BESCHWERDEKAMMERN DES EUROPÄISCHEN PATENTAMTS

BOARDS OF APPEAL OF THE EUROPEAN PATENT OFFICE

CHAMBRES DE RECOURS DE L'OFFICE EUROPEEN DES BREVETS

Internal distribution code:
(A) [ ] Publication in OJ
(B) [ ] To Chairmen and Members
(C) [X] To Chairmen
(D) [ ] No distribution

D E C I S I O N
of 26 June 2002

Case Number: T 0507/98 - 3.3.5

Application Number: 90908830.4

Publication Number: 0471036

IPC: B01J 13/12

Language of the proceedings: EN

Title of invention:
Encapsulation Process

Patentee:
Southern Research Institute

Opponent:
Alkermes Controlled Therapeutics Inc. II

Headword:
Encapsulation/SRI

Relevant legal provisions:
EPC Art. 56

Keyword:
"Proper construction of the claims"
"Inventive step (no, main request)"
"Inventive step (yes, after amendment)"

Decisions cited:
-

Catchword:
-

Europäisches Patentamt | European Patent Office | Office européen des brevets

Beschwerdekammern | Boards of Appeal | Chambres de recours

Case Number: T 0507/98 - 3.3.5

D E C I S I O N
of the Technical Board of Appeal 3.3.5
of 26 June 2002

Appellant: (Opponent)
Alkermes Controlled Therapeutics Inc. II
64 Sidney Street
Cambridge, Massachusetts 02139 (US)

Representative:
Sheard, Andrew Gregory
Kilburn & Strode
20 Red Lion Street
London WC1R 4PJ (GB)

Respondent: (Proprietor of the patent)
Southern Research Institute
2000 Ninth Avenue South
Birmingham
Alabama 35205 (US)

Representative:
Leissler-Gerstl, Gabriele
Eisenführ, Speiser & Partner
Patentanwälte
Arnulfstrasse 26
D-80335 München (DE)

Decision under appeal: **Interlocutory decision of the Opposition Division of the European Patent Office posted 26 March 1998 concerning maintenance of European patent No. 0 471 036 in amended form.**

Composition of the Board:

Chairman: R. K. Spangenberg
Members: B. P. Czech
M. B. Günzel

Summary of Facts and Submissions

I. The appeal is from the interlocutory decision of the opposition division to maintain European patent 0 471 036 in amended form. The amended independent claim 1 underlying that decision reads as follows, the sole amendment in comparison to claim 1 as granted being **highlighted**:

"1. A method of microencapsulating an agent, to form a microencapsulated product, comprising:

a) dispersing an effective amount of the agent in a solvent containing a dissolved wall-forming material to form a dispersion;

b) combining the dispersion with an effective amount of a continuous process medium to form an emulsion that contains the process medium and microdroplets comprising the agent, the solvent and the wall forming material; and

c) immediately **within up to three minutes** after the formation of the emulsion adding all at once the emulsion to an effective amount of an extraction medium to extract the solvent from the microdroplets to form the microencapsulated product, wherein the solvent has a solubility in the extraction medium from about 1 part per 100 to about 25 parts per 100."

II. In the contested decision the opposition division considered four patent documents, including the following:

D2 = EP-A-0 266 119

D3 = US-A-3 943 063
D4 = DE-A- 29 30 248

as well as

D5 = a declaration and an experimental report of Mr. Ramstack
D6 = a (first) declaration of Mr De Luca
D7 = a test report of the patent proprietor

From the minutes of the oral proceedings before the opposition division, it can be derived that the division considered that the method of claim 1 as granted lacked novelty over D2.

In the contested decision, the opposition division held that the patent as amended during the oral proceedings met the requirements of Articles 123(2) and (3), 84 and 83 EPC. The subject-matter claimed was found to be novel and inventive over the cited prior art.

III. With its statement of the grounds of appeal, the appellant (opponent) filed four further documents:

D8 = a second declaration of Mr. Ramstack
D9 = a second a declaration of Mr de Luca
D10 = a declaration of Mr. Lewis
D11 = a declaration of Mr. Rickey

Relying on the contents of documents D2-D11, it contested the findings of the opposition division and argued

- that the amendment to claim 1 carried out during the opposition proceedings lacked clarity;
- that the disclosure of the patent was

insufficient; and

- that the claimed subject-matter was not inventive.

IV. With his reply, the respondent (patent proprietor) filed two further prior art documents:

D12 = Journal of controlled release, 2, 1985, p.343-352; Tice T.R. et al., Preparation of injectable controlled-release microcapsules by a solvent-evaporation process, which had already been cited in D9

D13 = Biology of reproduction, 28, 1983, p.186-195; Beck R.L. et al., Poly(DL-Lactide-co-glycolide)/Norethisterone Microcapsules: An injectable Biodegradable Contraceptive; which had already been cited in D9

The respondent rejected the appellant's objections concerning the clarity of the amendment and the sufficiency of the disclosure. Moreover, it argued that the method as claimed was not obvious in view of the prior art cited.

V. In the annex to the summons to oral proceedings, the board inter alia indicated that the issues of clarity and/or construction of the claims might be closely linked with the issue of the original disclosure. The parties were invited to prepare themselves to comment on the meaning of the expressions "immediately", "immediately within up to three minutes", "all at once" and "the formation of the emulsion". Moreover, the parties' attention was drawn to certain passages of D4.

VI. In its reply to the summons, the respondent indicated passages of the application as filed, which in its

opinion formed the basis for some of the expressions used in claim 1. It also submitted auxiliary requests consisting of amended sets of claims.

VII. Oral proceedings took place on 26 June 2002.

In the course of the proceedings, the board informed the parties of its intended construction of claim 1 according to the main request.

In response thereto, the respondent presented five sets of amended claims as new auxiliary requests.

Amended part b) of claim 1 according to the first auxiliary request reads as follows, the sole amendment in comparison to claim 1 according to the main request being **highlighted**

"b) combining the dispersion with an effective amount of a continuous process medium to form an emulsion that contains the process medium and microdroplets comprising the agent, the solvent and the wall forming material **within 30 seconds**; and"

VIII. The parties' oral and written submissions, as far as they are relevant for the present decision, can be summarised as follows.

Referring inter alia to the examples of the patent, the appellant submitted that the expression "formation of an emulsion" was to be interpreted as referring to the preparation of an emulsion including the adjustment of its properties, required for obtaining useful microcapsules. It contested the clarity of the amendment carried out and pointed out that the feature

"within three minutes" was not presented in connection with the preparation of the emulsion in the application as filed. It submitted that "all at once" had to be understood as "in one go" or "non-intermittently", and in a relatively short period. Referring to D5 and D8, it argued that the patent did not enable the invention to be performed in the whole range claimed. Concerning the subject-matter of the claims according to both the main and the first auxiliary request, it argued that starting from D2, example I.B as closest prior art, at least part of the subject-matter embraced by claim 1 did not solve the underlying technical problem as shown in D5/D8. Concerning the obviousness of the features "immediately", "all at once" and "within three minutes", he referred to D6 and D9 to D11 as documentary proof of what had to be considered as common general knowledge. D3 and D4 did not teach against a fast addition of the emulsion to the extraction medium. In respect of the first auxiliary request, it argued that it was obvious to speed up the known process to avoid leaking of the agent, as far as good capsules were obtained, and that no unexpected effect could be invoked for this measure.

The respondent submitted that the amendment was clear. In accordance with the description of the patent, the feature "formation of the emulsion" did not include any optional further stirring as referred to in some of the examples, which therefore was supposed to be carried out within the "three minute" period mentioned in claim 1. In his view, the expression "within three minutes" qualified the term "immediately". It also submitted that "all at once" had to be understood as "instantaneously". It argued that sufficiency of the disclosure was established by means of the examples in

the patent and in D7. Concerning inventive step, it argued that the cited prior art documents did not suggest the claimed rapid processing of the emulsion in order to improve the poor encapsulation efficiency reported in the example I.B of D2. It generally rejected the declaratory evidence concerning the alleged general knowledge.

IX. The appellant requested that the decision under appeal be set aside and that the patent be revoked.

As main request, the respondent requested that the appeal be dismissed. As first to fifth auxiliary requests the respondent requested that the patent be maintained with the claims of one of the first to fifth auxiliary requests, taken in their numerical order.

Reasons for the Decision

Main request

1. *Construction of amended claim 1*

1.1 The expression "after formation of the emulsion"

1.1.1 According to step b) of the claimed method an emulsion has to be formed, which contains process medium and microdroplets comprising the agent, the solvent and the wall forming material. According to step c) this emulsion is then further processed by extracting the solvent to form microencapsulated products.

1.1.2 In agreement with the parties, the board can accept that - in the broadest sense - **an** emulsion is formed as

soon as two substantially immiscible liquid phases are brought into contact, especially under stirring. On the other hand, in order to obtain microcapsules having defined properties, **the** emulsion which is subjected to the solvent removal by means of extraction must have certain properties as well, such as comprising microdroplets of a certain shape and size distribution, which are generally brought about by agitation of the mixture. Since the meaning to be given to the expression "after formation of **the** emulsion" as used in claim 1 was in dispute, the board has to construe the proper meaning thereof in the context of the application as originally filed.

1.1.3 The said expression was originally present in claim 3 as filed, and was later incorporated into claim 1. The board holds that there is nothing in original claims 1 and 3 that supports the appellant's view that the expression under dispute refers to the point in time where the dispersion and the process medium are first put into contact, and thus form an "emulsion" in the broadest sense. Since the two claims do not expressly contain any reference to a step relating to the adjustment of the emulsion properties, such as by further stirring, the board holds that the expression is to be construed as relating to the point in time at which the emulsion formed is - in every aspect - ready for extraction, and not to any two phase mixture obtained by pouring together the two liquid phases.

1.1.4 From page 10, lines 28 to 30 of the application as filed, it follows that an emulsion can be formed within 30 seconds up to 5 minutes, depending on the surfactant used and the method of agitation. The examples mention stirring of the emulsion for up to 7 minutes

(example 3) before going on to the extraction step, and are thus in general agreement with the quoted passage. Hence, the board holds that the description as filed does not support the respondent's view either, according to which the emulsion referred to in steps b) and c) of claim 1 is not necessarily the emulsion ready for extraction, obtained eg after an optional prolonged stirring of the two phase mixture. The fact that in examples 1, 2, 3 and 5 use is made of language such as "the resulting emulsion was stirred", "the microdroplets were stirred" and "as the emulsion was stirred" cannot alter this view. Although according to these examples an emulsion is formed upon joining of the two liquid phases under stirring, it is not stated in these examples that these emulsions are immediately, ie without further stirring, in a condition to be extracted to form the desired microcapsules. The further statement in the description that "as soon as **an** emulsion forms, all of the process medium containing the organic microdroplets is transferred, as quickly as possible, to an extraction medium" (see page 10, lines 31 to 37) is considered to be too vague and general to be suitable for further qualifying the meaning to be given to the expression "formation of the emulsion" in claim 1. In any case, it cannot be construed as a direct contradiction to the immediately preceding statement concerning the time required for the formation of the emulsion.

1.2 The feature "within up to three minutes"

1.2.1 This feature was present in claim 2 as originally filed (claim 2 of the contested patent). In the latter claim, this expression is related to the **addition** of the emulsion to the extraction medium without, however,

specifying the point in time at which the "clock starts ticking". The point in time to be considered for that purpose being in dispute, the proper meaning has to be construed by the board in the context of the application as filed.

1.2.2 Claim 2 is the only part of the application as filed where the expression "within three minutes" is related to the step of **adding** the emulsion to the extraction medium. The passages on page 5, lines 10 to 14 and page 10, lines 32 to 37 of the description concern the **extraction** of a certain amount of solvent ("most" and "greater than 20%, respectively) from the added microdroplets, again without indicating the point in time at which "the clock starts ticking".

1.2.3 In these passages, the application itself differentiates between the "adding" or "transfer" of the emulsion to the extraction medium on the one hand, and the "removing the solvent" on the other hand. Moreover, it is technically plausible that the "adding" could take less time (e.g. a few seconds) than the actual extraction of the solvent from the droplets, depending on physico-chemical parameters of the system, see eg the 15 to 30 minutes required for total extraction as mentioned on page 11, lines 14 to 16.

1.2.4 In the absence of any further indication in claim 1 concerning the starting point of the three minute time period, the board thus takes the view that neither the passages of the description mentioned above nor the examples of the patent give a more specific meaning to the expression "adding ... within three minutes" as comprised in original claim 2, linking the "three minutes" with the mixing of the emulsion in the sense

that some of the time required for mixing the initial emulsion before its extraction would have to be included.

1.3 The feature "all at once"

The board takes from the parties' submissions that, in its broadest sense, the expression "all at once" has to be considered as meaning "in one go" or "non-intermittently" as well as "relatively rapidly".

1.4 In view of the above, taking into consideration the entire disclosure of the application as filed, the board comes to the conclusion that step c) of claim 1 has to be construed as meaning that as soon as the emulsion formed in step b) is suitable for being extracted to form microcapsules having the desired properties, the transfer takes place immediately, i.e. without any unnecessary delay, and all at once, i.e. non-intermittently and within a time span starting when the emulsion has reached the said state, said time span being at most three minutes long. The three minutes are considered to qualify the term immediately and the time required for all the necessary steps up to the end of the emulsion transfer.

2. *Admissibility of the amendment*

Considering the construction of amended claim 1 as adopted by the board, the transfer of the feature "within up to three minutes" from former claim 2 into claim 1 is not considered to contravene the requirements of Article 123(2)EPC.

3. *Sufficiency*

3.1 The appellant has not questioned the technical feasibility as such of the method as claimed, which does not mandatorily require a specific encapsulation efficiency to be achieved.

3.2 Moreover, the contested patent as well as the test reports D5 and D7 contain examples showing that the claimed process is indeed feasible, because working along the general lines of the examples of the patent leads to microcapsules. A skilled person, familiar with common technical considerations to be borne in mind in the field of emulsion-based microencapsulation, such as the choice of appropriate solvents, finds sufficient guidance in the contested patent to perform the claimed method for a given agent to be encapsulated. Even if it was possible to find combinations of agents, emulsifiers, solvents, processing media and/or extraction media, which, when processed according to claim 1, would not lead to useful microcapsules, this could not be considered to justify an attack under Article 100(b)EPC, since such methods are not encompassed by present claim 1.

3.2 Hence, the board holds that the disclosure of the patent is sufficiently clear and complete for the skilled person to be able to carry out the method as claimed.

4. *Novelty*

Novelty of the subject-matter of claim 1 has not been challenged in the appeal proceedings. The board is also convinced that none of the prior art documents

mentioned in the appeal proceedings discloses a process with all the features of present claim 1, and that the method according to the latter is novel. The differences between the claimed method and the disclosures of the pertinent prior art documents discussed during the appeal proceedings will become apparent from the following discussion of inventive step.

5. *Inventive step*

5.1 Closest prior art

5.1.1 In its example I.B, D2 undisputedly discloses the microencapsulation of a water soluble agent by means of a process comprising the preparation of an emulsion according to steps a) and b) of present claim 1. More specifically, it is stated in D2 that "after the resulting ... emulsion was stirred for about 10 minutes", it was "transferred" to a beaker containing water as extraction medium. Like in some of the examples of the contested patent, methylene chloride is used as the solvent, together with an aqueous PVA solution as the extraction medium. The requirement of present claim 1 concerning the solubility of the solvent in the extraction medium must thus be fulfilled as well.

5.1.2 D2 does not expressly state
i) whether the whole ten minutes of stirring are actually required to obtain the emulsion ready for transfer
ii) whether the manipulations required for transferring the emulsion are initiated as soon as possible, namely immediately after the emulsion is ready for extraction;

iii) whether the transfer is done all at once (i.e. non-intermittently and not too slowly) and
iv) the time within which the transfer has to be carried out.

5.1.3 Ad feature i): The respondent did not argue that the emulsion prepared according to example I.B of the respondent's own application D2 had been "overstirred" in the sense that it was stirred much longer than the time required to bring the emulsion to a state ready for extraction. In the absence of any apparent reason why a skilled person would stir longer than necessary, the board holds that, by analogy with eg the five minutes stirring time mentioned in examples 4 or 8 of the contested patent, the stirring time of 10 minutes is the time that the author of D2 considered to be required to obtain - under the specific circumstances (in terms of the products to be combined, the stirring method used etc.) - an emulsion having the necessary properties for being further processed to microcapsules of the desired properties, ie being ready for extraction.

On the other hand, features ii) to iv) are not clearly and unambiguously disclosed in D2 in an implicit manner. The "transfer" mentioned could - in principle - be carried out after a certain waiting time, intermittently and/or in a time span exceeding three minutes counted from the point in time where the emulsion is ready for transfer.

5.2 The technical problem

5.2.1 Present claim 1 does not require specific values for the encapsulation efficiency to be achieved. Although

the respondent argued that example I.B of D2 disclosed a "very low" encapsulation efficiency, it has not provided any evidence showing that the use of the specific substances (agent, solvent, processing medium and extraction medium) referred to therein would lead to a comparatively better encapsulation efficiency than the one reported in example I.B, if the transfer of the emulsion prepared according to this example was carried out all at once, rather than intermittently and/or slowly, and/or within a time span of up to more than three minutes, rather than up to three minutes, from the point in time where the latter is ready for extraction, ie **after** the 10 minutes stirring. In the absence of such data, the alleged improvement cannot be taken into consideration when formulating the technical problem.

5.2.2 In view of example I.B of D2 the technical problem to be solved by the subject-matter of claim 1 can, however, be seen in finding, within the general indications given in D2, suitable conditions for carrying out the transfer of the emulsion.

5.3 Obviousness of the solution

5.3.1 To reduce the example of D2 to practice, the skilled person has to fill the aforementioned "gaps" in the disclosure of D2. Hence, it remains to be seen whether the measures proposed in claim 1 for this purpose are obvious in the light of the prior art.

5.3.2 Concerning the feature "immediately"

As it emerges from the application as filed, it was generally known at the filing date that in emulsion-

based processes the agents to be encapsulated can migrate out of the droplets and into the processing medium during the polymer removal step, resulting in a poor encapsulation efficiency, see page 3, lines 9 to 16. This is confirmed by D12, although in the context of an emulsion/evaporation technique. In D12 it is stated that "the resultant core loading of the microcapsules will depend upon the solubility of the core material in the processing medium". D12 goes on to say that "if the core material is too soluble in the processing medium, it will be extracted from the oil microdroplets into the aqueous phase before the microcapsule walls have a chance to form. As a result the core loading will be lower than expected.", see the paragraph bridging pages 345 and 346. Hence D12 confirms that the skilled person in the field of emulsion-based microencapsulation techniques was aware of the problem of the agent leaking into the processing medium during extraction of the emulsion.

Hence, the skilled person had good reasons not to let the emulsion ready for extraction stand or further stir it without a specific purpose before the extraction step and to carry out the addition thereof to the extraction medium immediately. Moreover, the board shares the appellant's view that logic or chemical common sense dictates not to let the emulsion stand since the latter is a dynamic system with a general tendency for de-emulsification.

Generally speaking the board furthermore holds that, in the absence of any teaching to the contrary in the prior art, a skilled person, when reproducing an experimental method described in the literature, would have no reason to deliberately pause between two

process steps described. The respondent's argument according to which the prior art would show that it was usual before the filing date of the present patent to wait or further stir the emulsion before going on with the extraction step is based on an interpretation of the expression "formation of the emulsion" that the board does not accept, and cannot, therefore, be taken into consideration. The respondent has not shown that the stirring times disclosed in the prior art are to be considered as a mere waiting time rather than a necessary measure to bring the emulsion in a state appropriate for extraction.

D4, which also relates to emulsion-based microencapsulation techniques, discloses the transfer of the emulsion into an extracting medium as soon as an appropriate degree of dispersion is reached, ie as soon as the emulsion is ready for extraction, see examples 1 and 4.

Document D3, disclosing an emulsion-based encapsulation process wherein the extraction medium is added to the emulsion, is silent about any purposeless waiting between the point in time at which the emulsion has reached the desired state and the admixing of the extracting medium. According to example 1, the emulsion is stirred for several minutes until its state is "stabilised", as according to examples 4, 5, 6 and 8 of the contested patent.

D12 and D13, relating to an emulsion based evaporative technique, use similar language. In D12, it is stated that "once the emulsion has stabilised, the solvent is ... removed" and "once the emulsion is made, the solvent is removed", see page 344 , right-hand column,

lines 10 to 12 and page 345, left-hand column, lines 4 to 6. D13 mentions stirring "to form a stable emulsion" and indicates that the solvent removal is initiated "after the emulsion had been stirred for 10 minutes, ...", see page 187, right-hand column, the last four lines.

5.3.3 Concerning the feature "all at once" and "within three minutes"

Although the board does not share the opinion of the opposition division that D2 clearly and unambiguously discloses an "all at once" transfer, it nevertheless takes the view that such a way of transferring is technically simple and the most obvious one, in particular in the absence of good reasons for adding the emulsion intermittently, ie more slowly. Considering that D2 does not mention intermittent slow addition, and that no equipment other than a 100 ml resin kettle is mentioned in example I.B, the skilled person would not envisage the use of equipment permitting a more gradual or intermittent transfer such as a dropping funnel. In contrast therewith, document D3, although relating to a different process, explicitly mentions the use of such equipment in example 7. Moreover, the examples of D4, relating to a process similar to the one claimed, confirm that the non-intermittent addition of the emulsion to the extraction medium was known in the field of emulsion-based encapsulation before the date of filing of the contested patent, see the expressions "einfließen lassen" and "Eingießen" (pouring).

In view of the well-known considerations concerning the problem of leakage of the agent into the processing medium (see item 5.3.2), the skilled person had good reasons to transfer the emulsion as quickly as possible, provided the quality of the capsules obtained was not compromised. Considering that the amount of emulsion to be transferred according to example I.B of D2 is only 60 ml, it is difficult to imagine how a non-intermittent transfer could take more time than a few seconds. Assuming that it did, some very specific dosing equipment would be required, of which, however, no mention is made in D2. Moreover, D4 shows that fast addition of the emulsion to the extraction medium was known in the field of emulsion-based encapsulation before the date of filing of the contested patent, see page 7, lines 6 to 7 ("rasch"), ie "in ca. 5 s", this definition for "rasch" being given in comparative examples 1 and 3.

D12 and D13, as far as relied upon by the respondent, suggest slow solvent removal, but for reasons which are not applicable in the case of solvent removal by means of an extraction medium.

5.4 The board thus concludes that in view of what was generally known at the priority date, and based on chemical common sense considerations, and/or on the disclosure of D4, the skilled person reducing to practice example I.B of D2, would not waste time after formation of the emulsion ready for extraction, and would start the transfer thereof to the extraction medium immediately, in order not to risk de-emulsification (by letting the emulsion rest) and/or a reduced encapsulation efficiency due to leakage of the agent into the processing medium (extended purposeless

stirring). Moreover, in the absence of any reasons for not doing so, it would carry out the transfer all at once, as fast as sensible without compromising capsule quality. Considering the very small amounts of reagents involved, such a transfer would be terminated within the three minutes specified in claim 1.

5.5 Therefore, the method of claim 1 according to the main request is found not to be based on an inventive step.

First auxiliary request

6. *Construction of claim 1*

The proper construction of claim 1 according to the present request is the same as the one of claim 1 according to the main request, except for the additional limitation that the emulsion ready to be transferred to the extraction medium must be prepared within 30 seconds.

7. *Admissibility of the amendments*

7.1 Although the examples disclose emulsion forming times of up to a few minutes, the formation of an emulsion "within 30 seconds" is unequivocally disclosed on page 10, lines 28 to 30 of the description as filed (page 5, lines 15 to 16 of the contested patent). Moreover, the speed of the entire process was always presented as essential.

7.2 Dependent claims 42 to 46 (numbering in the granted patent), relating to the preparation of microbubbles (ie hollow particles, see page 2, line 21 to 22 of the patent) were deleted. The remaining dependent claims

were re-numbered and the back-references contained therein were adapted.

7.3 The board is therefore satisfied that the amendments satisfy the requirements of Articles 123(2) and (3) EPC.

7.4 The appellant did not raise any objection under Article 84 EPC against these amendments nor does the board have any such objection.

8. *Sufficiency of the disclosure*

Irrespective of the fact that according to the examples of the patent times longer than 30 seconds (where specified) are used for the preparation of the emulsions to be transferred, the board is convinced that methods leading to microcapsules, wherein the emulsion must be formed within 30 seconds, are feasible and available to a skilled person. This view is corroborated by the experimental results reported by both the appellant and the respondent, see D5 and D7. Moreover, the contested patent contains some guidance concerning the factors that may affect the time required for emulsification, such as the emulsifiers used and the method of agitation used, see page 5, lines 15 to 16. Also taking into consideration the observations made under item 3. here above, the board concludes that the contested patent discloses the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art.

9. *Novelty*

It follows from the fact that present claim 1 is narrower in scope than claim 1 according to the main request, that the subject-matter of the former is also novel.

10. Inventive step

10.1 Closest prior art

In agreement with the parties, the board sees no reason for deviating from the consideration of the disclosure of D2, example I.B as the closest prior art.

10.2 Technical problem

In the absence of any evidence to the contrary, and based on simple physico-chemical considerations (diffusion of agent into process medium is time dependent), the board finds it plausible that the loss of agent into the processing medium is reduced by shortening the emulsion formation time. Moreover, the data provided in D7 and in D8 confirm that for agents soluble in the process medium the encapsulation efficiency may rapidly deteriorate with increasing emulsifying time. The technical problem to be solved when starting from example I.B of D2 can thus be seen in the provision of a process leading to microcapsules with an optimised encapsulation efficiency. Although the effect will certainly be more pronounced in the case of agents having relatively high solubilities in the processing medium, it will nevertheless also occur to a lesser degree in the case of agents having relatively low solubilities in the processing medium.

10.3 Non-obviousness of the solution

10.3.1 D2 discloses an emulsion formation time of 10 minutes, and does not, taken alone, suggest dramatically shorter emulsion preparation times.

10.3.2 The skilled person was aware (see item 5.3.2 here above) of the problems of agent leaking into the process medium during the extraction of the microdroplets making up the emulsion. However, the very concept of forming an emulsion ready to be extracted to give microcapsules in a very short time of at most 30 seconds, in order to avoid such leaking of the agent into the processing medium at the emulsifying stage, is not addressed in the cited by prior art. Hence, without hindsight considerations, the skilled person was not induced by the cited prior art to dramatically reduce the time required to form the emulsion from 10 minutes (as in D2) to 30 seconds. Moreover, none of the cited prior art documents suggests that useful microcapsules could be obtained with such short processing times.

D4 is silent about the time required for the formation of the emulsions to be transferred, except for example 4, where 10 minutes are required to obtain an emulsion having a sufficient degree of dispersity. Hence this document cannot suggest the modification of the method disclosed in D2 towards dramatically shorter emulsion preparation times.

In document D3, only example 1 contains indications concerning the time required to form an emulsion, ie "several minutes". Hence, irrespective of the differences in terms of the encapsulation process disclosed therein, D3 cannot suggest a severe reduction of the emulsion preparation time either.

10.4 Hence the subject-matter of claim 1, and consequently of the dependent claims 2 to 49, is found to be based on an inventive step.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.

2. The case is remitted to the opposition division with the order to maintain the patent with the claims of the "New First Auxiliary Request" filed during the oral proceedings and a description to be adapted.

The Registrar: The Chairman:

P. Martorana R. Spangenberg