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**Datasheet for the decision
of 1 October 2015**

Case Number: T 2564/11 - 3.3.07

Application Number: 01922258.7

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A61K47/42

Language of the proceedings: EN

Title of invention:
PROTEIN MATRIX MATERIALS, DEVICES AND METHODS OF MAKING AND
USING THEREOF

Applicant:
Gel-Del Technologies, Inc.

Relevant legal provisions:
EPC Art. 56

Keyword:
Inventive step - main request and auxiliary requests (no)



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Chambres de recours**

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Case Number: T 2564/11 - 3.3.07

D E C I S I O N
of Technical Board of Appeal 3.3.07
of 1 October 2015

Appellant: Gel-Del Technologies, Inc.
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted on 27 June 2011 refusing European patent application No. 01922258.7 pursuant to Article 97(2) EPC.**

Composition of the Board:

Chairman J. Riolo
Members: A. Usuelli
M.-B. Tardo-Dino

Summary of Facts and Submissions

- I. The appeal of the applicant (appellant) lies from the decision of the examining division announced at oral proceedings on 6 May 2011 to refuse European patent application n° 01 922 258.7.
- II. The documents cited during the examination proceedings included the following:
- D1: US-A-5,418,222
D2: EP-A-0 485 210
D5: J. Cappello et al., J. Controlled Release, 53 (1998), pages 105-117
- III. The decision was based on two sets of claims filed with letter of 6 April 2011 as main request, and during oral proceedings on 6 May 2011 as auxiliary request.

Independent claim 1 of the main request related to a solvated compressed protein matrix material.

Independent claim 2 of the main request read as follows:

- "2. A method of making a solvated compressed protein matrix material, comprising the steps of:
- (a) preparing a coatable composition comprising one or more biocompatible protein materials and one or more biocompatible solvents;
 - (b) coating the composition to form a film;
 - (c) partially drying the coated film to a solvent content of 20% to 80% until the coated film can be formed into a non-brittle cohesive body;
 - (d) forming said cohesive body; and

- (e) compressing the cohesive body to reduce bulk solvent and form a protein matrix material."

Independent claim 1 of the first auxiliary request read as follows:

- "1. A method of making a solvated compressed protein matrix material, comprising the steps of:
- (a) preparing a coatable composition comprising one or more biocompatible protein materials and one or more biocompatible solvents;
 - (b) coating the composition to form a film;
 - (c) partially drying the coated film to a solvent content of 35% to 80% until the coated film can be formed into a non-brittle cohesive body;
 - (d) forming said cohesive body; and
 - (e) compressing the cohesive body at a pressure of 689kPa to 689,500kPa (100psi to 100,000psi) for a time period of from 2 seconds to 48 hours to reduce bulk solvent and form a protein matrix material, having a solvent content of 30% to 50%."

- IV. In its decision the examining division held *inter alia* that both D1 and D5 were prejudicial to the novelty of claim 1 of the main request.

The claims of the first auxiliary request met the requirements of Article 123(2) EPC. Novelty was established over D1 by virtue of the limitation of the solvent content of the product to the range of from 30 to 50%, and in that the pressure applied according to D1 is not further specified.

Claim 1 of the first auxiliary request did not meet the requirements of Article 56 EPC. D1 was the closest prior art since it related to collagen films for

improving the sustained release delivery of a pharmaceutical, particularly in the context of enhancing wound healing. There was no evidence on file showing that the matrix material according to claim 1 was superior to that of D1 as alleged in terms of its strength, delayed degradation, and controlled delivery of an active agent. The pressure and time ranges recited were so broad that it was unlikely that an improvement could arise therefrom, and the claimed lower limit of 30% for the final solvent content of the material was within the range of the general teaching of D1 to provide from 10-30% glycerol. The objective technical problem was thus the provision of an alternative process for producing a solvated compressed protein matrix material. Such a process was conventional for the skilled person starting from the teaching of D1.

- V. With the statement setting out the grounds of appeal dated 7 November 2011, the appellant submitted six sets of claims consisting of a main request and auxiliary requests 1-3, 5 and 6. A fourth claim set was not submitted, although the statement of grounds mentioned how such a request would be constructed.

Independent claim 2 was identical in the main request and the first to fourth auxiliary requests, and corresponded to independent claim 1 of the fifth auxiliary request. This claim was identical to claim 2 of the main request refused by the examining division (see point III above).

Independent claim 1 of the sixth auxiliary request corresponded to claim 1 of the first auxiliary request refused by the examining division (see point III above).

With the statement setting out the grounds of appeal the appellant furthermore submitted the following item of evidence:

Declaration of Dr Masters dated 6 November 2011

- VI. In a communication dated 11 September 2015 issued in preparation for oral proceedings, the Board noted in the context of inventive step that the comparative data submitted with the Declaration of Dr Masters did not support the alleged effect of improved mechanical strength over the closest prior art D1. Consequently, with respect to claim 2 of the main request, the objective technical problem appeared to be the provision of an alternative process for the production of a protein matrix to that of D1, example 2, and the solution appeared obvious. Furthermore, the Board expressed the preliminary opinion that none of the amendments proposed according to the auxiliary requests would appear to lead to a different conclusion.
- VII. Oral proceedings were held on 1 October 2015 in the absence of the appellant as announced with letter of 30 September 2015.
- VIII. The appellant's arguments can be summarised as follows:

Main request

It was the method of manufacture which imparted the advantageous physical properties to the protein matrix material of the invention. The declaration of Dr Masters demonstrated that the material of claim 1, by virtue of its method of manufacture according to claim 2, was different from that disclosed in example 2

of D1, and displayed comparatively enhanced maximum tensile strength. As far as the process of preparation was concerned, D1 failed to disclose the features (c), (d) and (e) of claim 2. Claims 1 and 2 were thus novel. Inventive step was supported by the data provided in the declaration Dr Masters.

Auxiliary requests

Since the process claim according to the first, second, third and fifth auxiliary requests was identical to that of the main request, the arguments submitted in respect of the main request applied. Claim 1 of the sixth auxiliary request was further distinguished from D1 by the limited solvent content of the product, and was inventive by virtue of the unexpected advantageous properties conferred on the product, as demonstrated by the declaration of Dr Masters.

- IX. The appellant requested in writing that the decision under appeal be set aside and a patent be granted on the basis of the set of claims of the main request, or alternatively on the basis of the sets of claims of the first to sixth auxiliary requests, all filed with the statement setting out the grounds of appeal.

Reasons for the Decision

Main request

1. Claim 2 - Inventive step

The invention defined in claim 2 concerns a method of making a solvated compressed protein matrix comprising a series of steps (a) to (e).

Closest prior art

- 1.1 According to the contested decision, D1 represented the closest prior art. The appellant has not contested this finding, and the Board sees no reason to differ. This document discloses in example 2 the preparation of a double layer collagen film which comprises the preparation of membranes A and B which differ each other in that membrane B comprises an active agent. Membrane A is prepared by a solvent casting method from an aqueous solution containing soluble collagen (4% collagen in 10mM acetate buffer (pH 4) in 0.85% NaCl solution), glycerol (20% w/w of collagen) and ethanol (20% of the solution). The solvent casting method is described in more detail in example 1 (column 6, lines 55 - column 7, line 6): the solution is cast on a Teflon surface and dried at room temperature *until the weight of the film was constant (for about 1-3 days)*. The ethanol is added to the solution to "facilitate the solvent drying process" (column 6, lines 59-60). Example 1 discloses a single layer collagen film equivalent to membrane A of example 2 and prepared in the same manner. Thus while the preparation method of D1 discloses steps (a) and (b) of the method of claim 2, it does not disclose partial drying according to step (c), forming of the cohesive body according to step (d), nor compression thereof according to step (e).

Technical problem

- 1.2 According to the application as filed, the general object of the invention is to provide an improved material for medical devices which is biodegradable and resorbable, and which overcomes the problems of the

devices of the prior art such as the rapid dissolving, degradation, disintegration and loss of form when placed in an aqueous environment, resulting in sub-optimal drug delivery and/or structural and durability characteristics (page 2, lines 18-page 3, line 3 and page 4, lines 4-15).

- 1.3 The appellant in the statement setting out the grounds of appeal (page 6, paragraph 2), has acknowledged that although examples 22 to 25 of the application describe the mechanical and hydraulic testing of a product according to claim 1, the results were not compared with any of the products of the prior art. Indeed, although a theoretical explanation of the advantages of the compression step to eliminate bulk solvent is provided (e.g. page 5, lines 13-19), evidence in the form of comparative data supporting the alleged advantages is lacking.
- 1.4 On the other hand the appellant with the declaration of Dr Masters has filed a set of experiments which purport to compare the "mechanical and hydraulic" strength of the material "according to the invention" with that of the product of example 2 of D1. Specifically, the tests measure the maximum tensile strength of the respective materials. The results (table 1 of the declaration) clearly show that the material prepared "according to the invention" has a tensile strength of approximately twelve times that of the material according to D1.

However, as pointed out by the Board in the communication sent in preparation for oral proceedings, the comparative experiment is not suitable to demonstrate that the effect originates in the distinguishing features of the process of claim 1 with respect to that disclosed in D1. Specifically, in

relation to the preparation of the product of the invention ("GDT Wafer"):

- A partial drying step in accordance with the process of claim 2, step (c) is lacking: it is simply stated that the ingredients are "*mixed ... until it attained a cohesive state..*", providing the skilled reader with the impression that the mixture reached the cohesive state directly without first being diluted to the extent that *partial drying* is required to reach the cohesive state;
- the solvent content of the cohesive body formed in step (c) is not provided, thus it is unknown whether the claimed range of 20% to 80% is attained.

1.5 Furthermore, and independently of the above deficiencies, the declaration of Dr Masters does not indicate the solvent content of the respective products. In the absence of this information, it cannot be excluded that the effect of improved tensile strength is linked merely to the solvent content of the product. Indeed it is not implausible to imagine, for example, that the mere presence of less solvent could provide a more concentrated product with closer interaction between polymer molecules, leading to a better mechanical resistance.

However, the solvent content of the product obtained according to the process of claim 2 is variable because it depends *inter alia* on the quantity of solvent removed during the steps of partially drying and compressing (steps (c) and (e)). In step (c) it is broadly indicated that the product is partly dried to a solvent content of 20% to 80%. In step (e) no

quantitative information is given as to the reduction of solvent caused by the compression. It follows that also the mechanical properties of the product obtained according to the process of claim 2 may vary across the scope of the claim.

- 1.6 It follows from the above that the evidence provided by the declaration of Dr Masters is not suitable for demonstrating an improvement in respect of the subject-matter of claim 2 over the closest prior art D1.

Although this issue was raised in the communication sent in preparation of oral proceedings, the appellant did not reply nor attend oral proceedings to contest that opinion.

- 1.7 In view of these considerations, the objective problem underlying the subject-matter of claim 2 is defined as the provision of a further method for the preparation of a protein matrix material.

- 1.8 Obviousness

- 1.9 Since the method of D1 essentially consists of mixing the ingredients and drying, the skilled person wishing to solve the aforementioned problem would simply look to other ways of achieving the same. One of the possible solutions which would be available to the skilled person would be partial drying of the mixture, followed by compression to remove further solvent according to claim 2. These steps are disclosed for example in D2, which discloses a fibrin/collagen membrane for biomedical use. Here, both compression and evaporation are mentioned as techniques by which the solvent may be removed (page 3, lines 13-18; examples). Hence, the solution adopted in the application in suit

for removing solvent is suggested in the prior art and therefore it cannot justify the acknowledgement of inventive step.

- 1.10 It follows that the subject-matter of claim 2 does not involve an inventive step.

First, second and third Auxiliary requests

2. Inventive step

- 2.1 Since claim 2 of the first, second and third auxiliary requests are identical to that of the main request, the same conclusions apply in respect of inventive step.

Fourth auxiliary request

3. Rather than submitting a verbally specified fourth auxiliary request, the appellant refers to the form that such a request could take in the statement setting out the grounds of appeal. Thus, the fourth auxiliary request ".is the claims containing the following amendments to claims 10, 17, 19 and 23 in combination with any of the above requests".

- 3.1 Independently of the question whether a non-verbalised set of claims such as this can be considered as achieving the procedural status of a request, or whether it should be considered as non-existing, it is observed that the proposed amendments do not include changes to claim 2 which is identical to that of the higher ranking requests, such that the conclusions in respect of inventive step in any case would be identical. This means that the proposed request was doomed to failure.

Fifth Auxiliary request

4. Inventive step

- 4.1 Since claim 1 of the fifth auxiliary request is identical to claim 2 of the main request, the same conclusions apply in respect of inventive step.

Sixth Auxiliary request

5. Inventive step

- 5.1 The subject-matter of claim 1 of the sixth auxiliary requests differs from that of claim 2 of the main request in that in step (c), the solvent content after partial drying is limited to the range of 35% to 80%, a pressure and time range is specified for the compression step, and the solvent content of the protein matrix material product is defined as falling within the range of 30% to 50% (see point III above).

As far as the process is concerned, no new distinguishing features have been added with respect to claim 2 of the main request, which differed from the process of D1 in that the latter did not disclose steps (c), (d) and (e). D1 does not provide any information as to the solvent content of the product, and thus cannot be said to unambiguously disclose a solvent content in the range recited.

However, in addition to the reasons provided in respect of claim 2 of the main request, the comparative tests of the declaration of Dr Masters are not suitable for demonstrating an effect over D1 since the solvent content of the "product of the present invention" is

not provided, meaning it is unknown whether the solvent content of the product falls within the claimed range.

It follows that the objective technical problem remains the provision of a further method for the preparation of a protein matrix material.

The solution is obvious for the same reasons as those provided for claim 2 of the main request. Furthermore, with no further effect provided, it lies within the general ability of the skilled person wishing to solve the aforementioned problem to choose an appropriate compression pressure and time within the very broad range provided, and solvent content of the product falling within the claimed range.

It follows that claim 1 of the sixth auxiliary request does not involve an inventive step.

Conclusion

6. Since none of the auxiliary requests meet the requirements of inventive step, the appeal is to be dismissed, and there is no need for the Board to decide on any other issue.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar:

The Chairman:



S. Fabiani

J. Riolo

Decision electronically authenticated