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**Datasheet for the decision
of 5 May 2026**

Case Number: T 1201/24 - 3.3.09

Application Number: 19700209.0

Publication Number: 3740555

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C11D17/00

Language of the proceedings: EN

Title of invention:
LAUNDRY DETERGENT

Patent Proprietors:
Unilever IP Holdings B.V.
Unilever Global IP Limited

Opponent:
Henkel AG & Co. KGaA

Headword:
Unilever/Fragrance ratio

Relevant legal provisions:
EPC Art. 100(a), 56

Keyword:
Inventive step - (yes) - unexpected improvement shown



Beschwerdekammern

Boards of Appeal

Chambres de recours

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Case Number: T 1201/24 - 3.3.09

D E C I S I O N
of Technical Board of Appeal 3.3.09
of 5 May 2026

Appellant:

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Decision under appeal:

**Decision of the Opposition Division of the
European Patent Office posted/electronically
transmitted on 25 July 2024 rejecting the
opposition filed against European patent No.
3740555 pursuant to Article 101(2) EPC.**

Composition of the Board:

Chairman	F. Rinaldi
Members:	S. Arrojo
	R. Romandini

Summary of Facts and Submissions

- I. The appeal filed by the opponent (appellant) lies against the opposition division's decision to reject the opposition against the European patent.
- II. The appellant requests that the opposition division's decision be set aside and the patent be revoked.
- III. The appellant's arguments can be summarised as follows.
 - The invention defined in the granted claims is obvious when starting from **D6 (WO 2010/060677 A1)** as the closest prior art.
 - As multiple parameters were modified across the various tests in the patent, the observed results cannot be conclusively attributed to any single differentiating feature.
- IV. The patent proprietor (respondent) requests that the appeal be dismissed and that the patent be maintained as granted (main request) or, alternatively, that the patent be maintained on the basis of one of auxiliary requests 1 to 3 filed as annexes to the reply to the grounds of appeal.
- V. The respondent's arguments may be summarised as follows.
 - The claims as granted involve an inventive step over D6 as the closest prior art.

- The experimental data in the patent validly demonstrate that the claimed ratio of neat perfume to encapsulated perfume successfully achieves an enhanced fragrance experience throughout the different washing and post-washing stages.

1.1 Claim 1 as granted (main request) reads as follows:

"1. A liquid laundry detergent composition comprising:

a) from 3 to 60% by weight based on the total weight of the composition of one or more deterative surfactants selected from non-soap anionic surfactants, nonionic surfactants and mixtures thereof;

b) from 0.01 to 1% by weight based on the total weight of the composition of a fragrance formulation (f1) which is in the form of free droplets dispersed in the composition;

c) from 0.01 to 1% by weight based on the total weight of the composition of a fragrance formulation (f2) which is entrapped within discrete polymeric microparticles dispersed in the composition, in which the polymeric microparticles are polymeric core-shell microcapsules in which at least one generally spherical continuous shell of polymeric material surrounds a core containing the fragrance formulation (f2);

in which the total amount of fragrance formulation (f1) and fragrance formulation (f2) ranges from 0.6 to 0.9% by weight based on the total weight of the composition; and in which the weight ratio of fragrance formulation (f1) to fragrance formulation (f2) in the composition ranges from 40:60 to 60:40;

and in which the polymeric core-shell microcapsule is an aminoplast microcapsule with an aminoplast shell

surrounding a core containing the fragrance formulation (f2);

in which a deposition aid is attached to the outside of the shell by means of covalent bonding."

- VI. At the oral proceedings, both parties confirmed that their final requests corresponded to their initial requests (see points II. and IV. above).

Reasons for the Decision

Main Request

1. Inventive Step (Article 100(a)/56 EPC)
- 1.1 The invention concerns a liquid laundry detergent composition comprising, among other things, neat (i.e. non-encapsulated) and encapsulated perfumes in specific amounts and proportions. These are intended to provide an enhanced fragrance experience within the formulation itself, immediately after washing (damp test fabric) and after drying of the clothes (dry test fabric).

Closest Prior Art and Distinguishing Features

- 1.2 The board, in agreement with the parties, considers **D6** to be the closest prior art, as it is directed towards the same objective as the contested patent: improving the intensity and longevity of fragrance on fabric.
- 1.3 D6 discloses a scented laundry detergent comprising neat and encapsulated fragrances. The problem addressed therein is the improvement of fragrance intensity and longevity after the washing process (see pages 1 and

2). To this end, D6 discloses a detergent composition (see claims 1, 2 and 9) comprising:

an anionic and/or nonionic surfactant,
an amount of 0.05 to 5.0 wt% – preferably 0.1 to 3.0 wt% – of non-encapsulated perfume, and
0.05 to 4.0 wt% – preferably 0.1 to 2.0 wt% – of encapsulated perfume.

1.4 The subject-matter of claim 1 differs from the disclosure of D6 in the following aspects.

i) The total perfume content is confined to a range of 0.6 to 0.9 wt%, which is significantly narrower than the range of 0.1 to 9.0 wt% derivable from the sum of the neat (f1) and encapsulated (f2) perfume ranges disclosed in D6.

ii) While the individual amounts of neat (f1) and encapsulated (f2) perfume in claim 1 overlap with the ranges in D6, a double selection from the lower portions of the respective ranges in D6 would be required to arrive at the values in claim 1.

iii) The weight ratio of neat to encapsulated fragrance (hereinafter the "f1:f2 ratio") is specifically limited to between 40:60 and 60:40.

iv) The deposition aid is covalently attached to the exterior of the microcapsule shell.

Problem Solved by the Invention

1.5 According to paragraph [0005] of the patent, the object of the invention is to ensure a satisfactory fragrance experience throughout the various phases of the washing

and post-washing process – specifically in the product itself, on damp fabric immediately after washing, and after drying – without excessively increasing manufacturing costs.

- 1.6 The appellant argued that the tests in the patent failed to demonstrate any surprising effect. Consequently, the only problem solved by the invention was the provision of an alternative fluid detergent composition. The appellant's arguments are set out in greater detail as follows.
 - 1.6.1 Lack of controlled experiments: multiple parameters were modified simultaneously across the various tests in the patent; thus, no controlled experiments were provided. In particular, the tests varied the individual amounts of neat and encapsulated perfume as well as the total fragrance content. There was, therefore, no basis for attributing the observed results specifically to the f1:f2 ratio defined in claim 1.
 - 1.6.2 Predictability of results: the most significant factor affecting fragrance intensity at different stages was, predictably, the respective amounts of neat and encapsulated perfumes. This could not be considered a surprising effect, as the skilled person was aware of the respective roles of neat perfume (for initial scent) and encapsulated perfume (for later stages of the washing cycle).
 - 1.6.3 Logarithmic relationship: the relationship between fragrance intensity and perfume concentration was known to be logarithmic. Therefore, observing non-linear increases or decreases when varying perfume amounts

would not be perceived as a surprising effect by the skilled person.

- 1.6.4 Consistency of the alleged effect: the appellant contended that if the intended effect was simply to achieve a "satisfactory" intensity across all stages, then the value of 23.58 obtained in Example 2 for dry fabric had to be considered a satisfactory result. If so, several comparative examples in the patent also achieved satisfactory intensity, which implied that the technical effect was also obtained outside the claimed range.
- 1.6.5 Feature iv) - deposition aid: there was no basis to attribute a technical effect to the deposition aid being covalently attached to the microcapsule shells (distinguishing feature iv). The patent provided no indication that the exemplary tests were conducted using formulations specifically featuring such covalent attachment.
- 1.7 The board disagrees with the appellant's assessment for the following reasons.
 - 1.7.1 As shown in table 1 of the patent, Comparative Examples A to E and Examples 1 to 3 contain identical components in identical amounts, with the sole exception of the individual concentrations of neat (f1) and encapsulated (f2) perfumes. It is apparent that modifying these individual amounts is unavoidable, as it is the only feasible way to vary both the f1:f2 ratio and the total fragrance content, which are the decisive parameters for the alleged effect of enhancing the fragrance experience across different stages while avoiding excessive manufacturing costs (i.e. by limiting the

total amount of fragrance used).

1.7.2 As explained below, when the experimental data in the patent are analysed across the different washing stages using appropriate comparators, the results demonstrate a surprising technical effect attributable to the specific f1:f2 ratio.

1.7.3 *Perceived fragrance in the formulation*

Comparative Example A contains a high concentration of neat perfume and no encapsulated fragrance.

Unsurprisingly, this results in high fragrance intensity within the formulation and in the damp test fabric (damp phase) but low intensity after drying. Consequently, it is not unexpected that the incorporation of encapsulated perfume in Example 1 leads to a significantly higher fragrance intensity after drying, as the primary purpose of encapsulation is to facilitate fragrance release at later stages.

It is, however, unexpected that the fragrance intensity in the detergent and damp phase decreases only marginally (by approximately 3% and 7%, respectively), despite the concentration of neat perfume being reduced to less than one-third of that used in Comparative Example A. The overall result is a comparable fragrance experience during the initial phases, followed by a substantially enhanced experience after drying. Notably, this is achieved even though the total fragrance content in the composition according to the invention is, as stated above, about one-third lower than in Comparative Example A.

The board has taken due account of the appellant's argument that this fragrance profile could be explained

by a logarithmic dependency, where intensity increases rapidly at lower concentrations before reaching a plateau at a saturation point. However, an analysis of the results across the subsequent washing phases demonstrates that this is not the case.

1.7.4 Perceived fragrance in the damp test fabric

The maximum perceived intensity in the damp fabric is obtained in Comparative Example A, which contains a high concentration of neat perfume and no encapsulated fragrance. As the amount of encapsulated perfume increases, the intensity tends to remain stable or decrease, indicating that the neat perfume is the primary source of the perceived fragrance at this stage.

The results further demonstrate that fragrance intensity increases only marginally at lower neat perfume concentrations. For instance, the intensity increases by less than 15% when the neat perfume content is increased by nearly 300% (comparing Comparative Example E at 0.07 wt% to Comparative Example F at 0.27 wt%). Conversely, the intensity increases more significantly at higher concentrations, rising by nearly 50% when the neat perfume content is increased by only 33% (comparing Comparative Example F at 0.27 wt% to Example 3 at 0.36 wt%). This trend is further corroborated by the data for Examples 1 and 2.

These observations cannot be attributed to a secondary contribution from the encapsulated perfume, as the encapsulated perfume content is significantly higher in Comparative Examples B to F than in Examples 2 and 3, and is similar to or higher than the level in Example 1.

The analysis of the results for the damp fabric, therefore, clearly refutes the appellant's argument that the perceived fragrance across the different phases follows a logarithmic dependency on the absolute amounts of the perfumes. This conclusion is further reinforced by the analysis of the results for the dry fabric.

1.7.5 Results in the dry test fabric

At this stage, the effect of the neat perfume is negligible. This is expected, as the washing cycle and subsequent 24-hour drying period inevitably result in the loss of a significant portion of the volatile, unprotected neat (non-encapsulated) perfume.

The perceived intensity in the Comparative Examples – which contain either no encapsulated fragrance (Comparative Example A) or a relatively high amount – exhibits a linear dependency on the concentration of encapsulated perfume. However, the intensities recorded for Examples 1 and 3 clearly deviate from this linear trend, achieving fragrance intensities appreciably higher than would be expected in view of the Comparative Examples.

The most unexpected results are observed in Example 3. Despite containing an encapsulated perfume concentration (0.29 wt%) significantly lower than those in Comparative Examples B to F (ranging from 0.41 to 0.56 wt%), Example 3 achieves a much higher perceived fragrance intensity on the dry fabric (37.23) than any of these comparative examples (which range from 21.34 to 27.21).

A similar trend is observed in Example 1, which also achieves a higher fragrance intensity than any of Comparative Examples B to F, despite its encapsulated perfume content (0.46 wt%) being similar to that of Comparative Examples C (0.45 wt%) and D (0.41 wt%), and lower than that of Comparative Examples B (0.48 wt%), E (0.54 wt%) and F (0.56 wt%).

1.7.6 Effect of the f1:f2 ratio on perceived intensity at similar total perfume concentration

In view of the above considerations, the absolute concentration of neat and encapsulated perfumes is clearly not the sole factor affecting perceived fragrance intensity across the various washing stages. The only remaining factor that plausibly explains the aforementioned unexpected results is the f1:f2 ratio. This is confirmed by comparing results from tests using similar total perfume concentrations.

Example 2 vs. Comparative Example F: these two compositions use an identical total amount of fragrance. However, in Example 2, the concentration of neat perfume is higher than in Comparative Example F, with a corresponding reduction in encapsulated perfume. The f1:f2 ratio in Example 2 (59:41) falls within the claimed range, whereas that of Comparative Example F (33:67) does not. The results demonstrate that the fragrance intensity for the detergent according to the invention is significantly higher in the formulation and on damp fabric (approximately 40% and 50% higher, respectively), at the expense of only a modest reduction in intensity after drying (approximately 13%).

Example 3 vs. Comparative Examples D and E: Example 3 uses a total fragrance amount similar to that of Comparative Examples D and E, but with a lower proportion of encapsulated perfume. While the improved fragrance experience in the formulation and damp phases is expected – given the higher neat fragrance content – the significantly improved intensity on the dry fabric is entirely unexpected, especially in view of the appreciably lower amount of encapsulated perfume used.

It is further noted that in **Example 2**, where the f1:f2 ratio is closest to the limit of the claimed range (59:41 vs. 60:40), the results across all washing phases are superior to the comparators, yet the improvements are less pronounced than those observed in Examples 1 and 3. This further supports the conclusion that the claimed f1:f2 range is specifically optimised to achieve the desired effect.

- 1.8 Consequently, the technical effect is not, as the appellant argued, merely to achieve a minimum intensity threshold at all stages or simply to provide an alternative. Rather, the invention successfully achieves a comparatively enhanced experience relative to the total amount of perfume used.
- 1.9 Regarding distinguishing feature iv) – the shell comprising a covalently attached deposition aid – the question of its contribution to the improvement may be left open. There is no evidence that this feature is used in the experimental tests conducted in the patent. Nevertheless, this feature is not decisive for the present discussion, as it does not undermine the finding that the f1:f2 ratio successfully achieves the desired effect.

1.10 The board therefore concludes that the tests in the patent credibly demonstrate that working within the claimed f1:f2 ratio successfully achieves a comparatively enhanced fragrance experience throughout the different washing stages without requiring excessive total amounts of perfume.

1.11 The problem solved by the invention is, therefore, the provision of a detergent with an improved fragrance experience throughout the different washing stages without an excessive increase in costs.

Obviousness

1.12 The appellant argued that a person skilled in the art, starting from D6, would be aware of the respective roles of neat and encapsulated perfumes in enhancing fragrance intensity at different stages. According to the appellant, when seeking to provide an improved fragrance experience throughout the washing process, the skilled person would resort to routine optimisation or trial-and-error tests to adjust the total and relative amounts of perfume. This, the appellant contended, effectively equates to an adjustment of the f1:f2 ratio.

1.13 The appellant further maintained that the most logical starting point for such optimisation would be a 50:50 ratio, as this represents a compromise between the two extremes and the most straightforward means of ensuring a balanced fragrance experience across all stages. Accordingly, arriving at the claimed range would be a matter of routine optimisation, if not entirely trivial from the outset of a routine trial-and-error process.

1.14 The board disagrees with the appellant's position.

- 1.14.1 While it is not disputed that a skilled person would generally be aware of the respective roles of neat and encapsulated perfumes, the board considers that the selected ratios and amounts in the patent solve a technical problem that goes beyond the mere balancing of known effects.
- 1.14.2 A skilled person seeking to improve the fragrance experience would typically focus on adjusting the chemical nature of the fragrances and/or the encapsulations (as is the case in D6), or alternatively, as argued by the appellant itself, on adjusting the individual amounts of the perfumes rather than the f1:f2 ratio as such. While adjusting individual amounts implicitly modifies the ratio, the board has concluded that such an optimisation would not lead the skilled person to the claimed invention in an obvious manner.
- 1.14.3 The argument that a 50:50 ratio would be a logical starting point is speculative and based on hindsight. In practice, a skilled person would focus on the specific washing stage where an improvement is desired (e.g. increasing encapsulated perfume to improve intensity on dry fabric). In this context, the f1:f2 ratio is an incidental result rather than a primary design parameter. Furthermore, there is no technical basis for assuming neat and encapsulated perfumes would be treated equally; cost considerations or the superior versatility of encapsulated perfumes might lead a skilled person to favour a ratio significantly different from 50:50.
- 1.14.4 Document D6 teaches total perfume amounts of 0.1 to 3.0 wt% (neat) and 0.1 to 2.0 wt% (encapsulated),

leading to a total content of 0.2 to 5.0 wt%. From this starting point, it would be *prima facie* obvious either to minimise the total amount to reduce costs (as suggested on page 2, 2nd. par.) or to increase it to maximise intensity.

- 1.14.5 What the skilled person would fail to recognise from D6 is that operating within the specific range of 0.6 to 0.9 wt% (a moderate amount of fragrances compared to the range of up to 5 wt% disclosed in D6) delivers a significantly enhanced fragrance experience, provided the f1:f2 ratio is strictly maintained between 60:40 and 40:60.
- 1.14.6 Illustration of this point using the experimental data in the patent: if a skilled person sought to improve the relatively weak performance of Comparative Example C, it would be obvious to increase both the neat perfume content and the total fragrance amount. As shown by Comparative Example D, which features a higher total amount falling within the claimed range, this approach achieves the intended purpose for those specific parameters. However, the f1:f2 ratio in Comparative Example D remains outside the claimed range. The skilled person would have had no reason to expect that further narrowing this ratio to the 40:60-60:40 range would result in the significant increases in intensity demonstrated in Example 3 – particularly the improved performance on dry fabric despite using significantly lower amounts of encapsulated fragrance.
- 1.14.7 A person skilled in the art, starting from document D6, would therefore not have arrived at the claimed invention in an obvious way when seeking to solve the underlying technical problem.

1.15 The ground for opposition under Article 100(a) EPC in conjunction with Article 56 EPC (lack of inventive step) does not, therefore, prejudice maintenance of the patent as granted.

2. Concluding remarks

2.1 The sole ground for opposition invoked by the appellant does not prejudice maintenance of the patent as granted. The appeal should therefore be dismissed.

2.2 In view of this conclusion, there is no need to address the respondent's request to disregard some of the lines of argument presented by the appellant as being late filed.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



A. Vottner

F. Rinaldi

Decision electronically authenticated