

**Internal distribution code:**

- (A)  Publication in OJ  
(B)  To Chairmen and Members  
(C)  To Chairmen  
(D)  No distribution

**Datasheet for the decision  
of 9 March 2011**

**Case Number:** T 0897/08 - 3.3.09

**Application Number:** 96941469.7

**Publication Number:** 0873054

**IPC:** A23L 1/05

**Language of the proceedings:** EN

**Title of invention:**

Dietary fiber gels for preparing calorie reduced foods

**Patentee:**

The United States of America, represented by The Secretary of  
Agriculture

**Opponent:**

Cerestar Holding B.V.

**Headword:**

-

**Relevant legal provisions:**

RPBA Art. 12(2)

EPC Art. 56

**Relevant legal provisions (EPC 1973):**

-

**Keyword:**

"Inventive step - no"

**Decisions cited:**

-

**Catchword:**

-



Case Number: T 0897/08 - 3.3.09

**DECISION**  
of the Technical Board of Appeal 3.3.09  
of 9 March 2011

**Appellant:** The United States of America, represented by  
(Patent Proprietor) The Secretary of Agriculture  
Washington, DC 20230-1400 (US)

**Representative:** Elbel, Michaela  
Pateris  
Patentanwälte, Partnerschaft  
Postfach 33 07 11  
D-80067 München (DE)

**Respondent:** Cerestar Holding B.V.  
(Opponent) Nijverheidsstraat 1, PO Box 9  
NL-4551 LA Sas van Gent (NL)

**Representative:** Wilkinson, Stephen John  
Stevens, Hewlett & Perkins  
1 St. Augustine's Place  
Bristol BS1 4UD (GB)

**Decision under appeal:** Decision of the Opposition Division of the  
European Patent Office posted 29 February 2008  
revoking European patent No. 0873054 pursuant  
to Article 101(3)(b) EPC.

**Composition of the Board:**

**Chairman:** W. Sieber  
**Members:** M. O. Müller  
F. Blumer

## Summary of Facts and Submissions

- I. This appeal is by the proprietor of European patent No. 0 873 054 against the decision of the opposition division to revoke the patent.

The granted patent contains 18 claims, of which claim 1 reads as follows:

"1. A noncaloric, gellable product consisting of cellulosic, physically disrupted cellular debris, obtainable from a substrate under conditions of shear sufficient to completely disintegrate the morphological cellular structures of said substrate, characterized by the property of yielding a viscosity of at least 0,3 Pa s (300 cps) and a hydration capacity of at least 10 % when reconstituted with water at 3% solids."

- II. The opponent had requested revocation of the patent on the grounds that the claimed subject-matter was neither novel nor inventive (Article 100(a) EPC) and that 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 (Article 100(b) EPC).

The documents cited during opposition proceedings included:

D1: H. Bollinger, "Wheat Fiber Gel in the Food Industry", FOOD MARKETING & TECHNOLOGY, 1995, pages 4 - 6.

- III. In its decision, which was announced orally on 22 January 2008 and issued in writing on 29 February

2008, the opposition division revoked the patent because the subject-matter of the claims as granted lacked an inventive step and the auxiliary request did not meet the requirements of Articles 123(2) EPC and 84 EPC. The opposition division argued inter alia as follows:

With regard to the question of inventive step of the subject-matter of granted claim 1, D1 constituted the closest prior art. The objective technical problem was the provision of a gellable, noncaloric product with excellent hydration capacity, yielding a significant viscosity level, thus providing a creamy mouthfeel and rendering it suitable for use as a fat and/or flour replacer. However, this technical problem was already addressed and successfully solved in D1. No unexpected technical effects or advantages of the "complete" disintegration of cellular structures had been demonstrated. D1 also directly linked the presence of microfine particles with the advantageous properties. Hence, even if hydration capacity and viscosity-increasing properties would have been improved by complete transformation of the fibre into microfine particles, these technical effects would have been expected by the skilled person in view of the teaching of D1. Therefore, the subject-matter of granted claim 1 lacked an inventive step in view of this document.

- IV. On 29 April 2008, the appellant (proprietor) filed a notice of appeal against the above decision and paid the prescribed fee on the same day. A statement setting out the grounds of appeal was filed on 7 July 2008 together with

- A1: J. Rettenmaier & Söhne, "VITACEL® Wheat Fiber", obtained from [www.jrs.de](http://www.jrs.de), printed on 26 June, 2008;
- A2: J. Sieg et al, "Gesunde Nahrungsfasern", Article in online journal: [dei - die ernährungsindustrie](http://www.dei.de), volume 11, 2006, page 8, obtained from [www.dei.de](http://www.dei.de);
- A3: J. Rettenmaier & Söhne, Technical information (Technische Information), "Herstellung des VITACEL® oder VIVAPUR® Gels", undated;
- A4: S. Lander, "Gesund und verarbeitungsfreundlich", Article in online journal: [dei - die ernährungsindustrie](http://www.dei.de), volume 02, 2003, page 43, obtained from [www.dei.de](http://www.dei.de); and
- A5: "Rund um die Weizenfaser", Article in online journal: [dei - die ernährungsindustrie](http://www.dei.de), volume 05, 2008, page 54, obtained from [www.dei.de](http://www.dei.de).
- V. By letter of 19 November 2008, the respondent (opponent) filed a reply to the appeal together with
- D10: CRC Handbook of Chemistry and Physics, R. C. Weast and M. J. Astle (ed.), 59th edition, CRC Press, 1978, page F-51; and
- D11: US 5,123,962 A.
- VI. In the annex to the summons of 26 August 2010, the board stated that there could be information missing with regard to the measurement of viscosity and/or hydration capacity required by claim 1. In this context,

the board referred in particular to the reconstitution conditions to be applied before these measurements were made. The board also addressed the issue of inventive step in view of D1 as the closest prior art document.

VII. By letter of 23 December 2010, the appellant announced that it would not attend the oral proceedings.

VIII. On 9 March 2011, oral proceedings were held before the board in the absence of the appellant. The respondent maintained its request previously submitted in writing, namely that the appeal be dismissed.

IX. The appellant's arguments can be summarized as follows:

The claimed subject-matter differed from D1 in that the cellular structures were completely disintegrated and in that the viscosity of the product was at least 0.3 Pa s. There was no hint in D1 which would have prompted the skilled person to expect that the complete disruption of the cellular structures would lead to such a result. Therefore, the subject-matter of claim 1 was inventive in view of D1.

X. The respondent's position can be summarized as follows:

A1-A5 should not be admitted into the proceedings.

The viscosity and hydration capacity required by claim 1 were unclear. More particularly, as evidenced by tables 5A, 5B and 6A in the opposed patent, viscosity and hydration capacity depended on various reconstitution conditions, namely temperature, shear time and shear intensity, none of which was defined in

claim 1 of the patent specification. In fact, this lack of information amounted to lack of sufficiency.

With regard to the question of inventive step of the subject-matter of claim 1, D1 had to be considered to represent the closest prior art. The distinguishing feature, if any, was the fact that, contrary to D1, the cellular structures of the claimed product were disintegrated completely. The problem solved by this difference was a further increase in viscosity and hydration capacity. It followed from D11 that this further increase could be achieved by reducing the particle size of the gel. The skilled person aiming at a further increase in viscosity and hydration capacity would therefore reduce the particle size of the gel of D1 to values as disclosed in D11. As the particle sizes in D11 were far below those of plant cells, the skilled person would automatically arrive at completely disintegrated cellular structures as required by claim 1. The subject-matter of this claim therefore lacked an inventive step in view of D1 in combination with D11.

XI. The appellant (patentee) requested (in writing) that the decision under appeal be set aside and the patent be maintained as granted.

XII. The respondent (opponent) requested that the appeal be dismissed.

## **Reasons for the Decision**

1. The appeal is admissible.
  
2. *Admissibility of A1-A5*

A1-A5 were filed by the appellant with the statement of grounds of appeal. The respondent objected to the admission of these documents.

These documents were submitted by the appellant in order to prove that the gel in D1 does not exhibit completely disintegrated cellular structures. As will be set out below, the board accepts the appellant's argument in this respect without taking A1-A5 into account. Therefore, the decision is in favour of the appellant in this respect irrespective of A1-A5. There is thus no need to decide on the admissibility of these documents into the proceedings.

3. *Admissibility of D11*

No objection was raised by the appellant against the admissibility of this document.

D11 was filed by the respondent with the response to the statement of grounds of appeal. The submission of D11 is thus in line with Article 12(2) RPBA and the document is admitted into the present appeal proceedings.



4. *Inventive step*

4.1 The opposed patent is directed to cellulosic gellable products which are useful in preparing calorie-reduced foods. The patent aims in particular at products that can be reconstituted to gels that have high viscosities and high hydration capacities (page 2, lines 7-8, page 3, lines 7-15, page 4, lines 46-48 and claim 1).

4.2 D1 is also directed to a noncaloric fibre gel that can be used as an ingredient for low-calorie product formulations (last paragraph of the column in the middle of page 4). Moreover, just like the opposed patent, D1 aims at gels with high viscosity and high hydration capacity (first paragraph of the column in the middle of page 4, last paragraph of the right-hand column of page 4, last paragraph of the left-hand column on page 5 and last paragraph of the left-hand column on page 6).

In line with the submissions of both parties, D1 can therefore be considered to represent the closest prior art.

The gel of D1 is a wheat fibre gel designated "Vitacel". This gel is produced by a milling technique called "fiber fibrillation". This technique comprises the steps of stirring wheat fibre into water, milk or other liquids, and subsequently forming the gel through shear forces (high-speed mixer or colloid mill) or high pressure (homogenizer) (lines 4-8 of the left-hand column of page 5 of D1). Thereby a "very large proportion of microfine particles" is obtained (first three lines of the column in the middle of page 4).

4.3 The viscosities reported in the examples of the opposed patent are higher than those disclosed in figures 3 and 4 of D1. Moreover, in the absence of any disclosure of hydration capacities in D1, it can be assumed in the appellant's favour that the hydration capacities obtained in the examples of the opposed patent are also higher than those in D1.

Consequently, as acknowledged by the respondent, the objective technical problem can be seen in the provision of gels with even further increased viscosity and hydration capacity. This problem is also referred to in paragraph [0011] of the opposed patent.

4.4 The opposed patent proposes as a solution to this problem a noncaloric, gellable product with completely disintegrated morphological cellular structures, which has a viscosity of at least 0,3 Pa s (300 cps) and a hydration capacity of at least 10 % when reconstituted with water at 3% solids (claim 1).

4.5 It remains to be decided whether or not the proposed solution to the objective technical problem mentioned above (see point 4.3) is obvious in view of the state of the art.

4.5.1 D1 itself is silent as to the provision of gels with further increased viscosity and hydration capacity.

4.5.2 D11, however, demonstrates that the hydration capacity and the viscosity of a cellulosic fibre product are improved by complete transformation of the cellulosic fibre material into microfine particles. D11 concerns

finely divided suspensions of cellulosic material obtained by preferably subjecting pre-treated cellulosic material to a high-pressure homogenization treatment or a treatment in a colloidal mill (involving the application of high shear) to reduce the cellulosic material in size (column 12, lines 21-43). A preferred stirred medium wet grinding apparatus used in D11 is illustrated in figure 3. In this apparatus, a grinding medium is put in a closed container (stator) equipped with rotary blades (rotor) and a forced motion is given to the medium by the rotor rotating at high speed. A suspension containing the pre-treated cellulosic material is then poured into it and ground while being forcedly passed therethrough. The grinding medium to be used preferably includes ceramic or metallic beads (column 9, lines 31-38).

D11 teaches the skilled person in particular that viscosity and water retention, which is equivalent to hydration capacity, are directly related to the particle size of the gel (column 5, lines 1-3). With regard to this relationship, D11 discloses the following:

"The problem associated with the conventional suspension consists in that a proportion of such microfine particles of 3  $\mu\text{m}$  or less, though certainly present, is very low in relation to the total amount of particles. Namely, even in the conventional suspension having the maximum possible degree of particle fineness, a proportion (cumulative volume ratio) of microfine particles of 3  $\mu\text{m}$  or less is only 20.8% by volume at the highest amount possible, whereas one of the

suspensions obtained in the present invention contains such microfine particles in a proportion reaching 100% by volume. This is the basis for such a great difference in water retention properties, viscosity, and dispersion stability between the suspensions of the present invention and conventional suspensions" (column 5, lines 16-30).

"The present inventors have confirmed that there is a good agreement between a suspended particle size as expressed in a 50% cumulative volume diameter or a cumulative volume ratio of particles having a particle diameter of 3  $\mu\text{m}$  or less and water retention properties" (column 6, lines 22-27).

This teaching is corroborated by tables 8 and 9 of D11. More particularly, in table 8, an increase in the cumulative volume ratio of particles with a particle size of 3  $\mu\text{m}$  or less from a value of 13.9% to a value of 75.0% leads to viscosity increase from 280 cps to 1175 cps and a water retention increase from 420% to 1360%. Similarly, in table 9, an increase in the cumulative volume ratio of particles with a particle size of 3  $\mu\text{m}$  or less from a value of 14.3% to a value of 95.6% leads to a viscosity increase from 6600 cps to 20800 cps and a water retention increase from 389% to 1049%.

The skilled person would therefore learn from D11 that the higher the ratio of particles with a particle size of 3  $\mu\text{m}$  or less, the higher the viscosity and hydration capacity. Consequently, the skilled person trying to

increase further the viscosity and hydration capacity of the gel of D1 would, in view of the teaching of D11, reduce the particle size of the gel to below 3  $\mu\text{m}$ . Since, furthermore, a particle size of 3  $\mu\text{m}$  is far below the size of plant cells, the skilled person would thereby completely disintegrate the cellular structures of the gel of D1. The complete disintegration of cellular structures as required by claim 1 is therefore obvious in view of D1 and D11.

- 4.5.3 As regards the specific values for viscosity and hydration capacity required in claim 1, it can clearly be assumed, in the absence of any proof to the contrary, that the skilled person would automatically arrive at these specific values when completely disintegrating the cellular structures in view of the teaching of D11. With regard to viscosity, this is supported by the appellant's own submission on page 7 of the statement of grounds of appeal, where the following is stated: "Feature (d) of claim 1 (ie the complete disintegration of cellular structures) has indeed a technical effect which renders the product of the patent in suit substantially different to ''vitacel'' of D1. The complete disintegration of the morphological structure, which is achieved by sufficient shear leads to a viscosity which is by a factor 1000 (figure 3, D1) but at least by a factor 10-50 (figure 4, D1) higher than ''vitacel''" (first insertion in brackets made by the board).

With regard to hydration capacity, support comes from page 4, lines 27-30 of the opposed patent, where it is stated that at 3% solids the reconstituted gels are characterised by "hydration capacities up to at least

about 25, that is they absorb at least approximately 24 times their weight in water", which is far above the lower limit required by claim 1.

For this reason alone, the required specific values for viscosity and hydration capacity are obvious.

4.5.4 Moreover, it appears that the values required by claim 1 are virtually meaningless due to a lack of information concerning the actual measurement of these parameters. For example, the product has to be reconstituted with water at 3% solids before the actual measurement. However, neither the claim nor the remaining part of the opposed patent defines the conditions for the reconstitution of the product, although these conditions are crucial for the values actually measured. The respondent referred in this context, eg, to table 5B in the opposed patent. This table shows that an oven dried product under vigorous reconstitution has a viscosity of 7300 cps whereas the same product under mild reconstitution has a viscosity of only 55 cps. This is, for one and the same product, a variation of about 13000%. A similar deficiency, although much less marked, can be found for the hydration capacity in the opposed patent. For this reason, too, the required values for viscosity and hydration capacity in claim 1 cannot contribute to inventive step.

4.6 In conclusion, the solution according to claim 1 of providing a noncaloric, gellable product with completely disintegrated morphological cellular structures that has a viscosity of at least 0,3 Pa s (300 cps) and a hydration capacity of at least 10 %

when reconstituted with water at 3% solids lacks an inventive step in view of D1 in combination with D11.

5. In view of this finding, the other objections raised by the respondent with respect to novelty and sufficiency of disclosure (in particular as to whether or not the lack of information concerning the method of measurement for viscosity and hydration capacity amounts to insufficiency of disclosure) need not be discussed.

## **Order**

### **For these reasons it is decided that:**

The appeal is dismissed.

The Registrar:

The Chairman:

G. Röhn

W. Sieber