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Datasheet for the decision of 24 September 2015

Case Number: T 0940/13 - 3.3.09

Application Number: 06020381.7

Publication Number: 1736060

IPC: A23L1/00, A23P1/04

Language of the proceedings: EN

Title of invention:
Encapsulated agglomeration of microcapsules and method for the preparation thereof

Patent Proprietor:
DSM Nutritional Products AG

Opponent:
Friesland Brands B.V.

Headword:

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

Keyword:
"Added subject-matter (no)"
"Novelty: main request and auxiliary request 1 (no); auxiliary request 2 (yes)"
"Inventive step: auxiliary request 2 (no); auxiliary request 3 (yes)"

Decisions cited:

Catchword:

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Case Number: T 0940/13 - 3.3.09

D E C I S I O N
of Technical Board of Appeal 3.3.09
of 24 September 2015

Appellant: (Patent Proprietor)	DSM Nutritional Products AG Wurmisweg 576 4303 Kaiseraugst (CH)
Representative:	Teipel, Stephan Lederer & Keller Patentanwälte Partnerschaft mbB Unsöldstrasse 2 80538 München (DE)
Respondent: (Opponent)	Friesland Brands B.V. Stationsplein 4 3818 LE Amersfoort (NL)
Representative:	V.O. P.O. Box 87930 2508 DH Den Haag (NL)
Decision under appeal:	**Interlocutory decision of the Opposition Division of the European Patent Office posted on 7 February 2013 maintaining European patent No. 1736060 in amended form.**

Composition of the Board:

Chairman W. Sieber
Members: J. Jardón Álvarez
E. Kossonakou

Summary of Facts and Submissions

I. This decision concerns the appeal filed on 26 March 2013 by the patent proprietor (in the following: the appellant) against the interlocutory decision of the opposition division that European patent No. 1 736 060 as amended met the requirements of the EPC.

II. The opponent (in the following: the respondent) had requested revocation of the patent in its entirety on the grounds of Article 100(a) (lack of novelty and inventive step), (b) and (c) EPC.

The documents cited during the opposition proceedings included:

D2: US 2 800 457 A; and

D12: US 3 041 289 A.

III. The opposition division's decision was based on a main request (claims as granted) and two auxiliary requests. It can be summarised as follows:

- The subject-matter of claim 1 of the main request and of auxiliary request 1 lacked novelty in view of example 1 of D12;

- The claims of auxiliary request 2 fulfilled the requirements of the EPC. The amendments made to claim 1 were based on the disclosure of the application as filed, and the invention was disclosed in a manner sufficiently clear and complete for it to be carried out by a skilled person. The claimed subject-matter was novel

because none of the cited documents disclosed the use of a gelatine A having a Bloom strength of 275. The claimed subject-mater also involved an inventive step because the advantageous effect achieved by using said specific gelatine A in relation to capsule strength was not obvious from the cited prior art.

IV. The statement setting out the grounds of appeal was filed on 17 June 2013. The appellant requested that the decision under appeal be set aside and that the patent be maintained as granted (main request). Alternatively, it requested that the patent be maintained in amended form with the claims according to auxiliary requests 1 to 5 filed with the statement of grounds of appeal.

V. With its reply dated 4 November 2013 the respondent requested that the appeal be dismissed.

VI. In a communication dated 17 April 2015 in preparation for oral proceedings the board indicated the points to be discussed during the oral proceedings.

VII. On 24 September 2015 oral proceedings were held before the board. The appellant maintained its main request and auxiliary requests 1 to 3.

Claim 1 of the main request (claims as granted) reads as follows:

"1. A microcapsule comprising an agglomeration of primary microcapsules, each individual primary microcapsule having a primary shell encapsulating a loading substance, and the agglomeration being encapsulated by an outer shell, the shell material

being a two-component system made from a mixture of different types of polymer components, and wherein:

(a) the loading substance is an oil, wherein the oil is selected from fish oils, vegetable oils, mineral oils, derivatives thereof or mixture thereof; or

(b) the loading substance is an omega-3 fatty acid, wherein the fatty acid is selected from α-linolenic acid, octadecatetraenoic acid, eicosapentaenoic acid and docosahexaenoic acid and derivatives thereof and mixtures thereof; and

the loading substance may include an antioxidant selected from CoQ_{10} and vitamin E."

Claim 1 of auxiliary request 1 differs from claim 1 of the main request only in that the shell material is defined as:

"being a complex coacervate between two polymer components".

Claim 1 of auxiliary request 2 reads as follows:

"1. A microcapsule comprising an agglomeration of primary microcapsules, each individual primary microcapsule having a primary shell encapsulating a loading substance, and the agglomeration being encapsulated by an outer shell, wherein the primary shell and the outer shell are each formed from a complex coacervate between two polymer components wherein one polymer component is gelatine type A and the other is selected from the group consisting of gelatine type B, polyphosphate, gum arabic, alginate,

chitosan, carrageenan, pectin and carboxymethyl-cellulose, and wherein:

(a) the loading substance is an oil, wherein the oil is selected from fish oils, vegetable oils, mineral oils, derivatives thereof or mixture thereof; or

(b) the loading substance is an omega-3 fatty acid, wherein the fatty acid is selected from α-linolenic acid, octadecatetraenoic acid, eicosapentaenoic acid and docosahexaenoic acid and derivatives thereof and mixtures thereof; and

the loading substance may include an antioxidant selected from CoQ_{10} and vitamin E."

Claim 1 of auxiliary request 3 differs from claim 1 of auxiliary request 2 only in that the complex coacervate is further restricted to

"a complex coacervate between two polymer components wherein one polymer component is gelatine type A and the other is polyphosphate".

Claims 2 to 7 are dependent claims.

VIII. The arguments of the appellant, insofar as they are relevant for the present decision, may be summarised as follows:

- The novelty attack resulted from a misinterpretation of the wording of claim 1 and of the disclosure of D12. The wording of the claim required the use of two polymers to form the shell material, the same two polymers being present in both the primary and the outer shell. But three

different polymers were used in example 1 of D12, with the result that there would be either three polymers in one or both shells or two different polymers in each shell, none of these possibilities being covered by the wording of claim 1.

- The subject-matter of claim 1 of auxiliary request 2 involved an inventive step. The appellant had repeated example 1 of D12 and found that the powder obtained had an unacceptable appearance, was sticky in texture and had a strong, offensive smell. The problem to be solved by the patent in view of D12 was to provide an improved microcapsule. This problem was solved by the claimed microcapsules, wherein by using only two polymers during their preparation, the agglomeration process was improved. This solution was not obvious in view of the prior art cited.

- Lastly, the subject-matter of claim 1 of auxiliary request 3 also involved an inventive step over the disclosure of D12. The use of a coacervate prepared from gelatine A and polyphosphate was preferable to the coacervates used in D12 including gum arabic, in particular in relation to the protection of the oil against oxidation. There was no hint of this advantage in either D12 itself or the other documents cited.

IX. The arguments of the respondent, insofar as they are relevant for the present decision, may be summarised as follows:

- The subject-matter of the claims of the main and the first auxiliary requests was not supported by

the application as filed, and lacked novelty and inventive step. Moreover, the patent did not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art. Concerning the interpretation of claim 1, it argued that its subject-matter allowed not only the use of two different polymers for each shell but also for each component of the shell to be a mixture of two or more polymers.

- The subject-matter of the claims of auxiliary request 2 lacked novelty and inventive step over the disclosure of D12 alone or in combination with D2.

- The subject-matter of claim 1 of auxiliary request 3 extended beyond the content of the application as filed and lacked inventive step in view of the disclosure of D12 alone or combined with the general knowledge of the skilled person.

X. The appellant requested that the decision under appeal be set aside and 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, all as filed on 26 March 2013 with the statement of grounds of appeal.

XI. The respondent requested that the appeal be dismissed.

Reasons for the Decision

MAIN REQUEST (claims as granted)

1. Interpretation of claim 1

1.1 Claim 1 is directed to:

a) a microcapsule comprising:
a1) an agglomeration of primary microcapsules,
a2) each individual primary microcapsule having a primary shell
b) encapsulating a loading substance,
b1) namely a specific oil; or
b2) a specific omega-3 fatty acid; and
b3) optionally including an antioxidant selected from CoQ_{10} and vitamin E;
c) the agglomeration of primary microcapsules being encapsulated by an outer shell,
d) the shell material being a two-component system made from a mixture of different types of polymer components.

1.2 Concerning the interpretation of feature d) the parties had opposite views:

1.2.1 The appellant maintained that the shell material was made of a mixture of two (different) polymers (A and B) and that the scope of the claim was limited to the use of the same two polymers (A/B) for both the primary and the outer shell. In its view, the language of the claim did not cover the possibility of having two different polymers in each shell (A/B for the primary shell and A/C or C/D for the outer shell), because both shells were derived from the same shell material. This was

clear from the claim itself which referred to "the shell material".

Nevertheless, taking into account this limitation, the primary shell and the outer shell could have a different composition (a different ratio of the two polymers A/B) because they were formed at different points in the process.

1.2.2 By contrast, the respondent saw no limitation in the claim to the use of the same material for both shells. The claim defined the shell material as "being a two-component system" but the language of the claim did not require that the same shell material was used for both the primary shell and the outer shell. Additionally, each component of the system was "made from a mixture of different types of polymer components", with the consequence that the claim included the possibility of using two or more different polymers for each of the "components" of the shell. Thus, the claim embraced not only microcapsules prepared using two different polymers for each shell (for instance A/B and A/C or C/D), but also microcapsules wherein each of the components of the shell was made of more than two polymers (A,A'/B,B'; A'B'/CD, etc.)

1.3 The board agrees with the respondent that the subject-matter of the claim is not limited to microcapsules wherein the same two polymers (A/B) are present in both shells.

1.3.1 The language of the claim limits its scope neither to the use of the "same" shell material for the primary shell and the outer shell nor to the use of only one polymer for each of the components of the system. Contrary to the opinion of the appellant, the definite

article in the expression "the shell material" does not imply that the **same** shell material is used in both shells. This remains open in the claim.

1.3.2 The specification itself confirms this broad interpretation of the claim. Thus, in paragraph [0021] it is stated that:

"It is also possible at this stage to add more polymer components, either of the same kind **or a different kind**, in order to thicken the outer shell and/or **produce microcapsules having primary and outer shells of different composition**" (emphasis by the board),

and in paragraph [0010] that:

"Examples of polymer components include, but are not limited to, gelatines, polyphosphate, polysaccharides **and mixtures thereof**. Preferred polymer components are gelatine A, gelatine B, polyphosphate, gum arabic, alginate, chitosan, carrageenan, pectin, carboxymethyl-cellulose (CMC) **or a mixture thereof**" (emphasis by the board).

These disclosures in the specification confirm that it was the intention of the appellant to cover microcapsules with different compositions for the primary shell and the outer shell and to include a mixture of polymers as one of the components of the shell material.

1.3.3 The board can also not accept the argument of the appellant that the sentences quoted above resulted from a poor adaptation of the description to the claims allowed during examination proceedings.

The appellant has voluntarily chosen to define the claimed subject-matter by features a) to d) (see above 1.1), without any limitation to the use of the same two polymers for both shells. These features then determine the subject-matter covered by the claim. The deletion of the sentences quoted above would not limit the scope of the claim.

2. Novelty

2.1 The opposition division denied novelty of the subject-matter of claim 1 in view of the disclosure of D12.

2.1.1 D12 discloses a method of making encapsulated clusters of smaller individual capsules, each individual capsule consisting of a core of substantially water-insoluble material surrounded by its own polymer encapsulating shell, and each cluster of such capsules itself, as a whole, being contained in a shell of polymer encapsulating material (see column 1, lines 10 to 17; see also figure 1).

2.1.2 The core material includes mineral, animal and vegetable oils (column 2, line 20) and the shell-forming material can be chosen from gelatine, gum arabic, and other film-forming polymers (column 4, lines 40 to 51).

2.1.3 In example 1, castor oil is encapsulated using an aqueous solution of three polymers, namely pigskin gelatine (*i.e.* gelatine A), gum arabic and polyvinylmethylethermaleic anhydride copolymer. The process requires preparing an oil-in-water emulsion with the three film-forming hydrophilic polymer materials at a pH of about 9 and then lowering the pH to 6 to insolubilise the polymer material and form the

capsule walls (the primary shell in the wording of the patent) and further lowering it to 4.2 to insolubilise the remaining fraction of polymer material and form the outer cluster walls (the outer shell in the wording of the patent).

2.1.4 Although example 1 of D12 does not specify the exact composition of the shells, it discloses that:

"both the capsule walls and the cluster walls contain gelatin as a dense liquid polymer complex either with the polyvinylmethylethermaleic anhydride copolymer, the gum-arabic, or both" (column 5, lines 52 to 55).

It follows from the above that the capsules according to D12 will have either two different polymers in each shell (gelatine and polyvinylmethylethermaleic anhydride copolymer in one shell and gelatine and gum arabic in the other shell) or all three polymers in one or both shells.

2.1.5 All these alternatives are covered by the subject-matter of claim 1 of the main request, which therefore lacks novelty.

2.2 The appellant argued that the subject-matter of claim 1 was novel over D12 essentially because the claimed microcapsules were limited to those with the same two polymers being present in both shells.

2.3 The board cannot accept this argument because it is based on a wrong interpretation of the subject-matter covered by the claim as explained in detail in point 1 above (see in particular point 1.3.1).

2.4 Consequently, the main request is not allowable.

AUXILIARY REQUEST 1

3. Novelty

3.1 In claim 1 of auxiliary request 1 the shell material is defined as being a complex coacervate between two polymer components.

3.2 This limitation cannot make the claim novel. In D12 the wall-forming materials (the hydrophilic polymer materials) are caused to separate out as complex colloid-rich phases, in steps, by the phenomenon of coacervation (see column 3, lines 26 to 46; see also column 5, lines 13 and 36).

3.3 The reasoning set out above for the main request applies also for claim 1 of auxiliary request 1, which lacks novelty for the same reasons.

3.4 Consequently, auxiliary request 1 is not allowable.

AUXILIARY REQUEST 2

4. Novelty

4.1 In claim 1 of this request the first polymer component is gelatine type A and the other polymer component is selected from the group consisting of gelatine type B, polyphosphate, gum arabic, alginate, chitosan, carrageenan, pectin and carboxymethylcellulose.

4.2 Although considerably limited over the previous requests, the subject-matter of this claim still allows the shell material of the primary shell and the outer shell to be formed of different polymers, one being

gelatine A and the other being one of the polymers listed above for the other component. In other words, the claim now covers only the possibility that one component of the shell material is gelatine A and the other component a further polymer for both shells (A/B and A/B) or the possibility that one component of the shell material is gelatine A and the other component is a polymer (B) for the primary shell and a different polymer for the outer shell (A/B and A/C respectively).

4.3 The opponent still contested novelty of the subject-matter of claim 1 in view of the disclosure of example 1 of D12.

4.4 However, the subject-matter of claim 1 does not cover the possibility that one of the polymers of the shell is a polyvinylmethylethermaleic anhydride copolymer, and therefore the microcapsules of example 1 of D12 do not anticipate the subject-matter of claim 1.

4.5 The board cannot accept the argument of the respondent that the teaching of example 1 of D12 would also include the possibility of both the primary shell and the outer shell being formed only of gelatine A and gum arabic.

4.5.1 As explained in column 9, lines 66 to 75 of D12, the deposition of the capsule wall material occurs in one pH range, and the deposition of the wall material surrounding the clusters of capsules occurs at a lower pH range. These pH ranges are reached successively over time by continuously lowering the pH. The composition of the wall material depends on the fractions of polymer material which become insoluble at a given pH value. In example 1, three different hydrophilic

polymers are used that will solidify and deposit to form the wall material.

4.5.2 Thus, the skilled person reading example 1 of D12 would understand that the cluster walls (outer shell) will be formed either of the mixture of the three polymers used or of only two of them (if one of the polymers has already been used up during the formation of the primary shells). In any case, the three polymers have to be present as wall material, either in the primary shell or in the outer shell. The alternative suggested by the respondent, wherein one of the added polymers would not be used up during the shell formation (primary or outer shell), is hypothetical and in fact goes against the teaching of the document. It would be excluded by the skilled person reading D12.

4.6 For these reasons, the subject-matter of claim 1 of auxiliary request 2 is novel over D12.

5. *Inventive step*

5.1 Closest prior art

D12 discussed above in relation to novelty was agreed to represent the closest prior-art document.

5.2 Problem to be solved

5.2.1 According to the appellant, the capsules obtained by the process of D12 present some drawbacks. As pointed out in the statement of grounds of appeal, the appellant had repeated example 1 of D12 and had found that the obtained powder had an unacceptable appearance: it was beige in colour, sticky in texture and had a strong, offensive smell.

5.2.2 Therefore the appellant defined the technical problem to be solved by the invention as the provision of microcapsules having improved organoleptic properties with respect to smell, taste and mouth feel and, in addition, having improved stability and shelf life.

5.2.3 This problem is said to be solved by the claimed microcapsules that are prepared by a method that allows for both shells (primary and outer) to be formed from the same two polymers but at different points in time. According to the appellant, microcapsules having a strong shell, a high loading capacity and improved organoleptic properties are obtained "if the primary and the outer shell are each formed from only two polymer compounds which are deposited as shells by cooling the aqueous mixture ..." (last paragraph of page 5 of the statement of grounds of appeal, emphasis by the appellant). The ability to control the agglomeration process to obtain the improvement is said to be, in part, a function of having only a two-polymer system.

5.2.4 It is however conspicuous to the board that the subject-matter of claim 1 is not limited to microcapsules formed from only two polymer components but also covers the use of three polymers as in the method of D12 (see above, point 4.2). For microcapsules having three polymers in the shell material, no improvement over the teaching of D12 can be acknowledged, since there is simply no proof of it.

5.3 Reformulation of the problem and its solution

5.3.1 In view of the above, an improvement cannot be acknowledged as the objective problem underlying the

invention for the whole breadth of claim 1. As a consequence the problem has to be reformulated in a less ambitious manner not involving such an improvement.

5.3.2 The objective problem can thus be formulated as the provision of alternative microcapsules to those known from D12.

5.3.3 This less ambitious problem is undisputedly solved by the claimed microcapsules.

5.4 Obviousness

5.4.1 In the absence of any improvement, the claimed microcapsules have to be considered as an obvious alternative to the known microcapsules of D12.

5.4.2 Given that gelatine is one of the preferred polymers disclosed in D12 and that further polymers covered by claim 1, such as gum arabic and carrageenan, are also mentioned in D12 (column 4, lines 40 to 44), the skilled person would arrive in an obvious manner at the claimed microcapsules.

5.5 For these reasons, the subject-matter of claim 1 of auxiliary request 2 lacks inventive step and the request is not allowable.

6. Since the main request and auxiliary requests 1 and 2 were not allowable for lack of novelty or inventive step, there was no need for the board to decide on the objections under Articles 100(b) and (c) EPC.

AUXILIARY REQUEST 3

7. *Amendments*

7.1 Claim 1 of auxiliary request 3 has been limited to gelatine type A and polyphosphate as polymer materials. It is based on claim 1 of the earlier application as filed, wherein it was specified that:

- the microcapsules include a loading substance (support: page 4, lines 1 to 3);

- the shell material is a complex coacervate between two polymers (support page 5, lines 27 to 28), and the polymers are gelatine type A and polyphosphate (support: page 6, line 3);

- the loading substance is a specific oil or omega-3 fatty acid (support: page 4, lines 19 to 20 and 23 to 27); and

- an antioxidant is optionally present (support: page 5, lines 12 to 13).

7.2 The respondent did not dispute that the features of claim 1 were disclosed in the (earlier) application as filed but argued that the claim contravened Articles 123(2)/76(1) EPC because they were not disclosed in the combination now claimed.

7.3 The board notes that the use of a complex coacervate between gelatine type A and polyphosphate is indeed a preferred embodiment disclosed as such in the application as filed (page 6, line 3) and exemplified in most of the examples (cf. examples 1 to 5, 7 and 8). The skilled person would understand from this

information that this shell material can be used with the various loading substances therein disclosed. The subject-matter of claim 1 therefore does not extend beyond the content of the application as filed.

7.4 Claims 2 to 7 correspond, respectively, to granted claims 2 to 6 and 8. They were not contested by the respondent.

7.5 For these reasons the subject-matter of the claims fulfils the requirements of Article 123(2) EPC.

8. Sufficiency

No objection of lack of sufficiency was raised against auxiliary request 3 during the oral proceedings. In this context the board notes that claim 1 of this request has been limited to two specific components for forming the coacervate complex, so that the arguments of the respondent concerning the broad subject-matter of the claims of previous requests no longer apply to auxiliary request 3.

9. Inventive step

9.1 The claimed subject-matter is now limited to the use of the same two polymers, namely gelatine type A and polyphosphate, in both shells. There is no possibility for a further polymer to be present in the shells.

9.2 Closest prior art

D12 remains the closest prior-art document.

9.3 Problem to be solved and its solution

9.3.1 According to the appellant, the use of polyphosphate instead of gum arabic as used in example 1 of D12 results in microcapsules having improved properties, namely higher oxidative stability and encapsulated oil quality.

9.3.2 The examples and comparative examples in the patent do indeed show the advantageous properties of the microcapsules prepared using polyphosphate compared to similar microcapsules having gum arabic. Thus, the microcapsules of example 1 of the patent have an induction period of 38 hours and are better protected against oxidation than the microcapsules of example 6 using gum arabic as shell material and having an induction period of only 30 hours. Moreover, the microcapsules containing polyphosphate show a lower peroxide value, indicating a lower concentration of oxidation products.

9.3.3 The board is therefore satisfied that the above-mentioned problem has been solved by the claimed microcapsules. This finding has not been contested by the respondent.

9.4 Obviousness

9.4.1 It remains to be decided whether, in view of the available prior art, it would have been obvious for the skilled person to solve this technical problem by the means claimed, namely by using the specific two components system of gelatine A and polyphosphate.

9.4.2 D12 itself gives no hint. The encapsulating wall-forming materials used in D12 are chosen from gelatine,

gum arabic, chondrus, zein and soy bean protein (see column 4, lines 40 to 43). Although other film-forming materials such as polyvinylmethylethermaleic anhydride copolymer, polyethyleneimine, polyethylenemaleic anhydride copolymer and polymerisable water-soluble equivalents are also mentioned in D12 (column 4, lines 45 to 48), polyphosphate is not mentioned at all as a polymer that could be used as wall-forming material.

9.4.3 The respondent argued that polyphosphate was a common material used for encapsulation and that the skilled person would consider it as an obvious alternative to the polymers used in D12. This argumentation is not convincing. At most, the skilled person might use it to obtain further microcapsules, but not to solve the problem underlying the invention, namely to obtain microcapsules with improved oxidative stability and encapsulated oil quality. Therefore this argument is made with hindsight knowledge of the invention and must fail.

9.5 In view of the above, the board concludes that the person skilled in the art, starting from D12 as the closest prior art, would not have arrived in an obvious manner at the subject-matter of claim 1 of auxiliary request 3. The subject-matter of claim 1, as well as that of dependent claims 2 to 7, involves an inventive step.

10. During the oral proceedings the appellant filed a description adapted to the claims of auxiliary request 3. The amendments were discussed with the respondent, who did not raise any objection to them.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the opposition division with the order to maintain the patent on the basis of the following documents:

   - Claims 1 to 7 filed as auxiliary request 3 with letter dated 17 June 2013;

   - Description pages 2 to 7 as filed on 24 September 2015 during the oral proceedings before the board; and

   - Figures 1 and 2 of the published patent specification.

The Registrar: The Chairman:

M. Cañueto Carbajo W. Sieber

Decision electronically authenticated