56 EPC in view of each of D1 and D11.

XII. The respondent's arguments are summarised as follows:

The main request and both auxiliary requests fulfil the requirement of the EPC.

With regard to the requirements of Article 123(2) EPC, particular reference was made to passages individually disclosing features of claim 1 of the main request.

XIII. The appellants requested that the decision under appeal be set aside and that the patent be revoked.

The respondent requested that the appeals be dismissed (main request), or in the alternative that the patent be maintained in amended form on the basis of auxiliary

requests 1 or 2, as filed with its reply dated 18 December 2018.

Reasons for the Decision

Main request

1. Amendments

For the reasons set out below, the main request does not meet the requirements of Article 123(2) EPC.

1.1 Claim 1 relates to a benefit agent delivery particle comprising at least 70% benefit agents having a ClogP of greater than 0 but less than 3.5 and a shell having, compared with the core, a solubility parameter difference of from 1 to 20 $MPa^{1/2}$.

1.2 The following features of claim 1 find a basis in the application as originally filed:

Claim 2 as originally filed discloses perfume oil as a specific benefit agent, albeit in a list, and claim 7 as originally filed discloses the claimed shell material weight range. Due to the claim dependencies, the subject-matter of the benefit agent delivery particle from claims 1, 2 and 7 as originally filed is disclosed in combination.

Additionally, unlike the other components of claim 2 as originally filed, perfume is set apart on several occasions in the description: e.g. on page 3, line 11,

on page 11, lines 14 to 16, and on page 9, lines 3 and 4.

Furthermore, the passage on page 4, lines 8 to 11, as originally filed, which relates to the "detailed description of the invention", discloses that the shell is the product of a first and a second shell forming material. This is also indicated as the starting point for the invention in the "Background of the invention" section, more precisely on page 1, lines 17 to 22.

Aliphatic polyisocyanates as specific first shell forming materials are disclosed on page 9, lines 7 and 8, as originally filed as an element in a list with three elements: aromatic polyisocyanates, aliphatic polyisocyanates and mixtures thereof.

The skilled person understands in this regard, in spite of the specific reference to the "process", that aliphatic polyisocyanates as the "first shell forming material" refer to both the "Process of Making Benefit Containing Delivery Particles" (page 8, line 1) and the "Benefit Agent Delivery Particle" (page 4, line 1) since the particle is the result of the process of making. Consequently, the first shell forming material is used in both.

The first table on page 29 moreover shows that the examples with a core comprising perfume oil and using an aliphatic polyisocyanate as the first shell forming material, i.e. Examples 1, 2, 3, 5, 8 and 9, have an increased solid content recovery when compared with Example 4 with an aromatic polyisocyanate (toluene diisocyanate). According to page 11, lines 27 to 32, an improved solid content recovery in turn results in an improved encapsulation efficiency.

1.3 However, the use of a general, unspecific second shell forming material in such a benefit agent delivery particle, as currently allowed by claim 1, in combination with the remaining features mentioned above has *not* been originally disclosed and therefore goes beyond the original disclosure.

The only second shell forming materials mentioned in the application as filed are polyamines. This applies particularly to the passage on page 9, lines 20 to 26, as well as to the examples.

The first and the second shell forming materials are indeed not merely vaguely related features but features that are inextricably linked; it is the shell resulting from the reaction of these two materials that is responsible for the beneficial properties of the particles with regard to the encapsulation efficiency, the reduced leakage and the desired fracture profile (page 4, lines 2 to 17, and page 11, lines 27 to 32).

The fact that a specific polyamine, i.e. ethylene diamine, is used as the second shell forming material in all of these examples shows that not just *any* second shell forming material may be used.

1.4 Consequently, claim 1, which does not specify the second shell forming material, presents the skilled person with information that goes beyond the original disclosure (Article 123(2) EPC).

First auxiliary request

2. Amendments

Since claim 1 of auxiliary request 1 does not restrict the "second shell forming material" either, this request fails for the same reasons as the main request (Article 123(2) EPC).

Second auxiliary request

3. Amendments

For the reasons set out below, the subject-matter of claim 1 of auxiliary request 2 fulfils the requirements of Article 123(2) EPC.

3.1 By means of the restriction in claim 1 that the second shell forming material is to be selected from the list of specific polyamines on page 9, lines 20 to 26, the objection in point 1.3 above has been overcome.

Indeed, this selection of specific polyamines is in line with the pointer given by the first table on page 29 that specific polyamines, in this case ethylene diamine, are to be used.

3.2 In the appellants' view, claim 1 nevertheless amounts to an intermediate generalisation from the examples in the first table on page 29, in which a very specific combination of perfume oil and first and second shell forming materials is used, namely the perfume oil composition from page 23, isophorone diisocyanate and

ethylene diamine. Claim 1 would therefore go beyond the original disclosure.

As set out above under point 1.2, however, the principal basis for the claimed subject-matter is provided by the original claims 1, 2 and 7 in combination with several passages of the general parts of the description, in particular the cited passages on page 9. The first table on page 29 is an additional pointer which shows that not just *any* second shell forming material may be used in the inventive particles which use an aliphatic polyisocyanate.

There is hence no intermediate generalisation from the specific examples of the first table on page 29 as originally filed.

3.3 The specifications that the solubility parameter difference is actually the Hansen solubility parameter difference and that the unit of the solubility parameter is $MPa^{1/2}$ does not go beyond the original disclosure either.

In this regard, the appellants have noted that:
- Table 1 only refers to the core, not to the shell, and
- the passage on page 20, line 25, to page 21, line 5, relates to the solubility parameter but not to the solubility parameter *difference*.

3.4 The board notes, however, that the *Hansen* solubility parameter is the only solubility parameter specifically mentioned in the application as originally filed (Table 1; page 20, line 25, to page 21, line 5); no other method is explicitly mentioned, in particular not the Hildebrand solubility parameter. Moreover, there is

no contradiction between the Hansen solubility parameter and the general considerations on page 11, lines 9 to 13, of the application as originally filed. This holds for both the solubility parameter itself and the solubility parameter *difference* between the core and the shell.

3.5 Similarly, $MPa^{1/2}$ is the only unit mentioned in the application as originally filed (with regard to the core in Table 1 and with regard to the shell in the paragraph bridging pages 11 and 12).

3.6 Consequently, the skilled person is in no doubt that the Hansen solubility parameter difference and the unit $MPa^{1/2}$ are meant in claim 1 as originally filed.

The more specific details introduced into claim 1 with regard to the nature of the solubility parameter and its unit of measurement therefore do not present the skilled person with new information.

4. Sufficiency of disclosure

In the appellants' view, the invention is not sufficiently disclosed, in particular because of the the feature "Hansen solubility parameter difference" in claim 1.

The board firstly notes that it is not a necessary condition for sufficiency of disclosure that the Hansen solubility parameter differences are indicated for the examples of the patent in suit. In other words, the lack of indication of the solubility parameter differences in the examples does not automatically mean that the skilled person cannot carry out the invention.

Moreover, the Hansen solubility parameter is defined in paragraphs [0079] and [0080] of the patent in suit. A computer program for its calculation, i.e. "Molecular Modeling Pro", is indicated as well as a formula for its calculation in multi-component compositions.

Moreover, the Hansen solubility parameter itself and the commercial computer program are known (see for example D1 (page 3, lines 8 to 19), D5 (page 3, line 27, to page 4, line 7, and the combined view in all the four columns of Table 1) or D7 (page 1815, right hand column)).

The appellants' arguments with regard to the influence of further parameters on the results or the computer program relate, at most, to issues of clarity. Yet, this cannot be discussed in the present case, since this parameter is present in the claims as granted.

Importantly, although the burden of proof in the present case lies with the appellants, they have provided no evidence for their allegation that the invention is not sufficiently disclosed. In particular, they have not tried to reproduce particles of the present invention and shown that they were not able to do so.

Consequently, the requirements of Article 83 EPC are met.

5. Novelty

At the appeal stage, the appellants have attacked novelty exclusively in view of D1, more precisely Example 1F thereof.

5.1 This example discloses a benefit agent delivery particle with a core comprising at least 70% of a perfume oil, namely methyl-2,2-dimethyl-6-methylene-1-cyclohexanecarboxylate (MDMC), which, according to D4, has a ClogP of 3.199.

The surrounding shell is the product of a first and a second shell forming material, i.e. isophorone diisocyanate (IPDI), an aliphatic diisocyanate also disclosed in the patent in suit (paragraph [0034]), and bis-(2-aminopropyl)polypropyleneglycol 130 (Jeffamin D230).

Since, according to page 12, line 23, Example 1F of D1 yields capsules according to the invention of D1, the polymeric shell has a Hansen solubility parameter between 20 and 30 $MPa^{1/2}$, as required by claim 1.

5.2 With regard to the core, while it seems unlikely that the relatively small amount of hexadecane (nC16) significantly modifies the Hansen solubility parameter of the main constituent, namely of the perfume oil MDMC, which is 17.6 according to Table 1 of D1, this cannot be entirely excluded. A Hansen solubility parameter difference between shell and core in the claimed range is therefore not directly and unambiguously derivable from D1 and has not been proven either.

5.3 Moreover, Jeffamin D230 is not an element in the list of second shell forming materials from claim 1 at issue.

5.4 Finally, since the conversion of IPDI and Jeffamin D230 at 70°C and the duration of the interfacial polymerisation reaction of Example 1F of D1 is unknown, it cannot be ascertained that the "shell material weight" is within the claimed range.

Depending on the assumptions made, the parties came to different results as regards the minimum conversion necessary to arrive at the claimed "shell material weight":

- 56% conversion according to the statement setting out the grounds of appeal by appellant 1 (page 5, last column of the table), where, however, the unreacted IPDI still present in the core seems to have been neglected, or

- 30% conversion according to the statement setting out the grounds of appeal by appellant 2 (page 7, penultimate paragraph).

Whether it is 56% or 30%, the appellants have failed to submit experimental evidence that such a conversion is actually achieved in Example 1F of D1.

There is hence no unambiguous disclosure of the "shell material weight".

5.5 As an aside, this does not cast doubt on the fact that the requirements of Article 83 EPC are met since the skilled person knows how to vary the conversion of a chemical reaction (in many cases by varying the

temperature or the duration of the reaction, for example) and thus arrives at a shell material weight in the claimed range. Moreover, they learn from the patent in suit that the conversion also depends on the solubility parameter difference, this difference being indicated in claim 1. Crucially, the appellants have not submitted evidence to show that they tried to produce particles according to claim 1 of the patent in suit without success.

Since the remaining claims are directly or indirectly dependent on claim 1, the reasoning applies to these claims as well.

5.6 For these reasons, the subject-matter of the claims is novel over D1 (Article 54(1) and (2) EPC).

6. Inventive step

6.1 The invention relates to a benefit agent delivery particle.

6.2 At the appeal stage, the appellants have mainly focused on D1 as the most promising springboard for assessing inventive step.

D1 also relates to shell-core benefit agent delivery particles (claim 1) and, as indicated above under point 5., especially Example 1F has numerous features in common with claim 1 of auxiliary request 2.

On the other hand, D1 favours a controlled release of the core (page 1, lines 5 to 10), whereas the patent in suit seeks to minimise (or even avoid) leakage

(paragraph [0020]; leakage of 0% is disclosed in paragraphs [0025] and [0053]).

Notwithstanding the different purpose, D1 is taken here as the starting point for assessing inventive step in order to follow the appellants' reasoning.

6.3 According to the patent in suit, the problem to be solved is to provide a benefit delivery particle with maximised encapsulation efficiency, minimum leakage and a desired fracture profile (paragraph [0020]).

6.4 The patent in suit proposes solving this problem by means of the benefit agent delivery particle from claim 1, characterised by:
(a) a polyamine from the specific list in claim 1 as the second shell forming material,
(b) a Hansen solubility parameter difference between shell and core of from 1 to 20 $MPa^{1/2}$ (which is different from *maximising* the difference, as appellant 2 puts it), and
(c) a shell material weight based on the total particle of from 20% to 60%.

6.5 According to Examples 1, 2, 3, 5, 8 and 9 in the table in paragraph [0106] of the patent in suit, particles with an aliphatic polyisocyanate as the first shell forming material and a polyamine from the specific list in claim 2 as the second shell forming material show a high degree of solid content recovery (SCR).

The increased SCR and a reduced degree of leakage are also confirmed by D13 (page 2, "RESULTS").

According to paragraphs [0043] and [0044] of the patent in suit, a high SCR is the consequence of a proper

solubility parameter difference and indicates an improved encapsulation efficiency.

While it cannot be ascertained that the Hansen solubility parameter difference and the shell material weight of Examples 1, 2, 3, 5, 8 and 9 in the table in paragraph [0106] of the patent in suit are within the claimed ranges, the burden of proof lies at present with the appellants. Yet, they have chosen not to submit experimental evidence to show anything to the contrary.

Likewise, the appellants have not provided any counter evidence regarding an effect related to the distinguishing features.

There is consequently no evidence on file to prove that the problem has not been successfully solved.

6.6 In the absence of a hint in the available prior art that
- the polyamines of claim 1 as second shell forming material,
- the claimed shell material weight, and
- the claimed Hansen solubility parameter difference between the shell and the core material solve the posed technical problem, an inventive step of the subject-matter of claim 1 over D1 is acknowledged.

Even if there were such a hint in the available prior art, *arguendo*, the skilled person would not, when starting from a document seeking a "controlled release" of the core (D1: lines 5 to 10), seek to modify D1 in order to arrive at particles with minimised leakage.

Indeed, according to established case law, closest prior art that is not directed to the same purpose or effect as the invention cannot lead the skilled person in an obvious way to the claimed invention (see the introductory remarks to the Case Law of the Boards of Appeal, 9th ed., I.D.3.2).

6.7 Another objection, starting from D11 as the closest prior art, has barely been substantiated at the appeal stage.

Therefore, the statement setting out the grounds of appeal by appellant 2 does not contain a feature analysis with regard to this document. Relevant passages of the document are not cited either.

That notwithstanding, the board notes that D11 is directed to benefit agent particles with a core and a shell having a reduced leakage rate.

However, D11 fails to mention *aliphatic* polyisocyanates.

Consequently, at least for similar reasons to D1, the subject-matter of claim 1 of auxiliary request 2 is also inventive over D11.

6.8 Claim 1 of auxiliary request 2 hence meets the requirements of Article 56 EPC.

6.9 Due to the direct or indirect dependencies on claim 1, this also holds for the other claims.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the department of first instance with the order to maintain the patent in amended form on the basis of the claims of auxiliary request 2 as filed with the reply dated 18 December 2018 and a description to be adapted if necessary.

The Registrar: The Chairman:

C. Vodz E. Bendl

Decision electronically authenticated